



DRAFT

Site Assessment Report

**Former Underground Storage Tanks H-19-1, H-19-2, and H-19-3
Building H-19
Marine Corps Base
Camp Lejeune, North Carolina**

Prepared For:

**Commander
Naval Facilities Engineering Command
Atlantic Division
1510 Gilbert Street
Norfolk, Virginia 23511-6287**

Prepared By:

**MACTEC Engineering and Consulting, Inc.
3301 Atlantic Avenue
Raleigh, North Carolina 27604**

**Navy Contract No. N62470-95-D-6009
MACTEC Job No. 30740-6-0600-0093**

December 23, 2003

December 23, 2003

DRAFT

Commander
Naval Facilities Engineering Command
Atlantic Division
1510 Gilbert Street
Norfolk, Virginia 23511-6287

Attention: Mr. John D. Conway, P.G., Code EV32JC

Subject: **Site Assessment Report**
Former USTs H-19-1, H-19-2, and H-19-3
Building H-19
Marine Corps Base
Camp Lejeune, North Carolina
NAVY Contract No. N62470-95-D-6009
MACTEC Job No. 30740-6-0600-0093

Dear Mr. Conway:

MACTEC Engineering and Consulting, Inc. (MACTEC), formerly known as Law Engineering and Environmental Services, Inc. (LAW), is pleased to submit the attached Site Assessment Report to the Naval Facilities Engineering Command, Atlantic Division (LANTDIV). MACTEC has completed the activities specified in Delivery Orders 0093 and 0140. These activities were performed in order to comply with the Risk Based Corrective Action rules established on January 2, 1998. The objective of our services was to provide the necessary information to enable the State to assign the project site no further action status.

MACTEC appreciates the opportunity to continue to provide services to LANTDIV and the MCB on your environmental projects. Should you have any questions regarding the contents of this submittal, please contact us.

Sincerely,

MACTEC Engineering and Consulting, Inc.

William S. Grimes, L.G.
Project Geologist

Richard A. Kolb, L.G.
Principal Geologist

Attachment: Site Assessment Report and Appendices

cc: Roger R. Marce, Jr.- Contracts, correspondence only
N. Neal Paul, - Installations and Environment/EMD/EQB, MCB, Camp Lejeune
Michael E. Mason, P.E., Program Manager, Catlin Engineers & Scientists, Inc.,
correspondence only

DRAFT

Site Assessment Report

A. Site Identification

DATE OF REPORT: December 23, 2003

Facility I.D.: Not Assigned

UST Incident Number (if known): 17633

Site Name: Building H-19

Site Location: Marine Corps Base

Nearest City/Town: Camp Lejeune, North Carolina County: Onslow

Risk Classification: 30/E (Low Risk)

Reason for Risk: No Free Product, Groundwater Contamination less than GCLs

Land Use Category: Industrial/Commercial

UST Owner: Commanding General

Address: PSC Box 20004, Marine Corps Base, Camp Lejeune, NC 28542-0004 Phone: (910) 451-5068

UST Operator: Commanding General

Address: PSC Box 20004, Marine Corps Base, Camp Lejeune, NC 28542-0004 Phone: (910) 451-5068

Property Owner: Commanding General

Address: PSC Box 20004, Marine Corps Base, Camp Lejeune, NC 28542-0004 Phone: (910) 451-5068

Property Occupant: Marine Corps Air Station Operations

Address: H-19, Curtis Road, MCAS, New River, NC Phone: 910-449-5008

Consultant/Contractor: MACTEC Engineering and Consulting, Inc.

Address: 3301 Atlantic Avenue, Raleigh, NC 27604 Phone: (919) 876-0416

Attention: Mr. Jeff Mann, P.E.

Release Information

Date Discovered: June 2, 1993

Latitude: 34.676583 N

Longitude: 77.370377 W

Estimated Quantity of Release: Unknown

Cause of Release: Unknown

Source of Release (e.g., Piping/UST): Leaking Underground Storage Tank (UST)

Sizes and contents of UST system(s) from which the release occurred): Based on the UST closure report, the site contained two 15,000-gallon capacity heating oil (diesel fuel) USTs and one 5,000-gallon capacity waste oil UST systems.

I, William S. Grimes, a Licensed Geologist for MACTEC Engineering and Consulting, Inc., do certify that the information contained in this report is correct and accurate to the best of my knowledge.

William S. Grimes, L.G.

Project Geologist

(Please Affix Seal and Signature)

EXECUTIVE SUMMARY

The Building H-19 site is located in the Hadnot Point area of the Camp Lejeune Marine Corps Base in Camp Lejeune, North Carolina. Two diesel-fuel and one waste-oil underground storage tanks (USTs) were located north of Building H-19 and west of the former location of Building H-20. The diesel-fuel USTs each had a capacity of 15,000-gallons and the waste-oil UST had a capacity of 5,000-gallons. Product-delivery lines formerly connected the USTs to Building H-20, which housed the boiler plant for the old naval hospital. The USTs were removed in May and June 1993. The USTs were apparently the source of the release. The quantity of the release is unknown.

Peele's Pump and Tank Company (Peele's) excavated and disposed of approximately 45 tons of contaminated soil from the diesel-fuel UST excavation and approximately 130 tons of contaminated soil from the waste-oil UST excavation during UST-closure activities. Peele's submitted three soil samples collected from the base of the diesel-fuel UST excavation and three soil samples collected from the base of the waste-oil UST excavation for laboratory testing. The laboratory detected oil and grease in one sample from each of the UST basins at concentrations that exceeded the Action Levels in effect at that time. Peele's reportedly encountered groundwater in both excavations prior to collecting their samples. Free product was not identified within either basin during excavation.

R.E. Wright Environmental, Inc. (Wright) conducted a Five plus Two Additional Wells Site Check in 1995. During their investigation, Wright installed seven monitoring wells, and collected soil samples from each well boring and groundwater samples from each well for laboratory testing. The laboratory detected diesel range - total petroleum hydrocarbons (TPH) in one of the soil samples at a concentration in excess of the Action Level. The laboratory detected volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs) in two of the groundwater samples at concentrations that exceeded the North Carolina Groundwater Quality Standards (2L Standards) in effect at that time.

MACTEC Engineering and Consulting, Inc. (MACTEC), operating as Law Engineering and Environmental Services, Inc. (LAW), advanced 19 Powerprobe borings and collected soil samples from 16 of those borings, advanced and sampled three hand-auger borings, installed seven monitoring wells (five Type II and two Type III wells), sampled the new and existing site-monitoring wells, and prepared a Draft Leaking UST Site Assessment Report in 1997. The laboratory detected diesel range-TPH in one Powerprobe soil sample at a concentration in excess of the Action Level. Soil samples collected from the hand-auger borings and from one monitoring well boring did not exhibit the presence of VOCs, SVOCs, or the eight RCRA metals at concentrations in excess of the North Carolina Corrective Action Limits in effect at the time. The laboratory detected several VOCs at concentrations in excess of the 2L Standards in the groundwater samples collected during this investigation. The laboratory did not detect SVOCs or metals at concentrations that exceeded the 2L Standards.

LAW conducted quarterly free-product gauging events at the site from July 2000 to April 2001, and collected groundwater samples during the October 2000 and April 2001 gauging events. LAW measured a 0.01-foot thickness of free product during the January 2001 gauging event in monitoring well USTH19-MW03. LAW did not identify free product during the remaining gauging events. The laboratory detected p-isopropyltoluene in the groundwater sample collected from USTH19-MW07 at a concentration above the laboratory detection limit during the April 2001 sampling event. A 2L Standard has not been established for p-isopropyltoluene; therefore, the laboratory detection limit is considered to be the standard. The laboratory did not detect SVOCs, extractable or volatile petroleum hydrocarbons tested for according to the Massachusetts Department of Environmental Protection Methods (MADEP Methods), or chromium or lead at concentrations that exceeded their respective 2L Standards in the groundwater samples collected during the October 2000 and April 2001 sampling events.

LAW advanced two hand-auger borings in the former diesel-fuel UST basin, one hand-auger boring in the former waste-oil UST basin, and two hand-auger borings along the product-delivery lines in July 2000 and submitted one soil sample from each boring to the laboratory for testing. The laboratory tested the soil samples from the diesel-fuel and waste-oil UST basins for VOCs, SVOCs, pesticides, polychlorinated biphenyls (PCBs), MADEP hydrocarbons, chromium, and lead. The laboratory tested the soil samples from the product-delivery lines for VOCs, SVOCs, and MADEP hydrocarbon fractions. The laboratory detected benzo[a]pyrene at a concentration in excess of the Industrial/Commercial Maximum Soil Contaminant Concentration (MSCC) in the sample collected from the waste-oil UST basin. The laboratory did not detect other target analytes in the remaining soil samples at concentrations that exceeded the respective Industrial/Commercial MSCCs.

LAW conducted quarterly free-product gauging activities from September 2001 to May 2002, and collected groundwater samples from selected monitoring wells for laboratory testing during the May 2002 event. LAW did not identify free product at the site during these quarterly gauging events. The laboratory detected chloroform at a concentration that exceeded its 2L Standard in the groundwater sample collected from monitoring well USTH19-MW01 during the May 2002 sampling event. The laboratory did not detect SVOCs, MADEP hydrocarbon fractions, chromium, or lead in the groundwater samples at concentrations in excess of the 2L Standards in the remaining groundwater samples tested.

Free product has not been identified at the site during the last five quarterly gauging events completed through May 2002. Dissolve-phase groundwater contamination has not been identified at the site at concentrations above the GCLs.

Based on these findings, MACTEC concludes that the Building H-19 site continues to meet criteria for State designation as Low Risk with a land use classification of Industrial/Commercial. Applicable cleanup levels are Industrial/Commercial MSCCs for soil and GCLs for groundwater. Dissolved-phase groundwater contamination has not been identified at concentrations in excess of the GCLs. The laboratory detected benzo[a]pyrene in one soil sample collected from the waste-oil UST basin at a concentration that exceeded its Industrial/Commercial MSCC. Therefore, additional assessment and/or remedial actions will likely be required for vadose-zone soil in the vicinity of the waste-oil UST.

MACTEC recommends collecting a soil sample from a location adjacent to where the sample that exhibited benzo[a]pyrene at a concentration in excess of the Industrial/Commercial MSCC was collected, and testing the sample in the laboratory to see if vadose-zone contamination has naturally attenuated to below the target cleanup goals in the past three years. Once laboratory test results confirm vadose-zone soils at the site do not exhibit petroleum-related compounds at concentrations above the target cleanup goals, a Notice of Residual Petroleum with land use restrictions should be prepared for the site, and if approved by DWM, the site should receive a notice of No Further Action required. MACTEC recommends that you submit a copy of this report to the Wilmington Regional Office of the North Carolina Department of Environment and Natural Resources, Division of Waste Management, UST Section for their review.

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1.0 Investigative History

The subject site is shown on Drawings 1 and 2. Property owner/occupant information is included in Table 1. The following table lists known environmental assessment or remediation reports prepared for the Building H-19 site:

NO.	REPORT TITLE	DATE	AUTHOR
1	Initial Site Assessment Report, UST Closure by Removal, (2) 15,000-gallon heating oil [sic], Building H-19	Undated	Peele's Pump and Tank Company; West Columbia, South Carolina
2	Initial Site Assessment Report, UST Closure by Removal, (2) 5,000-gallon waste oil [sic], Building H-19	Undated	Peele's Pump and Tank Company; West Columbia, South Carolina
3	Five Plus Two Additional Wells Site Check, UST H-19	June 1995	R. E. Wright Environmental, Inc; Norfolk Virginia
4	Leaking UST Site Assessment Report (Draft), UST H-19	May 1997	Law Engineering and Environmental Services, Inc.
5	Report of Natural Attenuation Monitoring, Building H-19	February 1998	Law Engineering and Environmental Services, Inc.
6	Second Natural Attenuation Monitoring Report, Building H-19, Hadnot Point	September 1998	Law Engineering and Environmental Services, Inc.
7	First Semi-Annual Groundwater Monitoring Report, Buildings H-19-1, H-19-2, and H-19-3	December 2000	Law Engineering and Environmental Services, Inc.
8	Second Semi-Annual Groundwater Monitoring Report, Buildings H-19-1, H-19-2, and H-19-3	May 2001	Law Engineering and Environmental Services, Inc.

2.0 Soil Sampling

On May 2, 1993, Peele's Pump and Tank Company (Peele's) removed two 15,000-gallon capacity underground storage tanks (USTs) that had been used to store diesel fuel. In their undated UST Closure Report, Peele's reported collecting three grab soil samples from the excavation floor. One soil sample was collected beneath each UST, and the leachate extracted from each sample was tested for metals according to the Toxicity Characteristic Leachate Procedure (TCLP). Peele's collected a third soil sample from the center of the excavation, between the two tanks, and had the sample tested for oil and grease. The soil samples were collected from approximately 13 ft below land surface (bls). Peele's reported encountering groundwater during excavation activities, prior to collecting the soil samples. The soil sample collected from the center of the excavation exhibited oil and grease at a concentration of 600 mg/kg, in excess of the 250 mg/kg Action Level. Peele's did not submit soil samples for testing by other methods.

On June 2, 1993, Peele's returned to the site to remove a 5,000-gallon capacity UST that had been used to store waste oil. Peele's collected three soil samples from the floor of the excavation, approximately 12 ft bls. Peele's collected one soil sample from each end of the UST and one soil sample from beneath the center of the UST. The two soil samples collected from the ends of the UST were tested for oil and grease, and the leachate extracted from the sample collected from beneath the center of the UST was tested for metals according to TCLP. The soil samples tested for oil and grease exhibited concentrations of 1800 and 100 mg/kg. MACTEC does not have a copy of the laboratory test results for the metals testing. Peele's reported encountering groundwater in the excavation prior to collecting the soil samples.

On March 6 and 7, 1995, R. E. Wright Environmental Services, Inc. (Wright) advanced seven soil borings to depths of approximately 11.0 to 14.3 ft bls during the installation of seven groundwater monitoring wells. Wright reported continuously sampling each boring and screening the samples with a photoionization detector (PID) to measure organic vapors (Report No. 3). Wright selected the soil sample from each boring that exhibited the highest PID reading for laboratory testing for gasoline range organic-TPH (GRO-TPH), diesel range organic-TPH (DRO-TPH), oil and grease, halogenated solvents, and metals according to TCLP. The laboratory detected DRO-TPH at a concentration of 580 milligrams per kilogram (mg/kg) in the soil sample collected from seven to eight ft bls from MW-2. The laboratory detected 1,2,4-trimethylbenzene and 1,3,5-trimethylbenzene in the soil sample from the boring advanced for MW-2 and oil and grease in the soil samples, but not at concentrations above their respective Action Levels.

MACTEC Engineering and Consulting, Inc. (MACTEC), operating as Law Engineering and Environmental Services, Inc. (LAW), conducted soil-sampling activities from January 23 through March 25, 1997. LAW advanced 19 Powerprobe borings, three hand-auger borings, and seven hollow-stem auger borings at the site. Soil-sampling activities were conducted in an attempt to delineate the lateral and vertical extent of vadose-zone soil contamination and for the purpose of installing additional groundwater monitoring wells. Hollow-stem auger borings were converted into five Type II (shallow) and two Type III (deep) monitoring wells. The locations of the borings advanced during these events are illustrated on Drawing 3.

Soil samples from each Powerprobe and hand-auger boring, and selected borings for monitoring wells were submitted for laboratory testing. Soil samples collected from near the diesel tanks were tested for GRO- and DRO-TPH according to EPA Preparation Methods 5030/3550, respectively, and Test Method 8015M. Soil samples collected from near the waste-oil UST were tested for volatile organic compounds (VOCs) according to EPA Method 8021 and for oil and grease according to EPA Method 9071 with silica gel cleanup Methods 5520 E and F. The laboratory detected DRO-TPH in soil sample H19-DP10 at a concentration of 239 mg/kg, in excess of the 40 mg/kg Action Level. The laboratory did not DRO- or GRO-TPH, VOCs, or oil and grease in the remaining soil samples at concentrations that exceed the respective Action Levels. A summary of laboratory test results for this sampling event is included in Appendix A.

LAW returned to the site on July 12 and 18, 2000 to collect five soil samples. LAW collected two soil samples from the diesel-fuel UST excavation, one sample from the waste-oil UST excavation, and two samples adjacent to the fuel-delivery line. Soil boring logs for the borings advanced during this investigation are included in Appendix B. All of the soil samples collected were tested in the laboratory for VOCs according to EPA Method 8260, semi-volatile organic compounds (SVOCs) according to EPA Method 8270, and volatile and extractable petroleum hydrocarbons (VPH and EPH) according to the methods of the Massachusetts Department of Environmental Protection (MADEP). The soil samples collected from the waste-oil UST excavation and from the location of the fuel-delivery lines were tested for chromium and lead according to EPA Method 6010B.

The laboratory detected benzo[a]anthracene (1.1 mg/kg), benzo[a]pyrene (1.1 mg/kg), and benzo[b]fluoranthene (1.5 mg/kg) in soil sample USTH19-SB03-02 at concentrations that exceed their respective Soil-to-Groundwater and Residential Maximum Soil Contaminant Concentrations (MSCCs). The benzo[a]pyrene concentration exceeds the Industrial/Commercial MSCC. Laboratory test results for the July 2000 sampling event are summarized in Table 2 and on Drawing 3. A copy of the Laboratory Test Report including chain-of-custody record for the July 2000 sampling event is included in Appendix C.

3.0 Groundwater Monitoring/Sampling

Wright conducted the initial groundwater-sampling event at the site on March 7-8, 1997 as part of their Five Plus Two Additional Wells Site Check. Wright installed and sampled seven monitoring wells (USTH19-MW01 through -MW07) and had the groundwater samples tested for VOCs according to EPA Method 502.2 and for SVOCs according to EPA Method 625. Wright's groundwater sample from monitoring well USTH19-MW03 exhibited six VOCs and one SVOC at concentrations that exceeded the respective North Carolina Groundwater Quality Standards established in Title 15A, Subchapter 2L, Section .0202 of the North Carolina Administrative Code (2L Standards; 15A NCAC 2L .0202). The sample collected from monitoring well USTH19-MW07 exhibited five VOCs at concentrations that exceeded the respective 2L Standards.

LAW collected 16 groundwater samples on February 20-21, 1997 for laboratory testing as part of our Leaking UST Site Assessment. The 16 groundwater samples were tested in the laboratory for VOCs and SVOCs. The laboratory detected VOCs at concentrations in excess of the respective 2L Standards in 10 of the groundwater samples, and four SVOCs at concentrations in excess of the respective 2L Standards in one of the groundwater samples. Drawing 4 illustrates the location of the monitoring wells from which these groundwater samples were collected during the Leaking UST Site Assessment. A summary of laboratory test results is included in Appendix D.

LAW used the results of the groundwater-sampling event conducted in February 1997 to determine the locations for seven new monitoring wells. LAW sampled the new wells (MW-08 through -14) between March 27 and April 10, 1997, and submitted the samples to the laboratory for testing for VOCs, SVOCs, and for the metals arsenic, barium, cadmium, chromium, lead, selenium, and silver according to EPA Method 6010. The laboratory detected VOCs at concentrations that exceeded the respective 2L Standards in groundwater samples collected from monitoring wells USTH19-MW09, -MW10, -MW11, and -MW13. The laboratory did not detect SVOCs or metals at concentrations in excess of the 2L Standards. A table summarizing the analytical results of this sampling event is included in Appendix D. Drawing 4 illustrates the sampling locations from LAW's Draft Leaking Underground Storage Tank Site Assessment Report.

LAW conducted the first of two Natural Attenuation Monitoring events in January 1998. LAW gauged nine of the on-site monitoring wells for the presence of free product, collected depth-to-water measurements, and used these measurements to construct a water-table elevation map. LAW did not identify free product at the site during this event. LAW collected groundwater samples from monitoring wells USTH19-MW07 and USTH19-MW10 and submitted the samples for laboratory testing for VOCs and SVOCs. The laboratory detected tetrachloroethene at a concentration of 1.52 micrograms per liter ($\mu\text{g/l}$) in the groundwater sample collected from USTH19-MW07, which exceeds the 2L Standard of 0.7 $\mu\text{g/l}$. The laboratory detected eight VOCs in the sample from USTH19-MW07 and three VOCs in the sample from USTH19-MW10 at concentrations below the respective 2L Standards. A summary table of laboratory analytical results for this sampling event is included in Appendix E.

LAW conducted the second Natural Attenuation Monitoring event in July 1998. Monitoring wells USTH19-MW07 and USTH19-MW10 were gauged and sampled during this event. LAW did not identify free product in either of the two wells. Groundwater samples collected from these wells were tested in the laboratory for VOCs and SVOCs. Laboratory test results indicated an overall decrease in concentrations of petroleum-related compounds in the groundwater at the site. The laboratory detected tetrachloroethene at a concentration of 1.35 µg/l in the sample collected from USTH19-MW07, in excess of its 2L Standard. The concentrations of n-butylbenzene, naphthalene, and 1,2,4-trimethylbenzene in the sample from USTH19-MW07 increased since the January 1998 sampling event, but remained below the respective 2L Standards. The remaining VOCs identified in the sample from USTH19-MW07 had decreased in concentration since January 1998. The groundwater sample collected from USTH19-MW10 did not exhibit VOCs or SVOCs at concentrations in excess of the practical quantitation limit. A summary table of laboratory test results for this sampling event is included in Appendix F.

LAW initiated a quarterly gauging and semi-annual sampling program for the site in July 2000 (Report No. 7). On July 19, 2000, LAW gauged 12 of the 14 monitoring wells at the site. Monitoring wells USTH19-MW08 and USTH19-MW-12 could not be located during the July 2000 event. LAW did not identify the presence of free product during this gauging event.

LAW returned to the site on October 10, 2000 to gauge the onsite wells and collect groundwater samples from USTH19-MW01, -MW02, -MW03, -MW05, and -MW07 for laboratory testing for VOCs, SVOCs plus tentatively identified compounds (TICs), MADEP EPH and VPH, and for chromium and lead. The laboratory did not detect VOCs, SVOCs, MADEP compounds, or metals in the groundwater samples tested at concentrations above the practical quantitation limit. The laboratory detected low concentrations of one known and two unknown TICs in the groundwater sample collected from USTH19-MW03. 2L Standards have not been established for TICs. A complete copy of the First Semi-Annual Groundwater Monitoring Report is included in Appendix G.

LAW conducted the third quarterly gauging activities of all site-monitoring wells except USTH19-MW12 on January 16, 2001. USTH19-MW12 could not be located during this event. LAW detected a 0.01-foot thickness of free-product in monitoring well USTH19-MW03 during the January 2001 gauging event.

LAW returned to the site on April 11, 2001 to conduct the second, semi-annual, groundwater-monitoring event for the H-19 site. LAW gauged all site monitoring wells except USTH19-MW12, which could not be located. LAW submitted groundwater samples collected from monitoring wells USTH19-MW01, -MW02, MW-03, MW05, and -MW07 for laboratory testing for VOCs, SVOCs plus TICs, MADEP EPH and VPH, and for chromium and lead. The laboratory did not detect VOCs, SVOCs, EPH, VPH, chromium, or lead in the groundwater samples at concentrations that exceeded the 2L Standards. The laboratory detected low concentrations of unknown TICs in the groundwater samples collected from monitoring wells USTH19-MW01, -MW03, and MW-07. A complete copy of the Second Semi-Annual Groundwater Monitoring Report is included in Appendix H.

LAW conducted quarterly gauging events for the H-19 site during September and November 2001, and March and May 2002. LAW gauged each of the site monitoring wells during these events for the presence of free product. LAW did not detect a measurable thickness of free product during the four gauging events. The results of these gauging events are included in Appendix I.

LAW collected groundwater samples from monitoring wells USTH19-MW01, -MW02, -MW03, -MW05, and -MW07 during the May 2002 gauging event. LAW submitted these samples for laboratory testing for VOCs, SVOCs plus TICs, EPH, VPH, chromium, and lead. The laboratory did not detect SVOCs, EPH,

VPH, chromium, or lead in the groundwater samples tested at concentrations that exceeded the 2L Standards. The laboratory detected chloroform in groundwater sample USTH19-MW-01 at a concentration that exceeds the 2L Standard. The laboratory detected low concentrations of unknown TICs in the groundwater samples collected from monitoring wells USTH19-MW03, -MW05, and -MW07. Laboratory test results from the May 2002 sampling event are summarized on Table 3 and Drawing 4. A contour map of water-table elevations determined for the May 2002 monitoring event is included as Drawing 5. The laboratory test reports and chain-of-custody record for the May 2002 sampling event are included in Appendix J.

4.0 Conclusions

MACTEC has completed four quarterly gauging events from September 2001 through May 2002. Free product was not identified during these gauging events. Groundwater samples collected from selected site monitoring wells during the period from 1997 (LAW's Draft Leaking UST Site Assessment Report) through May 2002 (the most recent sampling event) have not exhibited petroleum constituents at concentrations that exceed the GCLs.

The laboratory detected benzo[a]pyrene in one soil sample collected from the waste-oil UST excavation at a concentration of 1.1 mg/kg. This concentration exceeds the Industrial/Commercial MSCC of 0.78 mg/kg established for benzo[a]pyrene. The laboratory did not detect other petroleum constituents in the vadose zone soil samples tested at concentrations in excess of established Industrial/Commercial MSCCs.

The source area is located in the Coastal Plain physiographic province. Recharge to the unconfined, surficial aquifer in this area of the Marine Corps Base is likely, but that aquifer is not used as a water-supply resource. The underlying Castle Hayne aquifer may obtain a portion of recharge from the surficial aquifer. However, the amount of recharge from the surficial aquifer to the Castle Hayne aquifer is expected to be limited by the semi-confining or confining hydrogeologic unit (Castle Hayne confining unit) between the two aquifers.

According to the hydrogeologic framework database maintained by NCDENR, the depth to the top of the Castle Hayne confining unit is approximately 106 ft at the subject site. Soil boring logs prepared for Type III monitoring wells USTH19-MW11 and USTH19-MW13, installed to a depth of 40 ft bls, show that LAW did not identify soil/lithologic units interpreted to be confining units. Groundwater samples collected from USTH19-MW11 during March and April of 1997 exhibited bromodichloromethane, chloroform, dibromochloromethane, and isopropylbenzene at concentrations that exceeded the 2L Standards. Groundwater samples collected from USTH19-MW13 during that same period exhibited chloroform, p-isopropyltoluene, and trichloroethene at concentrations that exceeded the 2L Standards. Of the target analytes identified, only chloroform and trichloroethene had established 2L Standards in 1997, when GCLs had not been established.

Based on these findings, MACTEC concludes that the subject site continues to meet criteria for State designation as Low Risk with a land use classification of industrial/commercial. Applicable cleanup levels are Industrial/Commercial MSCCs for soil and GCLs for groundwater. Groundwater samples collected in May 2002 did not exhibit petroleum constituents at concentrations in excess of these cleanup levels. Benzo[a]pyrene was detected in one soil sample collected from 3-5 ft bls in the former waste-oil UST basin at a concentration in excess of the Industrial/Commercial MSCC for that compound. Therefore, additional assessment/remedial activities will likely be required in this area prior to receiving a notice of No Further Action from DWM. Once laboratory test results confirm vadose zone soils at the site do not contain petroleum-related compounds at concentrations above the target cleanup goals, a

Notice of Residual Petroleum with land use restrictions should be prepared for the site, and if approved by DWM, the site should receive a notice of No Further Action.

MACTEC recommends that you submit a copy of this report to the Wilmington Regional Office of the North Carolina Department of Environment and Natural Resources, Division of Waste Management, UST Section for their review.

Tables

Table 1

Date: 12/19/03 **Property Owner/Occupant Incident No. and Name:** No. 17633, MCB Building H-19 **Facility ID#:** *not assigned*

Tax Parcel Number/ Map ID	Owner/ Occupant Name	Address
Not Applicable	Commanding General*	Marine Corps Base PSC Box 20004 Camp Lejeune, NC 28542-0004 (910) 451-5068

* Owner/ Occupant of Subject Site and Contiguous Properties.

Table 2

Date: 12/19/03

Summary of Soil Sampling Results - July 2000

Incident No. and Name: No. 17633, MCB Building H-19

Facility ID#: not assigned

Analytical Method →			8260B										8270										8081	8082	MADEP Hydrocarbon Fractions				6010B																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
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Sample ID	Date Collected	Sample Depth (ft. bls)																					Pesticides		PCB's		C ₅ -C ₈ Aliphatics		C ₉ -C ₁₈ Aliphatics		C ₁₉ -C ₃₆ Aliphatics		C ₉ -C ₃₂ Aromatics		Chromium		Lead																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
USTH19-SB01-04	7/12/00	7 to 9	No compounds detected										Benzo[a]anthracene		Benzo[a]pyrene		Benzo[b]fluoranthene		Benzo[g,h,i]perylene		Benzo[k]fluoranthene		Bis(2-)ethylexyl)phthalate		Chrysene		Fluoranthene		Indeno(1,2,3-c,d)pyrene		Pyrene		Pesticides		PCB's		C ₅ -C ₈ Aliphatics		C ₉ -C ₁₈ Aliphatics		C ₁₉ -C ₃₆ Aliphatics		C ₉ -C ₃₂ Aromatics		Chromium		Lead																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
													<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<0.34		<	

N/A = Not Applicable
NCD = No compounds detected by the referenced Method
NT = Sample not tested by the referenced Method
MSCC = Maximum Soil Contaminant Concentration
ft. bls = feet below land surface
Concentrations given in milligrams per kilogram (mg/kg)
<# = Result less than the given practical quantitation limit (PQL)
Bold numbers indicate concentrations in excess of PQL
Shaded cells indicate concentrations in excess of the Industrial/Commercial MSCC
HBL = Health Based Level

Table 3

Summary of Groundwater Sampling Results – May 2002
Incident No. and Name: No. 17633, MCB Building H-19

Facility ID#: Not assigned

Analytical Method →		6210D						625	MADEP VPH and EPH				6010B	
Well and Sample ID	Contaminant of Concern → Date Collected	n-Butylbenzene	sec-Butylbenzene	tert-Butylbenzene	Chloroform	Isopropylbenzene	TICS	C ₅ -C ₈ Aliphatics	C ₉ -C ₁₈ Aliphatics ¹	C ₁₉ -C ₃₆ Aliphatics	C ₉ -C ₂₂ Aromatics ²	Chromium	Lead	
		<0.5	<0.5	<0.5	13	<0.5	None Detected	<100	<100	<100	<100	<100	<10	<10
USTH19-MW01	5/30/02	<0.5	<0.5	<0.5	<0.5	<0.5	None Detected	<100	<100	<100	<100	<10	<10	
USTH19-MW02	5/30/02	<0.5	<0.5	<0.5	<0.5	<0.5	2 [21.6]	<100	<100	<100	<100	<10	<10	
USTH19-MW03	5/30/02	<0.5	<0.5	<0.5	<0.5	<0.5	1 [5.9]	<100	<100	<100	<100	<10	<10	
USTH19-MW05	5/30/02	<0.5	<0.5	<0.5	<0.5	<0.5	2 [10]	<100	<100	<100	<100	<10	<10	
USTH19-MW07	5/30/02	1	5	0.9	<0.5	3		<100	<100	<100	<100	<10	<10	
NC Groundwater Quality Standard		70	70	70	0.00019	70	N/E	420	4,200	42,000	210	50	15	
GCL		6,900	8,500	15,000	190	25,000	N/E	N/E	N/E	N/E	N/E	50,000	15,000	

All concentrations given in micrograms per liter (µg/l)

<# = Analytical result is less than the referenced practical quantitation limit (PQL)

Bold numbers indicate concentrations in excess of the PQL

Shaded cells with bold numbers indicate concentrations in excess of the North Carolina Groundwater Quality Standard

TICs = Tentatively Identified Compounds

#[#] = Number of TICs identified and [their total estimated concentration]

GCL = Gross Contaminant Level

N/E = Not Established

Notes:

¹ MADEP C₉-C₁₈ aliphatic concentrations are determined by combining the analytical results for the VPH C₉-C₁₂ and EPH C₉-C₁₈ aliphatic hydrocarbon fractions.

² MADEP C₉-C₂₂ aromatic concentrations are determined by combining the analytical results for the VPH C₉-C₁₀ and EPH C₁₁-C₂₂ aromatic hydrocarbon fractions.

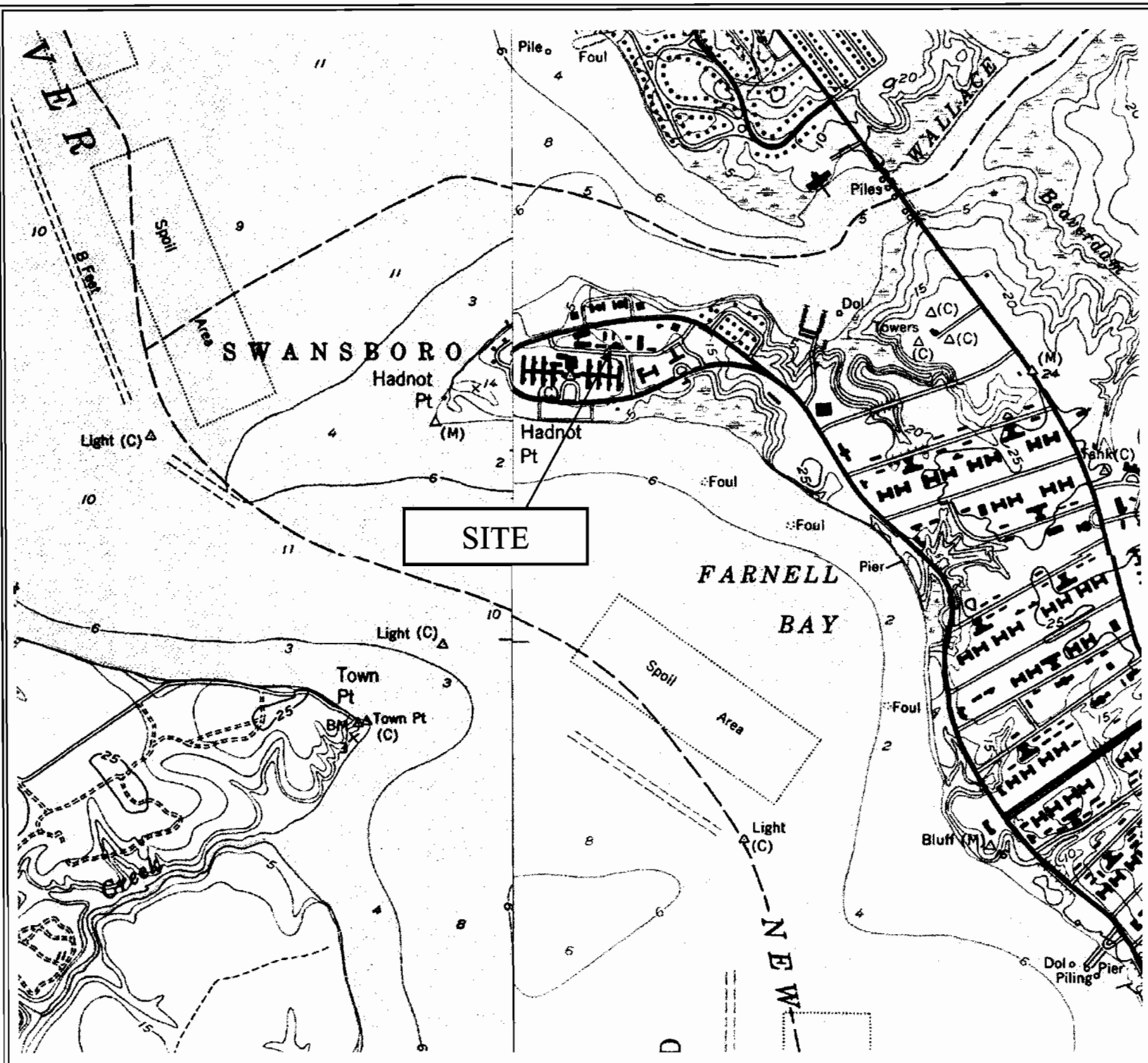
Prepared by: WBL

Date: 11/18/03

Checked by: DBY

Date: 12/18/03

Drawings



JACKSONVILLE SOUTH, N. C. CAMP LEJEUNE, N. C.

NW/4 NEW RIVER 15' QUADRANGLE

34077-F4-TF-024

34077-F3-TF-024

1952

PHOTOINSPECTED 1988

DMA 5553 III NW-SERIES V 842

1952

PHOTOREVISED 1971

DMA 5553 III NE-SERIES V842



NOTE: SITE LOCATION IS APPROXIMATE

NORTH

CONTOUR INTERVAL 5 FEET

NORTH AMERICAN DATUM OF 1929

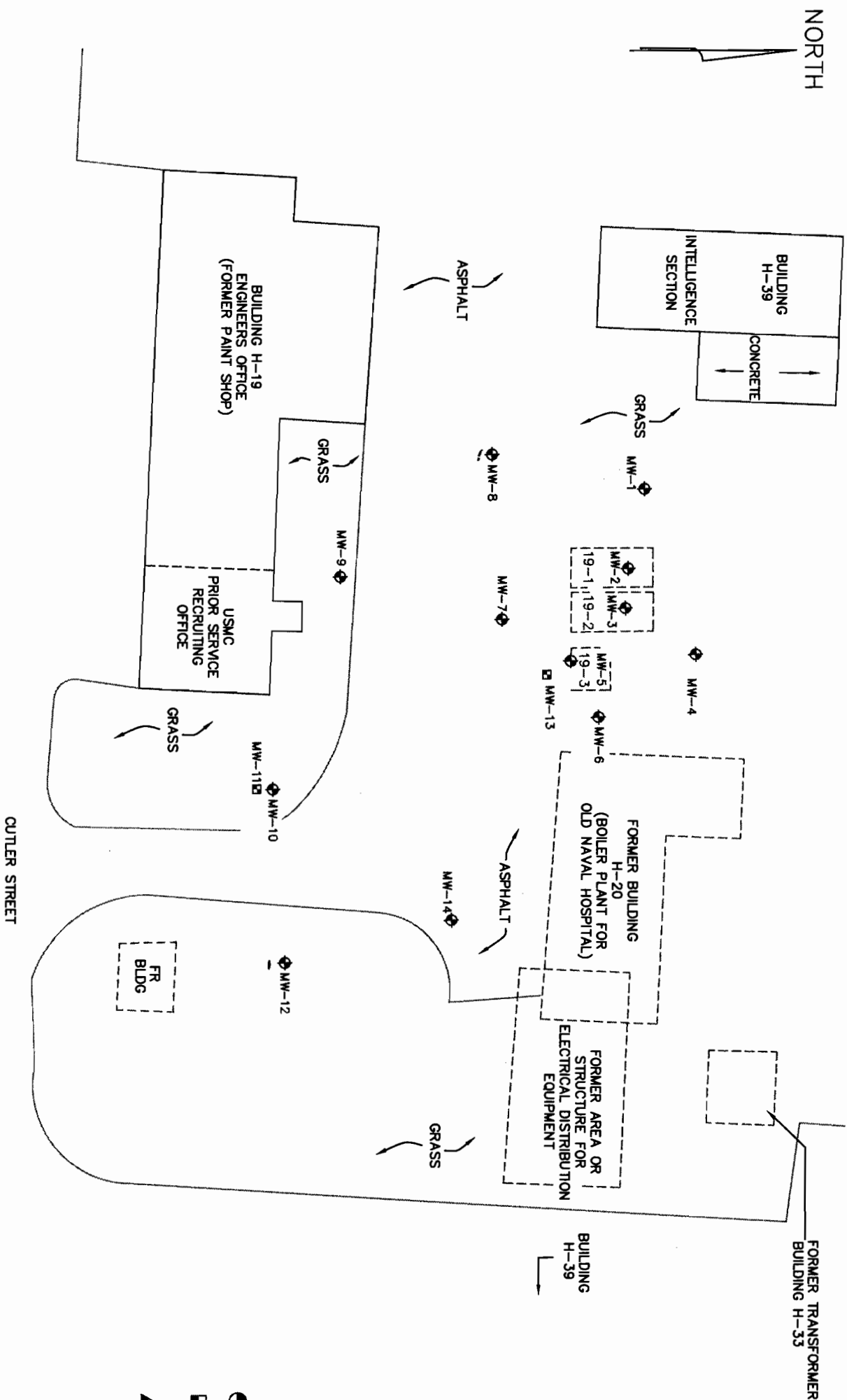
1000 0 1000 2000 FEET

MACTEC

MACTEC ENGINEERING AND CONSULTING, INC.
RALEIGH, NC 27604

TOPOGRAPHIC SITE MAP
FORMER USTs, BUILDING H-19
CAMP LEJEUNE, NORTH CAROLINA

DRAWN: CWA	DATE: DECEMBER 2003
DFT CHECK: <i>WSE</i>	SCALE: 1 : 24000
ENG CHECK: <i>SKY</i>	JOB: 30740-6-0600-0093
APPROVAL: <i>POA</i>	DRAWING: 1



- NOTES:
1. H-19 IS THE PREFIX WHICH PROCEEDS ALL SAMPLE LOCATIONS (OMITTED FOR BREVITY)
 2. PERMANENT WELLS MW-1 THROUGH MW-7 INSTALLED BY R.E. WRIGHT ENVIRONMENTAL INC., MARCH 1995. RESAMPLED BY LAW IN FEBRUARY 1997.
 3. PERMANENT WELLS MW-8 THROUGH MW-14 INSTALLED BY LAW IN MARCH 1997. WELLS SAMPLED BY LAW IN MARCH AND EARLY APRIL 1997.
 4. CORNERS OF BLDG H-19, H-39, FENCE POST, AND SAMPLING POINTS LOCATED IN FIELD BY PROFESSIONAL LAND SURVEYOR. THE LOCATIONS OF UTILITIES AND OTHER FEATURES ARE APPROXIMATE.

SITE LOCATION MAP

FORMER USTS, BUILDING H-19
CAMP LEJEUNE, NORTH CAROLINA

EXPLANATION

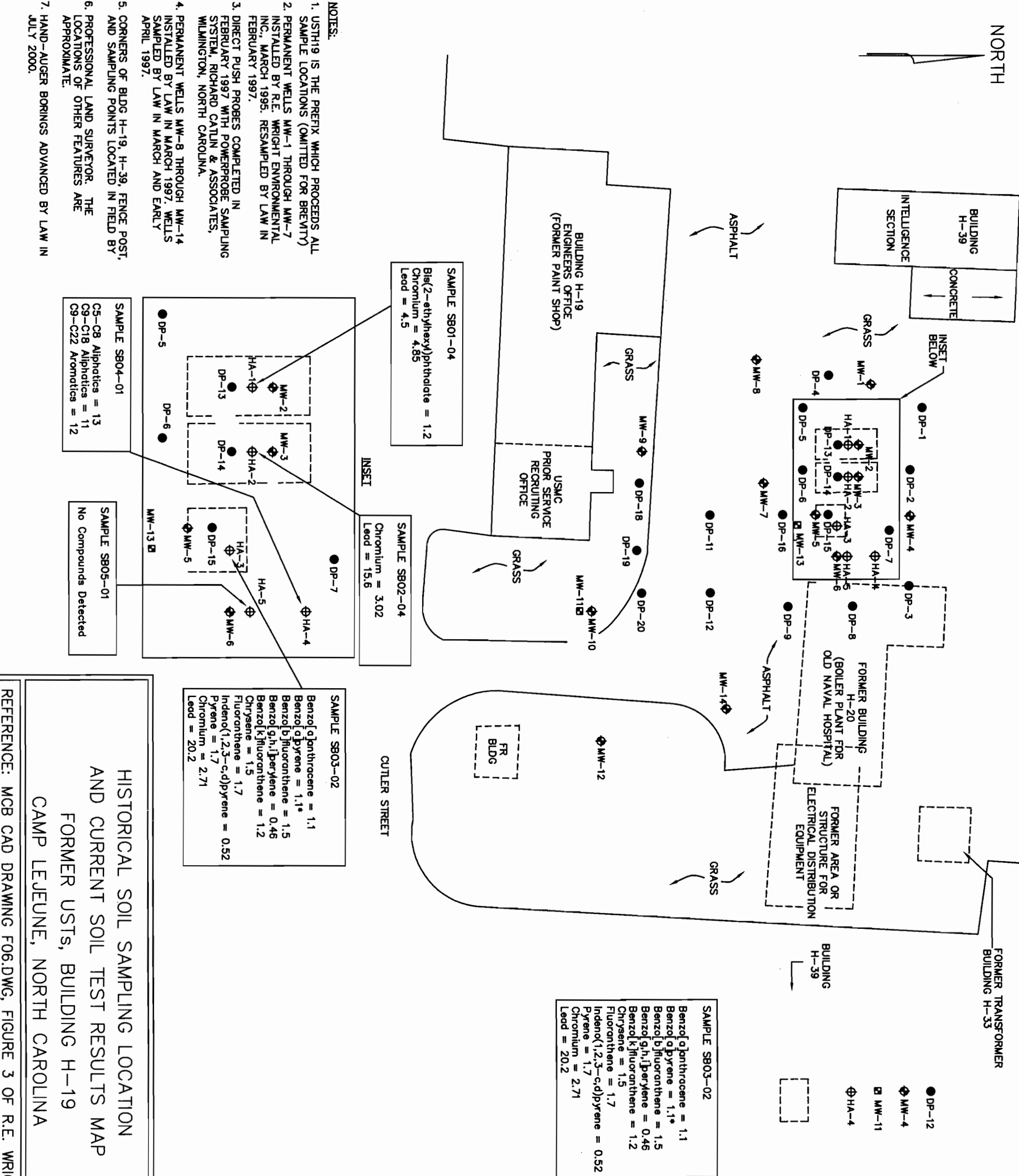
- MW-9 TYPE II MONITORING WELL LOCATION
- MW-11 TYPE III MONITORING WELL LOCATION
- ▲ MW-1 MONITORING WELL LOCATION
- [19-1] FORMER LOCATION OF USTs AND BUILDINGS (LOCATION OF H-20 FROM R.E. WRIGHT SITE CHECK REPORT)



MACTEC ENGINEERING AND CONSULTING
RALEIGH, NORTH CAROLINA

DRAWN: <i>Curly</i>	DATE: NOVEMBER 2003
DFT CHECK: <i>usb</i>	SCALE: 1"=40'
ENG CHECK: <i>2008</i>	JOB: 30740-6-0600/0093
APPROVAL: <i>LM</i>	DRAWING: 2

NORTH



EXPLANATION

- DIRECT PUSH LOCATION
- TYPE II MONITORING WELL LOCATION
- TYPE III MONITORING WELL LOCATION
- HAND AUGER LOCATION

FORMER LOCATION OF UTS AND BUILDINGS (LOCATION OF H-20 FROM R.E. WRIGHT SITE CHECK REPORT)

SAMPLE ID

Laboratory Test Results in mg/kg
Concentrations marked with on "*" indicate concentrations in excess of Industrial/Commercial Maximum Soil Contaminant Concentrations



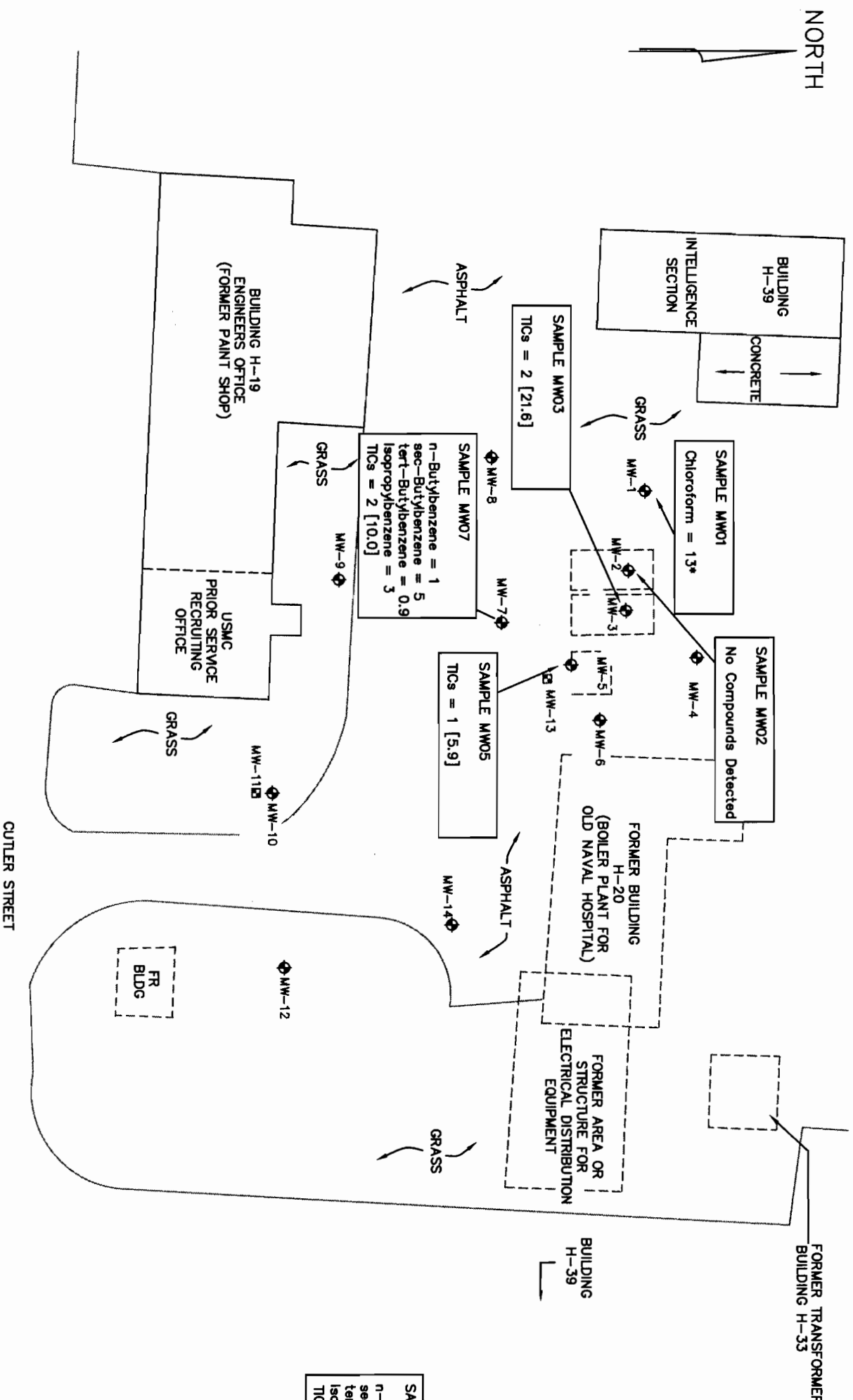
MACTEC ENGINEERING AND CONSULTING INC.
RALEIGH, NORTH CAROLINA

- NOTES:
1. USTH19 IS THE PREFIX WHICH PROCEEDS ALL SAMPLE LOCATIONS (OMITTED FOR BREVITY)
 2. PERMANENT WELLS MW-1 THROUGH MW-7 INSTALLED BY R.E. WRIGHT ENVIRONMENTAL INC., MARCH 1995. RESAMPLED BY LAW IN FEBRUARY 1997.
 3. DIRECT PUSH PROBES COMPLETED IN FEBRUARY 1997 WITH POWERPROBE SAMPLING SYSTEM, RICHARD CATTIN & ASSOCIATES, WILMINGTON, NORTH CAROLINA.
 4. PERMANENT WELLS MW-8 THROUGH MW-14 INSTALLED BY LAW IN MARCH 1997. WELLS SAMPLED BY LAW IN MARCH AND EARLY APRIL 1997.
 5. CORNERS OF BLDG H-19, H-39, FENCE POST, AND SAMPLING POINTS LOCATED IN FIELD BY PROFESSIONAL LAND SURVEYOR. THE LOCATIONS OF OTHER FEATURES ARE APPROXIMATE.
 7. HAND-AUGER BORINGS ADVANCED BY LAW IN JULY 2000.

HISTORICAL SOIL SAMPLING LOCATION AND CURRENT SOIL TEST RESULTS MAP
FORMER UTS, BUILDING H-19
CAMP LEJEUNE, NORTH CAROLINA

DRAWN: CWA	DATE: NOVEMBER 2003
DFT CHECK: <i>l-y</i>	SCALE: AS SHOWN
ENG CHECK: <i>day</i>	JOB: 30740-6-0600/0093
APPROVAL: <i>de</i>	DRAWING: 3

REFERENCE: MCB CAD DRAWING F06.DWG, FIGURE 3 OF R.E. WRIGHT, 1995; AND MBC DRAWING 228551, 305171, 4052508



- NOTES:
1. H-19 IS THE PREFIX WHICH PROCEEDS ALL SAMPLE LOCATIONS (OMITTED FOR BREVITY)
 2. PERMANENT WELLS MW-1 THROUGH MW-7 INSTALLED BY R.E. WRIGHT ENVIRONMENTAL INC. MARCH 1995. RESAMPLED BY LAW IN FEBRUARY 1997.
 3. PERMANENT WELLS MW-8 THROUGH MW-14 INSTALLED BY LAW IN MARCH 1997. WELLS SAMPLED BY LAW IN MARCH AND EARLY APRIL 1997.
 4. CORNERS OF BLDG H-19, H-39, FENCE POST, AND SAMPLING POINTS LOCATED IN FIELD BY PROFESSIONAL LAND SURVEYOR. THE LOCATIONS OF UTILITIES AND OTHER FEATURES ARE APPROXIMATE.

- EXPLANATION
- MW-9
 - MW-11
 - ▲ MW-1
 - TYPE II MONITORING WELL LOCATION
 - TYPE III MONITORING WELL LOCATION
 - MONITORING WELL LOCATION (R.E.WRIGHT)
 - FORMER LOCATION OF UTS AND BUILDINGS (LOCATION OF H-20 FROM R.E. WRIGHT SITE CHECK REPORT)

SAMPLE MW07

n-Butylbenzene = 1
sec-Butylbenzene = 5
tert-Butylbenzene = 0.9
Isopropylbenzene = 3
TICS = 2 [10.0]

Sample ID

Laboratory test results in micrograms per liter for groundwater samples collected 5/30/2002.

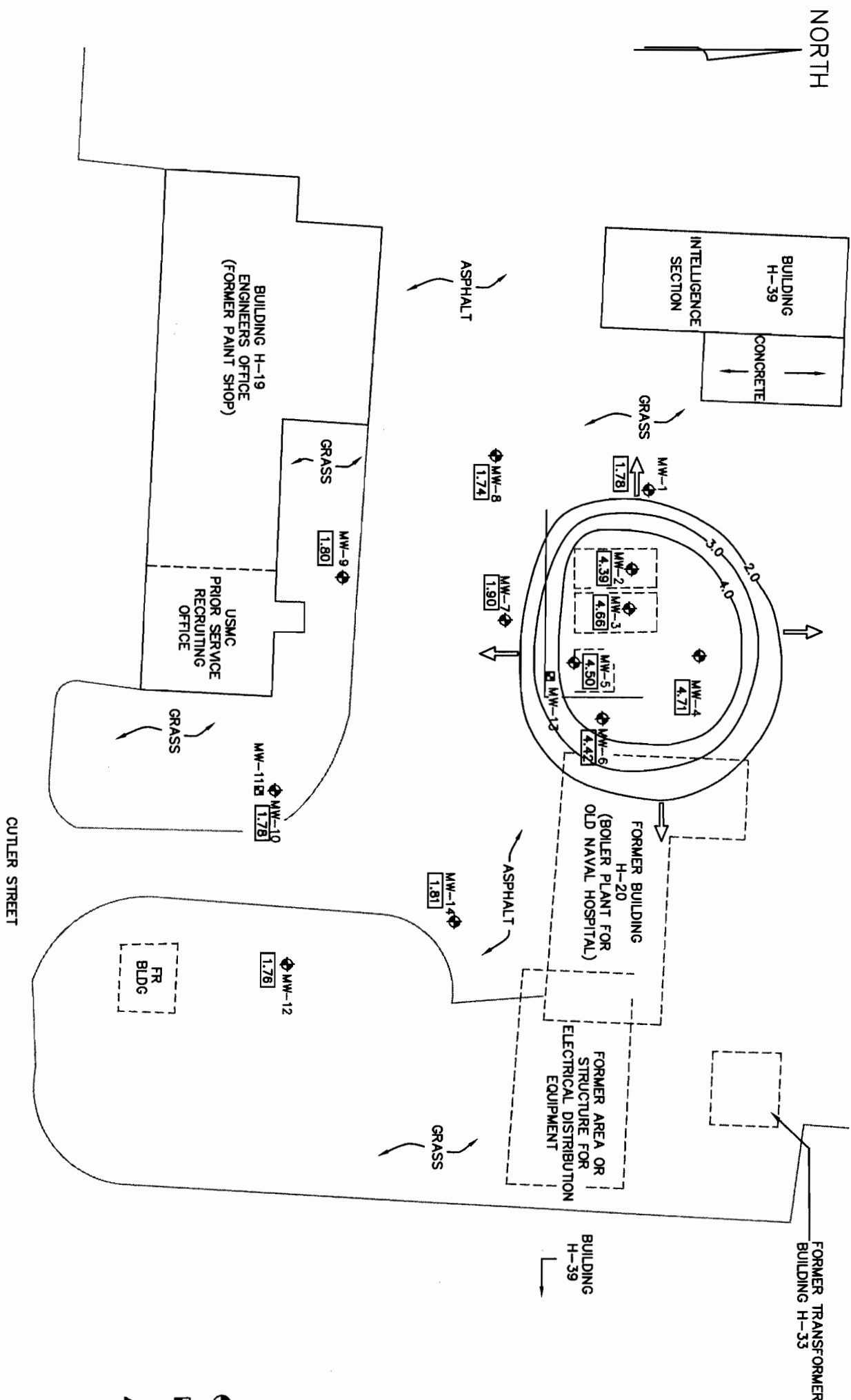
Concentration marked with an "*" indicates concentration in excess of the 2L Standards.



DRAWN: CWA	DATE: NOVEMBER 2003
DFT CHECK: WSC	SCALE: 1"=40'
ENG CHECK: May	JOB: 30740-6-0600/0093
APPROVAL: MC	DRAWING: 4

GROUNDWATER TEST RESULTS MAP FOR
MAY 2002 SAMPLING EVENT
FORMER UTS, BUILDING H-19
CAMP LEJEUNE, NORTH CAROLINA

REFERENCE: MCB CAD DRAWING F06.DWG, FIGURE 3 OF R.E. WRIGHT, 1995, AND MBC DRAWING 228551, 305171, 4052508



- 2.0

4.2

Monitoring Well Location (Type II)

Monitoring Well Location (Type III)

Existing Monitoring Well Location (R.E. Wright)

Former Location of U.S. and Buildings (Location of H-20 from R.E. Wright Site Check Report)
- Water-Table Elevation Contour Lines (ft. MSL)

Water-Table Elevation (ft. MSL)

Estimated Direction of Groundwater Flow

Monitoring Well Location (Type II)

Monitoring Well Location (Type III)

Existing Monitoring Well Location (R.E. Wright)

Former Location of U.S. and Buildings (Location of H-20 from R.E. Wright Site Check Report)

1. PERMANENT WELLS MW-1 THROUGH MW-7 INSTALLED BY R.E. WRIGHT ENVIRONMENTAL INC., MARCH 1995. RESAMPLED BY LAW IN FEBRUARY 1997.
2. PERMANENT WELLS MW-8 THROUGH MW-14 INSTALLED BY LAW IN MARCH 1997. WELLS SAMPLED BY LAW IN MARCH AND EARLY APRIL 1997.
3. CORNERS OF BLDG H-19, H-39, FENCE POST, AND SAMPLING POINTS LOCATED IN FIELD BY PROFESSIONAL LAND SURVEYOR. THE LOCATIONS OF UTILITIES AND OTHER FEATURES ARE APPROXIMATE.
4. TYPE III MONITORING WELLS NOT CONSIDERED FOR GROUNDWATER TABLE ELEVATION CONTOUR MAP
5. CONTOUR INTERVAL= 1.0' (FT.)

WATER-TABLE ELEVATION CONTOUR MAP

MAY 30, 2002

FORMER USTS, BUILDING H-19

CAMP LEJEUNE, NORTH CAROLINA

MACTEC

MACTEC ENGINEERING AND CONSULTING, INC.

RALEIGH, NORTH CAROLINA

DRAWN: CWA

DFT CHECK: *WJA*

ENG CHECK: *WJA*

APPROVAL: *WJA*

DATE: NOV. 2003

SCALE: 1"=40'

JOB: 30740-6-0600/0093

DRAWING: 5

Appendix A

Summary of Laboratory Test Results: 1997 Soil Samples

TABLE 4.2
SUMMARY OF LABORATORY ANALYTICAL RESULTS, SOIL SAMPLES (DIRECT PUSH)
LEAKING UNDERGROUND STORAGE TANKS
SITE ASSESSMENT REPORT
UST H-19
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA
LAW JOB NO. 30740-6-0600/0010

SAMPLE LOCATION		LABORATORY RESULTS		
BORING IDENTIFICATION	SAMPLE DEPTH (FT) below land surface	TPH-GASOLINE (mg/Kg)	TPH-DIESEL (mg/Kg)	OTHER TEST
GEOPROBE ASSESSMENT:				
H19-DP1	4 to 7	ND	ND	--
H19-DP2	0 to 1.5	ND	ND	--
H19-DP3	4 to 6	ND	ND	--
H19-DP4	4 to 6	ND	ND	--
H19-DP5	6 to 8	ND	ND	--
H19-DP6	4 to 8	ND	ND	--
	6 to 8	--	--	EPA 8021 = ND
H19-DP7	2 to 4	8.90	239	--
H19-DP8	0 to 2	--	--	Oil & Grease = 111
H19-DP9	2 to 4	--	--	Oil & Grease = ND EPA 8021 = ND
	6 to 8	ND	ND	--
H19-DP10	6 to 8	ND	ND	EPA 8021 = ND
H19-DP11	2 to 6	ND	ND	EPA 8021 = ND Oil & Grease = ND
H19-DP12	4 to 8	ND	ND	EPA 8021 = ND Oil & Grease = 11.3
H19-DP13	0 to 4	ND	ND	--
H19-DP14	4 to 8	ND	ND	EPA 8021 = ND
H19-DP15	0 to 4	--	ND	Oil & Grease = 122
H19-DP16	4 to 6	ND	ND	--
	6 to 8	--	--	EPA 8021 = ND

Bold # = Concentrations detected above NC soil remediation guidelines.

-- = Samples not analyzed for test.

ND = Not detected; see laboratory reports for applicable limit.

NA = Not Analyzed

NC Action Level for:

Low Boiling Point Hydrocarbons (Gasoline) = 10 mg/Kg

Medium Boiling Point Hydrocarbons (Diesel) = 40 mg/Kg

TABLE 4.3

**SUMMARY OF LABORATORY ANALYTICAL RESULTS
SOIL SAMPLES (MONITORING WELLS/HAND AUGER PROBES)**

UST H-19

MARINE CORPS BASE

CAMP LEJEUNE, NORTH CAROLINA

LAW JOB. NO. 30740-6-0600/0010

PARAMETER	MONITORING WELL/HAND AUGER PROBE NO.	MW-13	HA-1	HA-2	HA-3	COMPOSITE SOIL SAMPLE FROM ROLL-OFF BOX	N.C. CORRECTIVE ACTION LIMITS (mg/kg) (mg/L for TCLP)
	SAMPLE INTERVAL (FT)	3 to 5	2 to 6	2 to 6	2 to 6.5	--	
	DATE SAMPLED	3/19/97	3/20/97	3/20/97	3/20/97	3/25/97	
Soil PH		7.66	7.34	--	--	8.62	--
Ignitability		No Flash	No Flash	--	--	No Flash	No Flash > 200° F Flashpoint
EPA Method 6010 (TCLP) [Metals, mg/L]							
Arsenic		.09	.08	.06	.03	ND	5.0
Barium		.68	.70	.67	.56	.60	100.0
Cadmium		ND	ND	ND	ND	ND	1.0
Chromium		.01	ND	ND	ND	ND	5.0
Lead		ND	.21	ND	ND	ND	5.0
Mercury		ND	ND	ND	ND	ND	.20
Selenium		ND	ND	ND	ND	ND	1.0
Silver		ND	ND	ND	ND	ND	5.0
EPA Method 1311 (TCLP) Volatiles		ND	ND	ND	ND	ND	Compound Specific
EPA Method 1311 (TCLP) Semi-volatiles		ND	ND	ND	ND	ND	Compound Specific

ND: Not Detected or Compounds not detected by laboratory test

--: Laboratory test not performed or not applicable

*: Specific action levels have not been established for EPA 8021 compounds

Appendix B

Soil Boring Logs – July 2000

DEPTH (ft)	DESCRIPTION SEE KEY SYMBOL SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS BELOW.	LEGEND	ELEV (ft)	SAMPLES			REMARKS
				IDENT	TYPE	N-COUNT	
						1st 6" 2nd 6" 3rd 6"	
				ROD % REC			
0	Tan and gray, silty, fine to coarse sand (SM).			GS-1			
				GS-2			
				GS-3			
				GS-4			
5				GS-5			5
				GS-6			
	Boring terminated 7 feet below ground surface.			GS-7			
10							10
15							15
20							20
25							25
30							30
35							35
40							40
45							

ROCK NAVY H-19.GPJ LAW GIBB.GDT 12/18/03

DRILLER: Bill Deobald
EQUIPMENT: Hand auger
METHOD:
HOLE DIA.:
REMARKS:

TEST BORING RECORD

PROJECT: Building H-19 **BORING NO.:** USTH19-SB01
COORD N:
COORD E:
DRILLED: July 12, 2000
PROJ. NO.: 30740-6-0600-0093

PAGE 1 OF 1

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

LAW
LAWGIBB Group Member

DEPTH (ft)	DESCRIPTION SEE KEY SYMBOL SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS BELOW.	LEGEND	ELEV (ft)	SAMPLES			REMARKS
				IDENT	TYPE	N-COUNT	
						1st 6" 2nd 6" 3rd 6" ROD % REC	
0	Tan and gray, silty, fine to coarse sand (SM).			GS-1			
				GS-2			
				GS-3			
	Tan and gray, clayey fine to coarse sand (SC).			GS-4			
5	Tan and gray, silty, fine to coarse sand (SM).			GS-5			
				GS-6			
	Boring terminated 7.5 feet below ground surface.			GS-7			
10							
15							
20							
25							
30							
35							
40							
45							

ROCK NAVY H-19.GPJ LAW GIBB.GDT 12/18/03

DRILLER: Bill Deobald
EQUIPMENT: Hand auger
METHOD:
HOLE DIA.:
REMARKS:

TEST BORING RECORD

PROJECT: Building H-19 BORING NO.: USTH19-SB02
COORD N:
COORD E:
DRILLED: July 12, 2000
PROJ. NO.: 30740-6-0600-0093

PAGE 1 OF 1

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

LAW

LAWGIBB Group Member

DEPTH (ft)	DESCRIPTION SEE KEY SYMBOL SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS BELOW.	LEGEND	ELEV (ft)	SAMPLES			REMARKS
				IDENT	TYPE	N-COUNT	
						1st 6" 2nd 6" 3rd 6" ROD % REC	
0	Tan and gray, silty, fine to coarse sand (SM).			GS-1			
				GS-2			
				GS-3			
				GS-4			
5	Boring terminated 5 feet below ground surface.			GS-5			
10							
15							
20							
25							
30							
35							
40							
45							

ROCK NAVY H-19 GPJ LAW GIBB.GDT 12/18/03

DRILLER: Bill Deobald
EQUIPMENT: Hand auger
METHOD:
HOLE DIA.:
REMARKS:

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

TEST BORING RECORD

PROJECT: Building H-19 BORING NO.: USTH19-SB03
COORD N:
COORD E:
DRILLED: July 12, 2000
PROJ. NO.: 30740-6-0600-0093

PAGE 1 OF 1

LAW
LAWGIBB Group Member

D E P T H (ft)	DESCRIPTION SEE KEY SYMBOL SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS BELOW.	L E G E N D	E L E V (ft)	SAMPLES			REMARKS
				I D E N T	T Y P E	N-COUNT	
						1st 6" 2nd 6" 3rd 6" ROD % REC	
0	Asphalt						
	ABC stone						
	Tan and gray, silty, fine to coarse sand (SM).						
	Boring terminated 2.5 feet below ground surface at refusal.			GS-1			
				GS-2			
				GS-3			
5							5
10							10
15							15
20							20
25							25
30							30
35							35
40							40
45							

ROCK NAVY H-19 GPI LAW GIBB GDT 12/18/03

DRILLER: Bill Deobald
EQUIPMENT: Hand auger
METHOD:
HOLE DIA.:
REMARKS:

TEST BORING RECORD

PROJECT: Building H-19 BORING NO.: USTH19-SB04
COORD N:
COORD E:
DRILLED: July 12, 2000
PROJ. NO.: 30740-6-0600-0093

PAGE 1 OF 1

THIS RECORD IS A REASONABLE INTERPRETATION
OF SUBSURFACE CONDITIONS AT THE EXPLORATION
LOCATION. SUBSURFACE CONDITIONS AT OTHER
LOCATIONS AND AT OTHER TIMES MAY DIFFER.
INTERFACES BETWEEN STRATA ARE APPROXIMATE.
TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

LAW
LAWGIBB Group Member

DEPTH (ft)	DESCRIPTION SEE KEY SYMBOL SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS BELOW.	LEGEND	ELEV (ft)	SAMPLES			REMARKS
				IDENT	TYPE	N-COUNT	
						1st 6" 2nd 6" 3rd 6" ROD % REC	
0	Asphalt			GS-1			
	ABC stone			GS-2			
	Tan and gray, silty, fine to coarse sand (SM).			GS-3			
	Boring terminated 3 feet below ground surface.						
5							
10							
15							
20							
25							
30							
35							
40							
45							

ROCK NAVY H-19 GPI LAW GIBB GDT 12/18/03

DRILLER: Bill Deobald
EQUIPMENT: Hand auger
METHOD:
HOLE DIA.:
REMARKS:

TEST BORING RECORD

PROJECT: Building H-19 **BORING NO.:** USTH19-SB05
COORD N:
COORD E:
DRILLED: July 12, 2000
PROJ. NO.: 30740-6-0600-0093

PAGE 1 OF 1

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

LAW

LAWGIBB Group Member

Appendix C

**Laboratory Test Reports and Chain-of-Custody Records:
Soil Samples – July 2000**

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 8260B

Client Sample ID: USTH19-SB01-04

Date Analyzed: 7/23/00

Client Project ID: H-19

Analyzed By: RNP

Lab Sample ID: 91510

Date Collected: 7/12/00

Lab Project ID: G132-685

Date Received: 7/12/00

Matrix: Soil

%Solids: 89.1

Dilution: 1

Compound	Quantitation Limit (ug/KG)	Result (ug/KG)
Acetone	56	BQL
Acrolein	110	BQL
Acrylonitrile	110	BQL
Benzene	5.6	BQL
Bromobenzene	5.6	BQL
Bromochloromethane	5.6	BQL
Bromodichloromethane	5.6	BQL
Bromoform	5.6	BQL
Bromomethane	5.6	BQL
2-Butanone	28	BQL
n-Butylbenzene	5.6	BQL
sec-Butylbenzene	5.6	BQL
tert-Butylbenzene	5.6	BQL
Carbon disulfide	5.6	BQL
Carbon tetrachloride	5.6	BQL
Chlorobenzene	5.6	BQL
Chloroethane	5.6	BQL
2-Chloroethyl vinyl ether	5.6	BQL
Chloroform	5.6	BQL
Chloromethane	5.6	BQL
2-Chlorotoluene	5.6	BQL
4-Chlorotoluene	5.6	BQL
Dibromochloromethane	5.6	BQL
1,2-Dibromo-3-chloropropane	5.6	BQL
Dibromomethane	5.6	BQL
1,2-Dibromoethane (EDB)	5.6	BQL
1,2-Dichlorobenzene	5.6	BQL
1,3-Dichlorobenzene	5.6	BQL
1,4-Dichlorobenzene	5.6	BQL
trans-1,4-Dichloro-2-butene	5.6	BQL
1,1-Dichloroethane	5.6	BQL
1,1-Dichloroethene	5.6	BQL
1,2-Dichloroethane	5.6	BQL
cis-1,2-Dichloroethene	5.6	BQL
trans-1,2-dichloroethene	5.6	BQL
1,2-Dichloropropane	5.6	BQL
1,3-Dichloropropane	5.6	BQL
2,2-Dichloropropane	5.6	BQL
1,1-Dichloropropene	5.6	BQL
cis-1,3-Dichloropropene	5.6	BQL
trans-1,3-Dichloropropene	5.6	BQL
Dichlorodifluoromethane	5.6	BQL
Diisopropyl ether (DIPE)	5.6	BQL
Ethylbenzene	5.6	BQL
Hexachlorobutadiene	5.6	BQL

Reviewed by: My

Flags: BQL = Below Quantitation Limit

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North Carolina Wastewater Certification #481

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 8260B

Client Sample ID: USTH19-SB01-04

Client Project ID: H-19

Lab Sample ID: 91510

Lab Project ID: G132-685

Matrix: Soil

%Solids: 89.1

Date Analyzed: 7/23/00

Analyzed By: RNP

Date Collected: 7/12/00

Date Received: 7/12/00

Dilution: 1

Compound	Quantitation Limit (ug/KG)	Result (ug/KG)
2-Hexanone	5.6	BQL
Iodomethane	5.6	BQL
Isopropylbenzene	5.6	BQL
4-Isopropyltoluene	5.6	BQL
Methylene chloride	22	BQL
4-Methyl-2-pentanone	5.6	BQL
Methyl-tert-butyl ether (MTBE)	5.6	BQL
Naphthalene	5.6	BQL
n-Propyl benzene	5.6	BQL
Styrene	5.6	BQL
1,1,1,2-Tetrachloroethane	5.6	BQL
1,1,2,2-Tetrachloroethane	5.6	BQL
Tetrachloroethene	5.6	BQL
Toluene	5.6	BQL
1,2,3-Trichlorobenzene	5.6	BQL
1,2,4-Trichlorobenzene	5.6	BQL
Trichloroethene	5.6	BQL
1,1,1-Trichloroethane	5.6	BQL
1,1,2-Trichloroethane	5.6	BQL
Trichlorofluoromethane	5.6	BQL
1,2,3-Trichloropropane	5.6	BQL
1,2,4-Trimethylbenzene	5.6	BQL
1,3,5-Trimethylbenzene	5.6	BQL
Vinyl chloride	5.6	BQL
m,p-Xylene	11	BQL
o-Xylene	5.6	BQL

Surrogate Spike Recoveries

Compound	Spike Added (ug/KG)	Surrogate Result (ug/KG)	%Rec
Bromofluorobenzene	50	52.6	105
1,2-Dichloroethane-d4	50	49.7	99
Toluene-d8	50	49.9	100

Comments:

All results are corrected for dilution.

Reviewed by: jm

Flags: BQL = Below Quantitation Limit

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatile Base/Neutral Extractables

by GCMS 8270

Client Sample ID: USTH19-SB01-04

Client Project ID: H-19

Lab Sample ID: 91510

Lab Project ID: G132-685

Matrix: Soil

Date Collected: 7/12/00

Date Received: 7/12/00

Date Analyzed: 7/22/00

Analyzed By: MRC

Dilution: 1

Compound	Quantitation Limit (ug/KG)	Result (ug/KG)
Acenaphthene	340	BQL
Acenaphthylene	340	BQL
Anthracene	340	BQL
Benzo[a]anthracene	340	BQL
Benzo[a]pyrene	340	BQL
Benzo[b]fluoranthene	340	BQL
Benzo[g,h,i]perylene	340	BQL
Benzo[k]fluoranthene	340	BQL
Bis(2-chloroethoxy)methane	340	BQL
Bis(2-chloroethyl)ether	340	BQL
Bis(2-chloroisopropyl)ether	340	BQL
Bis(2-ethylhexyl)phthalate	340	1200 ✓
4-bromophenyl phenyl ether	340	BQL
Butylbenzylphthalate	340	BQL
4-Chloroaniline	340	BQL
2-Chloronaphthalene	340	BQL
4-Chlorophenyl phenyl ether	340	BQL
Chrysene	340	BQL
Di-n-Butylphthalate	340	BQL
Di-n-octylphthalate	340	BQL
Dibenzo[a,h]anthracene	340	BQL
Dibenzofuran	340	BQL
1,2-Dichlorobenzene	340	BQL
1,3-Dichlorobenzene	340	BQL
1,4-Dichlorobenzene	340	BQL
3,3'-Dichlorobenzidine	690	BQL
Diethylphthalate	340	BQL
Dimethylphthalate	340	BQL
4,6-Dinitro-2-methylphenol	1700	BQL
2,4-Dinitrotoluene	340	BQL
2,6-Dinitrotoluene	340	BQL
Fluoranthene	340	BQL
Fluorene	340	BQL
Hexachlorobenzene	340	BQL
Hexachlorobutadiene	340	BQL
Hexachlorocyclopentadiene	690	BQL
Hexachloroethane	340	BQL
Indeno(1,2,3-c,d)pyrene	340	BQL
Isophorone	340	BQL
2-Methylnaphthalene	340	BQL

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatile Base/Neutral Extractables
by GCMS 8270

Client Sample ID: USTH19-SB01-04

Client Project ID: H-19

Lab Sample ID: 91510

Lab Project ID: G132-685

Matrix: Soil

%Solids: 89.1

Date Collected: 7/12/00

Date Received: 7/12/00

Date Analyzed: 7/22/00

Analyzed By: MRC

Dilution: 1

Compound	Quantitation Limit (ug/KG)	Result (ug/KG)
N-Nitrosodi-n-propylamine	340	BQL
N-Nitrosodiphenylamine	340	BQL
Naphthalene	340	BQL
2-Nitroaniline	340	BQL
3-Nitroaniline	340	BQL
4-Nitroaniline	340	BQL
Nitrobenzene	340	BQL
Phenanthrene	340	BQL
Pyrene	340	BQL
1,2,4-Trichlorobenzene	340	BQL

Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	10	102
Nitrobenzene-d5	10	9.4	94
4-Terphenyl-d14	10	11	106

Comments:

Results are corrected for %solids and dilution where applicable.

Flags:

BQL = Below Quantitation Limit.

Reviewed By: mw

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: LAW ENGINEERINGProject Name: H-19

Sample Information and Analytical Results	
Sample Identification	USTH19-SB01-04
Sample Matrix	Soil
Collection Option (for Soil)*	3
Date Collected	07/12/00
Date Received	07/12/00
Date Extracted	07/12/00
Date Analyzed	08/01/00
Dry Weight	89
Dilution Factor	1
C ₅ -C ₈ Aliphatics**	< 10 (mg/Kg)
C ₉ -C ₁₂ Aliphatics**	< 10 (mg/Kg)
C ₉ -C ₁₀ Aromatics**	< 10 (mg/Kg)
Surrogate % Recovery - PID	69
Surrogate % Recovery - FID	83

* = Option 1 = Established fill line on vial, Option 2 = Sampling Device/Brand, or Option 3 = Field weight of soil.

** = Excludes any surrogates or internal standards.

Lab Info: G132-685-91510

Reviewed By: lw

PARADIGM ANALYTICAL LABORATORIES, INC.

EPH (Aliphatics/Aromatics) Results

by MDEP-EPH

Client Name: LAW ENGINEERING

Project Name: H-19

Sample Information and Analytical Results	
Sample Identification	USTH19-SB01-04
Sample Matrix	Soil
Date Collected	07/12/00
Date Received	07/12/00
Date Extracted	07/18/00
Date Analyzed	07/26/00
Dry Weight	89.1
Dilution Factor	1
C ₉ -C ₁₈ Aliphatics*	< 10 (mg/Kg)
C ₁₉ -C ₃₆ Aliphatics*	< 10 (mg/Kg)
C ₁₁ -C ₂₂ Aromatics*	< 10 (mg/Kg)
Aliphatic Surrogate % Recovery	96
Aromatic Surrogate % Recovery	96

Comments:

- * = Excludes any surrogates or internal standards.
Sample did not require fractionation.

Lab info: G132-685-91510

Reviewed By: mm

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Pesticides

by EPA 8081

Client Sample ID: USTH19-SB01-04

Client Project ID: H-19

Lab Sample ID: 91510

Lab Project ID: G132-685

Matrix: Soil

%SOLIDS 89.1

Date Collected: 7/12/00

Date Received: 7/12/00

Date Analyzed: 7/25/00

Analyzed By: CLP

Dilution: 1

Compound	Quantitation Limit (ug/KG)	Result (ug/KG)
alpha-BHC	7.0	BQL
beta-BHC	7.0	BQL
delta-BHC	7.0	BQL
gamma-BHC (Lindane)	7.0	BQL
Heptachlor	7.0	BQL
Aldrin	7.0	BQL
Heptachlor epoxide	7.0	BQL
Endosulfan I	7.0	BQL
Dieldrin	7.0	BQL
4,4'-DDE	7.0	BQL
Endrin	7.0	BQL
DDD	7.0	BQL
Endosulfan II	7.0	BQL
4,4'-DDT	7.0	BQL
Methoxychlor	7.0	BQL
Toxaphene	35	BQL
Chlordane	35	BQL
Endrin aldehyde	7.0	BQL
Endosulfan sulfate	7.0	BQL
Endrin ketone	7.0	BQL

Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovered
TCMX	100	74	74

Comments:

BQL = Below Quantitation Limit

Reviewed By: mm

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for PCBs
by EPA 8082

Client Sample ID: USTH19-SB01-04

Client Project ID: H-19

Lab Sample ID: 91510

Lab Project ID: G132-685

Matrix: Soil

%SOLIDS: 89.1

Date Collected: 7/12/00

Date Received: 7/12/00

Date Analyzed: 7/21/00

Analyzed By: MRC

Dilution: 1

Compound	Quantitation Limit (ug/KG)	Result (ug/KG)
Arochlor-1016	160	BQL
Arochlor-1221	160	BQL
Arochlor-1232	160	BQL
Arochlor-1242	160	BQL
Arochlor-1248	160	BQL
Arochlor-1254	160	BQL
Arochlor-1260	160	BQL

Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovered
DBC	100	68	68

Comments:

BQL = Below Quantitation Limit

NA = Not applicable, surrogate diluted out.

Reviewed By: MRC

PARADIGM ANALYTICAL LABORATORIES, INC.
Results for Inorganics

Client Sample ID: USTH19-SB01-04
Client Project ID: H-19
Lab Sample ID: 91510
Lab Project ID: G132-685

Analyzed By: JMF
Date Collected: 7/12/00
Date Received: 7/12/00
Matrix: Soil

Solids 89.09

Metals	Result	Quantitation Limit	Units	Procedure	Date Analyzed
Chromium	4.85 ✓	1.12	MG/KG	6010B	7/25/00
Lead	4.50 ✓	1.12	MG/KG	6010B	7/25/00

Comments

BQL = Below Quantitation Limits

Reviewed By: Wm

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 8260B

Client Sample ID: USTH19-SB02-04

Client Project ID: H-19

Lab Sample ID: 91511

Lab Project ID: G132-685

Matrix: Soil

%Solids: 90.4

Date Analyzed: 7/23/00

Analyzed By: RNP

Date Collected: 7/12/00

Date Received: 7/12/00

Dilution: 1

Compound	Quantitation Limit (ug/KG)	Result (ug/KG)
Acetone	55	BQL
Acrolein	110	BQL
Acrylonitrile	110	BQL
Benzene	5.5	BQL
Bromobenzene	5.5	BQL
Bromochloromethane	5.5	BQL
Bromodichloromethane	5.5	BQL
Bromoform	5.5	BQL
Bromomethane	5.5	BQL
2-Butanone	28	BQL
n-Butylbenzene	5.5	BQL
sec-Butylbenzene	5.5	BQL
tert-Butylbenzene	5.5	BQL
Carbon disulfide	5.5	BQL
Carbon tetrachloride	5.5	BQL
Chlorobenzene	5.5	BQL
Chloroethane	5.5	BQL
2-Chloroethyl vinyl ether	5.5	BQL
Chloroform	5.5	BQL
Chloromethane	5.5	BQL
2-Chlorotoluene	5.5	BQL
4-Chlorotoluene	5.5	BQL
Dibromochloromethane	5.5	BQL
1,2-Dibromo-3-chloropropane	5.5	BQL
Dibromomethane	5.5	BQL
1,2-Dibromoethane (EDB)	5.5	BQL
1,2-Dichlorobenzene	5.5	BQL
1,3-Dichlorobenzene	5.5	BQL
1,4-Dichlorobenzene	5.5	BQL
trans-1,4-Dichloro-2-butene	5.5	BQL
1,1-Dichloroethane	5.5	BQL
1,1-Dichloroethene	5.5	BQL
1,2-Dichloroethane	5.5	BQL
cis-1,2-Dichloroethene	5.5	BQL
trans-1,2-dichloroethene	5.5	BQL
1,2-Dichloropropane	5.5	BQL
1,3-Dichloropropane	5.5	BQL
2,2-Dichloropropane	5.5	BQL
1,1-Dichloropropene	5.5	BQL
cis-1,3-Dichloropropene	5.5	BQL
trans-1,3-Dichloropropene	5.5	BQL
Dichlorodifluoromethane	5.5	BQL
Diisopropyl ether (DIPE)	5.5	BQL
Ethylbenzene	5.5	BQL
Hexachlorobutadiene	5.5	BQL

Reviewed by: lwa

Flags: BQL = Below Quantitation Limit

North Carolina Wastewater Certification #481

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 8260B

Client Sample ID: USTH19-SB02-04

Date Analyzed: 7/23/00

Client Project ID: H-19

Analyzed By: RNP

Lab Sample ID: 91511

Date Collected: 7/12/00

Lab Project ID: G132-685

Date Received: 7/12/00

Matrix: Soil

%Solids: 90.4

Dilution: 1

Compound	Quantitation Limit (ug/KG)	Result (ug/KG)
2-Hexanone	5.5	BQL
Iodomethane	5.5	BQL
Isopropylbenzene	5.5	BQL
4-Isopropyltoluene	5.5	BQL
Methylene chloride	22	BQL
4-Methyl-2-pentanone	5.5	BQL
Methyl-tert-butyl ether (MTBE)	5.5	BQL
Naphthalene	5.5	BQL
n-Propyl benzene	5.5	BQL
Styrene	5.5	BQL
1,1,1,2-Tetrachloroethane	5.5	BQL
1,1,2,2-Tetrachloroethane	5.5	BQL
Tetrachloroethene	5.5	BQL
Toluene	5.5	BQL
1,2,3-Trichlorobenzene	5.5	BQL
1,2,4-Trichlorobenzene	5.5	BQL
Trichloroethene	5.5	BQL
1,1,1-Trichloroethane	5.5	BQL
1,1,2-Trichloroethane	5.5	BQL
Trichlorofluoromethane	5.5	BQL
1,2,3-Trichloropropane	5.5	BQL
1,2,4-Trimethylbenzene	5.5	BQL
1,3,5-Trimethylbenzene	5.5	BQL
Vinyl chloride	5.5	BQL
m-,p-Xylene	11	BQL
o-Xylene	5.5	BQL

Surrogate Spike Recoveries

Compound	Spike Added (ug/KG)	Surrogate Result (ug/KG)	%Rec
Bromofluorobenzene	50	51.6	103
1,2-Dichloroethane-d4	50	49.5	99
Toluene-d8	50	50.7	101

Comments:

All results are corrected for dilution.

Reviewed by: 

Flags: BQL = Below Quantitation Limit

North Carolina Wastewater Certification #481

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatile Base/Neutral Extractables

by GCMS 8270

Client Sample ID: USTH19-SB02-04

Client Project ID: H-19

Lab Sample ID: 91511

Lab Project ID: G132-685

Matrix: Soil

Date Collected: 7/12/00

Date Received: 7/12/00

Date Analyzed: 7/22/00

Analyzed By: MRC

Dilution: 1

%Solids: 90.4

Compound	Quantitation Limit (ug/KG)	Result (ug/KG)
Acenaphthene	340	BQL
Acenaphthylene	340	BQL
Anthracene	340	BQL
Benzo[a]anthracene	340	BQL
Benzo[a]pyrene	340	BQL
Benzo[b]fluoranthene	340	BQL
Benzo[g,h,i]perylene	340	BQL
Benzo[k]fluoranthene	340	BQL
Bis(2-chloroethoxy)methane	340	BQL
Bis(2-chloroethyl)ether	340	BQL
Bis(2-chloroisopropyl)ether	340	BQL
Bis(2-ethylhexyl)phthalate	340	BQL
4-bromophenyl phenyl ether	340	BQL
Butylbenzylphthalate	340	BQL
4-Chloroaniline	340	BQL
2-Chloronaphthalene	340	BQL
4-Chlorophenyl phenyl ether	340	BQL
Chrysene	340	BQL
Di-n-Butylphthalate	340	BQL
Di-n-octylphthalate	340	BQL
Dibenzo[a,h]anthracene	340	BQL
Dibenzofuran	340	BQL
1,2-Dichlorobenzene	340	BQL
1,3-Dichlorobenzene	340	BQL
1,4-Dichlorobenzene	340	BQL
3,3'-Dichlorobenzidine	680	BQL
Diethylphthalate	340	BQL
Dimethylphthalate	340	BQL
4,6-Dinitro-2-methylphenol	1700	BQL
2,4-Dinitrotoluene	340	BQL
2,6-Dinitrotoluene	340	BQL
Fluoranthene	340	BQL
Fluorene	340	BQL
Hexachlorobenzene	340	BQL
Hexachlorobutadiene	340	BQL
Hexachlorocyclopentadiene	680	BQL
Hexachloroethane	340	BQL
Indeno(1,2,3-c,d)pyrene	340	BQL
Isophorone	340	BQL
2-Methylnaphthalene	340	BQL

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatile Base/Neutral Extractables

by GCMS 8270

Client Sample ID: USTH19-SB02-04

Client Project ID: H-19

Lab Sample ID: 91511

Lab Project ID: G132-685

Matrix: Soil

%Solids: 90.4

Date Collected: 7/12/00

Date Received: 7/12/00

Date Analyzed: 7/22/00

Analyzed By: MRC

Dilution: 1

Compound	Quantitation Limit (ug/KG)	Result (ug/KG)
N-Nitrosodi-n-propylamine	340	BQL
N-Nitrosodiphenylamine	340	BQL
Naphthalene	340	BQL
2-Nitroaniline	340	BQL
3-Nitroaniline	340	BQL
4-Nitroaniline	340	BQL
Nitrobenzene	340	BQL
Phenanthrene	340	BQL
Pyrene	340	BQL
1,2,4-Trichlorobenzene	340	BQL

Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	11	110
Nitrobenzene-d5	10	10	101
4-Terphenyl-d14	10	11	106

Comments:

Results are corrected for %solids and dilution where applicable.

Flags:

BQL = Below Quantitation Limit.

Reviewed By: mm

PARADIGM ANALYTICAL LABORATORIES, INC.

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: LAW ENGINEERING

Project Name: H-19

Sample Information and Analytical Results	
Sample Identification	USTH19-SB02-04
Sample Matrix	Soil
Collection Option (for Soil)*	3
Date Collected	07/12/00
Date Received	07/12/00
Date Extracted	07/12/00
Date Analyzed	08/01/00
Dry Weight	90
Dilution Factor	1
C ₅ -C ₈ Aliphatics**	< 10 (mg/Kg)
C ₉ -C ₁₂ Aliphatics**	< 10 (mg/Kg)
C ₉ -C ₁₀ Aromatics**	< 10 (mg/Kg)
Surrogate % Recovery - PID	69
Surrogate % Recovery - FID	84

* = Option 1 = Established fill line on vial, Option 2 = Sampling Device/Brand, or Option 3 = Field weight of soil.

** = Excludes any surrogates or internal standards.

Lab Info: G132-685-91511

Reviewed By: lwn

PARADIGM ANALYTICAL LABORATORIES, INC.

EPH (Aliphatics/Aromatics) Results

by MDEP-EPH

Client Name: LAW ENGINEERING

Project Name: H-19

Sample Information and Analytical Results	
Sample Identification	USTH19-SB02-04
Sample Matrix	Soil
Date Collected	07/12/00
Date Received	07/12/00
Date Extracted	07/18/00
Date Analyzed	07/26/00
Dry Weight	90.4
Dilution Factor	1
C ₉ -C ₁₈ Aliphatics*	< 10 (mg/Kg)
C ₁₉ -C ₃₆ Aliphatics*	< 10 (mg/Kg)
C ₁₁ -C ₂₂ Aromatics*	< 10 (mg/Kg)
Aliphatic Surrogate % Recovery	110
Aromatic Surrogate % Recovery	110

Comments:

* = Excludes any surrogates or internal standards.

Sample did not require fractionation.

Lab info: G132-685-91511

Reviewed By: Wm

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Pesticides by EPA 8081

Client Sample ID: USTH19-SB02-04

Date Collected: 7/12/00

Client Project ID: H-19

Date Received: 7/12/00

Lab Sample ID: 91511

Date Analyzed: 7/25/00

Lab Project ID: G132-685

Analyzed By: CLP

Matrix: Soil

%SOLIDS 90.4

Dilution: 1

Compound	Quantitation Limit (ug/KG)	Result (ug/KG)
alpha-BHC	6.8	BQL
beta-BHC	6.8	BQL
delta-BHC	6.8	BQL
gamma-BHC (Lindane)	6.8	BQL
Heptachlor	6.8	BQL
Aldrin	6.8	BQL
Heptachlor epoxide	6.8	BQL
Endosulfan I	6.8	BQL
Dieldrin	6.8	BQL
4,4'-DDE	6.8	BQL
Endrin	6.8	BQL
DDD	6.8	BQL
Endosulfan II	6.8	BQL
4,4'-DDT	6.8	BQL
Methoxychlor	6.8	BQL
Toxaphene	34	BQL
Chlordane	34	BQL
Endrin aldehyde	6.8	BQL
Endosulfan sulfate	6.8	BQL
Endrin ketone	6.8	BQL

Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovered
TCMX	100	73	73

Comments:

BQL = Below Quantitation Limit

Reviewed By:

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for PCBs

by EPA 8082

Client Sample ID: USTH19-SB02-04

Client Project ID: H-19

Lab Sample ID: 91511

Lab Project ID: G132-685

Matrix: Soil

%SOLIDS: 90.4

Date Collected: 7/12/00

Date Received: 7/12/00

Date Analyzed: 7/21/00

Analyzed By: CLP

Dilution: 1

Compound	Quantitation Limit (ug/KG)	Result (ug/KG) ✓
Arochlor-1016	170	BQL
Arochlor-1221	170	BQL
Arochlor-1232	170	BQL
Arochlor-1242	170	BQL
Arochlor-1248	170	BQL
Arochlor-1254	170	BQL
Arochlor-1260	170	BQL

Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovered
TCMX	100	83	83

Comments:

BQL = Below Quantitation Limit

NA = Not applicable, surrogate diluted out.

Reviewed By: hwa

PARADIGM ANALYTICAL LABORATORIES, INC.
Results for Inorganics

Client Sample ID: USTH19-SB02-04
Client Project ID: H-19
Lab Sample ID: 91511
Lab Project ID: G132-685

Analyzed By: JMF
Date Collected: 7/12/00
Date Received: 7/12/00
Matrix: Soil

Solids 90.43

Metals	Result	Quantitation Limit	Units	Procedure	Date Analyzed
Chromium	3.02 ✓	1.08	MG/KG	6010B	7/25/00
Lead	15.6 ✓	1.08	MG/KG	6010B	7/25/00

Comments

BQL = Below Quantitation Limits

Reviewed By: Mn

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 8260B

Client Sample ID: USTH19-SB03-02

Client Project ID: H-19

Lab Sample ID: 91512

Lab Project ID: G132-685

Matrix: Soil

%Solids: 90.2

Date Analyzed: 7/24/00

Analyzed By: RNP

Date Collected: 7/12/00

Date Received: 7/12/00

Dilution: 1

Compound	Quantitation Limit (ug/KG)	Result (ug/KG)
Acetone	55	BQL
Acrolein	110	BQL
Acrylonitrile	110	BQL
Benzene	5.5	BQL
Bromobenzene	5.5	BQL
Bromochloromethane	5.5	BQL
Bromodichloromethane	5.5	BQL
Bromoform	5.5	BQL
Bromomethane	5.5	BQL
2-Butanone	28	BQL
n-Butylbenzene	5.5	BQL
sec-Butylbenzene	5.5	BQL
tert-Butylbenzene	5.5	BQL
Carbon disulfide	5.5	BQL
Carbon tetrachloride	5.5	BQL
Chlorobenzene	5.5	BQL
Chloroethane	5.5	BQL
2-Chloroethyl vinyl ether	5.5	BQL
Chloroform	5.5	BQL
Chloromethane	5.5	BQL
2-Chlorotoluene	5.5	BQL
4-Chlorotoluene	5.5	BQL
Dibromochloromethane	5.5	BQL
1,2-Dibromo-3-chloropropane	5.5	BQL
Dibromomethane	5.5	BQL
1,2-Dibromoethane (EDB)	5.5	BQL
1,2-Dichlorobenzene	5.5	BQL
1,3-Dichlorobenzene	5.5	BQL
1,4-Dichlorobenzene	5.5	BQL
trans-1,4-Dichloro-2-butene	5.5	BQL
1,1-Dichloroethane	5.5	BQL
1,1-Dichloroethene	5.5	BQL
1,2-Dichloroethane	5.5	BQL
cis-1,2-Dichloroethene	5.5	BQL
trans-1,2-dichloroethene	5.5	BQL
1,2-Dichloropropane	5.5	BQL
1,3-Dichloropropane	5.5	BQL
2,2-Dichloropropane	5.5	BQL
1,1-Dichloropropene	5.5	BQL
cis-1,3-Dichloropropene	5.5	BQL
trans-1,3-Dichloropropene	5.5	BQL
Dichlorodifluoromethane	5.5	BQL
Diisopropyl ether (DIPE)	5.5	BQL
Ethylbenzene	5.5	BQL
Hexachlorobutadiene	5.5	BQL

Reviewed by: mm

Flags: BQL = Below Quantitation Limit

N.C. Certification #481 S.C. Certification #99029

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 8260B

Client Sample ID: USTH19-SB03-02

Date Analyzed: 7/24/00

Client Project ID: H-19

Analyzed By: RNP

Lab Sample ID: 91512

Date Collected: 7/12/00

Lab Project ID: G132-685

Date Received: 7/12/00

Matrix: Soil

%Solids: 90.2

Dilution: 1

Compound	Quantitation Limit (ug/KG)	Result (ug/KG)
2-Hexanone	5.5	BQL
Iodomethane	5.5	BQL
Isopropylbenzene	5.5	BQL
4-Isopropyltoluene	5.5	BQL
Methylene chloride	22	BQL
4-Methyl-2-pentanone	5.5	BQL
Methyl-tert-butyl ether (MTBE)	5.5	BQL
Naphthalene	5.5	BQL
n-Propyl benzene	5.5	BQL
Styrene	5.5	BQL
1,1,1,2-Tetrachloroethane	5.5	BQL
1,1,2,2-Tetrachloroethane	5.5	BQL
Tetrachloroethene	5.5	BQL
Toluene	5.5	BQL
1,2,3-Trichlorobenzene	5.5	BQL
1,2,4-Trichlorobenzene	5.5	BQL
Trichloroethene	5.5	BQL
1,1,1-Trichloroethane	5.5	BQL
1,1,2-Trichloroethane	5.5	BQL
Trichlorofluoromethane	5.5	BQL
1,2,3-Trichloropropane	5.5	BQL
1,2,4-Trimethylbenzene	5.5	BQL
1,3,5-Trimethylbenzene	5.5	BQL
Vinyl chloride	5.5	BQL
m,p-Xylene	11	BQL
o-Xylene	5.5	BQL

Surrogate Spike Recoveries

Compound	Spike Added (ug/KG)	Surrogate Result (ug/KG)	%Rec
Bromofluorobenzene	50	52.6	105
1,2-Dichloroethane-d4	50	52.5	105
Toluene-d8	50	51.3	103

Comments:

All results are corrected for dilution.

Reviewed by: MN

Flags: BQL = Below Quantitation Limit

N.C. Certification #481 S.C. Certification #99029

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatile Base/Neutral Extractables by GCMS 8270

Client Sample ID: USTH19-SB03-02

Client Project ID: H-19

Lab Sample ID: 91512

Lab Project ID: G132-685

Matrix: Soil

%Solids: 90.2

Date Collected: 7/12/00

Date Received: 7/12/00

Date Analyzed: 7/22/00

Analyzed By: MRC

Dilution: 1

Compound	Quantitation Limit (ug/KG)	Result (ug/KG)
Acenaphthene	340	BQL
Acenaphthylene	340	BQL
Anthracene	340	BQL
Benzo[a]anthracene	340	1100 ✓
Benzo[a]pyrene	340	1100 ✓
Benzo[b]fluoranthene	340	1500 ✓
Benzo[g,h,i]perylene	340	460 ✓
Benzo[k]fluoranthene	340	1200 ✓
Bis(2-chloroethoxy)methane	340	BQL
Bis(2-chloroethyl)ether	340	BQL
Bis(2-chloroisopropyl)ether	340	BQL
Bis(2-ethylhexyl)phthalate	340	BQL
4-bromophenyl phenyl ether	340	BQL
Butylbenzylphthalate	340	BQL
4-Chloroaniline	340	BQL
2-Chloronaphthalene	340	BQL
4-Chlorophenyl phenyl ether	340	BQL
Chrysene	340	1500 ✓
Di-n-Butylphthalate	340	BQL
Di-n-octylphthalate	340	BQL
Dibenzo[a,h]anthracene	340	BQL
Dibenzofuran	340	BQL
1,2-Dichlorobenzene	340	BQL
1,3-Dichlorobenzene	340	BQL
1,4-Dichlorobenzene	340	BQL
3,3'-Dichlorobenzidine	680	BQL
Diethylphthalate	340	BQL
Dimethylphthalate	340	BQL
4,6-Dinitro-2-methylphenol	1700	BQL
2,4-Dinitrotoluene	340	BQL
2,6-Dinitrotoluene	340	BQL
Fluoranthene	340	1700 ✓
Fluorene	340	BQL
Hexachlorobenzene	340	BQL
Hexachlorobutadiene	340	BQL
Hexachlorocyclopentadiene	680	BQL
Hexachloroethane	340	BQL
Indeno(1,2,3-c,d)pyrene	340	520 ✓
Isophorone	340	BQL
2-Methylnaphthalene	340	BQL

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatile Base/Neutral Extractables
by GCMS 8270

Client Sample ID: USTH19-SB03-02

Client Project ID: H-19

Lab Sample ID: 91512

Lab Project ID: G132-685

Matrix: Soil

%Solids: 90.2

Date Collected: 7/12/00

Date Received: 7/12/00

Date Analyzed: 7/22/00

Analyzed By: MRC

Dilution: 1

Compound	Quantitation Limit (ug/KG)	Result (ug/KG)
N-Nitrosodi-n-propylamine	340	BQL
N-Nitrosodiphenylamine	340	BQL
Naphthalene	340	BQL
2-Nitroaniline	340	BQL
3-Nitroaniline	340	BQL
4-Nitroaniline	340	BQL
Nitrobenzene	340	BQL
Phenanthrene	340	BQL
Pyrene	340	1700 ✓
1,2,4-Trichlorobenzene	340	BQL

Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	12	117
Nitrobenzene-d5	10	10	101
4-Terphenyl-d14	10	11	108

Comments:

Results are corrected for %solids and dilution where applicable.

Flags:

BQL = Below Quantitation Limit.

Reviewed By: ma

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Pesticides

by EPA 8081

Client Sample ID: USTH19-SB03-02

Date Collected: 7/12/00

Client Project ID: H-19

Date Received: 7/12/00

Lab Sample ID: 91512

Date Analyzed: 7/25/00

Lab Project ID: G132-685

Analyzed By: CLP

Matrix: Soil

%SOLIDS 90.2

Dilution: 1

Compound	Quantitation Limit (ug/KG)	✓	Result (ug/KG)
alpha-BHC	6.8		BQL
beta-BHC	6.8		BQL
delta-BHC	6.8		BQL
gamma-BHC (Lindane)	6.8		BQL
Heptachlor	6.8		BQL
Aldrin	6.8		BQL
Heptachlor epoxide	6.8		BQL
Endosulfan I	6.8		BQL
Dieldrin	6.8		BQL
4,4'-DDE	6.8		BQL
Endrin	6.8		BQL
DDD	6.8		BQL
Endosulfan II	6.8		BQL
4,4'-DDT	6.8		BQL
Methoxychlor	6.8		BQL
Toxaphene	34		BQL
Chlordane	34		BQL
Endrin aldehyde	6.8		BQL
Endosulfan sulfate	6.8		BQL
Endrin ketone	6.8		BQL

Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovered
TCMX	100	67	67

Comments:

BQL = Below Quantitation Limit

Reviewed By: Wm

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for PCBs
by EPA 8082

Client Sample ID: USTH19-SB03-02

Client Project ID: H-19

Lab Sample ID: 91512

Lab Project ID: G132-685

Matrix: Soil

%SOLIDS: 90.2

Date Collected: 7/12/00

Date Received: 7/12/00

Date Analyzed: 7/21/00

Analyzed By: CLP

Dilution: 1

Compound	Quantitation Limit (ug/KG)	Result (ug/KG)
Arochlor-1016	170	BQL
Arochlor-1221	170	BQL
Arochlor-1232	170	BQL
Arochlor-1242	170	BQL
Arochlor-1248	170	BQL
Arochlor-1254	170	BQL
Arochlor-1260	170	BQL

Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovered
TCMX	100	76	76

Comments:

BQL = Below Quantitation Limit

NA = Not applicable, surrogate diluted out.

Reviewed By: 

PARADIGM ANALYTICAL LABORATORIES, INC.

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: LAW ENGINEERING

Project Name: H-19

Sample Information and Analytical Results	
Sample Identification	USTH19-SB03-02
Sample Matrix	Soil
Collection Option (for Soil)*	3
Date Collected	07/12/00
Date Received	07/12/00
Date Extracted	07/12/00
Date Analyzed	08/01/00
Dry Weight	90
Dilution Factor	1
C ₅ -C ₈ Aliphatics**	< 10 (mg/Kg)
C ₉ -C ₁₂ Aliphatics**	< 10 (mg/Kg)
C ₉ -C ₁₀ Aromatics**	< 10 (mg/Kg)
Surrogate % Recovery - PID	68
Surrogate % Recovery - FID	82

* = Option 1 = Established fill line on vial, Option 2 = Sampling Device/Brand, or Option 3 = Field weight of soil.

** = Excludes any surrogates or internal standards.

Lab Info: G132-685-91512

Reviewed By: MM

PARADIGM ANALYTICAL LABORATORIES, INC.

EPH (Aliphatics/Aromatics) Results

by MDEP-EPH

Client Name: LAW ENGINEERING

Project Name: H-19

Sample Information and Analytical Results	
Sample Identification	USTH19-SB03-02
Sample Matrix	Soil
Date Collected	07/12/00
Date Received	07/12/00
Date Extracted	07/18/00
Date Analyzed	07/26/00
Dry Weight	90.2
Dilution Factor	1
C ₉ -C ₁₈ Aliphatics*	< 10 (mg/Kg)
C ₁₉ -C ₃₆ Aliphatics*	< 10 (mg/Kg)
C ₁₁ -C ₂₂ Aromatics*	< 10 (mg/Kg)
Aliphatic Surrogate % Recovery	97
Aromatic Surrogate % Recovery	98

Comments:

* = Excludes any surrogates or internal standards.
Sample did not require fractionation.

Lab info: G132-685-91512

Reviewed By: 

PARADIGM ANALYTICAL LABORATORIES, INC.
Results for Inorganics

Client Sample ID: USTH19-SB03-02
Client Project ID: H-19
Lab Sample ID: 91512
Lab Project ID: G132-685

Analyzed By: JMF
Date Collected: 7/12/00
Date Received: 7/12/00
Matrix: Soil

Solids 90.20

Metals	Result	Quantitation Limit	Units	Procedure	Date Analyzed
Chromium	2.71 ✓	1.10	MG/KG	6010B	7/25/00
Lead	20.2 ✓	1.10	MG/KG	6010B	7/25/00

Comments

BQL = Below Quantitation Limits

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 8260B

Client Sample ID: USTH19-SB04-01

Client Project ID: H-19

Lab Sample ID: 92018

Lab Project ID: G132-688

Matrix: Soil

%Solids: 85.8

Date Analyzed: 7/24/00

Analyzed By: RNP

Date Collected: 7/18/00

Date Received: 7/21/00

Dilution: 1

Compound	Quantitation Limit (ug/KG)	Result (ug/KG)
Acetone	58	BQL
Acrolein	120	BQL
Acrylonitrile	120	BQL
Benzene	5.8	BQL
Bromobenzene	5.8	BQL
Bromochloromethane	5.8	BQL
Bromodichloromethane	5.8	BQL
Bromoform	5.8	BQL
Bromomethane	5.8	BQL
2-Butanone	29	BQL
n-Butylbenzene	5.8	BQL
sec-Butylbenzene	5.8	BQL
tert-Butylbenzene	5.8	BQL
Carbon disulfide	5.8	BQL
Carbon tetrachloride	5.8	BQL
Chlorobenzene	5.8	BQL
Chloroethane	5.8	BQL
2-Chloroethyl vinyl ether	5.8	BQL
Chloroform	5.8	BQL
Chloromethane	5.8	BQL
2-Chlorotoluene	5.8	BQL
4-Chlorotoluene	5.8	BQL
Dibromochloromethane	5.8	BQL
1,2-Dibromo-3-chloropropane	5.8	BQL
Dibromomethane	5.8	BQL
1,2-Dibromoethane (EDB)	5.8	BQL
1,2-Dichlorobenzene	5.8	BQL
1,3-Dichlorobenzene	5.8	BQL
1,4-Dichlorobenzene	5.8	BQL
trans-1,4-Dichloro-2-butene	5.8	BQL
1,1-Dichloroethane	5.8	BQL
1,1-Dichloroethene	5.8	BQL
1,2-Dichloroethane	5.8	BQL
cis-1,2-Dichloroethene	5.8	BQL
trans-1,2-dichloroethene	5.8	BQL
1,2-Dichloropropane	5.8	BQL
1,3-Dichloropropane	5.8	BQL
2,2-Dichloropropane	5.8	BQL
1,1-Dichloropropene	5.8	BQL
cis-1,3-Dichloropropene	5.8	BQL
trans-1,3-Dichloropropene	5.8	BQL
Dichlorodifluoromethane	5.8	BQL
Diisopropyl ether (DIPE)	5.8	BQL
Ethylbenzene	5.8	BQL
Hexachlorobutadiene	5.8	BQL

Reviewed by: W

Flags: BQL = Below Quantitation Limit

North Carolina Wastewater Certification #481

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 8260B

Client Sample ID: USTH19-SB04-01

Date Analyzed: 7/24/00

Client Project ID: H-19

Analyzed By: RNP

Lab Sample ID: 92018

Date Collected: 7/18/00

Lab Project ID: G132-688

Date Received: 7/21/00

Matrix: Soil

%Solids: 85.8

Dilution: 1

Compound	Quantitation Limit (ug/KG)	Result (ug/KG)
2-Hexanone	5.8	BQL
Iodomethane	5.8	BQL
Isopropylbenzene	5.8	BQL
4-Isopropyltoluene	5.8	BQL
Methylene chloride	23	BQL
4-Methyl-2-pentanone	5.8	BQL
Methyl-tert-butyl ether (MTBE)	5.8	BQL
Naphthalene	5.8	BQL
n-Propyl benzene	5.8	BQL
Styrene	5.8	BQL
1,1,1,2-Tetrachloroethane	5.8	BQL
1,1,2,2-Tetrachloroethane	5.8	BQL
Tetrachloroethene	5.8	BQL
Toluene	5.8	BQL
1,2,3-Trichlorobenzene	5.8	BQL
1,2,4-Trichlorobenzene	5.8	BQL
Trichloroethene	5.8	BQL
1,1,1-Trichloroethane	5.8	BQL
1,1,2-Trichloroethane	5.8	BQL
Trichlorofluoromethane	5.8	BQL
1,2,3-Trichloropropane	5.8	BQL
1,2,4-Trimethylbenzene	5.8	BQL
1,3,5-Trimethylbenzene	5.8	BQL
Vinyl chloride	5.8	BQL
m-,p-Xylene	12	BQL
o-Xylene	5.8	BQL

Surrogate Spike Recoveries	Spike Added (ug/KG)	Surrogate Result (ug/KG)	%Rec
Compound			
Bromofluorobenzene	50	50.2	100
1,2-Dichloroethane-d4	50	51.2	102
Toluene-d8	50	50.8	102

Comments:

All results are corrected for dilution.

Reviewed by: 

Flags: BQL = Below Quantitation Limit

North Carolina Wastewater Certification #481

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatile Base/Neutral Extractables by GCMS 8270

Client Sample ID: USTH19-SB04-01

Client Project ID: H-19

Lab Sample ID: 92018

Lab Project ID: G132-688

Matrix: Soil

%Solids: 85.8

Date Collected: 7/18/00

Date Received: 7/21/00

Date Analyzed: 7/26/00

Analyzed By: MRC

Dilution: 1

Compound	Quantitation Limit (ug/KG)	Result (ug/KG) ✓
Acenaphthene	360	BQL
Acenaphthylene	360	BQL
Anthracene	360	BQL
Benzo[a]anthracene	360	BQL
Benzo[a]pyrene	360	BQL
Benzo[b]fluoranthene	360	BQL
Benzo[g,h,i]perylene	360	BQL
Benzo[k]fluoranthene	360	BQL
Bis(2-chloroethoxy)methane	360	BQL
Bis(2-chloroethyl)ether	360	BQL
Bis(2-chloroisopropyl)ether	360	BQL
Bis(2-ethylhexyl)phthalate	360	BQL
4-bromophenyl phenyl ether	360	BQL
Butylbenzylphthalate	360	BQL
4-Chloroaniline	360	BQL
2-Chloronaphthalene	360	BQL
4-Chlorophenyl phenyl ether	360	BQL
Chrysene	360	BQL
Di-n-Butylphthalate	360	BQL
Di-n-octylphthalate	360	BQL
Dibenzo[a,h]anthracene	360	BQL
Dibenzofuran	360	BQL
1,2-Dichlorobenzene	360	BQL
1,3-Dichlorobenzene	360	BQL
1,4-Dichlorobenzene	360	BQL
3,3'-Dichlorobenzidine	720	BQL
Diethylphthalate	360	BQL
Dimethylphthalate	360	BQL
4,6-Dinitro-2-methylphenol	1800	BQL
2,4-Dinitrotoluene	360	BQL
2,6-Dinitrotoluene	360	BQL
Fluoranthene	360	BQL
Fluorene	360	BQL
Hexachlorobenzene	360	BQL
Hexachlorobutadiene	360	BQL
Hexachlorocyclopentadiene	720	BQL
Hexachloroethane	360	BQL
Indeno(1,2,3-c,d)pyrene	360	BQL
Isophorone	360	BQL
2-Methylnaphthalene	360	BQL

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatile Base/Neutral Extractables
by GCMS 8270

Client Sample ID: USTH19-SB04-01

Client Project ID: H-19

Lab Sample ID: 92018

Lab Project ID: G132-688

Matrix: Soil

%Solids: 85.8

Date Collected: 7/18/00

Date Received: 7/21/00

Date Analyzed: 7/26/00

Analyzed By: MRC

Dilution: 1

Compound	Quantitation Limit (ug/KG)	Result (ug/KG)
N-Nitrosodi-n-propylamine	360	BQL
N-Nitrosodiphenylamine	360	BQL
Naphthalene	360	BQL
2-Nitroaniline	360	BQL
3-Nitroaniline	360	BQL
4-Nitroaniline	360	BQL
Nitrobenzene	360	BQL
Phenanthrene	360	BQL
Pyrene	360	BQL
1,2,4-Trichlorobenzene	360	BQL

Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	11	106
Nitrobenzene-d5	10	10	105
4-Terphenyl-d14	10	9.6	96

Comments:

Results are corrected for %solids and dilution where applicable.

Flags:

BQL = Below Quantitation Limit.

Reviewed By: MRC

PARADIGM ANALYTICAL LABORATORIES, INC.

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: LAW ENGINEERING

Project Name: H-19

Sample Information and Analytical Results	
Sample Identification	USTH19-SB04-01
Sample Matrix	Soil
Collection Option (for Soil)*	3
Date Collected	07/18/00
Date Received	07/21/00
Date Extracted	07/18/00
Date Analyzed	08/04/00
Dry Weight	86
Dilution Factor	1
C ₅ -C ₈ Aliphatics**	13 (mg/Kg)
C ₉ -C ₁₂ Aliphatics**	11 (mg/Kg)
C ₉ -C ₁₀ Aromatics**	< 10 (mg/Kg)
Surrogate % Recovery - PID	73
Surrogate % Recovery - FID	86

* = Option 1 = Established fill line on vial, Option 2 = Sampling Device/Brand, or Option 3 = Field weight of soil.

** = Excludes any surrogates or internal standards.

Lab Info: G132-688-92018

Reviewed By: mm

PARADIGM ANALYTICAL LABORATORIES, INC.

EPH (Aliphatics/Aromatics) Results

by MDEP-EPH

Client Name: LAW ENGINEERING

Project Name: H-19

Sample Information and Analytical Results	
Sample Identification	USTH19-SB04-01
Sample Matrix	Soil
Date Collected	07/18/00
Date Received	07/21/00
Date Extracted	07/19/00
Date Analyzed	07/27/00
Dry Weight	85.8
Dilution Factor	1
C ₉ -C ₁₈ Aliphatics*	< 10 (mg/Kg)
C ₁₉ -C ₃₆ Aliphatics*	< 10 (mg/Kg)
C ₁₁ -C ₂₂ Aromatics*	12 (mg/Kg)
Aliphatic Surrogate % Recovery	130
Aromatic Surrogate % Recovery	30
Fractionation Surrogate 1 % Recovery	55

Comments:

* = Excludes any surrogates or internal standards.

Lab info: G132-688-92018

Reviewed By: MD

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 8260B

Client Sample ID: USTH19-SB05-01

Date Analyzed: 7/24/00

Client Project ID: H-19

Analyzed By: RNP

Lab Sample ID: 91513

Date Collected: 7/12/00

Lab Project ID: G132-685

Date Received: 7/12/00

Matrix: Soil

%Solids: 88.9

Dilution: 1

Compound	Quantitation Limit (ug/KG)	Result (ug/KG)
Acetone	56	BQL
Acrolein	110	BQL
Acrylonitrile	110	BQL
Benzene	5.6	BQL
Bromobenzene	5.6	BQL
Bromochloromethane	5.6	BQL
Bromodichloromethane	5.6	BQL
Bromoform	5.6	BQL
Bromomethane	5.6	BQL
2-Butanone	28	BQL
n-Butylbenzene	5.6	BQL
sec-Butylbenzene	5.6	BQL
tert-Butylbenzene	5.6	BQL
Carbon disulfide	5.6	BQL
Carbon tetrachloride	5.6	BQL
Chlorobenzene	5.6	BQL
Chloroethane	5.6	BQL
2-Chloroethyl vinyl ether	5.6	BQL
Chloroform	5.6	BQL
Chloromethane	5.6	BQL
2-Chlorotoluene	5.6	BQL
4-Chlorotoluene	5.6	BQL
Dibromochloromethane	5.6	BQL
1,2-Dibromo-3-chloropropane	5.6	BQL
Dibromomethane	5.6	BQL
1,2-Dibromoethane (EDB)	5.6	BQL
1,2-Dichlorobenzene	5.6	BQL
1,3-Dichlorobenzene	5.6	BQL
1,4-Dichlorobenzene	5.6	BQL
trans-1,4-Dichloro-2-butene	5.6	BQL
1,1-Dichloroethane	5.6	BQL
1,1-Dichloroethene	5.6	BQL
1,2-Dichloroethane	5.6	BQL
cis-1,2-Dichloroethene	5.6	BQL
trans-1,2-dichloroethene	5.6	BQL
1,2-Dichloropropane	5.6	BQL
1,3-Dichloropropane	5.6	BQL
2,2-Dichloropropane	5.6	BQL
1,1-Dichloropropene	5.6	BQL
cis-1,3-Dichloropropene	5.6	BQL
trans-1,3-Dichloropropene	5.6	BQL
Dichlorodifluoromethane	5.6	BQL
Diisopropyl ether (DIPE)	5.6	BQL
Ethylbenzene	5.6	BQL
Hexachlorobutadiene	5.6	BQL

Reviewed by: MM

Flags: BQL = Below Quantitation Limit

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 8260B

Client Sample ID: USTH19-SB05-01

Date Analyzed: 7/24/00

Client Project ID: H-19

Analyzed By: RNP

Lab Sample ID: 91513

Date Collected: 7/12/00

Lab Project ID: G132-685

Date Received: 7/12/00

Matrix: Soil

%Solids: 88.9

Dilution: 1

Compound	Quantitation Limit (ug/KG)	Result (ug/KG)
2-Hexanone	5.6	BQL
Iodomethane	5.6	BQL
Isopropylbenzene	5.6	BQL
4-Isopropyltoluene	5.6	BQL
Methylene chloride	23	BQL
4-Methyl-2-pentanone	5.6	BQL
Methyl-tert-butyl ether (MTBE)	5.6	BQL
Naphthalene	5.6	BQL
n-Propyl benzene	5.6	BQL
Styrene	5.6	BQL
1,1,1,2-Tetrachloroethane	5.6	BQL
1,1,2,2-Tetrachloroethane	5.6	BQL
Tetrachloroethene	5.6	BQL
Toluene	5.6	BQL
1,2,3-Trichlorobenzene	5.6	BQL
1,2,4-Trichlorobenzene	5.6	BQL
Trichloroethene	5.6	BQL
1,1,1-Trichloroethane	5.6	BQL
1,1,2-Trichloroethane	5.6	BQL
Trichlorofluoromethane	5.6	BQL
1,2,3-Trichloropropane	5.6	BQL
1,2,4-Trimethylbenzene	5.6	BQL
1,3,5-Trimethylbenzene	5.6	BQL
Vinyl chloride	5.6	BQL
m-,p-Xylene	11	BQL
o-Xylene	5.6	BQL

Surrogate Spike Recoveries	Spike Added (ug/KG)	Surrogate Result (ug/KG)	%Rec
Compound			
Bromofluorobenzene	50	50.8	102
1,2-Dichloroethane-d4	50	48.9	98
Toluene-d8	50	50.6	101

Comments:

All results are corrected for dilution.

Reviewed by: 

Flags: BQL = Below Quantitation Limit

North Carolina Wastewater Certification #481

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatile Base/Neutral Extractables by GCMS 8270

Client Sample ID: USTH19-SB05-01

Client Project ID: H-19

Lab Sample ID: 91513

Lab Project ID: G132-685

Matrix: Soil

Date Collected: 7/12/00

Date Received: 7/12/00

Date Analyzed: 7/22/00

Analyzed By: MRC

Dilution: 1

Compound	Quantitation Limit (ug/KG)	Result (ug/KG)
Acenaphthene	350	BQL ✓
Acenaphthylene	350	BQL
Anthracene	350	BQL
Benzo[a]anthracene	350	BQL
Benzo[a]pyrene	350	BQL
Benzo[b]fluoranthene	350	BQL
Benzo[g,h,i]perylene	350	BQL
Benzo[k]fluoranthene	350	BQL
Bis(2-chloroethoxy)methane	350	BQL
Bis(2-chloroethyl)ether	350	BQL
Bis(2-chloroisopropyl)ether	350	BQL
Bis(2-ethylhexyl)phthalate	350	BQL
4-bromophenyl phenyl ether	350	BQL
Butylbenzylphthalate	350	BQL
4-Chloroaniline	350	BQL
2-Chloronaphthalene	350	BQL
4-Chlorophenyl phenyl ether	350	BQL
Chrysene	350	BQL
Di-n-Butylphthalate	350	BQL
Di-n-octylphthalate	350	BQL
Dibenzo[a,h]anthracene	350	BQL
Dibenzofuran	350	BQL
1,2-Dichlorobenzene	350	BQL
1,3-Dichlorobenzene	350	BQL
1,4-Dichlorobenzene	350	BQL
3,3'-Dichlorobenzidine	700	BQL
Diethylphthalate	350	BQL
Dimethylphthalate	350	BQL
4,6-Dinitro-2-methylphenol	1700	BQL
2,4-Dinitrotoluene	350	BQL
2,6-Dinitrotoluene	350	BQL
Fluoranthene	350	BQL
Fluorene	350	BQL
Hexachlorobenzene	350	BQL
Hexachlorobutadiene	350	BQL
Hexachlorocyclopentadiene	700	BQL
Hexachloroethane	350	BQL
Indeno(1,2,3-c,d)pyrene	350	BQL
Isophorone	350	BQL
2-Methylnaphthalene	350	BQL

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatile Base/Neutral Extractables
by GCMS 8270

Client Sample ID: USTH19-SB05-01

Client Project ID: H-19

Lab Sample ID: 91513

Lab Project ID: G132-685

Matrix: Soil

Date Collected: 7/12/00

Date Received: 7/12/00

Date Analyzed: 7/22/00

Analyzed By: MRC

Dilution: 1

%Solids: 88.9

Compound	Quantitation Limit (ug/KG)	Result (ug/KG)
N-Nitrosodi-n-propylamine	350	BQL
N-Nitrosodiphenylamine	350	BQL
Naphthalene	350	BQL
2-Nitroaniline	350	BQL
3-Nitroaniline	350	BQL
4-Nitroaniline	350	BQL
Nitrobenzene	350	BQL
Phenanthrene	350	BQL
Pyrene	350	BQL
1,2,4-Trichlorobenzene	350	BQL

Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	11	109
Nitrobenzene-d5	10	9.5	95
4-Terphenyl-d14	10	11	109

Comments:

Results are corrected for %solids and dilution where applicable.

Flags:

BQL = Below Quantitation Limit.

Reviewed By: Ym

PARADIGM ANALYTICAL LABORATORIES, INC.

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: LAW ENGINEERING

Project Name: H-19

Sample Information and Analytical Results	
Sample Identification	USTH19-SB05-01
Sample Matrix	Soil
Collection Option (for Soil)*	3
Date Collected	07/12/00
Date Received	07/12/00
Date Extracted	07/12/00
Date Analyzed	08/01/00
Dry Weight	89
Dilution Factor	1
C ₅ -C ₈ Aliphatics**	< 10 (mg/Kg)
C ₉ -C ₁₂ Aliphatics**	< 10 (mg/Kg)
C ₉ -C ₁₀ Aromatics**	< 10 (mg/Kg)
Surrogate % Recovery - PID	68
Surrogate % Recovery - FID	82

* = Option 1 = Established fill line on vial, Option 2 = Sampling Device/Brand, or Option 3 = Field weight of soil.

** = Excludes any surrogates or internal standards.

Lab Info: G132-685-91513

Reviewed By: JVM

PARADIGM ANALYTICAL LABORATORIES, INC.

EPH (Aliphatics/Aromatics) Results

by MDEP-EPH

Client Name: LAW ENGINEERING

Project Name: H-19

Sample Information and Analytical Results	
Sample Identification	USTH19-SB05-01
Sample Matrix	Soil
Date Collected	07/12/00
Date Received	07/12/00
Date Extracted	07/19/00
Date Analyzed	07/24/00
Dry Weight	88.9
Dilution Factor	1
C ₉ -C ₁₈ Aliphatics*	< 10 (mg/Kg)
C ₁₉ -C ₃₆ Aliphatics*	< 10 (mg/Kg)
C ₁₁ -C ₂₂ Aromatics*	< 10 (mg/Kg)
Aliphatic Surrogate % Recovery	84
Aromatic Surrogate % Recovery	85

Comments:

* = Excludes any surrogates or internal standards.

Sample did not require fractionation. .

Lab info: G132-685-91513

Reviewed By: WJ

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 8260B

Client Sample ID: USTH19-SB06-04

Client Project ID: H-19

Lab Sample ID: 91514

Lab Project ID: G132-685

Matrix: Soil

%Solids: 86.2

Date Analyzed: 7/24/00

Analyzed By: RNP

Date Collected: 7/12/00

Date Received: 7/12/00

Dilution: 1

Compound	Quantitation Limit (ug/KG)	Result (ug/KG)
Acetone	58	BQL ✓
Acrolein	120	BQL
Acrylonitrile	120	BQL
Benzene	5.8	BQL
Bromobenzene	5.8	BQL
Bromochloromethane	5.8	BQL
Bromodichloromethane	5.8	BQL
Bromoform	5.8	BQL
Bromomethane	5.8	BQL
2-Butanone	29	BQL
n-Butylbenzene	5.8	BQL
sec-Butylbenzene	5.8	BQL
tert-Butylbenzene	5.8	BQL
Carbon disulfide	5.8	BQL
Carbon tetrachloride	5.8	BQL
Chlorobenzene	5.8	BQL
Chloroethane	5.8	BQL
2-Chloroethyl vinyl ether	5.8	BQL
Chloroform	5.8	BQL
Chloromethane	5.8	BQL
2-Chlorotoluene	5.8	BQL
4-Chlorotoluene	5.8	BQL
Dibromochloromethane	5.8	BQL
1,2-Dibromo-3-chloropropane	5.8	BQL
Dibromomethane	5.8	BQL
1,2-Dibromoethane (EDB)	5.8	BQL
1,2-Dichlorobenzene	5.8	BQL
1,3-Dichlorobenzene	5.8	BQL
1,4-Dichlorobenzene	5.8	BQL
trans-1,4-Dichloro-2-butene	5.8	BQL
1,1-Dichloroethane	5.8	BQL
1,1-Dichloroethene	5.8	BQL
1,2-Dichloroethane	5.8	BQL
cis-1,2-Dichloroethene	5.8	BQL
trans-1,2-dichloroethene	5.8	BQL
1,2-Dichloropropane	5.8	BQL
1,3-Dichloropropane	5.8	BQL
2,2-Dichloropropane	5.8	BQL
1,1-Dichloropropene	5.8	BQL
cis-1,3-Dichloropropene	5.8	BQL
trans-1,3-Dichloropropene	5.8	BQL
Dichlorodifluoromethane	5.8	BQL
Diisopropyl ether (DIPE)	5.8	BQL
Ethylbenzene	5.8	BQL
Hexachlorobutadiene	5.8	BQL

Reviewed by: lwn

Flags: BQL = Below Quantitation Limit

North Carolina Wastewater Certification #481

PARADIGM ANALYTICAL LABORATORIES, INC.
Results for Volatiles
by GCMS 8260B

Client Sample ID: USTH19-SB06-04

Date Analyzed: 7/24/00

Client Project ID: H-19

Analyzed By: RNP

Lab Sample ID: 91514

Date Collected: 7/12/00

Lab Project ID: G132-685

Date Received: 7/12/00

Matrix: Soil

%Solids: 86.2

Dilution: 1

Compound	Quantitation Limit (ug/KG)	Result (ug/KG)
2-Hexanone	5.8	BQL ✓
Iodomethane	5.8	BQL
Isopropylbenzene	5.8	BQL
4-Isopropyltoluene	5.8	BQL
Methylene chloride	23	BQL
4-Methyl-2-pentanone	5.8	BQL
Methyl-tert-butyl ether (MTBE)	5.8	BQL
Naphthalene	5.8	BQL
n-Propyl benzene	5.8	BQL
Styrene	5.8	BQL
1,1,1,2-Tetrachloroethane	5.8	BQL
1,1,2,2-Tetrachloroethane	5.8	BQL
Tetrachloroethene	5.8	BQL
Toluene	5.8	BQL
1,2,3-Trichlorobenzene	5.8	BQL
1,2,4-Trichlorobenzene	5.8	BQL
Trichloroethene	5.8	BQL
1,1,1-Trichloroethane	5.8	BQL
1,1,2-Trichloroethane	5.8	BQL
Trichlorofluoromethane	5.8	BQL
1,2,3-Trichloropropane	5.8	BQL
1,2,4-Trimethylbenzene	5.8	BQL
1,3,5-Trimethylbenzene	5.8	BQL
Vinyl chloride	5.8	BQL
m-,p-Xylene	12	BQL
o-Xylene	5.8	BQL

Surrogate Spike Recoveries

Compound	Spike Added (ug/KG)	Surrogate Result (ug/KG)	%Rec
Bromofluorobenzene	50	48.8	98
1,2-Dichloroethane-d4	50	55.8	112
Toluene-d8	50	51.6	103

Comments:

All results are corrected for dilution.

Reviewed by: W

Flags: BQL = Below Quantitation Limit

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatile Base/Neutral Extractables

by GCMS 8270

Client Sample ID: USTH19-SB06-04

Client Project ID: H-19

Lab Sample ID: 91514

Lab Project ID: G132-685

Matrix: Soil

%Solids: 86.2

Date Collected: 7/12/00

Date Received: 7/12/00

Date Analyzed: 7/22/00

Analyzed By: MRC

Dilution: 1

Compound	Quantitation Limit (ug/KG)	Result (ug/KG)
Acenaphthene	360	BQL
Acenaphthylene	360	BQL
Anthracene	360	BQL
Benzo[a]anthracene	360	BQL
Benzo[a]pyrene	360	BQL
Benzo[b]fluoranthene	360	BQL
Benzo[g,h,i]perylene	360	BQL
Benzo[k]fluoranthene	360	BQL
Bis(2-chloroethoxy)methane	360	BQL
Bis(2-chloroethyl)ether	360	BQL
Bis(2-chloroisopropyl)ether	360	BQL
Bis(2-ethylhexyl)phthalate	360	BQL
4-bromophenyl phenyl ether	360	BQL
Butylbenzylphthalate	360	BQL
4-Chloroaniline	360	BQL
2-Chloronaphthalene	360	BQL
4-Chlorophenyl phenyl ether	360	BQL
Chrysene	360	BQL
Di-n-Butylphthalate	360	BQL
Di-n-octylphthalate	360	BQL
Dibenzo[a,h]anthracene	360	BQL
Dibenzofuran	360	BQL
1,2-Dichlorobenzene	360	BQL
1,3-Dichlorobenzene	360	BQL
1,4-Dichlorobenzene	360	BQL
3,3'-Dichlorobenzidine	710	BQL
Diethylphthalate	360	BQL
Dimethylphthalate	360	BQL
4,6-Dinitro-2-methylphenol	1800	BQL
2,4-Dinitrotoluene	360	BQL
2,6-Dinitrotoluene	360	BQL
Fluoranthene	360	BQL
Fluorene	360	BQL
Hexachlorobenzene	360	BQL
Hexachlorobutadiene	360	BQL
Hexachlorocyclopentadiene	710	BQL
Hexachloroethane	360	BQL
Indeno(1,2,3-c,d)pyrene	360	BQL
Isophorone	360	BQL
2-Methylnaphthalene	360	BQL

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatile Base/Neutral Extractables

by GCMS 8270

Client Sample ID: USTH19-SB06-04

Client Project ID: H-19

Lab Sample ID: 91514

Lab Project ID: G132-685

Matrix: Soil

%Solids: 86.2

Date Collected: 7/12/00

Date Received: 7/12/00

Date Analyzed: 7/22/00

Analyzed By: MRC

Dilution: 1

Compound	Quantitation Limit (ug/KG)	Result (ug/KG)
N-Nitrosodi-n-propylamine	360	BQL
N-Nitrosodiphenylamine	360	BQL
Naphthalene	360	BQL
2-Nitroaniline	360	BQL
3-Nitroaniline	360	BQL
4-Nitroaniline	360	BQL
Nitrobenzene	360	BQL
Phenanthrene	360	BQL
Pyrene	360	BQL
1,2,4-Trichlorobenzene	360	BQL

Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	11	114
Nitrobenzene-d5	10	10	101
4-Terphenyl-d14	10	11	110

Comments:

Results are corrected for %solids and dilution where applicable.

Flags:

BQL = Below Quantitation Limit.

Reviewed By: mw

PARADIGM ANALYTICAL LABORATORIES, INC.

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: LAW ENGINEERING

Project Name: H-19

Sample Information and Analytical Results	
Sample Identification	USTH19-SB06-04
Sample Matrix	Soil
Collection Option (for Soil)*	3
Date Collected	07/12/00
Date Received	07/12/00
Date Extracted	07/12/00
Date Analyzed	08/01/00
Dry Weight	86
Dilution Factor	1
C ₅ -C ₈ Aliphatics**	< 10 (mg/Kg)
C ₉ -C ₁₂ Aliphatics**	< 10 (mg/Kg)
C ₉ -C ₁₀ Aromatics**	< 10 (mg/Kg)
Surrogate % Recovery - PID	68
Surrogate % Recovery - FID	83

* = Option 1 = Established fill line on vial, Option 2 = Sampling Device/Brand, or Option 3 = Field weight of soil.

** = Excludes any surrogates or internal standards.

Lab Info: G132-685-91514

Reviewed By: WV

PARADIGM ANALYTICAL LABORATORIES, INC.

EPH (Aliphatics/Aromatics) Results

by MDEP-EPH

Client Name: LAW ENGINEERING

Project Name: H-19

Sample Information and Analytical Results	
Sample Identification	USTH19-SB06-04
Sample Matrix	Soil
Date Collected	07/12/00
Date Received	07/12/00
Date Extracted	07/19/00
Date Analyzed	07/25/00
Dry Weight	86.2
Dilution Factor	1
C ₉ -C ₁₈ Aliphatics*	< 10 (mg/Kg)
C ₁₉ -C ₃₆ Aliphatics*	< 10 (mg/Kg)
C ₁₁ -C ₂₂ Aromatics*	< 10 (mg/Kg)
Aliphatic Surrogate % Recovery	84
Aromatic Surrogate % Recovery	84

Comments:

* = Excludes any surrogates or internal standards.

Sample did not require fractionation.

Lab info: G132-685-91514

Reviewed By: mw

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: LAW ENGINEERINGProject Name: H-19

Sample Information and Analytical Results	
Sample Identification	Trip Blank
Sample Matrix	Soil
Collection Option (for Soil)*	3
Date Collected	07/12/00
Date Received	07/12/00
Date Extracted	07/12/00
Date Analyzed	07/31/00
Dry Weight	100
Dilution Factor	1
C ₅ -C ₈ Aliphatics**	< 10 (mg/Kg)
C ₉ -C ₁₂ Aliphatics**	< 10 (mg/Kg)
C ₉ -C ₁₀ Aromatics**	< 10 (mg/Kg)
Surrogate % Recovery - PID	66
Surrogate % Recovery - FID	82

* = Option 1 = Established fill line on vial, Option 2 = Sampling Device/Brand, or Option 3 = Field weight of soil.

** = Excludes any surrogates or internal standards.

Lab Info: G132-685-91515

Reviewed By: mm

PARADIGM ANALYTICAL LABORATORIES, INC.

Attachment 2

VPH Laboratory Reporting Form

Calibration and QA/QC Information

FID Initial Calibration Date: 07/30/00

PID Initial Calibration Date: 07/30/00

Calibration Ranges and Limits

Range	MDL		ML		RL	
	(µg/L)	(mg/Kg)	(µg/L)	(mg/Kg)	(µg/L)	(mg/Kg)
C ₅ -C ₈ Aliphatics	2.4	0.12	7.5	0.38	100	10
C ₉ -C ₁₂ Aliphatics	1.3	0.065	4.0	0.21	100	10
C ₉ -C ₁₀ Aromatics	0.5	0.025	1.6	0.08	100	10

Calibration Concentration Levels

Range	Levels		%RSD or CCC	Method of Quantitation
	(µg/L)	(mg/Kg)		
C ₅ -C ₈ Aliphatics	40	2	10.9	Calibration Factor
	160	8		
	400	20		
	1600	80		
	4000	200		
C ₉ -C ₁₂ Aliphatics	30	1.5	10.3	Calibration Factor
	120	6		
	300	15		
	1200	60		
	3000	150		
C ₉ -C ₁₀ Aromatics	65	3.25	18.5	Calibration Factor
	260	13		
	650	32.5		
	2600	130		
	6500	325		

Calibration Check Date: 08/01/00

Calibration Check

Range	Levels		RPD
	(µg/L)	(mg/Kg)	
C ₅ -C ₈ Aliphatics	400	20	11.8
C ₉ -C ₁₂ Aliphatics	300	15	15.4
C ₉ -C ₁₀ Aromatics	650	32.5	-5.5

MDL = Method Detection Limit

ML = Minimum Limit

RL = Reportable Limit

RPD = Relative Percent Difference

%RSD = Percent Relative Standard Deviation

CCC = Correlation Coefficient of Curve

Reviewed By: ma

EPH Laboratory Reporting Form

Calibration and QA/QC Information

Initial Calibration Date: 07/20/00

Calibration Ranges and Limits

Range	MDL (mg/Kg)	(µg/L)	ML (mg/Kg)	(µg/L)	RL (mg/Kg)	(µg/L)
C ₉ -C ₁₈ Aliphatics	0.1	2	0.3	6.5	100	10
C ₁₉ -C ₃₆ Aliphatics	0.1	1	0.3	3.1	100	10
C ₁₁ -C ₂₂ Aromatics	0.2	2.5	0.6	8	100	10

Calibration Concentration Levels

Range	Levels (µg/L) (mg/Kg)	%RSD or CCC	Method of Quantitation
C ₉ -C ₁₈ Aliphatics	0.06 1	2.20	Calibration Factor
	0.15 2.5		
	0.3 5		
	0.6 10		
	1.2 20		
C ₁₉ -C ₃₆ Aliphatics	0.08 1.33	6.9	Calibration Factor
	0.2 3.33		
	0.4 6.67		
	0.8 13.3		
	1.6 26.7		
C ₁₁ -C ₂₂ Aromatics	0.12 2	6	Calibration Factor
	0.3 5		
	0.6 10		
	1.2 20		
	2.4 40		

Calibration Check Date: 07/24/00

Calibration Check

Range	Levels (µg/mL) (mg/Kg)	RPD
C ₉ -C ₁₈ Aliphatics	0.6 10	2.4
C ₁₉ -C ₃₆ Aliphatics	0.8 13.3	-6.6
C ₁₁ -C ₂₂ Aromatics	1.2 20	-7.7

MDL = Method Detection Limit

ML = Minimum Limit

RL = Reportable Limit

RPD = Relative Percent Difference

%RSD = Percent Relative Standard Deviation

CCC = Correlation Coefficient of Curve

EPH Laboratory Reporting Form

Calibration and QA/QC Information

Initial Calibration Date: 07/20/00

Calibration Ranges and Limits

Range	MDL (mg/Kg)	(µg/L)	ML (mg/Kg)	(µg/L)	RL (mg/Kg)	(µg/L)
C ₉ -C ₁₈ Aliphatics	0.1	2	0.3	6.5	100	10
C ₁₉ -C ₃₆ Aliphatics	0.1	1	0.3	3.1	100	10
C ₁₁ -C ₂₂ Aromatics	0.2	2.5	0.6	8	100	10

Calibration Concentration Levels

Range	Levels (µg/L) (mg/Kg)	%RSD or CCC	Method of Quantitation
C ₉ -C ₁₈ Aliphatics	0.06 1	2.20	Calibration Factor
	0.15 2.5		
	0.3 5		
	0.6 10		
	1.2 20		
C ₁₉ -C ₃₆ Aliphatics	0.08 1.33	6.9	Calibration Factor
	0.2 3.33		
	0.4 6.67		
	0.8 13.3		
	1.6 26.7		
C ₁₁ -C ₂₂ Aromatics	0.12 2	6	Calibration Factor
	0.3 5		
	0.6 10		
	1.2 20		
	2.4 40		

Calibration Check Date: 07/26/00

Calibration Check

Range	Levels (µg/mL) (mg/Kg)	RPD
C ₉ -C ₁₈ Aliphatics	0.6 10	2.0
C ₁₉ -C ₃₆ Aliphatics	0.8 13.3	-5.2
C ₁₁ -C ₂₂ Aromatics	1.2 20	-7.0

MDL = Method Detection Limit

ML = Minimum Limit

RL = Reportable Limit

RPD = Relative Percent Difference

%RSD = Percent Relative Standard Deviation

CCC = Correlation Coefficient of Curve

PARADIGM ANALYTICAL LABORATORIES, INC.

Attachment 2

VPH Laboratory Reporting Form

Calibration and QA/QC Information

FID Initial Calibration Date: 07/30/00

PID Initial Calibration Date: 07/30/00

Calibration Ranges and Limits

Range	MDL		ML		RL	
	(µg/L)	(mg/Kg)	(µg/L)	(mg/Kg)	(µg/L)	(mg/Kg)
C ₅ -C ₈ Aliphatics	2.4	0.12	7.5	0.38	100	10
C ₉ -C ₁₂ Aliphatics	1.3	0.065	4.0	0.21	100	10
C ₉ -C ₁₀ Aromatics	0.5	0.025	1.6	0.08	100	10

Calibration Concentration Levels

Range	Levels		%RSD or CCC	Method of Quantitation
	(µg/L)	(mg/Kg)		
C ₅ -C ₈ Aliphatics	40	2	10.9	Calibration Factor
	160	8		
	400	20		
	1600	80		
	4000	200		
C ₉ -C ₁₂ Aliphatics	30	1.5	10.3	Calibration Factor
	120	6		
	300	15		
	1200	60		
	3000	150		
C ₉ -C ₁₀ Aromatics	65	3.25	18.5	Calibration Factor
	260	13		
	650	32.5		
	2600	130		
	6500	325		

Calibration Check Date: 08/03/00

Calibration Check

Range	Levels		RPD
	(µg/L)	(mg/Kg)	
C ₅ -C ₈ Aliphatics	400	20	-3.3
C ₉ -C ₁₂ Aliphatics	300	15	1.8
C ₉ -C ₁₀ Aromatics	650	32.5	-10.8

MDL = Method Detection Limit

ML = Minimum Limit

RL = Reportable Limit

RPD = Relative Percent Difference

%RSD = Percent Relative Standard Deviation

CCC = Correlation Coefficient of Curve

Reviewed By: W

EPH Laboratory Reporting Form

Calibration and QA/QC Information

Initial Calibration Date: 07/20/00

Calibration Ranges and Limits

Range	MDL (mg/Kg)	(µg/L)	ML (mg/Kg)	(µg/L)	RL (mg/Kg)	(µg/L)
C ₉ -C ₁₈ Aliphatics	0.1	2	0.3	6.5	100	10
C ₁₉ -C ₃₆ Aliphatics	0.1	1	0.3	3.1	100	10
C ₁₁ -C ₂₂ Aromatics	0.2	2.5	0.6	8	100	10

Calibration Concentration Levels

Range	Levels (µg/L) (mg/Kg)	%RSD or CCC	Method of Quantitation
C ₉ -C ₁₈ Aliphatics	0.06 1	2.20	Calibration Factor
	0.15 2.5		
	0.3 5		
	0.6 10		
	1.2 20		
C ₁₉ -C ₃₆ Aliphatics	0.08 1.33	6.9	Calibration Factor
	0.2 3.33		
	0.4 6.67		
	0.8 13.3		
	1.6 26.7		
C ₁₁ -C ₂₂ Aromatics	0.12 2	6	Calibration Factor
	0.3 5		
	0.6 10		
	1.2 20		
	2.4 40		

Calibration Check Date: 07/27/00

Calibration Check

Range	Levels (µg/mL) (mg/Kg)	RPD
C ₉ -C ₁₈ Aliphatics	0.6 10	-11.0
C ₁₉ -C ₃₆ Aliphatics	0.8 13.3	-10.3
C ₁₁ -C ₂₂ Aromatics	1.2 20	-12.6

MDL = Method Detection Limit

ML = Minimum Limit

RL = Reportable Limit

RPD = Relative Percent Difference

%RSD = Percent Relative Standard Deviation

CCC = Correlation Coefficient of Curve

PARADIGM ANALYTICAL LABORATORIES, INC.

Attachment 2

VPH Laboratory Reporting Form

Calibration and QA/QC Information

FID Initial Calibration Date: 07/30/00

PID Initial Calibration Date: 07/30/00

Calibration Ranges and Limits

Range	MDL		ML		RL	
	(µg/L)	(mg/Kg)	(µg/L)	(mg/Kg)	(µg/L)	(mg/Kg)
C ₅ -C ₈ Aliphatics	2.4	0.12	7.5	0.38	100	10
C ₉ -C ₁₂ Aliphatics	1.3	0.065	4.0	0.21	100	10
C ₉ -C ₁₀ Aromatics	0.5	0.025	1.6	0.08	100	10

Calibration Concentration Levels

Range	Levels		%RSD or CCC	Method of Quantitation
	(µg/L)	(mg/Kg)		
C ₅ -C ₈ Aliphatics	40	2	10.9	Calibration Factor
	160	8		
	400	20		
	1600	80		
	4000	200		
C ₉ -C ₁₂ Aliphatics	30	1.5	10.3	Calibration Factor
	120	6		
	300	15		
	1200	60		
	3000	150		
C ₉ -C ₁₀ Aromatics	65	3.25	18.5	Calibration Factor
	260	13		
	650	32.5		
	2600	130		
	6500	325		

Calibration Check Date: 08/01/00

Calibration Check

Range	Levels		RPD
	(µg/L)	(mg/Kg)	
C ₅ -C ₈ Aliphatics	400	20	11.8
C ₉ -C ₁₂ Aliphatics	300	15	15.4
C ₉ -C ₁₀ Aromatics	650	32.5	-5.5

MDL = Method Detection Limit

ML = Minimum Limit

RL = Reportable Limit

RPD = Relative Percent Difference

%RSD = Percent Relative Standard Deviation

CCC = Correlation Coefficient of Curve

Reviewed By: ma

PARADIGM ANALYTICAL LABORATORIES, INC.
Attachment 3

EPH Laboratory Reporting Form

Calibration and QA/QC Information

Initial Calibration Date: 07/20/00

Calibration Ranges and Limits

Range	MDL (mg/Kg)	(µg/L)	ML (mg/Kg)	(µg/L)	RL (mg/Kg)	(µg/L)
C ₉ -C ₁₈ Aliphatics	0.1	2	0.3	6.5	100	10
C ₁₉ -C ₃₆ Aliphatics	0.1	1	0.3	3.1	100	10
C ₁₁ -C ₂₂ Aromatics	0.2	2.5	0.6	8	100	10

Calibration Concentration Levels

Range	Levels (µg/L) (mg/Kg)	%RSD or CCC	Method of Quantitation
C ₉ -C ₁₈ Aliphatics	0.06 1	2.20	Calibration Factor
	0.15 2.5		
	0.3 5		
	0.6 10		
	1.2 20		
C ₁₉ -C ₃₆ Aliphatics	0.08 1.33	6.9	Calibration Factor
	0.2 3.33		
	0.4 6.67		
	0.8 13.3		
	1.6 26.7		
C ₁₁ -C ₂₂ Aromatics	0.12 2	6	Calibration Factor
	0.3 5		
	0.6 10		
	1.2 20		
	2.4 40		

Calibration Check Date: 07/26/00

Calibration Check

Range	Levels (µg/mL) (mg/Kg)	RPD
C ₉ -C ₁₈ Aliphatics	0.6 10	2.0
C ₁₉ -C ₃₆ Aliphatics	0.8 13.3	-5.2
C ₁₁ -C ₂₂ Aromatics	1.2 20	-7.0

MDL = Method Detection Limit

ML = Minimum Limit

RL = Reportable Limit

RPD = Relative Percent Difference

%RSD = Percent Relative Standard Deviation

CCC = Correlation Coefficient of Curve

COC#

Chain-of-Custody Record & Analytical Request

Page of

4-19

7/12/00

Report To:

Contact: BILL DEOBALD

Turnaround: 5min 20sec

Phone: 919-876-0416

Job Number: 30740-6-0600-93-92

Fax: 9/9

P.O. Number: 307-00612-00

Sample ID	Date	Time	Matrix	Preservatives		Analyses					Comments: Please specify any special reporting requirements																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
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15TH19-SB1	7/16/00	0900	SO	2		1	1	1	1																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				

**SEE REVERSE FOR
TERMS AND CONDITIONS**

ADIGMA ANALYTICAL LABORATORIES, INC.

Northchase Parkway SE, Wilmington, NC 28405

Tel: (910) 350-1903 FAX: (910) 350-1557

Chain-of Custody Record & Analytical Request

CO# 18736

Page 1 of 1

t: LAW ENGINEERING Project ID: H-19 Date: 7/12/00
 ess: 3321 ATLANTIC AVE Contact: BILL DEOBALD Turnaround: STANDARD
 ess: RALEIGH, NC 27604 Phone: 919-876-0416 Job Number: 30740-6-0600-93-92
 #: 14861489 P.O. Number: 307-98612-00 Invoice To: LAW CORP - ALPHARETTA

Sample ID	Date	Time	Matrix	Preservatives		Analyses			Temperature	State Certification Requested
				1	2	1	2	3		
419-SB1	7/12/00	0900	So	✓	2	1	1	1		
419-SB2	7/12/00	1000	So		2	1	1	1		
419-SB3	7/12/00	1115	So		2	1	1	1		
419-SB5	7/12/00	1230	So		2	1	1	1		
419-SB6	7/12/00	0900	So		2	1	1	1		
Comments: Please specify any special reporting requirements 8270 Base Material only Report in EPA format UST H19-SB01-04 UST H19-SB02-04 UST H19-SB03-02 UST H19-SB05-01 UST H19-SB06-04 CORRECTED SAMPLE ID 7/25/00										

Relinquished By: [Signature] Date: 7/12/00 Time: 3:00 PM Received By: [Signature] Date: 7/12/00 Time: 3:00 PM
 State Certification Requested: NC SC Other: Watkin
 SEE REVERSE FOR TERMS AND CONDITIONS

Client: LAW ENGINEERING Project ID: H-19 Date: 7/12/00 Report To: _____
 Address: 3301 ATLANTIC AVE Contact: BILL DEOBALD Turnaround: _____
 Address: RALEIGH, NC 27604 Phone: 919-876-0416 Job Number: 30740-6-0600-93-92
 Quote #: 1486 Fax: 919-831-8136 P.O. Number: 307-00612-00 Invoice To: LAW CORP - ALPHARETTA

[illegible]

ORIGINAL

Appendix D

Summary of Laboratory Test Results: 1997 Groundwater Samples

TABLE 5.1 (Page 1 of 6) SUMMARY OF LABORATORY ANALYTICAL RESULTS, GROUNDWATER SAMPLES (POWERPROBE™) LEAKING UNDERGROUND STORAGE TANK SITE ASSESSMENT REPORT UST H-19 CAMP LEJEUNE, NORTH CAROLINA LAW JOB NO. 30740-6-0600/0010									
PARAMETER	DIRECT PUSH PROBE SAMPLE NUMBER	DP-1	DP-2	DP-3	DP-4	DP-5	DP-6	DP-7	N.C. GROUNDWATER STANDARDS
	SCREENED INTERVAL	1.9-6.9	2.8-7.8	2.7-7.7	4.6-9.6	5-10	4.5-9.5	2.8-7.8	
	SAMPLE DATES	2/20/97	2/20/97	2/20/97	2/20/97	2/20/97	2/20/97	2/20/97	
EPA METHOD 502.2 Volatile Organic Compounds (concentration data in µg/l)									
Benzene			.05	.06	.05			.05	1.0
Chloroform		.22	.05	.03	.02				0.19
Ethylbenzene				.10				.13	29
Naphthalene		.27	.10	.10	.13	.43		.41	21
Tetrachloroethene		.12	.10	.10	.12	.19	.15	.23	0.7
Toluene		1.24	5.75	3.97	1.02	1.54	.58	6.91	1000
1,2,4-Trimethylbenzene								.58	*
Total Xylenes				.44		.40		.42	530
Total BTEX		1.24	5.75	4.57	1.07	1.94	.58	7.51	NA
Total EPA Method 502.2 (Volatile Organics)		1.85	6.00	4.80	2.56	2.56	.73	8.73	NA

Compounds which were detected by the analysis are listed.
 Empty cells indicate that the compound was not detected at concentrations above the method detection limit.
 Abbreviations:
 Bold Numbers = Concentrations detected above NC 2L Groundwater Standards.
 NA = Sample not analyzed for test.
 ND = No EPA 502.2 or 625 method compounds detected. See laboratory reports for applicable limits.
 -- = Not Applicable
 * = The NC 2L Groundwater Standard is equal to the laboratory detection limit.

TABLE 5.1 (Page 2 of 6)
SUMMARY OF LABORATORY ANALYTICAL RESULTS, GROUNDWATER SAMPLES (POWERPROBE™)
LEAKING UNDERGROUND STORAGE TANK SITE ASSESSMENT REPORT

UST H-19
 CAMP LEJEUNE, NORTH CAROLINA
 LAW JOB NO. 30740-6-0600/0010

PARAMETER	DIRECT PUSH PROBE SAMPLE NUMBER	DP-1	DP-2	DP-3	DP-4	DP-5	DP-6	DP-7	N.C. GROUNDWATER STANDARDS µg/l
	SCREENED INTERVAL	1.9-6.9	2.8-7.8	2.7-7.7	4.6-9.6	5-10	4.5-9.5	2.8-7.8	
	SAMPLE DATES	2/20/97	2/20/97	2/20/97	2/20/97	2/20/97	2/20/97	2/20/97	
EPA METHOD 625 Base Neutrals Only (concentration data in µg/l)									
Anthracene							2.34		2100
Benzo(a)anthracene							1.39		.05
Benzo(b)fluoranthene							3.32		*
Benzo(k)fluoranthene							1.56		*
Benzo(g,h,i) perylene							2.44		210
Benzo(a)pyrene							1.74		*
Chrysene							1.62		4.80
Fluoranthene							5.59		280
Fluorene									280
Naphthalene								1.78	21
Phenanthrene									210
Pyrene							7.91		210
Total EPA 625 B,N Compounds		ND	ND	ND	ND	ND	27.91	1.78	NA

Compounds which were detected by the analysis are listed.

Empty cells indicate that the compound was not detected at concentrations above the method detection limit.

Abbreviations:

Bold Numbers = Concentrations detected above NC 2L Groundwater Standards.

NA = Sample not analyzed for test.

ND = No EPA 502.2 or 625 method compounds detected. See laboratory reports for applicable limits.

-- = Not Applicable

* = The NC 2L Groundwater Standard is equal to the laboratory detection limit.

TABLE 5.1 (Page 3 of 6)
SUMMARY OF LABORATORY ANALYTICAL RESULTS, GROUNDWATER SAMPLES (POWERPROBE™)
LEAKING UNDERGROUND STORAGE TANK SITE ASSESSMENT REPORT
UST H-19
CAMP LEJEUNE, NORTH CAROLINA
LAW JOB NO. 30740-6-0600/0010

PARAMETER	DIRECT PUSH PROBE SAMPLE NUMBER	DP-8	DP-9	DP-10	DP-11	DP-12	DP-16	DP17 (duplicate of DP-16)	N.C. GROUNDWATER STANDARDS
	SCREENED INTERVAL	2.4-7.4	4.4-9.4	0-9.6	2.9-7.9	2.8-7.8	2.8-7.8	2.8-7.8	
	SAMPLE DATES	2/20/97	2/21/97	2/20/97	2/21/97	2/21/97	2/21/97	2/21/97	
EPA METHOD 502.2 Volatile Organic Compounds (concentration data in µg/l)									
Benzene		.09	.26	.15	.22	.23		.08	1.0
n-Butylbenzene				159.00	44.50			.22	*
sec-Butylbenzene				28.10	15.40	.43		.37	*
tert-Butylbenzene				6.26	5.80				*
1,2 Dichlorobenzene			.25			.21			620
Ethylbenzene		.06		2.64	2.85	.17	.37		29
Isopropylbenzene				13.90	13.50			.19	*
p-Isopropyltoluene				4.69					*
Naphthalene		.16	.36	7.71	1.93	.63	.43	.58	21
n-Propylbenzene				9.58	5.92				*
Styrene					4.01				100
1,1,1,2-Tetrachloroethane				.17					*
Tetrachloroethene		.13				.27		.17	0.7
Toluene		1.80	9.15	14.80	6.87	5.37	9.43	8.62	1000
1,2,4-Trimethylbenzene			.49	61.50	4.85	.73			*
1,3,5-Trimethylbenzene				84.10	10.30	.28			*
Total Xylenes			.72	40.05	9.94	.55	.23	.28	530
Total BTEX		1.95	9.87	57.64	19.88	6.32	10.03	8.98	NA
Total EPA Method 502.2 (Volatile Organics)		2.24	10.97	432.65	126.09	8.87	10.46	10.51	NA

Compounds which were detected by the analysis are listed.
Empty cells indicate that the compound was not detected at concentrations above the method detection limit.
Abbreviations:
Bold Numbers = Concentrations detected above NC 2L Groundwater Standards.
NA = Sample not analyzed for test.
ND = No EPA 502.2 or 625 method compounds detected. See laboratory reports for applicable limits.
-- = Not Applicable
* = The NC 2L Groundwater Standard is equal to the laboratory detection limit.

TABLE 5.1 (Page 4 of 6) SUMMARY OF LABORATORY ANALYTICAL RESULTS, GROUNDWATER SAMPLES (POWERPROBE™) LEAKING UNDERGROUND STORAGE TANK SITE ASSESSMENT REPORT UST H-19 CAMP LEJEUNE, NORTH CAROLINA LAW JOB NO. 30740-6-0600/0010									
PARAMETER	DIRECT PUSH PROBE SAMPLE NUMBER	DP-8	DP-9	DP-10	DP-11	DP-12	DP-16	DP-17 (duplicate of DP-16)	N.C. GROUNDWATER STANDARDS
	SCREENED INTERVAL	2.4-7.4	4.4-9.4	0-9.6	2.9-7.9	2.8-7.8	2.8-7.8	2.8-7.8	
	SAMPLE DATES	2/20/97	2/21/97	2/20/97	2/21/97	2/21/97	2/21/97	2/21/97	
EPA METHOD 625 Base Neutrals Only (concentration data in µg/l)									
Fluorene									280
Naphthalene					1.12				21
Phenanthrene									210
Pyrene									210
Total EPA 625 B,N Compounds		ND	ND	ND	1.12	ND	ND	ND	NA

Compounds which were detected by the analysis are listed.
 Empty cells indicate that the compound was not detected at concentrations above the method detection limit.
 Abbreviations:
 Bold Numbers = Concentrations detected above NC 2L Groundwater Standards.
 NA = Sample not analyzed for test.
 ND = No EPA 502.2 or 625 method compounds detected. See laboratory reports for applicable limits.
 -- = Not Applicable
 * = The NC 2L Groundwater Standard is equal to the laboratory detection limit.

TABLE 5.1 (Page 5 of 6)
SUMMARY OF LABORATORY ANALYTICAL RESULTS, GROUNDWATER SAMPLES (POWERPROBE™)
LEAKING UNDERGROUND STORAGE TANK SITE ASSESSMENT REPORT
UST H-19
CAMP LEJEUNE, NORTH CAROLINA
LAW JOB NO. 30740-6-0600/0010

PARAMETER	DIRECT PUSH PROBE SAMPLE NUMBER	DP-18	DP-19	DP-20	TB 10666	N.C. GROUNDWATER STANDARDS
	SCREENED INTERVAL	4.8-9.8	1.9-6.9	4.9-9.9		
	SAMPLE DATES	2/21/97	2/21/97	2/21/97		
EPA METHOD 502.2 Volatile Organic Compounds (concentration data in µg/l)						
Benzene		.15	.42			1.0
n-Butylbenzene		.50	.24	10.50		*
sec-Butylbenzene				2.17		*
tert-Butylbenzene						*
Chloroform						0.19
1,2 Dichlorobenzene		.17	.19			620
Ethylbenzene			.27	1.80		29
Isopropylbenzene				1.54		*
p-Isopropyltoluene				1.12		*
Naphthalene		1.73		68.90	.22	21
n-Propylbenzene				1.98		*
Styrene				.73		100
1,1,1,2-Tetrachloroethane						*
Tetrachloroethene		.19	.24			0.7
Toluene		2.84	20.5	7.41	.12	1000
1,2,4-Trichlorobenzene			.35			*
1,2,4-Trimethylbenzene		.40		17.40		*
1,3,5-Trimethylbenzene				9.75		*
Total Xylenes		.40	.39	8.65	.66	530
Total BTEX		3.39	21.58	17.86	.78	NA
Total EPA Method 502.2 (Volatile Organics)		6.38	22.60	131.95	1.00	NA

Compounds which were detected by the analysis are listed.
Empty cells indicate that the compound was not detected at concentrations above the method detection limit.
Abbreviations:
Bold Numbers = Concentrations detected above NC 2L Groundwater Standards.
NA = Sample not analyzed for test.
ND = No EPA 502.2 or 625 method compounds detected. See laboratory reports for applicable limits.
-- = Not Applicable
* = The NC 2L Groundwater Standard is equal to the laboratory detection limit.

TABLE 5.1 (Page 6 of 6)						
SUMMARY OF LABORATORY ANALYTICAL RESULTS, GROUNDWATER SAMPLES (POWERPROBE™)						
LEAKING UNDERGROUND STORAGE TANK SITE ASSESSMENT REPORT						
UST H-19						
CAMP LEJEUNE, NORTH CAROLINA						
LAW JOB NO. 30740-6-0600/0010						
PARAMETER	DIRECT PUSH PROBE SAMPLE NUMBER	DP-18	DP-19	DP-20	TB Trip Blank	N.C. GROUNDWATER STANDARDS
	SCREENED INTERVAL	4.8-9.8	1.9-6.9	4.9-9.9		
	SAMPLE DATES	2/21/97	2/21/97	2/21/97		
	EPA METHOD 625 Base Neutrals Only (concentration data in µg/l)					
Acenaphthene				1.25		80
Fluorene				1.12		280
Naphthalene				15.10		21
Phenanthrene						210
Pyrene						210
Total EPA 625 B,N Compounds		ND	ND	17.47	ND	NA

Compounds which were detected by the analysis are listed.
 Empty cells indicate that the compound was not detected at concentrations above the method detection limit.
 Abbreviations:
 Bold Numbers = Concentrations detected above NC 2L Groundwater Standards.
 NA = Sample not analyzed for test.
 ND = No EPA 502.2 or 625 method compounds detected. See laboratory reports for applicable limits.
 -- = Not Applicable
 * = The NC 2L Groundwater Standard is equal to the laboratory detection limit.

TABLE 5.3 (Page 1 of 6)

**SUMMARY OF LABORATORY ANALYTICAL RESULTS (µg/l)
GROUNDWATER SAMPLES (EXISTING AND NEW MONITORING WELLS)**

UST H-19

CAMP LEJEUNE, NORTH CAROLINA
LAW JOB NO. 30740-6-0600/Phase 0010

PARAMETER	MONITORING WELL NO. (Type II unless specified)	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	N.C. GROUNDWATER STANDARDS
	SCREENED INTERVALS (feet)	4-14'	1-11'	1.5-11.5'	4-14'	4-14'	4-14'	
	SAMPLE DATES	2/12/97	2/11/97	2/12/97	2/11/97	2/11/97	2/11/97	
EPA METHOD 502.2 Volatile Organic Compound Results in µg/l.								
BENZENE				.37				1.0
CHLOROFORM		.40			.02			.19
CIS-1,2-DICHLOROETHANE				.14				70
1,2-DICHLOROBENZENE		.15						620
1,2-DICHLOROETHANE			.14					.38
ISOPROPYLBENZENE				.13				**
n-BUTYLBENZENE				.24				**
NAPHTHALENE		.13	1.21	.89			.53	21.0
SEC-BUTYLBENZENE				.27				**
TOLUENE		.22	.30	.39			.16	1,000.0
TOTAL XYLENES		.17	.62	.17				530.0
TOTAL BTX		.39	.92	.93	ND	ND	.16	--
TOTAL EPA METHOD 502.2		1.07	2.27	2.60	.02	ND	.69	--

Compounds which were detected by the analysis are listed.

Empty cells indicate that the compound was not detected at concentrations above the method detection limit.

Abbreviations:

Bold Numbers = Concentrations detected above NC 2L Groundwater Standards.

NA = Sample not analyzed for test.

ND = No EPA 502.2 or 625 method compounds detected. See laboratory reports for applicable limits.

-- = Not Applicable.

* = The NC 2L Groundwater Standard is equal to the laboratory detection limit.

TABLE 5.3 (Page 2 of 6)

SUMMARY OF LABORATORY ANALYTICAL RESULTS (µg/l)
GROUNDWATER SAMPLES (EXISTING AND NEW MONITORING WELLS)

UST H-19

CAMP LEJEUNE, NORTH CAROLINA
LAW JOB NO. 30740-6-0600/Phase 0010

PARAMETER	MONITORING WELL NO. (TYPE)	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	NC
	SCREENED INTERVALS	4-14'	1-11'	1.5-11.5'	4-14'	4-14'	4-14'	GROUNDWATER STANDARDS
	SAMPLE DATES	2/12/97	2/11/97	2/12/97	2/11/97	2/11/97	2/11/97	
EPA METHOD 625 Base Neutral Semi-Volatile Compound Results in µg/l								
NAPHTHALENE		8.59						21.0
PHENANTHRENE				1.31				210.0
TOTAL EPA METHOD 625		8.59	ND	1.31	ND	ND	ND	
TOTAL METALS BY EPA METHOD 6010 (ICP) Results in µg/l								
ARSENIC		NA	NA	NA	NA	NA	NA	50.0
BARIUM		NA	NA	NA	NA	NA	NA	2,000.0
CADMIUM		NA	NA	NA	NA	NA	NA	5.0
CHROMIUM		NA	NA	NA	NA	NA	NA	50.0
LEAD		NA	NA	NA	NA	NA	NA	15.0
SELENIUM		NA	NA	NA	NA	NA	NA	50.0
SILVER		NA	NA	NA	NA	NA	NA	18.0

Compounds which were detected by the analysis are listed.

Empty cells indicate that the compound was not detected at concentrations above the method detection limit.

Abbreviations:

Bold Numbers = Concentrations detected above NC 2L Groundwater Standards.

NA = Sample not analyzed for test.

ND = No EPA 502.2 or 625 method compounds detected. See laboratory reports for applicable limits.

-- = Not Applicable.

* = The NC 2L Groundwater Standard is equal to the laboratory detection limit.

TABLE 5.3 (Page 3 of 6)

**SUMMARY OF LABORATORY ANALYTICAL RESULTS (µg/L)
GROUNDWATER SAMPLES (EXISTING AND NEW MONITORING WELLS)**

UST H-19

**CAMP LEJEUNE, NORTH CAROLINA
LAW JOB NO. 30740-6-0600/Phase 0010**

PARAMETER	MONITORING WELL NO. OR HYDROPUNCH NO.)	MW-7 (TYPE II)	MW-15 RINSE BLANK	TRIP BLANK I (resampling of existing wells)	MW-8	MW-9	MW-10	N.C. GROUNDWATER STANDARDS
	SCREENED INTERVALS (feet)	4 - 14'	--	--	3.8 - 13.8'	3.9 - 13.9'	4 - 14'	
	SAMPLE DATES	2/12/97	2/11/97	2/11/97	3/27/97	4/10/97	3/27/97	
EPA METHOD 502.2 Volatile Organic Compound Results in µg/L.								
BENZENE		.08						1.0
BROMOFORM				.75				.19
CHLOROFORM		.05	.06	.02		1.14		.19
DIBROMOCHLOROMETHANE				.17		.07		**
1,2-DICHLOROETHANE		.05						.38
ETHYLBENZENE		.07					3.20	29.0
ISOPROPYLBENZENE		2.34					1.64	**
n-BUTYLBENZENE		7.82					11.40	**
n-PROPYLBENZENE		.39					1.52	**
NAPHTHALENE		.13	.16				19.40	21.0
SEC-BUTYLBENZENE		3.37						**
STYRENE		.61						100.0
TERT-BUTYLBENZENE		.33						**
TETRACHLOROETHENE							.62	.70
TOLUENE		.92					.32	1,000.0
TRICHLOROFLUOROMETHANE							0.62	2,100.0
1,2,4-TRIMETHYLBENZENE		4.31					2.28	**
1,3,5-TRIMETHYLBENZENE		.58					1.62	**
TOTAL XYLENES							3.64	530.0
TOTAL BTX		1.07	ND	ND	ND	ND	7.16	--
TOTAL EPA METHOD 502.2		21.05	.22	.94	ND	1.21	46.26	--

Compounds which were detected by the analysis are listed.

Empty cells indicate that the compound was not detected at concentrations above the method detection limit.

Abbreviations:

Bold Numbers = Concentrations detected above NC 2L Groundwater Standards.

NA = Sample not analyzed for test.

ND = No EPA 502.2 or 625 method compounds detected. See laboratory reports for applicable limits.

-- = Not Applicable.

* = The NC 2L Groundwater Standard is equal to the laboratory detection limit.

TABLE 5.3 (Page 4 of 6)

**SUMMARY OF LABORATORY ANALYTICAL RESULTS (µg/L)
GROUNDWATER SAMPLES (EXISTING AND NEW MONITORING WELLS)**

UST H-19

**CAMP LEJEUNE, NORTH CAROLINA
LAW JOB NO. 30740-6-0600/Phase 0010**

PARAMETER	MONITORING WELL NO. OR HYDROPUNCH NO.	MW-7 (TYPE III)	MW-15 RINSE BLANK	TRIP BLANK I (2/11/97)	MW-8	MW-9	MW-10	N.C. GROUNDWATER STANDARDS
	SCREENED INTERVALS	4-14'	--	--	3.8 - 13.8'	3.9 - 13.9'	4 - 14'	
	SAMPLE DATES	3/27/97	2/11/97	2/11/97	3/27/97	4/10/97	3/27/97	
EPA METHOD 625 Base Neutral Semi-Volatile Organic Compounds Results in µg/l								
FLUORENE							2.20	280.0
NAPHTHALENE		1.32		NA			14.90	21.0
PHENANTHRENE				NA			ND	210.0
TOTAL EPA METHOD 625		1.32	ND	NA	ND	ND	17.10	--
TOTAL METALS BY EPA METHOD 6010 (ICP) results in µg/l								
ARSENIC		NA	NA	NA				50.0
BARIUM		NA	NA	NA	62.0	39.0	79.0	2,000.0
CADMIUM		NA	NA	NA				5.0
CHROMIUM		NA	NA	NA				50.0
LEAD		NA	NA	NA				15.0
SELENIUM		NA	NA	NA				50.0
SILVER		NA	NA	NA				18.0

Compounds which were detected by the analysis are listed.

Empty cells indicate that the compound was not detected at concentrations above the method detection limit.

Abbreviations:

Bold Numbers = Concentrations detected above NC 2L Groundwater Standards.

NA = Sample not analyzed for test.

ND = No EPA 502.2 or 625 method compounds detected. See laboratory reports for applicable limits.

-- = Not Applicable.

* = The NC 2L Groundwater Standard is equal to the laboratory detection limit

TABLE 5.3 (Page 5 of 6)

**SUMMARY OF LABORATORY ANALYTICAL RESULTS (µg/L)
GROUNDWATER SAMPLES (EXISTING AND NEW MONITORING WELLS)**
UST H-19
CAMP LEJEUNE, NORTH CAROLINA
LAW JOB NO. 30740-6-0600/Phase 0010

PARAMETER	MONITORING WELL NO. (TYPE)	MW-11 (Type III)	MW-12	MW-13 (Type III)	MW-14	Trip Blank 2	Trip Blank 3	Rinse Blank	Drum Composite	N.C. GW STANDARDS
	SCREENED INTERVALS	35 - 40	4 - 14	35 - 40	4.1 - 14.1					
	SAMPLE DATES	3/27/97	3/27/97	4/10/97	3/27/97	3/27/97	4/10/97	3/27/97	4/10/97	
EPA METHOD 502.2 Volatile Organic Compounds Results in µg/L.										
BENZENE		.05		.06						1.0
BROMODICHLOROMETHANE		.05								**
BROMOFORM					.34					.19
n-BUTYLBENZENE									.23	**
CHLOROFORM		.73		1.28					.49	.19
DIBROMOCHLOROMETHANE		.03								**
CIS-1,2-DICHLOROETHENE				7.31						70.0
TRANS-1,2-DICHLOROETHENE				2.22						70.0
1,3-DICHLOROPROPANE					.10					**
ETHYLBENZENE									.21	29.0
ISOPROPYLBENZENE		.13							.18	**
p-ISOPROPYLTOLUENE				.48						**
METHYL-TERT-BUTYL-ETHER					1.03	.19				200
NAPHTHALENE		.36						.71	.08	21.0
STYRENE		.38		.18	.69					100.0
TETRACHLOROETHENE						.17				0.7
TOLUENE		.20		.11				.08	.08	1,000.0
TOTAL XYLENES		.18							.18	530.0
TRICHLOROETHENE				21.10					7.14	2.8
1,1,2-TRICHLOROETHANE				.06					.23	2,100.0
TRICHLOROFLUOROMETHANE					.58					**
TOTAL BTEX		.43	ND	.17	ND	ND	ND	ND	.47	--
TOTAL EPA METHOD 502.2		2.11	.27	32.80	2.30	.80	ND	.79	9.54	--

Compounds which were detected by the analysis are listed.

Empty cells indicate that the compound was not detected at concentrations above the method detection limit.

Abbreviations:

Bold Numbers = Concentrations detected above NC 2L Groundwater Standards.

NA = Sample not analyzed for test.

ND = No EPA 502.2 or 625 method compounds detected. See laboratory reports for applicable limits.

-- = Not Applicable.

* = The NC 2L Groundwater Standard is equal to the laboratory detection limit.

TABLE 5.3 (Page 6 of 6)

SUMMARY OF LABORATORY ANALYTICAL RESULTS
GROUNDWATER SAMPLES (MONITORING WELLS & HYDROPUNCHES)
BUILDING 1450, TANKS 1,2,5,6,7
CAMP LEJEUNE, NORTH CAROLINA
LAW JOB NO. 30740-5-0500/Phase 0182

PARAMETER	MONITORING WELL NO. (TYPE)	MW-11 (TYPE III)	MW-12	MW-13 (TYPE III)	MW-14	Trip Blank 2	Trip Blank 3	Rinse Blank	Drum Composite	N.C. GW Standards
	SCREENED INTERVALS	35-40	4 - 14	35 - 40	4.1 - 14.1	--	--	--	--	
	SAMPLE DATES	3/27/97	3/27/97	3/27/97	3/27/97	3/27/97	4/10/97	3/27/97	4/10/97	
EPA METHOD 625 Base Neutral Semi-Volatile Organic Compounds Results in µg/l										
FLUORENE							NA	NA		280.0
NAPHTHALENE							NA	NA		21.0
PHENANTHRENE							NA	NA		210.0
TOTAL EPA METHOD 625		ND	ND	ND	ND	ND	NA	NA	ND	
TOTAL METALS BY EPA METHOD 6010 Results in µg/l										
ARSENIC		NA		NA		NA	NA	NA		50.0
BARIUM		NA	117.00	NA	119.00	NA	NA	NA	33	2,000.0
CADMIUM		NA		NA		NA	NA	NA		5.0
CHROMIUM		NA		NA		NA	NA	NA		50.0
LEAD		NA		NA		NA	NA	NA		15.0
SELENIUM		NA		NA		NA	NA	NA		50.0
SILVER		NA		NA		NA	NA	NA		18.0

Compounds which were detected by the analysis are listed.

Empty cells indicate that the compound was not detected at concentrations above the method detection limit.

Abbreviations:

Bold Numbers = Concentrations detected above NC 2L Groundwater Standards.

NA = Sample not analyzed for test.

ND = No EPA 502.2 or 625 method compounds detected. See laboratory reports for applicable limits.

-- = Not Applicable.

* = The NC 2L Groundwater Standard is equal to the laboratory detection limit.

Appendix E

Summary of Laboratory Test Results: First Natural Attenuation Monitoring Event



Contaminant Identified at Greater than 0.1 µg/L [NC 2L Groundwater Standard, µg/L]	USTH19-MW07 (January 1998)	USTH19-MW07 (February 1997)	USTH19-MW10 (January 1998)	USTH19-MW10 (February 1997)
Free Product	NMT	NMT	NMT	NMT
VOCs, EPA 502.2	Concentrations Identified (µg/L)			
Ethylbenzene [29]	ND	0.07	0.22	3.20
Isopropylbenzene [70]	5.32	2.34	ND	1.64
methyl-tert-butyl-ether [200]	ND	ND	0.22	ND
n-Butylbenzene [70]	ND	7.82	ND	11.40
n-Propylbenzene [70]	1.54	0.39	ND	1.52
Naphthalene [21]	ND	0.13	1.33	19.40
sec-Butylbenzene [70]	7.21	3.37	ND	ND
Styrene [100]	2.05	0.61	ND	ND
Tert-Butylbenzene [70]	2.52	0.33	ND	ND
Tetrachloroethene [0.7]	1.52	ND	ND	0.62
Toluene [1000]	1.93	0.92	ND	0.32
Trichlorofluoromethane [2100]	ND	ND	ND	0.62
1,2,4-Trimethylbenzene [350]	0.92	4.31	ND	2.28
1,3,5-Trimethylbenzene [350]	ND	0.58	ND	1.62
Total Xylenes [530]	1.14	ND	ND	3.64
Total EPA 502.2	24.15	20.87	1.77	46.26
B N SVOCs, EPA 625	Concentration Identified (µg/L)			
Fluorene [280.0]	ND	ND	ND	2.20
Naphthalene [21]	ND	1.32	ND	14.90
Phenanthrene [210]	ND	ND	ND	ND
Total EPA 625	--	1.32	--	17.1

B N = Base Neutrals

MDL = Method Detection Limit

NMT = No measurable Thickness

VOCs = Volatile Organic Compounds

Bold Numbers = Concentration above N.C. 2L Groundwater Std.

ND = Not Detected

SVOCs = Semi-volatile Organic Compounds

The recent results from groundwater sampling, in comparison with the initial laboratory data obtained in May 1995, indicate that five of the six contaminants recently identified in well USTH19-MW07 have increased in concentration. The concentration of tetrachloroethene identified in groundwater sample

Appendix F

Summary of Laboratory Test Results: Second Natural Attenuation Monitoring Event

TABLE 1 - SUMMARY OF CURRENT AND HISTORICAL LABORATORY RESULTS, BUILDING H-19

Contaminant Identifier (Concentration in $\mu\text{g/L}$) [N.C. 21C Groundwater Standard, $\mu\text{g/L}$]	USTH19-MW10 (July 1998)	USTH19-MW10 (January 1998)	USTH19-MW10 (February 1998)	USTH19-MW10 (July 1998)	USTH19-MW10 (January 1998)	USTH19-MW10 (February 1998)	USTH19-MW10 (July 1998)
VOCs, EPA 502.2	Concentrations Identified ($\mu\text{g/L}$)						
Ethylbenzene [29]	ND	ND	0.07	ND	0.22	ND	3.20
Isopropylbenzene [70]	2.71	5.32	2.34	ND	ND	ND	1.64
methyl-tert-butyl-ether [200]	ND	ND	ND	ND	0.22	ND	ND
n-Butylbenzene [70]	8.81	ND	7.82	ND	ND	ND	11.40
n-Propylbenzene [70]	.39	1.54	0.39	ND	ND	ND	1.52
Naphthalene [21]	.33	ND	0.13	ND	1.33	ND	19.40
sec-Butylbenzene [70]	3.72	7.21	3.37	ND	ND	ND	ND
Styrene [100]	.51	2.05	0.61	ND	ND	ND	ND
Tert-Butylbenzene [70]	.87	2.52	0.33	ND	ND	ND	ND
Tetrachloroethene [0.7]	1.35	1.52	ND	ND	ND	ND	0.62
Toluene [1000]	.42	1.93	0.92	ND	ND	ND	0.32
Trichlorofluoromethane [2100]	ND	ND	ND	ND	ND	ND	0.62
1,2,4-Trimethylbenzene [350]	4.06	0.92	4.31	ND	ND	ND	2.28
1,3,5-Trimethylbenzene [350]	ND	ND	0.58	ND	ND	ND	1.62
Total Xylenes [530]	1.12	1.14	ND	ND	ND	ND	3.64
Total EPA 502.2	24.29	24.15	20.87	--	1.77	ND	46.26
B N SVOCs, EPA 625	Concentrations Identified ($\mu\text{g/L}$)						
Bis (2-ethylhexyl) phthalate	7.56	ND		ND	ND	ND	ND
Fluorene [280.0]	ND	ND	ND	ND	ND	ND	2.20
Naphthalene [21]	ND	ND	1.32	ND	ND	ND	14.90
Phenanthrene [210]	ND	ND	ND	ND	ND	ND	ND
Total EPA 625	7.56	--	1.32	--	--	--	17.1

Note: A duplicate groundwater sample was obtained from well USTH19-MW10. No EPA 502.2 or EPA 625 compounds were identified.

B N = Base Neutrals

Bold Numbers = Concentration above N.C. 21L Groundwater Std.

MDL = Method Detection Limit

ND = Not Detected

VOCs = Volatile Organic Compounds

SVOCs = Semi-volatile Organic Compounds

Appendix G
First Semi-Annual Groundwater
Monitoring Report



L A W

C A T L I N

ENVIRONMENTAL AND
ENGINEERING CONSULTANTS

RALEIGH, N.C.
WILMINGTON, N.C.

**FIRST SEMI-ANNUAL GROUNDWATER
MONITORING REPORT**

FILE COPY

**BUILDING H-19-1, H-19-2, and H-19-3
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA**

Issued: December 12, 2000

Navy Contract No. N62470-95-D-6009

Delivery Order No. 0093

LAW Job No. 30740-6-0600-0093

**Law Engineering and Environmental Services, Inc.
3301 Atlantic Avenue
Raleigh, North Carolina 27604**

CATLIN

ENVIRONMENTAL AND
ENGINEERING CONSULTANTS

LAW

WILMINGTON, N.C.
RALEIGH, N.C.

December 12, 2000

Commander
LANTNAVFACENGCOM
1510 Gilbert Street
Norfolk, Virginia 23511-2699

Attention: Ms. Lori P. Reuther, Code: EV21LR

Subject: **First Semi-Annual Groundwater Monitoring Report
Former USTs H-19-1, H-19-2 and H-19-3
Marine Corps Base
Camp Lejeune, North Carolina
Navy Contract Number N62470-95-D-6009
Delivery Order Number: 0093
Law Job Number: 30740-6-0600-0093**

Dear Ms. Reuther:

In accordance with Naval Facilities Engineering Command Order for Supplies and Services Contract No. N62470-95-D-6009, Delivery Order Number 0093, Law Engineering and Environmental Services, Inc. (LAW) is pleased to provide this Semi-Annual Groundwater Monitoring Report for the above referenced site. Our services included groundwater level gauging, and collection and analysis of groundwater samples from selected, existing monitoring wells. The purpose of our services was to document the presence or absence of free product, determine the current groundwater flow conditions across the site, and evaluate groundwater quality at selected locations.

Background Information

LAW has completed the first two rounds of quarterly water-table monitoring, and the first of two semi-annual groundwater sampling events at the Building H-19 site, located at the Marine Corps Base (MCB) Camp Lejeune, North Carolina. Three underground storage tanks (USTs) were located approximately 90 feet north of Building H-19 and were associated with former boiler plant building H-20. The tanks included two 15,000-gallon capacity diesel fuel tanks, and one 5,000-gallon capacity waste oil tank.

RICHARD CATLIN & ASSOC.
220 OLD DAIRY ROAD
P.O. BOX 10279
WILMINGTON, NC 28405-3755
(910) 452-5861

LAW ENVIRONMENTAL
3301 ATLANTIC AVENUE
P.O. BOX 18288
RALEIGH, NC 27619
(919) 876-0416

The tanks were installed in 1943 and removed in 1993. Vadose-zone soils were excavated from the site at the time of removal. Groundwater contamination was identified by LAW at the site as recently as 1998. The presence of free product was not identified at that time.

The table below lists known environmental assessment or remediation reports prepared for the subject site. Please reference the reports listed for additional background information and study findings associated with the Building H-19 site.

Previous Environmental Reports for Building H-19 Site

NO	REPORT TITLE	DATE	AUTHOR
1	Initial Site Assessment Report, UST Closure by Removal, (2) 15,000-gallon heating oil [sic], Building H-19	Undated	Peele's Pump and Tank Company, West Columbia, South Carolina
2	Initial Site Assessment Report, UST Closure by Removal, (2) 5,000-gallon waste oil [sic], Building H-19	Undated	Peele's Pump and Tank Company, West Columbia, South Carolina
3	Five Plus Two Additional Wells Site Check, UST H-19	June 1995	R. E. Wright Environmental, Inc. Norfolk Virginia
4	Leaking UST Site Assessment Report (Draft), UST H-19	May 1997	Law Engineering and Environmental Services, Inc.
5	Report of Natural Attenuation Monitoring, Building H-19	February 1998	Law Engineering and Environmental Services, Inc.
6	Second Natural Attenuation Monitoring Report, Building H-19, Hadnot Point	September 1998	Law Engineering and Environmental Services, Inc.

Current Groundwater Sampling and Gauging Event

LAW gauged 12 existing monitoring wells and collected groundwater samples from five selected wells in October 2000. The depth to groundwater was measured in monitoring wells UST H19-MW01 through UST H19-MW14 (except wells UST H19-MW08 and UST H19-MW12 which could not be located) using an electronic interface probe or water gauging meter on July 19, 2000 and October 10, 2000. Well UST H19-

MW08 was located and gauged during the October event, but well UST H19-MW-12 has been destroyed. Groundwater elevations were calculated by subtracting the water-table depth from surveyed top-of-casing elevations (Tables 1 and 2). Figures 1 and 2 are water-table elevation contour maps, as prepared from water-table measurements obtained during the July and October 2000 gauging events. The groundwater flow directions represented in Figures 1 and 2 are similar to that depicted on the water-table contour map by LAW for January 1998 (Report No. 5: Figure 1).

Groundwater samples were collected from monitoring wells (UST H19-MW01, UST H19-MW02, UST H19-MW03, UST H19-MW05 and UST H19-MW07) on October 11, 2000. The five monitoring wells were purged prior to sample collection. The stagnant water from the well casing and sand pack was removed in an effort to collect samples representative of the water quality in the aquifer surrounding the screened interval. Each well was purged and sampled using a new, dedicated disposable bailer. LAW personnel donned a new pair of laboratory grade gloves prior to purging, sampling and collecting water-level measurements at each well to minimize the potential for cross contamination. Specific conductance, pH, groundwater temperature, turbidity and dissolved oxygen were measured and recorded throughout the purging process. Well purging continued until three standing well volumes were removed and indicator parameters had stabilized. Groundwater samples were then collected and decanted from the bailer into pre-labeled sample containers. These containers were sealed, and stored in a chilled cooler. Custody of the samples was maintained by LAW personnel, from the time of collection through delivery to the analytical laboratory.

The groundwater samples from each of the five selected wells, including one duplicate and a trip blank, were submitted to Paradigm Analytical Laboratory. The samples were analyzed for volatile organic compounds (VOCs) using Standard Method 6210D, for semi-volatile organic compounds (SVOCs) plus Tentatively Identified Compounds (TICs) by EPA Method 625, for volatile petroleum hydrocarbons (VPH) and extractable petroleum hydrocarbons (EPH) by the Massachusetts Department of Environmental Protection method, and for the metals chromium and lead by Standard Method 6010B.

Comments

Tables 3 and 4 summarize the laboratory results from the January 1998, where available, and October 2000 sampling events. Laboratory reports for the October 2000 sampling event are attached.

No detectable concentrations of VOCs, SVOCs, or SVOC TICs were identified in groundwater samples from wells UST H19-MW01, UST H19-MW02, UST H19-MW05, or UST H19-MW07. The concentrations of ten VOCs from the 1998 sampling event in groundwater from monitoring well UST H19-MW07 have decreased to nondetectable levels. MADEP VPH and EPH class compounds were not detected in these samples either.

Low concentrations of one known and two unknown SVOC TICs were detected in the groundwater sample from UST H19-MW03. No VOCs or SVOC were identified in this sample. Additionally, no MADEP VPH or EPH hydrocarbon chains were detected in groundwater from monitoring well UST H19-MW03 during the October 2000 sampling event.

No metals were detected in any of the groundwater samples analyzed.

Results of groundwater analysis for this sampling event indicate the presence of very low concentrations of SVOCs TICs at one well location at the subject site. LAW recommends completing the remaining activities defined in Delivery Order 0093 for this site. If free product is not identified in the next two gauging events, and concentrations of petroleum constituents in groundwater remain below GCLs, this site should meet criteria for regulatory closure.

This report is intended for the exclusive use of Naval Facilities Engineering Command, Atlantic Division. The contents should not be relied upon by any other parties without the expressed written consent of LAW. The findings are relevant to the dates of our site work and should not be relied upon to represent site conditions on other dates.

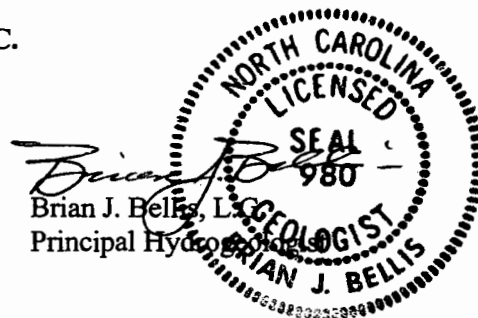
We appreciate the opportunity to provide environmental services on this project. If any questions arise, please contact us at (919) 876-0416.

Sincerely,

LAW ENGINEERING AND ENVIRONMENTAL SERVICES, INC.



William S. Grimes
Staff Geologist



Brian J. Bellis, L.L.C.
Principal Hydrogeologist

Attachments: Table 1 – Monitoring Well Casing and Groundwater Elevations, July 19, 2000
Table 2 – Monitoring Well Casing and Groundwater Elevations, October 10, 2000
Table 3 – Summary of Laboratory Analytical Results, Volatile and Semi-Volatile Organic Compounds (2 pages)
Table 4 – Summary of MADEP VPH and EPH Laboratory Analytical Results
Figure 1 – Water Table Elevation Contour Map for July 2000
Figure 2 – Water Table Elevation Contour Map for October 2000
Laboratory Report and Chain of Custody Record

cc: Mr. Neal Paul, Marine Corps Base Camp Lejeune
Ms. Christine Foskey, LANTNAVFACENGOM – Contracts, Correspondence Only
Mr. Michael E. Mason, Program Manager, Catlin Engineers and Scientists, Inc., Correspondence Only

TABLE 1
BUILDING H-19
MONITORING WELL CASING
AND GROUNDWATER ELEVATIONS
JULY 19, 2000

DATA POINT	TOP OF CASING ELEVATION (feet)	DEPTH TO WATER (feet)	FREE PRODUCT THICKNESS (feet)	WATER TABLE ELEVATION (feet)
UST H19-MW01	13.11	11.55	NMT	1.56
UST H19-MW02	12.93	8.71	NMT	4.22
UST H19-MW03	13.25	8.87	NMT	4.38
UST H19-MW04	13.88	9.31	NMT	4.57
UST H19-MW05	13.42	9.00	NMT	4.42
UST H19-MW06	13.67	9.41	NMT	4.26
UST H19-MW07	10.42	8.65	NMT	1.77
UST H19-MW08	9.70	Well Not Located	--	--
UST H19-MW09	9.97	8.33	NMT	1.64
UST H19-MW10	10.32	8.67	NMT	1.65
UST H19-MW11	10.51	8.07	NMT	2.44
UST H19-MW12	10.93	Well Not Located	--	--
UST H19-MW13	10.89	8.95	NMT	1.94
UST H19-MW14	11.26	9.57	NMT	1.69

NMT = No Measurable Thickness

Top of casing elevations provided to LAW by Taylor, Wiseman & Taylor, Raleigh, NC.

TABLE 2
BUILDING H-19
MONITORING WELL CASING
AND GROUNDWATER ELEVATIONS
OCTOBER 10, 2000

DATA POINT	TOP OF CASING ELEVATION (feet)	DEPTH TO WATER (feet)	FUEL PRODUCT THICKNESS (feet)	WATER TABLE ELEVATION (feet)
UST H19-MW01	13.11	9.86	NMT	3.25
UST H19-MW02	12.93	7.00	NMT	5.93
UST H19-MW03	13.25	7.26	NMT	5.99
UST H19-MW04	13.88	7.78	NMT	6.10
UST H19-MW05	13.42	7.49	NMT	5.93
UST H19-MW06	13.67	7.83	NMT	5.84
UST H19-MW07	10.42	7.00	NMT	3.42
UST H19-MW08	9.70	6.51	NMT	3.19
UST H19-MW09	9.97	6.73	NMT	3.24
UST H19-MW10	10.32	7.01	NMT	3.31
UST H19-MW11	10.51	7.22	NMT	3.29
UST H19-MW12	10.93	Well Destroyed	--	--
UST H19-MW13	10.89	7.44	NMT	3.45
UST H19-MW14	11.26	8.00	NMT	3.26

NMT = No Measurable Thickness

Top of casing elevations provided to LAW by Taylor, Wiseman & Taylor, Raleigh, NC.

TABLE 3 (PAGE 1 OF 2)
SUMMARY OF LABORATORY ANALYTICAL RESULTS (GROUNDWATER SAMPLES)
VOLATILE AND SEMI-VOLATILE ORGANIC COMPOUNDS
FORMER USTs H-19-1, H-19-2 and H-19-3 MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

STANDARD METHOD 6210D - VOLATILE ORGANIC COMPOUNDS (mg/L)									
Benzene	ND	ND	ND	ND	ND	5.0			.001
sec-Butylbenzene	ND	ND	ND	ND	ND	8.5			.070
Ethylbenzene	ND	ND	ND	ND	ND	29.0			.029
Isopropylbenzene	ND	ND	ND	ND	ND	25.0			.070
Naphthalene	ND	ND	ND	ND	ND	15.5			.021
n-Propyl benzene	ND	ND	ND	ND	ND	30.0			.070
1,2,4-Trimethylbenzene	ND	ND	ND	ND	ND	28.5			.350
1,3,5-Trimethylbenzene	ND	ND	ND	ND	ND	25.0			.350
Toluene	ND	ND	ND	ND	ND	257.5			1.000
Xylenes (Total)	ND	ND	ND	ND	ND	87.5			.530
Total EPA Method 602	--	--	--	--	--	N/A			N/A
Total Standard Method 6210D	--	--	--	--	--	N/A			N/A
EPA METHOD 625 - BASE, NEUTRAL AND ACID EXTRACTABLE SEMIVOLATILE ORGANIC COMPOUNDS (mg/L)									
Acenaphthene	ND	ND	ND	ND	ND	2.12			.08
Anthracene	ND	ND	ND	ND	ND	.645			2.10
Bis (2-ethylhexyl) phthalate	ND	ND	ND	ND	ND	Not Established			.003
4,6-Dinitro-2-methylphenol	ND	ND	ND	ND	ND	Not Established			PQL
Fluorene	ND	ND	ND	ND	ND	.950			.28
Naphthalene	ND	ND	ND	ND	ND	15.5			.021
Phenanthrene	ND	ND	ND	ND	ND	.41			.21
Pyrene	ND	ND	ND	ND	ND	.210			.21
Total EPA Method 625	ND	ND	ND	ND	ND	N/A			N/A
EPA METHOD 625, TENTATIVELY IDENTIFIED COMPOUNDS - TICs (mg/L)									
Known TICs [Concentration]	--	--	--	1 [.028]	--	N/A			N/A
Unknown TICs [Concentration]	--	--	--	2 [.0181]	--	N/A			N/A

ND = Not Detected above the laboratory practical quantitation limit (PQL). See laboratory report.

N/A = Not applicable

TABLE 3 (PAGE 2 OF 2)
SUMMARY OF LABORATORY ANALYTICAL RESULTS (GROUNDWATER SAMPLES)
VOLATILE AND SEMI-VOLATILE ORGANIC COMPOUNDS
FORMER USTs H-19-1, H-19-2 and H-19-3 MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

PARAMETER	GROUNDWATER SAMPLE ID	USFHW (AW0798) (4/10/14)	USFHW (AW0790) (8/10/14)	GROSS CONTAMINATION REVEALS (GCL)	NC (GROUNDWATER) QUALITY STANDARD
STANDARD METHOD 6210D (including historical results by EPA Method 502.2) – VOLATILE ORGANIC COMPOUNDS (mg/L)					
Benzene		ND	ND	5.0	.001
sec-Butylbenzene		.00721	ND	8.5	.070
tert-Butylbenzene		.00252	ND	15.0	.070
Ethylbenzene		ND	ND	29.0	.029
Isopropylbenzene		.00532	ND	25.0	.070
Naphthalene		ND	ND	15.5	.021
n-Propylbenzene		.00154	ND	30.0	.070
Styrene		.00205	ND	100.0**	0.10
Tetrachloroethene		.00152	ND	7.0	0.0007
Toluene		.00193	ND	257.5	1.000
1,2,4-Trimethylbenzene		.000933	ND	28.5	.35
Xylenes (Total)		.001143	ND	87.5	.530
Total EPA Method 502.2		.02417	--	N/A	N/A
Total Standard Method 6210D		--	--	N/A	N/A
EPA METHOD 625 – BASE, NEUTRAL AND ACID EXTRACTABLE SEMIVOLATILE ORGANIC COMPOUNDS (mg/L)					
Acenaphthene		ND	ND	2.12	.08
Anthracene		ND	ND	.645	2.10
Bis (2-ethylhexyl) phthalate		ND	ND	Not Established	.003
4,6-Dinitro-2-methylphenol		ND	ND	Not Established	PQL
Fluorene		ND	ND	.950	.28
Naphthalene		ND	ND	15.5	.021
Phenanthrene		ND	ND	.41	.21
Pyrene		ND	ND	.210	.21
Total EPA Method 625		--	--	N/A	N/A
EPA METHOD 625, TENTATIVELY IDENTIFIED COMPOUNDS – TICs (mg/L)					
Known TICs [Concentration]		--	--	N/A	N/A
Unknown TICs [Concentration]		--	--	N/A	N/A

* = Data from LAW Report of Natural Attenuation Monitoring, February 1998; Delivery Order 0026

** = GCL = 1,000 * groundwater standard because 1/2 of the water solubility of styrene = 160 mg/L.

ND = Not Detected above the laboratory practical quantitation limit (PQL). See laboratory report.

N/A = Not applicable

TABLE 4
SUMMARY OF MADEP VPH AND EPH LABORATORY RESULTS (GROUNDWATER SAMPLES)
FORMER USTs H-19-1, H-19-2 and H-19-3 MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

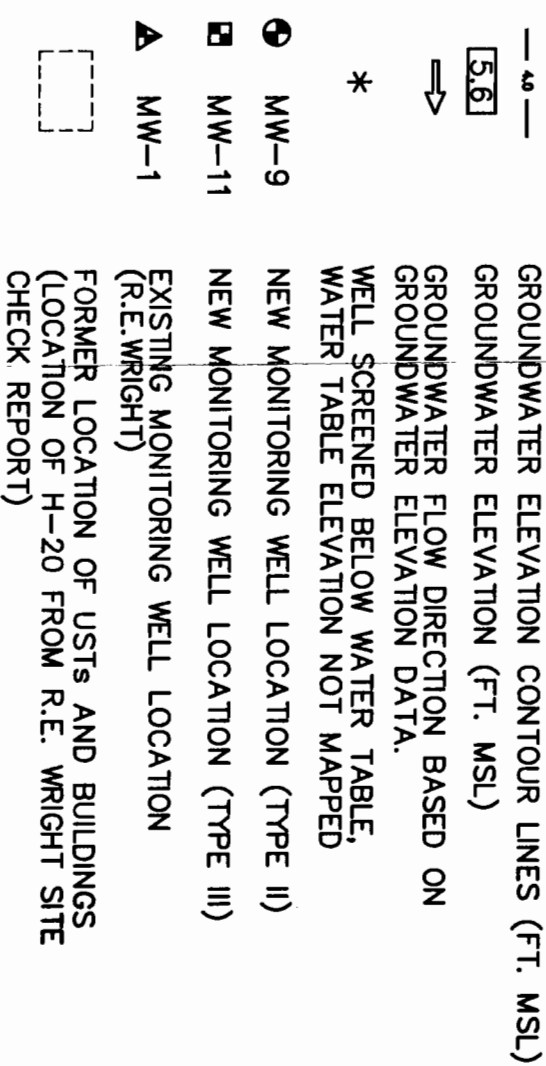
PARAMETER	GROUNDWATER SAMPLE ID	US1119 (C/V01-000)	US1119 (C/V02-000)	US1119 (C/V03-000)	US1119 (C/V04-000)	US1119 (C/V05-000)	US1119 (C/V06-000)	INTERIM GROUNDWATER VPH/ND (A PHASE III CHANGES)
WELLS SCREEN DEPTHS (ft)		10 to 15	2 to 12	1 to 10	1 to 10	1 to 12	1 to 12	
SAMPLE ID		1041700	1051701	1061701	1071701	1081701	1091701	
MADEP, Total Volatile Petroleum Hydrocarbon Compounds (VPH), mg/L								
C5 to C8 Aliphatics		ND	ND	ND	ND	ND	ND	
C9 to C12 Aliphatics		ND	ND	ND	ND	ND	ND	
C9 to C10 Aromatics		ND	ND	ND	ND	ND	ND	
MADEP, Total Extractable Petroleum Hydrocarbon Compounds (EPH), mg/L								
C9 to C18 Aliphatics		ND	ND	ND	ND	ND	ND	
C19 to C36 Aliphatics		ND	ND	ND	ND	ND	ND	
C11 to C22 Aromatics		ND	ND	ND	ND	ND	ND	
MADEP, CARBON CLASS RANGE TOTALS, mg/L (if concentration identified)								
C5 to C8 Aliphatics (VPH)		--	--	--	--	--	--	0.42
C9 to C12 Aliphatics		--	--	--	--	--	--	Not Established: Note 1
C9 to C10 Aromatics		--	--	--	--	--	--	Not Established: Note 2
C9 to C18 Aliphatics (VPH + EPH)		--	--	--	--	--	--	4.2
C19 to C36 Aliphatics (EPH)		--	--	--	--	--	--	42.0
C11 to C22 Aromatics (VPH + EPH)		--	--	--	--	--	--	0.21

ND = No compounds detected above the laboratory practical quantitation limit (PQL). See laboratory reports
 Shaded Cells = Groundwater Contaminant Concentration exceeds the N.C. Groundwater Standard
 MADEP = Massachusetts Department of Environmental Protection.

* Gross Contamination levels have not been established for these parameters

Notes:

1. The DWQ has not established a groundwater standard for the C9 to C12 aliphatic compound class of VPH. Instead, the DWQ established a groundwater standard for the C9 to C18 aliphatic compound class, which includes both VPH and EPH.
2. The DWQ has not established a groundwater standard for the C9 to C10 aromatic compound class of VPH. Instead, the DWQ established a groundwater standard for the C11 to C32 aromatic compound class which includes both VPH and EPH.



GROUNDWATER ELEVATION CONTOUR LINES (FT. MSL)
GROUNDWATER ELEVATION (FT. MSL)
GROUNDWATER FLOW DIRECTION BASED ON
GROUNDWATER ELEVATION DATA.
WELL SCREENED BELOW WATER TABLE,
WATER TABLE ELEVATION NOT MAPPED
NEW MONITORING WELL LOCATION (TYPE II)
NEW MONITORING WELL LOCATION (TYPE III)
EXISTING MONITORING WELL LOCATION
(R.E.WRIGHT)
FORMER LOCATION OF USTs AND BUILDINGS
(LOCATION OF H-20 FROM R.E. WRIGHT SITE
CHECK REPORT)

- G:\CADD\40-60600\H-30\H-30_PLAN(1).dwg

CAMP LEJEUNE, NORTH CAROLINA

REFERENCE: MCB CAD DRAWING F06.DWG, FIGURE 3 OF R.E. WRIGHT, 1995. AND MBC DRAWING 228551, 305171, 4052508

LAWGIBB Group Member

LAW ENGINEERING AND
ENVIRONMENTAL SERVICES, INC.
RALEIGH, NORTH CAROLINA

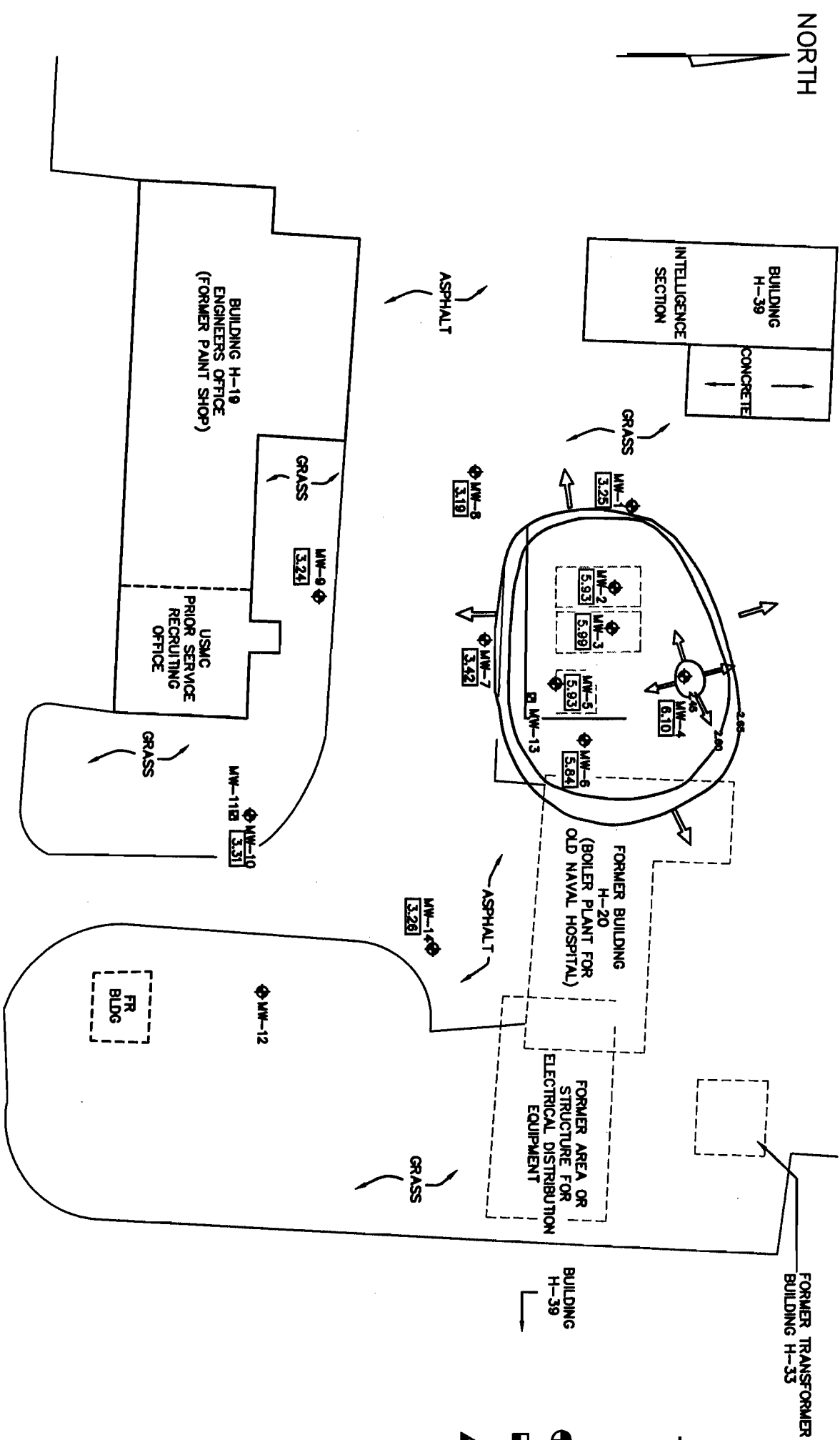
DRAWN: LGL DATE: DECEMBER 2000

DFT CHECK: WSC- SCALE: 1"=40'

ENG CHECK: -

JOB: 30740-6-0600/0093

APPROVAL:  FIGURE: 1



- LEGEND**
- 2.00 —
 - [5.6] ⇒
 - MW-9
 - MW-11
 - ▲ MW-1
 -
- GROUNDWATER ELEVATION CONTOUR LINES (FT. MSL)
GROUNDWATER ELEVATION (FT. MSL)
GROUNDWATER FLOW DIRECTION BASED ON GROUNDWATER ELEVATION DATA.
NEW MONITORING WELL LOCATION (TYPE II)
NEW MONITORING WELL LOCATION (TYPE III)
EXISTING MONITORING WELL LOCATION (R.E. WRIGHT)
FORMER LOCATION OF USTs AND BUILDINGS (LOCATION OF H-20 FROM R.E. WRIGHT SITE CHECK REPORT)

- NOTES.**
1. H-19 IS THE PREFIX WHICH PROCEEDS ALL SAMPLE LOCATIONS (OMITTED FOR BREVITY)
 2. PERMANENT WELLS MW-1 THROUGH MW-7 INSTALLED BY R.E. WRIGHT ENVIRONMENTAL INC. MARCH 1995. RESAMPLED BY LAW IN FEBRUARY 1997.
 3. PERMANENT WELLS MW-8 THROUGH MW-14 INSTALLED BY LAW IN MARCH 1997. WELLS SAMPLED BY LAW IN MARCH AND EARLY APRIL 1997.
 4. CORNERS OF BLDG H-19, H-39, FENCE POST, AND SAMPLING POINTS LOCATED IN FIELD BY PROFESSIONAL LAND SURVEYOR. THE LOCATIONS OF UTILITIES AND OTHER FEATURES ARE APPROXIMATE.
 5. TYPE III MONITORING WELLS NOT CONSIDERED FOR GROUNDWATER TABLE ELEVATION CONTOUR MAP
 6. CONTOUR INTERVALS= 1.0FT.

G:\CADD\40-60600\H-30\H-30_PLAN(2).dwg

GROUNDWATER TABLE ELEVATION MAP
OCTOBER 10, 2000
LEAKING UNDERGROUND STORAGE TANK H-19
CAMP LEJEUNE, NORTH CAROLINA

REFERENCE: MCB CAD DRAWING F06.DWG, FIGURE 3 OF R.E. WRIGHT, 1995, AND MBC DRAWING 228551, 305171, 4052508

LAW
LAWGIBB Group Member
LAW ENGINEERING AND ENVIRONMENTAL SERVICES, INC.
RALEIGH, NORTH CAROLINA

DRAWN:	LGL	DATE: DECEMBER 2000
DFT CHECK:	USC	SCALE: 1"=40'
ENG CHECK:	-	JOB: 30740-6-0600/0093
APPROVAL:	BYB	FIGURE: 2

Laboratory Report and Chain of Custody Records

PARADIGM ANALYTICAL LABORATORIES, INC.

2627 Northchase Parkway S.E.
Wilmington, North Carolina 28405
(910) 350-1903
Fax (910) 350-1557

Mr. Bill Deobald
Law Engineering
3301 Atlantic Ave.
Raleigh, NC 27604

November 2, 2000

Report Number: G132-732

Client Project ID: H19

Dear Mr. Deobald,

Enclosed are the results of the analytical services performed under the referenced project. Copies of this report and supporting data will be retained in our files for a period of five years in the event they are required for future reference. Any samples submitted to our laboratory will be retained for a maximum of thirty (30) days from the date of this report unless other arrangements are requested.

If there are any questions about the report or the services performed during this project, please call for assistance. We will be happy to answer any questions or concerns which you may have.

Thank you for using Paradigm Analytical Labs for your analytical services. We look forward to working with you again on any additional analytical needs which you may have.

Sincerely,

Paradigm Analytical Laboratories, Inc.



Laboratory Director
Mark Randall

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 6210D

Client Sample ID: USTH19-GW01-00D

Client Project ID: H19

Lab Sample ID: 97091

Lab Project ID: G132-732

Matrix: Water

Date Analyzed: 10/25/00

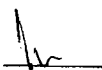
Analyzed By: RNP

Date Collected: 10/11/00

Date Received: 10/12/00

Dilution: 1.0

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Benzene	0.5	BQL
Bromobenzene	0.5	BQL
Bromochloromethane	0.5	BQL
Bromodichloromethane	0.5	BQL
Bromoform	0.5	BQL
Bromomethane	0.5	BQL
n-Butylbenzene	0.5	BQL
sec-Butylbenzene	0.5	BQL
tert-Butylbenzene	0.5	BQL
Carbon tetrachloride	0.5	BQL
Chlorobenzene	0.5	BQL
Chloroethane	0.5	BQL
Chloroform	0.5	BQL
Chloromethane	0.5	BQL
2-Chlorotoluene	0.5	BQL
4-Chlorotoluene	0.5	BQL
Dibromochloromethane	0.5	BQL
1,2-Dibromo-3-chloropropane	5	BQL
Dibromomethane	0.5	BQL
1,2-Dibromoethane (EDB)	0.5	BQL
1,2-Dichlorobenzene	0.5	BQL
1,3-Dichlorobenzene	0.5	BQL
1,4-Dichlorobenzene	0.5	BQL
1,1-Dichloroethane	0.5	BQL
1,1-Dichloroethene	0.5	BQL
1,2-Dichloroethane	0.5	BQL
cis-1,2-Dichloroethene	0.5	BQL
trans-1,2-dichloroethene	0.5	BQL
1,2-Dichloropropane	0.5	BQL
1,3-Dichloropropane	0.5	BQL
2,2-Dichloropropane	0.5	BQL
1,1-Dichloropropene	0.5	BQL
Dichlorodifluoromethane	5	BQL
Diisopropyl ether (DIPE)	0.5	BQL
Ethylbenzene	0.5	BQL
Hexachlorobutadiene	0.5	BQL
Isopropylbenzene	0.5	BQL
4-Isopropyltoluene	0.5	BQL
Methylene chloride	5	BQL
Methyl-tert-butyl ether (MTBE)	0.5	BQL

Reviewed by: 

Flags: BQL = Below Quantitation Limit

N.C. Certification #481 S.C. Certification #99029

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PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 6210D

Client Sample ID: USTH19-GW01-00D

Client Project ID: H19

Lab Sample ID: 97091

Lab Project ID: G132-732

Matrix: Water

Date Analyzed: 10/25/00

Analyzed By: RNP

Date Collected: 10/11/00

Date Received: 10/12/00

Dilution: 1.0

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Naphthalene	0.5	BQL
n-Propyl benzene	0.5	BQL
Styrene	0.5	BQL
1,1,1,2-Tetrachloroethane	0.5	BQL
1,1,2,2-Tetrachloroethane	0.5	BQL
Tetrachloroethene	0.5	BQL
Toluene	0.5	BQL
1,2,3-Trichlorobenzene	0.5	BQL
1,2,4-Trichlorobenzene	0.5	BQL
Trichloroethene	0.5	BQL
1,1,1-Trichloroethane	0.5	BQL
1,1,2-Trichloroethane	0.5	BQL
Trichlorofluoromethane	0.5	BQL
1,2,3-Trichloropropane	0.5	BQL
1,2,4-Trimethylbenzene	0.5	BQL
1,3,5-Trimethylbenzene	0.5	BQL
Vinyl chloride	0.5	BQL
m-,p-Xylene	1	BQL
o-Xylene	0.5	BQL

Surrogate Spike Recoveries

Compound	Spike Added (ug/L)	Surrogate Result (ug/L)	%Rec
Bromofluorobenzene	10.0	9.9	99
1,2-Dichloroethane-d4	10.0	10.0	100
Toluene-d8	10.0	10.0	100

Comments:

All results are corrected for dilution.

Reviewed by: 

Flags: BQL = Below Quantitation Limit.

N.C. Certification #481 S.C. Certification #99029

Page 2

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 6210D

Client Sample ID: USTH19-GW02-00D

Client Project ID: H19

Lab Sample ID: 97092

Lab Project ID: G132-732

Matrix: Water

Date Analyzed: 10/25/00

Analyzed By: RNP

Date Collected: 10/11/00

Date Received: 10/12/00

Dilution: 1.0

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Benzene	0.5	BQL
Bromobenzene	0.5	BQL
Bromochloromethane	0.5	BQL
Bromodichloromethane	0.5	BQL
Bromoform	0.5	BQL
Bromomethane	0.5	BQL
n-Butylbenzene	0.5	BQL
sec-Butylbenzene	0.5	BQL
tert-Butylbenzene	0.5	BQL
Carbon tetrachloride	0.5	BQL
Chlorobenzene	0.5	BQL
Chloroethane	0.5	BQL
Chloroform	0.5	BQL
Chloromethane	0.5	BQL
2-Chlorotoluene	0.5	BQL
4-Chlorotoluene	0.5	BQL
Dibromochloromethane	0.5	BQL
1,2-Dibromo-3-chloropropane	5	BQL
Dibromomethane	0.5	BQL
1,2-Dibromoethane (EDB)	0.5	BQL
1,2-Dichlorobenzene	0.5	BQL
1,3-Dichlorobenzene	0.5	BQL
1,4-Dichlorobenzene	0.5	BQL
1,1-Dichloroethane	0.5	BQL
1,1-Dichloroethene	0.5	BQL
1,2-Dichloroethane	0.5	BQL
cis-1,2-Dichloroethene	0.5	BQL
trans-1,2-dichloroethene	0.5	BQL
1,2-Dichloropropane	0.5	BQL
1,3-Dichloropropane	0.5	BQL
2,2-Dichloropropane	0.5	BQL
1,1-Dichloropropene	0.5	BQL
Dichlorodifluoromethane	5	BQL
Diisopropyl ether (DIPE)	0.5	BQL
Ethylbenzene	0.5	BQL
Hexachlorobutadiene	0.5	BQL
Isopropylbenzene	0.5	BQL
4-Isopropyltoluene	0.5	BQL
Methylene chloride	5	BQL
Methyl-tert-butyl ether (MTBE)	0.5	BQL

Reviewed by: LN

Flags: BQL = Below Quantitation Limit

N.C. Certification #481 S.C. Certification #99029

Page 1

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 6210D

Client Sample ID: USTH19-GW02-00D

Date Analyzed: 10/25/00

Client Project ID: H19

Analyzed By: RNP

Lab Sample ID: 97092

Date Collected: 10/11/00

Lab Project ID: G132-732

Date Received: 10/12/00

Matrix: Water

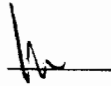
Dilution: 1.0

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Naphthalene	0.5	BQL
n-Propyl benzene	0.5	BQL
Styrene	0.5	BQL
1,1,1,2-Tetrachloroethane	0.5	BQL
1,1,2,2-Tetrachloroethane	0.5	BQL
Tetrachloroethene	0.5	BQL
Toluene	0.5	BQL
1,2,3-Trichlorobenzene	0.5	BQL
1,2,4-Trichlorobenzene	0.5	BQL
Trichloroethene	0.5	BQL
1,1,1-Trichloroethane	0.5	BQL
1,1,2-Trichloroethane	0.5	BQL
Trichlorofluoromethane	0.5	BQL
1,2,3-Trichloropropane	0.5	BQL
1,2,4-Trimethylbenzene	0.5	BQL
1,3,5-Trimethylbenzene	0.5	BQL
Vinyl chloride	0.5	BQL
m-,p-Xylene	1	BQL
o-Xylene	0.5	BQL

Surrogate Spike Recoveries	Spike Added	Surrogate Result	%Rec
Compound	(ug/L)	(ug/L)	
Bromofluorobenzene	10.0	10.2	102
1,2-Dichloroethane-d4	10.0	10.1	101
Toluene-d8	10.0	10.1	101

Comments:

All results are corrected for dilution.

Reviewed by: 

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 6210D

Client Sample ID: USTH19-GW03-00D

Client Project ID: H19

Lab Sample ID: 97093

Lab Project ID: G132-732

Matrix: Water

Date Analyzed: 10/25/00

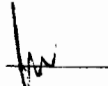
Analyzed By: RNP

Date Collected: 10/11/00

Date Received: 10/12/00

Dilution: 1.0

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Benzene	0.5	BQL
Bromobenzene	0.5	BQL
Bromochloromethane	0.5	BQL
Bromodichloromethane	0.5	BQL
Bromoform	0.5	BQL
Bromomethane	0.5	BQL
n-Butylbenzene	0.5	BQL
sec-Butylbenzene	0.5	BQL
tert-Butylbenzene	0.5	BQL
Carbon tetrachloride	0.5	BQL
Chlorobenzene	0.5	BQL
Chloroethane	0.5	BQL
Chloroform	0.5	BQL
Chloromethane	0.5	BQL
2-Chlorotoluene	0.5	BQL
4-Chlorotoluene	0.5	BQL
Dibromochloromethane	0.5	BQL
1,2-Dibromo-3-chloropropane	5	BQL
Dibromomethane	0.5	BQL
1,2-Dibromoethane (EDB)	0.5	BQL
1,2-Dichlorobenzene	0.5	BQL
1,3-Dichlorobenzene	0.5	BQL
1,4-Dichlorobenzene	0.5	BQL
1,1-Dichloroethane	0.5	BQL
1,1-Dichloroethene	0.5	BQL
1,2-Dichloroethane	0.5	BQL
cis-1,2-Dichloroethene	0.5	BQL
trans-1,2-dichloroethene	0.5	BQL
1,2-Dichloropropane	0.5	BQL
1,3-Dichloropropane	0.5	BQL
2,2-Dichloropropane	0.5	BQL
1,1-Dichloropropene	0.5	BQL
Dichlorodifluoromethane	5	BQL
Diisopropyl ether (DIPE)	0.5	BQL
Ethylbenzene	0.5	BQL
Hexachlorobutadiene	0.5	BQL
Isopropylbenzene	0.5	BQL
4-Isopropyltoluene	0.5	BQL
Methylene chloride	5	BQL
Methyl-tert-butyl ether (MTBE)	0.5	BQL

Reviewed by: 

Flags: BQL = Below Quantitation Limit

N.C. Certification #481 S.C. Certification #99029

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PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 6210D

Client Sample ID: USTH19-GW03-00D

Client Project ID: H19

Lab Sample ID: 97093

Lab Project ID: G132-732

Matrix: Water

Date Analyzed: 10/25/00

Analyzed By: RNP

Date Collected: 10/11/00

Date Received: 10/12/00

Dilution: 1.0

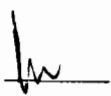
Compound	Quantitation Limit (ug/L)	Result (ug/L)
Naphthalene	0.5	BQL
n-Propyl benzene	0.5	BQL
Styrene	0.5	BQL
1,1,1,2-Tetrachloroethane	0.5	BQL
1,1,2,2-Tetrachloroethane	0.5	BQL
Tetrachloroethene	0.5	BQL
Toluene	0.5	BQL
1,2,3-Trichlorobenzene	0.5	BQL
1,2,4-Trichlorobenzene	0.5	BQL
Trichloroethene	0.5	BQL
1,1,1-Trichloroethane	0.5	BQL
1,1,2-Trichloroethane	0.5	BQL
Trichlorofluoromethane	0.5	BQL
1,2,3-Trichloropropane	0.5	BQL
1,2,4-Trimethylbenzene	0.5	BQL
1,3,5-Trimethylbenzene	0.5	BQL
Vinyl chloride	0.5	BQL
m-,p-Xylene	1	BQL
o-Xylene	0.5	BQL

Surrogate Spike Recoveries

Compound	Spike Added (ug/L)	Surrogate Result (ug/L)	%Rec
Bromofluorobenzene	10.0	10.1	101
1,2-Dichloroethane-d4	10.0	10.1	101
Toluene-d8	10.0	10.2	102

Comments:

All results are corrected for dilution.

Reviewed by: 

Flags: BQL = Below Quantitation Limit

N.C. Certification #481 S.C. Certification #99029

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PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 6210D

Client Sample ID: USTH19-GW05-00D

Client Project ID: H19

Lab Sample ID: 97094

Lab Project ID: G132-732

Matrix: Water

Date Analyzed: 10/25/00

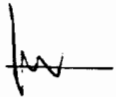
Analyzed By: RNP

Date Collected: 10/11/00

Date Received: 10/12/00

Dilution: 1.0

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Benzene	0.5	BQL
Bromobenzene	0.5	BQL
Bromochloromethane	0.5	BQL
Bromodichloromethane	0.5	BQL
Bromoform	0.5	BQL
Bromomethane	0.5	BQL
n-Butylbenzene	0.5	BQL
sec-Butylbenzene	0.5	BQL
tert-Butylbenzene	0.5	BQL
Carbon tetrachloride	0.5	BQL
Chlorobenzene	0.5	BQL
Chloroethane	0.5	BQL
Chloroform	0.5	BQL
Chloromethane	0.5	BQL
2-Chlorotoluene	0.5	BQL
4-Chlorotoluene	0.5	BQL
Dibromochloromethane	0.5	BQL
1,2-Dibromo-3-chloropropane	5	BQL
Dibromomethane	0.5	BQL
1,2-Dibromoethane (EDB)	0.5	BQL
1,2-Dichlorobenzene	0.5	BQL
1,3-Dichlorobenzene	0.5	BQL
1,4-Dichlorobenzene	0.5	BQL
1,1-Dichloroethane	0.5	BQL
1,1-Dichloroethene	0.5	BQL
1,2-Dichloroethane	0.5	BQL
cis-1,2-Dichloroethene	0.5	BQL
trans-1,2-dichloroethene	0.5	BQL
1,2-Dichloropropane	0.5	BQL
1,3-Dichloropropane	0.5	BQL
2,2-Dichloropropane	0.5	BQL
1,1-Dichloropropene	0.5	BQL
Dichlorodifluoromethane	5	BQL
Diisopropyl ether (DIPE)	0.5	BQL
Ethylbenzene	0.5	BQL
Hexachlorobutadiene	0.5	BQL
Isopropylbenzene	0.5	BQL
4-Isopropyltoluene	0.5	BQL
Methylene chloride	5	BQL
Methyl-tert-butyl ether (MTBE)	0.5	BQL

Reviewed by: 

Flags: BQL = Below Quantitation Limit.

N.C. Certification #481 S.C. Certification #99029

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PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 6210D

Client Sample ID: USTH19-GW05-00D

Client Project ID: H19

Lab Sample ID: 97094

Lab Project ID: G132-732

Matrix: Water

Date Analyzed: 10/25/00

Analyzed By: RNP

Date Collected: 10/11/00

Date Received: 10/12/00

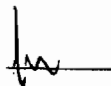
Dilution: 1.0

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Naphthalene	0.5	BQL
n-Propyl benzene	0.5	BQL
Styrene	0.5	BQL
1,1,1,2-Tetrachloroethane	0.5	BQL
1,1,2,2-Tetrachloroethane	0.5	BQL
Tetrachloroethene	0.5	BQL
Toluene	0.5	BQL
1,2,3-Trichlorobenzene	0.5	BQL
1,2,4-Trichlorobenzene	0.5	BQL
Trichloroethene	0.5	BQL
1,1,1-Trichloroethane	0.5	BQL
1,1,2-Trichloroethane	0.5	BQL
Trichlorofluoromethane	0.5	BQL
1,2,3-Trichloropropane	0.5	BQL
1,2,4-Trimethylbenzene	0.5	BQL
1,3,5-Trimethylbenzene	0.5	BQL
Vinyl chloride	0.5	BQL
m-,p-Xylene	1	BQL
o-Xylene	0.5	BQL

Surrogate Spike Recoveries	Spike Added (ug/L)	Surrogate Result (ug/L)	%Rec
Compound			
Bromofluorobenzene	10.0	10.1	101
1,2-Dichloroethane-d4	10.0	10.2	102
Toluene-d8	10.0	10.1	101

Comments:

All results are corrected for dilution.

Reviewed by: 

Flags: BQL = Below Quantitation Limit

N.C. Certification #481 S.C. Certification #99029

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PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 6210D

Client Sample ID: USTH19-GW07-00D

Client Project ID: H19

Lab Sample ID: 97095

Lab Project ID: G132-732

Matrix: Water

Date Analyzed: 10/25/00

Analyzed By: RNP

Date Collected: 10/11/00

Date Received: 10/12/00

Dilution: 1.0

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Benzene	0.5	BQL
Bromobenzene	0.5	BQL
Bromochloromethane	0.5	BQL
Bromodichloromethane	0.5	BQL
Bromoform	0.5	BQL
Bromomethane	0.5	BQL
n-Butylbenzene	0.5	BQL
sec-Butylbenzene	0.5	BQL
tert-Butylbenzene	0.5	BQL
Carbon tetrachloride	0.5	BQL
Chlorobenzene	0.5	BQL
Chloroethane	0.5	BQL
Chloroform	0.5	BQL
Chloromethane	0.5	BQL
2-Chlorotoluene	0.5	BQL
4-Chlorotoluene	0.5	BQL
Dibromochloromethane	0.5	BQL
1,2-Dibromo-3-chloropropane	5	BQL
Dibromomethane	0.5	BQL
1,2-Dibromoethane (EDB)	0.5	BQL
1,2-Dichlorobenzene	0.5	BQL
1,3-Dichlorobenzene	0.5	BQL
1,4-Dichlorobenzene	0.5	BQL
1,1-Dichloroethane	0.5	BQL
1,1-Dichloroethene	0.5	BQL
1,2-Dichloroethane	0.5	BQL
cis-1,2-Dichloroethene	0.5	BQL
trans-1,2-dichloroethene	0.5	BQL
1,2-Dichloropropane	0.5	BQL
1,3-Dichloropropane	0.5	BQL
2,2-Dichloropropane	0.5	BQL
1,1-Dichloropropene	0.5	BQL
Dichlorodifluoromethane	5	BQL
Diisopropyl ether (DIPE)	0.5	BQL
Ethylbenzene	0.5	BQL
Hexachlorobutadiene	0.5	BQL
Isopropylbenzene	0.5	BQL
4-Isopropyltoluene	0.5	BQL
Methylene chloride	5	BQL
Methyl-tert-butyl ether (MTBE)	0.5	BQL

Reviewed by: W

Flags: BQL = Below Quantitation Limit

N.C. Certification #481 S.C. Certification #99029

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PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 6210D

Client Sample ID: USTH19-GW07-00D

Date Analyzed: 10/25/00

Client Project ID: H19

Analyzed By: RNP

Lab Sample ID: 97095

Date Collected: 10/11/00

Lab Project ID: G132-732

Date Received: 10/12/00

Matrix: Water

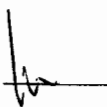
Dilution: 1.0

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Naphthalene	0.5	BQL
n-Propyl benzene	0.5	BQL
Styrene	0.5	BQL
1,1,1,2-Tetrachloroethane	0.5	BQL
1,1,2,2-Tetrachloroethane	0.5	BQL
Tetrachloroethene	0.5	BQL
Toluene	0.5	BQL
1,2,3-Trichlorobenzene	0.5	BQL
1,2,4-Trichlorobenzene	0.5	BQL
Trichloroethene	0.5	BQL
1,1,1-Trichloroethane	0.5	BQL
1,1,2-Trichloroethane	0.5	BQL
Trichlorofluoromethane	0.5	BQL
1,2,3-Trichloropropane	0.5	BQL
1,2,4-Trimethylbenzene	0.5	BQL
1,3,5-Trimethylbenzene	0.5	BQL
Vinyl chloride	0.5	BQL
m-,p-Xylene	1	BQL
o-Xylene	0.5	BQL

Surrogate Spike Recoveries	Spike Added (ug/L)	Surrogate Result (ug/L)	%Rec
Compound			
Bromofluorobenzene	10.0	10.4	104
1,2-Dichloroethane-d4	10.0	9.7	97
Toluene-d8	10.0	9.9	99

Comments:

All results are corrected for dilution.

Reviewed by: 

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

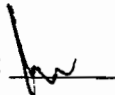
Client Name: LAW ENGINEERINGProject Name: H19

Sample Information and Analytical Results	
Sample Identification	USTH19-GW01-00D
Sample Matrix	Water
Collection Option (for Soil)*	
Date Collected	10/11/00
Date Received	10/12/00
Date Extracted	10/13/00
Date Analyzed	10/13/00
Dry Weight	
Dilution Factor	1
C ₅ -C ₈ Aliphatics**	< 100 (µg/L)
C ₉ -C ₁₂ Aliphatics**	< 100 (µg/L)
C ₉ -C ₁₀ Aromatics**	< 100 (µg/L)
Surrogate % Recovery - PID	100
Surrogate % Recovery - FID	92

* = Option 1 = Established fill line on vial, Option 2 = Sampling Device/Brand, or Option 3 = Field weight of soil.

** = Excludes any surrogates or internal standards.

Lab Info: G132-732-97091

Reviewed By: 

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: LAW ENGINEERING

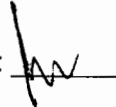
Project Name: H19

Sample Information and Analytical Results	
Sample Identification	USTH19-GW02-00D
Sample Matrix	Water
Collection Option (for Soil)*	
Date Collected	10/11/00
Date Received	10/12/00
Date Extracted	10/13/00
Date Analyzed	10/13/00
Dry Weight	
Dilution Factor	1
C ₅ -C ₈ Aliphatics**	< 100 (µg/L)
C ₉ -C ₁₂ Aliphatics**	< 100 (µg/L)
C ₉ -C ₁₀ Aromatics**	< 100 (µg/L)
Surrogate % Recovery - PID	100
Surrogate % Recovery - FID	92

* = Option 1 = Established fill line on vial, Option 2 = Sampling Device/Brand, or Option 3 = Field weight of soil.

** = Excludes any surrogates or internal standards.

Lab Info: G132-732-97092

Reviewed By: 

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: LAW ENGINEERING

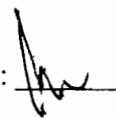
Project Name: H19

Sample Information and Analytical Results	
Sample Identification	USTH19-GW03-00D
Sample Matrix	Water
Collection Option (for Soil)*	
Date Collected	10/11/00
Date Received	10/12/00
Date Extracted	10/14/00
Date Analyzed	10/14/00
Dry Weight	
Dilution Factor	1
C ₅ -C ₈ Aliphatics**	< 100 (µg/L)
C ₉ -C ₁₂ Aliphatics**	< 100 (µg/L)
C ₉ -C ₁₀ Aromatics**	< 100 (µg/L)
Surrogate % Recovery - PID	100
Surrogate % Recovery - FID	95

* = Option 1 = Established fill line on vial, Option 2 = Sampling Device/Brand, or Option 3 = Field weight of soil.

** = Excludes any surrogates or internal standards.

Lab Info: G132-732-97093

Reviewed By: 

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

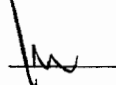
Client Name: LAW ENGINEERINGProject Name: H19

Sample Information and Analytical Results	
Sample Identification	USTH19-GW05-00D
Sample Matrix	Water
Collection Option (for Soil)*	
Date Collected	10/11/00
Date Received	10/12/00
Date Extracted	10/13/00
Date Analyzed	10/13/00
Dry Weight	
Dilution Factor	1
C ₅ -C ₈ Aliphatics**	< 100 (µg/L)
C ₉ -C ₁₂ Aliphatics**	< 100 (µg/L)
C ₉ -C ₁₀ Aromatics**	< 100 (µg/L)
Surrogate % Recovery - PID	100
Surrogate % Recovery - FID	94

* = Option 1 = Established fill line on vial, Option 2 = Sampling Device/Brand, or Option 3 = Field weight of soil.

** = Excludes any surrogates or internal standards.

Lab Info: G132-732-97094

Reviewed By: 

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: LAW ENGINEERING

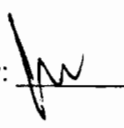
Project Name: H19

Sample Information and Analytical Results	
Sample Identification	USTH19-GW07-00D
Sample Matrix	Water
Collection Option (for Soil)*	
Date Collected	10/11/00
Date Received	10/12/00
Date Extracted	10/13/00
Date Analyzed	10/13/00
Dry Weight	
Dilution Factor	1
C ₅ -C ₈ Aliphatics**	< 100 (µg/L)
C ₉ -C ₁₂ Aliphatics**	< 100 (µg/L)
C ₉ -C ₁₀ Aromatics**	< 100 (µg/L)
Surrogate % Recovery - PID	97
Surrogate % Recovery - FID	89

* = Option 1 = Established fill line on vial, Option 2 = Sampling Device/Brand, or Option 3 = Field weight of soil.

** = Excludes any surrogates or internal standards.

Lab Info: G132-732-97095

Reviewed By: 

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

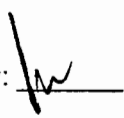
Client Name: LAW ENGINEERINGProject Name: H19

Sample Information and Analytical Results	
Sample Identification	USTH19-GW99-00D
Sample Matrix	Water
Collection Option (for Soil)*	
Date Collected	10/12/00
Date Received	10/12/00
Date Extracted	10/14/00
Date Analyzed	10/14/00
Dry Weight	
Dilution Factor	1
C ₅ -C ₈ Aliphatics**	< 100 (µg/L)
C ₉ -C ₁₂ Aliphatics**	< 100 (µg/L)
C ₉ -C ₁₀ Aromatics**	< 100 (µg/L)
Surrogate % Recovery - PID	100
Surrogate % Recovery - FID	92

* = Option 1 = Established fill line on vial, Option 2 = Sampling Device/Brand, or Option 3 = Field weight of soil.

** = Excludes any surrogates or internal standards.

Lab Info: G132-732-97096

Reviewed By: 

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

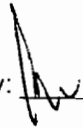
Client Name: LAW ENGINEERINGProject Name: H19

Sample Information and Analytical Results	
Sample Identification	Trip Blank
Sample Matrix	Water
Collection Option (for Soil)*	
Date Collected	10/11/00
Date Received	10/12/00
Date Extracted	10/13/00
Date Analyzed	10/13/00
Dry Weight	
Dilution Factor	1
C ₅ -C ₈ Aliphatics**	< 100 (µg/L)
C ₉ -C ₁₂ Aliphatics**	< 100 (µg/L)
C ₉ -C ₁₀ Aromatics**	< 100 (µg/L)
Surrogate % Recovery - PID	110
Surrogate % Recovery - FID	95

* = Option 1 = Established fill line on vial, Option 2 = Sampling Device/Brand, or Option 3 = Field weight of soil.

** = Excludes any surrogates or internal standards.

Lab Info: G132-732-97097

Reviewed By: 

VPH Laboratory Reporting Form

Calibration and QA/QC Information

FID Initial Calibration Date: 10/12/00PID Initial Calibration Date: 10/12/00

Calibration Ranges and Limits

Range	MDL		ML		RL	
	($\mu\text{g/L}$)	(mg/Kg)	($\mu\text{g/L}$)	(mg/Kg)	($\mu\text{g/L}$)	(mg/Kg)
C ₅ -C ₈ Aliphatics	2.4	0.12	7.5	0.38	100	10
C ₉ -C ₁₂ Aliphatics	1.3	0.065	4.0	0.21	100	10
C ₉ -C ₁₀ Aromatics	0.5	0.025	1.6	0.08	100	10

Calibration Concentration Levels

Range	Levels		%RSD or CCC	Method of Quantitation
	($\mu\text{g/L}$)	(mg/Kg)		
C ₅ -C ₈ Aliphatics	40	2	1.7	Calibration Factor
	160	8		
	400	20		
	1600	80		
	4000	200		
C ₉ -C ₁₂ Aliphatics	30	1.5	10.9	Calibration Factor
	120	6		
	300	15		
	1200	60		
	3000	150		
C ₉ -C ₁₀ Aromatics	65	3.25	21.2	Calibration Factor
	260	13		
	650	32.5		
	2600	130		
	6500	325		

Calibration Check Date: 10/13/00

Calibration Check

Range	Levels		RPD
	($\mu\text{g/L}$)	(mg/Kg)	
C ₅ -C ₈ Aliphatics	400	20	13.0
C ₉ -C ₁₂ Aliphatics	300	15	12.4
C ₉ -C ₁₀ Aromatics	650	32.5	-6.0

MDL = Method Detection Limit

ML = Minimum Limit

RL = Reportable Limit

RPD = Relative Percent Difference

%RSD = Percent Relative Standard Deviation

CCC = Correlation Coefficient of Curve

Reviewed By: AW

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatiles by GCMS 625

Client Sample ID: USTH19-GW01-00D
 Client Project ID: H19
 Lab Sample ID: 97091
 Lab Project ID: G132-732
 Matrix: Water

Date Collected: 10/11/00
 Date Received: 10/12/00
 Date Analyzed: 10/28/00
 Analyzed By: MRC
 Dilution: 1

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Acenaphthene	10	BQL
Acenaphthylene	10	BQL
Anthracene	10	BQL
Benzo[a]anthracene	10	BQL
Benzo[a]pyrene	10	BQL
Benzo[b]fluoranthene	10	BQL
Benzo[g,h,i]perylene	10	BQL
Benzo[k]fluoranthene	10	BQL
Bis(2-chloroethoxy)methane	10	BQL
Bis(2-chloroethyl)ether	10	BQL
Bis(2-chloroisopropyl)ether	10	BQL
Bis(2-ethylhexyl)phthalate	10	BQL
4-bromophenyl phenyl ether	10	BQL
Butylbenzylphthalate	10	BQL
4-Chloro-3-methylphenol	10	BQL
2-Chloronaphthalene	10	BQL
2-Chlorophenol	10	BQL
4-Chlorophenyl phenyl ether	10	BQL
Chrysene	10	BQL
Di-n-Butylphthalate	10	BQL
Di-n-octylphthalate	10	BQL
Dibenzo[a,h]anthracene	10	BQL
1,2-Dichlorobenzene	10	BQL
1,3-Dichlorobenzene	10	BQL
1,4-Dichlorobenzene	10	BQL
3,3'-Dichlorobenzidine	20	BQL
2,4-Dichlorophenol	10	BQL
Diethylphthalate	10	BQL
2,4-Dimethylphenol	10	BQL
Dimethylphthalate	10	BQL
4,6-Dinitro-2-methylphenol	50	BQL
2,4-Dinitrophenol	50	BQL
2,4-Dinitrotoluene	10	BQL
2,6-Dinitrotoluene	10	BQL
Fluoranthene	10	BQL
Fluorene	10	BQL
Hexachlorobenzene	10	BQL
Hexachlorobutadiene	10	BQL
Hexachlorocyclopentadiene	20	BQL
Hexachloroethane	10	BQL

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatiles by GCMS 625

Client Sample ID: USTH19-GW01-00D
 Client Project ID: H19
 Lab Sample ID: 97091
 Lab Project ID: G132-732
 Matrix: Water

Date Collected: 10/11/00
 Date Received: 10/12/00
 Date Analyzed: 10/28/00
 Analyzed By: MRC
 Dilution: 1

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Indeno(1,2,3-c,d)pyrene	10	BQL
Isophorone	10	BQL
N-Nitrosodi-n-propylamine	10	BQL
N-Nitrosodiphenylamine	10	BQL
Naphthalene	10	BQL
Nitrobenzene	10	BQL
2-Nitrophenol	10	BQL
4-Nitrophenol	50	BQL
Pentachlorophenol	50	BQL
Phenanthrene	10	BQL
Phenol	10	BQL
Pyrene	10	BQL
1,2,4-Trichlorobenzene	10	BQL
2,4,6-Trichlorophenol	10	BQL

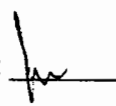
Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	7.7	77
2-Fluorophenol	10	7.3	73
Nitrobenzene-d5	10	7.6	76
Phenol-d6	10	7.2	72
2,4,6-Tribromophenol	10	7.9	79
4-Terphenyl-d14	10	10	101

Comments:

Results are corrected for %solids and dilution where applicable.

Flags:

BQL = Below Quantitation Limit.

Reviewed By: 

Results of Library Search for Semivolatile Compounds
by GCMS

Client Sample ID: USTH19-GW01-00D
Client Project ID: H19
Lab Sample ID: 97091
Lab Project ID: G132-732
Matrix: Water

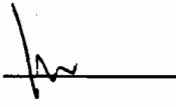
Date Collected: 10/11/00
Date Received: 10/12/00
Date Analyzed: 10/28/00
Analyzed By: MRC
Dilution: 1

Num.	Compound	CAS#	Match Probability	Result (ug/L)
1	No library search compounds detected.			
2				
3				
4				
5				
6				
7				
8				
9				
10				

Comment:

Tentatively Identified Compound (TIC) refers to substances which are not present in the list of target compounds. Therefore, not all TICs are identified and quantitated using individual standards. TIC listings are prepared utilizing a computerized library search of electron impact mass spectral data and evaluation of the relevant data by a mass spectral data specialist.

Quantitation is accomplished by relative peak height of the compound compared to that of the nearest internal standard from the total ion chromatogram. TICs are identified and quantitated only if the peak height is equal to or greater than 10% of that of the nearest internal standard. Quantitation provided is an estimate.

Reviewed by: 

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatiles by GCMS 625

Client Sample ID: USTH19-GW02-00D
 Client Project ID: H19
 Lab Sample ID: 97092
 Lab Project ID: G132-732
 Matrix: Water

Date Collected: 10/11/00
 Date Received: 10/12/00
 Date Analyzed: 10/23/00
 Analyzed By: MRC
 Dilution: 1

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Acenaphthene	10	BQL
Acenaphthylene	10	BQL
Anthracene	10	BQL
Benzo[a]anthracene	10	BQL
Benzo[a]pyrene	10	BQL
Benzo[b]fluoranthene	10	BQL
Benzo[g,h,i]perylene	10	BQL
Benzo[k]fluoranthene	10	BQL
Bis(2-chloroethoxy)methane	10	BQL
Bis(2-chloroethyl)ether	10	BQL
Bis(2-chloroisopropyl)ether	10	BQL
Bis(2-ethylhexyl)phthalate	10	BQL
4-bromophenyl phenyl ether	10	BQL
Butylbenzylphthalate	10	BQL
4-Chloro-3-methylphenol	10	BQL
2-Chloronaphthalene	10	BQL
2-Chlorophenol	10	BQL
4-Chlorophenyl phenyl ether	10	BQL
Chrysene	10	BQL
Di-n-Butylphthalate	10	BQL
Di-n-octylphthalate	10	BQL
Dibenzo[a,h]anthracene	10	BQL
1,2-Dichlorobenzene	10	BQL
1,3-Dichlorobenzene	10	BQL
1,4-Dichlorobenzene	10	BQL
3,3'-Dichlorobenzidine	20	BQL
2,4-Dichlorophenol	10	BQL
Diethylphthalate	10	BQL
2,4-Dimethylphenol	10	BQL
Dimethylphthalate	10	BQL
4,6-Dinitro-2-methylphenol	50	BQL
2,4-Dinitrophenol	50	BQL
2,4-Dinitrotoluene	10	BQL
2,6-Dinitrotoluene	10	BQL
Fluoranthene	10	BQL
Fluorene	10	BQL
Hexachlorobenzene	10	BQL
Hexachlorobutadiene	10	BQL
Hexachlorocyclopentadiene	20	BQL
Hexachloroethane	10	BQL

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatiles by GCMS 625

Client Sample ID: USTH19-GW02-00D
Client Project ID: H19
Lab Sample ID: 97092
Lab Project ID: G132-732
Matrix: Water

Date Collected: 10/11/00
Date Received: 10/12/00
Date Analyzed: 10/23/00
Analyzed By: MRC
Dilution: 1

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Indeno(1,2,3-c,d)pyrene	10	BQL
Isophorone	10	BQL
N-Nitrosodi-n-propylamine	10	BQL
N-Nitrosodiphenylamine	10	BQL
Naphthalene	10	BQL
Nitrobenzene	10	BQL
2-Nitrophenol	10	BQL
4-Nitrophenol	50	BQL
Pentachlorophenol	50	BQL
Phenanthrene	10	BQL
Phenol	10	BQL
Pyrene	10	BQL
1,2,4-Trichlorobenzene	10	BQL
2,4,6-Trichlorophenol	10	BQL

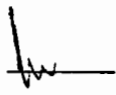
Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	8.2	82
2-Fluorophenol	10	6.7	67
Nitrobenzene-d5	10	7.7	77
Phenol-d6	10	7.4	74
2,4,6-Tribromophenol	10	7.3	73
4-Terphenyl-d14	10	5.7	57

Comments:

Results are corrected for %solids and dilution where applicable.

Flags:

BQL = Below Quantitation Limit.

Reviewed By: 

Results of Library Search for Semivolatile Compounds
by GCMS

Client Sample ID: USTH19-GW02-00D

Client Project ID: H19

Lab Sample ID: 97092

Lab Project ID: G132-732

Matrix: Water

Date Collected: 10/11/00

Date Received: 10/12/00

Date Analyzed: 10/23/00

Analyzed By: MRC

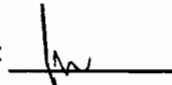
Dilution: 1

Num.	Compound	CAS#	Match Probability	Result (ug/L)
1	No library search compounds detected.			
2				
3				
4				
5				
6				
7				
8				
9				
10				

Comment:

Tentatively Identified Compound (TIC) refers to substances which are not present in the list of target compounds. Therefore, not all TICs are identified and quantitated using individual standards. TIC listings are prepared utilizing a computerized library search of electron impact mass spectral data and evaluation of the relevant data by a mass spectral data specialist.

Quantitation is accomplished by relative peak height of the compound compared to that of the nearest internal standard from the total ion chromatogram. TICs are identified and quantitated only if the peak height is equal to or greater than 10% of that of the nearest internal standard. Quantitation provided is an estimate.

Reviewed by: 

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatiles
by GCMS 625

Client Sample ID: USTH19-GW03-00D

Client Project ID: H19

Lab Sample ID: 97093

Lab Project ID: G132-732

Matrix: Water

Date Collected: 10/11/00

Date Received: 10/12/00

Date Analyzed: 10/24/00

Analyzed By: MRC

Dilution: 1

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Acenaphthene	10	BQL
Acenaphthylene	10	BQL
Anthracene	10	BQL
Benzo[a]anthracene	10	BQL
Benzo[a]pyrene	10	BQL
Benzo[b]fluoranthene	10	BQL
Benzo[g,h,i]perylene	10	BQL
Benzo[k]fluoranthene	10	BQL
Bis(2-chloroethoxy)methane	10	BQL
Bis(2-chloroethyl)ether	10	BQL
Bis(2-chloroisopropyl)ether	10	BQL
Bis(2-ethylhexyl)phthalate	10	BQL
4-bromophenyl phenyl ether	10	BQL
Butylbenzylphthalate	10	BQL
4-Chloro-3-methylphenol	10	BQL
2-Chloronaphthalene	10	BQL
2-Chlorophenol	10	BQL
4-Chlorophenyl phenyl ether	10	BQL
Chrysene	10	BQL
Di-n-Butylphthalate	10	BQL
Di-n-octylphthalate	10	BQL
Dibenzo[a,h]anthracene	10	BQL
1,2-Dichlorobenzene	10	BQL
1,3-Dichlorobenzene	10	BQL
1,4-Dichlorobenzene	10	BQL
3,3'-Dichlorobenzidine	20	BQL
2,4-Dichlorophenol	10	BQL
Diethylphthalate	10	BQL
2,4-Dimethylphenol	10	BQL
Dimethylphthalate	10	BQL
4,6-Dinitro-2-methylphenol	50	BQL
2,4-Dinitrophenol	50	BQL
2,4-Dinitrotoluene	10	BQL
2,6-Dinitrotoluene	10	BQL
Fluoranthene	10	BQL
Fluorene	10	BQL
Hexachlorobenzene	10	BQL
Hexachlorobutadiene	10	BQL
Hexachlorocyclopentadiene	20	BQL
Hexachloroethane	10	BQL

Results for Semivolatiles
by GCMS 625

Client Sample ID: USTH19-GW03-00D
Client Project ID: H19
Lab Sample ID: 97093
Lab Project ID: G132-732
Matrix: Water

Date Collected: 10/11/00
Date Received: 10/12/00
Date Analyzed: 10/24/00
Analyzed By: MRC
Dilution: 1

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Indeno(1,2,3-c,d)pyrene	10	BQL
Isophorone	10	BQL
N-Nitrosodi-n-propylamine	10	BQL
N-Nitrosodiphenylamine	10	BQL
Naphthalene	10	BQL
Nitrobenzene	10	BQL
2-Nitrophenol	10	BQL
4-Nitrophenol	50	BQL
Pentachlorophenol	50	BQL
Phenanthrene	10	BQL
Phenol	10	BQL
Pyrene	10	BQL
1,2,4-Trichlorobenzene	10	BQL
2,4,6-Trichlorophenol	10	BQL

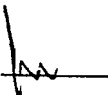
Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	8.4	84
2-Fluorophenol	10	6.8	68
Nitrobenzene-d5	10	7.8	78
Phenol-d6	10	7.7	77
2,4,6-Tribromophenol	10	8.2	82
4-Terphenyl-d14	10	7.2	72

Comments:

Results are corrected for %solids and dilution where applicable.

Flags:

BQL = Below Quantitation Limit.

Reviewed By: 

PARADIGM ANALYTICAL LABORATORIES, INC.

Results of Library Search for Semivolatile Compounds
by GCMS

Client Sample ID: USTH19-GW03-00D

Client Project ID: H19

Lab Sample ID: 97093

Lab Project ID: G132-732

Matrix: Water

Date Collected: 10/11/00

Date Received: 10/12/00

Date Analyzed: 10/24/00

Analyzed By: MRC

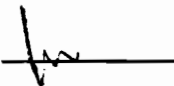
Dilution: 1

Num.	Compound	CAS#	Match Probability	Result (ug/L)
1	Sulfur, mol. (S8)	010544-50-0	87	28
2	Unknown			13
3	Unknown			5.1
4				
5				
6				
7				
8				
9				
10				

Comment:

Tentatively Identified Compound (TIC) refers to substances which are not present in the list of target compounds. Therefore, not all TICs are identified and quantitated using individual standards. TIC listings are prepared utilizing a computerized library search of electron impact mass spectral data and evaluation of the relevant data by a mass spectral data specialist.

Quantitation is accomplished by relative peak height of the compound compared to that of the nearest internal standard from the total ion chromatogram. TICs are identified and quantitated only if the peak height is equal to or greater than 10% of that of the nearest internal standard. Quantitation provided is an estimate.

Reviewed by: 

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatiles by GCMS 625

Client Sample ID: USTH19-GW05-00D
 Client Project ID: H19
 Lab Sample ID: 97094
 Lab Project ID: G132-732
 Matrix: Water

Date Collected: 10/11/00
 Date Received: 10/12/00
 Date Analyzed: 10/24/00
 Analyzed By: MRC
 Dilution: 1

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Acenaphthene	10	BQL
Acenaphthylene	10	BQL
Anthracene	10	BQL
Benzo[a]anthracene	10	BQL
Benzo[a]pyrene	10	BQL
Benzo[b]fluoranthene	10	BQL
Benzo[g,h,i]perylene	10	BQL
Benzo[k]fluoranthene	10	BQL
Bis(2-chloroethoxy)methane	10	BQL
Bis(2-chloroethyl)ether	10	BQL
Bis(2-chloroisopropyl)ether	10	BQL
Bis(2-ethylhexyl)phthalate	10	BQL
4-bromophenyl phenyl ether	10	BQL
Butylbenzylphthalate	10	BQL
4-Chloro-3-methylphenol	10	BQL
2-Chloronaphthalene	10	BQL
2-Chlorophenol	10	BQL
4-Chlorophenyl phenyl ether	10	BQL
Chrysene	10	BQL
Di-n-Butylphthalate	10	BQL
Di-n-octylphthalate	10	BQL
Dibenzo[a,h]anthracene	10	BQL
1,2-Dichlorobenzene	10	BQL
1,3-Dichlorobenzene	10	BQL
1,4-Dichlorobenzene	10	BQL
3,3'-Dichlorobenzidine	20	BQL
2,4-Dichlorophenol	10	BQL
Diethylphthalate	10	BQL
2,4-Dimethylphenol	10	BQL
Dimethylphthalate	10	BQL
4,6-Dinitro-2-methylphenol	50	BQL
2,4-Dinitrophenol	50	BQL
2,4-Dinitrotoluene	10	BQL
2,6-Dinitrotoluene	10	BQL
Fluoranthene	10	BQL
Fluorene	10	BQL
Hexachlorobenzene	10	BQL
Hexachlorobutadiene	10	BQL
Hexachlorocyclopentadiene	20	BQL
Hexachloroethane	10	BQL

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatiles by GCMS 625

Client Sample ID: USTH19-GW05-00D
 Client Project ID: H19
 Lab Sample ID: 97094
 Lab Project ID: G132-732
 Matrix: Water

Date Collected: 10/11/00
 Date Received: 10/12/00
 Date Analyzed: 10/24/00
 Analyzed By: MRC
 Dilution: 1

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Indeno(1,2,3-c,d)pyrene	10	BQL
Isophorone	10	BQL
N-Nitrosodi-n-propylamine	10	BQL
N-Nitrosodiphenylamine	10	BQL
Naphthalene	10	BQL
Nitrobenzene	10	BQL
2-Nitrophenol	10	BQL
4-Nitrophenol	50	BQL
Pentachlorophenol	50	BQL
Phenanthrene	10	BQL
Phenol	10	BQL
Pyrene	10	BQL
1,2,4-Trichlorobenzene	10	BQL
2,4,6-Trichlorophenol	10	BQL

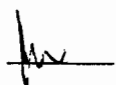
Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	7.5	75
2-Fluorophenol	10	6.6	66
Nitrobenzene-d5	10	7.3	73
Phenol-d6	10	7.1	71
2,4,6-Tribromophenol	10	7	70
4-Terphenyl-d14	10	8.6	86

Comments:

Results are corrected for %solids and dilution where applicable.

Flags:

BQL = Below Quantitation Limit.

Reviewed By: 

Results of Library Search for Semivolatile Compounds
by GCMS

Client Sample ID: USTH19-GW05-00D

Client Project ID: H19

Lab Sample ID: 97094

Lab Project ID: G132-732

Matrix: Water

Date Collected: 10/11/00

Date Received: 10/12/00

Date Analyzed: 10/24/00

Analyzed By: MRC

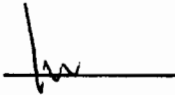
Dilution: 1

Num.	Compound	CAS#	Match Probability	Result (ug/L)
1	No library search compounds detected.			
2				
3				
4				
5				
6				
7				
8				
9				
10				

Comment:

Tentatively Identified Compound (TIC) refers to substances which are not present in the list of target compounds. Therefore, not all TICs are identified and quantitated using individual standards. TIC listings are prepared utilizing a computerized library search of electron impact mass spectral data and evaluation of the relevant data by a mass spectral data specialist.

Quantitation is accomplished by relative peak height of the compound compared to that of the nearest internal standard from the total ion chromatogram. TICs are identified and quantitated only if the peak height is equal to or greater than 10% of that of the nearest internal standard. Quantitation provided is an estimate.

Reviewed by: 

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatiles by GCMS 625

Client Sample ID: USTH19-GW07-00D
 Client Project ID: H19
 Lab Sample ID: 97095
 Lab Project ID: G132-732
 Matrix: Water

Date Collected: 10/11/00
 Date Received: 10/12/00
 Date Analyzed: 10/24/00
 Analyzed By: MRC
 Dilution: 1

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Acenaphthene	10	BQL
Acenaphthylene	10	BQL
Anthracene	10	BQL
Benzo[a]anthracene	10	BQL
Benzo[a]pyrene	10	BQL
Benzo[b]fluoranthene	10	BQL
Benzo[g,h,i]perylene	10	BQL
Benzo[k]fluoranthene	10	BQL
Bis(2-chloroethoxy)methane	10	BQL
Bis(2-chloroethyl)ether	10	BQL
Bis(2-chloroisopropyl)ether	10	BQL
Bis(2-ethylhexyl)phthalate	10	BQL
4-bromophenyl phenyl ether	10	BQL
Butylbenzylphthalate	10	BQL
4-Chloro-3-methylphenol	10	BQL
2-Chloronaphthalene	10	BQL
2-Chlorophenol	10	BQL
4-Chlorophenyl phenyl ether	10	BQL
Chrysene	10	BQL
Di-n-Butylphthalate	10	BQL
Di-n-octylphthalate	10	BQL
Dibenzo[a,h]anthracene	10	BQL
1,2-Dichlorobenzene	10	BQL
1,3-Dichlorobenzene	10	BQL
1,4-Dichlorobenzene	10	BQL
3,3'-Dichlorobenzidine	20	BQL
2,4-Dichlorophenol	10	BQL
Diethylphthalate	10	BQL
2,4-Dimethylphenol	10	BQL
Dimethylphthalate	10	BQL
4,6-Dinitro-2-methylphenol	50	BQL
2,4-Dinitrophenol	50	BQL
2,4-Dinitrotoluene	10	BQL
2,6-Dinitrotoluene	10	BQL
Fluoranthene	10	BQL
Fluorene	10	BQL
Hexachlorobenzene	10	BQL
Hexachlorobutadiene	10	BQL
Hexachlorocyclopentadiene	20	BQL
Hexachloroethane	10	BQL

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatiles by GCMS 625

Client Sample ID: USTH19-GW07-00D

Client Project ID: H19

Lab Sample ID: 97095

Lab Project ID: G132-732

Matrix: Water

Date Collected: 10/11/00

Date Received: 10/12/00

Date Analyzed: 10/24/00

Analyzed By: MRC

Dilution: 1

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Indeno(1,2,3-c,d)pyrene	10	BQL
Isophorone	10	BQL
N-Nitrosodi-n-propylamine	10	BQL
N-Nitrosodiphenylamine	10	BQL
Naphthalene	10	BQL
Nitrobenzene	10	BQL
2-Nitrophenol	10	BQL
4-Nitrophenol	50	BQL
Pentachlorophenol	50	BQL
Phenanthrene	10	BQL
Phenol	10	BQL
Pyrene	10	BQL
1,2,4-Trichlorobenzene	10	BQL
2,4,6-Trichlorophenol	10	BQL

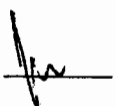
Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	7.2	72
2-Fluorophenol	10	6.2	62
Nitrobenzene-d5	10	7.1	71
Phenol-d6	10	6.9	69
2,4,6-Tribromophenol	10	7.6	76
4-Terphenyl-d14	10	10.2	102

Comments:

Results are corrected for %solids and dilution where applicable.

Flags:

BQL = Below Quantitation Limit.

Reviewed By: 

Results of Library Search for Semivolatile Compounds
by GCMS

Client Sample ID: USTH19-GW07-00D
Client Project ID: H19
Lab Sample ID: 97095
Lab Project ID: G132-732
Matrix: Water

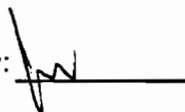
Date Collected: 10/11/00
Date Received: 10/12/00
Date Analyzed: 10/24/00
Analyzed By: MRC
Dilution: 1

Num.	Compound	CAS#	Match Probability	Result (ug/L)
1	No library search compounds detected.			
2				
3				
4				
5				
6				
7				
8				
9				
10				

Comment:

Tentatively Identified Compound (TIC) refers to substances which are not present in the list of target compounds. Therefore, not all TICs are identified and quantitated using individual standards. TIC listings are prepared utilizing a computerized library search of electron impact mass spectral data and evaluation of the relevant data by a mass spectral data specialist.

Quantitation is accomplished by relative peak height of the compound compared to that of the nearest internal standard from the total ion chromatogram. TICs are identified and quantitated only if the peak height is equal to or greater than 10% of that of the nearest internal standard. Quantitation provided is an estimate.

Reviewed by: 

EPH (Aliphatics/Aromatics) Results

by MDEP-EPH

Client Name: LAW ENGINEERING

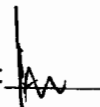
Project Name: H19

Sample Information and Analytical Results	
Sample Identification	USTH19-GW01-00D
Sample Matrix	Water
Date Collected	10/11/00
Date Received	10/12/00
Date Extracted	10/18/00
Date Analyzed	10/18/00
Dry Weight	
Dilution Factor	1
C ₉ -C ₁₈ Aliphatics*	< 100 (µg/L)
C ₁₉ -C ₃₆ Aliphatics*	< 100 (µg/L)
C ₁₁ -C ₂₂ Aromatics*	< 100 (µg/L)
Aliphatic Surrogate % Recovery	69
Aromatic Surrogate % Recovery	81

Comments:

* = Excludes any surrogates or internal standards.
Sample did not require fractionation.

Lab info: G132-732-97091

Reviewed By: 

EPH (Aliphatics/Aromatics) Results

by MDEP-EPH

Client Name: LAW ENGINEERING

Project Name: H19

Sample Information and Analytical Results	
Sample Identification	USTH19-GW02-00D
Sample Matrix	Water
Date Collected	10/11/00
Date Received	10/12/00
Date Extracted	10/18/00
Date Analyzed	10/27/00
Dry Weight	
Dilution Factor	1
C ₉ -C ₁₈ Aliphatics*	< 100 (µg/L)
C ₁₉ -C ₃₆ Aliphatics*	< 100 (µg/L)
C ₁₁ -C ₂₂ Aromatics*	< 100 (µg/L)
Aliphatic Surrogate % Recovery	20
Aromatic Surrogate % Recovery	59

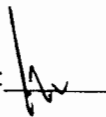
Comments:

* = Excludes any surrogates or internal standards.

Sample did not require fractionation.

Low surrogate confirmed by duplicate analysis.

Lab info: G132-732-97092

Reviewed By: 

EPH (Aliphatics/Aromatics) Results

by MDEP-EPH

Client Name: LAW ENGINEERING

Project Name: H19

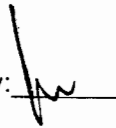
Sample Information and Analytical Results	
Sample Identification	USTH19-GW03-00D
Sample Matrix	Water
Date Collected	10/11/00
Date Received	10/12/00
Date Extracted	10/18/00
Date Analyzed	10/18/00
Dry Weight	
Dilution Factor	1
C ₉ -C ₁₈ Aliphatics*	< 100 (µg/L)
C ₁₉ -C ₃₆ Aliphatics*	< 100 (µg/L)
C ₁₁ -C ₂₂ Aromatics*	< 100 (µg/L)
Aliphatic Surrogate % Recovery	47
Aromatic Surrogate % Recovery	72

Comments:

* = Excludes any surrogates or internal standards.

Sample did not require fractionation.

Lab info: G132-732-97093

Reviewed By: 

EPH (Aliphatics/Aromatics) Results

by MDEP-EPH

Client Name: LAW ENGINEERING

Project Name: H19

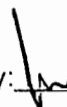
Sample Information and Analytical Results	
Sample Identification	USTH19-GW05-00D
Sample Matrix	Water
Date Collected	10/11/00
Date Received	10/12/00
Date Extracted	10/18/00
Date Analyzed	10/27/00
Dry Weight	
Dilution Factor	1
C ₉ -C ₁₈ Aliphatics*	< 100 (µg/L)
C ₁₉ -C ₃₆ Aliphatics*	< 100 (µg/L)
C ₁₁ -C ₂₂ Aromatics*	< 100 (µg/L)
Aliphatic Surrogate % Recovery	41
Aromatic Surrogate % Recovery	83

Comments:

* = Excludes any surrogates or internal standards.

Sample did not require fractionation.

Lab info: G132-732-97094

Reviewed By: 

EPH (Aliphatics/Aromatics) Results

by MDEP-EPH

Client Name: LAW ENGINEERING

Project Name: H19

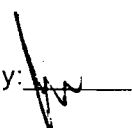
Sample Information and Analytical Results	
Sample Identification	USTH19-GW07-00D
Sample Matrix	Water
Date Collected	10/11/00
Date Received	10/12/00
Date Extracted	10/18/00
Date Analyzed	10/27/00
Dry Weight	
Dilution Factor	1
C ₉ -C ₁₈ Aliphatics*	< 100 (µg/L)
C ₁₉ -C ₃₆ Aliphatics*	< 100 (µg/L)
C ₁₁ -C ₂₂ Aromatics*	< 100 (µg/L)
Aliphatic Surrogate % Recovery	41
Aromatic Surrogate % Recovery	80

Comments:

* = Excludes any surrogates or internal standards.

Sample did not require fractionation.

Lab info: G132-732-97095

Reviewed By: 

PARADIGM ANALYTICAL LABORATORIES, INC.

Attachment 3

EPH Laboratory Reporting Form

Calibration and QA/QC Information

Initial Calibration Date: 10/16/00

Calibration Ranges and Limits

Range	MDL (mg/Kg)	(µg/L)	ML (mg/Kg)	(µg/L)	RL (mg/Kg)	(µg/L)
C ₉ -C ₁₈ Aliphatics	0.1	2	0.3	6.5	100	10
C ₁₉ -C ₃₆ Aliphatics	0.1	1	0.3	3.1	100	10
C ₁₁ -C ₂₂ Aromatics	0.2	2.5	0.6	8	100	10

Calibration Concentration Levels

Range	Levels (µg/L) (mg/Kg)	%RSD or CCC	Method of Quantitation
C ₉ -C ₁₈ Aliphatics	0.06 1	3.60	Calibration Factor
	0.15 2.5		
	0.3 5		
	0.6 10		
	1.2 20		
C ₁₉ -C ₃₆ Aliphatics	0.08 1.33	2.3	Calibration Factor
	0.2 3.33		
	0.4 6.67		
	0.8 13.3		
	1.6 26.7		
C ₁₁ -C ₂₂ Aromatics	0.12 2	3.7	Calibration Factor
	0.3 5		
	0.6 10		
	1.2 20		
	2.4 40		

Calibration Check Date: 10/18/00

Calibration Check

Range	Levels (µg/mL) (mg/Kg)	RPD
C ₉ -C ₁₈ Aliphatics	0.6 10	0.5
C ₁₉ -C ₃₆ Aliphatics	0.8 13.3	-0.9
C ₁₁ -C ₂₂ Aromatics	1.2 20	-1.0

MDL = Method Detection Limit

ML = Minimum Limit

RL = Reportable Limit

RPD = Relative Percent Difference

%RSD = Percent Relative Standard Deviation

CCC = Correlation Coefficient of Curve

PARADIGM ANALYTICAL LABORATORIES, INC.

Attachment 3

EPH Laboratory Reporting Form

Calibration and QA/QC Information

Initial Calibration Date: 10/16/00

Calibration Ranges and Limits

Range	MDL (mg/Kg)	(µg/L)	ML (mg/Kg)	(µg/L)	RL (mg/Kg)	(µg/L)
C ₉ -C ₁₈ Aliphatics	0.1	2	0.3	6.5	100	10
C ₁₉ -C ₃₆ Aliphatics	0.1	1	0.3	3.1	100	10
C ₁₁ -C ₂₂ Aromatics	0.2	2.5	0.6	8	100	10

Calibration Concentration Levels

Range	Levels (µg/L)	(mg/Kg)	%RSD or CCC	Method of Quantitation
C ₉ -C ₁₈ Aliphatics	0.06	1	3.60	Calibration Factor
	0.15	2.5		
	0.3	5		
	0.6	10		
	1.2	20		
C ₁₉ -C ₃₆ Aliphatics	0.08	1.33	2.3	Calibration Factor
	0.2	3.33		
	0.4	6.67		
	0.8	13.3		
	1.6	26.7		
C ₁₁ -C ₂₂ Aromatics	0.12	2	3.7	Calibration Factor
	0.3	5		
	0.6	10		
	1.2	20		
	2.4	40		

Calibration Check Date: 10/27/00

Calibration Check

Range	Levels (µg/mL)	(mg/Kg)	RPD
C ₉ -C ₁₈ Aliphatics	0.6	10	-1.4
C ₁₉ -C ₃₆ Aliphatics	0.8	13.3	-5.2
C ₁₁ -C ₂₂ Aromatics	1.2	20	-3.5

MDL = Method Detection Limit

ML = Minimum Limit

RL = Reportable Limit

RPD = Relative Percent Difference

%RSD = Percent Relative Standard Deviation

CCC = Correlation Coefficient of Curve

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Inorganics

Client Sample ID: USTH19-GW01-00D
Client Project ID: H19
Lab Sample ID: 97091
Lab Project ID: G132-732

Analyzed By: JMF
Date Collected: 10/11/00
Date Received: 10/12/00
Matrix: Water

Metals	Result	Quantitation Limit	Units	Procedure	Date Analyzed
Chromium	BQL	0.0100	MG/L	6010B	10/24/00
Lead	BQL	0.0100	MG/L	6010B	10/24/00

Comments

BQL = Below Quantitation Limits

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Inorganics

Client Sample ID: USTH19-GW02-00D
Client Project ID: H19
Lab Sample ID: 97092
Lab Project ID: G132-732

Analyzed By: JMF
Date Collected: 10/11/00
Date Received: 10/12/00
Matrix: Water

Metals	Result	Quantitation Limit	Units	Procedure	Date Analyzed
Chromium	BQL	0.0100	MG/L	6010B	10/24/00
Lead	BQL	0.0100	MG/L	6010B	10/24/00

Comments

BQL = Below Quantitation Limits

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Inorganics

Client Sample ID: USTH19-GW03-00D
Client Project ID: H19
Lab Sample ID: 97093
Lab Project ID: G132-732

Analyzed By: JMF
Date Collected: 10/11/00
Date Received: 10/12/00
Matrix: Water

Metals	Result	Quantitation Limit	Units	Procedure	Date Analyzed
Chromium	BQL	0.0100	MG/L	6010B	10/24/00
Lead	BQL	0.0100	MG/L	6010B	10/24/00

Comments

BQL = Below Quantitation Limits

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Inorganics

Client Sample ID: USTH19-GW05-00D
Client Project ID: H19
Lab Sample ID: 97094
Lab Project ID: G132-732

Analyzed By: JMF
Date Collected: 10/11/00
Date Received: 10/12/00
Matrix: Water

Metals	Result	Quantitation Limit	Units	Procedure	Date Analyzed
Chromium	BQL	0.0100	MG/L	6010B	10/24/00
Lead	BQL	0.0100	MG/L	6010B	10/24/00

Comments

BQL = Below Quantitation Limits

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Inorganics

Client Sample ID: USTH19-GW07-00D
Client Project ID: H19
Lab Sample ID: 97095
Lab Project ID: G132-732

Analyzed By: JMF
Date Collected: 10/11/00
Date Received: 10/12/00
Matrix: Water

Metals	Result	Quantitation Limit	Units	Procedure	Date Analyzed
Chromium	BQL	0.0100	MG/L	6010B	10/24/00
Lead	BQL	0.0100	MG/L	6010B	10/24/00

Comments

BQL = Below Quantitation Limits

ent: Law Engineering
 dress: 3301 Atlantic Ave
 dress: Raleigh, NC 27604
 ote #: 1489

Project ID: H19
 Contact: Bill Deobald
 Phone: 831-8051
 Fax: 831-8136

Date: 10-11-00
 Turnaround: standard
 Job Number: 30740-6-0600-92-92
 P.O. Number: 307-00256-00

Report To: Bill Deobald
Law- Raleigh
 Invoice To: Law Corporate in Alpharetta

[illegible]

Appendix H

**Second Semi-Annual Groundwater
Monitoring Report**

FILE COPY



LAW

CATLIN

**ENVIRONMENTAL AND
ENGINEERING CONSULTANTS**

**RALEIGH, N.C.
WILMINGTON, N.C.**

**SECOND SEMI-ANNUAL GROUNDWATER
MONITORING REPORT**

**BUILDING H-19-1, H-19-2, and H-19-3
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA**

Issued: May 23, 2001

**Navy Contract No. N62470-95-D-6009
Delivery Order No. 0093
LAW Job No. 30740-6-0600-0093**

**Law Engineering and Environmental Services, Inc.
3301 Atlantic Avenue
Raleigh, North Carolina 27604**

CATLIN

ENVIRONMENTAL AND
ENGINEERING CONSULTANTS

LAW

WILMINGTON, N.C.
RALEIGH, N.C.

May 23, 2001

Commander
LANTNAVFACENGCOM
1510 Gilbert Street
Norfolk, Virginia 23511-2699

Attention: Ms. Lori P. Reuther, Code: EV21LR

Subject: **Second Semi-Annual Groundwater Monitoring Report
Former USTs H-19-1, H-19-2 and H-19-3
Marine Corps Base
Camp Lejeune, North Carolina
Navy Contract Number N62470-95-D-6009
Delivery Order Number: 0093
Law Job Number: 30740-6-0600-0093**

Dear Ms. Reuther:

In accordance with Naval Facilities Engineering Command Order for Supplies and Services Contract No. N62470-95-D-6009, Delivery Order Number 0093, Law Engineering and Environmental Services, Inc. (LAW) is pleased to provide this Semi-Annual Groundwater Monitoring Report for the above referenced site. Our services included groundwater level gauging, and collection and analysis of groundwater samples from selected, existing monitoring wells. The purpose of our services was to document the presence or absence of free product, determine the current groundwater flow conditions across the site, and evaluate groundwater quality at selected locations.

Background Information

LAW has completed the second two rounds of quarterly water-table monitoring, and the second of two semi-annual groundwater sampling events at the Building H-19 site, located at the Marine Corps Base (MCB) Camp Lejeune, North Carolina. Three underground storage tanks (USTs) were located approximately 90 feet north of Building H-19 and were associated with former boiler plant building H-20. The tanks included two 15,000-gallon capacity diesel fuel tanks, and one 5,000-gallon capacity waste oil tank.

The tanks were installed in 1943 and removed in 1993. Vadose-zone soils were excavated from the site at the time of removal. Groundwater contamination was identified by R.E. Wright in 1995 and by LAW on subsequent dates.

The table below lists known environmental assessment or remediation reports prepared for the subject site. Please reference the reports listed for additional background information and study findings associated with the Building H-19 site.

Previous Environmental Reports for Building H-19 Site

NO.	REPORT TITLE	DATE	AUTHOR
1	Initial Site Assessment Report, UST Closure by Removal, (2) 15,000-gallon heating oil [sic], Building H-19	Undated	Peele's Pump and Tank Company, West Columbia, South Carolina
2	Initial Site Assessment Report, UST Closure by Removal, (2) 5,000-gallon waste oil [sic], Building H-19	Undated	Peele's Pump and Tank Company, West Columbia, South Carolina
3	Five Plus Two Additional Wells Site Check, UST H-19	June 1995	R. E. Wright Environmental, Inc. Norfolk Virginia
4	Leaking UST Site Assessment Report (Draft), UST H-19	May 1997	Law Engineering and Environmental Services, Inc.
5	Report of Natural Attenuation Monitoring, Building H-19	February 1998	Law Engineering and Environmental Services, Inc.
6	Second Natural Attenuation Monitoring Report, Building H-19, Hadnot Point	September 1998	Law Engineering and Environmental Services, Inc.
7	First Semi-Annual Groundwater Monitoring Report, Buildings H-19-1, H-19-2, and H-19-3	12/00	Law Engineering and Environmental Services, Inc.

Current Groundwater Sampling and Gauging Event

LAW gauged 12 existing monitoring wells and collected groundwater samples from five selected wells in April 2001. The depth to groundwater was measured in monitoring wells UST H19-MW01 through UST H19-MW14 (except well UST H19-MW12 which could not be located and is presumed to be paved over)

using an electronic interface probe or water gauging meter on January 16, 2001 and April 11, 2001. During the January 2001 gauging event, a 0.01-foot thickness of product was identified in monitoring well UST H19-MW-03. No free product was identified in well UST H19-MW-03 during the April 2001 event.

Groundwater elevations were calculated by subtracting the water-table depth from surveyed top-of-casing elevations (Tables 1 and 2). Figures 1 and 2 are water-table elevation contour maps, as prepared from water-table measurements obtained during the January and April 2001 gauging events. The groundwater flow directions represented in Figures 1 and 2 are similar to those depicted on the water-table contour map prepared by LAW for January 1998 (Report No. 5: Figure 1) and October 2000 (Report No. 7: Figure 1).

Groundwater samples were collected from monitoring wells UST H19-MW01, UST H19-MW02, UST H19-MW03, UST H19-MW05 and UST H19-MW07 on April 11, 2001. The five monitoring wells were purged prior to sample collection. The stagnant water from the well casing and sand pack was removed in an effort to collect samples representative of the water quality in the aquifer surrounding the screened interval. Each well was purged and sampled using a new, dedicated disposable bailer. LAW personnel donned a new pair of laboratory grade gloves prior to purging, sampling and collecting water-level measurements at each well to minimize the potential for cross contamination. Specific conductance, pH, groundwater temperature, turbidity and dissolved oxygen were measured and recorded throughout the purging process. Well purging continued until three standing well volumes were removed and indicator parameters had stabilized. Groundwater samples were then collected and decanted from the bailer into pre-labeled sample containers. These containers were sealed, and stored in a chilled cooler. Custody of the samples was maintained by LAW personnel, from the time of collection through delivery to the analytical laboratory.

The groundwater samples from each of the five selected wells, including one duplicate and a trip blank, were submitted to Paradigm Analytical Laboratory. The samples were analyzed for volatile organic compounds (VOCs) using Standard Method 6210D, for semi-volatile organic compounds (SVOCs) plus Tentatively Identified Compounds (TICs) by EPA Method 625, for volatile petroleum hydrocarbons (VPH) and extractable petroleum hydrocarbons (EPH) by the Massachusetts Department of Environmental Protection method, and for the metals chromium and lead by Standard Method 6010B.

Comments

Tables 3 and 4 summarize the laboratory results from the January 1998 event (where available) and the October 2000, and April 2001 sampling events. Laboratory reports for the April 2001 sampling event are attached.

Chloroform was the only VOC identified in the groundwater sample from monitoring well UST H19-MW01 during the April 2001 sampling event, and its detected concentration is below the North Carolina Groundwater Standard (2L Standard). One low concentration of an unknown SVOC TIC was also detected in the groundwater sample from MW01. No SVOCs, metals, VPH or EPH hydrocarbons were detected in the groundwater sample from MW01.

The groundwater sample from monitoring well UST H19-MW02 did not exhibit detectable concentrations of VOCs, SVOCs, SVOC TICs, VPH or EPH compounds. The metal lead was detected at a concentration of 0.0105 mg/L, below its 2L standard of 0.015 mg/L.

The groundwater sample from monitoring well UST H19-MW03 did not exhibit detectable concentrations of VOCs or SVOCs. Low concentrations of two unknown SVOC TICs and lead were detected in the sample from MW03 during the April 2001 sampling event. The detected lead concentration was below its 2L Standard. No VPH or EPH hydrocarbon compounds were detected in the groundwater sample from MW03.

The groundwater sample from monitoring well UST H19-MW05 did not exhibit detectable concentrations of VOCs, SVOCs, SVOC TICs, metals, VPH or EPH compounds during the April 2001 sampling event.

Low concentrations of seven VOCs, four unknown SVOC TICs, and the VPH hydrocarbon fraction C9 to C12 aliphatics were detected in the groundwater sample from monitoring well UST H19-MW07 during the April 2001 sampling event. All detected concentrations were below their respective 2L Standards. No SVOCs, metals, or EPH hydrocarbon compounds were identified in this sample.

Results of groundwater analysis for this sampling event indicate the presence of very low concentrations of VOCs, SVOCs TICs, lead, and VPH hydrocarbon compounds in the vicinity of UST H19. All of the concentrations detected during this sampling event are below their respective 2L Standards. This sampling event completes the monitoring activities defined in Delivery Order 0093 for this site. Since a measurable thickness of free product was identified during the January 2001 gauging events, gauging activities will likely

be required for at least three more quarters. If free product is not measured during these three gauging events, and because petroleum-related compound concentrations in the groundwater in the vicinity of UST H19 have remained below their respective Gross Contaminant Levels and 2L Standards, this site should meet criteria for regulatory closure.

This report is intended for the exclusive use of Naval Facilities Engineering Command, Atlantic Division. The contents should not be relied upon by any other parties without the expressed written consent of LAW. The findings are relevant to the dates of our site work and should not be relied upon to represent site conditions on other dates.

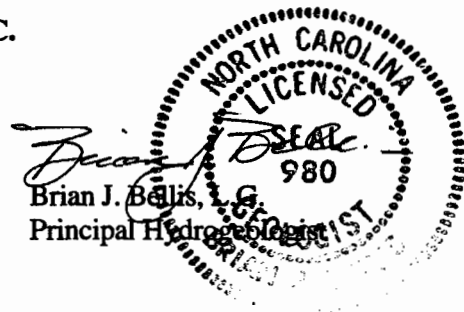
We appreciate the opportunity to provide environmental services on this project. If any questions arise, please contact us at (919) 876-0416.

Sincerely,

LAW ENGINEERING AND ENVIRONMENTAL SERVICES, INC.



William S. Grimes
Staff Geologist



Attachments: Table 1 – Monitoring Well Casing and Groundwater Elevations, January 16, 2001
Table 2 – Monitoring Well Casing and Groundwater Elevations, April 11, 2001
Table 3 – Summary of Laboratory Analytical Results, Volatile and Semi-Volatile Organic Compounds (2 pages)
Table 4 – Summary of MADEP VPH and EPH Laboratory Analytical Results
Figure 1 – Water Table Elevation Contour Map for January 2001
Figure 2 – Water Table Elevation Contour Map for April 2001
Laboratory Report and Chain of Custody Record

cc: Mr. Neal Paul, Marine Corps Base Camp Lejeune
Ms. Christine Foskey, LANTNAVFACENGOM – Contracts, Correspondence Only
Mr. Michael E. Mason, Program Manager, Catlin Engineers and Scientists, Inc., Correspondence Only

Tables

**TABLE 1
BUILDING H-19
MONITORING WELL CASING
AND GROUNDWATER ELEVATIONS
JANUARY 16, 2001**

DATA POINT	TOP OF CASING ELEVATION (feet)	DEPTH TO WATER (feet)	FREE PRODUCT THICKNESS (feet)	WATER TABLE ELEVATION (feet)
UST H19-MW01	13.11	10.83	NMT	2.28
UST H19-MW02	12.93	7.99	NMT	4.94
UST H19-MW03	13.25	8.31	0.01	4.95*
UST H19-MW04	13.88	8.76	NMT	5.12
UST H19-MW05	13.42	8.48	NMT	4.94
UST H19-MW06	13.67	8.82	NMT	4.85
UST H19-MW07	10.42	8.07	NMT	2.35
UST H19-MW08	9.70	7.52	NMT	2.18
UST H19-MW09	9.97	7.73	NMT	2.24
UST H19-MW10	10.32	8.09	NMT	2.23
UST H19-MW11	10.51	8.22	NMT	2.29
UST H19-MW12	10.93	CNL	NA	NA
UST H19-MW13	10.89	8.31	NMT	2.58
UST H19-MW14	11.26	9.01	NMT	2.25

NMT = No Measurable Thickness

Top of casing elevations provided to LAW by Taylor, Wiseman & Taylor, Raleigh, NC.

* = Corrected water table elevation obtained by adding 80% of the product thickness to the measured water table elevation.

CNL = Could not locate

NA = Not available

TABLE 2
BUILDING H-19
MONITORING WELL CASING
AND GROUNDWATER ELEVATIONS
APRIL 11, 2001

DATA POINT	TOP OF CASING ELEVATION (feet)	DEPTH TO WATER (feet)	FREE PRODUCT THICKNESS (feet)	WATER TABLE ELEVATION (feet)
UST H19-MW01	13.11	10.50	NMT	2.61
UST H19-MW02	12.93	7.70	NMT	5.23
UST H19-MW03	13.25	7.98	NMT	5.27
UST H19-MW04	13.88	8.43	NMT	5.45
UST H19-MW05	13.42	8.17	NMT	5.25
UST H19-MW06	13.67	8.52	NMT	5.15
UST H19-MW07	10.42	7.78	NMT	2.64
UST H19-MW08	9.70	7.20	NMT	2.50
UST H19-MW09	9.97	7.42	NMT	2.55
UST H19-MW10	10.32	7.78	NMT	2.54
UST H19-MW11	10.51	8.00	NMT	2.51
UST H19-MW12	10.93	CNL	NA	NA
UST H19-MW13	10.89	8.10	NMT	2.79
UST H19-MW14	11.26	8.70	NMT	2.56

NMT = No Measurable Thickness

Top of casing elevations provided to LAW by Taylor, Wiseman & Taylor, Raleigh, NC.

CNL = Could not locate

NA = Not available

TABLE 3 (PAGE 1 OF 3)
SUMMARY OF LABORATORY ANALYTICAL RESULTS (GROUNDWATER SAMPLES)
VOLATILE AND SEMI-VOLATILE ORGANIC COMPOUNDS
FORMER USTs H-19-1, H-19-2 and H-19-3 MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

PARAMETER	GROUNDWATER SAMPLE ID	USTH19- GW01-00D*	USTH19- GW01-01B	USTH19- GW02-00D*	USTH19- GW02-01B	GROSS CONTAMINATION LEVELS (GCL)	NC GROUNDWATER QUALITY STANDARD
	WELL SCREEN DEPTH (ft)	3 to 13	3 to 13	4 to 14	4 to 14		
	SAMPLE DATE	10/11/00	4/11/01	10/11/00	4/11/01		
STANDARD METHOD 6210D - VOLATILE ORGANIC COMPOUNDS (mg/L)							
Chloroform		ND	.016	ND	ND	190	.19
Total Standard Method 6210D		ND	.016	ND	ND	N/A	N/A
EPA METHOD 625 - BASE, NEUTRAL AND ACID EXTRACTABLE SEMI-VOLATILE ORGANIC COMPOUNDS (mg/L)							
<i>No compounds detected</i>							
EPA METHOD 625 - TENTATIVELY IDENTIFIED COMPOUNDS - TICs (mg/L)							
Known TICs [Concentration]		ND	ND	ND	ND	N/A	N/A
Unknown TICs [Concentration]		ND	1 [0.0041]	ND	ND	N/A	N/A
EPA METHOD 6010B - METALS (mg/L)							
Lead		ND	ND	ND	0.0105	15	0.015

* = Data from LAW First Semi-Annual Groundwater Monitoring Report, December 2000; Delivery Order 0093.

ND = Not Detected above the laboratory practical quantitation limit (PQL). See laboratory report.

N/A = Not applicable

TABLE 3 (PAGE 2 OF 3)
SUMMARY OF LABORATORY ANALYTICAL RESULTS (GROUNDWATER SAMPLES)
VOLATILE AND SEMI-VOLATILE ORGANIC COMPOUNDS
FORMER USTs H-19-1, H-19-2 and H-19-3 MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

PARAMETER	GROUNDWATER	USTH19- GW03-00D*	USTH19- GW03-01B	USTH19- GW05-00D*	USTH19- GW05-01B	GROSS CONTAMINATION LEVELS (GCL)	NC GROUNDWATER QUALITY STANDARD
	SAMPLE ID	1 to 11	1 to 11	3 to 13	3 to 13		
	WELL SCREEN DEPTH (ft)						
	SAMPLE DATE	10/11/00	4/11/01	10/11/00	4/11/01		
STANDARD METHOD 6210D – VOLATILE ORGANIC COMPOUNDS (mg/L)							
No compounds detected							
EPA METHOD 625 – BASE, NEUTRAL AND ACID EXTRACTABLE SEMI-VOLATILE ORGANIC COMPOUNDS (mg/L)							
No compounds detected							
EPA METHOD 625 - TENTATIVELY IDENTIFIED COMPOUNDS – TICs (mg/L)							
Known TICs [Concentration]		1 [.028]	ND	ND	ND	N/A	N/A
Unknown TICs [Concentration]		2 [.0181]	2 [.0226]	ND	ND	N/A	N/A
EPA METHOD 6010B – METALS (mg/L)							
Lead		ND	0.0101	ND	ND	15	0.015

* = Data from LAW First Semi-Annual Groundwater Monitoring Report, December 2000; Delivery Order 0093.

ND = Not Detected above the laboratory practical quantitation limit (PQL). See laboratory report.

N/A = Not applicable

TABLE 3 (PAGE 3 OF 3)
SUMMARY OF LABORATORY ANALYTICAL RESULTS (GROUNDWATER SAMPLES)
VOLATILE AND SEMI-VOLATILE ORGANIC COMPOUNDS
FORMER USTs H-19-1, H-19-2 and H-19-3 MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

PARAMETER	GROUNDWATER SAMPLE ID	USTH19- GW07-98A*	USTH19- GW07-00D**	USTH19- GW07-01B	GROSS CONTAMINATION LEVELS (GCL)	NC GROUNDWATER QUALITY STANDARD
	WELL SCREEN DEPTH (ft)	4 to 14	4 to 14	4 to 14		
	SAMPLE DATE	1/30/98	10/11/00	4/11/01		
STANDARD METHOD 6210D (including historical results by EPA Method 502.2) - VOLATILE ORGANIC COMPOUNDS (mg/L)						
n-Butylbenzene		ND	ND	.003	6.9	.070
sec-Butylbenzene		.00721	ND	.007	8.5	.070
tert-Butylbenzene		.00252	ND	.001	15.0	.070
Isopropylbenzene		.00532	ND	.008	25.0	.070
4-Isopropyltoluene		ND	ND	.0008	Not established	Not established
Naphthalene		ND	ND	.001	15.5	.021
n-Propylbenzene		.00154	ND	ND	30.0	.070
Styrene		.00205	ND	ND	100.0***	0.10
Tetrachloroethene		.00152	ND	ND	7.0	0.0007
Toluene		.00193	ND	ND	257.5	1.000
1,2,4-Trimethylbenzene		.000933	ND	.0007	28.5	.35
Xylenes (Total)		.001143	ND	ND	87.5	.530
Total EPA Method 502.2		.02417	ND	ND	N/A	N/A
Total Standard Method 6210D		ND	ND	.0215	N/A	N/A
EPA METHOD 625 - BASE, NEUTRAL AND ACID EXTRACTABLE SEMI-VOLATILE ORGANIC COMPOUNDS (mg/L)						
<i>No compounds detected</i>						
EPA METHOD 625, TENTATIVELY IDENTIFIED COMPOUNDS - TICs (mg/L)						
Known TICs [Concentration]		ND	ND	ND	N/A	N/A
Unknown TICs [Concentration]		ND	ND	4 [.0192]	N/A	N/A
EPA METHOD 6010B, METALS (mg/L)						
<i>No metals detected</i>						

* = Data from LAW Report of Natural Attenuation Monitoring, February 1998; Delivery Order 0026
 ** = Data from LAW First Semi-Annual Groundwater Monitoring Report, December 2000; Delivery Order 0093
 *** = GCL = 1,000 * groundwater standard because 1/2 of the water solubility of styrene = 160 mg/L.
 ND = Not Detected above the laboratory practical quantitation limit (PQL). See laboratory report.
 N/A = Not applicable

TABLE 4 (PAGE 1 OF 3)
SUMMARY OF MADEP VPH AND EPH LABORATORY RESULTS (GROUNDWATER SAMPLES)
FORMER USTs H-19-1, H-19-2 and H-19-3 MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

PARAMETER	GROUNDWATER SAMPLE ID	USTH19- GW01-00D Note 3	USTH19- GW01-01B	USTH19- GW02-00D Note 3	USTH19- GW02-01B	INTERIM GROUNDWATER STANDARD* (VPH and EPH Class Ranges)
WELL SCREEN DEPTHS (ft)		3 to 13	3 to 13	4 to 14	4 to 14	
SAMPLE DATES		10/11/00	4/11/01	10/11/00	4/11/01	
MADEP, Total Volatile Petroleum Hydrocarbon Compounds (VPH), mg/L						
C5 to C8 Aliphatics		ND	ND	ND	ND	
C9 to C12 Aliphatics		ND	ND	ND	ND	
C9 to C10 Aromatics		ND	ND	ND	ND	
MADEP, Total Extractable Petroleum Hydrocarbon Compounds (EPH), mg/L						
C9 to C18 Aliphatics		ND	ND	ND	ND	
C19 to C36 Aliphatics		ND	ND	ND	ND	
C11 to C22 Aromatics		ND	ND	ND	ND	
MADEP, CARBON CLASS RANGE TOTALS, mg/L (if concentration identified)						
C5 to C8 Aliphatics (VPH)		ND	ND	ND	ND	0.42
C9 to C12 Aliphatics		ND	ND	ND	ND	Not Established: Note 1
C9 to C10 Aromatics		ND	ND	ND	ND	Not Established: Note 2
C9 to C18 Aliphatics (VPH + EPH)		ND	ND	ND	ND	4.2
C19 to C36 Aliphatics (EPH)		ND	ND	ND	ND	42.0
C11 to C22 Aromatics (VPH + EPH)		ND	ND	ND	ND	0.21

ND = No compounds detected above the laboratory practical quantitation limit (PQL). See laboratory reports

Shaded Cells = Groundwater Contaminant Concentration exceeds the N.C. Groundwater Standard

MADEP = Massachusetts Department of Environmental Protection.

* Gross Contamination levels have not been established for these parameters

Notes:

1. The DWQ has not established a groundwater standard for the C9 to C12 aliphatic compound class of VPH. Instead, the DWQ established a groundwater standard for the C9 to C18 aliphatic compound class, which includes both VPH and EPH.
2. The DWQ has not established a groundwater standard for the C9 to C10 aromatic compound class of VPH. Instead, the DWQ established a groundwater standard for the C11 to C32 aromatic compound class which includes both VPH and EPH.
3. Data from LAW First Semi-Annual Groundwater Monitoring Report, December 2000; Delivery Order 0093.

TABLE 4 (PAGE 2 OF 3)
SUMMARY OF MADEP VPH AND EPH LABORATORY RESULTS (GROUNDWATER SAMPLES)
FORMER USTs H-19-1, H-19-2 and H-19-3 MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

PARAMETER	GROUNDWATER SAMPLE ID	USTH19- GW03-00D Note 6	USTH19- GW03-01B	USTH19- GW05-00D Note 6	USTH19- GW05-01B	INTERIM GROUNDWATER STANDARD* (VPH and EPH Class Ranges)
WELL SCREEN DEPTHS (ft)		1 to 11	1 to 11	3 to 13	3 to 13	
SAMPLE DATES		10/11/00	4/11/01	10/11/00	4/11/01	
MADEP, Total Volatile Petroleum Hydrocarbon Compounds (VPH), mg/L						
C5 to C8 Aliphatics		ND	ND	ND	ND	
C9 to C12 Aliphatics		ND	ND	ND	ND	
C9 to C10 Aromatics		ND	ND	ND	ND	
MADEP, Total Extractable Petroleum Hydrocarbon Compounds (EPH), mg/L						
C9 to C18 Aliphatics		ND	ND	ND	ND	
C19 to C36 Aliphatics		ND	ND	ND	ND	
C11 to C22 Aromatics		ND	ND	ND	ND	
MADEP, CARBON CLASS RANGE TOTALS, mg/L (if concentration identified)						
C5 to C8 Aliphatics (VPH)		ND	ND	ND	ND	0.42
C9 to C12 Aliphatics		ND	ND	ND	ND	Not Established: Note 4
C9 to C10 Aromatics		ND	ND	ND	ND	Not Established: Note 5
C9 to C18 Aliphatics (VPH + EPH)		ND	ND	ND	ND	4.2
C19 to C36 Aliphatics (EPH)		ND	ND	ND	ND	42.0
C9 to C32 Aromatics (VPH + EPH)		ND	ND	ND	ND	0.21

ND = No compounds detected above the laboratory practical quantitation limit (PQL). See laboratory reports

Shaded Cells = Groundwater Contaminant Concentration exceeds the N.C. Groundwater Standard

MADEP = Massachusetts Department of Environmental Protection.

* Gross Contamination levels have not been established for these parameters

Notes:

- The DWQ has not established a groundwater standard for the C9 to C12 aliphatic compound class of VPH. Instead, the DWQ established a groundwater standard for the C9 to C18 aliphatic compound class, which includes both VPH and EPH.
- The DWQ has not established a groundwater standard for the C9 to C10 aromatic compound class of VPH. Instead, the DWQ established a groundwater standard for the C9 to C32 aromatic compound class which includes both VPH and EPH.
- Data from LAW First Semi-Annual Groundwater Monitoring Report, December 2000; Delivery Order 0093.

TABLE 4 (PAGE 3 OF 3)
SUMMARY OF MADEP VPH AND EPH LABORATORY RESULTS (GROUNDWATER SAMPLES)
FORMER USTs H-19-1, H-19-2 and H-19-3 MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

PARAMETER	GROUNDWATER SAMPLE ID	USTH19- GW07-00D Note 9	USTH19- GW07-00D	INTERIM GROUNDWATER STANDARD* (VPH and EPH Class Ranges)
	WELL SCREEN DEPTHS (ft)	4 to 14	4 to 14	
	SAMPLE DATES	10/11/00	4/11/01	
MADEP, Total Volatile Petroleum Hydrocarbon Compounds (VPH), mg/L				
C5 to C8 Aliphatics		ND	ND	
C9 to C12 Aliphatics		ND	.260	
C9 to C10 Aromatics		ND	ND	
MADEP, Total Extractable Petroleum Hydrocarbon Compounds (EPH), mg/L				
C9 to C18 Aliphatics		ND	ND	
C19 to C36 Aliphatics		ND	ND	
C11 to C22 Aromatics		ND	ND	
MADEP, CARBON CLASS RANGE TOTALS, mg/L (if concentration identified)				
C5 to C8 Aliphatics (VPH)		ND	ND	0.42
C9 to C12 Aliphatics		ND	.260	Not Established: Note 7
C9 to C10 Aromatics		ND	ND	Not Established: Note 8
C9 to C18 Aliphatics (VPH + EPH)		ND	.260	4.2
C19 to C36 Aliphatics (EPH)		ND	ND	42.0
C11 to C22 Aromatics (VPH + EPH)		ND	ND	0.21

ND = No compounds detected above the laboratory practical quantitation limit (PQL). See laboratory reports

Shaded Cells = Groundwater Contaminant Concentration exceeds the N.C. Groundwater Standard

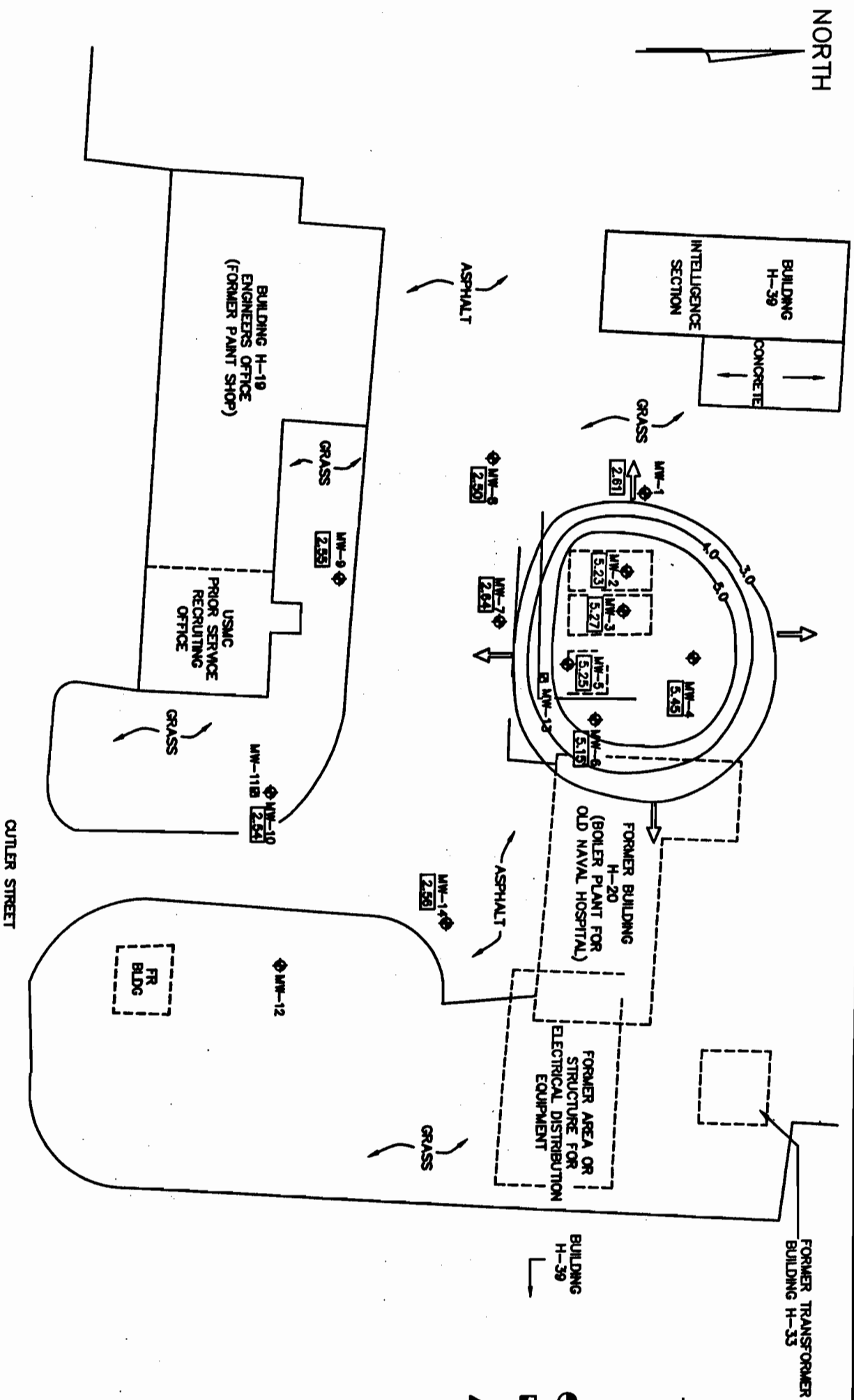
MADEP = Massachusetts Department of Environmental Protection.

* Gross Contamination levels have not been established for these parameters

Notes:

7. The DWQ has not established a groundwater standard for the C9 to C12 aliphatic compound class of VPH. Instead, the DWQ established a groundwater standard for the C9 to C18 aliphatic compound class, which includes both VPH and EPH.
8. The DWQ has not established a groundwater standard for the C9 to C10 aromatic compound class of VPH. Instead, the DWQ established a groundwater standard for the C11 to C32 aromatic compound class which includes both VPH and EPH.
9. Data from LAW First Semi-Annual Groundwater Monitoring Report, December 2000, Delivery Order 0093.

Figures



- LEGEND**
- 2.00 —
 - [5.6] ⇒ GROUNDWATER ELEVATION (FT. MSL)
 - ⇒ GROUNDWATER FLOW DIRECTION BASED ON GROUNDWATER ELEVATION DATA.
 - ⊕ MW-9 NEW MONITORING WELL LOCATION (TYPE II)
 - ▣ MW-11 NEW MONITORING WELL LOCATION (TYPE II)
 - ▲ MW-1 NEW MONITORING WELL LOCATION (TYPE III)
 - EXISTING MONITORING WELL LOCATION (R.E. WRIGHT)
 - FORMER LOCATION OF USTs AND BUILDINGS (LOCATION OF H-20 FROM R.E. WRIGHT SITE CHECK REPORT)

- NOTES:**
1. H-19 IS THE PREFIX WHICH PRECEEDS ALL SAMPLE LOCATIONS (OMITTED FOR BREVITY)
 2. PERMANENT WELLS MW-1 THROUGH MW-7 INSTALLED BY R.E. WRIGHT ENVIRONMENTAL INC., MARCH 1995. RESAMPLED BY LAW IN FEBRUARY 1997.
 3. PERMANENT WELLS MW-8 THROUGH MW-14 INSTALLED BY LAW IN MARCH 1997. WELLS SAMPLED BY LAW IN MARCH AND EARLY APRIL 1997.
 4. CORNERS OF BLDG H-19, H-39, FENCE POST, AND SAMPLING POINTS LOCATED IN FIELD BY PROFESSIONAL LAND SURVEYOR. THE LOCATIONS OF UTILITIES AND OTHER FEATURES ARE APPROXIMATE
 5. TYPE III MONITORING WELLS NOT CONSIDERED FOR GROUNDWATER TABLE ELEVATION CONTOUR MAP
 6. CONTOUR INTERVAL= 1.0' (FT.)

GROUNDWATER TABLE ELEVATION MAP
APRIL 11, 2001
LEAKING UNDERGROUND STORAGE TANK H-19
CAMP LEJEUNE, NORTH CAROLINA

LAW

LAWGIBB Group Member

LAW ENGINEERING AND ENVIRONMENTAL SERVICES, INC.

RALEIGH, NORTH CAROLINA

DRAWN: LGL

DATE: APRIL 2001

DFT CHECK: LGL

SCALE: 1"=40'

ENG CHECK: WBT

JOB: 30740-6-0600/0093

APPROVAL: [Signature]

FIGURE: 2

REFERENCE: MCB CAD DRAWING F06.DWG, FIGURE 3 OF R.E. WRIGHT, 1995, AND MBC DRAWING 228551, 305171, 4052508

H-19_4_01.dwg

Laboratory Report and Chain of Custody Records

PARADIGM ANALYTICAL LABORATORIES, INC.

2627 Northchase Parkway S.E.
Wilmington, North Carolina 28405
(910) 350-1903
Fax (910) 350-1557

Mr. Bill Deobald
Law Engineering
3301 Atlantic Ave.
Raleigh, NC 27604

May 1, 2001

Report Number: G132-855

Client Project ID: H-19

Dear Mr. Deobald,

Enclosed are the results of the analytical services performed under the referenced project. Copies of this report and supporting data will be retained in our files for a period of five years in the event they are required for future reference. Any samples submitted to our laboratory will be retained for a maximum of thirty (30) days from the date of this report unless other arrangements are requested.

If there are any questions about the report or the services performed during this project, please call for assistance. We will be happy to answer any questions or concerns which you may have.

Thank you for using Paradigm Analytical Labs for your analytical services. We look forward to working with you again on any additional analytical needs which you may have.

Sincerely,

Paradigm Analytical Laboratories, Inc.



Laboratory Director
Mark Randall

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 6210D

Client Sample ID: USTH19-GW01-01B

Client Project ID: H-19

Lab Sample ID: 18460

Lab Project ID: G132-855

Matrix: Water

Date Analyzed: 4/20/01

Analyzed By: EKR

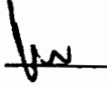
Date Collected: 4/11/01

Date Received: 4/13/01

Dilution: 1.0

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Benzene	0.5	BQL
Bromobenzene	0.5	BQL
Bromochloromethane	0.5	BQL
Bromodichloromethane	0.5	BQL
Bromoform	0.5	BQL
Bromomethane	0.5	BQL
n-Butylbenzene	0.5	BQL
sec-Butylbenzene	0.5	BQL
tert-Butylbenzene	0.5	BQL
Carbon tetrachloride	0.5	BQL
Chlorobenzene	0.5	BQL
Chloroethane	0.5	BQL
Chloroform	0.5	BQL
Chloromethane	0.5	BQL
2-Chlorotoluene	0.5	BQL
4-Chlorotoluene	0.5	BQL
Dibromochloromethane	0.5	BQL
1,2-Dibromo-3-chloropropane	5	BQL
Dibromomethane	0.5	BQL
1,2-Dibromoethane (EDB)	0.5	BQL
1,2-Dichlorobenzene	0.5	BQL
1,3-Dichlorobenzene	0.5	BQL
1,4-Dichlorobenzene	0.5	BQL
1,1-Dichloroethane	0.5	BQL
1,1-Dichloroethene	0.5	BQL
1,2-Dichloroethane	0.5	BQL
cis-1,2-Dichloroethene	0.5	BQL
trans-1,2-dichloroethene	0.5	BQL
1,2-Dichloropropane	0.5	BQL
1,3-Dichloropropane	0.5	BQL
2,2-Dichloropropane	0.5	BQL
1,1-Dichloropropene	0.5	BQL
Dichlorodifluoromethane	5	BQL
Diisopropyl ether (DIPE)	0.5	BQL
Ethylbenzene	0.5	BQL
Hexachlorobutadiene	0.5	BQL
Isopropylbenzene	0.5	BQL
4-Isopropyltoluene	0.5	BQL
Methylene chloride	5	BQL
Methyl-tert-butyl ether (MTBE)	0.5	BQL

16

Reviewed by: 

Flags: BQL = Below Quantitation Limit

N.C. Certification #481 S.C. Certification #99029

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PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 6210D

Client Sample ID: USTH19-GW01-01B

Client Project ID: H-19

Lab Sample ID: 18460

Lab Project ID: G132-855

Matrix: Water

Date Analyzed: 4/20/01

Analyzed By: EKR

Date Collected: 4/11/01

Date Received: 4/13/01

Dilution: 1.0

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Naphthalene	0.5	BQL
n-Propyl benzene	0.5	BQL
Styrene	0.5	BQL
1,1,1,2-Tetrachloroethane	0.5	BQL
1,1,2,2-Tetrachloroethane	0.5	BQL
Tetrachloroethene	0.5	BQL
Toluene	0.5	BQL
1,2,3-Trichlorobenzene	0.5	BQL
1,2,4-Trichlorobenzene	0.5	BQL
Trichloroethene	0.5	BQL
1,1,1-Trichloroethane	0.5	BQL
1,1,2-Trichloroethane	0.5	BQL
Trichlorofluoromethane	0.5	BQL
1,2,3-Trichloropropane	0.5	BQL
1,2,4-Trimethylbenzene	0.5	BQL
1,3,5-Trimethylbenzene	0.5	BQL
Vinyl chloride	0.5	BQL
m-,p-Xylene	1	BQL
o-Xylene	0.5	BQL

Surrogate Spike Recoveries

Compound	Spike Added (ug/L)	Surrogate Result (ug/L)	%Rec
Bromofluorobenzene	10.0	10.5	105
1,2-Dichloroethane-d4	10.0	11.2	112
Toluene-d8	10.0	10.3	103

Comments:

All results are corrected for dilution.

Reviewed by:

Flags: BQL = Below Quantitation Limit

N.C. Certification #481 S.C. Certification #99029

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatiles by GCMS 625

Client Sample ID: USTH19-GW01-01B

Client Project ID: H-19

Lab Sample ID: 18460

Lab Project ID: G132-855

Matrix: Water

Date Collected: 4/11/01

Date Received: 4/13/01

Date Analyzed: 4/19/01

Analyzed By: MRC

Dilution: 1

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Acenaphthene	10	BQL
Acenaphthylene	10	BQL
Anthracene	10	BQL
Benzo[a]anthracene	10	BQL
Benzo[a]pyrene	10	BQL
Benzo[b]fluoranthene	10	BQL
Benzo[g,h,i]perylene	10	BQL
Benzo[k]fluoranthene	10	BQL
Bis(2-chloroethoxy)methane	10	BQL
Bis(2-chloroethyl)ether	10	BQL
Bis(2-chloroisopropyl)ether	10	BQL
Bis(2-ethylhexyl)phthalate	10	BQL
4-bromophenyl phenyl ether	10	BQL
Butylbenzylphthalate	10	BQL
4-Chloro-3-methylphenol	10	BQL
2-Chloronaphthalene	10	BQL
2-Chlorophenol	10	BQL
4-Chlorophenyl phenyl ether	10	BQL
Chrysene	10	BQL
Di-n-Butylphthalate	10	BQL
Di-n-octylphthalate	10	BQL
Dibenzo[a,h]anthracene	10	BQL
1,2-Dichlorobenzene	10	BQL
1,3-Dichlorobenzene	10	BQL
1,4-Dichlorobenzene	10	BQL
3,3'-Dichlorobenzidine	20	BQL
2,4-Dichlorophenol	10	BQL
Diethylphthalate	10	BQL
2,4-Dimethylphenol	10	BQL
Dimethylphthalate	10	BQL
4,6-Dinitro-2-methylphenol	50	BQL
2,4-Dinitrophenol	50	BQL
2,4-Dinitrotoluene	10	BQL
2,6-Dinitrotoluene	10	BQL
Fluoranthene	10	BQL
Fluorene	10	BQL
Hexachlorobenzene	10	BQL
Hexachlorobutadiene	10	BQL
Hexachlorocyclopentadiene	20	BQL
Hexachloroethane	10	BQL

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatiles by GCMS 625

Client Sample ID: USTH19-GW01-01B

Client Project ID: H-19

Lab Sample ID: 18460

Lab Project ID: G132-855

Matrix: Water.

Date Collected: 4/11/01

Date Received: 4/13/01

Date Analyzed: 4/19/01

Analyzed By: MRC

Dilution: 1

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Indeno(1,2,3-c,d)pyrene	10	BQL
Isophorone	10	BQL
N-Nitrosodi-n-propylamine	10	BQL
N-Nitrosodiphenylamine	10	BQL
Naphthalene	10	BQL
Nitrobenzene	10	BQL
2-Nitrophenol	10	BQL
4-Nitrophenol	50	BQL
Pentachlorophenol	50	BQL
Phenanthrene	10	BQL
Phenol	10	BQL
Pyrene	10	BQL
1,2,4-Trichlorobenzene	10	BQL
2,4,6-Trichlorophenol	10	BQL

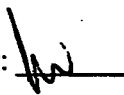
Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	9.2	92
2-Fluorophenol	10	9.1	91
Nitrobenzene-d5	10	8.2	82
Phenol-d6	10	8.5	85
2,4,6-Tribromophenol	10	8.8	88
4-Terphenyl-d14	10	10.0	100

Comments:

Results are corrected for %solids and dilution where applicable.

Flags:

BQL = Below Quantitation Limit.

Reviewed By: 

PARADIGM ANALYTICAL LABORATORIES, INC.

Results of Library Search for Semivolatile Compounds
by GCMS

Client Sample ID: USTH19-GW01-01B

Client Project ID: H-19

Lab Sample ID: 18460

Lab Project ID: G132-855

Matrix: Water

Date Collected: 4/11/01

Date Received: 4/13/01

Date Analyzed: 4/19/01

Analyzed By: MRC

Dilution: 1

Num.	Compound	CAS#	Match Probability	Result (ug/L)
1	Unknown			4.1
2				
3				
4				
5				
6				
7				
8				
9				
10				

Comment:

Tentatively Identified Compound (TIC) refers to substances which are not present in the list of target compounds. Therefore, not all TICs are identified and quantitated using individual standards. TIC listings are prepared utilizing a computerized library search of electron impact mass spectral data and evaluation of the relevant data by a mass spectral data specialist.

Quantitation is accomplished by relative peak height of the compound compared to that of the nearest internal standard from the total ion chromatogram. TICs are identified and quantitated only if the peak height is equal to or greater than 10% of that of the nearest internal standard. Quantitation provided is an estimate.

Reviewed by: lw

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Metals

Client Sample ID: USTH19-GW01-01B
Client Project ID: H-19
Lab Sample ID: 18460
Lab Project ID: G132-855
Batch ID: 1911

Analyzed By: RML
Date Collected: 4/11/01
Date Received: 4/13/01
Matrix: Water

Metals	Result	Quantitation Limit	DF	Units	Method	Date Analyzed
Chromium	BQL	0.0100	1	MG/L	6010B	4/24/01
Lead	BQL	0.0100	1	MG/L	6010B	4/24/01

Comments

BQL = Below Quantitation Limits
DF = Dilution Factor

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: LAW ENGINEERINGProject Name: H-19

Sample Information and Analytical Results	
Sample Identification	USTH19-GW01-01B
Sample Matrix	Water
Collection Option (for Soil)*	
Date Collected	04/11/01
Date Received	04/13/01
Date Extracted	04/19/01
Date Analyzed	04/19/01
Dry Weight	
Dilution Factor	1
C ₅ -C ₈ Aliphatics**	< 100 (µg/L)
C ₉ -C ₁₂ Aliphatics**	< 100 (µg/L)
C ₉ -C ₁₀ Aromatics**	< 100 (µg/L)
Surrogate % Recovery - PID	74
Surrogate % Recovery - FID	100

* = Option 1 = Established fill line on vial, Option 2 = Sampling Device/Brand, or Option 3 = Field weight of soil.

** = Excludes any surrogates or internal standards.

Lab Info: G132-855-18460

Reviewed By:

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: LAW ENGINEERINGProject Name: H-19

Sample Information and Analytical Results	
Sample Identification	USTH19-GW99-01B
Sample Matrix	Water
Collection Option (for Soil)*	
Date Collected	04/11/01
Date Received	04/13/01
Date Extracted	04/19/01
Date Analyzed	04/19/01
Dry Weight	
Dilution Factor	1
C ₅ -C ₈ Aliphatics**	< 100 (µg/L)
C ₉ -C ₁₂ Aliphatics**	< 100 (µg/L)
C ₉ -C ₁₀ Aromatics**	< 100 (µg/L)
Surrogate % Recovery - PID	75
Surrogate % Recovery - FID	110

Duplicate of
UST H19-GW01-01B

* = Option 1 = Established fill line on vial, Option 2 = Sampling Device/Brand, or Option 3 = Field weight of soil.

** = Excludes any surrogates or internal standards.

Lab Info: G132-855-18461

Reviewed By: 

EPH (Aliphatics/Aromatics) Results

by MDEP-EPH

Client Name: LAW ENGINEERINGProject Name: H-19

Sample Information and Analytical Results	
Sample Identification	USTH19-GW01-01B
Sample Matrix	Water
Date Collected	04/11/01
Date Received	04/13/01
Date Extracted	04/18/01
Date Analyzed	04/23/01
Dry Weight	
Dilution Factor	1
C ₉ -C ₁₈ Aliphatics*	< 100 (µg/L)
C ₁₉ -C ₃₆ Aliphatics*	< 100 (µg/L)
C ₁₁ -C ₂₂ Aromatics*	< 100 (µg/L)
Aliphatic Surrogate % Recovery	70
Aromatic Surrogate % Recovery	54

Comments:

* = Excludes any surrogates or internal standards.
Sample did not require fractionation.

Lab info: G132-855-18460

Reviewed By: *fw*

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 6210D

Client Sample ID: USTH19-GW02-01B

Client Project ID: H-19

Lab Sample ID: 18459

Lab Project ID: G132-855

Matrix: Water

Date Analyzed: 4/20/01

Analyzed By: EKR

Date Collected: 4/11/01

Date Received: 4/13/01

Dilution: 1.0

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Benzene	0.5	BQL
Bromobenzene	0.5	BQL
Bromochloromethane	0.5	BQL
Bromodichloromethane	0.5	BQL
Bromoform	0.5	BQL
Bromomethane	0.5	BQL
n-Butylbenzene	0.5	BQL
sec-Butylbenzene	0.5	BQL
tert-Butylbenzene	0.5	BQL
Carbon tetrachloride	0.5	BQL
Chlorobenzene	0.5	BQL
Chloroethane	0.5	BQL
Chloroform	0.5	BQL
Chloromethane	0.5	BQL
2-Chlorotoluene	0.5	BQL
4-Chlorotoluene	0.5	BQL
Dibromochloromethane	0.5	BQL
1,2-Dibromo-3-chloropropane	5	BQL
Dibromomethane	0.5	BQL
1,2-Dibromoethane (EDB)	0.5	BQL
1,2-Dichlorobenzene	0.5	BQL
1,3-Dichlorobenzene	0.5	BQL
1,4-Dichlorobenzene	0.5	BQL
1,1-Dichloroethane	0.5	BQL
1,1-Dichloroethene	0.5	BQL
1,2-Dichloroethane	0.5	BQL
cis-1,2-Dichloroethene	0.5	BQL
trans-1,2-dichloroethene	0.5	BQL
1,2-Dichloropropane	0.5	BQL
1,3-Dichloropropane	0.5	BQL
2,2-Dichloropropane	0.5	BQL
1,1-Dichloropropene	0.5	BQL
Dichlorodifluoromethane	5	BQL
Diisopropyl ether (DIPE)	0.5	BQL
Ethylbenzene	0.5	BQL
Hexachlorobutadiene	0.5	BQL
Isopropylbenzene	0.5	BQL
4-Isopropyltoluene	0.5	BQL
Methylene chloride	5	BQL
Methyl-tert-butyl ether (MTBE)	0.5	BQL

Reviewed by: 

Flags: BQL = Below Quantitation Limit

N.C. Certification #481 S.C. Certification #99029

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PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 6210D

Client Sample ID: USTH19-GW02-01B

Client Project ID: H-19

Lab Sample ID: 18459

Lab Project ID: G132-855

Matrix: Water

Date Analyzed: 4/20/01

Analyzed By: EKR

Date Collected: 4/11/01

Date Received: 4/13/01

Dilution: 1.0

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Naphthalene	0.5	BQL
n-Propyl benzene	0.5	BQL
Styrene	0.5	BQL
1,1,1,2-Tetrachloroethane	0.5	BQL
1,1,2,2-Tetrachloroethane	0.5	BQL
Tetrachloroethene	0.5	BQL
Toluene	0.5	BQL
1,2,3-Trichlorobenzene	0.5	BQL
1,2,4-Trichlorobenzene	0.5	BQL
Trichloroethene	0.5	BQL
1,1,1-Trichloroethane	0.5	BQL
1,1,2-Trichloroethane	0.5	BQL
Trichlorofluoromethane	0.5	BQL
1,2,3-Trichloropropane	0.5	BQL
1,2,4-Trimethylbenzene	0.5	BQL
1,3,5-Trimethylbenzene	0.5	BQL
Vinyl chloride	0.5	BQL
m-,p-Xylene	1	BQL
o-Xylene	0.5	BQL

Surrogate Spike Recoveries		Spike Added	Surrogate Result	%Rec
Compound		(ug/L)	(ug/L)	
Bromofluorobenzene		10.0	10.5	105
1,2-Dichloroethane-d4		10.0	11.3	113
Toluene-d8		10.0	10.2	102

Comments:

All results are corrected for dilution.

Reviewed by: *EW*

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatiles by GCMS 625

Client Sample ID: USTH19-GW02-01B

Client Project ID: H-19

Lab Sample ID: 18459

Lab Project ID: G132-855

Matrix: Water

Date Collected: 4/11/01

Date Received: 4/13/01

Date Analyzed: 4/19/01

Analyzed By: MRC

Dilution: 1

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Acenaphthene	10	BQL
Acenaphthylene	10	BQL
Anthracene	10	BQL
Benzo[a]anthracene	10	BQL
Benzo[a]pyrene	10	BQL
Benzo[b]fluoranthene	10	BQL
Benzo[g,h,i]perylene	10	BQL
Benzo[k]fluoranthene	10	BQL
Bis(2-chloroethoxy)methane	10	BQL
Bis(2-chloroethyl)ether	10	BQL
Bis(2-chloroisopropyl)ether	10	BQL
Bis(2-ethylhexyl)phthalate	10	BQL
4-bromophenyl phenyl ether	10	BQL
Butylbenzylphthalate	10	BQL
4-Chloro-3-methylphenol	10	BQL
2-Chloronaphthalene	10	BQL
2-Chlorophenol	10	BQL
4-Chlorophenyl phenyl ether	10	BQL
Chrysene	10	BQL
Di-n-Butylphthalate	10	BQL
Di-n-octylphthalate	10	BQL
Dibenzo[a,h]anthracene	10	BQL
1,2-Dichlorobenzene	10	BQL
1,3-Dichlorobenzene	10	BQL
1,4-Dichlorobenzene	10	BQL
3,3'-Dichlorobenzidine	20	BQL
2,4-Dichlorophenol	10	BQL
Diethylphthalate	10	BQL
2,4-Dimethylphenol	10	BQL
Dimethylphthalate	10	BQL
4,6-Dinitro-2-methylphenol	50	BQL
2,4-Dinitrophenol	50	BQL
2,4-Dinitrotoluene	10	BQL
2,6-Dinitrotoluene	10	BQL
Fluoranthene	10	BQL
Fluorene	10	BQL
Hexachlorobenzene	10	BQL
Hexachlorobutadiene	10	BQL
Hexachlorocyclopentadiene	20	BQL
Hexachloroethane	10	BQL

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatiles by GCMS 625

Client Sample ID: USTH19-GW02-01B

Client Project ID: H-19

Lab Sample ID: 18459

Lab Project ID: G132-855

Matrix: Water

Date Collected: 4/11/01

Date Received: 4/13/01

Date Analyzed: 4/19/01

Analyzed By: MRC

Dilution: 1

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Indeno(1,2,3-c,d)pyrene	10	BQL
Isophorone	10	BQL
N-Nitrosodi-n-propylamine	10	BQL
N-Nitrosodiphenylamine	10	BQL
Naphthalene	10	BQL
Nitrobenzene	10	BQL
2-Nitrophenol	10	BQL
4-Nitrophenol	50	BQL
Pentachlorophenol	50	BQL
Phenanthrene	10	BQL
Phenol	10	BQL
Pyrene	10	BQL
1,2,4-Trichlorobenzene	10	BQL
2,4,6-Trichlorophenol	10	BQL

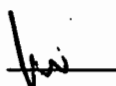
Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	8.0	80
2-Fluorophenol	10	8.0	80
Nitrobenzene-d5	10	7.2	72
Phenol-d6	10	7.1	71
2,4,6-Tribromophenol	10	7.2	72
4-Terphenyl-d14	10	7.5	75

Comments:

Results are corrected for %solids and dilution where applicable.

Flags:

BQL = Below Quantitation Limit.

Reviewed By: 

PARADIGM ANALYTICAL LABORATORIES, INC.

Results of Library Search for Semivolatile Compounds
by GCMS

Client Sample ID: USTH19-GW02-01B
Client Project ID: H-19
Lab Sample ID: 18459
Lab Project ID: G132-855
Matrix: Water

Date Collected: 4/11/01
Date Received: 4/13/01
Date Analyzed: 4/19/01
Analyzed By: MRC
Dilution: 1

Num.	Compound	CAS#	Match Probability	Result (ug/L)
1	No library search compounds detected.			
2				
3				
4				
5				
6				
7				
8				
9				
10				

Comment:

Tentatively Identified Compound (TIC) refers to substances which are not present in the list of target compounds. Therefore, not all TICs are identified and quantitated using individual standards. TIC listings are prepared utilizing a computerized library search of electron impact mass spectral data and evaluation of the relevant data by a mass spectral data specialist.

Quantitation is accomplished by relative peak height of the compound compared to that of the nearest internal standard from the total ion chromatogram. TICs are identified and quantitated only if the peak height is equal to or greater than 10% of that of the nearest internal standard. Quantitation provided is an estimate.

Reviewed by: 

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Metals

Client Sample ID: USTH19-GW02-01B
Client Project ID: H-19
Lab Sample ID: 18459
Lab Project ID: G132-855
Batch ID: 1911

Analyzed By: RML
Date Collected: 4/11/01
Date Received: 4/13/01
Matrix: Water

Metals	Result	Quantitation Limit	DF	Units	Method	Date Analyzed
Chromium	BQL	0.0100	1	MG/L	6010B	4/24/01
Lead	0.0105	0.0100	1	MG/L	6010B	4/24/01

Comments

BQL = Below Quantitation Limits

DF = Dilution Factor

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: LAW ENGINEERINGProject Name: H-19

Sample Information and Analytical Results	
Sample Identification	USTH19-GW02-01B
Sample Matrix	Water
Collection Option (for Soil)*	
Date Collected	04/11/01
Date Received	04/13/01
Date Extracted	04/19/01
Date Analyzed	04/19/01
Dry Weight	
Dilution Factor	1
C ₅ -C ₈ Aliphatics**	< 100 (µg/L)
C ₉ -C ₁₂ Aliphatics**	< 100 (µg/L)
C ₉ -C ₁₀ Aromatics**	< 100 (µg/L)
Surrogate % Recovery - PID	74
Surrogate % Recovery - FID	100

* = Option 1 = Established fill line on vial, Option 2 = Sampling Device/Brand, or Option 3 = Field weight of soil.

** = Excludes any surrogates or internal standards.

Lab Info: G132-855-18459

Reviewed By: Law

PARADIGM ANALYTICAL LABORATORIES, INC.

EPH (Aliphatics/Aromatics) Results

by MDEP-EPH

Client Name: LAW ENGINEERING

Project Name: H-19

Sample Information and Analytical Results	
Sample Identification	USTH19-GW02-01B
Sample Matrix	Water
Date Collected	04/11/01
Date Received	04/13/01
Date Extracted	04/18/01
Date Analyzed	04/20/01
Dry Weight	
Dilution Factor	1
C ₉ -C ₁₈ Aliphatics*	< 100 (µg/L)
C ₁₉ -C ₃₈ Aliphatics*	< 100 (µg/L)
C ₁₁ -C ₂₂ Aromatics*	< 100 (µg/L)
Aliphatic Surrogate % Recovery	120
Aromatic Surrogate % Recovery	96

Comments:

* = Excludes any surrogates or internal standards.
Sample did not require fractionation.

Lab info: G132-855-18459

Reviewed By: 

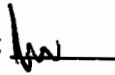
PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles by GCMS 6210D

Client Sample ID: USTH19-GW03-01B
 Client Project ID: H-19
 Lab Sample ID: 18458
 Lab Project ID: G132-855
 Matrix: Water

Date Analyzed: 4/20/01
 Analyzed By: EKR
 Date Collected: 4/11/01
 Date Received: 4/13/01
 Dilution: 1.0

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Benzene	0.5	BQL
Bromobenzene	0.5	BQL
Bromochloromethane	0.5	BQL
Bromodichloromethane	0.5	BQL
Bromoform	0.5	BQL
Bromomethane	0.5	BQL
n-Butylbenzene	0.5	BQL
sec-Butylbenzene	0.5	BQL
tert-Butylbenzene	0.5	BQL
Carbon tetrachloride	0.5	BQL
Chlorobenzene	0.5	BQL
Chloroethane	0.5	BQL
Chloroform	0.5	BQL
Chloromethane	0.5	BQL
2-Chlorotoluene	0.5	BQL
4-Chlorotoluene	0.5	BQL
Dibromochloromethane	0.5	BQL
1,2-Dibromo-3-chloropropane	5	BQL
Dibromomethane	0.5	BQL
1,2-Dibromoethane (EDB)	0.5	BQL
1,2-Dichlorobenzene	0.5	BQL
1,3-Dichlorobenzene	0.5	BQL
1,4-Dichlorobenzene	0.5	BQL
1,1-Dichloroethane	0.5	BQL
1,1-Dichloroethene	0.5	BQL
1,2-Dichloroethane	0.5	BQL
cis-1,2-Dichloroethene	0.5	BQL
trans-1,2-dichloroethene	0.5	BQL
1,2-Dichloropropane	0.5	BQL
1,3-Dichloropropane	0.5	BQL
2,2-Dichloropropane	0.5	BQL
1,1-Dichloropropene	0.5	BQL
Dichlorodifluoromethane	5	BQL
Diisopropyl ether (DIPE)	0.5	BQL
Ethylbenzene	0.5	BQL
Hexachlorobutadiene	0.5	BQL
Isopropylbenzene	0.5	BQL
4-Isopropyltoluene	0.5	BQL
Methylene chloride	5	BQL
Methyl-tert-butyl ether (MTBE)	0.5	BQL

Reviewed by: 

Flags: BQL = Below Quantitation Limit

N.C. Certification #481 S.C. Certification #99029

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PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles by GCMS 6210D

Client Sample ID: USTH19-GW03-01B
 Client Project ID: H-19
 Lab Sample ID: 18458
 Lab Project ID: G132-855
 Matrix: Water

Date Analyzed: 4/20/01
 Analyzed By: EKR
 Date Collected: 4/11/01
 Date Received: 4/13/01
 Dilution: 1.0

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Naphthalene	0.5	BQL
n-Propyl benzene	0.5	BQL
Styrene	0.5	BQL
1,1,1,2-Tetrachloroethane	0.5	BQL
1,1,2,2-Tetrachloroethane	0.5	BQL
Tetrachloroethene	0.5	BQL
Toluene	0.5	BQL
1,2,3-Trichlorobenzene	0.5	BQL
1,2,4-Trichlorobenzene	0.5	BQL
Trichloroethene	0.5	BQL
1,1,1-Trichloroethane	0.5	BQL
1,1,2-Trichloroethane	0.5	BQL
Trichlorofluoromethane	0.5	BQL
1,2,3-Trichloropropane	0.5	BQL
1,2,4-Trimethylbenzene	0.5	BQL
1,3,5-Trimethylbenzene	0.5	BQL
Vinyl chloride	0.5	BQL
m-,p-Xylene	1	BQL
o-Xylene	0.5	BQL

Surrogate Spike Recoveries	Spike Added (ug/L)	Surrogate Result (ug/L)	%Rec
Compound			
Bromofluorobenzene	10.0	10.4	104
1,2-Dichloroethane-d4	10.0	11.3	113
Toluene-d8	10.0	10.2	102

Comments:

All results are corrected for dilution.

Reviewed by: 

Flags: BQL = Below Quantitation Limit

N.C. Certification #481 S.C. Certification #99029

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatiles by GCMS 625

Client Sample ID: USTH19-GW03-01B

Client Project ID: H-19

Lab Sample ID: 18458

Lab Project ID: G132-855

Matrix: Water

Date Collected: 4/11/01

Date Received: 4/13/01

Date Analyzed: 4/20/01

Analyzed By: MRC

Dilution: 1

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Acenaphthene	10	BQL
Acenaphthylene	10	BQL
Anthracene	10	BQL
Benzo[a]anthracene	10	BQL
Benzo[a]pyrene	10	BQL
Benzo[b]fluoranthene	10	BQL
Benzo[g,h,i]perylene	10	BQL
Benzo[k]fluoranthene	10	BQL
Bis(2-chloroethoxy)methane	10	BQL
Bis(2-chloroethyl)ether	10	BQL
Bis(2-chloroisopropyl)ether	10	BQL
Bis(2-ethylhexyl)phthalate	10	BQL
4-bromophenyl phenyl ether	10	BQL
Butylbenzylphthalate	10	BQL
4-Chloro-3-methylphenol	10	BQL
2-Chloronaphthalene	10	BQL
2-Chlorophenol	10	BQL
4-Chlorophenyl phenyl ether	10	BQL
Chrysene	10	BQL
Di-n-Butylphthalate	10	BQL
Di-n-octylphthalate	10	BQL
Dibenzo[a,h]anthracene	10	BQL
1,2-Dichlorobenzene	10	BQL
1,3-Dichlorobenzene	10	BQL
1,4-Dichlorobenzene	10	BQL
3,3'-Dichlorobenzidine	20	BQL
2,4-Dichlorophenol	10	BQL
Diethylphthalate	10	BQL
2,4-Dimethylphenol	10	BQL
Dimethylphthalate	10	BQL
4,6-Dinitro-2-methylphenol	50	BQL
2,4-Dinitrophenol	50	BQL
2,4-Dinitrotoluene	10	BQL
2,6-Dinitrotoluene	10	BQL
Fluoranthene	10	BQL
Fluorene	10	BQL
Hexachlorobenzene	10	BQL
Hexachlorobutadiene	10	BQL
Hexachlorocyclopentadiene	20	BQL
Hexachloroethane	10	BQL

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatiles by GCMS 625

Client Sample ID: USTH19-GW03-01B

Client Project ID: H-19

Lab Sample ID: 18458

Lab Project ID: G132-855

Matrix: Water

Date Collected: 4/11/01

Date Received: 4/13/01

Date Analyzed: 4/20/01

Analyzed By: MRC

Dilution: 1

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Indeno(1,2,3-c,d)pyrene	10	BQL
Isophorone	10	BQL
N-Nitrosodi-n-propylamine	10	BQL
N-Nitrosodiphenylamine	10	BQL
Naphthalene	10	BQL
Nitrobenzene	10	BQL
2-Nitrophenol	10	BQL
4-Nitrophenol	50	BQL
Pentachlorophenol	50	BQL
Phenanthrene	10	BQL
Phenol	10	BQL
Pyrene	10	BQL
1,2,4-Trichlorobenzene	10	BQL
2,4,6-Trichlorophenol	10	BQL

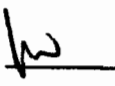
Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	8.6	86
2-Fluorophenol	10	9.2	92
Nitrobenzene-d5	10	8.4	84
Phenol-d6	10	8.5	85
2,4,6-Tribromophenol	10	9.4	94
4-Terphenyl-d14	10	4.9	49

Comments:

Results are corrected for %solids and dilution where applicable.

Flags:

BQL = Below Quantitation Limit.

Reviewed By: 

PARADIGM ANALYTICAL LABORATORIES, INC.

Results of Library Search for Semivolatile Compounds
by GCMS

Client Sample ID: USTH19-GW03-01B
Client Project ID: H-19
Lab Sample ID: 18458
Lab Project ID: G132-855
Matrix: Water

Date Collected: 4/11/01
Date Received: 4/13/01
Date Analyzed: 4/20/01
Analyzed By: MRC
Dilution: 1

Num.	Compound	CAS#	Match Probability	Result (ug/L)
1	Unknown			18
2	Unknown			4.6
3				
4				
5				
6				
7				
8				
9				
10				

Comment:

Tentatively Identified Compound (TIC) refers to substances which are not present in the list of target compounds. Therefore, not all TICs are identified and quantitated using individual standards. TIC listings are prepared utilizing a computerized library search of electron impact mass spectral data and evaluation of the relevant data by a mass spectral data specialist.

Quantitation is accomplished by relative peak height of the compound compared to that of the nearest internal standard from the total ion chromatogram. TICs are identified and quantitated only if the peak height is equal to or greater than 10% of that of the nearest internal standard. Quantitation provided is an estimate.

Reviewed by: hw

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Metals

Client Sample ID: USTH19-GW03-01B
Client Project ID: H-19
Lab Sample ID: 18458
Lab Project ID: G132-855
Batch ID: 1911

Analyzed By: RML
Date Collected: 4/11/01
Date Received: 4/13/01
Matrix: Water

Metals	Result	Quantitation Limit	DF	Units	Method	Date Analyzed
Chromium	BQL	0.0100	1	MG/L	6010B	4/24/01
Lead	0.0101	0.0100	1	MG/L	6010B	4/24/01

Comments

BQL = Below Quantitation Limits
DF = Dilution Factor

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: LAW ENGINEERINGProject Name: H-19

Sample Information and Analytical Results	
Sample Identification	USTH19-GW03-01B
Sample Matrix	Water
Collection Option (for Soil)*	
Date Collected	04/11/01
Date Received	04/13/01
Date Extracted	04/19/01
Date Analyzed	04/19/01
Dry Weight	
Dilution Factor	1
C ₅ -C ₈ Aliphatics**	< 100 (µg/L)
C ₉ -C ₁₂ Aliphatics**	< 100 (µg/L)
C ₉ -C ₁₀ Aromatics**	< 100 (µg/L)
Surrogate % Recovery - PID	81
Surrogate % Recovery - FID	120

* = Option 1 = Established fill line on vial, Option 2 = Sampling Device/Brand, or Option 3 = Field weight of soil.

** = Excludes any surrogates or internal standards.

Lab Info: G132-855-18458

Reviewed By: 

EPH (Aliphatics/Aromatics) Results

by MDEP-EPH

Client Name: LAW ENGINEERINGProject Name: H-19

Sample Information and Analytical Results	
Sample Identification	USTH19-GW03-01B
Sample Matrix	Water
Date Collected	04/11/01
Date Received	04/13/01
Date Extracted	04/18/01
Date Analyzed	04/23/01
Dry Weight	
Dilution Factor	1
C ₉ -C ₁₆ Aliphatics*	< 100 (µg/L)
C ₁₉ -C ₃₆ Aliphatics*	< 100 (µg/L)
C ₁₁ -C ₂₂ Aromatics*	< 100 (µg/L)
Aliphatic Surrogate % Recovery	36
Aromatic Surrogate % Recovery	54

Comments:

- * = Excludes any surrogates or internal standards.
Sample did not require fractionation.

Lab info: G132-855-18458

Reviewed By: lw

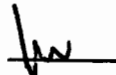
PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles by GCMS 6210D

Client Sample ID: USTH19-GW05-01B
Client Project ID: H-19
Lab Sample ID: 18457
Lab Project ID: G132-855
Matrix: Water

Date Analyzed: 4/20/01
Analyzed By: EKR
Date Collected: 4/11/01
Date Received: 4/13/01
Dilution: 1.0

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Benzene	0.5	BQL
Bromobenzene	0.5	BQL
Bromochloromethane	0.5	BQL
Bromodichloromethane	0.5	BQL
Bromoform	0.5	BQL
Bromomethane	0.5	BQL
n-Butylbenzene	0.5	BQL
sec-Butylbenzene	0.5	BQL
tert-Butylbenzene	0.5	BQL
Carbon tetrachloride	0.5	BQL
Chlorobenzene	0.5	BQL
Chloroethane	0.5	BQL
Chloroform	0.5	BQL
Chloromethane	0.5	BQL
2-Chlorotoluene	0.5	BQL
4-Chlorotoluene	0.5	BQL
Dibromochloromethane	0.5	BQL
1,2-Dibromo-3-chloropropane	5	BQL
Dibromomethane	0.5	BQL
1,2-Dibromoethane (EDB)	0.5	BQL
1,2-Dichlorobenzene	0.5	BQL
1,3-Dichlorobenzene	0.5	BQL
1,4-Dichlorobenzene	0.5	BQL
1,1-Dichloroethane	0.5	BQL
1,1-Dichloroethene	0.5	BQL
1,2-Dichloroethane	0.5	BQL
cis-1,2-Dichloroethene	0.5	BQL
trans-1,2-dichloroethene	0.5	BQL
1,2-Dichloropropane	0.5	BQL
1,3-Dichloropropane	0.5	BQL
2,2-Dichloropropane	0.5	BQL
1,1-Dichloropropene	0.5	BQL
Dichlorodifluoromethane	5	BQL
Diisopropyl ether (DIPE)	0.5	BQL
Ethylbenzene	0.5	BQL
Hexachlorobutadiene	0.5	BQL
Isopropylbenzene	0.5	BQL
4-Isopropyltoluene	0.5	BQL
Methylene chloride	5	BQL
Methyl-tert-butyl ether (MTBE)	0.5	BQL

Reviewed by: 

Flags: BQL = Below Quantitation Limit

N.C. Certification #481 S.C. Certification #99029

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PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles by GCMS 6210D

Client Sample ID: USTH19-GW05-01B
 Client Project ID: H-19
 Lab Sample ID: 18457
 Lab Project ID: G132-855
 Matrix: Water

Date Analyzed: 4/20/01
 Analyzed By: EKR
 Date Collected: 4/11/01
 Date Received: 4/13/01
 Dilution: 1.0

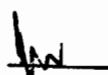
Compound	Quantitation Limit (ug/L)	Result (ug/L)
Naphthalene	0.5	BQL
n-Propyl benzene	0.5	BQL
Styrene	0.5	BQL
1,1,1,2-Tetrachloroethane	0.5	BQL
1,1,2,2-Tetrachloroethane	0.5	BQL
Tetrachloroethene	0.5	BQL
Toluene	0.5	BQL
1,2,3-Trichlorobenzene	0.5	BQL
1,2,4-Trichlorobenzene	0.5	BQL
Trichloroethene	0.5	BQL
1,1,1-Trichloroethane	0.5	BQL
1,1,2-Trichloroethane	0.5	BQL
Trichlorofluoromethane	0.5	BQL
1,2,3-Trichloropropane	0.5	BQL
1,2,4-Trimethylbenzene	0.5	BQL
1,3,5-Trimethylbenzene	0.5	BQL
Vinyl chloride	0.5	BQL
m-,p-Xylene	1	BQL
o-Xylene	0.5	BQL

Surrogate Spike Recoveries

Compound	Spike Added (ug/L)	Surrogate Result (ug/L)	%Rec
Bromofluorobenzene	10.0	10.4	104
1,2-Dichloroethane-d4	10.0	11.4	114
Toluene-d8	10.0	10.3	103

Comments:

All results are corrected for dilution.

Reviewed by: 

Flags: BQL = Below Quantitation Limit

N.C. Certification #481 S.C. Certification #99029

PARADIGM ANALYTICAL LABORATORIES, INC.

**Results for Semivolatiles
by GCMS 625**

Client Sample ID: USTH19-GW05-01B
Client Project ID: H-19
Lab Sample ID: 18457
Lab Project ID: G132-855
Matrix: Water

Date Collected: 4/11/01
Date Received: 4/13/01
Date Analyzed: 4/19/01
Analyzed By: MRC
Dilution: 1

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Acenaphthene	10	BQL
Acenaphthylene	10	BQL
Anthracene	10	BQL
Benzo[a]anthracene	10	BQL
Benzo[a]pyrene	10	BQL
Benzo[b]fluoranthene	10	BQL
Benzo[g,h,i]perylene	10	BQL
Benzo[k]fluoranthene	10	BQL
Bis(2-chloroethoxy)methane	10	BQL
Bis(2-chloroethyl)ether	10	BQL
Bis(2-chloroisopropyl)ether	10	BQL
Bis(2-ethylhexyl)phthalate	10	BQL
4-bromophenyl phenyl ether	10	BQL
Butylbenzylphthalate	10	BQL
4-Chloro-3-methylphenol	10	BQL
2-Chloronaphthalene	10	BQL
2-Chlorophenol	10	BQL
4-Chlorophenyl phenyl ether	10	BQL
Chrysene	10	BQL
Di-n-Butylphthalate	10	BQL
Di-n-octylphthalate	10	BQL
Dibenzo[a,h]anthracene	10	BQL
1,2-Dichlorobenzene	10	BQL
1,3-Dichlorobenzene	10	BQL
1,4-Dichlorobenzene	10	BQL
3,3'-Dichlorobenzidine	20	BQL
2,4-Dichlorophenol	10	BQL
Diethylphthalate	10	BQL
2,4-Dimethylphenol	10	BQL
Dimethylphthalate	10	BQL
4,6-Dinitro-2-methylphenol	50	BQL
2,4-Dinitrophenol	50	BQL
2,4-Dinitrotoluene	10	BQL
2,6-Dinitrotoluene	10	BQL
Fluoranthene	10	BQL
Fluorene	10	BQL
Hexachlorobenzene	10	BQL
Hexachlorobutadiene	10	BQL
Hexachlorocyclopentadiene	20	BQL
Hexachloroethane	10	BQL

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatiles by GCMS 625

Client Sample ID: USTH19-GW05-01B

Client Project ID: H-19

Lab Sample ID: 18457

Lab Project ID: G132-855

Matrix: Water

Date Collected: 4/11/01

Date Received: 4/13/01

Date Analyzed: 4/19/01

Analyzed By: MRC

Dilution: 1

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Indeno(1,2,3-c,d)pyrene	10	BQL
Isophorone	10	BQL
N-Nitrosodi-n-propylamine	10	BQL
N-Nitrosodiphenylamine	10	BQL
Naphthalene	10	BQL
Nitrobenzene	10	BQL
2-Nitrophenol	10	BQL
4-Nitrophenol	50	BQL
Pentachlorophenol	50	BQL
Phenanthrene	10	BQL
Phenol	10	BQL
Pyrene	10	BQL
1,2,4-Trichlorobenzene	10	BQL
2,4,6-Trichlorophenol	10	BQL

Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	8.6	86
2-Fluorophenol	10	8.2	82
Nitrobenzene-d5	10	8.0	80
Phenol-d6	10	7.7	77
2,4,6-Tribromophenol	10	8.3	83
4-Terphenyl-d14	10	8.1	81

Comments:

Results are corrected for %solids and dilution where applicable.

Flags:

BQL = Below Quantitation Limit.

Reviewed By: LN

PARADIGM ANALYTICAL LABORATORIES, INC.

Results of Library Search for Semivolatile Compounds
by GCMS

Client Sample ID: USTH19-GW05-01B
Client Project ID: H-19
Lab Sample ID: 18457
Lab Project ID: G132-855
Matrix: Water

Date Collected: 4/11/01
Date Received: 4/13/01
Date Analyzed: 4/19/01
Analyzed By: MRC
Dilution: 1

Num.	Compound	CAS#	Match Probability	Result (ug/L)
1	No library search compounds detected.			
2				
3				
4				
5				
6				
7				
8				
9				
10				

Comment:

Tentatively Identified Compound (TIC) refers to substances which are not present in the list of target compounds. Therefore, not all TICs are identified and quantitated using individual standards. TIC listings are prepared utilizing a computerized library search of electron impact mass spectral data and evaluation of the relevant data by a mass spectral data specialist.

Quantitation is accomplished by relative peak height of the compound compared to that of the nearest internal standard from the total ion chromatogram. TICs are identified and quantitated only if the peak height is equal to or greater than 10% of that of the nearest internal standard. Quantitation provided is an estimate.

Reviewed by: 

PARADIGM ANALYTICAL LABORATORIES, INC.**Results for Metals**

Client Sample ID: USTH19-GW05-01B

Analyzed By: RML

Client Project ID: H-19

Date Collected: 4/11/01

Lab Sample ID: 18457

Date Received: 4/13/01

Lab Project ID: G132-855

Matrix: Water

Batch ID: 1911

Metals	Result	Quantitation Limit	DF	Units	Method	Date Analyzed
Chromium	BQL	0.0100	1	MG/L	6010B	4/24/01
Lead	BQL	0.0100	1	MG/L	6010B	4/24/01

Comments

BQL = Below Quantitation Limits

DF = Dilution Factor

PARADIGM ANALYTICAL LABORATORIES, INC.

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: LAW ENGINEERING

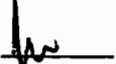
Project Name: H-19

Sample Information and Analytical Results	
Sample Identification	USTH19-GW05-01B
Sample Matrix	Water
Collection Option (for Soil)*	
Date Collected	04/11/01
Date Received	04/13/01
Date Extracted	04/19/01
Date Analyzed	04/19/01
Dry Weight	
Dilution Factor	1
C ₅ -C ₈ Aliphatics**	< 100 (µg/L)
C ₉ -C ₁₂ Aliphatics**	< 100 (µg/L)
C ₉ -C ₁₀ Aromatics**	< 100 (µg/L)
Surrogate % Recovery - PID	83
Surrogate % Recovery - FID	120

* = Option 1 = Established fill line on vial, Option 2 = Sampling Device/Brand, or Option 3 = Field weight of soil.

** = Excludes any surrogates or internal standards.

Lab Info: G132-855-18457

Reviewed By: 

EPH (Aliphatics/Aromatics) Results

by MDEP-EPH

Client Name: LAW ENGINEERING

Project Name: H-19

Sample Information and Analytical Results	
Sample Identification	USTH19-GW05-01B
Sample Matrix	Water
Date Collected	04/11/01
Date Received	04/13/01
Date Extracted	04/18/01
Date Analyzed	04/20/01
Dry Weight	
Dilution Factor	1
C ₉ -C ₁₈ Aliphatics*	< 100 (µg/L)
C ₁₉ -C ₃₆ Aliphatics*	< 100 (µg/L)
C ₁₁ -C ₂₂ Aromatics*	< 100 (µg/L)
Aliphatic Surrogate % Recovery	32
Aromatic Surrogate % Recovery	51

Comments:

* = Excludes any surrogates or internal standards.

Sample did not require fractionation.

Lab info: G132-855-18457

Reviewed By: 

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 6210D

Client Sample ID: USTH19-GW07-01B

Client Project ID: H-19

Lab Sample ID: 18456

Lab Project ID: G132-855

Matrix: Water

Date Analyzed: 4/20/01

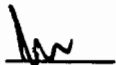
Analyzed By: EKR

Date Collected: 4/11/01

Date Received: 4/13/01

Dilution: 1.0

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Benzene	0.5	BQL
Bromobenzene	0.5	BQL
Bromochloromethane	0.5	BQL
Bromodichloromethane	0.5	BQL
Bromoform	0.5	BQL
Bromomethane	0.5	BQL
n-Butylbenzene	0.5	3
sec-Butylbenzene	0.5	7
tert-Butylbenzene	0.5	1
Carbon tetrachloride	0.5	BQL
Chlorobenzene	0.5	BQL
Chloroethane	0.5	BQL
Chloroform	0.5	BQL
Chloromethane	0.5	BQL
2-Chlorotoluene	0.5	BQL
4-Chlorotoluene	0.5	BQL
Dibromochloromethane	0.5	BQL
1,2-Dibromo-3-chloropropane	5	BQL
Dibromomethane	0.5	BQL
1,2-Dibromoethane (EDB)	0.5	BQL
1,2-Dichlorobenzene	0.5	BQL
1,3-Dichlorobenzene	0.5	BQL
1,4-Dichlorobenzene	0.5	BQL
1,1-Dichloroethane	0.5	BQL
1,1-Dichloroethene	0.5	BQL
1,2-Dichloroethane	0.5	BQL
cis-1,2-Dichloroethene	0.5	BQL
trans-1,2-dichloroethene	0.5	BQL
1,2-Dichloropropane	0.5	BQL
1,3-Dichloropropane	0.5	BQL
2,2-Dichloropropane	0.5	BQL
1,1-Dichloropropene	0.5	BQL
Dichlorodifluoromethane	5	BQL
Diisopropyl ether (DIPE)	0.5	BQL
Ethylbenzene	0.5	BQL
Hexachlorobutadiene	0.5	BQL
Isopropylbenzene	0.5	8
4-Isopropyltoluene	0.5	0.8
Methylene chloride	5	BQL
Methyl-tert-butyl ether (MTBE)	0.5	BQL

Reviewed by: 

Flags: BQL = Below Quantitation Limit

N.C. Certification #481 S.C. Certification #99029

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PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 6210D

Client Sample ID: USTH19-GW07-01B

Client Project ID: H-19

Lab Sample ID: 18456

Lab Project ID: G132-855

Matrix: Water

Date Analyzed: 4/20/01

Analyzed By: EKR

Date Collected: 4/11/01

Date Received: 4/13/01

Dilution: 1.0

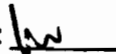
Compound	Quantitation Limit (ug/L)	Result (ug/L)
Naphthalene	0.5	1
n-Propyl benzene	0.5	BQL
Styrene	0.5	BQL
1,1,1,2-Tetrachloroethane	0.5	BQL
1,1,2,2-Tetrachloroethane	0.5	BQL
Tetrachloroethene	0.5	BQL
Toluene	0.5	BQL
1,2,3-Trichlorobenzene	0.5	BQL
1,2,4-Trichlorobenzene	0.5	BQL
Trichloroethene	0.5	BQL
1,1,1-Trichloroethane	0.5	BQL
1,1,2-Trichloroethane	0.5	BQL
Trichlorofluoromethane	0.5	BQL
1,2,3-Trichloropropane	0.5	BQL
1,2,4-Trimethylbenzene	0.5	0.7
1,3,5-Trimethylbenzene	0.5	BQL
Vinyl chloride	0.5	BQL
m-,p-Xylene	1	BQL
o-Xylene	0.5	BQL

Surrogate Spike Recoveries

Compound	Spike Added (ug/L)	Surrogate Result (ug/L)	%Rec
Bromofluorobenzene	10.0	10.5	105
1,2-Dichloroethane-d4	10.0	11.3	113
Toluene-d8	10.0	10.4	104

Comments:

All results are corrected for dilution.

Reviewed by: 

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatiles by GCMS 625

Client Sample ID: USTH19-GW07-01B
Client Project ID: H-19
Lab Sample ID: 18456
Lab Project ID: G132-855
Matrix: Water

Date Collected: 4/11/01
Date Received: 4/13/01
Date Analyzed: 4/20/01
Analyzed By: MRC
Dilution: 1

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Acenaphthene	10	BQL
Acenaphthylene	10	BQL
Anthracene	10	BQL
Benzo[a]anthracene	10	BQL
Benzo[a]pyrene	10	BQL
Benzo[b]fluoranthene	10	BQL
Benzo[g,h,i]perylene	10	BQL
Benzo[k]fluoranthene	10	BQL
Bis(2-chloroethoxy)methane	10	BQL
Bis(2-chloroethyl)ether	10	BQL
Bis(2-chloroisopropyl)ether	10	BQL
Bis(2-ethylhexyl)phthalate	10	BQL
4-bromophenyl phenyl ether	10	BQL
Butylbenzylphthalate	10	BQL
4-Chloro-3-methylphenol	10	BQL
2-Chloronaphthalene	10	BQL
2-Chlorophenol	10	BQL
4-Chlorophenyl phenyl ether	10	BQL
Chrysene	10	BQL
Di-n-Butylphthalate	10	BQL
Di-n-octylphthalate	10	BQL
Dibenzo[a,h]anthracene	10	BQL
1,2-Dichlorobenzene	10	BQL
1,3-Dichlorobenzene	10	BQL
1,4-Dichlorobenzene	10	BQL
3,3'-Dichlorobenzidine	20	BQL
2,4-Dichlorophenol	10	BQL
Diethylphthalate	10	BQL
2,4-Dimethylphenol	10	BQL
Dimethylphthalate	10	BQL
4,6-Dinitro-2-methylphenol	50	BQL
2,4-Dinitrophenol	50	BQL
2,4-Dinitrotoluene	10	BQL
2,6-Dinitrotoluene	10	BQL
Fluoranthene	10	BQL
Fluorene	10	BQL
Hexachlorobenzene	10	BQL
Hexachlorobutadiene	10	BQL
Hexachlorocyclopentadiene	20	BQL
Hexachloroethane	10	BQL

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatiles by GCMS 625

Client Sample ID: USTH19-GW07-01B
Client Project ID: H-19
Lab Sample ID: 18456
Lab Project ID: G132-855
Matrix: Water

Date Collected: 4/11/01
Date Received: 4/13/01
Date Analyzed: 4/20/01
Analyzed By: MRC
Dilution: 1

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Indeno(1,2,3-c,d)pyrene	10	BQL
Isophorone	10	BQL
N-Nitrosodi-n-propylamine	10	BQL
N-Nitrosodiphenylamine	10	BQL
Naphthalene	10	BQL
Nitrobenzene	10	BQL
2-Nitrophenol	10	BQL
4-Nitrophenol	50	BQL
Pentachlorophenol	50	BQL
Phenanthrene	10	BQL
Phenol	10	BQL
Pyrene	10	BQL
1,2,4-Trichlorobenzene	10	BQL
2,4,6-Trichlorophenol	10	BQL

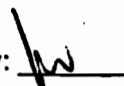
Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	8.6	86
2-Fluorophenol	10	8.7	87
Nitrobenzene-d5	10	8.0	80
Phenol-d6	10	8.0	80
2,4,6-Tribromophenol	10	7.5	75
4-Terphenyl-d14	10	5.7	57

Comments:

Results are corrected for %solids and dilution where applicable.

Flags:

BQL = Below Quantitation Limit.

Reviewed By: 

Results of Library Search for Semivolatile Compounds
by GCMS

Client Sample ID: USTH19-GW07-01B

Client Project ID: H-19

Lab Sample ID: 18456

Lab Project ID: G132-855

Matrix: Water

Date Collected: 4/11/01

Date Received: 4/13/01

Date Analyzed: 4/20/01

Analyzed By: MRC

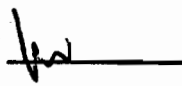
Dilution: 1

Num.	Compound	CAS#	Match Probability	Result (ug/L)
1	Unknown			5.9
2	Unknown			4.8
3	Unknown			4.5
4	Unknown			4
5				
6				
7				
8				
9				
10				

Comment:

Tentatively Identified Compound (TIC) refers to substances which are not present in the list of target compounds. Therefore, not all TICs are identified and quantitated using individual standards. TIC listings are prepared utilizing a computerized library search of electron impact mass spectral data and evaluation of the relevant data by a mass spectral data specialist.

Quantitation is accomplished by relative peak height of the compound compared to that of the nearest internal standard from the total ion chromatogram. TICs are identified and quantitated only if the peak height is equal to or greater than 10% of that of the nearest internal standard. Quantitation provided is an estimate.

Reviewed by: 

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Metals

Client Sample ID: USTH19-GW07-01B
Client Project ID: H-19
Lab Sample ID: 18456
Lab Project ID: G132-855
Batch ID: 1911

Analyzed By: RML
Date Collected: 4/11/01
Date Received: 4/13/01
Matrix: Water

Metals	Result	Quantitation Limit	DF	Units	Method	Date Analyzed
Chromium	BQL	0.0100	1	MG/L	6010B	4/24/01
Lead	BQL	0.0100	1	MG/L	6010B	4/24/01

Comments

BQL = Below Quantitation Limits

DF = Dilution Factor

PARADIGM ANALYTICAL LABORATORIES, INC.

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: LAW ENGINEERING

Project Name: H-19

Sample Information and Analytical Results	
Sample Identification	USTH19-GW07-01B
Sample Matrix	Water
Collection Option (for Soil)*	
Date Collected	04/11/01
Date Received	04/13/01
Date Extracted	04/19/01
Date Analyzed	04/19/01
Dry Weight	
Dilution Factor	1
C ₅ -C ₈ Aliphatics**	< 100 (µg/L)
C ₉ -C ₁₂ Aliphatics**	260 (µg/L)
C ₉ -C ₁₀ Aromatics**	< 100 (µg/L)
Surrogate % Recovery - PID	95
Surrogate % Recovery - FID	130

* = Option 1 = Established fill line on vial, Option 2 = Sampling Device/Brand, or Option 3 = Field weight of soil.

** = Excludes any surrogates or internal standards.

Lab Info: G132-855-18456

Reviewed By: [Signature]

EPH (Aliphatics/Aromatics) Results

by MDEP-EPH

Client Name: LAW ENGINEERING

Project Name: H-19

Sample Information and Analytical Results	
Sample Identification	USTH19-GW07-01B
Sample Matrix	Water
Date Collected	04/11/01
Date Received	04/13/01
Date Extracted	04/18/01
Date Analyzed	04/23/01
Dry Weight	
Dilution Factor	1
C ₉ -C ₁₈ Aliphatics*	< 100 (µg/L)
C ₁₉ -C ₃₆ Aliphatics*	< 100 (µg/L)
C ₁₁ -C ₂₂ Aromatics*	< 100 (µg/L)
Aliphatic Surrogate % Recovery	29
Aromatic Surrogate % Recovery	80

Comments:

* = Excludes any surrogates or internal standards.

Sample did not require fractionation.

Low surrogate confirmed by duplicate analysis.

Lab info: G132-855-18456

Reviewed By:

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 6210D

Client Sample ID: Trip Blank

Client Project ID: H-19

Lab Sample ID: 18462

Lab Project ID: G132-855

Matrix: Water

Date Analyzed: 4/20/01

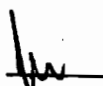
Analyzed By: EKR

Date Collected: 4/11/01

Date Received: 4/13/01

Dilution: 1.0

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Benzene	0.5	BQL
Bromobenzene	0.5	BQL
Bromochloromethane	0.5	BQL
Bromodichloromethane	0.5	BQL
Bromoform	0.5	BQL
Bromomethane	0.5	BQL
n-Butylbenzene	0.5	BQL
sec-Butylbenzene	0.5	BQL
tert-Butylbenzene	0.5	BQL
Carbon tetrachloride	0.5	BQL
Chlorobenzene	0.5	BQL
Chloroethane	0.5	BQL
Chloroform	0.5	BQL
Chloromethane	0.5	BQL
2-Chlorotoluene	0.5	BQL
4-Chlorotoluene	0.5	BQL
Dibromochloromethane	0.5	BQL
1,2-Dibromo-3-chloropropane	5	BQL
Dibromomethane	0.5	BQL
1,2-Dibromoethane (EDB)	0.5	BQL
1,2-Dichlorobenzene	0.5	BQL
1,3-Dichlorobenzene	0.5	BQL
1,4-Dichlorobenzene	0.5	BQL
1,1-Dichloroethane	0.5	BQL
1,1-Dichloroethene	0.5	BQL
1,2-Dichloroethane	0.5	BQL
cis-1,2-Dichloroethene	0.5	BQL
trans-1,2-dichloroethene	0.5	BQL
1,2-Dichloropropane	0.5	BQL
1,3-Dichloropropane	0.5	BQL
2,2-Dichloropropane	0.5	BQL
1,1-Dichloropropene	0.5	BQL
Dichlorodifluoromethane	5	BQL
Diisopropyl ether (DIPE)	0.5	BQL
Ethylbenzene	0.5	BQL
Hexachlorobutadiene	0.5	BQL
Isopropylbenzene	0.5	BQL
4-Isopropyltoluene	0.5	BQL
Methylene chloride	5	BQL
Methyl-tert-butyl ether (MTBE)	0.5	BQL

Reviewed by: 

Flags: BQL = Below Quantitation Limit

N.C. Certification #481 S.C. Certification #99029

Page 1

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles by GCMS 6210D

Client Sample ID: Trip Blank
Client Project ID: H-19
Lab Sample ID: 18462
Lab Project ID: G132-855
Matrix: Water

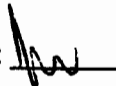
Date Analyzed: 4/20/01
Analyzed By: EKR
Date Collected: 4/11/01
Date Received: 4/13/01
Dilution: 1.0

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Naphthalene	0.5	BQL
n-Propyl benzene	0.5	BQL
Styrene	0.5	BQL
1,1,1,2-Tetrachloroethane	0.5	BQL
1,1,2,2-Tetrachloroethane	0.5	BQL
Tetrachloroethene	0.5	BQL
Toluene	0.5	BQL
1,2,3-Trichlorobenzene	0.5	BQL
1,2,4-Trichlorobenzene	0.5	BQL
Trichloroethene	0.5	BQL
1,1,1-Trichloroethane	0.5	BQL
1,1,2-Trichloroethane	0.5	BQL
Trichlorofluoromethane	0.5	BQL
1,2,3-Trichloropropane	0.5	BQL
1,2,4-Trimethylbenzene	0.5	BQL
1,3,5-Trimethylbenzene	0.5	BQL
Vinyl chloride	0.5	BQL
m,p-Xylene	1	BQL
o-Xylene	0.5	BQL

Surrogate Spike Recoveries		Spike Added	Surrogate Result	%Rec
Compound		(ug/L)	(ug/L)	
Bromofluorobenzene		10.0	10.4	104
1,2-Dichloroethane-d4		10.0	11.3	113
Toluene-d8		10.0	10.2	102

Comments:

All results are corrected for dilution.

Reviewed by: 

PARADIGM ANALYTICAL LABORATORIES, INC.

Attachment 2

VPH Laboratory Reporting Form

Calibration and QA/QC Information

FID Initial Calibration Date: 12/02/00

PID Initial Calibration Date: 12/02/00

Calibration Ranges and Limits

Range	MDL		ML		RL	
	(µg/L)	(mg/Kg)	(µg/L)	(mg/Kg)	(µg/L)	(mg/Kg)
C ₅ -C ₈ Aliphatics	2.4	0.12	7.5	0.38	100	10
C ₉ -C ₁₂ Aliphatics	1.3	0.065	4.0	0.21	100	10
C ₉ -C ₁₀ Aromatics	0.5	0.025	1.6	0.08	100	10

Calibration Concentration Levels

Range	Levels		%RSD or CCC	Method of Quantitation
	(µg/L)	(mg/Kg)		
C ₅ -C ₈ Aliphatics	40	2	15.5	Calibration Factor
	160	8		
	400	20		
	1600	80		
	4000	200		
C ₉ -C ₁₂ Aliphatics	30	1.5	18.8	Calibration Factor
	120	6		
	300	15		
	1200	60		
	3000	150		
C ₉ -C ₁₀ Aromatics	65	3.25	21.4	Calibration Factor
	260	13		
	650	32.5		
	2600	130		
	6500	325		

Calibration Check Date: 04/18/01

Calibration Check

Range	Levels		RPD
	(µg/L)	(mg/Kg)	
C ₅ -C ₈ Aliphatics	400	20	-12.0
C ₉ -C ₁₂ Aliphatics	300	15	-13.0
C ₉ -C ₁₀ Aromatics	650	32.5	-3.2

MDL = Method Detection Limit

ML = Minimum Limit

RL = Reportable Limit

RPD = Relative Percent Difference

%RSD = Percent Relative Standard Deviation

CCC = Correlation Coefficient of Curve

Reviewed By: 

N.C. Certification #481 S.C. Certification #99029

PARADIGM ANALYTICAL LABORATORIES, INC.

Attachment 3

EPH Laboratory Reporting Form

Calibration and QA/QC Information

Initial Calibration Date: 04/05/01

Calibration Ranges and Limits

Range	MDL (mg/Kg)	(µg/L)	ML (mg/Kg)	(µg/L)	RL (mg/Kg)	(µg/L)
C ₉ -C ₁₈ Aliphatics	0.1	2	0.3	6.5	100	10
C ₁₉ -C ₃₆ Aliphatics	0.1	1	0.3	3.1	100	10
C ₁₁ -C ₂₂ Aromatics	0.2	2.5	0.6	8	100	10

Calibration Concentration Levels

Range	Levels (mg/Kg)	(µg/L)	%RSD or CCC	Method of Quantitation
C ₉ -C ₁₈ Aliphatics	0.06	1	5.70	Calibration Factor
	0.15	2.5		
	0.3	5		
	0.6	10		
	1.2	20		
C ₁₉ -C ₃₆ Aliphatics	0.08	1.33	7.0	Calibration Factor
	0.2	3.33		
	0.4	6.67		
	0.8	13.3		
	1.6	26.7		
C ₁₁ -C ₂₂ Aromatics	0.12	2	3.2	Calibration Factor
	0.3	5		
	0.6	10		
	1.2	20		
	2.4	40		

Calibration Check Date: 04/23/01

Calibration Check

Range	Levels (µg/mL)	(mg/Kg)	RPD
C ₉ -C ₁₈ Aliphatics	0.6	10	-3.6
C ₁₉ -C ₃₆ Aliphatics	0.8	13.3	-5.3
C ₁₁ -C ₂₂ Aromatics	1.2	20	-4.0

MDL = Method Detection Limit

ML = Minimum Limit

RL = Reportable Limit

RPD = Relative Percent Difference

%RSD = Percent Relative Standard Deviation

CCC = Correlation Coefficient of Curve

EPH Laboratory Reporting Form

Calibration and QA/QC Information

Initial Calibration Date: 04/05/01

Calibration Ranges and Limits

Range	MDL (mg/Kg)	(µg/L)	ML (mg/Kg)	(µg/L)	RL (mg/Kg)	(µg/L)
C ₉ -C ₁₈ Aliphatics	0.1	2	0.3	6.5	100	10
C ₁₉ -C ₃₆ Aliphatics	0.1	1	0.3	3.1	100	10
C ₁₁ -C ₂₂ Aromatics	0.2	2.5	0.6	8	100	10

Calibration Concentration Levels

Range	Levels (µg/L) (mg/Kg)	%RSD or CCC	Method of Quantitation
C ₉ -C ₁₈ Aliphatics	0.06 1	5.70	Calibration Factor
	0.15 2.5		
	0.3 5		
	0.6 10		
	1.2 20		
C ₁₉ -C ₃₆ Aliphatics	0.08 1.33	7.0	Calibration Factor
	0.2 3.33		
	0.4 6.67		
	0.8 13.3		
	1.6 26.7		
C ₁₁ -C ₂₂ Aromatics	0.12 2	3.2	Calibration Factor
	0.3 5		
	0.6 10		
	1.2 20		
	2.4 40		

Calibration Check Date: 04/20/01

Calibration Check

Range	Levels (µg/mL) (mg/Kg)	RPD
C ₉ -C ₁₈ Aliphatics	0.6 10	-5.0
C ₁₉ -C ₃₆ Aliphatics	0.8 13.3	-8.2
C ₁₁ -C ₂₂ Aromatics	1.2 20	-2.4

MDL = Method Detection Limit

ML = Minimum Limit

RL = Reportable Limit

RPD = Relative Percent Difference

%RSD = Percent Relative Standard Deviation

CCC = Correlation Coefficient of Curve

Client: LAW ENGINEERING Project ID: H-19

Address: 3301 ATLANTIC AVE
Contact: GILL DEGBALD

Address: LAURENCE NC 27604 Phone: 919 831 8051

Quote #: 1489 Fax: 515 831 8136

Date: 4/1/01

Turnaround: STANDARD

Job Number: 30749-6-0600 ✓

P.O. Number: 378

Report To: FILL DEOBALA

LAW KAREIGH

Invoice To LAW Corp-ATPAC

[illegible]

Appendix I

Summary Tables of Quarterly Groundwater Gauging Events

TABLE 1
BUILDING H-19
MONITORING WELL CASING
AND GROUNDWATER ELEVATIONS
SEPTEMBER 11, 2001

DATA POINT	TOP OF CASING ELEVATION (feet)	DEPTH TO WATER (feet)	FREE PRODUCT THICKNESS (feet)	WATER TABLE ELEVATION (feet)
UST H19-MW01	13.11	10.72	NMT	2.39
UST H19-MW02	12.93	7.65	NMT	5.28
UST H19-MW03	13.25	8.32	NMT	4.93
UST H19-MW04	13.88	8.73	NMT	5.15
UST H19-MW05	13.42	8.46	NMT	4.96
UST H19-MW06	13.67	8.81	NMT	4.86
UST H19-MW07	10.42	8.03	NMT	2.39
UST H19-MW08	9.70	7.47	NMT	2.23
UST H19-MW09	9.97	7.69	NMT	2.28
UST H19-MW10	10.32	8.07	NMT	2.25
UST H19-MW11	10.51	8.21	NMT	2.30
UST H19-MW12	10.93	8.70	NMT	2.23
UST H19-MW13	10.89	8.46	NMT	2.43
UST H19-MW14	11.26	9.03	NMT	2.23

NMT = No Measurable Thickness

TABLE 1
BUILDING H-19
MONITORING WELL CASING
AND GROUNDWATER ELEVATIONS
NOVEMBER 13, 2001

DATA POINT	TOP OF CASING ELEVATION (feet)	DEPTH TO WATER (feet)	FREE PRODUCT THICKNESS (feet)	WATER TABLE ELEVATION (feet)
UST H19-MW01	13.11	11.63	NMT	1.48
UST H19-MW02	12.93	8.88	NMT	4.05
UST H19-MW03	13.25	9.03	NMT	4.22
UST H19-MW04	13.88	9.47	NMT	4.41
UST H19-MW05	13.42	9.22	NMT	4.20
UST H19-MW06	13.67	9.57	NMT	4.10
UST H19-MW07	10.42	8.80	NMT	1.62
UST H19-MW08	9.70	8.26	NMT	1.44
UST H19-MW09	9.97	8.49	NMT	1.48
UST H19-MW10	10.32	8.86	NMT	1.46
UST H19-MW11	10.51	8.99	NMT	1.52
UST H19-MW12	10.93	9.48	NMT	1.45
UST H19-MW13	10.89	8.31	NMT	2.58
UST H19-MW14	11.26	9.78	NMT	1.48

NMT = No Measurable Thickness

**TABLE 1
BUILDING H-19
MONITORING WELL CASING
AND GROUNDWATER ELEVATIONS
MARCH 6, 2002**

DATA POINT	TOP OF CASING ELEVATION (feet)	DEPTH TO WATER (feet)	FREE PRODUCT THICKNESS (feet)	WATER TABLE ELEVATION (feet)
UST H19-MW01	13.11	11.03	NMT	2.08
UST H19-MW02	12.93	7.81	NMT	5.12
UST H19-MW03	13.25	8.91	NMT	4.34
UST H19-MW04	13.88	9.04	NMT	4.84
UST H19-MW05	13.42	8.77	NMT	4.65
UST H19-MW06	13.67	9.12	NMT	4.55
UST H19-MW07	10.42	8.36	NMT	2.06
UST H19-MW08	9.70	7.77	NMT	1.93
UST H19-MW09	9.97	7.99	NMT	1.98
UST H19-MW10	10.32	8.38	NMT	1.94
UST H19-MW11	10.51	8.57	NMT	1.94
UST H19-MW12	10.93	9.01	NMT	1.92
UST H19-MW13	10.89	8.15	NMT	2.74
UST H19-MW14	11.26	9.34	NMT	1.92

NMT = No Measurable Thickness

Entered By: LS Date: 3/12/02
 Checked By: WBD Date: 3/19/02

TABLE 1
BUILDING H-19
MONITORING WELL CASING
AND GROUNDWATER ELEVATIONS
MAY 30, 2002

DATA POINT	TOP OF CASING ELEVATION (feet)	DEPTH TO WATER (feet)	FREE PRODUCT THICKNESS (feet)	WATER TABLE ELEVATION (feet)
UST H19-MW01	13.11	11.33	NMT	1.78
UST H19-MW02	12.93	8.54	NMT	4.39
UST H19-MW03	13.25	8.59	NMT	4.66
UST H19-MW04	13.88	9.17	NMT	4.71
UST H19-MW05	13.42	8.92	NMT	4.50
UST H19-MW06	13.67	9.25	NMT	4.42
UST H19-MW07	10.42	8.52	NMT	1.90
UST H19-MW08	9.70	7.96	NMT	1.74
UST H19-MW09	9.97	8.17	NMT	1.80
UST H19-MW10	10.32	8.54	NMT	1.78
UST H19-MW11	10.51	8.67	NMT	1.84
UST H19-MW12	10.93	9.17	NMT	1.76
UST H19-MW13	10.89	8.73	NMT	2.16
UST H19-MW14	11.26	9.45	NMT	1.81

NMT = No Measurable Thickness

Entered By: WSL Date: 11/17/03
 Checked By: ABY Date: 11/17/03

Appendix J

**Laboratory Test Reports and Chain-of-Custody Records:
Groundwater Samples – May 2002**

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 6210D

Client Sample ID: USTH19-MW01

Client Project ID: H-19

Lab Sample ID: 44872

Lab Project ID: G132-1048

Matrix: Water

Date Analyzed: 6/12/02

Analyzed By: EES

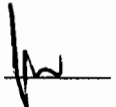
Date Collected: 5/30/02

Date Received: 5/30/02

Dilution: 1.0

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Benzene	0.5	BQL
Bromobenzene	0.5	BQL
Bromochloromethane	0.5	BQL
Bromodichloromethane	0.5	BQL
Bromoform	0.5	BQL
Bromomethane	0.5	BQL
n-Butylbenzene	0.5	BQL
sec-Butylbenzene	0.5	BQL
tert-Butylbenzene	0.5	BQL
Carbon tetrachloride	0.5	BQL
Chlorobenzene	0.5	BQL
Chloroethane	0.5	BQL
Chloroform	0.5	BQL
Chloromethane	0.5	BQL
2-Chlorotoluene	0.5	BQL
4-Chlorotoluene	0.5	BQL
Dibromochloromethane	0.5	BQL
1,2-Dibromo-3-chloropropane	5	BQL
Dibromomethane	0.5	BQL
1,2-Dibromoethane (EDB)	0.5	BQL
1,2-Dichlorobenzene	0.5	BQL
1,3-Dichlorobenzene	0.5	BQL
1,4-Dichlorobenzene	0.5	BQL
1,1-Dichloroethane	0.5	BQL
1,1-Dichloroethene	0.5	BQL
1,2-Dichloroethane	0.5	BQL
cis-1,2-Dichloroethene	0.5	BQL
trans-1,2-dichloroethene	0.5	BQL
1,2-Dichloropropane	0.5	BQL
1,3-Dichloropropane	0.5	BQL
2,2-Dichloropropane	0.5	BQL
1,1-Dichloropropene	0.5	BQL
Dichlorodifluoromethane	5	BQL
Diisopropyl ether (DIPE)	0.5	BQL
Ethylbenzene	0.5	BQL
Hexachlorobutadiene	0.5	BQL
Isopropylbenzene	0.5	BQL
4-Isopropyltoluene	0.5	BQL
Methylene chloride	5	BQL
Methyl-tert-butyl ether (MTBE)	0.5	BQL

13

Reviewed by: 

Flags: BQL = Below Quantitation Limit

N.C. Certification #481 S.C. Certification #99029

Page 1

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 6210D

Client Sample ID: USTH19-MW01

Client Project ID: H-19

Lab Sample ID: 44872

Lab Project ID: G132-1048

Matrix: Water

Date Analyzed: 6/12/02

Analyzed By: EES

Date Collected: 5/30/02

Date Received: 5/30/02

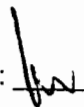
Dilution: 1.0

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Naphthalene	0.5	BQL
n-Propyl benzene	0.5	BQL
Styrene	0.5	BQL
1,1,1,2-Tetrachloroethane	0.5	BQL
1,1,2,2-Tetrachloroethane	0.5	BQL
Tetrachloroethene	0.5	BQL
Toluene	0.5	BQL
1,2,3-Trichlorobenzene	0.5	BQL
1,2,4-Trichlorobenzene	0.5	BQL
Trichloroethene	0.5	BQL
1,1,1-Trichloroethane	0.5	BQL
1,1,2-Trichloroethane	0.5	BQL
Trichlorofluoromethane	0.5	BQL
1,2,3-Trichloropropane	0.5	BQL
1,2,4-Trimethylbenzene	0.5	BQL
1,3,5-Trimethylbenzene	0.5	BQL
Vinyl chloride	0.5	BQL
m-,p-Xylene	1	BQL
o-Xylene	0.5	BQL

Surrogate Spike Recoveries	Spike Added (ug/L)	Surrogate Result (ug/L)	%Rec
Compound			
Bromofluorobenzene	10.0	10.0	100
1,2-Dichloroethane-d4	10.0	10.7	107
Toluene-d8	10.0	10.2	102

Comments:

All results are corrected for dilution.

Reviewed by: 

Flags: BQL = Below Quantitation Limit

N.C. Certification #481 S.C. Certification #99029

Page 2

Results for Semivolatiles
by GCMS 625

Client Sample ID: USTH19-MW01

Client Project ID: H-19

Lab Sample ID: 44872

Lab Project ID: G132-1048

Matrix: Water

Date Collected: 5/30/2002

Date Received: 5/30/2002

Date Analyzed: 6/6/2002

Analyzed By: MRC

Dilution: 1

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Acenaphthene	10	BQL
Acenaphthylene	10	BQL
Anthracene	10	BQL
Benzo[a]anthracene	10	BQL
Benzo[a]pyrene	10	BQL
Benzo[b]fluoranthene	10	BQL
Benzo[g,h,i]perylene	10	BQL
Benzo[k]fluoranthene	10	BQL
Bis(2-chloroethoxy)methane	10	BQL
Bis(2-chloroethyl)ether	10	BQL
Bis(2-chloroisopropyl)ether	10	BQL
Bis(2-ethylhexyl)phthalate	10	BQL
4-bromophenyl phenyl ether	10	BQL
Butylbenzylphthalate	10	BQL
4-Chloro-3-methylphenol	10	BQL
2-Chloronaphthalene	10	BQL
2-Chlorophenol	10	BQL
4-Chlorophenyl phenyl ether	10	BQL
Chrysene	10	BQL
Di-n-Butylphthalate	10	BQL
Di-n-octylphthalate	10	BQL
Dibenzo[a,h]anthracene	10	BQL
1,2-Dichlorobenzene	10	BQL
1,3-Dichlorobenzene	10	BQL
1,4-Dichlorobenzene	10	BQL
3,3'-Dichlorobenzidine	20	BQL
2,4-Dichlorophenol	10	BQL
Diethylphthalate	10	BQL
2,4-Dimethylphenol	10	BQL
Dimethylphthalate	10	BQL
4,6-Dinitro-2-methylphenol	50	BQL
2,4-Dinitrophenol	50	BQL
2,4-Dinitrotoluene	10	BQL
2,6-Dinitrotoluene	10	BQL
Fluoranthene	10	BQL
Fluorene	10	BQL
Hexachlorobenzene	10	BQL
Hexachlorobutadiene	10	BQL
Hexachlorocyclopentadiene	20	BQL
Hexachloroethane	10	BQL

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatiles

by GCMS 625

Client Sample ID: USTH19-MW01

Client Project ID: H-19

Lab Sample ID: 44872

Lab Project ID: G132-1048

Matrix: Water

Date Collected: 5/30/2002

Date Received: 5/30/2002

Date Analyzed: 6/6/2002

Analyzed By: MRC

Dilution: 1

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Indeno(1,2,3-c,d)pyrene	10	BQL
Isophorone	10	BQL
N-Nitrosodi-n-propylamine	10	BQL
N-Nitrosodiphenylamine	10	BQL
Naphthalene	10	BQL
Nitrobenzene	10	BQL
2-Nitrophenol	10	BQL
4-Nitrophenol	50	BQL
Pentachlorophenol	50	BQL
Phenanthrene	10	BQL
Phenol	10	BQL
Pyrene	10	BQL
1,2,4-Trichlorobenzene	10	BQL
2,4,6-Trichlorophenol	10	BQL

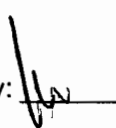
Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	9.1	91
2-Fluorophenol	10	8.2	82
Nitrobenzene-d5	10	8.0	80
Phenol-d6	10	8.1	81
2,4,6-Tribromophenol	10	8.1	81
4-Terphenyl-d14	10	11.1	111

Comments:

Results are corrected for %solids and dilution where applicable.

Flags:

BQL = Below Quantitation Limit.

Reviewed By: 

Results of Library Search for Semivolatile Compounds
by GCMS

Client Sample ID: USTH19-MW01

Client Project ID: H-19

Lab Sample ID: 44872

Lab Project ID: G132-1048

Matrix: Water

Date Collected: 5/30/2002

Date Received: 5/30/2002

Date Analyzed: 6/6/2002

Analyzed By: MRC

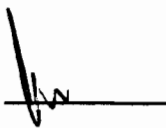
Dilution: 1

Num.	Compound	CAS#	Match Probability	Result (ug/L)
1	No library search compounds detected.			
2				
3				
4				
5				
6				
7				
8				
9				
10				

Comment:

Tentatively Identified Compound (TIC) refers to substances which are not present in the list of target compounds. Therefore, not all TICs are identified and quantitated using individual standards. TIC listings are prepared utilizing a computerized library search of electron impact mass spectral data and evaluation of the relevant data by a mass spectral data specialist.

Quantitation is accomplished by relative peak area of the compound compared to that of the nearest internal standard from the total ion chromatogram. TICs are identified and quantitated only if the peak area is equal to or greater than 10% of that of the nearest internal standard. Quantitation provided is an estimate.

Reviewed by: 

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: LAW ENGINEERING

Project Name: H-19

Sample Information and Analytical Results	
Sample Identification	USTH19-MW01
Sample Matrix	Water
Collection Option (for Soil)*	
Date Collected	05/30/02
Date Received	05/30/02
Date Extracted	06/06/02
Date Analyzed	06/06/02
Dry Weight	
Dilution Factor	1
C ₅ -C ₈ Aliphatics**	< 100 (µg/L)
C ₉ -C ₁₂ Aliphatics**	< 100 (µg/L)
C ₉ -C ₁₀ Aromatics**	< 100 (µg/L)
Surrogate % Recovery - PID	87
Surrogate % Recovery - FID	110

* = Option 1 = Established fill line on vial, Option 2 = Sampling Device/Brand, or Option 3 = Field weight of soil.

** = Excludes any surrogates or internal standards.

Lab Info: G132-1048-44872

Reviewed By: 

EPH (Aliphatics/Aromatics) Results

by MDEP-EPH

Client Name: LAW ENGINEERING

Project Name: H-19

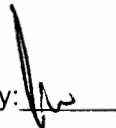
✓

Sample Information and Analytical Results	
Sample Identification	USTH19-MW01
Sample Matrix	Water
Date Collected	05/30/02
Date Received	05/30/02
Date Extracted	06/05/02
Date Analyzed	06/05/02
Dry Weight	
Dilution Factor	1
C ₉ -C ₁₈ Aliphatics*	< 100 (µg/L)
C ₁₉ -C ₃₆ Aliphatics*	< 100 (µg/L)
C ₁₁ -C ₂₂ Aromatics*	< 100 (µg/L)
Aliphatic Surrogate % Recovery	46
Aromatic Surrogate % Recovery	79

Comments:

* = Excludes any surrogates or internal standards.
Sample did not require fractionation.

Lab info: G132-1048-44872

Reviewed By: 

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Metals

Client Sample ID: USTH19-MW01
Client Project ID: H-19
Lab Sample ID: 44872
Lab Project ID: G132-1048
Batch ID: 2327

Analyzed By: PSW
Date Collected: 5/30/02
Date Received: 5/30/02
Matrix: Water

✓

Metals	Result	Quantitation Limit	DF	Units	Method	Date Analyzed
Chromium	BQL	0.0100	1	MG/L	6010B	6/11/02
Lead	BQL	0.0100	1	MG/L	6010B	6/11/02

Comments

BQL = Below Quantitation Limits

DF = Dilution Factor

J = Between MDL and RL

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 6210D

Client Sample ID: USTH19-MW02

Client Project ID: H-19

Lab Sample ID: 44878

Lab Project ID: G132-1048

Matrix: Water

Date Analyzed: 6/12/02

Analyzed By: EES

Date Collected: 5/30/02

Date Received: 5/30/02

Dilution: 1.0

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Benzene	0.5	BQL
Bromobenzene	0.5	BQL
Bromochloromethane	0.5	BQL
Bromodichloromethane	0.5	BQL
Bromoform	0.5	BQL
Bromomethane	0.5	BQL
n-Butylbenzene	0.5	BQL
sec-Butylbenzene	0.5	BQL
tert-Butylbenzene	0.5	BQL
Carbon tetrachloride	0.5	BQL
Chlorobenzene	0.5	BQL
Chloroethane	0.5	BQL
Chloroform	0.5	BQL
Chloromethane	0.5	BQL
2-Chlorotoluene	0.5	BQL
4-Chlorotoluene	0.5	BQL
Dibromochloromethane	0.5	BQL
1,2-Dibromo-3-chloropropane	5	BQL
Dibromomethane	0.5	BQL
1,2-Dibromoethane (EDB)	0.5	BQL
1,2-Dichlorobenzene	0.5	BQL
1,3-Dichlorobenzene	0.5	BQL
1,4-Dichlorobenzene	0.5	BQL
1,1-Dichloroethane	0.5	BQL
1,1-Dichloroethene	0.5	BQL
1,2-Dichloroethane	0.5	BQL
cis-1,2-Dichloroethene	0.5	BQL
trans-1,2-dichloroethene	0.5	BQL
1,2-Dichloropropane	0.5	BQL
1,3-Dichloropropane	0.5	BQL
2,2-Dichloropropane	0.5	BQL
1,1-Dichloropropene	0.5	BQL
Dichlorodifluoromethane	5	BQL
Diisopropyl ether (DIPE)	0.5	BQL
Ethylbenzene	0.5	BQL
Hexachlorobutadiene	0.5	BQL
Isopropylbenzene	0.5	BQL
4-Isopropyltoluene	0.5	BQL
Methylene chloride	5	BQL
Methyl-tert-butyl ether (MTBE)	0.5	BQL

Reviewed by: 

Flags: BQL = Below Quantitation Limit

N.C. Certification #481 S.C. Certification #99029

Page 1

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 6210D

Client Sample ID: USTH19-MW02

Client Project ID: H-19

Lab Sample ID: 44878

Lab Project ID: G132-1048

Matrix: Water

Date Analyzed: 6/12/02

Analyzed By: EES

Date Collected: 5/30/02

Date Received: 5/30/02

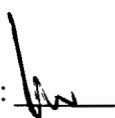
Dilution: 1.0

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Naphthalene	0.5	BQL
n-Propyl benzene	0.5	BQL
Styrene	0.5	BQL
1,1,1,2-Tetrachloroethane	0.5	BQL
1,1,2,2-Tetrachloroethane	0.5	BQL
Tetrachloroethene	0.5	BQL
Toluene	0.5	BQL
1,2,3-Trichlorobenzene	0.5	BQL
1,2,4-Trichlorobenzene	0.5	BQL
Trichloroethene	0.5	BQL
1,1,1-Trichloroethane	0.5	BQL
1,1,2-Trichloroethane	0.5	BQL
Trichlorofluoromethane	0.5	BQL
1,2,3-Trichloropropane	0.5	BQL
1,2,4-Trimethylbenzene	0.5	BQL
1,3,5-Trimethylbenzene	0.5	BQL
Vinyl chloride	0.5	BQL
m-,p-Xylene	1	BQL
o-Xylene	0.5	BQL

Surrogate Spike Recoveries	Spike Added (ug/L)	Surrogate Result (ug/L)	%Rec
Compound			
Bromofluorobenzene	10.0	10.0	100
1,2-Dichloroethane-d4	10.0	10.6	106
Toluene-d8	10.0	10.0	100

Comments:

All results are corrected for dilution.

Reviewed by: 

Flags: BQL = Below Quantitation Limit

N.C. Certification #481 S.C. Certification #99029

Page 2

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatiles
by GCMS 625

Client Sample ID: USTH19-MW02

Client Project ID: H-19

Lab Sample ID: 44878

Lab Project ID: G132-1048

Matrix: Water

Date Collected: 5/30/2002

Date Received: 5/30/2002

Date Analyzed: 6/8/2002

Analyzed By:

Dilution: 1

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Acenaphthene	10	BQL
Acenaphthylene	10	BQL
Anthracene	10	BQL
Benzo[a]anthracene	10	BQL
Benzo[a]pyrene	10	BQL
Benzo[b]fluoranthene	10	BQL
Benzo[g,h,i]perylene	10	BQL
Benzo[k]fluoranthene	10	BQL
Bis(2-chloroethoxy)methane	10	BQL
Bis(2-chloroethyl)ether	10	BQL
Bis(2-chloroisopropyl)ether	10	BQL
Bis(2-ethylhexyl)phthalate	10	BQL
4-bromophenyl phenyl ether	10	BQL
Butylbenzylphthalate	10	BQL
4-Chloro-3-methylphenol	10	BQL
2-Chloronaphthalene	10	BQL
2-Chlorophenol	10	BQL
4-Chlorophenyl phenyl ether	10	BQL
Chrysene	10	BQL
Di-n-Butylphthalate	10	BQL
Di-n-octylphthalate	10	BQL
Dibenzo[a,h]anthracene	10	BQL
1,2-Dichlorobenzene	10	BQL
1,3-Dichlorobenzene	10	BQL
1,4-Dichlorobenzene	10	BQL
3,3'-Dichlorobenzidine	20	BQL
2,4-Dichlorophenol	10	BQL
Diethylphthalate	10	BQL
2,4-Dimethylphenol	10	BQL
Dimethylphthalate	10	BQL
4,6-Dinitro-2-methylphenol	50	BQL
2,4-Dinitrophenol	50	BQL
2,4-Dinitrotoluene	10	BQL
2,6-Dinitrotoluene	10	BQL
Fluoranthene	10	BQL
Fluorene	10	BQL
Hexachlorobenzene	10	BQL
Hexachlorobutadiene	10	BQL
Hexachlorocyclopentadiene	20	BQL
Hexachloroethane	10	BQL

Results for Semivolatiles
by GCMS 625

Client Sample ID: USTH19-MW02
Client Project ID: H-19
Lab Sample ID: 44878
Lab Project ID: G132-1048
Matrix: Water

Date Collected: 5/30/2002
Date Received: 5/30/2002
Date Analyzed: 6/8/2002
Analyzed By:
Dilution: 1

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Indeno(1,2,3-c,d)pyrene	10	BQL
Isophorone	10	BQL
N-Nitrosodi-n-propylamine	10	BQL
N-Nitrosodiphenylamine	10	BQL
Naphthalene	10	BQL
Nitrobenzene	10	BQL
2-Nitrophenol	10	BQL
4-Nitrophenol	50	BQL
Pentachlorophenol	50	BQL
Phenanthrene	10	BQL
Phenol	10	BQL
Pyrene	10	BQL
1,2,4-Trichlorobenzene	10	BQL
2,4,6-Trichlorophenol	10	BQL

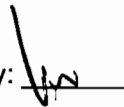
Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	8.1	81
2-Fluorophenol	10	6.4	64
Nitrobenzene-d5	10	7.1	71
Phenol-d6	10	6.7	67
2,4,6-Tribromophenol	10	9.1	91
4-Terphenyl-d14	10	10.9	109

Comments:

Results are corrected for %solids and dilution where applicable.

Flags:

BQL = Below Quantitation Limit.

Reviewed By: 

Results of Library Search for Semivolatile Compounds
by GCMS

Client Sample ID: USTH19-MW02

Client Project ID: H-19

Lab Sample ID: 44878

Lab Project ID: G132-1048

Matrix: Water

Date Collected: 5/30/02

Date Received: 5/30/02

Date Analyzed: 6/8/02

Analyzed By: MRC

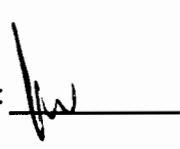
Dilution: 1

Num.	Compound	CAS#	Match Probability	Result (ug/L)
1	No library search compounds detected.			
2				
3				
4				
5				
6				
7				
8				
9				
10				

Comment:

Tentatively Identified Compound (TIC) refers to substances which are not present in the list of target compounds. Therefore, not all TICs are identified and quantitated using individual standards. TIC listings are prepared utilizing a computerized library search of electron impact mass spectral data and evaluation of the relevant data by a mass spectral data specialist.

Quantitation is accomplished by relative peak area of the compound compared to that of the nearest internal standard from the total ion chromatogram. TICs are identified and quantitated only if the peak area is equal to or greater than 10% of that of the nearest internal standard. Quantitation provided is an estimate.

Reviewed by: 

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: LAW ENGINEERING

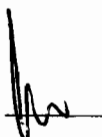
Project Name: H-19

Sample Information and Analytical Results	
Sample Identification	USTH19-MW02
Sample Matrix	Water
Collection Option (for Soil)*	
Date Collected	05/30/02
Date Received	05/30/02
Date Extracted	06/06/02
Date Analyzed	06/06/02
Dry Weight	
Dilution Factor	1
C ₅ -C ₈ Aliphatics**	< 100 (µg/L)
C ₉ -C ₁₂ Aliphatics**	< 100 (µg/L)
C ₉ -C ₁₀ Aromatics**	< 100 (µg/L)
Surrogate % Recovery - PID	90
Surrogate % Recovery - FID	110

* = Option 1 = Established fill line on vial, Option 2 = Sampling Device/Brand, or Option 3 = Field weight of soil.

** = Excludes any surrogates or internal standards.

Lab Info: G132-1048-44878

Reviewed By: 

EPH (Aliphatics/Aromatics) Results

by MDEP-EPH

Client Name: LAW ENGINEERING

Project Name: H-19

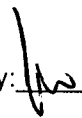
Sample Information and Analytical Results	
Sample Identification	USTH19-MW02
Sample Matrix	Water
Date Collected	05/30/02
Date Received	05/30/02
Date Extracted	06/05/02
Date Analyzed	06/05/02
Dry Weight	
Dilution Factor	1
C ₉ -C ₁₈ Aliphatics*	< 100 (µg/L)
C ₁₉ -C ₃₆ Aliphatics*	< 100 (µg/L)
C ₁₁ -C ₂₂ Aromatics*	< 100 (µg/L)
Aliphatic Surrogate % Recovery	30
Aromatic Surrogate % Recovery	48

Comments:

* = Excludes any surrogates or internal standards.

Sample did not require fractionation.

Lab info: G132-1048-44878

Reviewed By: 

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Metals

Client Sample ID: USTH19-MW02

Client Project ID: H-19

Lab Sample ID: 44878

Lab Project ID: G132-1048

Batch ID: 2327

Analyzed By: PSW

Date Collected: 5/30/02

Date Received: 5/30/02

Matrix: Water

Metals	Result	Quantitation Limit	DF	Units	Method	Date Analyzed
Chromium	BQL	0.0100	1	MG/L	6010B	6/11/02
Lead	BQL	0.0100	1	MG/L	6010B	6/11/02

Comments

BQL = Below Quantitation Limits

DF = Dilution Factor

J = Between MDL and RL

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 6210D

Client Sample ID: USTH19-MW03

Client Project ID: H-19

Lab Sample ID: 44873

Lab Project ID: G132-1048

Matrix: Water

Date Analyzed: 6/12/02

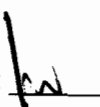
Analyzed By: EES

Date Collected: 5/30/02

Date Received: 5/30/02

Dilution: 1.0

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Benzene	0.5	BQL
Bromobenzene	0.5	BQL
Bromochloromethane	0.5	BQL
Bromodichloromethane	0.5	BQL
Bromoform	0.5	BQL
Bromomethane	0.5	BQL
n-Butylbenzene	0.5	BQL
sec-Butylbenzene	0.5	BQL
tert-Butylbenzene	0.5	BQL
Carbon tetrachloride	0.5	BQL
Chlorobenzene	0.5	BQL
Chloroethane	0.5	BQL
Chloroform	0.5	BQL
Chloromethane	0.5	BQL
2-Chlorotoluene	0.5	BQL
4-Chlorotoluene	0.5	BQL
Dibromochloromethane	0.5	BQL
1,2-Dibromo-3-chloropropane	5	BQL
Dibromomethane	0.5	BQL
1,2-Dibromoethane (EDB)	0.5	BQL
1,2-Dichlorobenzene	0.5	BQL
1,3-Dichlorobenzene	0.5	BQL
1,4-Dichlorobenzene	0.5	BQL
1,1-Dichloroethane	0.5	BQL
1,1-Dichloroethene	0.5	BQL
1,2-Dichloroethane	0.5	BQL
cis-1,2-Dichloroethene	0.5	BQL
trans-1,2-dichloroethene	0.5	BQL
1,2-Dichloropropane	0.5	BQL
1,3-Dichloropropane	0.5	BQL
2,2-Dichloropropane	0.5	BQL
1,1-Dichloropropene	0.5	BQL
Dichlorodifluoromethane	5	BQL
Diisopropyl ether (DIPE)	0.5	BQL
Ethylbenzene	0.5	BQL
Hexachlorobutadiene	0.5	BQL
Isopropylbenzene	0.5	BQL
4-Isopropyltoluene	0.5	BQL
Methylene chloride	5	BQL
Methyl-tert-butyl ether (MTBE)	0.5	BQL

Reviewed by: 

Flags: BQL = Below Quantitation Limit

N.C. Certification #481 S.C. Certification #99029

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Results for Volatiles

by GCMS 6210D

Client Sample ID: USTH19-MW03

Client Project ID: H-19

Lab Sample ID: 44873

Lab Project ID: G132-1048

Matrix: Water

Date Analyzed: 6/12/02

Analyzed By: EES

Date Collected: 5/30/02

Date Received: 5/30/02

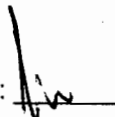
Dilution: 1.0 ✓

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Naphthalene	0.5	BQL
n-Propyl benzene	0.5	BQL
Styrene	0.5	BQL
1,1,1,2-Tetrachloroethane	0.5	BQL
1,1,2,2-Tetrachloroethane	0.5	BQL
Tetrachloroethene	0.5	BQL
Toluene	0.5	BQL
1,2,3-Trichlorobenzene	0.5	BQL
1,2,4-Trichlorobenzene	0.5	BQL
Trichloroethene	0.5	BQL
1,1,1-Trichloroethane	0.5	BQL
1,1,2-Trichloroethane	0.5	BQL
Trichlorofluoromethane	0.5	BQL
1,2,3-Trichloropropane	0.5	BQL
1,2,4-Trimethylbenzene	0.5	BQL
1,3,5-Trimethylbenzene	0.5	BQL
Vinyl chloride	0.5	BQL
m-,p-Xylene	1	BQL
o-Xylene	0.5	BQL

Surrogate Spike Recoveries	Spike Added	Surrogate Result	%Rec
Compound	(ug/L)	(ug/L)	
Bromofluorobenzene	10.0	10.0	100
1,2-Dichloroethane-d4	10.0	10.6	106
Toluene-d8	10.0	10.1	101

Comments:

All results are corrected for dilution.

Reviewed by: 

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatiles

by GCMS 625

Client Sample ID: USTH19-MW03

Client Project ID: H-19

Lab Sample ID: 44873

Lab Project ID: G132-1048

Matrix: Water

Date Collected: 5/30/2002

Date Received: 5/30/2002

Date Analyzed: 6/6/2002

Analyzed By: MRC

Dilution: 1

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Acenaphthene	10	BQL
Acenaphthylene	10	BQL
Anthracene	10	BQL
Benzo[a]anthracene	10	BQL
Benzo[a]pyrene	10	BQL
Benzo[b]fluoranthene	10	BQL
Benzo[g,h,i]perylene	10	BQL
Benzo[k]fluoranthene	10	BQL
Bis(2-chloroethoxy)methane	10	BQL
Bis(2-chloroethyl)ether	10	BQL
Bis(2-chloroisopropyl)ether	10	BQL
Bis(2-ethylhexyl)phthalate	10	BQL
4-bromophenyl phenyl ether	10	BQL
Butylbenzylphthalate	10	BQL
4-Chloro-3-methylphenol	10	BQL
2-Chloronaphthalene	10	BQL
2-Chlorophenol	10	BQL
4-Chlorophenyl phenyl ether	10	BQL
Chrysene	10	BQL
Di-n-Butylphthalate	10	BQL
Di-n-octylphthalate	10	BQL
Dibenzo[a,h]anthracene	10	BQL
1,2-Dichlorobenzene	10	BQL
1,3-Dichlorobenzene	10	BQL
1,4-Dichlorobenzene	10	BQL
3,3'-Dichlorobenzidine	20	BQL
2,4-Dichlorophenol	10	BQL
Diethylphthalate	10	BQL
2,4-Dimethylphenol	10	BQL
Dimethylphthalate	10	BQL
4,6-Dinitro-2-methylphenol	50	BQL
2,4-Dinitrophenol	50	BQL
2,4-Dinitrotoluene	10	BQL
2,6-Dinitrotoluene	10	BQL
Fluoranthene	10	BQL
Fluorene	10	BQL
Hexachlorobenzene	10	BQL
Hexachlorobutadiene	10	BQL
Hexachlorocyclopentadiene	20	BQL
Hexachloroethane	10	BQL

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatiles by GCMS 625

Client Sample ID: USTH19-MW03
Client Project ID: H-19
Lab Sample ID: 44873
Lab Project ID: G132-1048
Matrix: Water

Date Collected: 5/30/2002
Date Received: 5/30/2002
Date Analyzed: 6/6/2002
Analyzed By: MRC
Dilution: 1

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Indeno(1,2,3-c,d)pyrene	10	BQL
Isophorone	10	BQL
N-Nitrosodi-n-propylamine	10	BQL
N-Nitrosodiphenylamine	10	BQL
Naphthalene	10	BQL
Nitrobenzene	10	BQL
2-Nitrophenol	10	BQL
4-Nitrophenol	50	BQL
Pentachlorophenol	50	BQL
Phenanthrene	10	BQL
Phenol	10	BQL
Pyrene	10	BQL
1,2,4-Trichlorobenzene	10	BQL
2,4,6-Trichlorophenol	10	BQL

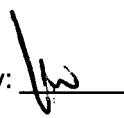
Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	9.0	90
2-Fluorophenol	10	8.0	80
Nitrobenzene-d5	10	7.9	79
Phenol-d6	10	7.8	78
2,4,6-Tribromophenol	10	8.5	85
4-Terphenyl-d14	10	10.4	104

Comments:

Results are corrected for %solids and dilution where applicable.

Flags:

BQL = Below Quantitation Limit.

Reviewed By: 

Results of Library Search for Semivolatile Compounds
by GCMS

Client Sample ID: USTH19-MW03
Client Project ID: H-19
Lab Sample ID: 44873
Lab Project ID: G132-1048
Matrix: Water

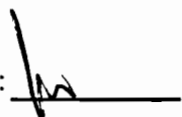
Date Collected: 5/30/2002
Date Received: 5/30/2002
Date Analyzed: 6/6/2002
Analyzed By: MRC
Dilution: 1

Num.	Compound	CAS#	Match Probability	Result (ug/L)
1	Unknown			16
2	Unknown			5.6
3				
4				21.6
5				
6				
7				
8				
9				
10				

Comment:

Tentatively Identified Compound (TIC) refers to substances which are not present in the list of target compounds. Therefore, not all TICs are identified and quantitated using individual standards. TIC listings are prepared utilizing a computerized library search of electron impact mass spectral data and evaluation of the relevant data by a mass spectral data specialist.

Quantitation is accomplished by relative peak area of the compound compared to that of the nearest internal standard from the total ion chromatogram. TICs are identified and quantitated only if the peak area is equal to or greater than 10% of that of the nearest internal standard. Quantitation provided is an estimate.

Reviewed by: 

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: LAW ENGINEERING

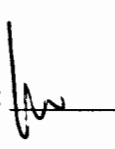
Project Name: H-19

Sample Information and Analytical Results	
Sample Identification	USTH19-MW03
Sample Matrix	Water
Collection Option (for Soil)*	
Date Collected	05/30/02
Date Received	05/30/02
Date Extracted	06/06/02
Date Analyzed	06/06/02
Dry Weight	
Dilution Factor	1
C ₅ -C ₈ Aliphatics**	< 100 (µg/L)
C ₉ -C ₁₂ Aliphatics**	< 100 (µg/L)
C ₉ -C ₁₀ Aromatics**	< 100 (µg/L)
Surrogate % Recovery - PID	93
Surrogate % Recovery - FID	110

* = Option 1 = Established fill line on vial, Option 2 = Sampling Device/Brand, or Option 3 = Field weight of soil.

** = Excludes any surrogates or internal standards.

Lab Info: G132-1048-44873

Reviewed By: 

EPH (Aliphatics/Aromatics) Results

by MDEP-EPH

Client Name: LAW ENGINEERING

Project Name: H-19

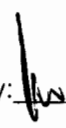
Sample Information and Analytical Results	
Sample Identification	USTH19-MW03
Sample Matrix	Water
Date Collected	05/30/02
Date Received	05/30/02
Date Extracted	06/06/02
Date Analyzed	06/07/02
Dry Weight	
Dilution Factor	1
C ₉ -C ₁₈ Aliphatics*	< 100 (µg/L)
C ₁₉ -C ₃₆ Aliphatics*	< 100 (µg/L)
C ₁₁ -C ₂₂ Aromatics*	< 100 (µg/L)
Aliphatic Surrogate % Recovery	59
Aromatic Surrogate % Recovery	60

Comments:

* = Excludes any surrogates or internal standards.

Sample did not require fractionation.

Lab info: G132-1048-44873

Reviewed By: 

Results for Metals

Client Sample ID: USTH19-MW03
Client Project ID: H-19
Lab Sample ID: 44873
Lab Project ID: G132-1048
Batch ID: 2327

Analyzed By: PSW
Date Collected: 5/30/02
Date Received: 5/30/02
Matrix: Water

Metals	Result	Quantitation Limit	DF	Units	Method	Date Analyzed
Chromium	BQL	0.0100	1	MG/L	6010B	6/11/02
Lead	BQL	0.0100	1	MG/L	6010B	6/11/02

Comments

BQL = Below Quantitation Limits

DF = Dilution Factor

J = Between MDL and RL

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 6210D

Client Sample ID: USTH19-MW05

Client Project ID: H-19

Lab Sample ID: 44874

Lab Project ID: G132-1048

Matrix: Water

Date Analyzed: 6/12/02

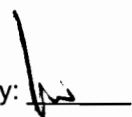
Analyzed By: EES

Date Collected: 5/30/02

Date Received: 5/30/02

Dilution: 1.0

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Benzene	0.5	BQL
Bromobenzene	0.5	BQL
Bromochloromethane	0.5	BQL
Bromodichloromethane	0.5	BQL
Bromoform	0.5	BQL
Bromomethane	0.5	BQL
n-Butylbenzene	0.5	BQL
sec-Butylbenzene	0.5	BQL
tert-Butylbenzene	0.5	BQL
Carbon tetrachloride	0.5	BQL
Chlorobenzene	0.5	BQL
Chloroethane	0.5	BQL
Chloroform	0.5	BQL
Chloromethane	0.5	BQL
2-Chlorotoluene	0.5	BQL
4-Chlorotoluene	0.5	BQL
Dibromochloromethane	0.5	BQL
1,2-Dibromo-3-chloropropane	5	BQL
Dibromomethane	0.5	BQL
1,2-Dibromoethane (EDB)	0.5	BQL
1,2-Dichlorobenzene	0.5	BQL
1,3-Dichlorobenzene	0.5	BQL
1,4-Dichlorobenzene	0.5	BQL
1,1-Dichloroethane	0.5	BQL
1,1-Dichloroethene	0.5	BQL
1,2-Dichloroethane	0.5	BQL
cis-1,2-Dichloroethene	0.5	BQL
trans-1,2-dichloroethene	0.5	BQL
1,2-Dichloropropane	0.5	BQL
1,3-Dichloropropane	0.5	BQL
2,2-Dichloropropane	0.5	BQL
1,1-Dichloropropene	0.5	BQL
Dichlorodifluoromethane	5	BQL
Diisopropyl ether (DIPE)	0.5	BQL
Ethylbenzene	0.5	BQL
Hexachlorobutadiene	0.5	BQL
Isopropylbenzene	0.5	BQL
4-Isopropyltoluene	0.5	BQL
Methylene chloride	5	BQL
Methyl-tert-butyl ether (MTBE)	0.5	BQL

Reviewed by: 

Flags: BQL = Below Quantitation Limit

N.C. Certification #481 S.C. Certification #99029

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PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 6210D

Client Sample ID: USTH19-MW05

Client Project ID: H-19

Lab Sample ID: 44874

Lab Project ID: G132-1048

Matrix: Water

Date Analyzed: 6/12/02

Analyzed By: EES

Date Collected: 5/30/02

Date Received: 5/30/02

Dilution: 1.0

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Naphthalene	0.5	BQL
n-Propyl benzene	0.5	BQL
Styrene	0.5	BQL
1,1,1,2-Tetrachloroethane	0.5	BQL
1,1,2,2-Tetrachloroethane	0.5	BQL
Tetrachloroethene	0.5	BQL
Toluene	0.5	BQL
1,2,3-Trichlorobenzene	0.5	BQL
1,2,4-Trichlorobenzene	0.5	BQL
Trichloroethene	0.5	BQL
1,1,1-Trichloroethane	0.5	BQL
1,1,2-Trichloroethane	0.5	BQL
Trichlorofluoromethane	0.5	BQL
1,2,3-Trichloropropane	0.5	BQL
1,2,4-Trimethylbenzene	0.5	BQL
1,3,5-Trimethylbenzene	0.5	BQL
Vinyl chloride	0.5	BQL
m-,p-Xylene	1	BQL
o-Xylene	0.5	BQL

Surrogate Spike Recoveries	Spike Added (ug/L)	Surrogate Result (ug/L)	%Rec
Compound			
Bromofluorobenzene	10.0	10.0	100
1,2-Dichloroethane-d4	10.0	10.4	104
Toluene-d8	10.0	10.0	100

Comments:

All results are corrected for dilution.

Reviewed by: 

Flags: BQL = Below Quantitation Limit

N.C. Certification #481 S.C. Certification #99029

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatiles
by GCMS 625

Client Sample ID: USTH19-MW05

Client Project ID: H-19

Lab Sample ID: 44874

Lab Project ID: G132-1048

Matrix: Water

Date Collected: 5/30/2002

Date Received: 5/30/2002

Date Analyzed: 6/6/2002

Analyzed By: MRC

Dilution: 1

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Acenaphthene	10	BQL
Acenaphthylene	10	BQL
Anthracene	10	BQL
Benzo[a]anthracene	10	BQL
Benzo[a]pyrene	10	BQL
Benzo[b]fluoranthene	10	BQL
Benzo[g,h,i]perylene	10	BQL
Benzo[k]fluoranthene	10	BQL
Bis(2-chloroethoxy)methane	10	BQL
Bis(2-chloroethyl)ether	10	BQL
Bis(2-chloroisopropyl)ether	10	BQL
Bis(2-ethylhexyl)phthalate	10	BQL
4-bromophenyl phenyl ether	10	BQL
Butylbenzylphthalate	10	BQL
4-Chloro-3-methylphenol	10	BQL
2-Chloronaphthalene	10	BQL
2-Chlorophenol	10	BQL
4-Chlorophenyl phenyl ether	10	BQL
Chrysene	10	BQL
Di-n-Butylphthalate	10	BQL
Di-n-octylphthalate	10	BQL
Dibenzo[a,h]anthracene	10	BQL
1,2-Dichlorobenzene	10	BQL
1,3-Dichlorobenzene	10	BQL
1,4-Dichlorobenzene	10	BQL
3,3'-Dichlorobenzidine	20	BQL
2,4-Dichlorophenol	10	BQL
Diethylphthalate	10	BQL
2,4-Dimethylphenol	10	BQL
Dimethylphthalate	10	BQL
4,6-Dinitro-2-methylphenol	50	BQL
2,4-Dinitrophenol	50	BQL
2,4-Dinitrotoluene	10	BQL
2,6-Dinitrotoluene	10	BQL
Fluoranthene	10	BQL
Fluorene	10	BQL
Hexachlorobenzene	10	BQL
Hexachlorobutadiene	10	BQL
Hexachlorocyclopentadiene	20	BQL
Hexachloroethane	10	BQL

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatiles
by GCMS 625

Client Sample ID: USTH19-MW05
Client Project ID: H-19
Lab Sample ID: 44874
Lab Project ID: G132-1048
Matrix: Water

Date Collected: 5/30/2002
Date Received: 5/30/2002
Date Analyzed: 6/6/2002
Analyzed By: MRC
Dilution: 1

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Indeno(1,2,3-c,d)pyrene	10	BQL
Isophorone	10	BQL
N-Nitrosodi-n-propylamine	10	BQL
N-Nitrosodiphenylamine	10	BQL
Naphthalene	10	BQL
Nitrobenzene	10	BQL
2-Nitrophenol	10	BQL
4-Nitrophenol	50	BQL
Pentachlorophenol	50	BQL
Phenanthrene	10	BQL
Phenol	10	BQL
Pyrene	10	BQL
1,2,4-Trichlorobenzene	10	BQL
2,4,6-Trichlorophenol	10	BQL

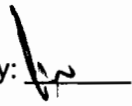
Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	8.9	89
2-Fluorophenol	10	8.4	84
Nitrobenzene-d5	10	8.2	82
Phenol-d6	10	7.9	79
2,4,6-Tribromophenol	10	7.8	78
4-Terphenyl-d14	10	9.9	99

Comments:

Results are corrected for %solids and dilution where applicable.

Flags:

BQL = Below Quantitation Limit.

Reviewed By: 

Results of Library Search for Semivolatile Compounds
by GCMS

Client Sample ID: USTH19-MW05

Client Project ID: H-19

Lab Sample ID: 44874

Lab Project ID: G132-1048

Matrix: Water

Date Collected: 5/30/2002

Date Received: 5/30/2002

Date Analyzed: 6/6/2002

Analyzed By: MRC

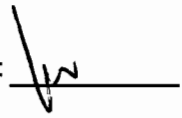
Dilution: 1

Num.	Compound	CAS#	Match Probability	Result (ug/L)
1	Unknown			5.9 ✓
2				
3				
4				
5				
6				
7				
8				
9				
10				

Comment:

Tentatively Identified Compound (TIC) refers to substances which are not present in the list of target compounds. Therefore, not all TICs are identified and quantitated using individual standards. TIC listings are prepared utilizing a computerized library search of electron impact mass spectral data and evaluation of the relevant data by a mass spectral data specialist.

Quantitation is accomplished by relative peak area of the compound compared to that of the nearest internal standard from the total ion chromatogram. TICs are identified and quantitated only if the peak area is equal to or greater than 10% of that of the nearest internal standard. Quantitation provided is an estimate.

Reviewed by: 

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: LAW ENGINEERING

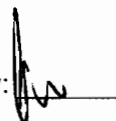
Project Name: H-19

Sample Information and Analytical Results	
Sample Identification	USTH19-MW05
Sample Matrix	Water
Collection Option (for Soil)*	
Date Collected	05/30/02
Date Received	05/30/02
Date Extracted	06/13/02
Date Analyzed	06/13/02
Dry Weight	
Dilution Factor	1
C ₅ -C ₈ Aliphatics**	< 100 (µg/L)
C ₉ -C ₁₂ Aliphatics**	< 100 (µg/L)
C ₉ -C ₁₀ Aromatics**	< 100 (µg/L)
Surrogate % Recovery - PID	87
Surrogate % Recovery - FID	94

* = Option 1 = Established fill line on vial, Option 2 = Sampling Device/Brand, or Option 3 = Field weight of soil.

** = Excludes any surrogates or internal standards.

Lab Info: G132-1048-44874

Reviewed By: 

EPH (Aliphatics/Aromatics) Results

by MDEP-EPH

Client Name: LAW ENGINEERING

Project Name: H-19

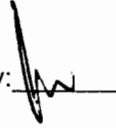
Sample Information and Analytical Results	
Sample Identification	USTH19-MW05
Sample Matrix	Water
Date Collected	05/30/02
Date Received	05/30/02
Date Extracted	06/06/02
Date Analyzed	06/06/02
Dry Weight	
Dilution Factor	1
C ₉ -C ₁₈ Aliphatics*	< 100 (µg/L)
C ₁₉ -C ₃₆ Aliphatics*	< 100 (µg/L)
C ₁₁ -C ₂₂ Aromatics*	< 100 (µg/L)
Aliphatic Surrogate % Recovery	32
Aromatic Surrogate % Recovery	59

Comments:

* = Excludes any surrogates or internal standards.

Sample did not require fractionation.

Lab info: G132-1048-44874

Reviewed By: 

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Metals

Client Sample ID: USTH19-MW05
Client Project ID: H-19
Lab Sample ID: 44874
Lab Project ID: G132-1048
Batch ID: 2327

Analyzed By: PSW
Date Collected: 5/30/02
Date Received: 5/30/02
Matrix: Water

Metals	Result	Quantitation Limit	DF	Units	Method	Date Analyzed
Chromium	BQL	0.0100	1	MG/L	6010B	6/11/02
Lead	BQL	0.0100	1	MG/L	6010B	6/11/02

Comments

BQL = Below Quantitation Limits

DF = Dilution Factor

J = Between MDL and RL

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 6210D

Client Sample ID: USTH19-MW07

Client Project ID: H-19

Lab Sample ID: 44875

Lab Project ID: G132-1048

Matrix: Water

Date Analyzed: 6/12/02

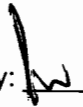
Analyzed By: EES

Date Collected: 5/30/02

Date Received: 5/30/02

Dilution: 1.0

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Benzene	0.5	BQL
Bromobenzene	0.5	BQL
Bromochloromethane	0.5	BQL
Bromodichloromethane	0.5	BQL
Bromoform	0.5	BQL
Bromomethane	0.5	BQL
n-Butylbenzene	0.5	1 ✓
sec-Butylbenzene	0.5	5 ✓
tert-Butylbenzene	0.5	0.9 ✓
Carbon tetrachloride	0.5	BQL
Chlorobenzene	0.5	BQL
Chloroethane	0.5	BQL
Chloroform	0.5	BQL
Chloromethane	0.5	BQL
2-Chlorotoluene	0.5	BQL
4-Chlorotoluene	0.5	BQL
Dibromochloromethane	0.5	BQL
1,2-Dibromo-3-chloropropane	5	BQL
Dibromomethane	0.5	BQL
1,2-Dibromoethane (EDB)	0.5	BQL
1,2-Dichlorobenzene	0.5	BQL
1,3-Dichlorobenzene	0.5	BQL
1,4-Dichlorobenzene	0.5	BQL
1,1-Dichloroethane	0.5	BQL
1,1-Dichloroethene	0.5	BQL
1,2-Dichloroethane	0.5	BQL
cis-1,2-Dichloroethene	0.5	BQL
trans-1,2-dichloroethene	0.5	BQL
1,2-Dichloropropane	0.5	BQL
1,3-Dichloropropane	0.5	BQL
2,2-Dichloropropane	0.5	BQL
1,1-Dichloropropene	0.5	BQL
Dichlorodifluoromethane	5	BQL
Diisopropyl ether (DIPE)	0.5	BQL
Ethylbenzene	0.5	BQL
Hexachlorobutadiene	0.5	BQL
Isopropylbenzene	0.5	3 ✓
4-Isopropyltoluene	0.5	BQL
Methylene chloride	5	BQL
Methyl-tert-butyl ether (MTBE)	0.5	BQL

Reviewed by: 

Flags: BQL = Below Quantitation Limit

N.C. Certification #481 S.C. Certification #99029

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PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 6210D

Client Sample ID: USTH19-MW07

Client Project ID: H-19

Lab Sample ID: 44875

Lab Project ID: G132-1048

Matrix: Water

Date Analyzed: 6/12/02

Analyzed By: EES

Date Collected: 5/30/02

Date Received: 5/30/02

Dilution: 1.0

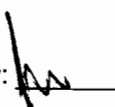
Compound	Quantitation Limit (ug/L)	Result (ug/L)
Naphthalene	0.5	BQL
n-Propyl benzene	0.5	BQL
Styrene	0.5	BQL
1,1,1,2-Tetrachloroethane	0.5	BQL
1,1,2,2-Tetrachloroethane	0.5	BQL
Tetrachloroethene	0.5	BQL
Toluene	0.5	BQL
1,2,3-Trichlorobenzene	0.5	BQL
1,2,4-Trichlorobenzene	0.5	BQL
Trichloroethene	0.5	BQL
1,1,1-Trichloroethane	0.5	BQL
1,1,2-Trichloroethane	0.5	BQL
Trichlorofluoromethane	0.5	BQL
1,2,3-Trichloropropane	0.5	BQL
1,2,4-Trimethylbenzene	0.5	BQL
1,3,5-Trimethylbenzene	0.5	BQL
Vinyl chloride	0.5	BQL
m-,p-Xylene	1	BQL
o-Xylene	0.5	BQL

Surrogate Spike Recoveries

Compound	Spike Added (ug/L)	Surrogate Result (ug/L)	%Rec
Bromofluorobenzene	10.0	10.1	101
1,2-Dichloroethane-d4	10.0	10.7	107
Toluene-d8	10.0	10.1	101

Comments:

All results are corrected for dilution.

Reviewed by: 

Flags: BQL = Below Quantitation Limit

N.C. Certification #481 S.C. Certification #99029

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PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatiles
by GCMS 625

Client Sample ID: USTH19-MW07

Client Project ID: H-19

Lab Sample ID: 44875

Lab Project ID: G132-1048

Matrix: Water

Date Collected: 5/30/2002

Date Received: 5/30/2002

Date Analyzed: 6/6/2002

Analyzed By: MRC

Dilution: 1

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Acenaphthene	10	BQL
Acenaphthylene	10	BQL
Anthracene	10	BQL
Benzo[a]anthracene	10	BQL
Benzo[a]pyrene	10	BQL
Benzo[b]fluoranthene	10	BQL
Benzo[g,h,i]perylene	10	BQL
Benzo[k]fluoranthene	10	BQL
Bis(2-chloroethoxy)methane	10	BQL
Bis(2-chloroethyl)ether	10	BQL
Bis(2-chloroisopropyl)ether	10	BQL
Bis(2-ethylhexyl)phthalate	10	BQL
4-bromophenyl phenyl ether	10	BQL
Butylbenzylphthalate	10	BQL
4-Chloro-3-methylphenol	10	BQL
2-Chloronaphthalene	10	BQL
2-Chlorophenol	10	BQL
4-Chlorophenyl phenyl ether	10	BQL
Chrysene	10	BQL
Di-n-Butylphthalate	10	BQL
Di-n-octylphthalate	10	BQL
Dibenzo[a,h]anthracene	10	BQL
1,2-Dichlorobenzene	10	BQL
1,3-Dichlorobenzene	10	BQL
1,4-Dichlorobenzene	10	BQL
3,3'-Dichlorobenzidine	20	BQL
2,4-Dichlorophenol	10	BQL
Diethylphthalate	10	BQL
2,4-Dimethylphenol	10	BQL
Dimethylphthalate	10	BQL
4,6-Dinitro-2-methylphenol	50	BQL
2,4-Dinitrophenol	50	BQL
2,4-Dinitrotoluene	10	BQL
2,6-Dinitrotoluene	10	BQL
Fluoranthene	10	BQL
Fluorene	10	BQL
Hexachlorobenzene	10	BQL
Hexachlorobutadiene	10	BQL
Hexachlorocyclopentadiene	20	BQL
Hexachloroethane	10	BQL

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatiles

by GCMS 625

Client Sample ID: USTH19-MW07

Client Project ID: H-19

Lab Sample ID: 44875

Lab Project ID: G132-1048

Matrix: Water

Date Collected: 5/30/2002

Date Received: 5/30/2002

Date Analyzed: 6/6/2002

Analyzed By: MRC

Dilution: 1

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Indeno(1,2,3-c,d)pyrene	10	BQL
Isophorone	10	BQL
N-Nitrosodi-n-propylamine	10	BQL
N-Nitrosodiphenylamine	10	BQL
Naphthalene	10	BQL
Nitrobenzene	10	BQL
2-Nitrophenol	10	BQL
4-Nitrophenol	50	BQL
Pentachlorophenol	50	BQL
Phenanthrene	10	BQL
Phenol	10	BQL
Pyrene	10	BQL
1,2,4-Trichlorobenzene	10	BQL
2,4,6-Trichlorophenol	10	BQL

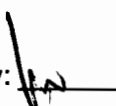
Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	9.4	94
2-Fluorophenol	10	9.0	90
Nitrobenzene-d5	10	8.7	87
Phenol-d6	10	8.6	86
2,4,6-Tribromophenol	10	8.1	81
4-Terphenyl-d14	10	10.0	100

Comments:

Results are corrected for %solids and dilution where applicable.

Flags:

BQL = Below Quantitation Limit.

Reviewed By: 

Results of Library Search for Semivolatile Compounds
by GCMS

Client Sample ID: USTH19-MW07
Client Project ID: H-19
Lab Sample ID: 44875
Lab Project ID: G132-1048
Matrix: Water

Date Collected: 5/30/2002
Date Received: 5/30/2002
Date Analyzed: 6/6/2002
Analyzed By: MRC
Dilution: 1

Num.	Compound	CAS#	Match Probability	Result (ug/L)
1	Unknown			5.7 ✓
2	Unknown			4.3 ✓
3				
4				
5				
6				
7				
8				
9				
10				

Comment:

Tentatively Identified Compound (TIC) refers to substances which are not present in the list of target compounds. Therefore, not all TICs are identified and quantitated using individual standards. TIC listings are prepared utilizing a computerized library search of electron impact mass spectral data and evaluation of the relevant data by a mass spectral data specialist.

Quantitation is accomplished by relative peak area of the compound compared to that of the nearest internal standard from the total ion chromatogram. TICs are identified and quantitated only if the peak area is equal to or greater than 10% of that of the nearest internal standard. Quantitation provided is an estimate.

Reviewed by: hw

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

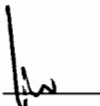
Client Name: LAW ENGINEERINGProject Name: H-19

Sample Information and Analytical Results	
Sample Identification	USTH19-MW07
Sample Matrix	Water
Collection Option (for Soil)*	
Date Collected	05/30/02
Date Received	05/30/02
Date Extracted	06/07/02
Date Analyzed	06/07/02
Dry Weight	
Dilution Factor	1
C ₅ -C ₈ Aliphatics**	< 100 (µg/L)
C ₉ -C ₁₂ Aliphatics**	< 100 (µg/L)
C ₉ -C ₁₀ Aromatics**	< 100 (µg/L)
Surrogate % Recovery - PID	100
Surrogate % Recovery - FID	100

* = Option 1 = Established fill line on vial, Option 2 = Sampling Device/Brand, or Option 3 = Field weight of soil.

** = Excludes any surrogates or internal standards.

Lab Info: G132-1048-44875

Reviewed By: 

EPH (Aliphatics/Aromatics) Results

by MDEP-EPH

Client Name: LAW ENGINEERING

Project Name: H-19

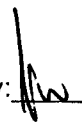
Sample Information and Analytical Results	
Sample Identification	USTH19-MW07
Sample Matrix	Water
Date Collected	05/30/02
Date Received	05/30/02
Date Extracted	06/05/02
Date Analyzed	06/05/02
Dry Weight	
Dilution Factor	1
C ₉ -C ₁₈ Aliphatics*	< 100 (µg/L)
C ₁₉ -C ₃₆ Aliphatics*	< 100 (µg/L)
C ₁₁ -C ₂₂ Aromatics*	< 100 (µg/L)
Aliphatic Surrogate % Recovery	34
Aromatic Surrogate % Recovery	72

Comments:

* = Excludes any surrogates or internal standards.

Sample did not require fractionation.

Lab info: G132-1048-44875

Reviewed By: 

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Metals

Client Sample ID: USTH19-MW07

Client Project ID: H-19

Lab Sample ID: 44875

Lab Project ID: G132-1048

Batch ID: 2327

Analyzed By: PSW

Date Collected: 5/30/02

Date Received: 5/30/02

Matrix: Water ✓

Metals	Result	Quantitation Limit	DF	Units	Method	Date Analyzed
Chromium	BQL	0.0100	1	MG/L	6010B	6/11/02
Lead	BQL	0.0100	1	MG/L	6010B	6/11/02

Comments

BQL = Below Quantitation Limits

DF = Dilution Factor

J = Between MDL and RL

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 6210D

Client Sample ID: USTH19-MW01-D

Client Project ID: H-19

Lab Sample ID: 44876

Lab Project ID: G132-1048

Matrix: Water

Date Analyzed: 6/12/02

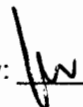
Analyzed By: EES

Date Collected: 5/30/02

Date Received: 5/30/02

Dilution: 1.0

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Benzene	0.5	BQL
Bromobenzene	0.5	BQL
Bromochloromethane	0.5	BQL
Bromodichloromethane	0.5	BQL
Bromoform	0.5	BQL
Bromomethane	0.5	BQL
n-Butylbenzene	0.5	BQL
sec-Butylbenzene	0.5	BQL
tert-Butylbenzene	0.5	BQL
Carbon tetrachloride	0.5	BQL
Chlorobenzene	0.5	BQL
Chloroethane	0.5	BQL
Chloroform	0.5	14
Chloromethane	0.5	BQL
2-Chlorotoluene	0.5	BQL
4-Chlorotoluene	0.5	BQL
Dibromochloromethane	0.5	BQL
1,2-Dibromo-3-chloropropane	5	BQL
Dibromomethane	0.5	BQL
1,2-Dibromoethane (EDB)	0.5	BQL
1,2-Dichlorobenzene	0.5	BQL
1,3-Dichlorobenzene	0.5	BQL
1,4-Dichlorobenzene	0.5	BQL
1,1-Dichloroethane	0.5	BQL
1,1-Dichloroethene	0.5	BQL
1,2-Dichloroethane	0.5	BQL
cis-1,2-Dichloroethene	0.5	BQL
trans-1,2-dichloroethene	0.5	BQL
1,2-Dichloropropane	0.5	BQL
1,3-Dichloropropane	0.5	BQL
2,2-Dichloropropane	0.5	BQL
1,1-Dichloropropene	0.5	BQL
Dichlorodifluoromethane	5	BQL
Diisopropyl ether (DIPE)	0.5	BQL
Ethylbenzene	0.5	BQL
Hexachlorobutadiene	0.5	BQL
Isopropylbenzene	0.5	BQL
4-Isopropyltoluene	0.5	BQL
Methylene chloride	5	BQL
Methyl-tert-butyl ether (MTBE)	0.5	BQL

Reviewed by: 

Flags: BQL = Below Quantitation Limit

N.C. Certification #481 S.C. Certification #99029

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PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 6210D

Client Sample ID: USTH19-MW01-D

Client Project ID: H-19

Lab Sample ID: 44876

Lab Project ID: G132-1048

Matrix: Water

Date Analyzed: 6/12/02

Analyzed By: EES

Date Collected: 5/30/02

Date Received: 5/30/02

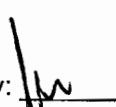
Dilution: 1.0

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Naphthalene	0.5	BQL
n-Propyl benzene	0.5	BQL
Styrene	0.5	BQL
1,1,1,2-Tetrachloroethane	0.5	BQL
1,1,2,2-Tetrachloroethane	0.5	BQL
Tetrachloroethene	0.5	BQL
Toluene	0.5	BQL
1,2,3-Trichlorobenzene	0.5	BQL
1,2,4-Trichlorobenzene	0.5	BQL
Trichloroethene	0.5	BQL
1,1,1-Trichloroethane	0.5	BQL
1,1,2-Trichloroethane	0.5	BQL
Trichlorofluoromethane	0.5	BQL
1,2,3-Trichloropropane	0.5	BQL
1,2,4-Trimethylbenzene	0.5	BQL
1,3,5-Trimethylbenzene	0.5	BQL
Vinyl chloride	0.5	BQL
m-,p-Xylene	1	BQL
o-Xylene	0.5	BQL

Surrogate Spike Recoveries	Spike Added (ug/L)	Surrogate Result (ug/L)	%Rec
Compound			
Bromofluorobenzene	10.0	10.0	100
1,2-Dichloroethane-d4	10.0	10.6	106
Toluene-d8	10.0	10.1	101

Comments:

All results are corrected for dilution.

Reviewed by: 

Flags: BQL = Below Quantitation Limit

N.C. Certification #481 S.C. Certification #99029

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PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Metals

Client Sample ID: USTH19-MW01-D
Client Project ID: H-19
Lab Sample ID: 44876
Lab Project ID: G132-1048
Batch ID: 2327

Analyzed By: PSW
Date Collected: 5/30/02
Date Received: 5/30/02
Matrix: Water

Metals	Result	Quantitation Limit	DF	Units	Method	Date Analyzed
Chromium	BQL	0.0100	1	MG/L	6010B	6/11/02
Lead	BQL	0.0100	1	MG/L	6010B	6/11/02

Comments

BQL = Below Quantitation Limits

DF = Dilution Factor

J = Between MDL and RL

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 6210D

Client Sample ID: TRIP BLANK

Client Project ID: H-19

Lab Sample ID: 44877

Lab Project ID: G132-1048

Matrix: Water

Date Analyzed: 6/13/02

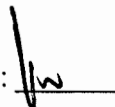
Analyzed By: EES

Date Collected: 5/30/02

Date Received: 5/30/02

Dilution: 1.0

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Benzene	0.5	BQL
Bromobenzene	0.5	BQL
Bromochloromethane	0.5	BQL
Bromodichloromethane	0.5	BQL
Bromoform	0.5	BQL
Bromomethane	0.5	BQL
n-Butylbenzene	0.5	BQL
sec-Butylbenzene	0.5	BQL
tert-Butylbenzene	0.5	BQL
Carbon tetrachloride	0.5	BQL
Chlorobenzene	0.5	BQL
Chloroethane	0.5	BQL
Chloroform	0.5	BQL
Chloromethane	0.5	BQL
2-Chlorotoluene	0.5	BQL
4-Chlorotoluene	0.5	BQL
Dibromochloromethane	0.5	BQL
1,2-Dibromo-3-chloropropane	5	BQL
Dibromomethane	0.5	BQL
1,2-Dibromoethane (EDB)	0.5	BQL
1,2-Dichlorobenzene	0.5	BQL
1,3-Dichlorobenzene	0.5	BQL
1,4-Dichlorobenzene	0.5	BQL
1,1-Dichloroethane	0.5	BQL
1,1-Dichloroethene	0.5	BQL
1,2-Dichloroethane	0.5	BQL
cis-1,2-Dichloroethene	0.5	BQL
trans-1,2-dichloroethene	0.5	BQL
1,2-Dichloropropane	0.5	BQL
1,3-Dichloropropane	0.5	BQL
2,2-Dichloropropane	0.5	BQL
1,1-Dichloropropene	0.5	BQL
Dichlorodifluoromethane	5	BQL
Diisopropyl ether (DIPE)	0.5	BQL
Ethylbenzene	0.5	BQL
Hexachlorobutadiene	0.5	BQL
Isopropylbenzene	0.5	BQL
4-Isopropyltoluene	0.5	BQL
Methylene chloride	5	BQL
Methyl-tert-butyl ether (MTBE)	0.5	BQL

Reviewed by: 

Flags: BQL = Below Quantitation Limit

N.C. Certification #481 S.C. Certification #99029

Page 1

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 6210D

Client Sample ID: TRIP BLANK

Client Project ID: H-19

Lab Sample ID: 44877

Lab Project ID: G132-1048

Matrix: Water

Date Analyzed: 6/13/02

Analyzed By: EES

Date Collected: 5/30/02

Date Received: 5/30/02

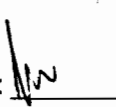
Dilution: 1.0

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Naphthalene	0.5	BQL
n-Propyl benzene	0.5	BQL
Styrene	0.5	BQL
1,1,1,2-Tetrachloroethane	0.5	BQL
1,1,2,2-Tetrachloroethane	0.5	BQL
Tetrachloroethene	0.5	BQL
Toluene	0.5	0.9
1,2,3-Trichlorobenzene	0.5	BQL
1,2,4-Trichlorobenzene	0.5	BQL
Trichloroethene	0.5	BQL
1,1,1-Trichloroethane	0.5	BQL
1,1,2-Trichloroethane	0.5	BQL
Trichlorofluoromethane	0.5	BQL
1,2,3-Trichloropropane	0.5	BQL
1,2,4-Trimethylbenzene	0.5	BQL
1,3,5-Trimethylbenzene	0.5	BQL
Vinyl chloride	0.5	BQL
m-,p-Xylene	1	BQL
o-Xylene	0.5	BQL

Surrogate Spike Recoveries	Spike Added (ug/L)	Surrogate Result (ug/L)	%Rec
Compound			
Bromofluorobenzene	10.0	10.3	103
1,2-Dichloroethane-d4	10.0	10.6	106
Toluene-d8	10.0	10.1	101

Comments:

All results are corrected for dilution.

Reviewed by: 

Attachment 2

VPH Laboratory Reporting Form

Calibration and QA/QC Information

FID Initial Calibration Date:

06/12/02

PID Initial Calibration Date:

06/12/02

Calibration Ranges and Limits

Range	MDL		ML		RL	
	($\mu\text{g/L}$)	(mg/Kg)	($\mu\text{g/L}$)	(mg/Kg)	($\mu\text{g/L}$)	(mg/Kg)
C ₅ -C ₈ Aliphatics	2.4	0.12	7.5	0.38	100	10
C ₉ -C ₁₂ Aliphatics	1.3	0.065	4.0	0.21	100	10
C ₉ -C ₁₀ Aromatics	0.5	0.025	1.6	0.08	100	10

Calibration Concentration Levels

Range	Levels		%RSD or CCC	Method of Quantitation
	($\mu\text{g/L}$)	(mg/Kg)		
C ₅ -C ₈ Aliphatics	20	2	11.6	Calibration Factor
	80	8		
	200	20		
	800	80		
	2000	200		
C ₉ -C ₁₂ Aliphatics	15	1.5	0.999	Linear Regression
	60	6		
	150	15		
	600	60		
	1500	150		
C ₉ -C ₁₀ Aromatics	32.5	3.25	11.3	Calibration Factor
	130	13		
	325	32.5		
	1300	130		
	3250	325		

Calibration Check Date:

06/13/02

Calibration Check

Range	Levels		RPD
	($\mu\text{g/L}$)	(mg/Kg)	
C ₅ -C ₈ Aliphatics	200	20	-4.7
C ₉ -C ₁₂ Aliphatics	150	15	15.0
C ₉ -C ₁₀ Aromatics	325	32.5	-11.7

MDL = Method Detection Limit

ML = Minimum Limit

RL = Reportable Limit

RPD = Relative Percent Difference

%RSD = Percent Relative Standard Deviation

CCC = Correlation Coefficient of Curve

Reviewed By: LN

PARADIGM ANALYTICAL LABORATORIES, INC.

Attachment 3

EPH Laboratory Reporting Form

Calibration and QA/QC Information
--

Initial Calibration Date: 12/11/01

Calibration Ranges and Limits

Range	MDL (mg/Kg)	(µg/L)	ML (mg/Kg)	(µg/L)	RL (mg/Kg)	(µg/L)
C ₉ -C ₁₈ Aliphatics	0.1	2	0.3	6.5	100	10
C ₁₉ -C ₃₆ Aliphatics	0.1	1	0.3	3.1	100	10
C ₁₁ -C ₂₂ Aromatics	0.2	2.5	0.6	8	100	10

Calibration Concentration Levels

Range	Levels (µg/L) (mg/Kg)		%RSD or CCC	Method of Quantitation
C ₉ -C ₁₈ Aliphatics	0.06	1	2.00	Calibration Factor
	0.15	2.5		
	0.3	5		
	0.6	10		
	1.2	20		
C ₁₉ -C ₃₆ Aliphatics	0.08	1.33	1.2	Calibration Factor
	0.2	3.33		
	0.4	6.67		
	0.8	13.3		
	1.6	26.7		
C ₁₁ -C ₂₂ Aromatics	0.12	2	3.3	Calibration Factor
	0.3	5		
	0.6	10		
	1.2	20		
	2.4	40		

Calibration Check Date: 06/05/02

Calibration Check

Range	Levels (µg/mL) (mg/Kg)		RPD
C ₉ -C ₁₈ Aliphatics	0.6	10	-8.6
C ₁₉ -C ₃₆ Aliphatics	0.8	13.3	11.5
C ₁₁ -C ₂₂ Aromatics	1.2	20	6.1

MDL = Method Detection Limit

ML = Minimum Limit

RL = Reportable Limit

RPD = Relative Percent Difference

%RSD = Percent Relative Standard Deviation

CCC = Correlation Coefficient of Curve

PARADIGM ANALYTICAL LABORATORIES, INC.

Attachment 3

EPH Laboratory Reporting Form

Calibration and QA/QC Information

Initial Calibration Date: 12/11/01

Calibration Ranges and Limits

Range	MDL (mg/Kg)	(µg/L)	ML (mg/Kg)	(µg/L)	RL (mg/Kg)	(µg/L)
C ₉ -C ₁₈ Aliphatics	0.1	2	0.3	6.5	100	10
C ₁₉ -C ₃₆ Aliphatics	0.1	1	0.3	3.1	100	10
C ₁₁ -C ₂₂ Aromatics	0.2	2.5	0.6	8	100	10

Calibration Concentration Levels

Range	Levels (µg/L)	(mg/Kg)	%RSD or CCC	Method of Quantitation
C ₉ -C ₁₈ Aliphatics	0.06	1	2.00	Calibration Factor
	0.15	2.5		
	0.3	5		
	0.6	10		
	1.2	20		
C ₁₉ -C ₃₆ Aliphatics	0.08	1.33	1.2	Calibration Factor
	0.2	3.33		
	0.4	6.67		
	0.8	13.3		
	1.6	26.7		
C ₁₁ -C ₂₂ Aromatics	0.12	2	3.3	Calibration Factor
	0.3	5		
	0.6	10		
	1.2	20		
	2.4	40		

Calibration Check Date: 06/07/02

Calibration Check

Range	Levels (µg/mL)	(mg/Kg)	RPD
C ₉ -C ₁₈ Aliphatics	0.6	10	-17.6
C ₁₉ -C ₃₆ Aliphatics	0.8	13.3	-6.0
C ₁₁ -C ₂₂ Aromatics	1.2	20	3.9

MDL = Method Detection Limit

ML = Minimum Limit

RL = Reportable Limit

RPD = Relative Percent Difference

%RSD = Percent Relative Standard Deviation

CCC = Correlation Coefficient of Curve

ne: (910)-350-1903 FAX: (910)-350-1557

Chain-of Custody Record & Analytical Request

COC#

3267

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Client: Law Engineering Project ID: H-19

Project ID: H-19

Date: 5/30/02

Report To: BILL DEOBALD

Address: 3301 ATLANTIC AVE
Contact: BILL DEGBA Turnaround: STANDARD

•Turnaround: STANDARD

Address: 3301 ATLANTIC AVE Contact: BILL DEGBARD Turnaround: STANDARD
Address: LAKEH N 27604 Phone: 919 831 8051 Job Number: 30740-60600-140-107

Press CAREGA N 27604 Phone: 919 831 8051

Job Number: 30740-6-0600-140-107

te #: 1489 P.O. Number: 18791
Fax: 919 831 8136

P.O. Number: 18791

[illegible]

NC _____ SC _____ Other _____

SEE REVERSE FOR
TERMS AND CONDITIONS