Third Quarter 2005

Groundwater Sampling Report
RED HILL FUEL STORAGE FACILITY, HAWAII

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November 2005

Department of the Navy
Commander, Pacific Division
Naval Facilities Engineering Command
Pearl Harbor, HI 96860-3134

NAVFAC
Naval Facilities Engineering Command
NAVFAC PACIFIC

Contract Number N62742-01-D-1806, CTO 0013

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Groundwater Sampling Report
RED HILL FUEL STORAGE FACILITY, HAWAII

November 2005

Prepared for:

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Naval Facilities Engineering Command
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Prepared under:

Contract Number N62742-01-D-1806, CTO 0013

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EXECUTIVE SUMMARY

The Department of the Navy, Naval Facilities Engineering Command, Pacific Division (NAVFAC PACIFIC) has retained Dawson Group, Inc. (DAWSON) to perform groundwater monitoring activities at the Red Hill Fuel Storage Facility (FSF), Hawaii. The Red Hill FSF consists of 20 active underground storage tanks (USTs) operated by the Fleet Industrial Supply Center (FISC) Pearl Harbor. Figure 1, *Site Vicinity Map*, illustrates the location of the project site.

This work was performed under NAVFAC PACIFIC Contract Number N62742-01-D-1806, Contract Task Order (CTO) 0013. This document is the third quarterly report and summarizes the following: field investigation, IDW disposal, sample results, and conclusions and recommendations for the next sampling event.

Site Background

From 1998 to 2001, the Navy conducted an investigation at the facility to assess potential releases from the fuel storage facility. In February 2001, the Navy installed a one-inch diameter sentinel well (MW-V1D) to monitor for contamination of the basal aquifer underlying the storage facility (AMEC Earth and Environmental, Inc. [AMEC], 2002). Sentinel well MW-V1D was installed and completed at approximately 100 feet below grade (fbg). At the time of well completion, depth to water in MW-V1D was measured at 86 fbg. The groundwater level at the project site fluctuates from dry season to wet season (AMEC, 2002).

A second monitoring well (MW-V2S) was installed and completed above the water-bearing zone at approximately 52 fbg. This monitoring well is located southwest of sentinel well MW-V1D and does not contain either groundwater or product. MW-V2S was intentionally completed above the water-bearing zone in order to avoid creation of a possible direct conduit to the basal aquifer (AMEC, 2002).

In February 2001, groundwater samples collected from sentinel well MW-V1D contained total petroleum hydrocarbon (TPH) concentrations ranging from 0.883 milligrams per liter (mg/L) to 1.05 mg/L and total lead ranging from 0.0104 mg/L to 0.015 mg/L. The maximum total lead concentration in the samples was equal to the primary drinking water standard of 0.015 mg/L for lead and exceeded the State of Hawaii Department of Health (HDOH) Tier 1 groundwater action level (GWAL) of 0.0056 mg/L (US Navy, 2004).

Following discussions with HDOH, a program was initiated to monitor the sentinel well MW-V1D and the Navy Public Works Center (PWC) potable water stilling basin for indications of contamination from the upgradient tank farm. The recommended parameters for analyses were TPH as diesel; TPH as gasoline; benzene, toluene, ethylbenzene, and total xylenes (BTEX); 1,2-dichloroethane (DCA); polynuclear aromatic hydrocarbons (PAHs); total lead; and 1,2-dibromoethane (EDB) (US Navy, 2004).

Field Activities

On 8 September 2005, three surface water samples (two primary and one duplicate) were collected from the PWC potable water stilling basin and analyzed for TPH as diesel, TPH as gasoline, 1,2-DCA, BTEX, methyl-tert-butyl ether (MtBE), total lead, and EDB.

On 8 September 2005, two groundwater samples (one primary and one duplicate) were collected from the sentinel well, MW-V1D and analyzed for TPH-D, TPH-G, 1,2-DCA, BTEX, total lead, and EDB.

Conclusions and Recommendations

The following conclusions are based on the data collected during this investigation.

Stilling Basin

- Concentrations of lead were detected above the laboratory method reporting limits (MRLs). No constituents were detected at concentrations above the HDOH Tier 1 GWALs or HDOH drinking water standard.

Sentinel Well

- Concentrations of TPH as diesel, naphthalene, 2-methylnaphthalene, acenaphthene, dibenzofuran, fluorene, phenanthrene, fluoranthene, pyrene, benz(a)anthracene, and chrysene were detected above laboratory MRLs. No constituents were detected at concentrations above the HDOH Tier 1 GWALs.
- Lead was detected at concentrations above the laboratory MRL. The concentrations were below both the HDOH Tier 1 GWAL and the HDOH drinking water standard in the sentinel well samples. The September 2005 results were also less than the corresponding 2001 investigation results (AMEC, 2002). This was the first time since the samples have been collected at MW-V1D that the lead concentrations have been below the HDOH Tier 1 GWAL and HDOH drinking water standard. Previous samples collected from MW-V1D had not been filtered prior to lead analysis.
- The groundwater in the upgradient sentinel well (MW-V1D) shows evidence of contamination in the basal aquifer by contaminants of potential concern.

Based on the findings during this investigation, DAWSON recommends the following actions:

- Installation of a dedicated pump within MW-V1D to avoid cross-contamination, to facilitate low-flow sampling methodology, to more efficiently sample the monitoring well, and to contribute to the repeatability of sampling methods.
- Continue to filter lead samples during collection and prior to analysis.
- Continue sampling at the stilling basin and the sentinel well during the next quarter (October through December 2005).

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ACRONYMS AND ABBREVIATIONS

ACRONYM/ ABBREVIATION	DEFINITION/MEANING
1,2 DCA	1,2 dichloroethane
AMEC	AMEC Earth and Environmental, Inc.
BTEX	benzene, toluene, ethylbenzene, and total xylene
CAS	Columbia Analytical Services
CFR	Code of Federal Regulations
COPC	contaminants of potential concern
COTR	Contracting Officer's Technical Representative
CTO	contract task order
DAWSON	Dawson Group, Inc.
DOT	Department of Transportation
DQO	Data Quality Objectives
DW	drinking water
EDB	1,2-dibromoethane
EM	Engineering Manual
EPA	United States Environmental Protection Agency
fbg	feet below grade
FISC	Fleet Industrial Supply Center
FSF	fuel storage facility
FSP	Field Sampling Plan
GWAL	groundwater action level
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Emergency Operations
HDOH	State of Hawaii Department of Health
IDW	investigation derived waste
IP	interface probe
IRP	Installation Restoration Program
mg/L	milligrams per liter
MRL	method reporting limit
MtBE	methyl tert-butyl ether
NAVFAC PACIFIC	Naval Facilities Engineering Command, Pacific
OSHA	Occupational Safety and Health Administration
PAH	polynuclear aromatic hydrocarbon
PVC	polyvinyl chloride
PWC	Public Works Center
QA	quality assurance
QC	quality control
RPM/NTR	Remedial Project Manager / Navy Technical Representative
SSHO	Site Safety and Health Officer
TPH	total petroleum hydrocarbons
U.S. Army	United States Department of the Army
UST	underground storage tank

ACRONYMS AND ABBREVIATIONS

ACRONYM/ ABBREVIATION	DEFINITION/MEANING
VOC	volatile organic compound
WP	Work Plan

1. INTRODUCTION

The Department of the Navy, Naval Facilities Engineering Command, Pacific Division (NAVFAC PACIFIC) has retained Dawson Group, Inc. (DAWSON) to perform groundwater monitoring activities at the Red Hill Fuel Storage Facility (FSF), Hawaii. The Red Hill FSF consists of 20 active underground storage tanks (USTs) operated by the Fleet Industrial Supply Center (FISC) Pearl Harbor. Figure 1, *Site Vicinity Map*, illustrates the location of the project site.

This work was performed under NAVFAC PACIFIC Contract Number N62742-01-D-1806, Contract Task Order (CTO) 0013. This document is the third quarterly report and summarizes the following: field investigation, IDW disposal, sample results, and conclusions and recommendations for the next sampling event.

1.1 Project Objectives

The project objective is to determine if petroleum-related groundwater contamination is present downgradient of the 20 active USTs. In order to achieve this objective, the following tasks will be conducted:

- Conduct quarterly sampling of surface water located in the stilling basin located at the potable water infiltration tunnel operated by the Navy.Public Works Center (PWC).
- Conduct quarterly sampling of groundwater from the sentinel monitoring well (MW-V1D) located downgradient of the 20 USTs.
- Present data in a quarterly report, which will include a description of the nature and extent of contamination, if any.

1.2 Document Organization

The following presents the organization of this document:

- **Section 1 Introduction:** presents the project objectives, organization of this document, site location and description, and previous environmental action/studies performed at this site.
- **Section 2 Data Quality Objectives:** provides the data quality objectives for the groundwater monitoring program.
- **Section 3 Methodologies and Procedures**: describes the equipment decontamination, laboratory analysis, stilling basin sample collection, groundwater monitoring well sample collection, and storage of investigation derived waste (IDW).
- **Section 4 Investigation Results:** presents the groundwater monitoring well sample results, stilling basin sample results, trip blank analytical results, data quality review, and IDW disposal.
- **Section 5 Conclusions and Recommendations:** provides discussion of the sampling results and recommendations for the Site.
- **Section 6 References**: lists the references cited in the text.
- **Appendix A:** presents the Non-Hazardous Waste Manifest.

- **Appendix B:** presents the laboratory analytical results for the groundwater samples collected during September 2005.
- **Appendix C:** presents the monitoring well sampling logs from September 2005.

1.3 Site Location and Facility Description

The Red Hill FSF project site is located in Halawa Heights on Oahu, Hawaii. Access is via Halawa Valley Road, located north of the project site. Primary highways in the vicinity of the project site are Interstate Highways H-1 and H-3. Land adjacent to the north of the project site is occupied by Halawa High and Medium Security Facility and private businesses. Land to the south and west of the project site includes the Coast Guard Reservation. Moanalua Valley is located east of the facility (Figure 1, *Site Vicinity Map*).

The Red Hill FSF consists of 20 active USTs operated by Navy FISC Pearl Harbor. Each UST has a capacity of 12.5 million gallons. The facility is located approximately 100 feet above the basal aquifer. Approximately 1,550 feet hydraulically downgradient from the tank farm, the Navy PWC operates a potable water infiltration tunnel (Figure 2, *Site Plan*).

1.4 Previous Environmental Actions/Studies

From 1998 to 2001, the Navy conducted an investigation at the facility to assess potential releases from the fuel storage facility. In February 2001, the Navy installed a one-inch diameter sentinel well (MW-V1D) to monitor for contamination of the basal aquifer underlying the storage facility (AMEC Earth and Environmental, Inc. [AMEC], 2002). Sentinel well MW-V1D was installed and completed at approximately 100 feet below grade (fbg). At the time of well completion, depth to water in MW-V1D was measured at 86 fbg. The groundwater at the project site fluctuates from dry season to wet season (AMEC, 2002).

A second monitoring well (MW-V2S) was installed and completed above the water-bearing zone at approximately 52 fbg. This monitoring well is located southwest of sentinel well MW-V1D and does not contain either groundwater or product. MW-V2S was intentionally completed above the water-bearing zone in order to avoid creation of a possible direct conduit to the basal aquifer (AMEC, 2002).

In February 2001, groundwater samples collected from sentinel well MW-V1D contained TPH concentrations ranging from 0.883 milligrams per liter (mg/L) to 1.05 mg/L and total lead ranging from 0.0104 mg/L to 0.015 mg/L. The maximum total lead concentration in the samples was equal to the primary drinking water standard of 0.015 mg/L for lead and exceeded the State of Hawaii Department of Health (HDOH) Tier 1 groundwater action level (GWAL) of 0.0056 mg/L (US Navy, 2004).

Following discussions with HDOH, a program was initiated to monitor the sentinel well MW-V1D and the PWC potable water stilling basin for indications of contamination from the upgradient tank farm. The recommended parameters for analyses were TPH; BTEX; 1,2 DCA; PAHs; total lead; and EDB (US Navy, 2004).

2. DATA QUALITY OBJECTIVES

Environmental data are needed to: 1) determine if groundwater contamination is present at the project site; 2) determine the best course of action; and 3) characterize IDW wastewater for disposal.

Chemical data must be of sufficient quality and quantity to confirm the presence or absence of contaminants of potential concern (COPC) in the groundwater beneath the Red Hill FSF. The COPCs for this investigation include TPH as diesel and as gasoline; BTEX; MtBE; 1,2 DCA; total lead; and EDB. The data quality objectives were designed to comply with the HDOH's *Technical Guidance Manual for Underground Storage Tank Closure and Release Response, Second Edition* (HDOH, 2000) and *Risk-Based Corrective Action and Decision Making at Sites With Contaminated Soil and Groundwater, Volume I and II* (HDOH, 1996).

The screening levels for this investigation will draw on the HDOH Tier 1 GWALs for sites receiving less than 200 centimeters of rainfall per year and threatening a drinking water source (HDOH, 2000).

For reference purposes, the HDOH Environmental Action Levels (EALs) for sites greater than 150 meters from a surface water body where groundwater is a current or potential source of drinking water (HDOH, 2005) have been included. However, it should be noted that the 2000 Tier 1 GWALs are the governing guidelines for the site as required by the HDOH's UST regulations.

To evaluate the absence or presence of contaminants, the following quality criteria will be followed:

1) Laboratory analytical methods will provide reporting limits that are lower than regulatory action levels,

2) Chemical analyses of COPC will be performed using EPA publication SW-846, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, Third Edition* methodology (EPA, 1998), and

3) Laboratory chemical data will be used to assess each analyte's concentration exceeding HDOH Tier 1 GWALs.

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3. METHODOLOGIES AND PROCEDURES

3.1 Equipment Decontamination

All water-level measuring and water sampling equipment was decontaminated at the start and end of the project, as well as between locations, to reduce the possibility of cross-contamination. The equipment was first washed in potable water and non-phosphate detergent. Then it was rinsed in potable water, rinsed in deionized/distilled water, sprayed with isopropyl alcohol, and rinsed with deionized/distilled water. Decontamination washwater was placed in a Department of Transportation (DOT)-approved, steel, 30-gallon drum and handled appropriately as described in detail in Section 5.3, *Investigation Derived Waste.*

3.2 Laboratory Analysis

The laboratory used standard analytical methods as outlined in the EPA's publication *SW846 – Test Methods for Evaluating Solid Waste, Third Edition* (EPA, 1998). The laboratory followed the EPA's method-specific quality control procedures as outline in *SW846.*

The groundwater samples collected from the stilling basin and the sentinel well were analyzed by Columbia Analytical Services for the following parameters:

- TPH as Diesel and TPH as Gasoline using EPA Method 8015M;
- BTEX, 1,2-DCA, and MtBE using EPA Method 8260B;
- EDB using EPA Method 504.1;
- PAHs using EPA Method 8270C SIM/PAHs; and
- Total Lead by EPA Method 6020.

The analytical methods were requested by the NAVFAC PACIFIC in the Statement of Work (SOW) (U.S. Navy, 2004) and are industry standards. Site investigation activities were conducted in accordance with the *WP/FSP* (DAWSON, 2005b) and the *Project Procedures Manual, U.S. Navy PACDIV Installation Restoration Program* (IRP) (PACDIV, 1998). Copies of laboratory reports and chain-of-custody records for groundwater samples are included in Appendix B, *Laboratory Reports and Chain-of-Custody Records for Primary and QC Groundwater and Stilling Basin Samples.*

3.3 Stilling Basin Sampling Methodology

Previously when sampling the stilling basin, no entry was permitted due to the characteristics of the stilling basin, which identified it as a permit-required confined space. Prior to this event, samples at the stilling basin were collected by lowering a sampling system which was a combination of a polyvinyl chloride (PVC) casing and a disposable bailer, where the bailer was inserted inside the PVC casing, and an IP probe was attached to the outside of the PVC casing. Together, the assembly was lowered to approximately six inches above the water surface, and then the bailer was lowered into the water to collect a sample. Once full, the bailer was raised into the PVC casing and the assembly was raised up through the entrance hatch, where the sample bottles were filled.

3.3.1 Installation of Temporary Well Conduit

On 28 June 2005, a temporary well conduit was installed at the PWC potable water stilling basin to increase the repeatability of sample collection, and to allow more efficient sampling of the groundwater. In order to install this conduit, entry into the stilling basin was allowed. A confined space entry permit was completed (Appendix C), the air within the stilling basin area was monitored (for combustible gases, oxygen, carbon dioxide, and methane), and a safety retrieval line with tripod and fall protection harness was used by the entrant. Each section of the conduit was lowered by rope to the entrant from the entrance hatch.

The bottom of the conduit was comprised of a 4-inch PVC end cap and 25 feet (5-foot sections) of factory-slotted (0.010), 2-inch diameter, schedule-40 polyvinyl chloride (PVC) screen. The sections, once lowered, were assembled by the entrant at the catwalk and secured to the outer side of the base of the ladder cage with heavy duty cable ties. The bottom of the screened interval was installed to be flush with the bottom of the PWC stilling basin. According to measurements taken from the catwalk, the screen was set in 23.1 feet of water.

Attached to the top of the screened PVC section was approximately 60 feet of 2-inch diameter, schedule-40 PVC (10-foot sections) casing. The sections were lowered to the entrant who attached them to the already-in-place sections of screen. Every 5 feet, the conduit was secured to the outer side of the ladder cage with heavy duty cable ties. The top of the conduit was secured with a monitoring well compression cap.

Once the conduit installation was completed, the safety retrieval line with tripod and fall protection harness was disassembled. The conduit was installed at a height so that future entry into the stilling basin can be avoided.

3.3.2 Surface Water Sampling Methodology

Access to the stilling basin requires opening an entrance hatch (approximately 24 inches in diameter). A lockout/tagout procedure was used to prevent accidental closure. From the open entrance hatch, the depth-to-water to the nearest 0.01 foot was measured using an interface probe (IP) through the well conduit. The measurement and time were recorded on the Surface Water Field Sampling Log (Appendix D, *Monitoring Well Sampling Forms*).

The samples were then collected using a new weighted, disposable, single-check valve bailer that remained sealed in plastic (by the manufacturer) until use. The bailer was equipped with a bottom-discharging device. The bailer was lowered to the water surface through the well conduit and the bottom was submerged in the surface water. Once full, the bailer was raised through the well conduit and through the entrance hatch, where the samples bottles were filled. This procedure was repeated until all required primary and field duplicate (QC) samples were collected.

3.3.3 Field Quality Control Sampling

Surface water field duplicate (QC) samples were collected once per sampling event, following the sample collection procedures listed in Section 6.2.2, *Surface Water Sampling Methodology*.

A laboratory-supplied trip blank was placed in the sample cooler containing the VOC samples to be shipped to the laboratory.

A temperature blank was placed in one sample cooler per shipment to be shipped to the laboratory.

3.4 Sentinel Well Sampling Methodology

This section describes the sampling methodology employed to collect groundwater samples.

3.4.1 Measurement of Static Water Level and Detection of an Immiscible Phase

Before sampling, the depth to standing water, depth to an immiscible layer (if any), and the total depth of the well were measured to the nearest 0.01 foot using an IP to provide baseline data. The data were recorded on the Monitoring Well Field Sampling Log (Appendix B).

In accordance with the SOW, if an immiscible phase is detected with the IP, the Project Manager and the Navy RPM/NTR are to be notified immediately. No groundwater sample is collected unless otherwise directed by the Project Manager and/or Navy RPM/NTR.

If no immiscible phase is detected with the IP, the measurements of depth to water and total depth of the well are used to calculate the volume of water in the well and the amount of water to be purged, as well as provide information on the integrity of the well (e.g., identification of siltation problems).

3.4.2 Well Purging Methodology

Purging was accomplished by removing groundwater from the well using a dedicated bailer approximately 12 feet in length and 0.5 inch in diameter attached to a new, dedicated rope. The bailer was lowered into the well with as little disturbance of the water as possible to minimize aeration of the water in the well. Once the bailer was full, it was slowly brought out of the water and the water was transferred to a clean container for evaluation of field parameters. The purge water was evaluated on a regular basis during purging and analyzed in the field for temperature, pH, specific conductivity, salinity, dissolved oxygen, redox potential, and turbidity using a YSI® water quality meter. At least four readings were taken during the purging process. The purging procedure was repeated until the calculated purge volume was removed or when three consecutive field parameter measurements had stabilized to within approximately 10 percent. All information was recorded on the Monitoring Well Field Sampling Log (Appendix B). The purge water was placed in the 30-gallon, steel drum located onsite.

3.4.3 Sample Collection Procedures

The sentinel well was sampled when groundwater within it was representative of aquifer conditions and after it had recovered sufficiently to provide enough volume for the groundwater sample. A period of no more than two hours elapsed between purging and sampling to prevent groundwater interaction with the casing and atmosphere. Depth to water was measured and recorded prior to sampling to demonstrate the degree of recovery of the well.

The bailer was lowered as described in Section 3.4.2, and once the bailer was full, it was brought out of the water and the water transferred directly into the laboratory-supplied containers. This procedure was repeated until all required primary and field duplicate (QC) samples were collected.

3.4.4 Field Quality Control Sampling

Groundwater field duplicate (QC) samples were collected once per sampling event, following the sample collection procedures listed in Section 3.4.3, *Sample Collection Procedures*.

A laboratory supplied trip blank was placed in the sample cooler containing the VOC samples to be shipped to the laboratory.

A temperature blank was placed in one sample cooler per shipment to be shipped to the laboratory.

3.5 Storage of Investigation Derived Waste

IDW generated during this investigation included monitoring well purge water and decontamination wastewater. Wastewater was stored in a DOT-approved, steel, 30-gallon drum. The drum was labeled and marked and stored within the Red Hill Fuel Storage Facility near MW-V1D. IDW management practices are described in detail in the WP/FSP (DAWSON, 2005b).

4. INVESTIGATION RESULTS

4.1 Stilling Basin Water Sample Results

Three surface water samples (two primary and one duplicate) were collected from the PWC potable water stilling basin and analyzed for TPH-D, TPH-G, 1,2-DCA, BTEX, MtBE, dissolved Lead, and EDB on 8 September 2005. The results are presented in *Table 1, Summary of Groundwater Sample Results* of this report. The laboratory analytical reports are presented in *Appendix A, Laboratory Reports and Chain-of-Custody Records for Primary and QC Groundwater and Stilling Basin Samples.*

4.1.1 Dissolved Lead

Lead samples were collected in the field with a bailer and transferred to unpreserved sample bottles. Those sample bottles were brought to the Dawson office and transferred to a preserved sample bottles using a peristaltic pump and new polyethylene tubing to filter the samples. Lead was detected above the laboratory method reporting limits (MRLs) at concentrations ranging from 0.00003 mg/L to 0.00027 mg/L (Table 1). These concentrations were below the HDOH GWAL of 0.0056 mg/L (HDOH, 2000) and the HDOH drinking water standard of 0.015 mg/L (HDOH, 2002).

4.1.2 Total Petroleum Hydrocarbons (TPH)

TPH as diesel was not detected above the laboratory MRLs in the any of the stilling basin samples (Table 1).

TPH as gasoline was not detected above the laboratory MRL in any stilling basin samples (Table 1).

4.1.3 1,2-Dibromoethane (EDB)

EDB was not detected above the laboratory MRLs in any stilling basin samples (Table 1).

4.1.4 Volatile Organic Compounds (VOCs)

No VOCs were detected above the laboratory MRLs in any stilling basin samples (Table 1).

4.1.5 Polynuclear Aromatic Hydrocarbons (PAHs)

Napthalene was detected above the laboratory MRL in sample RH-B-007 (0.000085 mg/L) and in the duplicate sample RH-B-009 (0.000045 mg/L). No other PAHs were detected above the laboratory MRL in any stilling basin samples (Table 1).

4.2 Sentinel Well Groundwater Sample Results

Two groundwater samples (one primary and one duplicate) were collected from the sentinel well, MW-V1D and analyzed for TPH-D, TPH-G, 1,2-DCA, BTEX, MtBE, dissolved Lead, and EDB on 8 September 2005. The results are presented in Table 2, *Summary of Groundwater Sample Results, MW-V1D,* of this report. The laboratory analytical reports are presented in Appendix A.

4.2.1 Dissolved Lead

Lead samples were collected in the field with a bailer and transferred to unpreserved sample bottles. Those sample bottles were brought to the Dawson office and transferred to a preserved sample bottles using a peristaltic pump and new polyethylene tubing to filter the samples. Lead was detected above the laboratory MRL at concentrations of 0.00021 mg/L and 0.000050 mg/L in the primary and duplicate samples (Table 2). Both of these results were below the HDOH GWAL of 0.0056 mg/L (HDOH, 2000) and below the HDOH drinking water standard of 0.015 mg/L (HDOH, 2002).

4.2.2 Total Petroleum Hydrocarbons (TPH)

TPH as diesel was detected at concentrations of 0.950 mg/L and 1.100 mg/L (Table 2). The laboratory report noted that both of the chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.

4.2.3 1,2-Dibromoethane (EDB)

EDB was not detected above the laboratory MRLs in the sentinel well sample (Table 2).

4.2.4 Volatile Organic Compounds (VOCs)

VOCs were not detected above the laboratory MRLs in any sentinel well samples (Table 2).

4.2.5 Polynuclear Aromatic Hydrocarbons (PAHs)

- Naphthalene was detected above the laboratory MRL at concentrations of 0.00083 mg/L and 0.00078 mg/L.
- 2-Methylnaphthalene was detected above the laboratory MRL in both samples at a concentration of 0.000038 mg/L.
- Acenaphthene was detected above the laboratory MRL at concentrations of 0.000054 mg/L and 0.000056 mg/L.
- Dibenzofuran was detected above the laboratory MRL in both samples at a concentration of 0.00013 mg/L.
- Fluorene was detected above the laboratory MRL in both samples at a concentration of 0.000064 mg/L.
- Phenanthrene was detected above the laboratory MRL at concentrations of 0.00011 mg/L and 0.00012 mg/L.
- Fluoranthene was detected above the laboratory MRL at concentrations of 0.000025 mg/L and 0.000049 mg/L.
- Pyrene was detected above the laboratory MRL at concentrations of 0.000030 mg/L and 0.000058 mg/L.
- Benz(a)anthracene was detected above the laboratory MRL in one sample at a concentration of 0.000025 mg/L (duplicate sample).
- Chrysene was detected above the laboratory MRL at concentrations of 0.000022 mg/L and 0.000036 mg/L (Table 2).

4.3 Trip Blank Analytical Results

One trip blank sample was submitted and analyzed for VOCs by EPA Method 8260b. The results are presented in Table 3, *Summary of Trip Blank Results*. The laboratory analytical reports are presented in Appendix A.

No VOCs were detected at concentrations above the laboratory MRLs in the trip blank sample.

4.4 Data Quality Review

4.4.1 Field Quality Assurance/Quality Control

Quality Assurance/Quality Control (QA/QC) checks employed during the collection of field data and sampling activities included the following:

- Collection of samples and field measurements by DAWSON. DAWSON personnel were familiar with EPA protocols concerning equipment decontamination, sample collection, sample and project documentation, and QA/QC procedures.
- Use of certified clean laboratory sample containers.
- Preservation of sample integrity by chilling samples in the field and maintaining proper temperature until receipt at the laboratory.

4.4.2 Laboratory/Quality Control Data Assessment

As part of the QC of this project, the DAWSON completed a desktop review of the data packages received from Columbia Analytical Services. The desktop review included a review of the hold times, reagent blanks, surrogate recoveries, sample duplicates, matrix spike/matrix spike duplicates recoveries, relative percent differences, blank spike recovery and reporting limits. DAWSON concluded that the laboratory analyses meet QC criteria and can be used for the intended purpose. The duplicate results were consistent with all primary sample results and thus valid and useable.

Laboratory Data Assessment

No anomalies associated with the analysis of these samples were observed.

Insufficient sample volume was received to perform a Matrix Spike/Matrix Spike Duplicate (MS/MSD). A Laboratory Control Sample/ Laboratory Control Sample Duplicate (LCS/LCSD) was analyzed and reported in lieu of the MS/MSD for these samples.

Data Discrepancies

The relative percent differences between the primary and duplicate sample concentrations are presented in Tables 1 and 2. There were no significant data discrepancies between the primary and duplicate sample results. Columbia Analytical Services performed analyses on both the primary and duplicate samples.

4.5 IDW Disposal

All IDW generated during the June through September 2005 were determined to be non-hazardous wastes and were taken to an offsite recycling facility on 16 September 2005. The Non-Hazardous Waste Manifest is presented in Appendix A of this report.

5. CONCLUSIONS AND RECOMMENDATIONS

The following conclusions are based on the data collected during this investigation.

Stilling Basin

- Concentrations of lead were detected above the laboratory method reporting limits (MRLs). No constituents were detected at concentrations above the HDOH Tier 1 GWALs or HDOH drinking water standard.

Sentinel Well

- Concentrations of TPH as diesel, naphthalene, 2-methylnaphthalene, acenaphthene, dibenzofuran, fluorene, phenanthrene, fluoranthene, pyrene, benz(a)anthracene, and chrysene were detected above laboratory MRLs. No constituents were detected at concentrations above the HDOH Tier 1 GWALs.
- Lead was detected at concentrations above the laboratory MRL. The concentrations were below both the HDOH Tier 1 GWAL and the HDOH drinking water standard in the sentinel well samples. The September 2005 results were also less than the corresponding 2001 investigation results (AMEC, 2002). This was the first time since the samples have been collected at MW-V1D that the lead concentrations have been below the HDOH Tier 1 GWAL and HDOH drinking water standard. Previous samples collected from MW-V1D had not been filtered prior to lead analysis.
- The groundwater in the upgradient sentinel well (MW-V1D) shows evidence of contamination in the basal aquifer by contaminants of potential concern.

Based on the findings during this investigation, DAWSON recommends the following actions:

- Installation of a dedicated pump within MW-V1D to avoid cross-contamination, to facilitate low-flow sampling methodology, to more efficiently sample the monitoring well, and to contribute to the repeatability of sampling methods.
- Continue to filter lead samples during collection and prior to analysis.
- Continue sampling at the stilling basin and the sentinel well during the next quarter (October through December 2005).

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FIGURES

Site Vicinity Map – Figure 1

Site Plan– Figure 2

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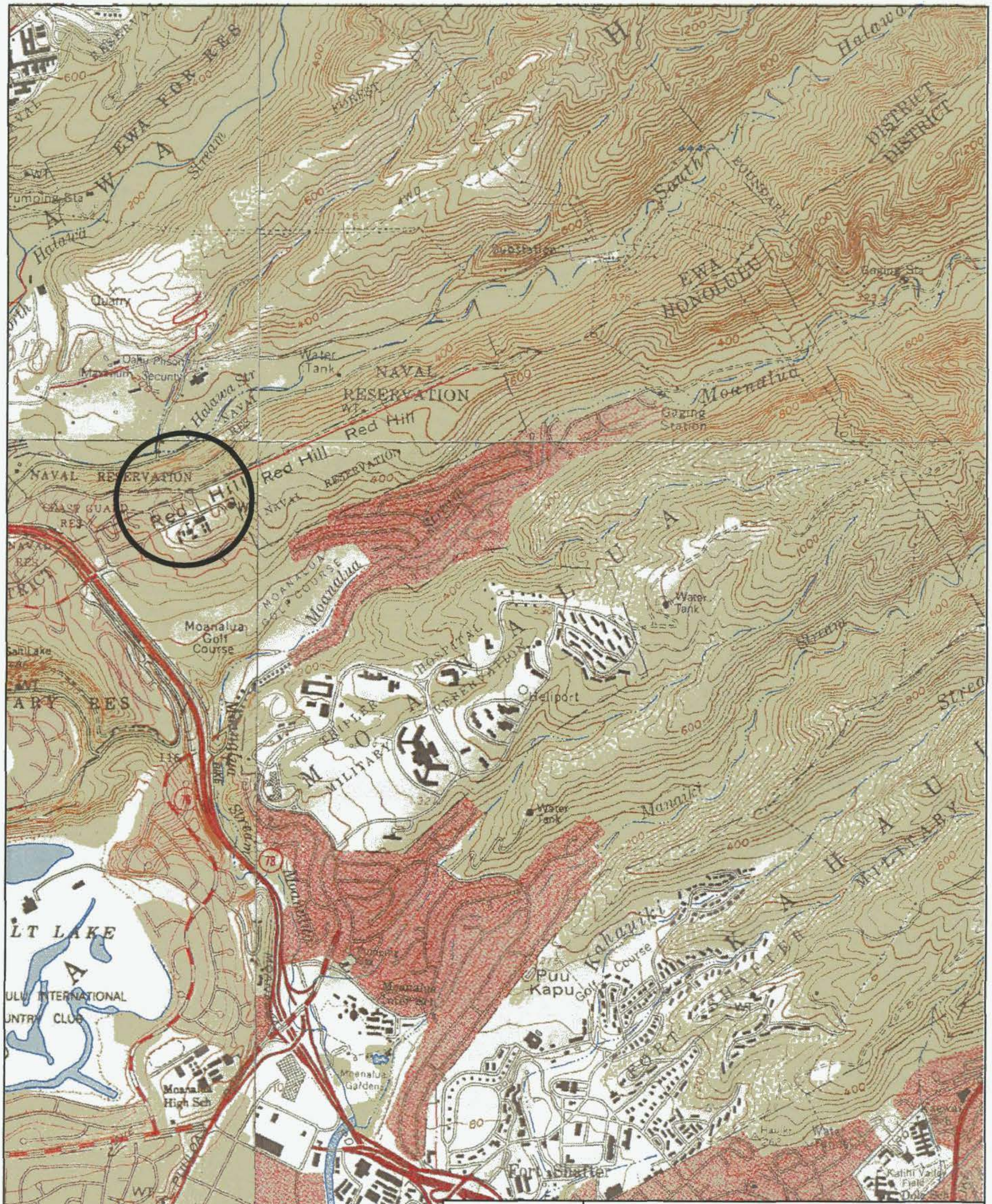

FIGURE 1

SITE VICINITY MAP

RED HILL FUEL STORAGE FACILITY
OAHU, HAWAII

Dawson Group, Inc.

JOB NO. 2001 022.013	NOVEMBER 2005	N62742-01-D-1806

QUARTERLY REPORT

LEGEND

EXISTING NAVY BOUNDARY

EXISTING NON-NAVY BOUNDARY

EXISTING ROAD OR PAVED AREA

QUEEN EMMA ESTATE

NORTH

SOUTH HALAWA STREAM

SOUTH HALAWA STREAM

RED HILL ADIT NO. 3
WATER PUMPING STATION

RED HILL OILY WASTE
DISPOSAL FACILITY

ADIT NO. 3
ENTRANCE

H-3 FREEWAY

SOUTH HALAWA STREAM

STILLING
BASIN

SENTINEL
WELL
MW-V1D

FISC UNDERGROUND
STORAGE TANKS

BOUNDARY OF THE RED HILL
NAVAL RESERVATION

SCALE: 1" = 600'

INFILTRATION
TUNNEL

MOANALUA GOLF COURSE

MOANALUA

FREEWAY

KUKUI DRIVE

ALAMANU DRIVE

SOURCE: EARTHTECH FIGURE 3-5, U.S. NAVY FISC RED HILL WATER DEVELOPMENT TUNNEL, 11/98.

Dawson Group, Inc.

CONTRACT NO.: N62742-01-D-1806, CTO 0013

FIGURE 2

SITE PLAN

GROUNDWATER SAMPLING REPORT
RED HILL FUEL STORAGE FACILITY, HAWAII

JOB NO.: 2001_022.013 | NOVEMBER 2005

TABLES

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TABLE 1
Summary of Groundwater Sample Results
Stilling Basin
Red Hill Fuel Storage Facility
Red Hill, Oahu, Hawaii

				Pumps Offline	Pumps Offline		Relative Percent Difference (RPD)	Pumps Offline	HDOH Tier 1 Groundwater Action Levels	Environmental Action Levels	UNITS
			SAMPLE IDENTIFICATION	RH-B-001	RH-B-004	RH-B-005		RH-B-007			
			SAMPLE TYPE	Primary	Primary	Duplicate		Primary			
			DATE COLLECTED	02/16/2005	06/28/2005	06/28/2005		09/08/2005			
	ANALYSIS	EPA METHOD	MRL								
Metals.	Total Lead	6020	*0 000050*	0 00033	0.000952	0.000549	*54%*	0.00005 ④	0.0056	0.015 ①②	mg/L
Hydrocarbons.	TPH as Diesel	8015M	*0 052*	ND	0.043 J	0.067 Z	*44%*	0.045 J	NE	0 100 ①	mg/L
	TPH as Residual Range	8015M	*0 100*	ND	NA	NA	NA	0 059 J	NE	0.100 ①	mg/L
	TPH as Gasoline	8015M	*0 050*	ND	<0.050	<0.050	NA	<0.050	NE	0.100 ①	mg/L
EDB:	1,2-Dibromoethane (EDB)	504.1	*0 0000095*	ND	<0.0000095	<0.0000097	NA	<0.0000095	NE	0.00012 ②	mg/L
VOCs:	Benzene	8260B	*0 00050*	ND	<0.00050	<0.00050	NA	<0 00050	1.70 ③	0.0050 ①	mg/L
	Methyl tert-Butyl Ether	8260B	*0.00050*	ND	<0.00050	<0.00050	NA	<0.00050	0.02 ③	0.0050 ①	mg/L
	Toluene	8260B	*0.00050*	0.001	<0.00050	<0.00050	NA	<0.00050	2 1 ③	0.040 ①	mg/L
	Ethylbenzene	8260B	*0 00050*	ND	<0.00050	<0.00050	NA	<0.00050	0.14 ③	0.030 ①	mg/L
	m,p-Xylenes	8260B	*0 00050*	ND	<0.00050	<0.00050	NA	<0 00050	10.0 ③	0.020 ①	mg/L
	o-Xylene	8260B	*0.00050*	ND	<0 00050	<0.00050	NA	<0 00050	10 0 ③	0 020 ①	mg/L
	1,2-Dichloroethane (1,2-DCA)	8260B	*0 00050*	ND	<0 00050	<0.00050	NA	<0.00050	0.005 ②	0.00012 ①	mg/L
PAHs	Naphthalene	8270C SIM	*0 000020*	ND	<0.000020	<0.000020	NA	0.000085	0.24	0.0062 ①	mg/L
	2-Methylnaphthalene	8270C SIM	*0 000020*	ND	<0.000020	<0.000020	NA	<0.000020	NE	0.010 ①	mg/L
	Acenaphthylene	8270C SIM	*0 000020*	ND	<0.000020	<0.000020	NA	<0 000020	NE	0.240 ①	mg/L
	Acenaphthene	8270C SIM	*0 000020*	ND	<0 000020	<0.000020	NA	<0 000020	0.32	0 020 ①	mg/L
	Dibenzofuran	8270C SIM	*0 000020*	ND	<0 000020	<0.000020	NA	<0.000020	NE	NE	mg/L
	Fluorene	8270C SIM	*0 000020*	ND	<0 000020	<0.000020	NA	<0.000020	NE	0 240 ①	mg/L
	Phenanthrene	8270C SIM	*0 000020*	ND	<0.000020	<0.000020	NA	<0.000020	NE	0.0077 ①	mg/L
	Anthracene	8270C SIM	*0 000020*	ND	<0.000020	<0.000020	NA	<0.000020	NE	NE	mg/L
	Fluoranthene	8270C SIM	*0 000020*	ND	<0.000020	<0.000020	NA	<0.000020	0.01	0 040 ①	mg/L
	Pyrene	8270C SIM	*0 000020*	ND	<0 000020	<0.000020	NA	<0.000020	NE	0 002 ①	mg/L
	Benz(a)anthracene	8270C SIM	*0 000020*	ND	<0.000020	<0 000020	NA	<0.000020	NE	0.000027 ①	mg/L
	Chrysene	8270C SIM	*0 000020*	ND	<0.000020	<0.000020	NA	<0 000020	NE	0.00035 ①	mg/L

TABLE 1
Summary of Groundwater Sample Results
Stilling Basin
Red Hill Fuel Storage Facility
Red Hill, Oahu, Hawaii

			Pumps Offline	Pumps Offline		Relative Percent Difference (RPD)	Pumps Offline	HDOH Tier 1 Groundwater Action Levels	Environmental Action Levels	
	SAMPLE IDENTIFICATION		RH-B-001	RH-B-004	RH-B-005		RH-B-007			
	SAMPLE TYPE		Primary	Primary	Duplicate		Primary			
	DATE COLLECTED		02/16/2005	06/28/2005	06/28/2005		09/09/2005			
ANALYSIS	EPA METHOD	MRL								UNITS
Benzo(b)fluoranthene	8270C SIM	0 000020	ND	<0.000020	<0 000020	NA	<0.000020	NE	0.000092 ①	mg/L
Benzo(k)fluoranthene	8270C SIM	0.000020	ND	<0.000020	<0.000020	NA	<0 000020	NE	0.00040 ①	mg/L
Benzo(a)pyrene	8270C SIM	0 000020	ND	<0.000020	<0 000020	NA	<0 000020	0 0002	0.000014 ①	mg/L
Indeno(1,2,3-cd)pyrene	8270C SIM	0 000020	ND	<0.000020	<0.000020	NA	<0 000020	NE	0.000092 ①	mg/L
Dibenz(a,h)anthracene	8270C SIM	0 000020	ND	<0.000020	<0 000026 ı	NA	<0.000020	NE	0.0000092 ①	mg/L
Benzo(g,h,ı)perylene	8270C SIM	0.000024	ND	<0.000024 ı	<0 000020	NA	<0.000020	NE	0 0001 ①	mg/L

Acronyms and Abbreviations

EPA	United States Environmental Protection Agency
RH	Red Hill Fuel Station Facility
PAHs	polynuclear aromatic hydrocarbons
mg/L	milligrams per liter
MRL	method reporting limit
<	less than
J	the result is an estimated concentration that is less than the MRL but greater than or equal to the MDL
Z	the chromatographic fingerprint does not resemble a petroleum product
ı	the MRL/MDL has been elevated due to a chromatographic interference
RPD	relative percent difference between primary and duplicate sample results RPD = Absolute value (primary - duplicate) / average (primary duplicate)
B	Stilling Basin
Bold	value is greater than regulatory action level
NE	none established
VOCs	volatile organic carbons
ND	not detected at or above laboratory MRL

Notes

① State of Hawaii Department of Health, 2005 Screening for Environmental Concerns At Sites with Contaminated Soil and Groundwater Volume 1, May 2005
② State of Hawaii, Department of Health, 2002 Hawaii Administrative Rules Chapter 11, Title 20 Potable Water Drinking Water Standards
③ State of Hawaii Department of Health, 2000 Hawaii Underground Storage Tank (UST) Technical Guidance Manual March 2000.
④ Lead samples were filtered in the field

TABLE 1
Summary of Groundwater Sample Results
Stilling Basin
Red Hill Fuel Storage Facility
Red Hill, Oahu, Hawaii

				Pumps Online		Relative Percent Difference (RPD)	Pumps Online	HDOH Tier 1 Groundwater Action Levels	Environmental Action Levels	UNITS
	SAMPLE IDENTIFICATION			RH-B-002	RH-B-003		RH-B-006			
	SAMPLE TYPE			Primary	Duplicate		Primary			
	DATE COLLECTED			02/16/2005	02/18/2005		06/28/2005			
	ANALYSIS	EPA METHOD	MRL							
Metals	Total Lead	6020	*0.000050*	0 00006	0.00005	*18%*	0.000129	0.0056	0.015 ①②	mg/L
Hydrocarbons	TPH as Diesel	8015M	*0 052*	ND [0 053]	ND	NA	0.058 Z	NE	0.100 ①	mg/L
	TPH as Residual Range	8015M	*0 100*	ND [0 11]	ND	NA	NA	NE	0 100 ①	mg/L
	TPH as Gasoline	8015M	*0 050*	ND	ND	NA	<0 050	NE	0.100 ①	mg/L
EDB	1,2-Dibromoethane (EDB)	504.1	*0.0000095*	ND [0 0000081]	ND [0 0000082]	NA	<0.0000095	NE	0.00012 ②	mg/L
VOCs	Benzene	8260B	*0 00050*	ND	ND	NA	<0.00050	1.70 ③	0 0050 ①	mg/L
	Methyl tert-Butyl Ether	8260B	*0 00050*	ND	ND	NA	<0.00050	0 02 ③	0.0050 ①	mg/L
	Toluene	8260B	*0.00050*	0 0012	0 00081	*39%*	<0.00050	2.1 ③	0 040 ①	mg/L
	Ethylbenzene	8260B	*0.00050*	ND	ND	NA	<0.00050	0 14 ③	0.030 ①	mg/L
	m,p-Xylenes	8260B	*0 00050*	ND	ND	NA	<0.00050	10.0 ③	0.020 ①	mg/L
	o-Xylene	8260B	*0 00050*	ND	ND	NA	<0.00050	10 0 ③	0.020 ①	mg/L
	1,2-Dichloroethane (1,2-DCA)	8260B	*0 00050*	ND	ND	NA	<0.00050	0 005 ②	0 00012 ①	mg/L
PAHs	Naphthalene	8270C SIM	*0 000020*	ND	ND	NA	<0.000021	0.24	0.0062 ①	mg/L
	2-Methylnaphthalene	8270C SIM	*0 000020*	ND	ND	NA	<0.000021	NE	0 010 ①	mg/L
	Acenaphthylene	8270C SIM	*0.000020*	ND	ND	NA	<0.000021	NE	0.240 ①	mg/L
	Acenaphthene	8270C SIM	*0 000020*	ND	ND	NA	<0 000021	0.32	0.020 ①	mg/L
	Dibenzofuran	8270C SIM	*0.000020*	ND	ND	NA	<0.000021	NE	NE	mg/L
	Fluorene	8270C SIM	*0 000020*	ND	ND	NA	<0 000021	NE	0.240 ①	mg/L
	Phenanthrene	8270C SIM	*0 000020*	ND	ND	NA	<0.000021	NE	0 0077 ①	mg/L
	Anthracene	8270C SIM	*0 000020*	ND	ND	NA	<0 000021	NE	NE	mg/L
	Fluoranthene	8270C SIM	*0 000020*	ND	ND	NA	<0.000021	0 01	0.040 ①	mg/L
	Pyrene	8270C SIM	*0 000020*	ND	ND	NA	<0 000021	NE	0.002 ①	mg/L
	Benz(a)anthracene	8270C SIM	*0 000020*	ND	ND	NA	<0.000021	NE	0 000027 ①	mg/L
	Chrysene	8270C SIM	*0 000020*	ND	ND	NA	<0.000021	NE	0.00035 ①	mg/L

TABLE 1
Summary of Groundwater Sample Results
Stilling Basin
Red Hill Fuel Storage Facility
Red Hill, Oahu, Hawaii

			Pumps Online		Relative Percent Difference (RPD)	Pumps Online	HDOH Tier 1 Groundwater Action Levels	Environmental Action Levels	
	SAMPLE IDENTIFICATION		RH-B-002	RH-B-003		RH-B-006			
	SAMPLE TYPE		Primary	Duplicate		Primary			
	DATE COLLECTED		02/16/2005	02/16/2005		06/28/2005			
	ANALYSIS	EPA METHOD	MRL						UNITS
	Benzo(b)fluoranthene	8270C SIM	*0.000020*	ND	ND	NA	<0.000021	NE	0.000092 ①	mg/L
	Benzo(k)fluoranthene	8270C SIM	*0 000020*	ND	ND	NA	<0.000021	NE	0.00040 ①	mg/L
	Benzo(a)pyrene	8270C SIM	*0 000020*	ND	ND	NA	<0 000021	0.0002	0 000014 ①	mg/L
	Indeno(1,2,3-cd)pyrene	8270C SIM	*0 000020*	ND	ND	NA	<0.000021	NE	0 000092 ①	mg/L
	Dibenz(a,h)anthracene	8270C SIM	*0 000020*	ND	ND	NA	<0.000021	NE	0.0000092 ①	mg/L
	Benzo(g,h,i)perylene	8270C SIM	*0 000024*	ND	ND	NA	<0 000021	NE	0 0001 ①	mg/L

Acronyms and Abbreviations

EPA	United States Environmental Protection Agency
RH	Red Hill Fuel Station Facility
PAHs	polynuclear aromatic hydrocarbons
mg/L	milligrams per liter
MRL	method reporting limit
<	less than
J	the result is an estimated concentration that is less than the MRL but greater than or equal to the MDL
Z	the chromatographic fingerprint does not resemble a petroleum product
I	the MRL/MDL has been elevated due to a chromatographic interference
RPD	relative percent difference between primary and duplicate sample results RPD = Absolute value (primary - duplicate) / average (primary duplicate)
B	Stilling Basin
Bold	value is greater than regulatory action level
NE	none established
VOCs	volatile organic carbons
ND	not detected at or above laboratory MRL

Notes

① State of Hawaii Department of Health, 2005 Screening for Environmental Concerns At Sites with Contaminated Soil and Groundwater. Volume 1, May 2005

② State of Hawaii, Department of Health, 2002 Hawaii Administrative Rules Chapter 11, Title 20 Potable Water Drinking Water Standards.

③ State of Hawaii Department of Health, 2000 Hawaii Underground Storage Tank (UST) Technical Guidance Manual March 2000

④ Lead samples were filtered in the field

TABLE 1
Summary of Groundwater Sample Results
Stilling Basin
Red Hill Fuel Storage Facility
Red Hill, Oahu, Hawaii

				Pumps Online		Relative Percent Difference (RPD)	HDOH Tier 1 Groundwater Action Levels	Environmental Action Levels	UNITS
			SAMPLE IDENTIFICATION	RH-B-008	RH-B-009				
			SAMPLE TYPE	Primary	Duplicate				
			DATE COLLECTED	09/08/2005	09/08/2005				
	ANALYSIS	EPA METHOD	MRL						
Metals.	Total Lead	6020	*0 000050*	0.00003 ④	0.00027 ④	*160%*	0.0056	0 015 ①②	mg/L
Hydrocarbons.	TPH as Diesel	8015M	*0 052*	<0.050	<0.050	NA	NE	0.100 ①	mg/L
	TPH as Residual Range	8015M	*0 100*	<0 100	<0.100	NA	NE	0 100 ①	mg/L
	TPH as Gasoline	8015M	*0 050*	<0.050	<0.050	NA	NE	0.100 ①	mg/L
EDB·	1,2-Dibromoethane (EDB)	504.1	*0.0000095*	<0 0000095	<0.0000095	NA	NE	0.00012 ②	mg/L
VOCs.	Benzene	8260B	*0.00050*	<0 00050	<0 00050	NA	1.70 ③	0.0050 ①	mg/L
	Methyl tert-Butyl Ether	8260B	*0.00050*	<0.00050	<0.00050	NA	0 02 ③	0 0050 ①	mg/L
	Toluene	8260B	*0.00050*	<0.00050	<0 00050	NA	2.1 ③	0.040 ①	mg/L
	Ethylbenzene	8260B	*0 00050*	<0.00050	<0 00050	NA	0.14 ③	0.030 ①	mg/L
	m,p-Xylenes	8260B	*0.00050*	<0.00050	<0.00050	NA	10 0 ③	0.020 ①	mg/L
	o-Xylene	8260B	*0 00050*	<0.00050	<0.00050	NA	10.0 ③	0.020 ①	mg/L
	1,2-Dichloroethane (1,2-DCA)	8260B	*0.00050*	<0.00050	<0.00050	NA	0.005 ②	0.00012 ①	mg/L
PAHs:	Naphthalene	8270C SIM	*0 000020*	<0.000020	0.000045	NA	0.24	0.0062 ①	mg/L
	2-Methylnaphthalene	8270C SIM	*0 000020*	<0 000020	<0 000020	NA	NE	0.010 ①	mg/L
	Acenaphthylene	8270C SIM	*0 000020*	<0.000020	<0 000020	NA	NE	0.240 ①	mg/L
	Acenaphthene	8270C SIM	*0.000020*	<0.000020	<0.000020	NA	0 32	0 020 ①	mg/L
	Dibenzofuran	8270C SIM	*0.000020*	<0.000020	<0 000020	NA	NE	NE	mg/L
	Fluorene	8270C SIM	*0 000020*	<0.000020	<0.000020	NA	NE	0.240 ①	mg/L
	Phenanthrene	8270C SIM	*0.000020*	<0 000020	<0.000020	NA	NE	0.0077 ①	mg/L
	Anthracene	8270C SIM	*0 000020*	<0.000020	<0.000020	NA	NE	NE	mg/L
	Fluoranthene	8270C SIM	*0 000020*	<0.000020	<0.000020	NA	0 01	0 040 ①	mg/L
	Pyrene	8270C SIM	*0 000020*	<0.000020	<0.000020	NA	NE	0.002 ①	mg/L
	Benz(a)anthracene	8270C SIM	*0 000020*	<0 000020	<0.000020	NA	NE	0.000027 ①	mg/L
	Chrysene	8270C SIM	*0 000020*	<0.000020	<0.000020	NA	NE	0.00035 ①	mg/L

TABLE 1
Summary of Groundwater Sample Results
Stilling Basin
Red Hill Fuel Storage Facility
Red Hill, Oahu, Hawaii

			Pumps Online					
		SAMPLE IDENTIFICATION	RH-B-008	RH-B-009	Relative Percent Difference (RPD)	HDOH Tier 1 Groundwater Action Levels	Environmental Action Levels	UNITS
		SAMPLE TYPE	Primary	Duplicate				
		DATE COLLECTED	09/08/2005	09/08/2005				
	ANALYSIS	EPA METHOD	MRL					
	Benzo(b)fluoranthene	8270C SIM	*0 000020*	<0 000020	<0.000020	NA	NE	0.000092 ①	mg/L
	Benzo(k)fluoranthene	8270C SIM	*0 000020*	<0 000020	<0.000020	NA	NE	0 00040 ①	mg/L
	Benzo(a)pyrene	8270C SIM	*0 000020*	<0.000020	<0.000020	NA	0.0002	0 000014 ①	mg/L
	Indeno(1,2,3-cd)pyrene	8270C SIM	*0.000020*	<0 000020	<0 000020	NA	NE	0.000092 ①	mg/L
	Dibenz(a,h)anthracene	8270C SIM	*0 000020*	<0.000020	<0.000020	NA	NE	0 0000092 ①	mg/L
	Benzo(g,h,i)perylene	8270C SIM	*0 000024*	<0 000020	<0.000020	NA	NE	0.0001 ①	mg/L

Acronyms and Abbreviations:

EPA	United States Environmental Protection Agency
RH	Red Hill Fuel Station Facility
PAHs	polynuclear aromatic hydrocarbons
mg/L	milligrams per liter
MRL	method reporting limit
<	less than
J	the result is an estimated concentration that is less than the MRL but greater than or equal to the MDL
Z	the chromatographic fingerprint does not resemble a petroleum product
I	the MRL/MDL has been elevated due to a chromatographic interference
RPD	relative percent difference between primary and duplicate sample results RPD = Absolute value (primary - duplicate) / average (primary duplicate)

Notes

① State of Hawaii Department of Health, 2005 Screening for Environmental Concerns At Sites with Contaminated Soil and Groundwater Volume 1, May 2005
② State of Hawaii, Department of Health, 2002 Hawaii Administrative Rules Chapter 11, Title 20 Potable Water Drinking Water Standards
③ State of Hawaii Department of Health, 2000 Hawaii Underground Storage Tank (UST) Technical Guidance Manual March 2000
④ Lead samples were filtered in the field.

TABLE 2
Summary of Groundwater Sample Results
MW-V1D
Red Hill Fuel Storage Facility
Red Hill, Oahu, Hawaii

				MW-1VD		Relative Percent Difference (RPD)	MW-1VD		Relative Percent Difference (RPD)	HDOH Tier 1 Groundwater Action Levels	Environmental Action Levels	UNITS
	SAMPLE IDENTIFICATION			RH-W-001 ③	RH-W-002		RH-W-003	RH-W-004				
	SAMPLE TYPE			Primary	Duplicate		Primary	Duplicate				
	DATE COLLECTED			02/17/2005	02/17/2005		06/28/2005	06/28/2005				
	ANALYSIS	EPA METHOD	MRL									
Metals:	Total Lead	6020	*0.000050*	**0.0102**	**0.0119**	*15%*	**0.006700**	**0.006980**	*4%*	0 0056	0.015 ①②	mg/L
Hydrocarbons:	TPH as Diesel	8015M	*0 052*	1.4 Y	1.5	*7%*	1 300 Z	1.100 Z	*17%*	NE	0.100 ①	mg/L
	TPH as Residual Range	8015M	*0.100*	0.77 O	0.89	*14%*	ND	NA	NA	NE	0.100 ①	mg/L
	TPH as Gasoline	8015M	*0 05*	ND	ND	NA	<0.050	<0 050	NA	NE	0.100 ①	mg/L
EDB:	1,2-Dibromoethane (EDB)	504.1	*0 0000095*	ND	ND [0 0000082]	NA	<0.0000095	<0.0000095	NA	NE	0.00012 ②	mg/L
BTEX·	Benzene	8260B	*0 00050*	ND	ND	NA	<0.00050	<0 00050	NA	1.70 ③	0.0050 ①	mg/L
	Methyl tert-Butyl Ether	8260B	*0 00050*	ND	ND	NA	<0.00050	<0 00050	NA	0.02 ③	0.0050 ①	mg/L
	Toluene	8260B	*0 00050*	ND	ND	NA	<0.00050	<0 00050	NA	2.1 ③	0 040 ①	mg/L
	Ethylbenzene	8260B	*0 00050*	ND	ND	NA	<0.00050	<0 00050	NA	0.14 ③	0.030 ①	mg/L
	m,p-Xylenes	8260B	*0 00050*	ND	ND	NA	<0.00050	<0 00050	NA	10.0 ③	0.020 ①	mg/L
	o-Xylene	8260B	*0 00050*	ND	ND	NA	<0.00050	<0 00050	NA	10.0 ③	0.020 ①	mg/L
	1,2-Dichloroethane (1,2-DCA)	8260B	*0 00050*	ND	ND	NA	<0.00050	<0 00050	NA	0.005 ②	0.00012 ①	mg/L
PAHs·	Naphthalene	8270C SIM	*0 000020*	0 00025	0.00021	*17%*	0.000073	0 000055	*28%*	0.24	0 0062 ①	mg/L
	2-Methylnaphthalene	8270C SIM	*0 000020*	0 00014	0.000057	*84%*	0.000054	0.000051	*6%*	NE	0.010 ①	mg/L
	Acenaphthylene	8270C SIM	*0 000020*	ND	ND	NA	<0.000020	<0.000020	NA	NE	0 240 ①	mg/L
	Acenaphthene	8270C SIM	*0 000020*	0.000052	0.000054	*4%*	0.000061	0.000061	*0%*	0 32	0.020 ①	mg/L
	Dibenzofuran	8270C SIM	*0 000020*	0.00013	0.00011	*17%*	0.00012	0.00012	*0%*	NE	NE	mg/L
	Fluorene	8270C SIM	*0 000020*	0.000053	0.000043	*21%*	0 000041	0.000039	*5%*	NE	0.240 ①	mg/L
	Phenanthrene	8270C SIM	*0 000020*	0.00012	0.000082	*38%*	0.00014	0.00010	*33%*	NE	0.0077 ①	mg/L
	Anthracene	8270C SIM	*0.000020*	ND	ND	NA	<0.000020	<0.000020	NA	NE	NE	mg/L
	Fluoranthene	8270C SIM	*0.000020*	0.000035	0.000021	*50%*	0.000093	0.000064	*37%*	0.01	0.040 ①	mg/L
	Pyrene	8270C SIM	*0 000020*	0.000056	0.000029	*64%*	0.00011	0.000072	*42%*	NE	0.002 ①	mg/L
	Benz(a)anthracene	8270C SIM	*0 000020*	ND	ND	NA	0.000047	0.000033	*35%*	NE	0.000027 ①	mg/L
	Chrysene	8270C SIM	*0 000020*	0.00002	ND	NA	0.000062	0.000044	*34%*	NE	0.00035 ①	mg/L

TABLE 2
Summary of Groundwater Sample Results
MW-V1D
Red Hill Fuel Storage Facility
Red Hill, Oahu, Hawaii

			MW-1VD		Relative Percent Difference (RPD)	MW-1VD		Relative Percent Difference (RPD)	HDOH Tier 1 Groundwater Action Levels	Environmental Action Levels	UNITS
SAMPLE IDENTIFICATION			RH-W-001 ③	RH-W-002		RH-W-003	RH-W-004				
SAMPLE TYPE			Primary	Duplicate		Primary	Duplicate				
DATE COLLECTED			02/17/2005	02/17/2005		06/28/2005	06/28/2005				
ANALYSIS	EPA METHOD	MRL									
Benzo(b)fluoranthene	8270C SIM	*0 000020*	0.000025	ND	NA	0.00004	0.000028	***35%***	NE	0.000092 ①	mg/L
Benzo(k)fluoranthene	8270C SIM	*0 000020*	ND	ND	NA	0.000051	0.000035	***37%***	NE	0.00040 ①	mg/L
Benzo(a)pyrene	8270C SIM	*0 000020*	0.000022	ND	NA	0.000045	0.000031	***37%***	0.0002	0 000014 ①	mg/L
Indeno(1,2,3-cd)pyrene	8270C SIM	*0 000020*	ND	ND	NA	0.000037	0.000024	***43%***	NE	0 000092 ①	mg/L
Dibenz(a,h)anthracene	8270C SIM	*0 000020*	ND	ND	NA	<0 000020	<0 000020	NA	NE	0.0000092 ①	mg/L
Benzo(g,h,i)perylene	8270C SIM	*0 000020*	ND	ND	NA	0.000034	0 000022	***43%***	NE	0.0001 ①	mg/L

Acronyms and Abbreviations

EPA	United States Environmental Protection Agency
RH	Red Hill Fuel Station Facility
PAHs	polynuclear aromatic hydrocarbons
mg/L	milligrams per liter
MRL	method reporting limit
B	Stilling Basin at PWC Potable Water Facility
<	less than
Z	the chromatographic fingerprint does not resemble a petroleum product.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correc carbon range, but the elution pattern does not match the calibration standard
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard
RPD	relative percent difference between primary and duplicate sample results RPD = Absolute value (primary - duplicate) / average (primary duplicate)

Bold	value is greater than regulatory action level
NE	none established
VOCs	volatile organic carbons
ND	not detected at or above the laboratory MRL

Notes

① State of Hawaii Department of Health, 2005 Screening for Environmental Concerns At Sites with Contaminated Soil and Groundwater Volume 1, May 2005

② State of Hawaii, Department of Health, 2002 Hawaii Administrative Rules Chapter 11, Title 20 Potable Water Drinking Water Standards

③ State of Hawaii Department of Health, 2000. Hawaii Underground Storage Tank (UST) Technical Guidance Manual March 2000

④ Lead samples were filtered in the field

TABLE 2
Summary of Groundwater Sample Results
MW-V1D
Red Hill Fuel Storage Facility
Red Hill, Oahu, Hawaii

				MW-1VD		Relative Percent Difference (RPD)	HDOH Tier 1 Groundwater Action Levels	Environmental Action Levels	UNITS
	SAMPLE IDENTIFICATION			RH-W-005	RH-W-006				
	SAMPLE TYPE			Primary	Duplicate				
	DATE COLLECTED			09/08/2005	09/08/2005				
ANALYSIS		EPA METHOD	MRL						
Metals:	Total Lead	6020	*0.000050*	0.00021 ④	0.000050 ④	*123%*	0.0056	0.015 ①②	mg/L
Hydrocarbons:	TPH as Diesel	8015M	*0 052*	0.950 Y	1.100 Y	*15%*	NE	0.100 ①	mg/L
	TPH as Residual Range	8015M	*0 100*	0.540 O	0.720 O	*25%*	NE	0 100 ①	mg/L
	TPH as Gasoline	8015M	*0 05*	<0.050	<0 050	NA	NE	0.100 ①	mg/L
EDB	1,2-Dibromoethane (EDB)	504.1	*0 0000095*	<0.0000096	<0.0000094	NA	NE	0.00012 ②	mg/L
BTEX	Benzene	8260B	*0.00050*	<0.00050	<0.00050	NA	1.70 ③	0.0050 ①	mg/L
	Methyl tert-Butyl Ether	8260B	*0 00050*	<0.00050	<0 00050	NA	0.02 ③	0 0050 ①	mg/L
	Toluene	8260B	*0 00050*	0.00015 J	0 00015 J	*0%*	2 1 ③	0.040 ①	mg/L
	Ethylbenzene	8260B	*0 00050*	<0.00050	<0.00050	NA	0.14 ③	0.030 ①	mg/L
	m,p-Xylenes	8260B	*0.00050*	<0.00050	<0.00050	NA	10.0 ③	0.020 ①	mg/L
	o-Xylene	8260B	*0 00050*	<0.00050	<0.00050	NA	10.0 ③	0.020 ①	mg/L
	1,2-Dichloroethane (1,2-DCA)	8260B	*0.00050*	<0.00050	<0.00050	NA	0.005 ②	0.00012 ①	mg/L
PAHs:	Naphthalene	8270C SIM	*0 000020*	0.00083	0 00078	*6%*	0.24	0 0062 ①	mg/L
	2-Methylnaphthalene	8270C SIM	*0.000020*	0.000038	0.000038	*0%*	NE	0.010 ①	mg/L
	Acenaphthylene	8270C SIM	*0.000020*	<0.000020	<0 000020	NA	NE	0.240 ①	mg/L
	Acenaphthene	8270C SIM	*0 000020*	0.000054	0.000056	*4%*	0 32	0.020 ①	mg/L
	Dibenzofuran	8270C SIM	*0 000020*	0.00013	0 00013	*0%*	NE	NE	mg/L
	Fluorene	8270C SIM	*0 000020*	0.000064	0.000064	*0%*	NE	0.240 ①	mg/L
	Phenanthrene	8270C SIM	*0 000020*	0.00011	0.00012	*9%*	NE	0 0077 ①	mg/L
	Anthracene	8270C SIM	*0 000020*	<0.000020	<0 000020	NA	NE	NE	mg/L
	Fluoranthene	8270C SIM	*0 000020*	0.000025	0.000049	*65%*	0.01	0.040 ①	mg/L
	Pyrene	8270C SIM	*0 000020*	0.000030	0.000058	*64%*	NE	0.002 ①	mg/L
	Benz(a)anthracene	8270C SIM	*0.000020*	<0.000020	0.000025	NA	NE	0.000027 ①	mg/L
	Chrysene	8270C SIM	*0 000020*	0.000022	0.000036	*48%*	NE	0 00035 ①	mg/L

TABLE 2
Summary of Groundwater Sample Results
MW-V1D
Red Hill Fuel Storage Facility
Red Hill, Oahu, Hawaii

			MW-1VD					
		SAMPLE IDENTIFICATION	RH-W-005	RH-W-006	Relative Percent Difference (RPD)	HDOH Tier 1 Groundwater Action Levels	Environmental Action Levels	UNITS
		SAMPLE TYPE	Primary	Duplicate				
		DATE COLLECTED	09/08/2005	09/08/2005				
	ANALYSIS	EPA METHOD	MRL					
	Benzo(b)fluoranthene	8270C SIM	*0 000020*	<0.000020	<0 000020	NA	NE	0.000092 ①	mg/L
	Benzo(k)fluoranthene	8270C SIM	*0 000020*	<0.000020	<0.000020	NA	NE	0.00040 ①	mg/L
	Benzo(a)pyrene	8270C SIM	*0 000020*	<0.000020	<0.000020	NA	0.0002	0.000014 ①	mg/L
	Indeno(1,2,3-cd)pyrene	8270C SIM	*0 000020*	<0.000020	<0.000020	NA	NE	0.000092 ①	mg/L
	Dibenz(a,h)anthracene	8270C SIM	*0 000020*	<0.000020	<0.000020	NA	NE	0.0000092 ①	mg/L
	Benzo(g,h,i)perylene	8270C SIM	*0.000020*	<0.000020	<0.000020	NA	NE	0.0001 ①	mg/L

Acronyms and Abbreviations

EPA	United States Environmental Protection Agency
RH	Red Hill Fuel Station Facility
PAHs	polynuclear aromatic hydrocarbons
mg/L	milligrams per liter
MRL	method reporting limit
B	Stilling Basin at *PWC Potable Water Facility*
<	less than
Z	the chromatographic fingerprint does not resemble a petroleum product
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correc carbon range, but the elution pattern does not match the calibration standard
o	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard
RPD	relative percent difference between primary and duplicate sample results RPD = Absolute value (primary - duplicate) / average (primary duplicate)

Notes

① State of Hawaii Department of Health, 2005 Screening for Environmental Concerns At Sites with Contaminated Soil and Groundwater Volume 1, May 2005
② State of Hawaii, Department of Health, 2002 Hawaii Administrative Rules Chapter 11, Title 20 Potable Water Drinking Water Standards
③ State of Hawaii Department of Health, 2000 Hawaii Underground Storage Tank (UST) Technical Guidance Manual March 2000
④ Lead samples were filtered in the field

TABLE 3
Summary of Trip Blank Results
Stilling Basin
Red Hill Fuel Storage Facility
Red Hill, Oahu, Hawaii

				SAMPLE IDENTIFICATION	Trip Blank *	Trip Blank *	Trip Blank			
				SAMPLE TYPE	Trip Blank	Trip Blank	Trip Blank			
				DATE COLLECTED	02/17/2005	06/28/2005	09/08/2005	HDOH Tier 1 Groundwater Action Levels	Environmental Action Levels	UNITS
	ANALYSIS	EPA METHOD	MRL							
Hydrocarbons.	TPH as Gasoline	8015M	*0 05*		NA	<0.050	NA	NE	0.100 ①	mg/L
BTEX:	Benzene	8260B	*0 00050*		ND	<0.00050	<0.00050	1.70 ①	0.0050 ①	mg/L
	Methyl tert-Butyl Ether	8260B	*0 00050*		ND	<0 00050	<0.00050	0.02 ①	0.0050 ①	mg/L
	Toluene	8260B	*0 00050*		0.0014	0.00054	<0.00050	2.1 ①	0.040 ①	mg/L
	Ethylbenzene	8260B	*0.00050*		ND	<0 00050	<0.00050	0.14 ①	0 030 ①	mg/L
	m,p-Xylenes	8260B	*0.00050*		ND	<0.00050	<0.00050	10.0 ①	0.020 ①	mg/L
	o-Xylene	8260B	*0 00050*		ND	<0.00050	<0.00050	10.0 ①	0.020 ①	mg/L
	1,2-Dichloroethane (DCA)	8260B	*0 00050*		ND	<0.00050	<0.00050	0.005 ②	0.005 ②	mg/L

Acronyms and Abbreviations

EPA	United States Environmental Protection Agency
PAHs	polynuclear aromatic hydrocarbons
mg/L	milligrams per liter
MRL	method reporting limit
<	less than
Bold	value is greater than regulatory action level
NE	none established
VOCs	volatile organic compounds
ND	not detected at or above the laboratory MRL

Notes

① State of Hawaii Department of Health, 2005 Screening for Environmental Concerns At Sites with Contaminated Soil and Groundwater Volume 1, May 2005

② State of Hawaii, Department of Health, 2002 Hawaii Administrative Rules Chapter 11, Title 20 Potable Water Drinking Water Standards

APPENDIX A

Non-Hazardous Waste Manifest

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NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.	Manifest Document No.	2. Page 1 of 2	
H I R 0 0 0 0 5 0 4 0 1	05R07		HIC1576-01

3. Generator's Name and Mailing Address: COMNAVREG HAWAII, CODE N45, REGIONAL ENV. DEPT.
850 TICONDEROGA STREET, SUITE 110, ATTN: AMANDA MANOI
PEARL HARBOR, HI 96860-5102
4. Generator's Phone ( ) 808-473-4137

5. Transporter 1 Company Name	6. US EPA ID Number	A. Transporter's Phone
PACIFIC COMMERCIAL SERVICES, LLC.	H I R 0 0 0 0 9 7 8 2 4	808-545-4599
7. Transporter 2 Company Name	8. US EPA ID Number	B. Transporter's Phone
MATSON NAVIGATION COMPANY	G A D 0 0 6 9 1 2 6 2 0	415-957-4777

9. Designated Facility Name and Site Address	10. US EPA ID Number	C. Facility's Phone
CLEAN HARBORS ARAGONITE, LLC 11600 NORTH APTUS ROAD ARAGONITE, UT 84029	U T D 9 8 1 5 5 2 1 7 7	801-323-8100

11. Waste Shipping Name and Description	12. Containers No.	12. Containers Type	13. Total Quantity	14. Unit Wt/Vol
a. MATERIAL NOT REGULATED BY DOT (MONITORING WELL WATER)	001	DM	00050	P
b.				
c.				
d.				

GR

D. Additional Descriptions for Materials Listed Above
11A NR CH121804 1X55G
11B *
11C *
11D *
DS1042281

E. Handling Codes for Wastes Listed Above: 07

15. Special Handling Instructions and Additional Information
24 HR EMERGENCY RESPONSE # : 1-800-645-8265
ERG#
JOB# 1576
SEND COPY TO:
PCS LLC
P.O. BOX 235117
HONOLULU, HI 96823

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name	Signature	Month	Day	Year
Amanda L. Manoi	Amanda L. Manoi	09	16	05

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
JINGBO CHANG		09	16	05

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
Gail Andrew		09	20	05

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

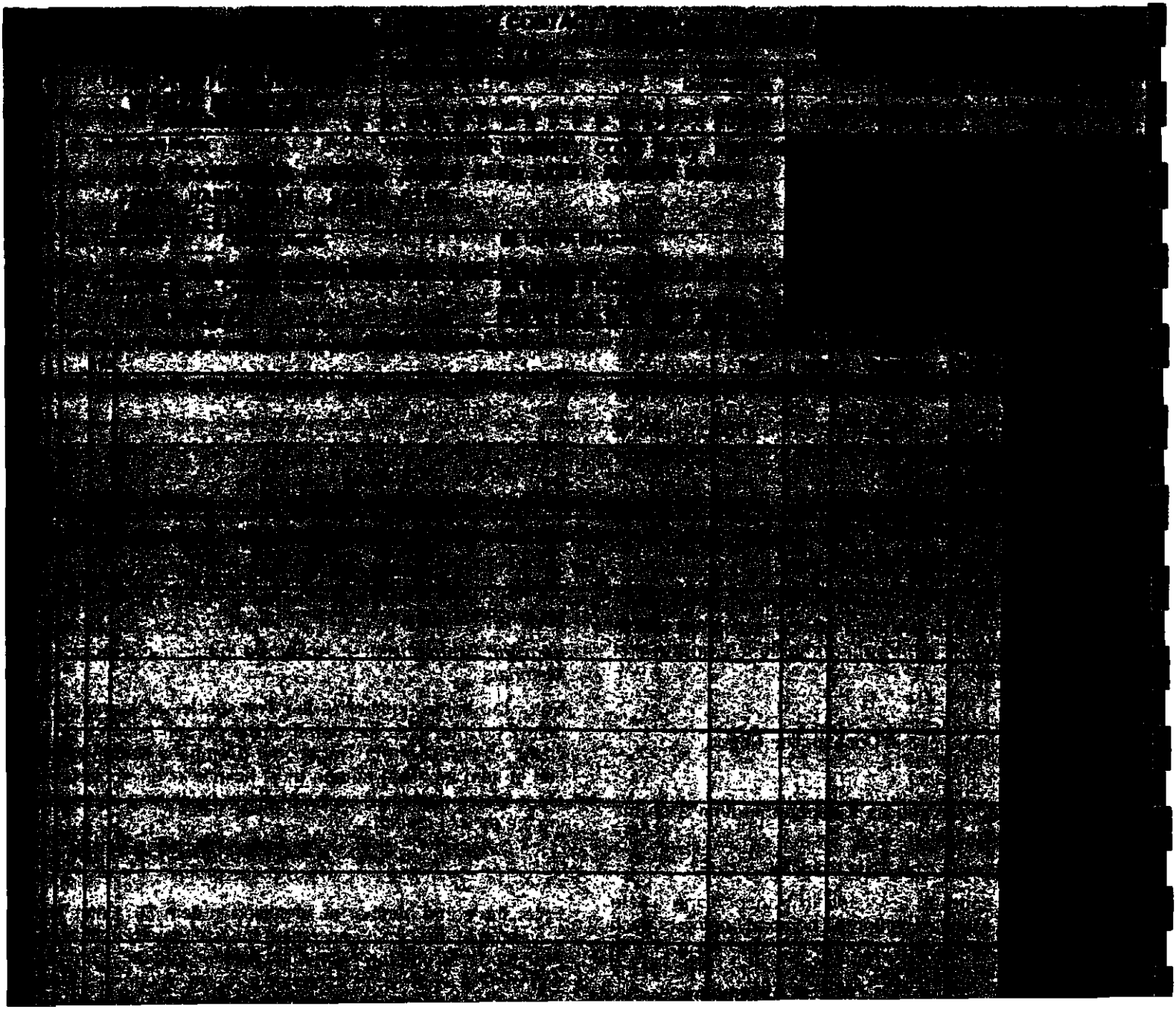
Printed/Typed Name	Signature	Month	Day	Year
TRAVIS L. SMITH		10	14	05

GENERATOR

TRANSPORTER

FACILITY

ORIGINAL - RETURN TO GENERATOR



APPENDIX B

Laboratory Reports and Chain-of-Custody Records for Primary and QC Groundwater and Stilling Basin Samples

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1317 South 13th Avenue P.O. Box 479 Kelso, Washington 98626 (360) 577-7222 (360) 636-1068 fax

Columbia Analytical Services
An Employee - Owned Company

October 14, 2005 Service Request No: K0503851

Heather Kerr
Dawson Group, Incorporated
3375 Koapaka Street, Suite B200
Honolulu, HI 96819

RE: Red Hill GW Sampling Event 3/2001022.013

Dear Heather:

Enclosed are the results of the sample(s) submitted to our laboratory on September 12, 2005. For your reference, these analyses have been assigned our service request number K0503851.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAC standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please call if you have any questions. My extension is 3260.

Respectfully submitted,

Columbia Analytical Services, Inc.

Harvey Jacky
Project Chemist

HJ/jeb

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier See case narrative
#	The control limit criteria is not applicable. See case narrative
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
i	The MRL/MDL has been elevated due to a matrix interference
X	See case narrative

Metals Data Qualifiers

#	The control limit criteria is not applicable See case narrative.
B	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL has been elevated due to a matrix interference.
X	See case narrative.
*	The duplicate analysis not within control limits. See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results (25% for CLP Pesticides)
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
i	The MRL/MDL has been elevated due to a chromatographic interference.
X	See case narrative.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard
Z	The chromatographic fingerprint does not resemble a petroleum product.

Case Narrative

COLUMBIA ANALYTICAL SERVICES, INC.

Client:	Dawson Group, Inc.	**Service Request No.:**	K0503851
Project:	Red Hill GW Sampling Event 3/2001022.013	**Date Received:**	9/12/05
Sample Matrix:	Water		

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses. Additional quality control analyses reported herein include: Laboratory Duplicate (DUP), Matrix Spike (MS), Matrix/Duplicate Matrix Spike (MS/DMS), and Laboratory Control Sample (LCS).

Sample Receipt

Five water samples were received for analysis at Columbia Analytical Services on 9/12/05. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Total Metals

No anomalies associated with the analysis of these samples were observed.

Diesel Range Organics by EPA Method 8015B

No anomalies associated with the analysis of these samples were observed.

Gasoline Range Organics by EPA Method 8015B

No anomalies associated with the analysis of these samples were observed.

EDB by EPA Method 504.1

No anomalies associated with the analysis of these samples were observed.

Volatile Organic Compounds by EPA Method 8260B

No anomalies associated with the analysis of these samples were observed.

Polynuclear Aromatic Hydrocarbons by EPA Method 8270C

Sample Notes and Discussion
Insufficient sample volume was received to perform a Matrix Spike/Matrix Spike Duplicate (MS/MSD). A Laboratory Control Sample/Duplicate Laboratory Control Sample (LCS/DLCS) was analyzed and reported in lieu of the MS/MSD for these samples.

Approved by HK Date 10/17/05

Chain of Custody Documentation

CHAIN OF CUSTODY

Columbia Analytical Services INC.
An Employee - Owned Company

1317 South 13th Ave. • Kelso, WA 98626 • (360) 577-7222 • (800) 695-7222x07 • FAX (360) 636-1068

SR#: _____ PAGE 1 OF 1 COC # _____

PROJECT NAME	RED HILL GW SAMPLING - EVENT 3
PROJECT NUMBER	2001022.013
PROJECT MANAGER	HEATHER KERR
COMPANY/ADDRESS	DAWSON GROUP, INC
	3375 KOAPAKA ST. STE. B200
CITY/STATE/ZIP	HONOLULU, HI 96819
E-MAIL ADDRESS	HKERR@dawsonba.com
PHONE #	(808) 536-5500
FAX #	(808) 536-5530
SAMPLER'S SIGNATURE	Heather Kerr

SAMPLE I.D.	DATE	TIME	LAB I.D.	MATRIX	NUMBER OF CONTAINERS	REMARKS
RH-W-005	9/8/05	0940		Water	13	
RH-W-006	9/8/05	0945		Water	13	
RH-B-007	9/8/05	1255		Water	13	
RH-B-008	9/8/05	1345		Water	13	
RH-B-009	9/8/05	1350		Water	12	NO DRO, only RRO
Temp Blank	—	—		Water	1	
Trip Blank	—	—		Water	2	

NO FURTHER ENTRIES

Semivolatile Organics by GC/MS 625 ☐ 8270 ☐ 8270LL ☐
Volatile Organics 624 ☐ 8260 ☒ MTBE; 1,2-DCA
Hydrocarbons (*see below) Gas ☒ Diesel ☒ 8021 ☐ BTEX ☐
☐ Fuel Fingerprint (FIQ) ☐ NW-HCID ☐ Oil ☐
Oil & Grease/TRPH 1664 HEM ☐ 1664 SGT ☐
PCB's Aroclors ☐ Congeners ☐
Pesticides/Herbicides 608 ☐ 8081A ☐ 8141A ☐ 8151A ☐
Chlorophenolics - 8151M Tri ☐ Tetra ☐ PCP ☐
PAHs 8310 ☐ SIM ☒
Metals (Total or Dissolved) Pb 6020 (See list below) HEX
Cyanide ☐ Hex-Chrom ☐
pH, Cond., Cl, SO_4, PO_4, F, NO_2, NO_3, BOD, TSS, TDS (circle)
NH_3-N, COD, Total-P, TKN, TOC, DOC (circle) NO_2+NO_3
TOX 9020 ☐ AOX 1650 ☐ 506 ☐
EDB, Method 504.1

REPORT REQUIREMENTS

___ I. Routine Report: Method Blank, Surrogate, as required

___ II. Report Dup., MS, MSD as required

_X_ III. Data Validation Report (includes all raw data)

___ IV CLP Deliverable Report

___ V. EDD

INVOICE INFORMATION

P.O. # 2001022.013.002

Bill To: DAWSON GROUP, INC
3375 KOAPAKA ST. B200
HON., HI 96819

TURNAROUND REQUIREMENTS

___ 24 hr. ___ 48 hr
___ 5 Day
_X_ Standard (10-15 working days)
___ Provide FAX Results

Requested Report Date

Circle which metals are to be analyzed:

Total Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe (Pb) Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

Dissolved Metals Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

*INDICATE STATE HYDROCARBON PROCEDURE: AK CA WI NORTHWEST (OTHER: HI (CIRCLE ONE)

SPECIAL INSTRUCTIONS/COMMENTS:

1. please email hkerr@dawsonba.com upon sample receipt.
2. please email preliminary results (PDF) to address above.
3. Follow with hardcopy of final.
4. please call with questions.

H250215

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Signature: Heather Kerr	Signature: Tracie Sober	Signature: Tracie Sober	Signature: Jenn Blank
Printed Name: HEATHER KERR	Printed Name: TRACIE SOBER	Printed Name: TRACIE SOBER	Printed Name: Jenn Blank
Firm: DAWSON GROUP	Firm: VWD CAS	Firm: VWD CAS	Firm: CAS
Date/Time: 9/9/05 0955	Date/Time: 9/9/05 0955	Date/Time: 9/9/05	Date/Time: 9/12/05 1002

RCOC #1 06/03

Cooler Receipt and Preservation Form

Project/Client DAWSON Work Order K05 3851

Cooler received on 9/10/05 and opened on 9/10/05 by [signature]

1.	Were custody seals on outside of coolers?				FX (Y)	N
	If yes, how many and where? 1F					
2.	Were custody seals intact?				(Y)	N
3.	Were signature and date present on the custody seals?				(Y)	N
4.	Is the shipper's airbill available and filed? If no, record airbill number: 829957502777				Y	(N)
5.	COC#					
	Temperature of cooler(s) upon receipt: (°C)	0.6				
	Temperature Blank: (°C)	2.6				
	Were samples hand delivered on the same day as collection?				Y	N
6.	Were custody papers properly filled out (ink, signed, etc.)?				(Y)	N
7.	Type of packing material present BUBBLE, MESH, ICE					
8.	**Did all bottles arrive in good condition (unbroken)?**				(Y)	N
9.	Were all bottle labels complete (i.e analysis, preservation, etc.)?				(Y)	N
10.	Did all bottle labels and tags agree with custody papers?				Y	(N)
11.	**Were the correct types of bottles used for the tests indicated?**				(Y)	N
12.	Were all of the preserved bottles received at the lab with the appropriate pH?				Y	N
13.	Were VOA vials checked for absence of air bubbles, and if present, noted below?				Y	N
14.	Did the bottles originate from CAS/K or a branch laboratory?				Y	N
15.	**Are CWA Microbiology samples received with >1/2 the 24hr. hold time remaining from collection?**				Y	N
16.	Was C12/Res negative?				Y	N

Explain any discrepancies: DID NOT RECEIVE ALL SAMPLES. RECEIVED: 500mL AMBER FOR -005, -006, -007. RECEIVED: 500mL RED FOR -005, -006, -007, -008, -009. RECEIVED 2, 1 LT AMBER FOR -006, -007. RECEIVED 1 LT AMBER FOR -005.

RESOLUTION:

Samples that required preservation or received out of temperature:

Sample ID	Reagent	Volume	Lot Number	Bottle Type	Rec'd out of Temperature	Initials

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Cooler Receipt and Preservation Form

Project/Client Dawson Work Order K05 3851

Cooler received on 9/12/05 and opened on 9/12/05 by FBlank

1.	Were custody seals on outside of coolers? If yes, how many and where? front	(Y)	N
2.	Were custody seals intact?	(Y)	N
3.	Were signature and date present on the custody seals?	(Y)	N
4.	Is the shipper's airbill available and filed? If no, record airbill number: 8329718 98120	Y	(N)
5.	COC#		
	Temperature of cooler(s) upon receipt: (°C) 3.5		
	Temperature Blank: (°C) 2.0		
	Were samples hand delivered on the same day as collection?	Y	(N)
6.	Were custody papers properly filled out (ink, signed, etc.)?	(Y)	N
7.	Type of packing material present loose ice - misc bubble wrap		
8.	**Did all bottles arrive in good condition (unbroken)?**	(Y)	N
9.	Were all bottle labels complete (i.e analysis, preservation, etc.)?	(Y)	N
10.	Did all bottle labels and tags agree with custody papers?	(Y)	N
11.	**Were the correct types of bottles used for the tests indicated?**	(Y)	N
12.	Were all of the preserved bottles received at the lab with the appropriate pH?	(Y)	N
13.	Were VOA vials checked for absence of air bubbles, and if present, noted below?	(Y)	N
14.	Did the bottles originate from CAS/K or a branch laboratory?	(Y)	N
15.	**Are CWA Microbiology samples received with >1/2 the 24hr. hold time remaining from collection?**	~~Y~~	~~N~~
16.	Was C12/Res negative?	(Y)	N

Explain any discrepancies: _____

RESOLUTION: _____

Samples that required preservation or received out of temperature:

Sample ID	Reagent	Volume	Lot Number	Bottle Type	Rec'd out of Temperature	Initials

00009

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Metals

METALS

- Cover Page -
INORGANIC ANALYSIS DATA PACKAGE

Client: Dawson Group, Incorporated | Service Request: K0503851

Project No.: 2001022.013

Project Name: Red Hill GW Sampling Event 3

Sample No.	Lab Sample ID.
RH-W-005	K0503851-001
RH-W-005D	K0503851-001D
RH-W-005S	K0503851-001S
RH-W-006	K0503851-002
RH-B-007	K0503851-003
RH-B-008	K0503851-004
RH-B-009	K0503851-005
Method Blank	K0503851-MB

Were ICP interelement corrections applied? Yes/No YES

Were ICP background corrections applied? Yes/No YES

If yes-were raw data generated before application of background corrections? Yes/No NO

Comments:

Signature: Date: 10/13/05

METALS
-1-
INORGANIC ANALYSIS DATA SHEET

Client:	Dawson Group, Incorporated	Service Request:	K0503851
Project No.:	2001022.013	Date Collected:	09/08/05
Project Name:	Red Hill GW Sampling Event 3	Date Received:	09/12/05
Matrix:	WATER	Units:	µG/L
		Basis:	NA

Sample Name: RH-W-005 Lab Code: K0503851-001

Analyte	Analysis Method	MRL	MDL	Dil.	Date Extracted	Date Analyzed	Result	C	Q
Lead	6020	0.02	0.01	1	9/15/05	10/10/05	0.21		

% Solids: 0.0

Comments:

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00012

METALS

-1-

INORGANIC ANALYSIS DATA SHEET

Client: Dawson Group, Incorporated
Project No.: 2001022.013
Project Name: Red Hill GW Sampling Event 3
Matrix: WATER

Service Request: K0503851
Date Collected: 09/08/05
Date Received: 09/12/05
Units: µG/L
Basis: NA

Sample Name: RH-W-006
Lab Code: K0503851-002

Analyte	Analysis Method	MRL	MDL	Dil.	Date Extracted	Date Analyzed	Result	C	Q
Lead	6020	0.02	0.01	1	9/15/05	10/10/05	0.05		

% Solids: 0.0

Comments:

METALS
-1-
INORGANIC ANALYSIS DATA SHEET

Client:	Dawson Group, Incorporated	Service Request:	K0503851
Project No.:	2001022.013	Date Collected:	09/08/05
Project Name:	Red Hill GW Sampling Event 3	Date Received:	09/12/05
Matrix:	WATER	Units:	µG/L
		Basis:	NA

Sample Name: RH-B-007 Lab Code: K0503851-003

Analyte	Analysis Method	MRL	MDL	Dil.	Date Extracted	Date Analyzed	Result	C	Q
Lead	6020	0.02	0.01	1	9/15/05	10/10/05	0.05		

% Solids: 0.0

Comments:

00014

METALS
-1-
INORGANIC ANALYSIS DATA SHEET

Client: Dawson Group, Incorporated
Project No.: 2001022.013
Project Name: Red Hill GW Sampling Event 3
Matrix: WATER

Service Request: K0503851
Date Collected: 09/08/05
Date Received: 09/12/05
Units: µG/L
Basis: NA

Sample Name: RH-B-008
Lab Code: K0503851-004

Analyte	Analysis Method	MRL	MDL	Dil.	Date Extracted	Date Analyzed	Result	C	Q
Lead	6020	0.02	0.01	1	9/15/05	10/10/05	0.03		

% Solids: 0.0

Comments:

METALS
-1-
INORGANIC ANALYSIS DATA SHEET

Client:	Dawson Group, Incorporated	Service Request:	K0503851
Project No.:	2001022.013	Date Collected:	09/08/05
Project Name:	Red Hill GW Sampling Event 3	Date Received:	09/12/05
Matrix:	WATER	Units:	µG/L
		Basis:	NA

Sample Name: RH-B-009 Lab Code: K0503851-005

Analyte	Analysis Method	MRL	MDL	Dil.	Date Extracted	Date Analyzed	Result	C	Q
Lead	6020	0.02	0.01	1	9/15/05	10/10/05	0.27		

% Solids: 0.0

Comments:

METALS

-1-

INORGANIC ANALYSIS DATA SHEET

Client: Dawson Group, Incorporated
Service Request: K0503851

Project No.: 2001022.013
Date Collected:

Project Name: Red Hill GW Sampling Event 3
Date Received:

Matrix: WATER
Units: µG/L

Basis: NA

Sample Name: Method Blank
Lab Code: K0503851-MB

Analyte	Analysis Method	MRL	MDL	Dil.	Date Extracted	Date Analyzed	Result	C	Q
Lead	6020	0.02	0.01	1	9/15/05	10/10/05	0.01	U	

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% Solids: 0.0

Comments:

00017

METALS
-5a-
SPIKE SAMPLE RECOVERY

Client: Dawson Group, Incorporated
Service Request: K0503851
Project No.: 2001022.013
Units: µg/L
Project Name: Red Hill GW Sampling Event 3
Basis: NA
Matrix: WATER
% Solids: 0.0

Sample Name: RH-W-005S
Lab Code: K0503851-001S

Analyte	Control Limit %R	Spike Result	C	Sample Result	C	Spike Added	%R	Q	Method
Lead	59 - 127	18.3		0.21		20.0	90		6020

An empty field in the Control Limit column indicates the control limit is not applicable.

METALS
-6-
DUPLICATES

Client: Dawson Group, Incorporated
Service Request: K0503851
Project No.: 2001022.013
Units: µg/L
Project Name: Red Hill GW Sampling Event 3
Basis: NA
Matrix: WATER
% Solids: 0.0

Sample Name:RH-W-005D
Lab Code: K0503851-001D

Analyte	Control Limit(%)	Sample (S)	C	Duplicate (D)	C	RPD	Q	Method
Lead	20	0.21		0.20		4		6020

An empty field in the Control Limit column indicates the control limit is not applicable.

METALS

-7-

LABORATORY CONTROL SAMPLE

Client: Dawson Group, Incorporated Service Request: K0503851

Project No.: 2001022.013

Project Name: Red Hill GW Sampling Event 3

Aqueous LCS Source: Inorganic Ventures Solid LCS Source:

Analyte	Aqueous ug/L			Solid (mg/kg)				
	True	Found	%R	True	Found	C	Limits	%R
Lead	20.0	19.8	99					

Diesel & Residual Range Organics

Client: Dawson Group, Incorporated
Project: Red Hill GW Sampling Event 3/2001022.013
Sample Matrix: Water

Service Request: K0503851
Date Collected: 09/08/2005
Date Received: 09/12/2005

Diesel and Residual Range Organics

Sample Name: RH-W-005
Lab Code: K0503851-001

Extraction Method: EPA 3510B
Analysis Method: 8015M

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	950	Y	52	20	1	09/14/05	09/18/05	KWG0516001	
Residual Range Organics (RRO)	540	O	110	29	1	09/14/05	09/18/05	KWG0516001	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	106	52-128	09/18/05	Acceptable
n-Triacontane	112	50-150	09/18/05	Acceptable

Comments:

Client:	Dawson Group, Incorporated	**Service Request:**	K0503851
Project:	Red Hill GW Sampling Event 3/2001022.013	**Date Collected:**	09/08/2005
Sample Matrix:	Water	**Date Received:**	09/12/2005

Diesel and Residual Range Organics

Sample Name:	RH-W-006	**Units:**	ug/L
Lab Code:	K0503851-002	**Basis:**	NA
Extraction Method:	EPA 3510B	**Level:**	Low
Analysis Method:	8015M		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	1100	Y	50	19	1	09/14/05	09/18/05	KWG0516001	
Residual Range Organics (RRO)	720	O	100	28	1	09/14/05	09/18/05	KWG0516001	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	104	52-128	09/18/05	Acceptable
n-Triacontane	112	50-150	09/18/05	Acceptable

Comments:

Client:	Dawson Group, Incorporated	**Service Request:**	K0503851
Project:	Red Hill GW Sampling Event 3/2001022.013	**Date Collected:**	09/08/2005
Sample Matrix:	Water	**Date Received:**	09/12/2005

Diesel and Residual Range Organics

Sample Name:	RH-B-007	**Units:**	ug/L
Lab Code:	K0503851-003	**Basis:**	NA
Extraction Method:	EPA 3510B	**Level:**	Low
Analysis Method:	8015M		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	45	J	50	19	1	09/14/05	09/18/05	KWG0516001	
Residual Range Organics (RRO)	59	J	100	28	1	09/14/05	09/18/05	KWG0516001	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	103	52-128	09/18/05	Acceptable
n-Triacontane	108	50-150	09/18/05	Acceptable

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Comments:

00024

Client:	Dawson Group, Incorporated	**Service Request:**	K0503851
Project:	Red Hill GW Sampling Event 3/2001022.013	**Date Collected:**	09/08/2005
Sample Matrix:	Water	**Date Received:**	09/12/2005

Diesel and Residual Range Organics

Sample Name:	RH-B-008	**Units:**	ug/L
Lab Code:	K0503851-004	**Basis:**	NA
Extraction Method:	EPA 3510B	**Level:**	Low
Analysis Method:	8015M		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	ND	U	50	19	1	09/14/05	09/18/05	KWG0516001	
Residual Range Organics (RRO)	ND	U	100	28	1	09/14/05	09/18/05	KWG0516001	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	100	52-128	09/18/05	Acceptable
n-Triacontane	106	50-150	09/18/05	Acceptable

Comments:

Client:	Dawson Group, Incorporated	**Service Request:**	K0503851
Project:	Red Hill GW Sampling Event 3/2001022.013	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

Diesel and Residual Range Organics

Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KWG0516001-5	**Basis:**	NA
Extraction Method:	EPA 3510B	**Level:**	Low
Analysis Method:	8015M		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	ND	U	50	19	1	09/14/05	09/18/05	KWG0516001	
Residual Range Organics (RRO)	ND	U	100	28	1	09/14/05	09/18/05	KWG0516001	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	102	52-128	09/18/05	Acceptable
n-Triacontane	110	50-150	09/18/05	Acceptable

Comments:

Client: Dawson Group, Incorporated
Project: Red Hill GW Sampling Event 3/2001022.013
Sample Matrix: Water

Service Request: K0503851

Surrogate Recovery Summary
Diesel and Residual Range Organics

Extraction Method: EPA 3510B
Analysis Method: 8015M

Units: PERCENT
Level: Low

Sample Name	Lab Code	Sur1	Sur2
RH-W-005	K0503851-001	106	112
RH-W-006	K0503851-002	104	112
RH-B-007	K0503851-003	103	108
RH-B-008	K0503851-004	100	106
Method Blank	KWG0516001-5	102	110
Batch QC	K0503875-001	104	107
Batch QCMS	KWG0516001-2	108	114
Lab Control Sample	KWG0516001-3	102	110
Duplicate Lab Control Sample	KWG0516001-4	108	109

Surrogate Recovery Control Limits (%)

Sur1 =	o-Terphenyl	52-128
Sur2 =	n-Triacontane	50-150

Results flagged with an asterisk (*) indicate values outside control criteria.
Results flagged with a pound (#) indicate the control criteria is not applicable.

00027

Client:	Dawson Group, Incorporated	**Service Request:**	K0503851
Project:	Red Hill GW Sampling Event 3/2001022.013	**Date Extracted:**	09/14/2005
Sample Matrix:	Water	**Date Analyzed:**	09/18/2005

Matrix Spike Summary
Diesel and Residual Range Organics

Sample Name:	Batch QC	**Units:**	ug/L
Lab Code:	K0503875-001	**Basis:**	NA
Extraction Method:	EPA 3510B	**Level:**	Low
Analysis Method:	8015M	**Extraction Lot:**	KWG0516001

Batch QCMS
KWG0516001-2

Analyte Name	Sample Result	Matrix Spike Result	Matrix Spike Expected	Matrix Spike %Rec	%Rec Limits
Diesel Range Organics (DRO)	23	3410	3200	106	57-158
Residual Range Organics (RRO)	ND	1620	1600	101	45-157

Results flagged with an asterisk (*) indicate values outside control criteria.
Results flagged with a pound (#) indicate the control criteria is not applicable.
Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Client: Dawson Group, Incorporated
Project: Red Hill GW Sampling Event 3/2001022.013
Sample Matrix: Water

Service Request: K0503851
Date Extracted: 09/14/2005
Date Analyzed: 09/18/2005

Lab Control Spike/Duplicate Lab Control Spike Summary
Diesel and Residual Range Organics

Extraction Method: EPA 3510B
Analysis Method: 8015M

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG0516001

Analyte Name	Lab Control Sample KWG0516001-3 Lab Control Spike Result	Expected	%Rec	Duplicate Lab Control Sample KWG0516001-4 Duplicate Lab Control Spike Result	Expected	%Rec	%Rec Limits	RPD	RPD Limit
Diesel Range Organics (DRO)	1530	1600	96	1630	1600	102	67-151	6	30
Residual Range Organics (RRO)	749	800	94	753	800	94	59-146	1	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Gasoline Range Organics

Client: Dawson Group, Incorporated
Project: Red Hill GW Sampling Event 3/2001022.013
Sample Matrix: Water

Service Request: K0503851
Date Collected: 09/08/2005
Date Received: 09/12/2005

Gasoline Range Organics

Sample Name: RH-W-005
Lab Code: K0503851-001

Extraction Method: EPA 5030B
Analysis Method: 8015B

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics (GRO)	ND	U	50	13	1	09/21/05	09/21/05	KWG0516380	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	103	75-120	09/21/05	Acceptable

Comments:

Client:	Dawson Group, Incorporated	**Service Request:**	K0503851
Project:	Red Hill GW Sampling Event 3/2001022.013	**Date Collected:**	09/08/2005
Sample Matrix:	Water	**Date Received:**	09/12/2005

Gasoline Range Organics

Sample Name:	RH-W-006	**Units:**	ug/L
Lab Code:	K0503851-002	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8015B		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics (GRO)	ND	U	50	13	1	09/22/05	09/22/05	KWG0516380	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	103	75-120	09/22/05	Acceptable

Comments:

00032

Client:	Dawson Group, Incorporated	**Service Request:**	K0503851
Project:	Red Hill GW Sampling Event 3/2001022.013	**Date Collected:**	09/08/2005
Sample Matrix:	Water	**Date Received:**	09/12/2005

Gasoline Range Organics

Sample Name:	RH-B-007	**Units:**	ug/L
Lab Code:	K0503851-003	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8015B		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics (GRO)	ND	U	50	13	1	09/22/05	09/22/05	KWG0516380	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	103	75-120	09/22/05	Acceptable

Comments:

Client:	Dawson Group, Incorporated	**Service Request:**	K0503851
Project:	Red Hill GW Sampling Event 3/2001022.013	**Date Collected:**	09/08/2005
Sample Matrix:	Water	**Date Received:**	09/12/2005

Gasoline Range Organics

Sample Name:	RH-B-008	**Units:**	ug/L
Lab Code:	K0503851-004	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8015B		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics (GRO)	ND	U	50	13	1	09/22/05	09/22/05	KWG0516380	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	103	75-120	09/22/05	Acceptable

Comments:

Client: Dawson Group, Incorporated
Project: Red Hill GW Sampling Event 3/2001022.013
Sample Matrix: Water

Service Request: K0503851
Date Collected: 09/08/2005
Date Received: 09/12/2005

Gasoline Range Organics

Sample Name: RH-B-009
Lab Code: K0503851-005

Extraction Method: EPA 5030B
Analysis Method: 8015B

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics (GRO)	ND	U	50	13	1	09/22/05	09/22/05	KWG0516380	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	103	75-120	09/22/05	Acceptable

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Comments:

00035

Client:	Dawson Group, Incorporated	**Service Request:**	K0503851
Project:	Red Hill GW Sampling Event 3/2001022.013	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

Gasoline Range Organics

Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KWG0516380-4	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8015B		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics (GRO)	ND	U	50	13	1	09/21/05	09/21/05	KWG0516380	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	103	75-120	09/21/05	Acceptable

Comments:

Client: Dawson Group, Incorporated
Project: Red Hill GW Sampling Event 3/2001022.013
Sample Matrix: Water

Service Request: K0503851

Surrogate Recovery Summary
Gasoline Range Organics

Extraction Method: EPA 5030B
Analysis Method: 8015B

Units: PERCENT
Level: Low

Sample Name	Lab Code	Sur1
RH-W-005	K0503851-001	103
RH-W-006	K0503851-002	103
RH-B-007	K0503851-003	103
RH-B-008	K0503851-004	103
RH-B-009	K0503851-005	103
Method Blank	KWG0516380-4	103
Batch QC	K0503875-001	103
Batch QCMS	KWG0516380-1	114
Lab Control Sample	KWG0516380-3	109
Duplicate Lab Control Sample	KWG0516380-5	108

Surrogate Recovery Control Limits (%)

Sur1 = 1,4-Difluorobenzene 75-120

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Results flagged with an asterisk (*) indicate values outside control criteria.
Results flagged with a pound (#) indicate the control criteria is not applicable.

00037

Client:	Dawson Group, Incorporated	**Service Request:**	K0503851
Project:	Red Hill GW Sampling Event 3/2001022.013	**Date Extracted:**	09/21/2005
Sample Matrix:	Water	**Date Analyzed:**	09/21/2005

Matrix Spike Summary
Gasoline Range Organics

Sample Name:	Batch QC	**Units:**	ug/L
Lab Code:	K0503875-001	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8015B	**Extraction Lot:**	KWG0516380

Batch QCMS
KWG0516380-1

Analyte Name	Sample Result	Matrix Spike Result	Matrix Spike Expected	Matrix Spike %Rec	%Rec Limits
Gasoline Range Organics (GRO)	ND	1090	1000	109	69-128

Results flagged with an asterisk (*) indicate values outside control criteria.
Results flagged with a pound (#) indicate the control criteria is not applicable.
Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Client: Dawson Group, Incorporated
Project: Red Hill GW Sampling Event 3/2001022.013
Sample Matrix: Water

Service Request: K0503851
Date Extracted: 09/21/2005
Date Analyzed: 09/21/2005

Lab Control Spike/Duplicate Lab Control Spike Summary
Gasoline Range Organics

Extraction Method: EPA 5030B
Analysis Method: 8015B

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG0516380

	Lab Control Sample KWG0516380-3 Lab Control Spike			Duplicate Lab Control Sample KWG0516380-5 Duplicate Lab Control Spike					
Analyte Name	**Result**	**Expected**	**%Rec**	**Result**	**Expected**	**%Rec**	**%Rec Limits**	**RPD**	**RPD Limit**
Gasoline Range Organics (GRO)	538	500	108	534	500	107	71-128	1	30

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Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00039

EPA Method 504.1

Client: Dawson Group, Incorporated
Project: Red Hill GW Sampling Event 3/2001022.013
Sample Matrix: Water

Service Request: K0503851
Date Collected: 09/08/2005
Date Received: 09/12/2005

EPA Method 504.1

Sample Name: RH-W-005
Lab Code: K0503851-001

Extraction Method: METHOD
Analysis Method: 504.1

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
1,2-Dibromoethane (EDB)	ND	U	0.0096	0.00096	1	09/14/05	09/14/05	KWG0516066	

Surrogate Name	%Rec	Control Limits	Note

Comments:

Client: Dawson Group, Incorporated
Project: Red Hill GW Sampling Event 3/2001022.013
Sample Matrix: Water

Service Request: K0503851
Date Collected: 09/08/2005
Date Received: 09/12/2005

EPA Method 504.1

Sample Name: RH-W-006
Lab Code: K0503851-002

Extraction Method: METHOD
Analysis Method: 504.1

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
1,2-Dibromoethane (EDB)	ND	U	0.0094	0.00096	1	09/14/05	09/14/05	KWG0516066	

Surrogate Name	%Rec	Control Limits	Note

Comments:

00042

Client: Dawson Group, Incorporated
Project: Red Hill GW Sampling Event 3/2001022.013
Sample Matrix: Water

Service Request: K0503851
Date Collected: 09/08/2005
Date Received: 09/12/2005

EPA Method 504.1

Sample Name: RH-B-007
Lab Code: K0503851-003
Extraction Method: METHOD
Analysis Method: 504.1

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
1,2-Dibromoethane (EDB)	ND	U	0.0095	0.00096	1	09/14/05	09/14/05	KWG0516066	

Surrogate Name	%Rec	Control Limits	Note

Comments:

Client:	Dawson Group, Incorporated	**Service Request:**	K0503851
Project:	Red Hill GW Sampling Event 3/2001022.013	**Date Collected:**	09/08/2005
Sample Matrix:	Water	**Date Received:**	09/12/2005

EPA Method 504.1

Sample Name:	RH-B-008	**Units:**	ug/L
Lab Code:	K0503851-004	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	504.1		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
1,2-Dibromoethane (EDB)	ND	U	0.0095	0.00096	1	09/14/05	09/14/05	KWG0516066	

Surrogate Name	%Rec	Control Limits	Note

Comments:

Client: Dawson Group, Incorporated
Project: Red Hill GW Sampling Event 3/2001022.013
Sample Matrix: Water

Service Request: K0503851
Date Collected: 09/08/2005
Date Received: 09/12/2005

EPA Method 504.1

Sample Name: RH-B-009
Lab Code: K0503851-005
Extraction Method: METHOD
Analysis Method: 504.1

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
1,2-Dibromoethane (EDB)	ND	U	0.0095	0.00096	1	09/14/05	09/14/05	KWG0516066	

Surrogate Name	%Rec	Control Limits	Note

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Comments:

00045

Client:	Dawson Group, Incorporated	**Service Request:**	K0503851
Project:	Red Hill GW Sampling Event 3/2001022.013	**Date Collected:**	NA
Sample Matrix:	Drinking water	**Date Received:**	NA

EPA Method 504.1

Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KWG0516066-3	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	504.1		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
1,2-Dibromoethane (EDB)	ND	U	0.011	0.00096	1	09/14/05	09/14/05	KWG0516066	

Surrogate Name	%Rec	Control Limits	Note

Comments:

Client: Dawson Group, Incorporated
Project: Red Hill GW Sampling Event 3/2001022.013
Sample Matrix: Drinking water

Service Request: K0503851
Date Extracted: 09/14/2005
Date Analyzed: 09/14/2005

Matrix Spike Summary
EPA Method 504.1

Sample Name: Batch QC
Lab Code: K0503674-002

Extraction Method: METHOD
Analysis Method: 504.1

Units: ug/L
Basis: NA

Level: Low
Extraction Lot: KWG0516066

Batch QCMS
KWG0516066-1
Matrix Spike

Analyte Name	Sample Result	Result	Expected	%Rec	%Rec Limits
1,2-Dibromoethane (EDB)	ND	0.0816	0.0678	120	65-135

Results flagged with an asterisk (*) indicate values outside control criteria.
Results flagged with a pound (#) indicate the control criteria is not applicable.
Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Client: Dawson Group, Incorporated
Project: Red Hill GW Sampling Event 3/2001022.013
Sample Matrix: Drinking water

Service Request: K0503851
Date Extracted: 09/14/2005
Date Analyzed: 09/14/2005

Lab Control Spike Summary
EPA Method 504.1

Extraction Method: METHOD
Analysis Method: 504.1

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG0516066

Analyte Name	Lab Control Sample KWG0516066-2 Lab Control Spike Result	Expected	%Rec	%Rec Limits
1,2-Dibromoethane (EDB)	0.0673	0.0714	94	70-130

Results flagged with an asterisk (*) indicate values outside control criteria.
Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00048

Volatile Organic Compounds
EPA Method 8260B

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Client: Dawson Group, Incorporated
Project: Red Hill GW Sampling Event 3/2001022.013
Sample Matrix: Water

Service Request: K0503851
Date Collected: 09/08/2005
Date Received: 09/12/2005

Volatile Organic Compounds

Sample Name: RH-W-005
Lab Code: K0503851-001

Extraction Method: EPA 5030B
Analysis Method: 8260B

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND	U	0.50	0.14	1	09/20/05	09/20/05	KWG0516329	
Methyl tert-Butyl Ether	ND	U	0.50	0.20	1	09/20/05	09/20/05	KWG0516329	
Toluene	**0.15**	J	0.50	0.11	1	09/20/05	09/20/05	KWG0516329	
Ethylbenzene	ND	U	0.50	0.13	1	09/20/05	09/20/05	KWG0516329	
m,p-Xylenes	ND	U	0.50	0.22	1	09/20/05	09/20/05	KWG0516329	
o-Xylene	ND	U	0.50	0.11	1	09/20/05	09/20/05	KWG0516329	
1,2-Dichloroethane (EDC)	ND	U	0.50	0.12	1	09/20/05	09/20/05	KWG0516329	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	98	80-119	09/20/05	Acceptable
Toluene-d8	108	83-113	09/20/05	Acceptable
4-Bromofluorobenzene	100	72-114	09/20/05	Acceptable

Comments:

Client: Dawson Group, Incorporated
Project: Red Hill GW Sampling Event 3/2001022.013
Sample Matrix: Water

Service Request: K0503851
Date Collected: 09/08/2005
Date Received: 09/12/2005

Volatile Organic Compounds

Sample Name: RH-W-006
Lab Code: K0503851-002
Extraction Method: EPA 5030B
Analysis Method: 8260B

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND	U	0.50	0.14	1	09/20/05	09/20/05	KWG0516329	
Methyl tert-Butyl Ether	ND	U	0.50	0.20	1	09/20/05	09/20/05	KWG0516329	
Toluene	0.15	J	0.50	0.11	1	09/20/05	09/20/05	KWG0516329	
Ethylbenzene	ND	U	0.50	0.13	1	09/20/05	09/20/05	KWG0516329	
m,p-Xylenes	ND	U	0.50	0.22	1	09/20/05	09/20/05	KWG0516329	
o-Xylene	ND	U	0.50	0.11	1	09/20/05	09/20/05	KWG0516329	
1,2-Dichloroethane (EDC)	ND	U	0.50	0.12	1	09/20/05	09/20/05	KWG0516329	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	96	80-119	09/20/05	Acceptable
Toluene-d8	107	83-113	09/20/05	Acceptable
4-Bromofluorobenzene	103	72-114	09/20/05	Acceptable

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Comments:

00051

Client: Dawson Group, Incorporated
Project: Red Hill GW Sampling Event 3/2001022.013
Sample Matrix: Water

Service Request: K0503851
Date Collected: 09/08/2005
Date Received: 09/12/2005

Volatile Organic Compounds

Sample Name: RH-B-007
Lab Code: K0503851-003

Extraction Method: EPA 5030B
Analysis Method: 8260B

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND	U	0.50	0.14	1	09/20/05	09/20/05	KWG0516329	
Methyl tert-Butyl Ether	ND	U	0.50	0.20	1	09/20/05	09/20/05	KWG0516329	
Toluene	ND	U	0.50	0.11	1	09/20/05	09/20/05	KWG0516329	
Ethylbenzene	ND	U	0.50	0.13	1	09/20/05	09/20/05	KWG0516329	
m,p-Xylenes	ND	U	0.50	0.22	1	09/20/05	09/20/05	KWG0516329	
o-Xylene	ND	U	0.50	0.11	1	09/20/05	09/20/05	KWG0516329	
1,2-Dichloroethane (EDC)	ND	U	0.50	0.12	1	09/20/05	09/20/05	KWG0516329	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	95	80-119	09/20/05	Acceptable
Toluene-d8	106	83-113	09/20/05	Acceptable
4-Bromofluorobenzene	96	72-114	09/20/05	Acceptable

Comments:

Client: Dawson Group, Incorporated
Project: Red Hill GW Sampling Event 3/2001022.013
Sample Matrix: Water

Service Request: K0503851
Date Collected: 09/08/2005
Date Received: 09/12/2005

Volatile Organic Compounds

Sample Name: RH-B-008
Lab Code: K0503851-004
Extraction Method: EPA 5030B
Analysis Method: 8260B

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND	U	0.50	0.14	1	09/20/05	09/20/05	KWG0516329	
Methyl tert-Butyl Ether	ND	U	0.50	0.20	1	09/20/05	09/20/05	KWG0516329	
Toluene	ND	U	0.50	0.11	1	09/20/05	09/20/05	KWG0516329	
Ethylbenzene	ND	U	0.50	0.13	1	09/20/05	09/20/05	KWG0516329	
m,p-Xylenes	ND	U	0.50	0.22	1	09/20/05	09/20/05	KWG0516329	
o-Xylene	ND	U	0.50	0.11	1	09/20/05	09/20/05	KWG0516329	
1,2-Dichloroethane (EDC)	ND	U	0.50	0.12	1	09/20/05	09/20/05	KWG0516329	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	96	80-119	09/20/05	Acceptable
Toluene-d8	107	83-113	09/20/05	Acceptable
4-Bromofluorobenzene	94	72-114	09/20/05	Acceptable

Comments:

00053

Client: Dawson Group, Incorporated
Project: Red Hill GW Sampling Event 3/2001022.013
Sample Matrix: Water

Service Request: K0503851
Date Collected: 09/08/2005
Date Received: 09/12/2005

Volatile Organic Compounds

Sample Name: RH-B-009
Lab Code: K0503851-005

Units: ug/L
Basis: NA

Extraction Method: EPA 5030B
Analysis Method: 8260B

Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND	U	0.50	0.14	1	09/20/05	09/20/05	KWG0516329	
Methyl tert-Butyl Ether	ND	U	0.50	0.20	1	09/20/05	09/20/05	KWG0516329	
Toluene	ND	U	0.50	0.11	1	09/20/05	09/20/05	KWG0516329	
Ethylbenzene	ND	U	0.50	0.13	1	09/20/05	09/20/05	KWG0516329	
m,p-Xylenes	ND	U	0.50	0.22	1	09/20/05	09/20/05	KWG0516329	
o-Xylene	ND	U	0.50	0.11	1	09/20/05	09/20/05	KWG0516329	
1,2-Dichloroethane (EDC)	ND	U	0.50	0.12	1	09/20/05	09/20/05	KWG0516329	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	99	80-119	09/20/05	Acceptable
Toluene-d8	107	83-113	09/20/05	Acceptable
4-Bromofluorobenzene	95	72-114	09/20/05	Acceptable

Comments:

Client: Dawson Group, Incorporated
Project: Red Hill GW Sampling Event 3/2001022.013
Sample Matrix: Water

Service Request: K0503851
Date Collected: 09/08/2005
Date Received: 09/12/2005

Volatile Organic Compounds

Sample Name: Trip Blank
Lab Code: K0503851-006
Extraction Method: EPA 5030B
Analysis Method: 8260B

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND	U	0.50	0.14	1	09/20/05	09/20/05	KWG0516329	
Methyl tert-Butyl Ether	ND	U	0.50	0.20	1	09/20/05	09/20/05	KWG0516329	
Toluene	ND	U	0.50	0.11	1	09/20/05	09/20/05	KWG0516329	
Ethylbenzene	ND	U	0.50	0.13	1	09/20/05	09/20/05	KWG0516329	
m,p-Xylenes	ND	U	0.50	0.22	1	09/20/05	09/20/05	KWG0516329	
o-Xylene	ND	U	0.50	0.11	1	09/20/05	09/20/05	KWG0516329	
1,2-Dichloroethane (EDC)	ND	U	0.50	0.12	1	09/20/05	09/20/05	KWG0516329	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	96	80-119	09/20/05	Acceptable
Toluene-d8	109	83-113	09/20/05	Acceptable
4-Bromofluorobenzene	97	72-114	09/20/05	Acceptable

Comments:

00055

Client: Dawson Group, Incorporated
Project: Red Hill GW Sampling Event 3/2001022.013
Sample Matrix: Water

Service Request: K0503851
Date Collected: NA
Date Received: NA

Volatile Organic Compounds

Sample Name: Method Blank
Lab Code: KWG0516329-2

Units: ug/L
Basis: NA

Extraction Method: EPA 5030B
Analysis Method: 8260B

Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND	U	0.50	0.14	1	09/20/05	09/20/05	KWG0516329	
Methyl tert-Butyl Ether	ND	U	0.50	0.20	1	09/20/05	09/20/05	KWG0516329	
Toluene	ND	U	0.50	0.11	1	09/20/05	09/20/05	KWG0516329	
Ethylbenzene	ND	U	0.50	0.13	1	09/20/05	09/20/05	KWG0516329	
m,p-Xylenes	ND	U	0.50	0.22	1	09/20/05	09/20/05	KWG0516329	
o-Xylene	ND	U	0.50	0.11	1	09/20/05	09/20/05	KWG0516329	
1,2-Dichloroethane (EDC)	ND	U	0.50	0.12	1	09/20/05	09/20/05	KWG0516329	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	94	80-119	09/20/05	Acceptable
Toluene-d8	107	83-113	09/20/05	Acceptable
4-Bromofluorobenzene	94	72-114	09/20/05	Acceptable

Comments:

00056

Client: Dawson Group, Incorporated
Project: Red Hill GW Sampling Event 3/2001022.013
Sample Matrix: Water

Service Request: K0503851

Surrogate Recovery Summary
Volatile Organic Compounds

Extraction Method: EPA 5030B
Analysis Method: 8260B

Units: PERCENT
Level: Low

Sample Name	Lab Code	Sur1	Sur2	Sur3
RH-W-005	K0503851-001	98	108	100
RH-W-006	K0503851-002	96	107	103
RH-B-007	K0503851-003	95	106	96
RH-B-008	K0503851-004	96	107	94
RH-B-009	K0503851-005	99	107	95
Trip Blank	K0503851-006	96	109	97
Method Blank	KWG0516329-2	94	107	94
RH-B-007MS	KWG0516329-3	103	109	100
RH-B-007DMS	KWG0516329-4	102	110	102
Lab Control Sample	KWG0516329-1	101	108	100

Surrogate Recovery Control Limits (%)

Sur1	= Dibromofluoromethane	80-119
Sur2	= Toluene-d8	83-113
Sur3	= 4-Bromofluorobenzene	72-114

Results flagged with an asterisk (*) indicate values outside control criteria.
Results flagged with a pound (#) indicate the control criteria is not applicable.

00057

Client: Dawson Group, Incorporated
Project: Red Hill GW Sampling Event 3/2001022.013
Sample Matrix: Water

Service Request: K0503851
Date Extracted: 09/20/2005
Date Analyzed: 09/20/2005

Matrix Spike/Duplicate Matrix Spike Summary
Volatile Organic Compounds

Sample Name: RH-B-007
Lab Code: K0503851-003

Units: ug/L
Basis: NA

Extraction Method: EPA 5030B
Analysis Method: 8260B

Level: Low
Extraction Lot: KWG0516329

Analyte Name	Sample Result	RH-B-007MS KWG0516329-3 Matrix Spike			RH-B-007DMS KWG0516329-4 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
Benzene	ND	11.4	10.0	114	11.2	10.0	112	75-130	2	30
Methyl tert-Butyl Ether	ND	9.19	10.0	92	9.74	10.0	97	50-152	6	30
Toluene	ND	11.0	10.0	110	10.7	10.0	107	72-132	3	30
Ethylbenzene	ND	11.6	10.0	116	11.5	10.0	115	83-130	1	30
m,p-Xylenes	ND	21.9	20.0	109	22.0	20.0	110	84-132	1	30
o-Xylene	ND	10.9	10.0	109	10.9	10.0	109	83-128	0	30
1,2-Dichloroethane (EDC)	ND	9.83	10.0	98	10.2	10.0	102	74-122	4	30

Results flagged with an asterisk (*) indicate values outside control criteria.
Results flagged with a pound (#) indicate the control criteria is not applicable.
Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Client: Dawson Group, Incorporated
Project: Red Hill GW Sampling Event 3/2001022.013
Sample Matrix: Water

Service Request: K0503851
Date Extracted: 09/20/2005
Date Analyzed: 09/20/2005

Lab Control Spike Summary
Volatile Organic Compounds

Extraction Method: EPA 5030B
Analysis Method: 8260B

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG0516329

Analyte Name	Lab Control Sample KWG0516329-1 Lab Control Spike Result	Expected	%Rec	%Rec Limits
Benzene	10.7	10.0	107	78-121
Methyl tert-Butyl Ether	9.29	10.0	93	63-132
Toluene	10.1	10.0	101	76-122
Ethylbenzene	10.7	10.0	107	84-122
m,p-Xylenes	20.6	20.0	103	83-125
o-Xylene	10.1	10.0	101	83-122
1,2-Dichloroethane (EDC)	9.40	10.0	94	74-121

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Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00059

Polynuclear Aromatic Hydrocarbons
EPA Method 8270C

Client: Dawson Group, Incorporated
Project: Red Hill GW Sampling Event 3/2001022.013
Sample Matrix: Water

Service Request: K0503851
Date Collected: 09/08/2005
Date Received: 09/12/2005

Polynuclear Aromatic Hydrocarbons

Sample Name: RH-W-005
Lab Code: K0503851-001

Extraction Method: EPA 3520C
Analysis Method: 8270C SIM

Units: ug/L
Basis: NA

Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	0.83		0.020	1	09/14/05	09/19/05	KWG0515969	
2-Methylnaphthalene	0.038		0.020	1	09/14/05	09/19/05	KWG0515969	
Acenaphthylene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Acenaphthene	0.054		0.020	1	09/14/05	09/19/05	KWG0515969	
Dibenzofuran	0.13		0.020	1	09/14/05	09/19/05	KWG0515969	
Fluorene	0.064		0.020	1	09/14/05	09/19/05	KWG0515969	
Phenanthrene	0.11		0.020	1	09/14/05	09/19/05	KWG0515969	
Anthracene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Fluoranthene	0.025		0.020	1	09/14/05	09/19/05	KWG0515969	
Pyrene	0.030		0.020	1	09/14/05	09/19/05	KWG0515969	
Benz(a)anthracene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Chrysene	0.022		0.020	1	09/14/05	09/19/05	KWG0515969	
Benzo(b)fluoranthene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Benzo(k)fluoranthene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Benzo(a)pyrene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Dibenz(a,h)anthracene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Benzo(g,h,i)perylene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	62	24-111	09/19/05	Acceptable
Fluoranthene-d10	57	26-123	09/19/05	Acceptable
Terphenyl-d14	38	25-146	09/19/05	Acceptable

Comments:

00061

Client: Dawson Group, Incorporated
Project: Red Hill GW Sampling Event 3/2001022.013
Sample Matrix: Water

Service Request: K0503851
Date Collected: 09/08/2005
Date Received: 09/12/2005

Polynuclear Aromatic Hydrocarbons

Sample Name: RH-W-006
Lab Code: K0503851-002

Extraction Method: EPA 3520C
Analysis Method: 8270C SIM

Units: ug/L
Basis: NA

Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**0.78**		0.020	1	09/14/05	09/19/05	KWG0515969	
2-Methylnaphthalene	**0.038**		0.020	1	09/14/05	09/19/05	KWG0515969	
Acenaphthylene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Acenaphthene	**0.056**		0.020	1	09/14/05	09/19/05	KWG0515969	
Dibenzofuran	**0.13**		0.020	1	09/14/05	09/19/05	KWG0515969	
Fluorene	**0.064**		0.020	1	09/14/05	09/19/05	KWG0515969	
Phenanthrene	**0.12**		0.020	1	09/14/05	09/19/05	KWG0515969	
Anthracene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Fluoranthene	**0.049**		0.020	1	09/14/05	09/19/05	KWG0515969	
Pyrene	**0.058**		0.020	1	09/14/05	09/19/05	KWG0515969	
Benz(a)anthracene	**0.025**		0.020	1	09/14/05	09/19/05	KWG0515969	
Chrysene	**0.036**		0.020	1	09/14/05	09/19/05	KWG0515969	
Benzo(b)fluoranthene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Benzo(k)fluoranthene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Benzo(a)pyrene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Dibenz(a,h)anthracene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Benzo(g,h,i)perylene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	67	24-111	09/19/05	Acceptable
Fluoranthene-d10	66	26-123	09/19/05	Acceptable
Terphenyl-d14	53	25-146	09/19/05	Acceptable

Comments:

Client: Dawson Group, Incorporated
Project: Red Hill GW Sampling Event 3/2001022.013
Sample Matrix: Water

Service Request: K0503851
Date Collected: 09/08/2005
Date Received: 09/12/2005

Polynuclear Aromatic Hydrocarbons

Sample Name: RH-B-007
Lab Code: K0503851-003
Extraction Method: EPA 3520C
Analysis Method: 8270C SIM

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	0.085		0.020	1	09/14/05	09/19/05	KWG0515969	
2-Methylnaphthalene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Acenaphthylene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Acenaphthene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Dibenzofuran	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Fluorene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Phenanthrene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Anthracene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Fluoranthene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Pyrene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Benz(a)anthracene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Chrysene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Benzo(b)fluoranthene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Benzo(k)fluoranthene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Benzo(a)pyrene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Dibenz(a,h)anthracene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Benzo(g,h,i)perylene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	73	24-111	09/19/05	Acceptable
Fluoranthene-d10	83	26-123	09/19/05	Acceptable
Terphenyl-d14	92	25-146	09/19/05	Acceptable

Comments:

00063

Client:	Dawson Group, Incorporated	**Service Request:**	K0503851
Project:	Red Hill GW Sampling Event 3/2001022.013	**Date Collected:**	09/08/2005
Sample Matrix:	Water	**Date Received:**	09/12/2005

Polynuclear Aromatic Hydrocarbons

Sample Name:	RH-B-008	**Units:**	ug/L
Lab Code:	K0503851-004	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
2-Methylnaphthalene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Acenaphthylene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Acenaphthene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Dibenzofuran	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Fluorene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Phenanthrene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Anthracene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Fluoranthene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Pyrene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Benz(a)anthracene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Chrysene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Benzo(b)fluoranthene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Benzo(k)fluoranthene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Benzo(a)pyrene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Dibenz(a,h)anthracene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Benzo(g,h,i)perylene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	74	24-111	09/19/05	Acceptable
Fluoranthene-d10	86	26-123	09/19/05	Acceptable
Terphenyl-d14	96	25-146	09/19/05	Acceptable

Comments:

Client: Dawson Group, Incorporated
Project: Red Hill GW Sampling Event 3/2001022.013
Sample Matrix: Water

Service Request: K0503851
Date Collected: 09/08/2005
Date Received: 09/12/2005

Polynuclear Aromatic Hydrocarbons

Sample Name: RH-B-009
Lab Code: K0503851-005

Extraction Method: EPA 3520C
Analysis Method: 8270C SIM

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	0.045		0.020	1	09/14/05	09/19/05	KWG0515969	
2-Methylnaphthalene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Acenaphthylene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Acenaphthene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Dibenzofuran	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Fluorene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Phenanthrene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Anthracene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Fluoranthene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Pyrene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Benz(a)anthracene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Chrysene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Benzo(b)fluoranthene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Benzo(k)fluoranthene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Benzo(a)pyrene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Dibenz(a,h)anthracene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Benzo(g,h,i)perylene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	73	24-111	09/19/05	Acceptable
Fluoranthene-d10	79	26-123	09/19/05	Acceptable
Terphenyl-d14	76	25-146	09/19/05	Acceptable

Comments:

Client: Dawson Group, Incorporated
Project: Red Hill GW Sampling Event 3/2001022.013
Sample Matrix: Water

Service Request: K0503851
Date Collected: NA
Date Received: NA

Polynuclear Aromatic Hydrocarbons

Sample Name: Method Blank
Lab Code: KWG0515969-3

Extraction Method: EPA 3520C
Analysis Method: 8270C SIM

Units: ug/L
Basis: NA

Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
2-Methylnaphthalene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Acenaphthylene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Acenaphthene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Dibenzofuran	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Fluorene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Phenanthrene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Anthracene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Fluoranthene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Pyrene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Benz(a)anthracene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Chrysene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Benzo(b)fluoranthene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Benzo(k)fluoranthene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Benzo(a)pyrene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Dibenz(a,h)anthracene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	
Benzo(g,h,i)perylene	ND	U	0.020	1	09/14/05	09/19/05	KWG0515969	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	77	24-111	09/19/05	Acceptable
Fluoranthene-d10	90	26-123	09/19/05	Acceptable
Terphenyl-d14	103	25-146	09/19/05	Acceptable

Comments:

Client: Dawson Group, Incorporated
Project: Red Hill GW Sampling Event 3/2001022.013
Sample Matrix: Water

Service Request: K0503851

Surrogate Recovery Summary
Polynuclear Aromatic Hydrocarbons

Extraction Method: EPA 3520C
Analysis Method: 8270C SIM

Units: PERCENT
Level: Low

Sample Name	Lab Code	Sur1	Sur2	Sur3
RH-W-005	K0503851-001	62	57	38
RH-W-006	K0503851-002	67	66	53
RH-B-007	K0503851-003	73	83	92
RH-B-008	K0503851-004	74	86	96
RH-B-009	K0503851-005	73	79	76
Method Blank	KWG0515969-3	77	90	103
Lab Control Sample	KWG0515969-1	80	92	97
Duplicate Lab Control Sample	KWG0515969-2	76	90	92

Surrogate Recovery Control Limits (%)

Sur1 =	Fluorene-d10	24-111
Sur2 =	Fluoranthene-d10	26-123
Sur3 =	Terphenyl-d14	25-146

Results flagged with an asterisk (*) indicate values outside control criteria.
Results flagged with a pound (#) indicate the control criteria is not applicable.

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00067

Client: Dawson Group, Incorporated
Project: Red Hill GW Sampling Event 3/2001022.013
Sample Matrix: Water

Service Request: K0503851
Date Extracted: 09/14/2005
Date Analyzed: 09/19/2005

Lab Control Spike/Duplicate Lab Control Spike Summary
Polynuclear Aromatic Hydrocarbons

Extraction Method: EPA 3520C
Analysis Method: 8270C SIM

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG0515969

	Lab Control Sample KWG0515969-1 Lab Control Spike			Duplicate Lab Control Sample KWG0515969-2 Duplicate Lab Control Spike					
Analyte Name	**Result**	**Expected**	**%Rec**	**Result**	**Expected**	**%Rec**	**%Rec Limits**	**RPD**	**RPD Limit**
Naphthalene	2.23	2.50	89	2.24	2.50	90	32-124	0	30
2-Methylnaphthalene	2.23	2.50	89	2.16	2.50	87	19-133	3	30
Acenaphthylene	2.49	2.50	100	2.49	2.50	100	36-128	0	30
Acenaphthene	2.49	2.50	100	2.48	2.50	99	36-126	0	30
Dibenzofuran	2.47	2.50	99	2.48	2.50	99	10-167	1	30
Fluorene	2.59	2.50	104	2.60	2.50	104	41-130	0	30
Phenanthrene	2.55	2.50	102	2.59	2.50	104	43-129	2	30
Anthracene	2.57	2.50	103	2.53	2.50	101	36-131	1	30
Fluoranthene	2.75	2.50	110	2.84	2.50	114	45-139	3	30
Pyrene	2.83	2.50	113	2.83	2.50	113	38-143	0	30
Benz(a)anthracene	2.61	2.50	105	2.59	2.50	104	45-131	1	30
Chrysene	2.71	2.50	109	2.70	2.50	108	47-132	1	30
Benzo(b)fluoranthene	2.64	2.50	106	2.66	2.50	107	51-135	1	30
Benzo(k)fluoranthene	2.55	2.50	102	2.65	2.50	106	46-139	4	30
Benzo(a)pyrene	2.64	2.50	106	2.62	2.50	105	40-138	1	30
Indeno(1,2,3-cd)pyrene	2.62	2.50	105	2.69	2.50	107	35-148	2	30
Dibenz(a,h)anthracene	2.54	2.50	102	2.59	2.50	104	42-143	2	30
Benzo(g,h,i)perylene	2.60	2.50	104	2.62	2.50	105	42-139	1	30

SEP 13 2005

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00068

APPENDIX C

Monitoring Well Sampling Logs

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SURFACE WATER FIELD SAMPLING LOG

Dawson Group, Inc.

PROJECT: Groundwater Sampling, Red Hill Fuel Storage Facility, Hawaii - Potable Water Infiltration Tunnel *

CONTRACT NO: N62742-01-D-1806, CTO 0013 JOB NO: 2001_022.013

DATE: 9/8/2005 TIME: 12:36 CLIMATIC CONDITIONS: NA

PERSONNEL: B Graham, H. Kerr

WELL INFORMATION

Well Name/Number: Stilling Basin

Well Location: *

Casing Diameter (inches): NA (d_c)

Total Well Depth (feet): NA

Initial Depth to Water (feet): 81.28 TOC

Depth to Product (feet): NA

Height of Water Column (feet): NA (h)

PURGE VOLUME

$V_c = (d_c)^2 \times (h) \times 0.041$

Volume of water in casing (gallons): NA (V_c)

Minimum Purge Volume (gallons): NA

EQUIPMENT

Instrument(s): Solinst Interphase Probe Model 122

Calibration Time: NA

Calibration Result / Comments: NA

PURGE LOG

Measurements of temperature, pH, specific conductivity, turbidity, dissolved oxygen, and redox will be collected initially, after every well volume removed, and at the end.

METHOD OF REMOVAL: New, disposable, polyethylene bailer PUMPING RATE: NA

DATE	TIME	CUMULATIVE GALLONS REMOVED	TEMP. (°C)	pH	SP COND. ( )	TURBIDITY ( )	DISSOLVED O_2 ( )	REDOX ( )

SAMPLE INFORMATION

SAMPLE WITHDRAWAL METHOD: New, disposable, polyethylene bailer SAMPLED BY: BG, HK

SAMPLE ID	P, QC, OR QA	TIME COLLECTED	DATE COLLECTED	NOTES
RH-B-007	P	12:55	9/8/2005	Pumps were offline 24 hours prior to sample
RH-B-008	P	13:45	9/8/2005	Pumps online for 15-20 minutes (turned on at 13:14)
RH-B-009	QC	13:50	9/8/2005	Pumps online for 15-20 minutes (turned on at 13:14)

Notes P = primary sample, QC = quality control (duplicate) sample, QA = quality assurance (triplicate) sample

APPEARANCE OF SAMPLE: Color: Clear Temp: NA DO: NA

Turbidity: NA pH: NA Redox: NA

Sediment: None Sp Cond: NA

LAB ANALYSIS PARAMETERS: (1) BTEX, MtBE, 1,2-DCA - EPA Method 8260B (2) EDB - EPA DW Method 504 1

(3) TPH as gasoline - EPA Method 8015B (4) TPH as diesel - EPA Method 8015B

(5) PAHs - EPA Method 8270C or SIM-PAHs (6) Total lead - EPA Method 6020

NUMBER & TYPE OF SAMPLE CONTAINERS USED (include preservatives, if any) (1) 3 40-mL VOAs with HCL

(2) 3 40-mL VOAS with sodium thiosulfate (3) 3 40-mL VOAs with HCL (4) 2 500-mL Glass Amber with HCL

(5) 2 1-L Glass Amber (none) (6) 1 500-mL plastic with HNO3

DECONTAMINATION PROCEDURES: see PACDIV IRP Procedures

SAMPLES DELIVERED TO: T. Sober, Columbia Analytical Services DATE: 9/9/2005

TRANSPORTER: TIME: 10:00

MONITORING WELL FIELD SAMPLING LOG

Dawson Group, Inc.

PROJECT: Groundwater Sampling, Red Hill Fuel Storage Facility, Hawaii - downgradient of USTs *
CONTRACT NO.: N62742-01-D-1806, CTO 0013 JOB NO : 2001_022 013
DATE: 9/8/2005 TIME: 8 39 CLIMATIC CONDITIONS: NA
PERSONNEL: B. Graham and H. Kerr

WELL INFORMATION

Well Name/Number: MW-V1D
Well Location: *
Casing Diameter (inches): 1 (d_c)
Total Well Depth (feet): 100
Initial Depth to Water (feet): 83 97
Depth to Product (feet): NMP
Height of Water Column (feet): 16.03 (h)

PURGE VOLUME

$V_c = (d_c)^2 \times (h) \times 0.041$

Volume of water in casing (gallons): 0.67 (V_c)

Minimum Purge Volume (gallons): 1.97

EQUIPMENT

Instrument(s): YSI (Pine rental)
Oakton T-100 Turbidity Meter
Calibration Time: 6 46
Calibration Result / Comments: OK

PURGE LOG

Measurements of temperature, pH, specific conductivity, turbidity, dissolved oxygen, and redox will be collected initially, after every well volume removed, and at the end.

METHOD OF REMOVAL: Dedicated Bailer PUMPING RATE: NA

DATE	TIME	CUMULATIVE MILLILITERS REMOVED	TEMP. (°C)	pH	SP COND (mS/cm)	TURBIDITY (NTU)	DISSOLVED O_2 (mg/L)	REDOX (mV)
9/8/2005	8:51	500	24.16	6.91	0.214	608	3.14	-31.1
9/8/2005	8:56	1500	23.63	7.05	0.224	253	2.34	-94.5
9/8/2005	9:09	2500	23.46	7.15	0.226	404	2.94	-87.1
9/8/2005	9:22	3500	23.55	7.25	0.225	552	2.57	-83.7
9/8/2005	9:34	4500	23.42	7.22	0.227	352	2.99	-82.0

SAMPLE INFORMATION

SAMPLE WITHDRAWAL METHOD: Dedicated bailer SAMPLED BY: BG, HK

SAMPLE ID	P, QC, OR QA	TIME COLLECTED	DATE COLLECTED	NOTES
RH-W-005	P	9:40	9/8/2005	
RH-W-006	QC	9:45	9/8/2005	

Notes P = primary sample, QC = quality control (duplicate) sample, QA = quality assurance (triplicate) sample

APPEARANCE OF SAMPLE: Color ____ Temp ____ DO ____
Turbidity ____ pH ____ Redox ____
Sediment ____ Sp. Cond ____

LAB ANALYSIS PARAMETERS: (1) BTEX, MtBE, 1,2-DCA - EPA Method 8260B (2) EDB - EPA DW Method 504 1
(3) TPH as gasoline - EPA Method 8015B (4) TPH as diesel - EPA Method 8015B
(5) PAHs - EPA Method 8270C or SIM-PAHs (6) Total lead - EPA Method 6020

NUMBER & TYPE OF SAMPLE CONTAINERS USED (include preservatives, if any): (1) 3 40-mL VOAs with HCL
(2) 3 40-mL VOAS with sodium thiosulfate (3) 3 40-mL VOAs with HCL (4) 2 500-mL Glass Amber with HCL
(5) 2 1-L Glass Amber (none) (6) 1 500-mL plastic with HNO3

DECONTAMINATION PROCEDURES: see PACDIV IRP procedures

SAMPLES DELIVERED TO: T. Sober, CAS DATE: 9/9/2005
TRANSPORTER: ____ TIME: 10:00