First Quarter 2005

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Groundwater Sampling
RED HILL FUEL STORAGE FACILITY, HAWAII

April 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

First Quarter 2005

Groundwater Sampling
RED HILL FUEL STORAGE FACILITY, HAWAII

April 2005

Prepared for:

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Commander, Pacific Division
Naval Facilities Engineering Command
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Prepared under:

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

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Groundwater Sampling
Red Hill Fuel Storage Facility, Hawaii

April 2005

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EXECUTIVE SUMMARY

The Department of the Navy, Naval Facilities Engineering Command, Pacific (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 first quarterly report and summarizes the following: field investigation, IDW disposal, sample results, and conclusions and recommendations for 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 detectable amounts of TPH 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 total petroleum hydrocarbons (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

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 16 February 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 on 17 February 2005.

Conclusions and Recommendations

The following conclusions are based on the findings of previous investigations and the data collected during this investigation.

Stilling Basin

- Total lead and toluene were the only constituents detected at concentrations above the laboratory MRLs in the stilling basin samples. All detected concentrations were below HDOH Tier 1 GWALs. Toluene was present in the trip blank associated with these samples.

Sentinel Well

- Total lead was detected at a concentration above the HDOH Tier 1 GWAL but below the HDOH drinking water standard in the sentinel well samples. The February 2005 results were also below the 2002 investigation results (AMEC, 2002).
- TPH as diesel was detected at a concentration above the laboratory MRL in both of the sentinel well samples. No action level has been established for this analyte.
- Numerous PAHs (naphthalene, 2-methylnaphthalene, acenaphthene, dibenzofuran, fluorene, phenanthrene, fluoranthene, pyrene, chrysene, benzo(b)fluoranthene, and benzo(a)pyrene) were detected above the laboratory MRLs in both of the sentinel well samples. None of the detected concentrations exceeded the established HDOH Tier 1 GWALs.
- The groundwater in the upgradient sentinel well (MW-V1D) shows evidence of COPC contamination in the basal aquifer.

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

- Continue sampling at the stilling basin and the sentinel well during the next quarter (April through June 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

ACRONYMS AND ABBREVIATIONS

ACRONYM/ ABBREVIATION	DEFINITION/MEANING
UST	underground storage tank
VOC	volatile organic compound
WP	Work Plan

1. INTRODUCTION

The Department of the Navy, Naval Facilities Engineering Command, Pacific (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 first 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 Scope of Work

The scope of work for this project consists of the following:

- **Planning.** A Work Plan/Field Sampling Plan (WP/FSP) and Site Health and Safety Plan (HASP) were prepared (DAWSON, 2005a and 2005b).
- **Site Preparation.** The project site was prepared for fieldwork by obtaining site access, right-of-entry clearances, necessary permits and any approvals for work.
- **Quarterly Groundwater Sampling.** Primary samples and quality control (QC) samples (i.e., field duplicates) are collected at two locations (stilling basin and sentinel well).

The Scope of Work, specific to the **Stilling Basin**, consists of the following:

- Notify Navy PWC personnel at the potable water infiltration tunnel to shut-off pumps for 24 hours prior to sampling activities.
- Collect one primary surface water sample in the stilling basin.
- Collect one field duplicate (QC) surface water sample in the stilling basin.
- After the pumps have been turned on and run for at least 20 to 25 minutes, collect one primary surface water sample in the stilling basin.

The Scope of Work, specific to the **Sentinel Well** (MW-V1D), consists of the following:

- Collect one primary groundwater sample from sentinel well MW-1VD.
- Collect one field duplicate (QC) groundwater sample from sentinel well MW-1VD.

- **Laboratory Analysis.** Submit all samples to Columbia Analytical Services (CAS) for the following analyses:
  - Benzene, toluene, ethylbenzene, and total xylenes (BTEX); methyl tert-butyl ether (MtBE); and 1,2 dichloroethane (1,2 DCA) by United States Environmental Protection Agency (EPA) Method 8260B,
  - Total petroleum hydrocarbons (TPH) as gasoline by EPA Method 8015M,
  - Ethylene dibromide (EDB) by EPA Drinking Water (DW) Method 504.1,
  - TPH as diesel by EPA Method 8015M,
  - Polynuclear aromatic hydrocarbons (PAHs) by EPA Method 8270C/SIM-PAHs, and
  - Total lead by EPA Method 6020.
  - Place a laboratory-supplied trip blank and temperature blank in every cooler.
- **IDW Disposal.** Dispose of all investigation-derived waste (IDW) by a certified disposal contractor, immediately following receipt of sample results.
- **Reporting.** The *First Quarter 2005, Groundwater Sampling Report* documents the field investigation, IDW disposal, sample results, and conclusions and recommendations for the next sampling event.

2. BACKGROUND

2.1 Site Location

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*).

2.2 Facility Description

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*).

2.3 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 detectable amounts of TPH 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 concentrations 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).

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3. PROJECT ORGANIZATION

The following individuals are identified as the key personnel for this project:

NAVFAC PACIFIC

Administrative Contracting Officer	Ms. Bernie Julian	(808) 474-0514
Project Contract Specialist	Ms. Sharon Tsuru	(808) 471-9473
Contracting Officer's Technical Representative (COTR)	Ms. Debbie Loo	(808) 472-1234
Alternative COTR	Ms. Kay O'Keefe	(808) 472-1435
Remedial Project Manager/Navy Technical Representative (RPM/NTR)	Mr. Glenn Yoshinaga	(808) 472-1416

DAWSON

Project Manager / Environmental Scientist	Ms. Heather Kerr	(808) 536-5500 ext. 341
Operations Manager / QC Manager	Mr. James Frifeldt	(808) 536-5500 ext. 305
Project Superintendent / Site Safety and Health Officer (SSHO)	Mr. Royce Ynigues	(808) 536-5500 ext. 331

SUBCONTRACTORS

Columbia Analytical Services	Laboratory Services	Ms. Tracie Sober	(808) 682-1767
Pacific Commercial Services	Soil/Water Disposal Services	Mr. Jingbo Chang	(808) 545-4599

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4. 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).

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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5. GENERAL WORK PROCEDURES

This section, along with Section 6, *Sampling Methodologies and Procedures,* describes the methods used to conduct the work at the site in February 2005. The stilling basin and the sentinel well, MW-V1D, were sampled. The general locations of the samples are illustrated on Figure 2, *Site Plan.*

5.1 Health and Safety Procedures

The HASP (DAWSON, 2005a) was prepared and completed in general conformance with appropriate guidelines from the Occupational Safety and Health Administration (OSHA) and the United States Department of the Army (U.S. Army) Engineering Manual (EM) 385-1-1, *Safety and Health Requirements Manual* (U.S. Army, 1996). The HASP identifies hazards associated with the tasks performed on this project, and addresses the appropriate management techniques required to reduce related risks. The HASP was kept at a known and easily accessible place during project field activities.

Prior to commencing work at the project site, the HASP was reviewed by Contractor personnel and their subcontractors. In addition, the HASP was presented to approved visitors to provide them with an awareness to avoid hazards associated with this project.

Daily health and safety tailgate meetings were held on site at the beginning of each workday to discuss the HASP and the activities to be conducted that day. These meetings summarize site-specific hazards, safety equipment, and emergency procedures. All on-site personnel attended and signed the daily tailgate safety meeting log. Before starting activities, the site safety and health officer (SSHO) established site access control and work zones, and set up emergency equipment.

All Contractor and subcontractor personnel present onsite had completed the 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training, Title 29 Code of Federal Regulations (CFR) Part 1910 Section 120 (CFR, 2005). All current training certificates for field personnel were presented in the HASP (DAWSON, 2005a).

5.2 Equipment Decontamination

All water-level measuring and water sampling equipment were decontaminated at the start and end of the project, as well as between locations, to reduce 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, open-head, steel, 15-gallon drum and handled appropriately as described in detail in Section 5.3, *Investigation Derived Waste.*

5.3 Investigation Derived Waste

5.3.1 Storage and Sampling

IDW generated during this investigation included monitoring well purge water and decontamination wastewater. Wastewater was stored in a 5-gallon plastic bucket within a DOT-approved, open-head, steel, 15-gallon drum (secondary containment). The drum was labeled

and marked and stored within the Red Hill Fuel Storage Facility near MW-V1D until disposal. IDW management practices are described in detail in the WP/FSP (DAWSON, 2005b).

5.3.2 IDW Disposal

All IDW generated during the sampling period (February 2005) were determined to be non-hazardous wastes and are currently awaiting disposal.

6. SAMPLING METHODOLOGIES AND PROCEDURES

6.1 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 analyses:

- 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 A, *Laboratory Reports and Chain-of-Custody Records for Primary and QC Groundwater and Stilling Basin Samples.*

6.2 Stilling Basin Sampling Methodology

This section describes the methodology for sampling the stilling basin. The characteristics of the stilling basin identify it as a ***permit-required confined space***. Thus, entry into the stilling basin was not permitted during sampling activities.

6.2.1 Non-Entry Sampling in the Stilling Basin

Non-entry 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). The measurement and time was recorded on the Surface Water Field Sampling Log (Appendix B, *Monitoring Well Sampling Forms*).

6.2.2 Surface Water Sampling Methodology

The samples were collected using a new weighted, disposable, single-check valve bailer that remained sealed in plastic (by the manufacturer) until use. These bailers are equipped with bottom-discharging devices. The sampling system 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.

This procedure was repeated until all required primary and field duplicate (QC) samples were collected.

6.2.3 *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.

6.3 Sentinel Well Sampling Methodology

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

6.3.1 *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 was measured to the nearest 0.01 foot using an IP to provide baseline data. This data was 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).

6.3.2 *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 a 5-gallon plastic bucket with lid and stored onsite inside a 15-gallon, open-head, steel drum (i.e., secondary containment).

6.3.3 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.

A new length of polyethylene rope was tied securely to the top end of the dedicated bailer. Once the bailer was full, it was brought out of the water and the sample transferred directly into the laboratory-supplied containers. This procedure was repeated until all required primary and field duplicate (QC) samples were collected.

6.3.4 Field Quality Control Sampling

Groundwater field duplicate (QC) samples were collected once per sampling event, following the sample collection procedures listed in Section 6.3.3, *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.

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7. INVESTIGATION RESULTS

7.1 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, Total Lead, and EDB on 16 February 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.*

7.1.1 Total Lead

Total lead was detected above the laboratory method reporting limits (MRLs) at concentrations ranging from 0.00005 mg/L to 0.00033 mg/L (Table 1). These concentrations were below the HDOH Tier 1 GWAL of 0.0056 mg/L.

7.1.2 Total Petroleum Hydrocarbons (TPH)

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

7.1.3 1,2-Dibromoethane (EDB)

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

7.1.4 Volatile Organic Compounds (VOCs)

Toluene was detected above the laboratory MRL at concentrations ranging from 0.00081 mg/L to 0.0012 mg/L (Table 1). These concentrations were below the HDOH Tier 1 GWAL of 2.1 mg/L.

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

7.1.5 Polynuclear Aromatic Hydrocarbons (PAHs)

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

7.2 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, Total Lead, and EDB on 17 February 2005. The results are presented in Table 2 of this report. The laboratory analytical reports are presented in Appendix A.

7.2.1 Total Lead

Total lead was detected above the laboratory MRL at concentrations ranging from of 0.0102 mg/L to 0.0119 mg/L (Table 2). Both of these results are above the HDOH Tier 1 GWAL of 0.0056 mg/L; however, the results are below the HDOH DW standard of 0.015 mg/L (HDOH, 2002).

7.2.2 Total Petroleum Hydrocarbons (TPH)

TPH as diesel was detected at concentrations ranging from 1.4 mg/L to 1.5 mg/L. (Table 2).

7.2.3 1,2-Dibromoethane (EDB)

No concentrations of EDB were detected above the laboratory MRLs in any sentinel well samples (Table 2).

7.2.4 Volatile Organic Compounds (VOCs)

No concentrations of EDB were detected above the laboratory MRLs in any sentinel well samples (Table 2).

7.2.5 Polynuclear Aromatic Hydrocarbons (PAHs)

- Naphthalene was detected above the laboratory MRL at concentrations ranging from 0.00021 mg/L to 0.00025 mg/L.
- 2-Methylnaphthalene was detected above the laboratory MRL at concentrations ranging from 0.000057 mg/L to 0.00014 mg/L.
- Acenaphthene was detected above the laboratory MRL at concentrations ranging from 0.000052 mg/L to 0.000054 mg/L.
- Dibenzofuran was detected above the laboratory MRL at concentration ranging from 0.00011 mg/L to 0.00013 mg/L.
- Fluorene was detected above the laboratory MRL at concentrations ranging from 0.000043 mg/L to 0.000053 mg/L.
- Phenanthrene was detected above the laboratory MRL at concentrations ranging from 0.000082 mg/L to 0.00012 mg/L.
- Fluoranthene was detected above the laboratory MRL at concentrations ranging from 0.000021 mg/L to 0.000035 mg/L.
- Pyrene was detected above the laboratory MRL at concentrations ranging from 0.000029 mg/L to 0.000056 mg/L.
- Chrysene was detected above the laboratory MRL at a concentration of 0.00002 mg/L.

- Benzo(b)fluoranthene was detected above the laboratory MRL at a concentration of 0.000025 mg/L.
- Benzo(a)pyrene was detected above the laboratory MRL at a concentration of 0.00002 mg/L (Table 2)

None of the detected concentrations exceeded the established HDOH Tier 1 GWALs.

7.3 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.

Toluene was detected in the trip blank above the laboratory MRL at 0.0014 mg/L. This concentration was below the HDOH Tier 1 GWAL of 2.1 mg/L. No other VOCs were detected above the laboratory MRLs.

7.4 Data Quality Review

7.4.1 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.

7.4.2 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 QC results were consistent with all primary sample results and thus valid and useable.

Data Discrepancies

There were no significant data discrepancies between the two sets of primary/QC groundwater samples. Columbia Analytical Services performed analyses on the primary and QC samples. The results of the QC samples are included in Tables 1 and 2 (listed as duplicate samples).

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8. CONCLUSIONS AND RECOMMENDATIONS

The following conclusions are based on the findings of previous investigations and the data collected during this investigation.

Stilling Basin

- Total lead and toluene were the only constituents detected at concentrations above the laboratory MRLs in the stilling basin samples. All detected concentrations were below HDOH Tier 1 GWALs. Toluene was present in the trip blank associated with these samples.

Sentinel Well

- Total lead was detected at a concentration above the HDOH Tier 1 GWAL but below the HDOH drinking water standard in the sentinel well samples. The February 2005 results were below the 2002 investigation results (AMEC, 2002).
- TPH as diesel was detected at a concentration above the laboratory MRL in both of the sentinel well samples. No action level has been established for this analyte.
- Numerous PAHs (naphthalene, 2-methylnaphthalene, acenaphthene, dibenzofuran, fluorene, phenanthrene, fluoranthene, pyrene, chrysene, benzo(b)fluoranthene, and benzo(a)pyrene) were detected above the laboratory MRLs in both of the sentinel well samples. None of the detected concentrations exceeded the established HDOH Tier 1 GWALs.
- The groundwater in the upgradient sentinel well (MW-V1D) shows evidence of COPC contamination in the basal aquifer.

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

- Continue sampling at the stilling basin and the sentinel well during the next quarter (April through June 2005).

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9. REFERENCES

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FIGURES

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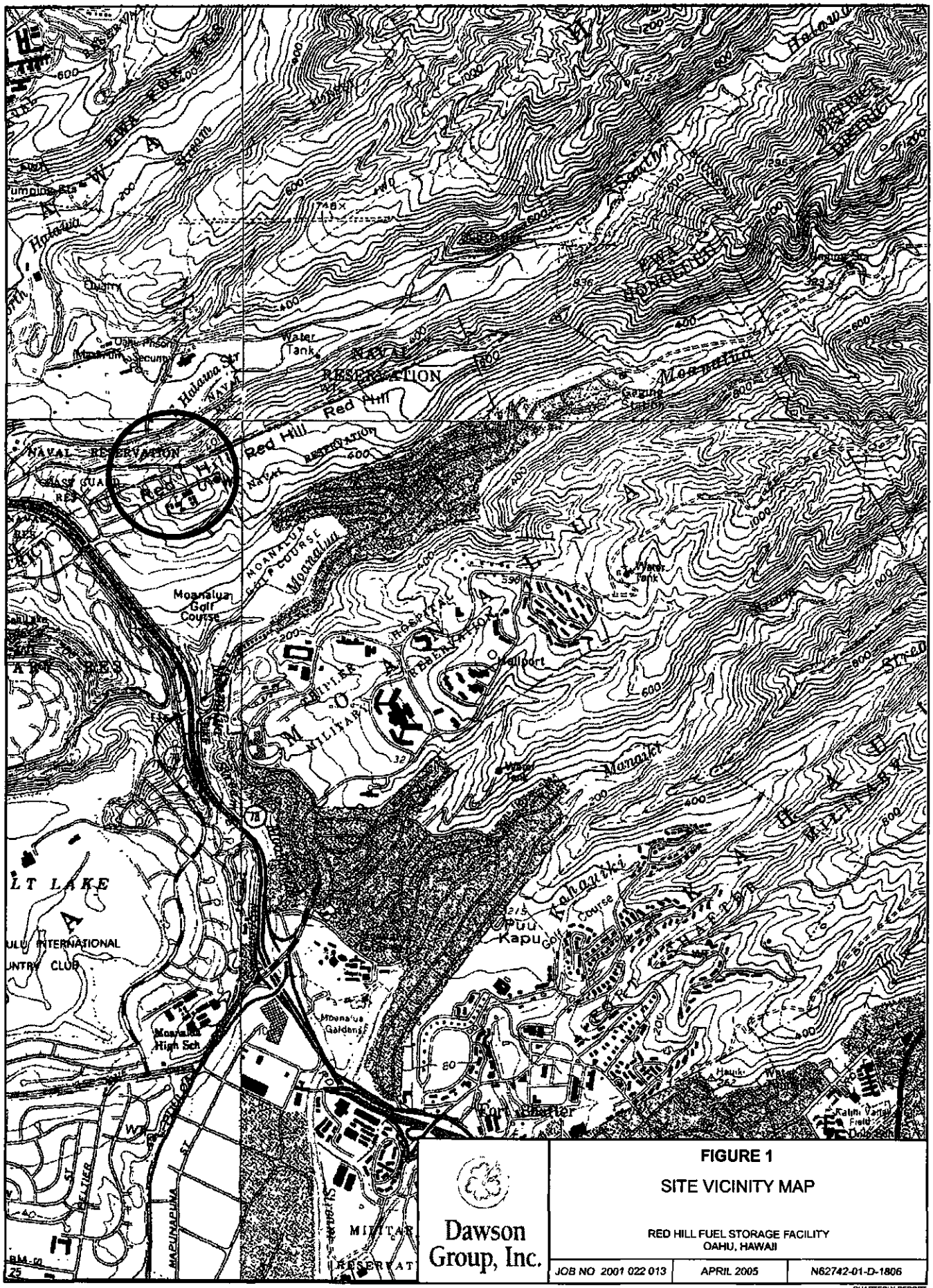

FIGURE 1

SITE VICINITY MAP

RED HILL FUEL STORAGE FACILITY
OAHU, HAWAII

Dawson Group, Inc.

JOB NO 2001 022 013	APRIL 2005	N62742-01-D-1806

QUARTERLY REPORT

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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 Online			
			SAMPLE IDENTIFICATION	RH-B-001	RH-B-002	RH-B-003	REGULATORY ACTION LEVELS	UNITS
			SAMPLE TYPE	Primary	Primary	Duplicate		
			DATE COLLECTED	02/16/2005	02/16/2005	02/16/2005		
	ANALYSIS	EPA METHOD	MRL					
Metals	Total Lead	6020	*0.00002*	***0.00033***	***0.00006***	***0.00005***	0 0056	mg/L
Hydrocarbons	TPH as Diesel	8015M	*0 05*	ND	ND [0 053]	ND	NE	mg/L
	TPH as Residual Range	8015M	*0 1*	ND	ND [0 11]	ND	NE	mg/L
	TPH as Gasoline	8015M	*0 05*	ND	ND	ND	NE	mg/L
EDB	1,2-Dibromoethane (EDB)	504 1	*0 0000083*	ND	ND [0 0000081]	ND [0 0000082]	NE	mg/L
VOCs	Benzene	8260B	*0 0005*	ND	ND	ND	1 70 ①	mg/L
	Methyl tert-Butyl Ether	8260B	*0 0005*	ND	ND	ND	0 02 ①	mg/L
	Toluene	8260B	*0.0005*	***0.001***	***0.0012***	***0.00081***	2 1 ①	mg/L
	Ethylbenzene	8260B	*0 0005*	ND	ND	ND	0 14 ①	mg/L
	m,p-Xylenes	8260B	*0.0005*	ND	ND	ND	10 0 ①	mg/L
	o-Xylene	8260B	*0 0005*	ND	ND	ND	10 0 ①	mg/L
	1,2-Dichloroethane (DCA)	8260B	*0 0005*	ND	ND	ND	0 005 ②	mg/L
PAHs	Naphthalene	8270C SIM	*0 00002*	ND	ND	ND	0 24	mg/L
	2-Methylnaphthalene	8270C SIM	*0 00002*	ND	ND	ND	NE	mg/L
	Acenaphthylene	8270C SIM	*0 00002*	ND	ND	ND	NE	mg/L
	Acenaphthene	8270C SIM	*0 00002*	ND	ND	ND	0 32	mg/L
	Dibenzofuran	8270C SIM	*0 00002*	ND	ND	ND	NE	mg/L
	Fluorene	8270C SIM	*0 00002*	ND	ND	ND	NE	mg/L
	Phenanthrene	8270C SIM	*0 00002*	ND	ND	ND	NE	mg/L
	Anthracene	8270C SIM	*0 00002*	ND	ND	ND	NE	mg/L
	Fluoranthene	8270C SIM	*0 00002*	ND	ND	ND	0 01	mg/L
	Pyrene	8270C SIM	*0 00002*	ND	ND	ND	NE	mg/L
	Benz(a)anthracene	8270C SIM	*0 00002*	ND	ND	ND	NE	mg/L
	Chrysene	8270C SIM	*0 00002*	ND	ND	ND	NE	mg/L

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

			Pumps Offline	Pumps Online			
		SAMPLE IDENTIFICATION	RH-B-001	RH-B-002	RH-B-003	REGULATORY ACTION LEVELS	UNITS
		SAMPLE TYPE	Primary	Primary	Duplicate		
		DATE COLLECTED	02/16/2005	02/16/2005	02/16/2005		
ANALYSIS	EPA METHOD	MRL					
	Benzo(b)fluoranthene	8270C SIM	*0 00002*	ND	ND	ND	NE	mg/L
	Benzo(k)fluoranthene	8270C SIM	*0.00002*	ND	ND	ND	NE	mg/L
	Benzo(a)pyrene	8270C SIM	*0 00002*	ND	ND	ND	0 0002	mg/L
	Indeno(1,2,3-cd)pyrene	8270C SIM	*0 00002*	ND	ND	ND	NE	mg/L
	Dibenz(a,h)anthracene	8270C SIM	*0 00002*	ND	ND	ND	NE	mg/L
	Benzo(g,h,i)perylene	8270C SIM	*0 00002*	ND	ND	ND	NE	mg/L

Notes

EPA	United States Environmental Protection Agency	B	Stilling Basin
[0 0001]	method reporting limit is other than stated	RH	Red Hill Fuel Station Facility
PAHs	polyaromatic hyrdocarbons	***Bold, Italic***	value is greater than laboratory MRL
mg/L	milligrams per liter	**Bold**	value is greater than regulatory action level
MRL	method reporting limit	NE	none established
ND	Not detected at or above the MRL	VOCs	volatile organic carbons

① State of Hawaii Department of Health, 2000 Hawaii Underground Storage Tank (UST) Technical Guidance Manual March 2000
② State of Hawaii, Department of Health, 2002 Hawaii Administrative Rules Chapter 11, Title 20 Potable Water Drinking Water Standards

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

				MW-1VD			
			SAMPLE IDENTIFICATION	RH-W-001 ③	RH-W-002	REGULATORY ACTION LEVELS	UNITS
			SAMPLE TYPE	Primary	Duplicate		
			DATE COLLECTED	02/17/2005	02/17/2005		
	ANALYSIS	EPA METHOD	MRL				
Metals	Total Lead	6020	*0 00002*	**0.0102**	**0.0119**	0 0056	mg/L
Hydrocarbons	TPH as Diesel	8015M	*0 05*	***1.4*** [Y]	***1.5***	NE	mg/L
	TPH as Residual Range	8015M	*0 1*	***0.77*** [O]	***0.89***	NE	mg/L
	TPH as Gasoline	8015M	*0.05*	ND	ND	NE	mg/L
EDB	1,2-Dibromoethane (EDB)	504 1	*0 0000083*	ND	ND [0 0000082]	NE	mg/L
BTEX	Benzene	8260B	*0 0005*	ND	ND	1 70 ①	mg/L
	Methyl tert-Butyl Ether	8260B	*0 0005*	ND	ND	0 02 ①	mg/L
	Toluene	8260B	*0 0005*	ND	ND	2 1 ①	mg/L
	Ethylbenzene	8260B	*0 0005*	ND	ND	0 14 ①	mg/L
	m,p-Xylenes	8260B	*0 0005*	ND	ND	10 0 ①	mg/L
	o-Xylene	8260B	*0 0005*	ND	ND	10 0 ①	mg/L
	1,2-Dichloroethane (DCA)	8260B	*0 0005*	ND	ND	0 005 ②	mg/L
PAHs	Naphthalene	8270C SIM	*0 00002*	***0.00025***	***0.00021***	0 24	mg/L
	2-Methylnaphthalene	8270C SIM	*0 00002*	***0.00014***	***0.000057***	NE	mg/L
	Acenaphthylene	8270C SIM	*0 00002*	ND	ND	NE	mg/L
	Acenaphthene	8270C SIM	*0 00002*	***0.000052***	***0.000054***	0 32	mg/L
	Dibenzofuran	8270C SIM	*0 00002*	***0.00013***	***0.00011***	NE	mg/L
	Fluorene	8270C SIM	*0 00002*	***0.000053***	***0.000043***	NE	mg/L
	Phenanthrene	8270C SIM	*0 00002*	***0.00012***	***0.000082***	NE	mg/L
	Anthracene	8270C SIM	*0 00002*	ND	ND	NE	mg/L
	Fluoranthene	8270C SIM	*0 00002*	***0.000035***	***0.000021***	0 01	mg/L
	Pyrene	8270C SIM	*0 00002*	***0.000056***	***0.000029***	NE	mg/L
	Benz(a)anthracene	8270C SIM	*0 00002*	ND	ND	NE	mg/L
	Chrysene	8270C SIM	*0 00002*	***0.00002***	ND	NE	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-001 ③	RH-W-002	REGULATORY ACTION LEVELS	UNITS
		SAMPLE TYPE	Primary	Duplicate		
		DATE COLLECTED	02/17/2005	02/17/2005		
ANALYSIS	EPA METHOD	MRL				
Benzo(b)fluoranthene	8270C SIM	*0 00002*	***0.000025***	ND	NE	mg/L
Benzo(k)fluoranthene	8270C SIM	*0.00002*	ND	ND	NE	mg/L
Benzo(a)pyrene	8270C SIM	*0.00002*	***0.000022***	ND	0 0002	mg/L
Indeno(1,2,3-cd)pyrene	8270C SIM	*0 00002*	ND	ND	NE	mg/L
Dibenz(a,h)anthracene	8270C SIM	*0 00002*	ND	ND	NE	mg/L
Benzo(g,h,i)perylene	8270C SIM	*0 00002*	ND	ND	NE	mg/L

Notes

EPA	United States Environmental Protection Agency	B	Stilling Basin at PWC Potable Water Facility
[0 0001]	method reporting limit is other than stated	RH	Red Hill Fuel Station Facility
PAHs	polyaromatic hyrdocarbons	***Bold, Italic***	value is greater than laboratory MRL
mg/L	milligrams per liter	**Bold**	value is greater than regulatory action level
MRL	method reporting limit	NE	none established
ND	None detected at or above the MRL	VOCs	volatile organic carbons
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		

① State of Hawaii Department of Health, 2000 Hawaii Underground Storage Tank (UST) Technical Guidance Manual March 2000
② State of Hawaii, Department of Health, 2002 Hawaii Administrative Rules Chapter 11, Title 20 Potable Water Drinking Water Standards
③ Sample RH-B-001 was received with a pH above the method preservation criteria of pH <2

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

			SAMPLE IDENTIFICATION	Trip Blank *	REGULATORY ACTION LEVELS	UNITS
			SAMPLE TYPE	Trip Blank		
			DATE COLLECTED	02/17/2005		
	ANALYSIS	EPA METHOD	MRL			
BTEX	Benzene	8260B	*0 0005*	ND	1 70 ①	mg/L
	Methyl tert-Butyl Ether	8260B	*0 0005*	ND	0 02 ①	mg/L
	Toluene	8260B	*0 0005*	***0.0014***	2 1 ①	mg/L
	Ethylbenzene	8260B	*0 0005*	ND	0 14 ①	mg/L
	m,p-Xylenes	8260B	*0.0005*	ND	10 0 ①	mg/L
	o-Xylene	8260B	*0.0005*	ND	10 0 ①	mg/L
	1,2-Dichloroethane (DCA)	8260B	*0.0005*	ND	0 005 ②	mg/L

Notes

EPA [0 0001]	United States Environmental Protection Agency method reporting limit is other than stated	***Bold, Italic***	value is greater than laboratory MRL
PAHs	polyaromatic hyrdocarbons	**Bold**	value is greater than regulatory action level
mg/L	milligrams per liter	NE	none established
MRL	method reporting limit	VOCs	volatile organic carbons
ND	None detected at or above the MRL		

* The sample "Trip Blank" analyzed with this sample contained low levels of target Toluene above the MRL The associated Storage Blank, which was prepared and stored at the laboratory the same time the Trip Blank was prepared, was analyzed as a Quality Assurance (QA) check The Storage Blank did not contain the analyte in question

① State of Hawaii Department of Health, 2000 Hawaii Underground Storage Tank (UST) Technical Guidance Manual March 2000

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

APPENDIX A

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

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

Columbia Analytical Services™

March 15, 2005 Service Request No K2501266

Heather Kerr
Dawson Group, Inc
Airport Industrial Park
3375 Koapaka Street, B-200
Honolulu, HI 96819

RE: Red Hill GW Sampling / 2001022.013

Dear Heather

Enclosed are the results of the sample(s) submitted to our laboratory on February 19, 2005 For your reference, these analyses have been assigned our service request number K2501266.

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 Jacoby
Project Chemist

HJ/jeb

Page 1 of 12

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.
ı	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 analyses is out of control limits, while sample absorbance is less than 50% of spike absorbance.
ı	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.
ı	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.:**	K2501266
Project:	Red Hill GW Sampling / 2001022 013	**Date Received:**	2/19/05
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

Six water samples were received for analysis at Columbia Analytical Services on 2/19/05 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

Sample Notes and Discussion:
Samples RH-B-001 and RH-B-001MS were received with a pH above the method preservation criteria of pH <2

EDB by EPA Method 504

No anomalies associated with the analysis of these samples were observed

Volatile Organic Compounds by EPA Method 8260B

Initial Calibration (ICAL) Exceptions:
The primary evaluation criterion was exceeded for Bromomethane and Methylene Chloride in ICAL ID CAL4205 In accordance with CAS standard operating procedures, the alternative evaluation specified in the EPA method was performed using the mean Relative Standard Deviation (RSD) of all analytes in the calibration The result of the mean RSD calculation was 5 9%. The calibration meets the alternative evaluation criteria Note that CAS/Kelso policy does not allow the use of averaging if any analyte in the ICAL exceeds 30% RSD

Approved by_____ Date 3/16/05

Surrogate Exceptions:
The control criteria were exceeded for the Toluene-d8 surrogate in LCS KWG0503506-1 The associated matrix spike recoveries of target compounds were in control, indicating the analysis was in control The surrogate outlier is flagged accordingly No further corrective action was appropriate

Sample Notes and Discussion
The Trip Blank analyzed with this sample contained low levels of target Toluene above the Method Reporting Limit (MRL) The associated Storage Blank, which was prepared and stored at the laboratory the same time the Trip Blank was prepared, was analyzed as a Quality Assurance (QA) check The Storage Blank did not contain the analyte in question

Polynuclear Aromatic Hydrocarbons by EPA Method 8270C

Notes of 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_____ Date 3/16/05

Columbia Analytical Services

CHAIN OF CUSTODY

SR# K2501266

PAGE ____ OF ____ COC # ____

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

PROJECT NAME: [illegible]
PROJECT NUMBER: [illegible]
PROJECT MANAGER: [illegible]
COMPANY NAME: [illegible]
CITY STATE ZIP: [illegible]
E-MAIL ADDRESS: [illegible]
PHONE #: [illegible] FAX #: [illegible]
SAMPLER'S SIGNATURE: [illegible]

Analyses: NUMBER OF CONTAINERS; Semivolatile Organics by GC/MS 625 / 8270 / 8270LL; Volatile Organics 624 / 8260 / 8021 / BTEX; Hydrocarbons (*see below) Gas / Diesel / Oil; Fuel Fingerprint (FID); NW-HCID Screen; 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 (See list below); 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; REMARKS

SAMPLE I.D.	DATE	TIME	LAB I.D.	MATRIX	NUMBER OF CONTAINERS
[illegible]	[illegible]	[illegible]	1	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	2	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	3	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	4	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]		6	[illegible]	[illegible]

REPORT REQUIREMENTS

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

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

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

___ IV. CLP Deliverable Report

___ V. EDD

INVOICE INFORMATION

P.O. #: [illegible]
Bill To: [illegible]

TURNAROUND REQUIREMENTS

___ 24 hr ___ 48 hr

___ 5 Day

Y 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 ____ (CIRCLE ONE)

SPECIAL INSTRUCTIONS/COMMENTS: [illegible]

K2500214

RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY
Signature: [illegible] Date/Time: [illegible]	Signature: [illegible] Date/Time: [illegible]	Signature: [illegible] Date/Time: 2/13/05 [illegible]	Signature: [illegible] Date/Time: [illegible]
Printed Name: [illegible] Firm: [illegible]	Printed Name: [illegible] Firm: [illegible]	Printed Name: [illegible] Firm: [illegible]	Printed Name: [illegible] Firm: [illegible]

00066

00067

Chain of Custody Documentation

Columbia Analytical Services Inc.
Cooler Receipt and Preservation Form

PC AJ

Project/Client Johnson Wing Work Order K250 1266

Cooler received on 9/19/05 and opened on 9/19/05 by BJ

1 Were custody seals on outside of coolers? (Y) N
If yes, how many and where? 1 front, 1 back
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 ______ Y N
5 COC#
Temperature of cooler(s) upon receipt: (°C) 4.8 3.1
Temperature Blank: (°C) 3.8 4.4
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 inserts 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
KH-10-001	HNO3	2mls				BJ
KH-10-002	HNO3	2mls				BJ

Metals

Columbia Analytical Services

METALS

- Cover Page -

INORGANIC ANALYSIS DATA PACKAGE

Client. Dawson Group, Inc. Service Request. K2501266

Project No.: 2001022.013

Project Name: Red Hill GW Sampling

Sample No.	Lab Sample ID
RH-B-001	K2501266-001
RH-B-002	K2501266-002
RH-B-003	K2501266-003
RH-W-001	K2501266-004
RH-W-002	K2501266-005
Method Balnk	K2501266-MB
Batch QC	K2501269-001D
Batch QC	K2501269-001S

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: Eileen Mandel Date: 3/10/05

Columbia Analytical Services

METALS

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INORGANIC ANALYSIS DATA SHEET

Client: Dawson Group, Inc. Service Request: K2501266

Project No . 2001022.013 Date Collected: 02/16/05

Project Name: Red Hill GW Sampling Date Received: 02/19/05

Matrix. WATER Units µG/L

Basis NA

Sample Name: RH-B-001 Lab Code: K2501266-001

Analyte	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	C	Q
Lead	6020	0.02	1	3/3/05	3/9/05	0 33		

% Solids: 0 0

Comments:

Columbia Analytical Services

METALS

-I-

INORGANIC ANALYSIS DATA SHEET

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

Service Request: K2501266
Date Collected: 02/16/05
Date Received: 02/19/05
Units µG/L
Basis NA

Sample Name: RH-B-002 Lab Code: K2501266-002

Analyte	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	C	Q
Lead	6020	0.02	1	3/3/05	3/9/05	0.06		

% Solids. 0.0

Comments:

Columbia Analytical Services

METALS

-I-

INORGANIC ANALYSIS DATA SHEET

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

Service Request: K2501266
Date Collected: 02/16/05
Date Received: 02/19/05
Units µG/L
Basis NA

Sample Name: RH-B-003 Lab Code. K2501266-003

Analyte	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	C	Q
Lead	6020	0.02	1	3/3/05	3/9/05	0.05		

% Solids: 0 0

Comments:

Form I - IN

Columbia Analytical Services

METALS

-1-

INORGANIC ANALYSIS DATA SHEET

Client: Dawson Group, Inc
Project No.: 2001022 013
Project Name: Red Hill GW Sampling
Matrix: WATER

Service Request: K2501266
Date Collected: 02/17/05
Date Received: 02/19/05
Units: µG/L
Basis: NA

Sample Name: RH-W-001
Lab Code: K2501266-004

Analyte	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	C	Q
Lead	6020	0 02	1	3/3/05	3/9/05	10 2		

% Solids: 0 0

Comments:

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Form I - IN

Columbia Analytical Services

METALS

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INORGANIC ANALYSIS DATA SHEET

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

Service Request: K2501266
Date Collected: 02/17/05
Date Received: 02/19/05
Units: µG/L
Basis: NA

Sample Name: RH-W-002
Lab Code: K2501266-005

Analyte	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	C	Q
Lead	6020	0.02	1	3/3/05	3/9/05	11.9		

% Solids: 0.0

Comments

00016

Form I - IN

Columbia Analytical Services

METALS

-1-

INORGANIC ANALYSIS DATA SHEET

Client	Dawson Group, Inc	Service Request:	K2501266
Project No.:	2001022.013	Date Collected:	NA
Project Name	Red Hill GW Sampling	Date Received:	NA
Matrix:	WATER	Units	µG/L
		Basis	NA

Sample Name: Method Balnk Lab Code: K2501266-MB

Analyte	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	C	Q
Lead	6020	0 02	1	3/3/05	3/9/05	0.02	U	

% Solids: 0.0

Comments:

00017

Form I - IN

Columbia Analytical Services

METALS

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SPIKE SAMPLE RECOVERY

Client:	Dawson Group, Inc.	Service Request:	K2501266
Project No :	2001022 013	Units:	µg/L
Project Name:	Red Hill GW Sampling	Basis.	NA
Matrix.	WATER	% Solids.	0 0

Sample Name. Batch QC Lab Code: K2501269-001S

Analyte	Control Limit %R	Spike Result	C	Sample Result	C	Spike Added	%R	Q	Method
Lead	59 - 127	18.9		0.23		20.0	93		6020

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

- 00018

Form V (PART 1) - IN

Columbia Analytical Services

METALS
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DUPLICATES

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

Service Request: K2501266
Units: µg/L
Basis: NA
% Solids: 0.0

Sample Name: Batch QC
Lab Code: K2501269-001D

Analyte	Control Limit(%)	Sample (S)	C	Duplicate (D)	C	RPD	Q	Method
Lead	20	0.23		0.23		1		6020

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

Form VI - IN

Diesel & Residual Range Organics

COLUMBIA ANALYTICAL SERVICES, INC

Analytical Results

Client:	Dawson Group Inc	**Service Request:**	K2501266
Project:	Red Hill GW Sampling/2001022 013	**Date Collected:**	02/16/2005
Sample Matrix:	Water	**Date Received:**	02/19/2005

Diesel and Residual Range Organics

Sample Name:	RH-B-001	**Units:**	ug/L
Lab Code:	K2501266-001	**Basis:**	NA
Extraction Method:	EPA 3510C	**Level:**	Low
Analysis Method:	8015M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	ND	U	50	1	02/22/05	03/02/05	KWG0502781	
Residual Range Organics (RRO)	ND	U	100	1	02/22/05	03/02/05	KWG0502781	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	83	52-128	03/02/05	Acceptable
n-Triacontane	90	50-150	03/02/05	Acceptable

Comments

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Dawson Group, Inc	**Service Request:**	K2501266
Project:	Red Hill GW Sampling/2001022 013	**Date Collected:**	02/16/2005
Sample Matrix:	Water	**Date Received:**	02/19/2005

Diesel and Residual Range Organics

Sample Name:	RH-B-002	**Units:**	ug/L
Lab Code:	K2501266-002	**Basis:**	NA
Extraction Method:	EPA 3510C	**Level:**	Low
Analysis Method:	8015M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	ND	U	53	1	02/22/05	03/02/05	KWG0502781	
Residual Range Organics (RRO)	ND	U	110	1	02/22/05	03/02/05	KWG0502781	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	82	52-128	03/02/05	Acceptable
n-Triacontane	89	50-150	03/02/05	Acceptable

Comments

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Dawson Group Inc
Project: Red Hill GW Sampling/2001022 013
Sample Matrix: Water

Service Request: K2501266
Date Collected: 02/16/2005
Date Received: 02/19/2005

Diesel and Residual Range Organics

Sample Name: RH-B-003
Lab Code: K2501266-003

Extraction Method: EPA 3510C
Analysis Method: 8015M

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	ND	U	50	1	02/22/05	03/02/05	KWG0502781	
Residual Range Organics (RRO)	ND	U	100	1	02/22/05	03/02/05	KWG0502781	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	77	52-128	03/02/05	Acceptable
n-Triacontane	84	50-150	03/02/05	Acceptable

Comments

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Dawson Group, Inc
Project: Red Hill GW Sampling/2001022 013
Sample Matrix: Water

Service Request: K2501266
Date Collected: 02/17/2005
Date Received: 02/19/2005

Diesel and Residual Range Organics

Sample Name: RH-W-001
Lab Code: K2501266-004

Extraction Method: EPA 3510C
Analysis Method: 8015M

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	1400	Y	50	1	02/22/05	03/02/05	KWG0502781	
Residual Range Organics (RRO)	770	O	100	1	02/22/05	03/02/05	KWG0502781	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	71	52-128	03/02/05	Acceptable
n-Triacontane	77	50-150	03/02/05	Acceptable

Comments

COLUMBIA ANALYTICAL SERVICES, INC

Analytical Results

Client: Dawson Group, Inc
Project: Red Hill GW Sampling/2001022 013
Sample Matrix: Water

Service Request: K2501266
Date Collected: 02/17/2005
Date Received: 02/19/2005

Diesel and Residual Range Organics

Sample Name: RH-W-002
Lab Code: K2501266-005
Extraction Method: EPA 3510C
Analysis Method: 8015M

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	1500		50	1	02/22/05	03/02/05	KWG0502781	
Residual Range Organics (RRO)	890		100	1	02/22/05	03/02/05	KWG0502781	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	72	52-128	03/02/05	Acceptable
n-Triacontane	73	50-150	03/02/05	Acceptable

Comments ______

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Dawson Group Inc
Project: Red Hill GW Sampling/2001022 013
Sample Matrix: Water

Service Request: K2501266
Date Collected: NA
Date Received: NA

Diesel and Residual Range Organics

Sample Name: Method Blank
Lab Code: KWG0502781-3
Extraction Method: EPA 3510C
Analysis Method: 8015M

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	ND	U	50	1	02/22/05	03/02/05	KWG0502781	
Residual Range Organics (RRO)	ND	U	100	1	02/22/05	03/02/05	KWG0502781	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	77	52-128	03/02/05	Acceptable
n-Triacontane	84	50-150	03/02/05	Acceptable

Comments ______

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Dawson Group, Inc
Project: Red Hill GW Sampling/2001022 013
Sample Matrix: Water

Service Request: K2501266

Surrogate Recovery Summary
Diesel and Residual Range Organics

Extraction Method: EPA 3510C
Analysis Method: 8015M

Units: PERCENT
Level: Low

Sample Name	Lab Code	Sur1	Sur2
RH-B-001	K2501266-001	83	90
RH-B-002	K2501266-002	82	89
RH-B-003	K2501266-003	77	84
RH-W-001	K2501266-004	71	77
RH-W-002	K2501266-005	72	73
Method Blank	KWG0502781-3	77	84
RH-B-001MS	KWG0502781-4	88	94
Lab Control Sample	KWG0502781-1	76	86
Duplicate Lab Control Sample	KWG0502781-2	80	87

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

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Dawson Group Inc
Project: Red Hill GW Sampling/2001022 013
Sample Matrix: Water

Service Request: K2501266
Date Extracted: 02/22/2005
Date Analyzed: 03/02/2005

Matrix Spike Summary
Diesel and Residual Range Organics

Sample Name: RH-B-001
Lab Code: K2501266-001

Extraction Method: EPA 3510C
Analysis Method: 8015M

Units: ug/L
Basis: NA

Level: Low
Extraction Lot: KWG0502781

RH-B-001MS
KWG0502781-4
Matrix Spike

Analyte Name	Sample Result	Result	Expected	%Rec	%Rec Limits
Diesel Range Organics (DRO)	ND	3040	3200	95	57-158
Residual Range Organics (RRO)	ND	1540	1600	96	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 recovery and relative percent difference (RPD) are determined by the software using values in the calculation which have not been rounded

COLUMBIA ANALYTICAL SERVICES, INC

QA/QC Report

Client:	Dawson Group, Inc	**Service Request:**	K2501266
Project:	Red Hill GW Sampling/2001022 013	**Date Extracted:**	02/22/2005
Sample Matrix:	Water	**Date Analyzed:**	03/02/2005

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

Extraction Method	EPA 3510C	**Units:**	ug/L
Analysis Method:	8015M	**Basis:**	NA
		Level:	Low
		Extraction Lot:	KWG0502781

	Lab Control Sample KWG0502781-1 **Lab Control Spike**			Duplicate Lab Control Sample KWG0502781-2 **Duplicate Lab Control Spike**					
Analyte Name	**Result**	**Expected**	**%Rec**	**Result**	**Expected**	**%Rec**	**%Rec Limits**	**RPD**	**RPD Limit**
Diesel Range Organics (DRO)	2940	3200	92	2990	3200	93	67-151	1	30
Residual Range Organics (RRO)	1530	1600	95	1490	1600	93	59-146	2	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

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Dawson Group, Inc	**Service Request:**	K2501266
Project:	Red Hill GW Sampling/2001022 013	**Date Collected:**	02/16/2005
Sample Matrix:	Water	**Date Received:**	02/19/2005

Gasoline Range Organics

Sample Name:	RH-B-001	**Units:**	ug/L
Lab Code:	K2501266-001	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8015B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics (GRO)	ND	U	50	1	02/25/05	02/25/05	KWG0503107	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	95	75-120	02/25/05	Acceptable

Comments ____________________

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Dawson Group, Inc	**Service Request:**	K2501266
Project:	Red Hill GW Sampling/2001022 013	**Date Collected:**	02/16/2005
Sample Matrix:	Water	**Date Received:**	02/19/2005

Gasoline Range Organics

Sample Name:	RH-B-002	**Units:**	ug/L
Lab Code:	K2501266-002	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8015B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics (GRO)	ND	U	50	1	02/25/05	02/25/05	KWG0503107	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	95	75-120	02/25/05	Acceptable

Comments ____________________

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Dawson Group, Inc
Project: Red Hill GW Sampling/2001022 013
Sample Matrix: Water

Service Request: K2501266
Date Collected: 02/16/2005
Date Received: 02/19/2005

Gasoline Range Organics

Sample Name: RH-B-003
Lab Code: K2501266-003

Extraction Method: EPA 5030B
Analysis Method: 8015B

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics (GRO)	ND	U	50	1	02/25/05	02/25/05	KWG0503107	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	95	75-120	02/25/05	Acceptable

Comments

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Dawson Group, Inc
Project: Red Hill GW Sampling/2001022 013
Sample Matrix: Water

Service Request: K2501266
Date Collected: 02/17/2005
Date Received: 02/19/2005

Gasoline Range Organics

Sample Name: RH-W-001
Lab Code: K2501266-004

Extraction Method: EPA 5030B
Analysis Method: 8015B

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics (GRO)	ND	U	50	1	02/25/05	02/25/05	KWG0503107	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	90	75-120	02/25/05	Acceptable

Comments

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Dawson Group, Inc
Project: Red Hill GW Sampling/2001022 013
Sample Matrix: Water

Service Request: K2501266
Date Collected: 02/17/2005
Date Received: 02/19/2005

Gasoline Range Organics

Sample Name: RH-W-002
Lab Code: K2501266-005
Extraction Method: EPA 5030B
Analysis Method: 8015B

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics (GRO)	ND	U	50	1	02/25/05	02/25/05	KWG0503107	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	93	75-120	02/25/05	Acceptable

Comments

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Dawson Group Inc
Project: Red Hill GW Sampling/2001022 013
Sample Matrix: Water

Service Request: K2501266
Date Collected: NA
Date Received: NA

Gasoline Range Organics

Sample Name: Method Blank
Lab Code: KWG0503107-5
Extraction Method: EPA 5030B
Analysis Method: 8015B

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics (GRO)	ND	U	50	1	02/25/05	02/25/05	KWG0503107	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	96	75-120	02/25/05	Acceptable

Comments:

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Dawson Group, Inc
Project: Red Hill GW Sampling/2001022 013
Sample Matrix: Water

Service Request: K2501266

Surrogate Recovery Summary
Gasoline Range Organics

Extraction Method: EPA 5030B
Analysis Method: 8015B

Units: PERCENT
Level: Low

Sample Name	Lab Code	Surl
RH-B-001	K2501266-001	95
RH-B-002	K2501266-002	95
RH-B-003	K2501266-003	95
RH-W-001	K2501266-004	90
RH-W-002	K2501266-005	93
Method Blank	KWG0503107-5	96
RH-B-001MS	KWG0503107-2	100
RH-B-001DMS	KWG0503107-3	98
Lab Control Sample	KWG0503107-4	101

Surrogate Recovery Control Limits (%)

Surl = 1,4-Difluorobenzene 75-120

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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COLUMBIA ANALYTICAL SERVICES, INC

QA/QC Report

Client: Dawson Group, Inc
Project: Red Hill GW Sampling/2001022 013
Sample Matrix: Water

Service Request: K2501266
Date Extracted: 02/25/2005
Date Analyzed: 02/25/2005

Matrix Spike/Duplicate Matrix Spike Summary
Gasoline Range Organics

Sample Name: RH-B-001
Lab Code: K2501266-001

Units: ug/L
Basis: NA

Extraction Method: EPA 5030B
Analysis Method: 8015B

Level: Low
Extraction Lot: KWG0503107

Analyte Name	Sample Result	RH-B-001MS KWG0503107-2 Matrix Spike Result	Expected	%Rec	RH-B-001DMS KWG0503107-3 Duplicate Matrix Spike Result	Expected	%Rec	%Rec Limits	RPD	RPD Limit
Gasoline Range Organics (GRO)	ND	489	500	98	451	500	90	69-128	8	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

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COLUMBIA ANALYTICAL SERVICES, INC

QA/QC Report

Client: Dawson Group, Inc
Project: Red Hill GW Sampling/2001022 013
Sample Matrix: Water

Service Request: K2501266
Date Extracted: 02/25/2005
Date Analyzed: 02/25/2005

Lab Control Spike Summary
Gasoline Range Organics

Extraction Method: EPA 5030B
Analysis Method: 8015B

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG0503107

	Lab Control Sample KWG0503107-4 Lab Control Spike			
Analyte Name	**Result**	**Expected**	**%Rec**	**%Rec Limits**
Gasoline Range Organics (GRO)	491	500	98	71-128

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.

EPA Method 504.1

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Dawson Group Inc	**Service Request:**	K2501266
Project:	Red Hill GW Sampling/2001022 013	**Date Collected:**	02/16/2005
Sample Matrix:	Water	**Date Received:**	02/19/2005

EPA Method 504.1

Sample Name:	RH-B-001	**Units:**	ug/L
Lab Code:	K2501266-001	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	504.1		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
1,2-Dibromoethane (EDB)	ND	U	0.0083	1	02/28/05	02/28/05	KWG0503282	

Surrogate Name	%Rec	Control Limits	Note

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Dawson Group, Inc	**Service Request:**	K2501266
Project:	Red Hill GW Sampling/2001022 013	**Date Collected:**	02/16/2005
Sample Matrix:	Water	**Date Received:**	02/19/2005

EPA Method 504.1

Sample Name	RH-B-002	**Units:**	ug/L
Lab Code:	K2501266-002	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	504.1		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
1,2-Dibromoethane (EDB)	ND	U	0.0081	1	02/28/05	02/28/05	KWG0503282	

Surrogate Name	%Rec	Control Limits	Note

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Dawson Group, Inc	**Service Request:**	K2501266
Project:	Red Hill GW Sampling/2001022 013	**Date Collected:**	02/16/2005
Sample Matrix:	Water	**Date Received:**	02/19/2005

EPA Method 504.1

Sample Name	RH-B-003	**Units:**	ug/L
Lab Code:	K2501266-003	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	504 1		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
1,2-Dibromoethane (EDB)	ND	U	0 0082	1	02/28/05	02/28/05	KWG0503282	

Surrogate Name	%Rec	Control Limits	Note

Comments

COLUMBIA ANALYTICAL SERVICES, INC

Analytical Results

Client:	Dawson Group, Inc	**Service Request:**	K2501266
Project:	Red Hill GW Sampling/2001022 013	**Date Collected:**	02/17/2005
Sample Matrix.	Water	**Date Received:**	02/19/2005

EPA Method 504.1

Sample Name:	RH-W-001	**Units:**	ug/L
Lab Code:	K2501266-004	**Basis:**	NA
Extraction Method:	METHOD	**Level.**	Low
Analysis Method:	504 1		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
1,2-Dibromoethane (EDB)	ND	U	0 0083	1	02/28/05	02/28/05	KWG0503282	

Surrogate Name	%Rec	Control Limits	Note

Comments

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Dawson Group, Inc	**Service Request:**	K2501266
Project:	Red Hill GW Sampling/2001022 013	**Date Collected:**	02/17/2005
Sample Matrix:	Water	**Date Received:**	02/19/2005

EPA Method 504.1

Sample Name:	RH-W-002	**Units:**	ug/L
Lab Code:	K2501266-005	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	504 1		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
1,2-Dibromoethane (EDB)	ND	U	0 0082	1	02/28/05	02/28/05	KWG0503282	

Surrogate Name	%Rec	Control Limits	Note

Comments

00045

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Dawson Group, Inc	**Service Request:**	K2501266
Project:	Red Hill GW Sampling/2001022 013	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

EPA Method 504.1

Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KWG0503282-3	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	504 1		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
1,2-Dibromoethane (EDB)	ND	U	0 011	1	02/28/05	02/28/05	KWG0503282	

Surrogate Name	%Rec	Control Limits	Note

Comments

00046

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Dawson Group, Inc	**Service Request:**	K2501266
Project:	Red Hill GW Sampling/2001022 013	**Date Extracted:**	02/28/2005
Sample Matrix:	Water	**Date Analyzed:**	02/28/2005

Matrix Spike Summary
EPA Method 504.1

Sample Name:	RH-B-003	**Units:**	ug/L
Lab Code:	K2501266-001	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	504.1	**Extraction Lot:**	KWG0503282

		RH-B-003MS KWG0503282-1 Matrix Spike			
Analyte Name	**Sample Result**	**Result**	**Expected**	**%Rec**	**%Rec Limits**
1,2-Dibromoethane (EDB)	ND	0.0596	0.0591	101	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.

00047

COLUMBIA ANALYTICAL SERVICES, INC

QA/QC Report

Client:	Dawson Group, Inc	**Service Request:**	K2501266
Project:	Red Hill GW Sampling/2001022 013	**Date Extracted:**	02/28/2005
Sample Matrix:	Water	**Date Analyzed:**	02/28/2005

Lab Control Spike Summary
EPA Method 504.1

Extraction Method:	METHOD	**Units:**	ug/L
Analysis Method:	504.1	**Basis:**	NA
		Level:	Low
		Extraction Lot:	KWG0503282

	Lab Control Sample KWG0503282-2 Lab Control Spike			
Analyte Name	**Result**	**Expected**	**%Rec**	**%Rec Limits**
1,2-Dibromoethane (EDB)	0.0744	0.0714	104	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

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Dawson Group, Inc	**Service Request:**	K2501266
Project:	Red Hill GW Sampling/2001022 013	**Date Collected:**	02/16/2005
Sample Matrix:	Water	**Date Received:**	02/19/2005

Volatile Organic Compounds

Sample Name:	RH-B-001	**Units:**	ug/L
Lab Code:	K2501266-001	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND	U	0 50	1	03/02/05	03/02/05	KWG0503506	
Methyl tert-Butyl Ether	ND	U	0 50	1	03/02/05	03/02/05	KWG0503506	
Toluene	1.0		0 50	1	03/02/05	03/02/05	KWG0503506	
Ethylbenzene	ND	U	0 50	1	03/02/05	03/02/05	KWG0503506	
m,p-Xylenes	ND	U	0 50	1	03/02/05	03/02/05	KWG0503506	
o-Xylene	ND	U	0 50	1	03/02/05	03/02/05	KWG0503506	
1,2-Dichloroethane (EDC)	ND	U	0 50	1	03/02/05	03/02/05	KWG0503506	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	105	80-119	03/02/05	Acceptable
Toluene-d8	113	83-113	03/02/05	Acceptable
4-Bromofluorobenzene	99	72-114	03/02/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Dawson Group, Inc	**Service Request:**	K2501266
Project:	Red Hill GW Sampling/2001022 013	**Date Collected:**	02/16/2005
Sample Matrix:	Water	**Date Received:**	02/19/2005

Volatile Organic Compounds

Sample Name:	RH-B-002	**Units:**	ug/L
Lab Code:	K2501266-002	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND	U	0 50	1	03/01/05	03/01/05	KWG0503498	
Methyl tert-Butyl Ether	ND	U	0 50	1	03/01/05	03/01/05	KWG0503498	
Toluene	1.2		0 50	1	03/01/05	03/01/05	KWG0503498	
Ethylbenzene	ND	U	0 50	1	03/01/05	03/01/05	KWG0503498	
m,p-Xylenes	ND	U	0 50	1	03/01/05	03/01/05	KWG0503498	
o-Xylene	ND	U	0 50	1	03/01/05	03/01/05	KWG0503498	
1,2-Dichloroethane (EDC)	ND	U	0 50	1	03/01/05	03/01/05	KWG0503498	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	95	80-119	03/01/05	Acceptable
Toluene-d8	91	83-113	03/01/05	Acceptable
4-Bromofluorobenzene	93	72-114	03/01/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Dawson Group, Inc	**Service Request:**	K2501266
Project:	Red Hill GW Sampling/2001022 013	**Date Collected:**	02/16/2005
Sample Matrix:	Water	**Date Received:**	02/19/2005

Volatile Organic Compounds

Sample Name:	RH-B-003	**Units:**	ug/L
Lab Code:	K2501266-003	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND	U	0.50	1	03/01/05	03/01/05	KWG0503498	
Methyl tert-Butyl Ether	ND	U	0 50	1	03/01/05	03/01/05	KWG0503498	
Toluene	0.81		0 50	1	03/01/05	03/01/05	KWG0503498	
Ethylbenzene	ND	U	0 50	1	03/01/05	03/01/05	KWG0503498	
m,p-Xylenes	ND	U	0 50	1	03/01/05	03/01/05	KWG0503498	
o-Xylene	ND	U	0 50	1	03/01/05	03/01/05	KWG0503498	
1,2-Dichloroethane (EDC)	ND	U	0 50	1	03/01/05	03/01/05	KWG0503498	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	94	80-119	03/01/05	Acceptable
Toluene-d8	91	83-113	03/01/05	Acceptable
4-Bromofluorobenzene	92	72-114	03/01/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Dawson Group, Inc
Project: Red Hill GW Sampling/2001022 013
Sample Matrix: Water

Service Request: K2501266
Date Collected: 02/17/2005
Date Received: 02/19/2005

Volatile Organic Compounds

Sample Name: RH-W-001
Lab Code: K2501266-004

Extraction Method: EPA 5030B
Analysis Method: 8260B

Units: ug/L
Basis: NA

Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND	U	0.50	1	03/02/05	03/02/05	KWG0503498	
Methyl tert-Butyl Ether	ND	U	0 50	1	03/02/05	03/02/05	KWG0503498	
Toluene	ND	U	0 50	1	03/02/05	03/02/05	KWG0503498	
Ethylbenzene	ND	U	0 50	1	03/02/05	03/02/05	KWG0503498	
m,p-Xylenes	ND	U	0 50	1	03/02/05	03/02/05	KWG0503498	
o-Xylene	ND	U	0 50	1	03/02/05	03/02/05	KWG0503498	
1,2-Dichloroethane (EDC)	ND	U	0 50	1	03/02/05	03/02/05	KWG0503498	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	93	80-119	03/02/05	Acceptable
Toluene-d8	89	83-113	03/02/05	Acceptable
4-Bromofluorobenzene	92	72-114	03/02/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Dawson Group, Inc
Project: Red Hill GW Sampling/2001022 013
Sample Matrix: Water

Service Request: K2501266
Date Collected: 02/17/2005
Date Received: 02/19/2005

Volatile Organic Compounds

Sample Name: RH-W-002
Lab Code: K2501266-005

Extraction Method: EPA 5030B
Analysis Method: 8260B

Units: ug/L
Basis: NA

Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND	U	0 50	1	03/02/05	03/02/05	KWG0503498	
Methyl tert-Butyl Ether	ND	U	0 50	1	03/02/05	03/02/05	KWG0503498	
Toluene	ND	U	0 50	1	03/02/05	03/02/05	KWG0503498	
Ethylbenzene	ND	U	0 50	1	03/02/05	03/02/05	KWG0503498	
m,p-Xylenes	ND	U	0 50	1	03/02/05	03/02/05	KWG0503498	
o-Xylene	ND	U	0 50	1	03/02/05	03/02/05	KWG0503498	
1,2-Dichloroethane (EDC)	ND	U	0 50	1	03/02/05	03/02/05	KWG0503498	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	95	80-119	03/02/05	Acceptable
Toluene-d8	92	83-113	03/02/05	Acceptable
4-Bromofluorobenzene	93	72-114	03/02/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Dawson Group, Inc
Project: Red Hill GW Sampling/2001022 013
Sample Matrix: Water

Service Request: K2501266
Date Collected: 02/16/2005
Date Received: 02/19/2005

Volatile Organic Compounds

Sample Name: Trip Blank
Lab Code: K2501266-006

Extraction Method: EPA 5030B
Analysis Method: 8260B

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND	U	0 50	1	03/02/05	03/02/05	KWG0503498	
Methyl tert-Butyl Ether	ND	U	0 50	1	03/02/05	03/02/05	KWG0503498	
Toluene	1.4		0 50	1	03/02/05	03/02/05	KWG0503498	
Ethylbenzene	ND	U	0 50	1	03/02/05	03/02/05	KWG0503498	
m,p-Xylenes	ND	U	0 50	1	03/02/05	03/02/05	KWG0503498	
o-Xylene	ND	U	0 50	1	03/02/05	03/02/05	KWG0503498	
1,2-Dichloroethane (EDC)	ND	U	0 50	1	03/02/05	03/02/05	KWG0503498	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	94	80-119	03/02/05	Acceptable
Toluene-d8	91	83-113	03/02/05	Acceptable
4-Bromofluorobenzene	92	72-114	03/02/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Dawson Group, Inc
Project: Red Hill GW Sampling/2001022 013
Sample Matrix: Water

Service Request: K2501266
Date Collected: NA
Date Received: NA

Volatile Organic Compounds

Sample Name: Method Blank
Lab Code: KWG0503391-4

Extraction Method: EPA 5030B
Analysis Method: 8260B

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND	U	0 50	1	03/01/05	03/01/05	KWG0503391	
Methyl tert-Butyl Ether	ND	U	0 50	1	03/01/05	03/01/05	KWG0503391	
Toluene	ND	U	0 50	1	03/01/05	03/01/05	KWG0503391	
Ethylbenzene	ND	U	0 50	1	03/01/05	03/01/05	KWG0503391	
m,p-Xylenes	ND	U	0 50	1	03/01/05	03/01/05	KWG0503391	
o-Xylene	ND	U	0 50	1	03/01/05	03/01/05	KWG0503391	
1,2-Dichloroethane (EDC)	ND	U	0 50	1	03/01/05	03/01/05	KWG0503391	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	101	80-119	03/01/05	Acceptable
Toluene-d8	113	83-113	03/01/05	Acceptable
4-Bromofluorobenzene	99	72-114	03/01/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Dawson Group, Inc	**Service Request:**	K2501266
Project:	Red Hill GW Sampling/2001022 013	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

Volatile Organic Compounds

Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KWG0503498-4	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND	U	0 50	1	03/01/05	03/01/05	KWG0503498	
Methyl tert-Butyl Ether	ND	U	0 50	1	03/01/05	03/01/05	KWG0503498	
Toluene	ND	U	0 50	1	03/01/05	03/01/05	KWG0503498	
Ethylbenzene	ND	U	0 50	1	03/01/05	03/01/05	KWG0503498	
m,p-Xylenes	ND	U	0 50	1	03/01/05	03/01/05	KWG0503498	
o-Xylene	ND	U	0 50	1	03/01/05	03/01/05	KWG0503498	
1,2-Dichloroethane (EDC)	ND	U	0 50	1	03/01/05	03/01/05	KWG0503498	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	92	80-119	03/01/05	Acceptable
Toluene-d8	91	83-113	03/01/05	Acceptable
4-Bromofluorobenzene	91	72-114	03/01/05	Acceptable

Comments:

00057

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Dawson Group, Inc	**Service Request:**	K2501266
Project:	Red Hill GW Sampling/2001022 013	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

Volatile Organic Compounds

Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KWG0503506-3	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND	U	0 50	1	03/02/05	03/02/05	KWG0503506	
Methyl tert-Butyl Ether	ND	U	0 50	1	03/02/05	03/02/05	KWG0503506	
Toluene	ND	U	0 50	1	03/02/05	03/02/05	KWG0503506	
Ethylbenzene	ND	U	0 50	1	03/02/05	03/02/05	KWG0503506	
m,p-Xylenes	ND	U	0 50	1	03/02/05	03/02/05	KWG0503506	
o-Xylene	ND	U	0 50	1	03/02/05	03/02/05	KWG0503506	
1,2-Dichloroethane (EDC)	ND	U	0 50	1	03/02/05	03/02/05	KWG0503506	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	106	80-119	03/02/05	Acceptable
Toluene-d8	113	83-113	03/02/05	Acceptable
4-Bromofluorobenzene	104	72-114	03/02/05	Acceptable

Comments:

00058

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Dawson Group, Inc
Project: Red Hill GW Sampling/2001022 013
Sample Matrix: Water

Service Request: K2501266

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-B-001	K2501266-001	105	113	99
RH-B-002	K2501266-002	95	91	93
RH-B-003	K2501266-003	94	91	92
RH-W-001	K2501266-004	93	89	92
RH-W-002	K2501266-005	95	92	93
Trip Blank	K2501266-006	94	91	92
Method Blank	KWG0503391-4	101	113	99
Method Blank	KWG0503498-4	92	91	91
Method Blank	KWG0503506-3	106	113	104
Batch QC	K2501197-001	101	113	98
Batch QCMS	KWG0503391-1	106	112	103
Batch QCDMS	KWG0503391-2	106	113	104
Lab Control Sample	KWG0503391-3	103	111	100
Lab Control Sample	KWG0503498-3	93	97	102
Lab Control Sample	KWG0503506-1	107	114	* 103

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.

00059

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Dawson Group, Inc
Project: Red Hill GW Sampling/2001022 013
Sample Matrix: Water

Service Request: K2501266
Date Extracted: 03/01/2005
Date Analyzed: 03/01/2005

Matrix Spike/Duplicate Matrix Spike Summary
Volatile Organic Compounds

Sample Name: Batch QC
Lab Code: K2501197-001

Units: ug/L
Basis: NA

Extraction Method: EPA 5030B
Analysis Method: 8260B

Level: Low
Extraction Lot: KWG0503391

Analyte Name	Sample Result	Batch QCMS KWG0503391-1 Matrix Spike Result	Expected	%Rec	Batch QCDMS KWG0503391-2 Duplicate Matrix Spike Result	Expected	%Rec	%Rec Limits	RPD	RPD Limit
Benzene	ND	10 8	10 0	108	10 8	10 0	108	75-130	0	30
Methyl tert-Butyl Ether	ND	9 96	10 0	100	9 84	10 0	98	50-152	1	30
Toluene	0 98	11 9	10 0	109	11 8	10 0	109	72-132	0	30
Ethylbenzene	ND	11 5	10 0	115	11 5	10 0	115	83-130	0	30
m,p-Xylenes	ND	22 7	20 0	113	22 3	20 0	112	84-132	2	30
o-Xylene	ND	11 2	10 0	112	11 2	10 0	112	83-128	0	30
1,2-Dichloroethane (EDC)	ND	10 5	10 0	105	10 3	10 0	103	74-122	2	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.

00060

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Dawson Group, Inc
Project: Red Hill GW Sampling/2001022 013
Sample Matrix: Water

Service Request: K2501266
Date Extracted: 03/01/2005
Date Analyzed: 03/01/2005

Lab Control Spike Summary
Volatile Organic Compounds

Extraction Method: EPA 5030B
Analysis Method: 8260B

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG0503391

Analyte Name	Lab Control Sample KWG0503391-3 Lab Control Spike Result	Expected	%Rec	%Rec Limits
Benzene	10 3	10 0	103	78-121
Methyl tert-Butyl Ether	9 69	10 0	97	63-132
Toluene	10 9	10 0	109	76-122
Ethylbenzene	9.96	10 0	100	84-122
m,p-Xylenes	19 8	20 0	99	83-125
o-Xylene	9 83	10 0	98	83-122
1,2-Dichloroethane (EDC)	10 0	10 0	100	74-121

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

00061

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Dawson Group, Inc
Project: Red Hill GW Sampling/2001022 013
Sample Matrix: Water

Service Request: K2501266
Date Extracted: 03/01/2005
Date Analyzed: 03/01/2005

Lab Control Spike Summary
Volatile Organic Compounds

Extraction Method: EPA 5030B
Analysis Method: 8260B

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG0503498

Analyte Name	Lab Control Sample KWG0503498-3 Lab Control Spike Result	Expected	%Rec	%Rec Limits
Benzene	8 91	10 0	89	78-121
Methyl tert-Butyl Ether	9 06	10 0	91	63-132
Toluene	8 58	10 0	86	76-122
Ethylbenzene	8 81	10 0	88	84-122
m,p-Xylenes	17 9	20 0	90	83-125
o-Xylene	8 94	10 0	89	83-122
1,2-Dichloroethane (EDC)	9 44	10 0	94	74-121

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

00062

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Dawson Group, Inc	**Service Request:**	K2501266
Project:	Red Hill GW Sampling/2001022 013	**Date Extracted:**	03/02/2005
Sample Matrix:	Water	**Date Analyzed:**	03/02/2005

Lab Control Spike Summary
Volatile Organic Compounds

Extraction Method:	EPA 5030B	**Units:**	ug/L
Analysis Method:	8260B	**Basis:**	NA
		Level:	Low
		Extraction Lot:	KWG0503506

	Lab Control Sample KWG0503506-1 Lab Control Spike			
Analyte Name	**Result**	**Expected**	**%Rec**	**%Rec Limits**
Benzene	10 2	10 0	102	78-121
Methyl tert-Butyl Ether	9 42	10 0	94	63-132
Toluene	10 7	10 0	107	76-122
Ethylbenzene	10 7	10 0	107	84-122
m,p-Xylenes	21 2	20 0	106	83-125
o-Xylene	10 4	10 0	104	83-122
1,2-Dichloroethane (EDC)	10 5	10 0	105	74-121

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.

Polynuclear Aromatic Hydrocarbons

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Dawson Group, Inc	**Service Request:**	K2501266
Project:	Red Hill GW Sampling/2001022 013	**Date Collected:**	02/16/2005
Sample Matrix:	Water	**Date Received:**	02/19/2005

Polynuclear Aromatic Hydrocarbons

Sample Name:	RH-B-001	**Units:**	ug/L
Lab Code:	K2501266-001	**Basis:**	NA
Extraction Method:	EPA 3535	**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	02/22/05	03/01/05	KWG0502797	
2-Methylnaphthalene	ND	U	0.020	1	02/22/05	03/01/05	KWG0502797	
Acenaphthylene	ND	U	0.020	1	02/22/05	03/01/05	KWG0502797	
Acenaphthene	ND	U	0.020	1	02/22/05	03/01/05	KWG0502797	
Dibenzofuran	ND	U	0.020	1	02/22/05	03/01/05	KWG0502797	
Fluorene	ND	U	0.020	1	02/22/05	03/01/05	KWG0502797	
Phenanthrene	ND	U	0.020	1	02/22/05	03/01/05	KWG0502797	
Anthracene	ND	U	0.020	1	02/22/05	03/01/05	KWG0502797	
Fluoranthene	ND	U	0.020	1	02/22/05	03/01/05	KWG0502797	
Pyrene	ND	U	0.020	1	02/22/05	03/01/05	KWG0502797	
Benz(a)anthracene	ND	U	0.020	1	02/22/05	03/01/05	KWG0502797	
Chrysene	ND	U	0.020	1	02/22/05	03/01/05	KWG0502797	
Benzo(b)fluoranthene	ND	U	0.020	1	02/22/05	03/01/05	KWG0502797	
Benzo(k)fluoranthene	ND	U	0.020	1	02/22/05	03/01/05	KWG0502797	
Benzo(a)pyrene	ND	U	0.020	1	02/22/05	03/01/05	KWG0502797	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	1	02/22/05	03/01/05	KWG0502797	
Dibenz(a,h)anthracene	ND	U	0.020	1	02/22/05	03/01/05	KWG0502797	
Benzo(g,h,i)perylene	ND	U	0.020	1	02/22/05	03/01/05	KWG0502797	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	74	37-107	03/01/05	Acceptable
Fluoranthene-d10	77	18-137	03/01/05	Acceptable
Terphenyl-d14	85	18-153	03/01/05	Acceptable

Comments:

00065

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Dawson Group, Inc	**Service Request:**	K2501266
Project:	Red Hill GW Sampling/2001022 013	**Date Collected:**	02/16/2005
Sample Matrix:	Water	**Date Received:**	02/19/2005

Polynuclear Aromatic Hydrocarbons

Sample Name:	RH-B-002	**Units:**	ug/L
Lab Code:	K2501266-002	**Basis:**	NA
Extraction Method:	EPA 3535	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	0.022	1	02/22/05	03/01/05	KWG0502797	
2-Methylnaphthalene	ND	U	0.022	1	02/22/05	03/01/05	KWG0502797	
Acenaphthylene	ND	U	0.022	1	02/22/05	03/01/05	KWG0502797	
Acenaphthene	ND	U	0.022	1	02/22/05	03/01/05	KWG0502797	
Dibenzofuran	ND	U	0.022	1	02/22/05	03/01/05	KWG0502797	
Fluorene	ND	U	0.022	1	02/22/05	03/01/05	KWG0502797	
Phenanthrene	ND	U	0.022	1	02/22/05	03/01/05	KWG0502797	
Anthracene	ND	U	0.022	1	02/22/05	03/01/05	KWG0502797	
Fluoranthene	ND	U	0.022	1	02/22/05	03/01/05	KWG0502797	
Pyrene	ND	U	0.022	1	02/22/05	03/01/05	KWG0502797	
Benz(a)anthracene	ND	U	0.022	1	02/22/05	03/01/05	KWG0502797	
Chrysene	ND	U	0.022	1	02/22/05	03/01/05	KWG0502797	
Benzo(b)fluoranthene	ND	U	0.022	1	02/22/05	03/01/05	KWG0502797	
Benzo(k)fluoranthene	ND	U	0.022	1	02/22/05	03/01/05	KWG0502797	
Benzo(a)pyrene	ND	U	0.022	1	02/22/05	03/01/05	KWG0502797	
Indeno(1,2,3-cd)pyrene	ND	U	0.022	1	02/22/05	03/01/05	KWG0502797	
Dibenz(a,h)anthracene	ND	U	0.022	1	02/22/05	03/01/05	KWG0502797	
Benzo(g,h,i)perylene	ND	U	0.022	1	02/22/05	03/01/05	KWG0502797	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	66	37-107	03/01/05	Acceptable
Fluoranthene-d10	75	18-137	03/01/05	Acceptable
Terphenyl-d14	86	18-153	03/01/05	Acceptable

Comments:

00066

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Dawson Group, Inc
Project: Red Hill GW Sampling/2001022 013
Sample Matrix: Water

Service Request: K2501266
Date Collected: 02/16/2005
Date Received: 02/19/2005

Polynuclear Aromatic Hydrocarbons

Sample Name: RH-B-003
Lab Code: K2501266-003

Extraction Method: EPA 3535
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	0.021	1	02/22/05	03/01/05	KWG0502797	
2-Methylnaphthalene	ND	U	0.021	1	02/22/05	03/01/05	KWG0502797	
Acenaphthylene	ND	U	0.021	1	02/22/05	03/01/05	KWG0502797	
Acenaphthene	ND	U	0.021	1	02/22/05	03/01/05	KWG0502797	
Dibenzofuran	ND	U	0.021	1	02/22/05	03/01/05	KWG0502797	
Fluorene	ND	U	0.021	1	02/22/05	03/01/05	KWG0502797	
Phenanthrene	ND	U	0.021	1	02/22/05	03/01/05	KWG0502797	
Anthracene	ND	U	0.021	1	02/22/05	03/01/05	KWG0502797	
Fluoranthene	ND	U	0.021	1	02/22/05	03/01/05	KWG0502797	
Pyrene	ND	U	0.021	1	02/22/05	03/01/05	KWG0502797	
Benz(a)anthracene	ND	U	0.021	1	02/22/05	03/01/05	KWG0502797	
Chrysene	ND	U	0.021	1	02/22/05	03/01/05	KWG0502797	
Benzo(b)fluoranthene	ND	U	0.021	1	02/22/05	03/01/05	KWG0502797	
Benzo(k)fluoranthene	ND	U	0.021	1	02/22/05	03/01/05	KWG0502797	
Benzo(a)pyrene	ND	U	0.021	1	02/22/05	03/01/05	KWG0502797	
Indeno(1,2,3-cd)pyrene	ND	U	0.021	1	02/22/05	03/01/05	KWG0502797	
Dibenz(a,h)anthracene	ND	U	0.021	1	02/22/05	03/01/05	KWG0502797	
Benzo(g,h,i)perylene	ND	U	0.021	1	02/22/05	03/01/05	KWG0502797	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	65	37-107	03/01/05	Acceptable
Fluoranthene-d10	70	18-137	03/01/05	Acceptable
Terphenyl-d14	83	18-153	03/01/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC

Analytical Results

Client: Dawson Group, Inc
Project: Red Hill GW Sampling/2001022 013
Sample Matrix: Water

Service Request: K2501266
Date Collected: 02/17/2005
Date Received: 02/19/2005

Polynuclear Aromatic Hydrocarbons

Sample Name: RH-W-001
Lab Code: K2501266-004

Extraction Method: EPA 3535
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	0.25		0.020	1	02/22/05	03/01/05	KWG0502797	
2-Methylnaphthalene	0.14		0.020	1	02/22/05	03/01/05	KWG0502797	
Acenaphthylene	ND	U	0.020	1	02/22/05	03/01/05	KWG0502797	
Acenaphthene	0.052		0.020	1	02/22/05	03/01/05	KWG0502797	
Dibenzofuran	0.13		0.020	1	02/22/05	03/01/05	KWG0502797	
Fluorene	0.053		0.020	1	02/22/05	03/01/05	KWG0502797	
Phenanthrene	0.12		0.020	1	02/22/05	03/01/05	KWG0502797	
Anthracene	ND	U	0.020	1	02/22/05	03/01/05	KWG0502797	
Fluoranthene	0.035		0.020	1	02/22/05	03/01/05	KWG0502797	
Pyrene	0.056		0.020	1	02/22/05	03/01/05	KWG0502797	
Benz(a)anthracene	ND	U	0.020	1	02/22/05	03/01/05	KWG0502797	
Chrysene	0.020		0.020	1	02/22/05	03/01/05	KWG0502797	
Benzo(b)fluoranthene	0.025		0.020	1	02/22/05	03/01/05	KWG0502797	
Benzo(k)fluoranthene	ND	U	0.020	1	02/22/05	03/01/05	KWG0502797	
Benzo(a)pyrene	0.022		0.020	1	02/22/05	03/01/05	KWG0502797	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	1	02/22/05	03/01/05	KWG0502797	
Dibenz(a,h)anthracene	ND	U	0.020	1	02/22/05	03/01/05	KWG0502797	
Benzo(g,h,i)perylene	ND	U	0.020	1	02/22/05	03/01/05	KWG0502797	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	73	37-107	03/01/05	Acceptable
Fluoranthene-d10	72	18-137	03/01/05	Acceptable
Terphenyl-d14	88	18-153	03/01/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Dawson Group, Inc	**Service Request:**	K2501266
Project:	Red Hill GW Sampling/2001022 013	**Date Collected:**	02/17/2005
Sample Matrix:	Water	**Date Received:**	02/19/2005

Polynuclear Aromatic Hydrocarbons

Sample Name:	RH-W-002	**Units:**	ug/L
Lab Code:	K2501266-005	**Basis:**	NA
Extraction Method:	EPA 3535	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**0.21**		0.020	1	02/22/05	03/01/05	KWG0502797	
2-Methylnaphthalene	**0.057**		0.020	1	02/22/05	03/01/05	KWG0502797	
Acenaphthylene	ND	U	0.020	1	02/22/05	03/01/05	KWG0502797	
Acenaphthene	**0.054**		0.020	1	02/22/05	03/01/05	KWG0502797	
Dibenzofuran	**0.11**		0.020	1	02/22/05	03/01/05	KWG0502797	
Fluorene	**0.043**		0.020	1	02/22/05	03/01/05	KWG0502797	
Phenanthrene	**0.082**		0.020	1	02/22/05	03/01/05	KWG0502797	
Anthracene	ND	U	0.020	1	02/22/05	03/01/05	KWG0502797	
Fluoranthene	**0.021**		0.020	1	02/22/05	03/01/05	KWG0502797	
Pyrene	**0.029**		0.020	1	02/22/05	03/01/05	KWG0502797	
Benz(a)anthracene	ND	U	0.020	1	02/22/05	03/01/05	KWG0502797	
Chrysene	ND	U	0.020	1	02/22/05	03/01/05	KWG0502797	
Benzo(b)fluoranthene	ND	U	0.020	1	02/22/05	03/01/05	KWG0502797	
Benzo(k)fluoranthene	ND	U	0.020	1	02/22/05	03/01/05	KWG0502797	
Benzo(a)pyrene	ND	U	0.020	1	02/22/05	03/01/05	KWG0502797	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	1	02/22/05	03/01/05	KWG0502797	
Dibenz(a,h)anthracene	ND	U	0.020	1	02/22/05	03/01/05	KWG0502797	
Benzo(g,h,i)perylene	ND	U	0.020	1	02/22/05	03/01/05	KWG0502797	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	65	37-107	03/01/05	Acceptable
Fluoranthene-d10	56	18-137	03/01/05	Acceptable
Terphenyl-d14	51	18-153	03/01/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Dawson Group, Inc	**Service Request:**	K2501266
Project:	Red Hill GW Sampling/2001022 013	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

Polynuclear Aromatic Hydrocarbons

Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KWG0502797-3	**Basis:**	NA
Extraction Method:	EPA 3535	**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	02/22/05	02/28/05	KWG0502797	
2-Methylnaphthalene	ND	U	0.020	1	02/22/05	02/28/05	KWG0502797	
Acenaphthylene	ND	U	0.020	1	02/22/05	02/28/05	KWG0502797	
Acenaphthene	ND	U	0.020	1	02/22/05	02/28/05	KWG0502797	
Dibenzofuran	ND	U	0.020	1	02/22/05	02/28/05	KWG0502797	
Fluorene	ND	U	0.020	1	02/22/05	02/28/05	KWG0502797	
Phenanthrene	ND	U	0.020	1	02/22/05	02/28/05	KWG0502797	
Anthracene	ND	U	0.020	1	02/22/05	02/28/05	KWG0502797	
Fluoranthene	ND	U	0.020	1	02/22/05	02/28/05	KWG0502797	
Pyrene	ND	U	0.020	1	02/22/05	02/28/05	KWG0502797	
Benz(a)anthracene	ND	U	0.020	1	02/22/05	02/28/05	KWG0502797	
Chrysene	ND	U	0.020	1	02/22/05	02/28/05	KWG0502797	
Benzo(b)fluoranthene	ND	U	0.020	1	02/22/05	02/28/05	KWG0502797	
Benzo(k)fluoranthene	ND	U	0.020	1	02/22/05	02/28/05	KWG0502797	
Benzo(a)pyrene	ND	U	0.020	1	02/22/05	02/28/05	KWG0502797	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	1	02/22/05	02/28/05	KWG0502797	
Dibenz(a,h)anthracene	ND	U	0.020	1	02/22/05	02/28/05	KWG0502797	
Benzo(g,h,i)perylene	ND	U	0.020	1	02/22/05	02/28/05	KWG0502797	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	63	37-107	02/28/05	Acceptable
Fluoranthene-d10	73	18-137	02/28/05	Acceptable
Terphenyl-d14	83	18-153	02/28/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Dawson Group, Inc
Project: Red Hill GW Sampling/2001022 013
Sample Matrix: Water

Service Request: K2501266

Surrogate Recovery Summary
Polynuclear Aromatic Hydrocarbons

Extraction Method: EPA 3535
Analysis Method: 8270C SIM

Units: PERCENT
Level: Low

Sample Name	Lab Code	Sur1	Sur2	Sur3
RH-B-001	K2501266-001	74	77	85
RH-B-002	K2501266-002	66	75	86
RH-B-003	K2501266-003	65	70	83
RH-W-001	K2501266-004	73	72	88
RH-W-002	K2501266-005	65	56	51
Method Blank	KWG0502797-3	63	73	83
Lab Control Sample	KWG0502797-1	69	74	74
Duplicate Lab Control Sample	KWG0502797-2	70	73	73

Surrogate Recovery Control Limits (%)

Sur1 = Fluorene-d10	37-107
Sur2 = Fluoranthene-d10	18-137
Sur3 = Terphenyl-d14	18-153

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

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Dawson Group, Inc
Project: Red Hill GW Sampling/2001022 013
Sample Matrix: Water

Service Request: K2501266
Date Extracted: 02/22/2005
Date Analyzed: 03/01/2005

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

Extraction Method: EPA 3535
Analysis Method: 8270C SIM

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG0502797

	Lab Control Sample KWG0502797-1 Lab Control Spike			Duplicate Lab Control Sample KWG0502797-2 Duplicate Lab Control Spike					
Analyte Name	Result	Expected	%Rec	Result	Expected	%Rec	%Rec Limits	RPD	RPD Limit
Naphthalene	2 24	2 50	90	2 27	2 50	91	42-108	1	30
2-Methylnaphthalene	2 10	2 50	84	2 16	2 50	87	29-121	3	30
Acenaphthylene	2 33	2 50	93	2 33	2 50	93	40-112	0	30
Acenaphthene	2 41	2 50	96	2 42	2 50	97	42-115	1	30
Dibenzofuran	2 34	2 50	94	2 38	2 50	95	34-121	2	30
Fluorene	2 39	2 50	96	2 43	2 50	97	47-117	2	30
Phenanthrene	2 36	2 50	94	2 36	2 50	94	50-115	0	30
Anthracene	2 41	2 50	96	2 41	2 50	96	54-118	0	30
Fluoranthene	2 80	2 50	112	2 69	2 50	108	50-127	4	30
Pyrene	2 46	2 50	99	2 47	2 50	99	45-133	0	30
Benz(a)anthracene	2 33	2 50	93	2 35	2 50	94	44-127	1	30
Chrysene	2 47	2 50	99	2 48	2 50	99	16-137	0	30
Benzo(b)fluoranthene	2 54	2.50	102	2 55	2 50	102	47-127	0	30
Benzo(k)fluoranthene	2 54	2 50	102	2 52	2 50	101	30-144	1	30
Benzo(a)pyrene	2 38	2 50	95	2 38	2 50	95	36-136	0	30
Indeno(1,2,3-cd)pyrene	2 29	2 50	92	2 30	2 50	92	20-150	0	30
Dibenz(a,h)anthracene	2 22	2 50	89	2 26	2 50	90	50-127	2	30
Benzo(g,h,i)perylene	2 27	2 50	91	2 31	2 50	92	56-119	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

APPENDIX B

Monitoring Well Sampling Forms

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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 2/17/2005 TIME 9 35 CLIMATIC CONDITIONS overcast
PERSONNEL J Borr, H Kerr

WELL INFORMATION		PURGE VOLUME		EQUIPMENT	
Well Name/Number	MW-V1D	$V_c = (d_c)^2 \times (h) \times 0.041$		Instrument(s)	YSI
Well Location	*				
Casing Diameter (inches)	1 (d_c)	Volume of water in		Calibration Time	7:30
Total Well Depth (feet)	100	casing (gallons)	0.7118 (V_c)	Calibration Result / Comments	
Initial Depth to Water (feet)	82 64				OK
Depth to Product (feet)	NMP	Minimum Purge Volume (gallons)	2.135		
Height of Water Column (feet)	17 36 (h)				

PURGE LOG *Measurements of temperature, pH, specific conductivity, turbidity, dissolved oxygen, and redox will be collected initially, after every well volumne removed, and at the end*

METHOD OF REMOVAL Dedicated Bailer PUMPING RATE N/A

DATE	TIME	CUMULATIVE GALLONS REMOVED	TEMP. (°C)	pH	SP. COND. (uS/cm)	TURBIDITY (NTU)	DISSOLVED O_2 (mg/L)	REDOX (mV)
2/17/2005	9:35	0	24.0	9.33	1.477	2.68	9.42	37.1
2/17/2005	9:50	0.25	22.32	9.18	1.559	NM	11.8	25.9
2/17/2005	10:14	0.5	23.6	9.4	1.499	53.2	11.35	9
2/17/2005	10:26	0.75	23.3	9.39	1.523	96.4	11.9	4.6

SAMPLE INFORMATION

SAMPLE WITHDRAWAL METHOD Bailer Dedicated SAMPLED BY JB, HK

SAMPLE ID	P, QC, OR QA	TIME COLLECTED	DATE COLLECTED	NOTES
RH-W-001	P	10:42	2/17/2005	
RH-W-002	QC	12:35	2/17/2005	

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

APPEARANCE OF SAMPLE Color yellow-beige Temp 22 85 DO 7 64 mg/L
Turbidity Ph 8 11 Redox -117 4 mV
Sediment slight Sp Cond 1 596

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 2/18/2005
TRANSPORTER FedEx - TIME

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 2/16/2005 TIME 9 27 CLIMATIC CONDITIONS sunny

PERSONNEL J Borr, H Kerr

WELL INFORMATION		PURGE VOLUME	EQUIPMENT
Well Name/Number	Stilling Basin	$V_c = (d_c)^2 \times (h) \times 0.041$	Instrument(s) Solinst Interface Probe
Well Location	*		
Casing Diameter (inches)	NA (d_c)	Volume of water in casing (gallons) NA (V_c)	Calibration Time NA
Total Well Depth (feet)	NA		Calibration Result / Comments NA
Initial Depth to Water (feet)	86 48		
Depth to Product (feet)	NA	Minimum Purge Volume (gallons) NA	
Height of Water Column (feet)	NA (h)		

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 JB, HK

SAMPLE ID	P, QC, OR QA	TIME COLLECTED	DATE COLLECTED	NOTES
RH-B-001	P	9:34	2/16/2005	Pumps were offline 24 hours prior to sample
RH-B-002	QC	11:15	2/16/2005	Pumps were offline 24 hours prior to sample
RH-B-003	P	12:41	2/16/2005	Pumps online for 15-20 minutes (turned on at 12:08)

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 2/18/2005

TRANSPORTER FedEx - TIME