Second Quarter 2005

Groundwater Sampling
RED HILL FUEL STORAGE FACILITY, HAWAII

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August 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

ENCLOSURE(1)

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Groundwater Sampling
RED HILL FUEL STORAGE FACILITY, HAWAII

August 2005

Prepared for:

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Commander, Pacific Division
Naval Facilities Engineering Command
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Prepared under:

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Second Quarter 2005

Groundwater Sampling
Red Hill Fuel Storage Facility, Hawaii

August 2005

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EXECUTIVE SUMMARY

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

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

Site Background

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

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

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

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

Field Activities

On 28 June 2005, a temporary well conduit was installed at the PWC potable water stilling basin to allow more efficient sampling of the groundwater. The conduit was comprised of 25 feet (5-foot sections) of factory-slotted (0.010), 2-inch diameter, schedule-40 polyvinyl chloride (PVC) screen. The screen was set in 23.1 feet of water. Attached to the top of the slotted PVC was approximately 60 feet of 2-inch diameter, schedule-40 PVC (in 10 foot sections) casing. Approximately every 5 feet, the conduit was secured to the outer side of the ladder cage with heavy duty cable ties. The bottom of the conduit was fitted with a PVC end cap and the top of the conduit was secured with a monitoring well compression cap.

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 28 June 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 28 June 2005.

Conclusions and Recommendations

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

Stilling Basin

- Concentrations of total lead, TPH as diesel, and TPH as gasoline were detected above the laboratory method reporting limits (MRLs). No constituents were detected at concentrations above the HDOH Tier 1 GWALs.

Sentinel Well

- Concentrations of TPH as diesel, TPH as gasoline, naphthalene, 2-methylnaphthalene, acenaphthene, dibenzofuran, fluorene, phenanthrene, fluoranthene, pyrene, benz(a)anthracene, chrysene, benzo(b)fluroanthene, benzo(k)fluoranthene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene, and benzo(g,h,i)perylene were detected above laboratory MRLs. No constituents were detected at concentrations above the HDOH Tier 1 GWALs.
- Total lead was detected at concentrations above the HDOH Tier 1 GWAL, however below the HDOH drinking water standard in the sentinel well samples. The June 2005 results were also less than the corresponding 2001 investigation results (AMEC, 2002).
- The groundwater in the upgradient sentinel well (MW-V1D) shows evidence of contamination in the basal aquifer by contaminants of potential concern.

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

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

TABLE OF CONTENTS

LIST OF FIGURES

FIGURES

LIST OF TABLES

TABLES

LIST OF APPENDICES

APPENDICES

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

This work was performed under NAVFAC PACIFIC Contract Number N62742-01-D-1806, Contract Task Order (CTO) 0013. This document is the second 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 *Second 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 TPH concentrations ranging from 0.883 milligrams per liter (mg/L) to 1.05 mg/L and total lead ranging from 0.0104 mg/L to 0.015 mg/L. The maximum total lead concentration in the samples was equal to the primary drinking water standard of 0.015 mg/L for lead and exceeded the State of Hawaii Department of Health (HDOH) Tier 1 groundwater action level (GWAL) of 0.0056 mg/L (US Navy, 2004).

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

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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
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
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).

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

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

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

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

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

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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 June 2005. The stilling basin and the sentinel well, MW-V1D, were sampled. The general locations of the sample points 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 the DAWSON field team. 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 summarized 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 on site 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 are included in the HASP (DAWSON, 2005a).

5.2 Equipment Decontamination

All water-level measuring and water sampling equipment was decontaminated at the start and end of the project, as well as between locations, to reduce the possibility of cross-contamination. The equipment was first washed in potable water and non-phosphate detergent. Then it was rinsed in potable water, rinsed in deionized/distilled water, sprayed with isopropyl alcohol, and rinsed with deionized/distilled water. Decontamination washwater was placed in a Department of Transportation (DOT)-approved, open-head, steel, 30-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 DOT-approved, open-head, steel, 30-gallon drum. 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 previous sampling period (February 2005) were determined to be non-hazardous wastes and were taken to an offsite recycling facility on 27 April 2005. The Non-Hazardous Waste Manifest is presented in Appendix A of this report.

All IDW generated in June 2005 were determined to be non-hazardous and are awaiting removal.

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 parameters:

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

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

6.2 Stilling Basin Sampling Methodology

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

6.2.1 Installation of Temporary Well Conduit

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

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

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

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

6.2.2 Surface Water Sampling Methodology

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

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

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 were measured to the nearest 0.01 foot using an IP to provide baseline data. The data were recorded on the Monitoring Well Field Sampling Log (Appendix B).

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

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

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 on site 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.

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 28 June 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 0.000129 mg/L to 0.000952 mg/L (Table 1). These concentrations were below the HDOH GWAL of 0.0056 mg/L (HDOH, 2000) and the HDOH drinking water standard of 0.015 mg/L (HDOH, 2002). Total lead samples during this quarter were not filtered during collection.

7.1.2 Total Petroleum Hydrocarbons (TPH)

TPH as diesel was detected above the laboratory MRLs in the two stilling basin samples at concentrations ranging from 0.058 mg/L to 0.067 mg/L (Table 1). The laboratory report noted that for these detections, the chromatographic fingerprint did not resemble a petroleum product.

TPH as gasoline was not detected above the laboratory MRL 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)

No 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 28 June 2005. The results are presented in Table 2, *Summary of Groundwater Sample Results, MW-V1D,* of this report. The laboratory analytical reports are presented in Appendix A.

7.2.1 Total Lead

Total lead was detected above the laboratory MRL at concentrations of 0.006700 mg/L and 0.006980 mg/L in the primary and duplicate samples (Table 2). Both of these results were

above the HDOH GWAL of 0.0056 mg/L (HDOH, 2000), however lower than the HDOH drinking water standard of 0.015 mg/L (HDOH, 2002). Total lead samples during this quarter were not filtered during collection.

7.2.2 Total Petroleum Hydrocarbons (TPH)

TPH as diesel was detected at concentrations of 1.100 mg/L and 1.300 mg/L (Table 2).

7.2.3 1,2-Dibromoethane (EDB)

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

7.2.4 Volatile Organic Compounds (VOCs)

VOCs were not 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 of 0.000055 mg/L and 0.000073 mg/L.
- 2-Methylnaphthalene was detected above the laboratory MRL at concentrations of 0.000051 mg/L and 0.000054 mg/L.
- Acenaphthene was detected above the laboratory MRL at a concentration 0.000061 mg/L.
- Dibenzofuran was detected above the laboratory MRL at a concentration of 0.00012 mg/L.
- Fluorene was detected above the laboratory MRL at concentrations of 0.000039 mg/L and 0.000041 mg/L.
- Phenanthrene was detected above the laboratory MRL at concentrations of 0.00010 mg/L and 0.00014 mg/L.
- Fluoranthene was detected above the laboratory MRL at concentrations of 0.000064 mg/L and 0.000093 mg/L.
- Pyrene was detected above the laboratory MRL at concentrations of 0.000072 mg/L and 0.00011 mg/L.
- Benz(a)anthracene was detected above the laboratory MRL at concentrations of 0.000033 mg/L and 0.000047 mg/L in the primary and duplicate samples.
- Chrysene was detected above the laboratory MRL at concentrations of 0.000044 mg/L and 0.000062 mg/L.
- Benzo(b)fluoranthene was detected above the laboratory MRL at concentrations of 0.000028 mg/L and 0.00004 mg/L.
- Benzo(k)fluroanthene was detected above the laboratory MRL at concentrations of 0.000035 mg/L and 0.000051 mg/L.
- Benzo(a)pyrene was detected above the laboratory MRL at concentrations of 0.000031 mg/L and 0.000045 mg/L in the primary and duplicate samples.
- Indeno(1,2,3-cd)pyrene was detected at concentrations above the laboratory MRL of 0.000024 mg/L and 0.000037 mg/L.

- Benzo(g,h,i)perylene was detected above the laboratory MRL at concentrations of 0.000022 mg/L and 0.000034 mg/L (Table 2).

7.3 Trip Blank Analytical Results

One trip blank sample was submitted and analyzed for TPH as gasoline by EPA Method 8015M and 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 a concentration of 0.00054 mg/L. Toluene was not detected in any of the primary or duplicate samples, so this finding does not affect the quality of the data or the reliability of the results. No TPH as gasoline and 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 duplicate results were consistent with all primary sample results and thus valid and useable.

Laboratory Data Assessment

For the semi-volatile organic compounds by EPA Method 8270C, elevated reporting limits were noted in some of the samples analyzed. The reporting limit is elevated for benzo(g,h,i)perylene in sample RH-B-004. The chromatogram indicated the presence of non-target background components. The matrix interference prevented adequate resolution of the target compound at the reporting limit. The result is flagged to indicate the matrix interference.

The reporting limit is elevated for dibenz(a,h)anthracene in sample RH-B-005. The chromatogram indicated the presence of non-target background components. The matrix

interference prevented adequate resolution of the target compound at the reporting limit. The result is flagged to indicate the matrix interference.

The method reporting limits (MRL) for sample RH-B-006 were elevated due to less than optimal sample volume available for analysis.

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

Data Discrepancies

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

8. CONCLUSIONS AND RECOMMENDATIONS

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

Stilling Basin

- Concentrations of total lead, TPH as diesel, and TPH as gasoline were detected above the laboratory method reporting limits (MRLs). No constituents were detected at concentrations above the HDOH Tier 1 GWALs.

Sentinel Well

- Concentrations of TPH as diesel, TPH as gasoline, naphthalene, 2-methylnaphthalene, acenaphthene, dibenzofuran, fluorene, phenanthrene, fluoranthene, pyrene, benz(a)anthracene, chrysene, benzo(b)fluroanthene, benzo(k)fluoranthene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene, and benzo(g,h,i)perylene were detected above laboratory MRLs. No constituents were detected at concentrations above the HDOH Tier 1 GWALs.
- Total lead was detected at concentrations above the HDOH Tier 1 GWAL, however below the HDOH drinking water standard in the sentinel well samples. The June 2005 results were also less than the corresponding 2001 investigation results (AMEC, 2002).
- The groundwater in the upgradient sentinel well (MW-V1D) shows evidence of contamination in the basal aquifer by contaminants of potential concern.

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

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

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9. REFERENCES

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FIGURES

Site Vicinity Map – Figure 1

Site Plan– Figure 2

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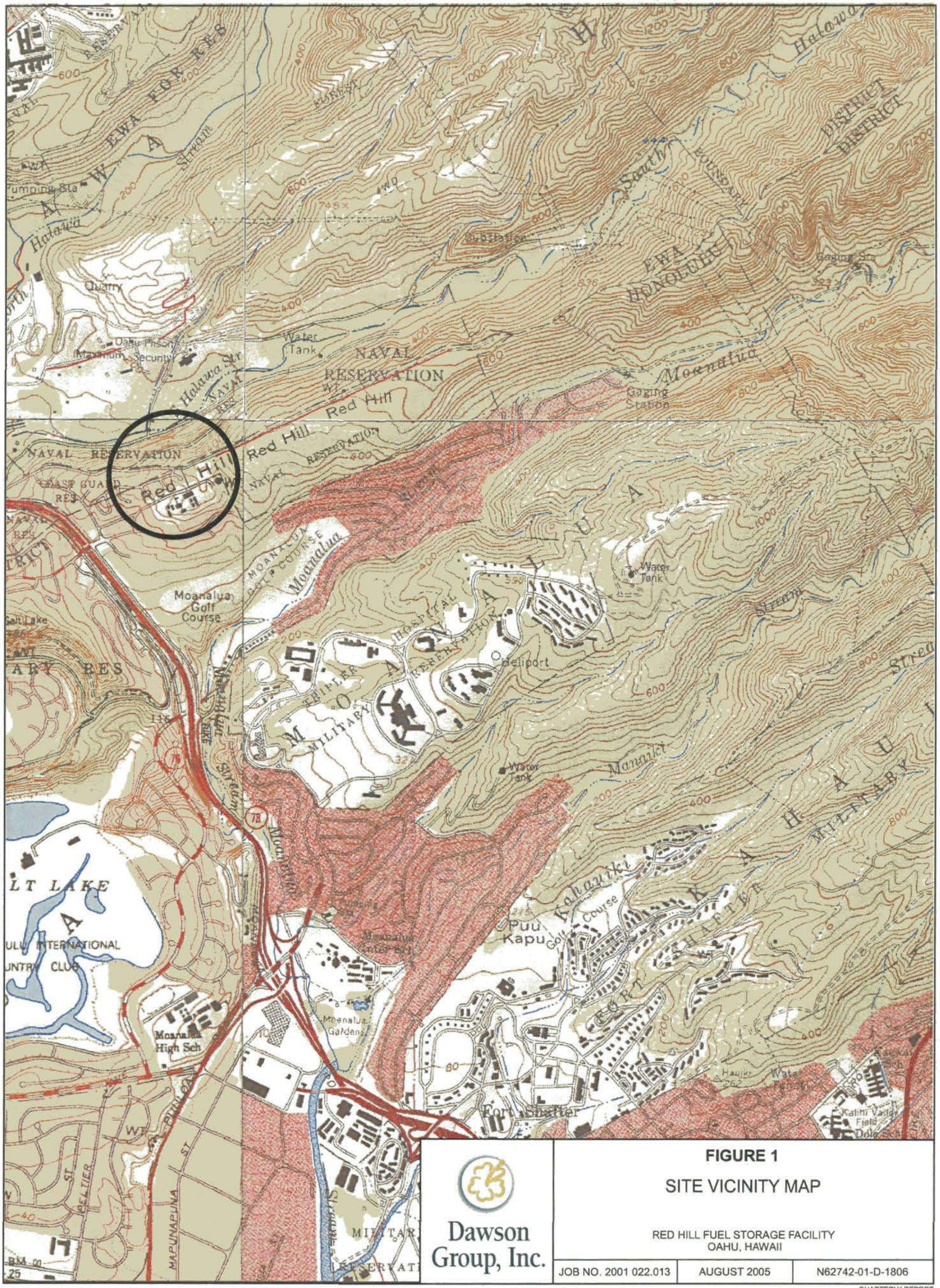

FIGURE 1

SITE VICINITY MAP

RED HILL FUEL STORAGE FACILITY
OAHU, HAWAII

Dawson Group, Inc.

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

LEGEND

EXISTING NAVY BOUNDARY

EXISTING NON-NAVY BOUNDARY

EXISTING ROAD OR PAVED AREA

QUEEN EMMA ESTATE

NORTH

SOUTH HALAWA STREAM

SOUTH HALAWA STREAM

RED HILL ADIT NO. 3
WATER PUMPING STATION

RED HILL OILY WASTE
DISPOSAL FACILITY

ADIT NO. 3
ENTRANCE

H-3 FREEWAY

SOUTH HALAWA STREAM

STILLING
BASIN

SENTINEL
WELL
MW-V1D

FISC UNDERGROUND
STORAGE TANKS

BOUNDARY OF THE RED HILL
NAVAL RESERVATION

SCALE: 1" = 600'

INFILTRATION
TUNNEL

MOANALUA GOLF COURSE

MOANALUA
FREEWAY

ALAMANU DRIVE

KUKUI DRIVE

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

Dawson Group, Inc.

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

FIGURE 2

SITE PLAN

GROUNDWATER SAMPLING
RED HILL FUEL STORAGE FACILITY, HAWAII

JOB NO.: 2001_022.013 | AUGUST 2005

TABLES

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

				Pumps Offline	Pumps Offline		Relative Percent Difference (RPD)	HDOH Tier 1 Groundwater Action Levels	Environmental Action Levels	UNITS
	SAMPLE IDENTIFICATION			RH-B-001	RH-B-004	RH-B-005				
	SAMPLE TYPE			Primary	Primary	Duplicate				
	DATE COLLECTED			02/16/2005	06/28/2005	06/28/2005				
	ANALYSIS	EPA METHOD	MRL							
Metals	Total Lead	6020	*0 000050*	0.00033	0.000952	0.000549	*54%*	0 0056	0.015 ①②	mg/L
Hydrocarbons:	TPH as Diesel	8015M	*0 052*	ND	0.043 J	0 067 Z	*44%*	NE	0.100 ①	mg/L
	TPH as Residual Range	8015M	*0 100*	ND	NA	NA	NA	NE		
	TPH as Gasoline	8015M	*0 050*	ND	<0.050	<0.050	NA	NE	0.100 ①	mg/L
EDB	1,2-Dibromoethane (EDB)	504.1	*0.0000095*	ND	<0.0000095	<0.0000097	NA	NE	0.00012 ②	mg/L
VOCs	Benzene	8260B	*0 00050*	ND	<0.00050	<0 00050	NA	1.70 ③	0.0050 ①	mg/L
	Methyl tert-Butyl Ether	8260B	*0.00050*	ND	<0 00050	<0 00050	NA	0 02 ③	0.0050 ①	mg/L
	Toluene	8260B	*0 00050*	0.001	<0 00050	<0 00050	NA	2 1 ③	0 040 ①	mg/L
	Ethylbenzene	8260B	*0 00050*	ND	<0 00050	<0.00050	NA	0 14 ③	0 030 ①	mg/L
	m,p-Xylenes	8260B	*0 00050*	ND	<0.00050	<0 00050	NA	10 0 ③	0 020 ①	mg/L
	o-Xylene	8260B	*0 00050*	ND	<0.00050	<0 00050	NA	10 0 ③	0.020 ①	mg/L
	1,2-Dichloroethane (1,2-DCA)	8260B	*0 00050*	ND	<0 00050	<0 00050	NA	0.005 ②	0 00012 ①	mg/L
PAHs:	Naphthalene	8270C SIM	*0 000020*	ND	<0.000020	<0 000020	NA	0.24	0.0062 ①	mg/L
	2-Methylnaphthalene	8270C SIM	*0.000020*	ND	<0.000020	<0 000020	NA	NE	0.010 ①	mg/L
	Acenaphthylene	8270C SIM	*0 000020*	ND	<0.000020	<0.000020	NA	NE	0.240 ①	mg/L
	Acenaphthene	8270C SIM	*0 000020*	ND	<0 000020	<0 000020	NA	0.32	0 020 ①	mg/L
	Dibenzofuran	8270C SIM	*0 000020*	ND	<0 000020	<0.000020	NA	NE	NE	mg/L
	Fluorene	8270C SIM	*0 000020*	ND	<0.000020	<0.000020	NA	NE	0.240 ①	mg/L
	Phenanthrene	8270C SIM	*0 000020*	ND	<0.000020	<0.000020	NA	NE	0 0077 ①	mg/L
	Anthracene	8270C SIM	*0 000020*	ND	<0 000020	<0.000020	NA	NE	NE	mg/L
	Fluoranthene	8270C SIM	*0 000020*	ND	<0.000020	<0 000020	NA	0.01	0.040 ①	mg/L
	Pyrene	8270C SIM	*0 000020*	ND	<0.000020	<0 000020	NA	NE	0.002 ①	mg/L
	Benz(a)anthracene	8270C SIM	*0 000020*	ND	<0.000020	<0 000020	NA	NE	0.000027 ①	mg/L
	Chrysene	8270C SIM	*0.000020*	ND	<0.000020	<0.000020	NA	NE	0.00035 ①	mg/L

TABLE 1
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Stilling Basin
Red Hill Fuel Storage Facility
Red Hill, Oahu, Hawaii

			Pumps Offline	Pumps Offline		Relative Percent Difference (RPD)	HDOH Tier 1 Groundwater Action Levels	Environmental Action Levels	
		SAMPLE IDENTIFICATION	RH-B-001	RH-B-004	RH-B-005				
		SAMPLE TYPE	Primary	Primary	Duplicate				
		DATE COLLECTED	02/16/2005	06/28/2005	06/28/2005				
	ANALYSIS	EPA METHOD	MRL						UNITS
	Benzo(b)fluoranthene	8270C SIM	*0 000020*	ND	<0.000020	<0.000020	NA	NE	0 000092 ①	mg/L
	Benzo(k)fluoranthene	8270C SIM	*0 000020*	ND	<0.000020	<0.000020	NA	NE	0.00040 ①	mg/L
	Benzo(a)pyrene	8270C SIM	*0 000020*	ND	<0 000020	<0 000020	NA	0.0002	0.000014 ①	mg/L
	Indeno(1,2,3-cd)pyrene	8270C SIM	*0 000020*	ND	<0 000020	<0 000020	NA	NE	0.000092 ①	mg/L
	Dibenz(a,h)anthracene	8270C SIM	*0 000020*	ND	<0.000020	<0 000020 i	NA	NE	0 0000092 ①	mg/L
	Benzo(g,h,i)perylene	8270C SIM	*0 000024*	ND	<0 000024 i	<0 000020	NA	NE	0 0001 ①	mg/L

Acronyms and Abbreviations

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

Notes

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

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

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

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

				Pumps Online		Relative Percent Difference (RPD)	Pumps Online	HDOH Tier 1 Groundwater Action Levels	Environmental Action Levels	UNITS
	SAMPLE IDENTIFICATION			RH-B-002	RH-B-003		RH-B-006			
	SAMPLE TYPE			Primary	Duplicate		Primary			
	DATE COLLECTED			02/16/2005	02/16/2005		06/28/2005			
	ANALYSIS	EPA METHOD	MRL							
Metals.	Total Lead	6020	*0 000050*	0.00006	0.00005	*18%*	0.000129	0 0056	0.015 ①②	mg/L
Hydrocarbons.	TPH as Diesel	8015M	*0.052*	ND [0 053]	ND	NA	0 058 Z	NE	0 100 ①	mg/L
	TPH as Residual Range	8015M	*0 100*	ND [0 11]	ND	NA	NA	NE		
	TPH as Gasoline	8015M	*0 050*	ND	ND	NA	<0.050	NE	0 100 ①	mg/L
EDB:	1,2-Dibromoethane (EDB)	504.1	*0 0000095*	ND [0 0000081]	ND [0 0000082]	NA	<0.0000095	NE	0 00012 ②	mg/L
VOCs.	Benzene	8260B	*0 00050*	ND	ND	NA	<0.00050	1 70 ③	0.0050 ①	mg/L
	Methyl tert-Butyl Ether	8260B	*0 00050*	ND	ND	NA	<0.00050	0 02 ③	0.0050 ①	mg/L
	Toluene	8260B	*0 00050*	0 0012	0 00081	*39%*	<0.00050	2 1 ③	0.040 ①	mg/L
	Ethylbenzene	8260B	*0 00050*	ND	ND	NA	<0 00050	0.14 ③	0.030 ①	mg/L
	m,p-Xylenes	8260B	*0 00050*	ND	ND	NA	<0 00050	10.0 ③	0 020 ①	mg/L
	o-Xylene	8260B	*0.00050*	ND	ND	NA	<0 00050	10.0 ③	0.020 ①	mg/L
	1,2-Dichloroethane (1,2-DCA)	8260B	*0 00050*	ND	ND	NA	<0.00050	0 005 ②	0 00012 ①	mg/L
PAHs:	Naphthalene	8270C SIM	*0 000020*	ND	ND	NA	<0.000021	0 24	0 0062 ①	mg/L
	2-Methylnaphthalene	8270C SIM	*0 000020*	ND	ND	NA	<0.000021	NE	0.010 ①	mg/L
	Acenaphthylene	8270C SIM	*0 000020*	ND	ND	NA	<0.000021	NE	0.240 ①	mg/L
	Acenaphthene	8270C SIM	*0 000020*	ND	ND	NA	<0.000021	0.32	0.020 ①	mg/L
	Dibenzofuran	8270C SIM	*0 000020*	ND	ND	NA	<0.000021	NE	NE	mg/L
	Fluorene	8270C SIM	*0 000020*	ND	ND	NA	<0.000021	NE	0.240 ①	mg/L
	Phenanthrene	8270C SIM	*0 000020*	ND	ND	NA	<0.000021	NE	0.0077 ①	mg/L
	Anthracene	8270C SIM	*0 000020*	ND	ND	NA	<0.000021	NE	NE	mg/L
	Fluoranthene	8270C SIM	*0.000020*	ND	ND	NA	<0.000021	0.01	0 040 ①	mg/L
	Pyrene	8270C SIM	*0 000020*	ND	ND	NA	<0.000021	NE	0 002 ①	mg/L
	Benz(a)anthracene	8270C SIM	*0 000020*	ND	ND	NA	<0.000021	NE	0.000027 ①	mg/L
	Chrysene	8270C SIM	*0 000020*	ND	ND	NA	<0.000021	NE	0 00035 ①	mg/L

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

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

Acronyms and Abbreviations.

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

Notes

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

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

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

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

				MW-1VD		Relative Percent Difference (RPD)	MW-1VD		Relative Percent Difference (RPD)	HDOH Tier 1 Groundwater Action Levels	Environmental Action Levels	UNITS
	SAMPLE IDENTIFICATION			RH-W-001 ③	RH-W-002		RH-W-003	RH-W-004				
	SAMPLE TYPE			Primary	Duplicate		Primary	Duplicate				
	DATE COLLECTED			02/17/2005	02/17/2005		06/28/2005	06/28/2005				
	ANALYSIS	EPA METHOD	MRL									
Metals.	Total Lead	6020	*0 000050*	**0.0102**	**0.0119**	*15%*	**0.006700**	**0.006980**	*4%*	0.0056	0 015 ①②	mg/L
Hydrocarbons.	TPH as Diesel	8015M	*0.052*	1.4 Y	1.5	*7%*	1.300 Z	1.100 Z	*17%*	NE	0.100 ①	mg/L
	TPH as Residual Range	8015M	*0 100*	0 77 O	0.89	*14%*	ND	NA	NA	NE	0 100 ①	mg/L
	TPH as Gasoline	8015M	*0 05*	ND	ND	NA	<0.050	<0 050	NA	NE	0.100 ①	mg/L
EDB.	1,2-Dibromoethane (EDB)	504.1	*0 0000095*	ND	ND [0 0000082]	NA	<0 0000095	<0.0000095	NA	NE	0 00012 ②	mg/L
BTEX:	Benzene	8260B	*0 00050*	ND	ND	NA	<0.00050	<0 00050	NA	1.70 ③	0.0050 ①	mg/L
	Methyl tert-Butyl Ether	8260B	*0 00050*	ND	ND	NA	<0 00050	<0 00050	NA	0.02 ③	0.0050 ①	mg/L
	Toluene	8260B	*0 00050*	ND	ND	NA	<0 00050	<0 00050	NA	2 1 ③	0.040 ①	mg/L
	Ethylbenzene	8260B	*0 00050*	ND	ND	NA	<0.00050	<0 00050	NA	0.14 ③	0.030 ①	mg/L
	m,p-Xylenes	8260B	*0 00050*	ND	ND	NA	<0 00050	<0 00050	NA	10 0 ③	0 020 ①	mg/L
	o-Xylene	8260B	*0.00050*	ND	ND	NA	<0.00050	<0 00050	NA	10 0 ③	0.020 ①	mg/L
	1,2-Dichloroethane (1,2-DCA)	8260B	*0 00050*	ND	ND	NA	<0.00050	<0 00050	NA	0 005 ②	0 00012 ①	mg/L
PAHs	Naphthalene	8270C SIM	*0 000020*	0 00025	0.00021	*17%*	0.000073	0.000055	*28%*	0.24	0.0062 ①	mg/L
	2-Methylnaphthalene	8270C SIM	*0 000020*	0 00014	0.000057	*84%*	0.000054	0.000051	*6%*	NE	0.010 ①	mg/L
	Acenaphthylene	8270C SIM	*0 000020*	ND	ND	NA	<0.000020	<0 000020	NA	NE	0.240 ①	mg/L
	Acenaphthene	8270C SIM	*0 000020*	0.000052	0.000054	*4%*	0.000061	0 000061	*0%*	0.32	0.020 ①	mg/L
	Dibenzofuran	8270C SIM	*0 000020*	0.00013	0 00011	*17%*	0.00012	0.00012	*0%*	NE	NE	mg/L
	Fluorene	8270C SIM	*0 000020*	0.000053	0.000043	*21%*	0.000041	0 000039	*5%*	NE	0.240 ①	mg/L
	Phenanthrene	8270C SIM	*0 000020*	0.00012	0 000082	*38%*	0.00014	0.00010	*33%*	NE	0.0077 ①	mg/L
	Anthracene	8270C SIM	*0 000020*	ND	ND	NA	<0.000020	<0 000020	NA	NE	NE	mg/L
	Fluoranthene	8270C SIM	*0 000020*	0.000035	0 000021	*50%*	0.000093	0.000064	*37%*	0.01	0.040 ①	mg/L
	Pyrene	8270C SIM	*0 000020*	0 000056	0.000029	*64%*	0.00011	0.000072	*42%*	NE	0.002 ①	mg/L
	Benz(a)anthracene	8270C SIM	*0 000020*	ND	ND	NA	0 000047	0.000033	*35%*	NE	0 000027 ①	mg/L
	Chrysene	8270C SIM	*0 000020*	0 00002	ND	NA	0.000062	0 000044	*34%*	NE	0.00035 ①	mg/L

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

			MW-1VD			MW-1VD					
SAMPLE IDENTIFICATION			RH-W-001 ③	RH-W-002	Relative Percent Difference (RPD)	RH-W-003	RH-W-004	Relative Percent Difference (RPD)	HDOH Tier 1 Groundwater Action Levels	Environmental Action Levels	UNITS
SAMPLE TYPE			Primary	Duplicate		Primary	Duplicate				
DATE COLLECTED			02/17/2005	02/17/2005		06/28/2005	06/28/2005				
ANALYSIS	EPA METHOD	MRL									
Benzo(b)fluoranthene	8270C SIM	*0.000020*	0 000025	ND	NA	0.00004	0.000028	*35%*	NE	0 000092 ①	mg/L
Benzo(k)fluoranthene	8270C SIM	*0.000020*	ND	ND	NA	0.000051	0.000035	*37%*	NE	0 00040 ①	mg/L
Benzo(a)pyrene	8270C SIM	*0 000020*	0 000022	ND	NA	0 000045	0 000031	*37%*	0 0002	0.000014 ①	mg/L
Indeno(1,2,3-cd)pyrene	8270C SIM	*0 000020*	ND	ND	NA	0 000037	0 000024	*43%*	NE	0.000092 ①	mg/L
Dibenz(a,h)anthracene	8270C SIM	*0 000020*	ND	ND	NA	<0.000020	<0 000020	NA	NE	######## ①	mg/L
Benzo(g,h,i)perylene	8270C SIM	*0 000020*	ND	ND	NA	0.000034	0 000022	*43%*	NE	0.0001 ①	mg/L

Acronyms and Abbreviations

EPA	United States Environmental Protection Agency
RH	Red Hill Fuel Station Facility
PAHs	polynuclear aromatic hydrocarbons
mg/L	milligrams per liter
MRL	method reporting limit
B	Stilling Basin at PWC Potable Water Facility
<	less than
Z	the chromatographic fingerprint does not resemble a petroleum product
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correc carbon range, but the elution pattern does not match the calibration standard
o	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard
RPD	relative percent difference between primary and duplicate sample results RPD = Absolute value (primary - duplicate) / average (primary duplicate)
Bold	value is greater than regulatory action level
NE	none established
VOCs	volatile organic carbons
ND	not detected at or above the laboratory MRL

Notes

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

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

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

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

				SAMPLE IDENTIFICATION	Trip Blank *	Trip Blank *	HDOH Tier 1 Groundwater Action Levels	Environmental Action Levels	UNITS
				SAMPLE TYPE	Trip Blank	Trip Blank			
				DATE COLLECTED	02/17/2005	06/28/2005			
	ANALYSIS	EPA METHOD	MRL						
Hydrocarbons	TPH as Gasoline	8015M	*0 05*		NA	<0.050	NE	0.100 ①	mg/L
BTEX:	Benzene	8260B	*0 00050*		ND	<0.00050	1.70 ①	0.0050 ①	mg/L
	Methyl tert-Butyl Ether	8260B	*0 00050*		ND	<0 00050	0 02 ①	0.0050 ①	mg/L
	Toluene	8260B	*0 00050*		0.0014	0 00054	2.1 ①	0 040 ①	mg/L
	Ethylbenzene	8260B	*0 00050*		ND	<0.00050	0 14 ①	0.030 ①	mg/L
	m,p-Xylenes	8260B	*0 00050*		ND	<0.00050	10 0 ①	0.020 ①	mg/L
	o-Xylene	8260B	*0 00050*		ND	<0 00050	10 0 ①	0.020 ①	mg/L
	1,2-Dichloroethane (DCA)	8260B	*0 00050*		ND	<0.00050	0.005 ②	0.005 ②	mg/L

Acronyms and Abbreviations

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

Notes

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

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

APPENDIX A

Non-Hazardous Waste Manifest

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NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.	Manifest Document No.	2. Page 1 of 1	1220-02
H I R 0 0 0 0 5 0 4 0 1	05R02		

3. Generator's Name and Mailing Address: COMNAVREG HAWAII, CODE N45, REGIONAL ENV. DEPT.
850 TICONDEROGA STREET, SUITE 110
PEARL HARBOR, HI 96860-5102

4. Generator's Phone (808-471-9890

5. Transporter 1 Company Name	6. US EPA ID Number	A. Transporter's Phone
PACIFIC COMMERCIAL SERVICES, LLC.	H I R 0 0 0 0 9 7 8 2 4	808-545-4599

7. Transporter 2 Company Name	8. US EPA ID Number	B. Transporter's Phone

9. Designated Facility Name and Site Address	10. US EPA ID Number	C. Facility's Phone
UNITEK SOLVENT SERVICES, INC. 91-125 KAOMI LOOP KAPOLEI, HI 96707	H I D 9 8 2 4 4 3 7 1 5	808-682-8284

11. Waste Shipping Name and Description	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol
a. MATERIAL NOT REGULATED BY DOT (PURGE WATER)	001	DM	00005	G
b.				
c.				
d.				

D. Additional Descriptions for Materials Listed Above
11A * HALOGEN:<1000 PPM
11B *
11C *
11D *

E. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information
24 HR EMERGENCY RESPONSE # : ERG#
808-478-8930

GENERATOR'S CERTIFICATION: I HEREBY DECLARE THAT THE CONTENTS OF THIS CONSIGNMENT ARE FULLY AND ACCURATELY DESCRIBED ABOVE BY PROPER SHIPPING NAME (WHERE APPLICABLE) AND ARE CLASSIFIED, PACKED, MARKED , AND LABELED AND ARE IN ALL RESPECTS IN PROPER CONDITION FOR TRANSPORT BY HIGHWAY ACCORDING TO APPLICABLE GOVERNMENT REGULATIONS I FURTHER CERTIFY THAT IF THIS IS USED OIL IT IS SUBJECT TO REGULATION UNDER 40 CFR PART 279; THAT IT DOES NOT CONTAIN PCBS GREATER THAN OR EQUAL TO 2 PPM; AND THAT IT HAS NOT BEEN CONTAMINATED WITH CARBURATOR CLEANERS, BRAKE SPRAY, FREON, HALOGENATED SOLVENTS, OR OTHER HAZARDOUS MATERIALS AND/OR HAZARDOUS WASTES

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

Printed/Typed Name	Signature	Month	Day	Year
Estrelita B. Higa	Estrelita B. Higa	04	27	05

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
JINGBU CHANG		04	27	05

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year

19. Discrepancy Indication Space
FECAL COLIFORM TEST RESULTS
HELD 2 DAYS

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

Printed/Typed Name	Signature	Month	Day	Year
[illegible]		04	27	05

TRANSPORTER #1

APPENDIX B

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

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

Columbia Analytical Services INC
An Employee - Owned Company

July 22, 2005 Service Request No: K0501600

Heather Kerr
Dawson Group, Incorporated
3375 Koapaka Street, Suite B200
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 July 1, 2005. For your reference, these analyses have been assigned our service request number K0501600.

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

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

Respectfully submitted,

Columbia Analytical Services, Inc.

Harvey Jacky
Project Chemist

HJ/jeb

Acronyms

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

Inorganic Data Qualifiers

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

Metals Data Qualifiers

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

Organic Data Qualifiers

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

Additional Petroleum Hydrocarbon Specific Qualifiers

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

Case Narrative

COLUMBIA ANALYTICAL SERVICES, INC.

Client:	Dawson Group, Inc.	**Service Request No.:**	K0501600
Project:	Red Hill GW Sampling / 2001022.013	**Date Received:**	7/01/05
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 7/01/05. 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.

EDB by EPA Method 504.1

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

Diesel Range Organics by EPA Method 8015B

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

Gasoline Range Organics by EPA Method 8015B

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

Volatile Organic Compounds by EPA Method 8260B

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

Semivolatile Organic Compounds by EPA Method 8270C

Elevated Method Reporting Limits:
The reporting limit is elevated for Benzo(g,h,i)perylene in sample RH-B_004. The chromatogram indicated the presence of non-target background components. The matrix interference prevented adequate resolution of the target compound at the reporting limit. The result is flagged to indicate the matrix interference.

Approved by _____ **Date** 7/15/05

The reporting limit is elevated for Dibenz(a,h)anthracene in sample RH-B-005. The chromatogram indicated the presence of non-target background components. The matrix interference prevented adequate resolution of the target compound at the reporting limit. The result is flagged to indicate the matrix interference.

The Method Reporting Limits (MRL) for sample RH-B-006 was elevated due to less than optimal sample volume available for analysis.

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

Approved by _____ **Date** 7/25/05

Chain of Custody Documentation

CHAIN OF CUSTODY

Columbia Analytical Services INC
An Employee - Owned Company

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

SR#: KBMC 1600

PAGE 1 OF 1 COC #

PROJECT NAME	RED HILL GW SAMPLING
PROJECT NUMBER	2001022.013
PROJECT MANAGER	HEATHER KERR
COMPANY/ADDRESS	DAWSON GROUP, INC
	3315 KOAPAKA ST. STE B200
CITY/STATE/ZIP	HON., HI 96819
E-MAIL ADDRESS	hkerr@dawson8a.com
PHONE #	(808) 536-5500
FAX #	(808) 536-5530
SAMPLER'S SIGNATURE	Heather Kerr

SAMPLE I.D.	DATE	TIME	LAB I D	MATRIX	NUMBER OF CONTAINERS	Semivolatile Organics by GC/MS 625☐ 8270☐	Volatile Organics 624☐ 8260☐	Hydrocarbons (*see below) Gas☒ Diesel☒ Oil☐ Fuel Fingerprint (FIO)☐ NW-HCID Screen☐ Oil & Grease/TRPH 1664☐ HEM☐	PCB's Aroclors☐ Congeners☐	Pesticides/Herbicides 608☐ 8081A☐ 8141A☐ 8151A☐	Chlorophenolics Tri☐ Tetra☐ PCP☐	PAHS 8310☐ SIM☒	Metals, Total or Dissolved (See list below)	Cyanide☐ 6020	pH, Cond., Cl, SO_4, PO_4, F, NO_2, NO_3, BOD, TSS, TDS (circle) NH_3-N, COD, Total-P, TKN, TOC, DOC (circle) NO_2+NO_3	TOX 9020☐ AOX 1650☐ 506☐	EDB 504.1	REMARKS
RH-W-003	6/28/05	1252		H2O	13		X	X				X	X					X	
RH-W-004	↓	1327		↓	13		X	X				X	X					X	all	did not collect RH-W VOAs w/ $Na_2S_2O_3$ DM
RH-B-004	↓	1634		↓	14		X	X				X	X					X	
RH-B-005	↓	1636		↓	14		X	X				X	X					X	
RH-B-006	↓	1803		H2O	14		X	X				X	X					X	
Trip Blank	—	—		H2O	4		X	X											
Temp Blank	—	—		H2O	1														
					NO	FURTHER	ENTRIES	RH	6/28/05										

REPORT REQUIREMENTS

- ___ I. Routine Report: Method Blank, Surrogate, as required
- ___ II. Report Dup., MS, MSD as required
- X III. Data Validation Report (includes all raw data)
- ___ IV. CLP Deliverable Report
- ___ V. EDD

INVOICE INFORMATION

P.O. # 2001022.013 002
Bill To: DAWSON GROUP
3315 KOAPAKA ST B200
HON, HI 96819

TURNAROUND REQUIREMENTS

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

Requested Report Date

Circle which metals are to be analyzed.

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

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

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

SPECIAL INSTRUCTIONS/COMMENTS:

1. please email hkerr@dawson8a.com upon sample receipt.
2. please email (PDF) preliminary results to hkerr@dawson8a.com
3. Follow with hardcopy of final results.
4. please call with any questions.

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Signature	Signature	Signature	Signature
Date/Time 6/29/05 1335	Date/Time 6.29.05 1335	Date/Time	Date/Time 7/1/05 1100
Printed Name Brigh	Printed Name Michael Dawson	Printed Name Michael Dawson	Printed Name
Firm Dawson	Firm VWD	Firm VWD	Firm CAS

Columbia Analytical Services Inc.
Cooler Receipt and Preservation Form

PC LINDA

Project/Client Dawson Group Work Order K05 1600

Cooler received on 7/1/05 and opened on 7/1/05 by A. Juell

1.	Were custody seals on outside of coolers?	(Y)	N
	If yes, how many and where? 1 f		
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: 8329 7189 8040	Y	(N)
5.	COC#		
	Temperature of cooler(s) upon receipt: (°C)	2.6 / 3.4 / 3.5 /	
	Temperature Blank: (°C)	NA / NA / 3.4 /	
	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 bags, sleeves, Bwrap, inserts		
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: 3 voas Rec'd w/ lg air bubbles for Trip Blanks

RESOLUTION:

Samples that required preservation or received out of temperature:

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

Metals

METALS

- Cover Page -
INORGANIC ANALYSIS DATA PACKAGE

Client: Dawson Group, Incorporated Service Request: K0501600

Project No.: 2001022.013

Project Name: Red Hill GW Sampling

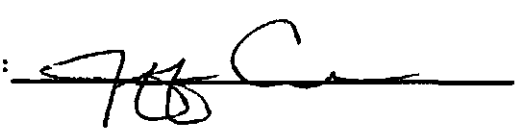
Sample No.	Lab Sample ID.
RH-W-003	K0501600-001
RH-W-003D	K0501600-001D
RH-W-003S	K0501600-001S
RH-W-004	K0501600-002
RH-B-004	K0501600-003
RH-B-005	K0501600-004
RH-B-006	K0501600-005
Method Blank	K0501600-MB

Were ICP interelement corrections applied? Yes/No YES

Were ICP background corrections applied? Yes/No YES

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

Comments:

Signature:  Date: 7/20/05

METALS
-1-
INORGANIC ANALYSIS DATA SHEET

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

Service Request: K0501600
Date Collected: 06/28/05
Date Received: 07/01/05
Units: µG/L
Basis: NA

Sample Name: RH-W-003
Lab Code: K0501600-001

Analyte	Analysis Method	MRL	MDL	Dil.	Date Extracted	Date Analyzed	Result	C	Q
Lead	6020	0.050	0.002	1	7/14/05	7/19/05	6.700		

% Solids: 0.0

Comments:

METALS

-1-

INORGANIC ANALYSIS DATA SHEET

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

Service Request: K0501600
Date Collected: 06/28/05
Date Received: 07/01/05
Units: µG/L
Basis: NA

Sample Name: RH-W-004

Lab Code: K0501600-002

Analyte	Analysis Method	MRL	MDL	Dil.	Date Extracted	Date Analyzed	Result	C	Q
Lead	6020	0.050	0.002	1	7/14/05	7/19/05	6.980		

% Solids: 0.0

Comments:

METALS
-1-
INORGANIC ANALYSIS DATA SHEET

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

Service Request: K0501600
Date Collected: 06/28/05
Date Received: 07/01/05
Units: µG/L
Basis: NA

Sample Name: RH-B-004
Lab Code: K0501600-003

Analyte	Analysis Method	MRL	MDL	Dil.	Date Extracted	Date Analyzed	Result	C	Q
Lead	6020	0.050	0.002	1	7/14/05	7/19/05	0.952		

% Solids: 0.0

Comments:

METALS

-1-

INORGANIC ANALYSIS DATA SHEET

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

Service Request: K0501600
Date Collected: 06/28/05
Date Received: 07/01/05
Units: µG/L
Basis: NA

Sample Name: RH-B-005
Lab Code: K0501600-004

Analyte	Analysis Method	MRL	MDL	Dil.	Date Extracted	Date Analyzed	Result	C	Q
Lead	6020	0.050	0.002	1	7/14/05	7/19/05	0.549		

% Solids: 0.0

Comments:

METALS
-1-
INORGANIC ANALYSIS DATA SHEET

Client:	Dawson Group, Incorporated	Service Request:	K0501600
Project No.:	2001022.013	Date Collected:	06/28/05
Project Name:	Red Hill GW Sampling	Date Received:	07/01/05
Matrix:	WATER	Units:	µG/L
		Basis:	NA

Sample Name: RH-B-006 Lab Code: K0501600-005

Analyte	Analysis Method	MRL	MDL	Dil.	Date Extracted	Date Analyzed	Result	C	Q
Lead	6020	0.050	0.002	1	7/14/05	7/19/05	0.129		

% Solids: 0.0

Comments:

METALS

-1-

INORGANIC ANALYSIS DATA SHEET

Client: Dawson Group, Incorporated
Service Request: K0501600
Project No.: 2001022.013
Date Collected:
Project Name: Red Hill GW Sampling
Date Received:
Matrix: WATER
Units: µG/L
Basis: NA

Sample Name: Method Blank
Lab Code: K0501600-MB

Analyte	Analysis Method	MRL	MDL	Dil.	Date Extracted	Date Analyzed	Result	C	Q
Lead	6020	0.050	0.002	1	7/14/05	7/19/05	0.002	U	

% Solids: 0.0

Comments:

METALS
- 5a -
SPIKE SAMPLE RECOVERY

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

Service Request: K0501600
Units: µg/L
Basis: NA
% Solids: 0.0

Sample Name: RH-W-003S
Lab Code: K0501600-001S

Analyte	Control Limit %R	Spike Result	C	Sample Result	C	Spike Added	%R	Q	Method
Lead	59 - 127	26.6		6.700		20.0	100		6020

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

METALS
-6-
DUPLICATES

Client: Dawson Group, Incorporated
Service Request: K0501600
Project No.: 2001022.013
Units: µg/L
Project Name: Red Hill GW Sampling
Basis: NA
Matrix: WATER
% Solids: 0.0

Sample Name: RH-W-003D
Lab Code: K0501600-001D

Analyte	Control Limit(%)	Sample (S)	C	Duplicate (D)	C	RPD	Q	Method
Lead	20	6.700		6.770		1		6020

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

METALS

-7-

LABORATORY CONTROL SAMPLE

Client: Dawson Group, Incorporated

Service Request: K0501600

Project No.: 2001022.013

Project Name: Red Hill GW Sampling

Aqueous LCS Source: Inorganic Ventures

Solid LCS Source:

Analyte	Aqueous ug/L True	Found	%R	Solid (mg/kg) True	Found	C	Limits		%R
Lead	20.0	19.5	98						

EPA Method 504.1

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

Service Request: K0501600
Date Collected: 06/28/2005
Date Received: 07/01/2005

EPA Method 504.1

Sample Name: RH-W-003
Lab Code: K0501600-001

Units: ug/L
Basis: NA

Extraction Method: METHOD
Analysis Method: 504.1

Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
1,2-Dibromoethane (EDB)	ND	U	0.0095	0.00096	1	07/11/05	07/11/05	KWG0511432	

Surrogate Name	%Rec	Control Limits	Note

Comments:

Analytical Results

Client:	Dawson Group, Incorporated	**Service Request:**	K0501600
Project:	Red Hill GW Sampling/2001022.013	**Date Collected:**	06/28/2005
Sample Matrix:	Water	**Date Received:**	07/01/2005

EPA Method 504.1

Sample Name:	RH-B-004	**Units:**	ug/L
Lab Code:	K0501600-003	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	504.1		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
1,2-Dibromoethane (EDB)	ND	U	0 0095	0.00096	1	07/11/05	07/11/05	KWG0511432	

Surrogate Name	%Rec	Control Limits	Note

Comments:

Analytical Results

Client:	Dawson Group, Incorporated	**Service Request:**	K0501600
Project:	Red Hill GW Sampling/2001022.013	**Date Collected:**	06/28/2005
Sample Matrix:	Water	**Date Received:**	07/01/2005

EPA Method 504.1

Sample Name:	RH-B-005	**Units:**	ug/L
Lab Code:	K0501600-004	**Basis:**	NA
Extraction Method:	*METHOD*	**Level:**	*Low*
Analysis Method:	504.1		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
1,2-Dibromoethane (EDB)	ND	U	0.0097	0.00096	1	07/11/05	07/11/05	KWG0511432	

Surrogate Name	%Rec	Control Limits	Note

Comments:

Analytical Results

Client:	Dawson Group, Incorporated	**Service Request:**	K0501600
Project:	Red Hill GW Sampling/2001022.013	**Date Collected:**	06/28/2005
Sample Matrix:	Water	**Date Received:**	07/01/2005

EPA Method 504.1

Sample Name:	RH-B-006	**Units:**	ug/L
Lab Code:	K0501600-005	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	504.1		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
1,2-Dibromoethane (EDB)	ND	U	0.0095	0.00096	1	07/11/05	07/11/05	KWG0511432	

Surrogate Name	%Rec	Control Limits	Note

Comments:

Analytical Results

Client:	Dawson Group, Incorporated	**Service Request:**	K0501600
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:	KWG0511432-3	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	504.1		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
1,2-Dibromoethane (EDB)	ND	U	0.011	0.00096	1	07/11/05	07/11/05	KWG0511432	

Surrogate Name	%Rec	Control Limits	Note

Comments:

Client:	Dawson Group, Incorporated	**Service Request:**	K0501600
Project:	Red Hill GW Sampling/2001022 013	**Date Extracted:**	07/11/2005
Sample Matrix:	Water	**Date Analyzed:**	07/11/2005

Matrix Spike Summary
EPA Method 504.1

Sample Name:	RH-B-004	**Units:**	ug/L
Lab Code:	K0501600-003	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	504.1	**Extraction Lot:**	KWG0511432

Analyte Name	Sample Result	RH-B-004MS KWG0511432-1 Matrix Spike Result	Expected	%Rec	%Rec Limits
1,2-Dibromoethane (EDB)	ND	0.0859	0.0714	120	65-135

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

QA/QC Report

Client:	Dawson Group, Incorporated	**Service Request:**	K0501600
Project:	Red Hill GW Sampling/2001022.013	**Date Extracted:**	07/11/2005
Sample Matrix:	Water	**Date Analyzed:**	07/11/2005

Lab Control Spike Summary
EPA Method 504.1

Extraction Method:	METHOD	**Units:**	ug/L
Analysis Method:	504 1	**Basis:**	NA
		Level:	Low
		Extraction Lot:	KWG0511432

	Lab Control Sample KWG0511432-2 Lab Control Spike			
Analyte Name	**Result**	**Expected**	**%Rec**	**%Rec Limits**
1,2-Dibromoethane (EDB)	0.0821	0 0714	115	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

DRO-X-8015

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

Service Request: K0501600
Date Collected: 06/28/2005
Date Received: 07/01/2005

Diesel Range Organics

Sample Name: RH-W-003
Lab Code: K0501600-001

Extraction Method: EPA 3510B
Analysis Method: 8015M

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	1300	Z	52	20	1	07/05/05	07/16/05	KWG0511055	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	95	52-128	07/16/05	Acceptable

Comments:

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

Service Request: K0501600
Date Collected: 06/28/2005
Date Received: 07/01/2005

Diesel Range Organics

Sample Name: RH-W-004
Lab Code: K0501600-002

Extraction Method: EPA 3510B
Analysis Method: 8015M

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	1100	Z	50	19	1	07/05/05	07/16/05	KWG0511055	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	86	52-128	07/16/05	Acceptable

Comments:

Analytical Results

Client:	Dawson Group, Incorporated	**Service Request:**	K0501600
Project:	Red Hill GW Sampling/2001022.013	**Date Collected:**	06/28/2005
Sample Matrix:	Water	**Date Received:**	07/01/2005

Diesel Range Organics

Sample Name:	RH-B-004	**Units:**	ug/L
Lab Code:	K0501600-003	**Basis:**	NA
Extraction Method:	EPA 3510B	**Level:**	Low
Analysis Method:	8015M		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	43	J	52	20	1	07/05/05	07/16/05	KWG0511055	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	88	52-128	07/16/05	Acceptable

Comments:

Analytical Results

Client:	Dawson Group, Incorporated	**Service Request:**	K0501600
Project:	Red Hill GW Sampling/2001022 013	**Date Collected:**	06/28/2005
Sample Matrix:	Water	**Date Received:**	07/01/2005

Diesel Range Organics

Sample Name:	RH-B-005	**Units:**	ug/L
Lab Code:	K0501600-004	**Basis:**	NA
Extraction Method:	EPA 3510B	**Level:**	Low
Analysis Method:	8015M		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	67	Z	52	20	1	07/05/05	07/16/05	KWG0511055	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	87	52-128	07/16/05	Acceptable

Comments:

Analytical Results

Client:	Dawson Group, Incorporated	**Service Request:**	K0501600
Project:	Red Hill GW Sampling/2001022 013	**Date Collected:**	06/28/2005
Sample Matrix:	Water	**Date Received:**	07/01/2005

Diesel Range Organics

Sample Name:	RH-B-006	**Units:**	ug/L
Lab Code:	K0501600-005	**Basis:**	NA
Extraction Method:	EPA 3510B	**Level:**	Low
Analysis Method:	8015M		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	58	Z	52	20	1	07/05/05	07/16/05	KWG0511055	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	93	52-128	07/16/05	Acceptable

Comments:

Analytical Results

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

Service Request: K0501600
Date Collected: NA
Date Received: NA

Diesel Range Organics

Sample Name: Method Blank
Lab Code: KWG0511055-3

Extraction Method: EPA 3510B
Analysis Method: 8015M

Units: ug/L
Basis: NA

Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	ND	U	50	19	1	07/05/05	07/16/05	KWG0511055	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	90	52-128	07/16/05	Acceptable

Comments:

QA/QC Report

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

Service Request: K0501600

Surrogate Recovery Summary
Diesel Range Organics

Extraction Method: EPA 3510B
Analysis Method: 8015M

Units: PERCENT
Level: Low

Sample Name	Lab Code	Sur1
RH-W-003	K0501600-001	95
RH-W-004	K0501600-002	86
RH-B-004	K0501600-003	88
RH-B-005	K0501600-004	87
RH-B-006	K0501600-005	93
Method Blank	KWG0511055-3	90
Lab Control Sample	KWG0511055-1	101
Duplicate Lab Control Sample	KWG0511055-2	99

Surrogate Recovery Control Limits (%)

Sur1 = o-Terphenyl	52-128

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

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

Service Request: K0501600
Date Extracted: 07/05/2005
Date Analyzed: 07/16/2005

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

Extraction Method: EPA 3510B
Analysis Method: 8015M

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG0511055

Analyte Name	Lab Control Sample KWG0511055-1 Lab Control Spike Result	Expected	%Rec	Duplicate Lab Control Sample KWG0511055-2 Duplicate Lab Control Spike Result	Expected	%Rec	%Rec Limits	RPD	RPD Limit
Diesel Range Organics (DRO)	3570	3200	111	3490	3200	109	67-151	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, Incorporated	**Service Request:**	K0501600
Project:	Red Hill GW Sampling/2001022.013	**Date Collected:**	06/28/2005
Sample Matrix:	Water	**Date Received:**	07/01/2005

Gasoline Range Organics

Sample Name:	RH-W-003	**Units:**	ug/L
Lab Code:	K0501600-001	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8015B		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics (GRO)	ND	U	50	13	1	07/08/05	07/08/05	KWG0511284	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	101	75-120	07/08/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Dawson Group, Incorporated	**Service Request:**	K0501600
Project:	Red Hill GW Sampling/2001022 013	**Date Collected:**	06/28/2005
Sample Matrix:	Water	**Date Received:**	07/01/2005

Gasoline Range Organics

Sample Name:	RH-W-004	**Units:**	ug/L
Lab Code:	K0501600-002	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8015B		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics (GRO)	ND	U	50	13	1	07/08/05	07/08/05	KWG0511284	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	101	75-120	07/08/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Dawson Group, Incorporated	**Service Request:**	K0501600
Project:	Red Hill GW Sampling/2001022.013	**Date Collected:**	06/28/2005
Sample Matrix:	Water	**Date Received:**	07/01/2005

Gasoline Range Organics

Sample Name:	RH-B-004	**Units:**	ug/L
Lab Code:	K0501600-003	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8015B		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics (GRO)	ND	U	50	13	1	07/08/05	07/08/05	KWG0511284	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	103	75-120	07/08/05	Acceptable

Comments:

Client:	Dawson Group, Incorporated	**Service Request:**	K0501600
Project:	Red Hill GW Sampling/2001022 013	**Date Collected:**	06/28/2005
Sample Matrix:	Water	**Date Received:**	07/01/2005

Gasoline Range Organics

Sample Name:	RH-B-005	**Units:**	ug/L
Lab Code:	K0501600-004	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8015B		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics (GRO)	ND	U	50	13	1	07/08/05	07/08/05	KWG0511284	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	102	75-120	07/08/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Dawson Group, Incorporated	**Service Request:**	K0501600
Project:	Red Hill GW Sampling/2001022 013	**Date Collected:**	06/28/2005
Sample Matrix:	Water	**Date Received:**	07/01/2005

Gasoline Range Organics

Sample Name:	RH-B-006	**Units:**	ug/L
Lab Code:	K0501600-005	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8015B		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics (GRO)	ND	U	50	13	1	07/08/05	07/08/05	KWG0511284	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	102	75-120	07/08/05	Acceptable

Comments:

Client:	Dawson Group, Incorporated	**Service Request:**	K0501600
Project:	Red Hill GW Sampling/2001022 013	**Date Collected:**	06/28/2005
Sample Matrix:	Water	**Date Received:**	07/01/2005

Gasoline Range Organics

Sample Name:	Trip Blank	**Units:**	ug/L
Lab Code:	K0501600-006	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8015B		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics (GRO)	ND	U	50	13	1	07/08/05	07/08/05	KWG0511284	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	104	75-120	07/08/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Dawson Group, Incorporated	**Service Request:**	K0501600
Project:	Red Hill GW Sampling/2001022.013	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

Gasoline Range Organics

Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KWG0511284-3	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8015B		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics (GRO)	ND	U	50	13	1	07/08/05	07/08/05	KWG0511284	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	105	75-120	07/08/05	Acceptable

Comments:

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

Service Request: K0501600

Surrogate Recovery Summary
Gasoline Range Organics

Extraction Method: EPA 5030B
Analysis Method: 8015B

Units: PERCENT
Level: Low

Sample Name	Lab Code	Sur1
RH-W-003	K0501600-001	101
RH-W-004	K0501600-002	101
RH-B-004	K0501600-003	103
RH-B-005	K0501600-004	102
RH-B-006	K0501600-005	102
Trip Blank	K0501600-006	104
Method Blank	KWG0511284-3	105
Lab Control Sample	KWG0511284-1	110
Duplicate Lab Control Sample	KWG0511284-2	111

Surrogate Recovery Control Limits (%)

Sur1 = 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.

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

Service Request: K0501600
Date Extracted: 07/08/2005
Date Analyzed: 07/08/2005

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

Extraction Method: EPA 5030B
Analysis Method: 8015B

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG0511284

	Lab Control Sample KWG0511284-1 Lab Control Spike			Duplicate Lab Control Sample KWG0511284-2 Duplicate Lab Control Spike					
Analyte Name	**Result**	**Expected**	**%Rec**	**Result**	**Expected**	**%Rec**	**%Rec Limits**	**RPD**	**RPD Limit**
Gasoline Range Organics (GRO)	521	500	104	553	500	111	71-128	6	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.

Volatile Organic Compounds
EPA Method 8260B

Analytical Results

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

Service Request: K0501600
Date Collected: 06/28/2005
Date Received: 07/01/2005

Volatile Organic Compounds

Sample Name: RH-W-003
Lab Code: K0501600-001

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	07/06/05	07/06/05	KWG0511093	
Methyl tert-Butyl Ether	ND	U	0.50	1	07/06/05	07/06/05	KWG0511093	
Toluene	ND	U	0.50	1	07/06/05	07/06/05	KWG0511093	
Ethylbenzene	ND	U	0.50	1	07/06/05	07/06/05	KWG0511093	
m,p-Xylenes	ND	U	0.50	1	07/06/05	07/06/05	KWG0511093	
o-Xylene	ND	U	0.50	1	07/06/05	07/06/05	KWG0511093	
1,2-Dichloroethane (EDC)	ND	U	0.50	1	07/06/05	07/06/05	KWG0511093	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	87	80-119	07/06/05	Acceptable
Toluene-d8	97	83-113	07/06/05	Acceptable
4-Bromofluorobenzene	95	72-114	07/06/05	Acceptable

Comments:

Analytical Results

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

Service Request: K0501600
Date Collected: 06/28/2005
Date Received: 07/01/2005

Volatile Organic Compounds

Sample Name: RH-W-004
Lab Code: K0501600-002

Units: ug/L
Basis: NA

Extraction Method: EPA 5030B
Analysis Method: 8260B

Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND	U	0.50	1	07/06/05	07/06/05	KWG0511093	
Methyl tert-Butyl Ether	ND	U	0.50	1	07/06/05	07/06/05	KWG0511093	
Toluene	ND	U	0.50	1	07/06/05	07/06/05	KWG0511093	
Ethylbenzene	ND	U	0.50	1	07/06/05	07/06/05	KWG0511093	
m,p-Xylenes	ND	U	0.50	1	07/06/05	07/06/05	KWG0511093	
o-Xylene	ND	U	0.50	1	07/06/05	07/06/05	KWG0511093	
1,2-Dichloroethane (EDC)	ND	U	0.50	1	07/06/05	07/06/05	KWG0511093	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	89	80-119	07/06/05	Acceptable
Toluene-d8	97	83-113	07/06/05	Acceptable
4-Bromofluorobenzene	97	72-114	07/06/05	Acceptable

Comments:

Analytical Results

Client:	Dawson Group, Incorporated	**Service Request:**	K0501600
Project:	Red Hill GW Sampling/2001022.013	**Date Collected:**	06/28/2005
Sample Matrix:	Water	**Date Received:**	07/01/2005

Volatile Organic Compounds

Sample Name:	RH-B-004	**Units:**	ug/L
Lab Code:	K0501600-003	**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	07/06/05	07/06/05	KWG0511093	
Methyl tert-Butyl Ether	ND	U	0.50	1	07/06/05	07/06/05	KWG0511093	
Toluene	ND	U	0.50	1	07/06/05	07/06/05	KWG0511093	
Ethylbenzene	ND	U	0.50	1	07/06/05	07/06/05	KWG0511093	
m,p-Xylenes	ND	U	0.50	1	07/06/05	07/06/05	KWG0511093	
o-Xylene	ND	U	0.50	1	07/06/05	07/06/05	KWG0511093	
1,2-Dichloroethane (EDC)	ND	U	0.50	1	07/06/05	07/06/05	KWG0511093	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	89	80-119	07/06/05	Acceptable
Toluene-d8	97	83-113	07/06/05	Acceptable
4-Bromofluorobenzene	90	72-114	07/06/05	Acceptable

Comments:

Analytical Results

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

Service Request: K0501600
Date Collected: 06/28/2005
Date Received: 07/01/2005

Volatile Organic Compounds

Sample Name: RH-B-005
Lab Code: K0501600-004

Units: ug/L
Basis: NA

Extraction Method: EPA 5030B
Analysis Method: 8260B

Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND	U	0.50	1	07/12/05	07/12/05	kwg0511436	
Methyl tert-Butyl Ether	ND	U	0.50	1	07/12/05	07/12/05	kwg0511436	
Toluene	ND	U	0.50	1	07/12/05	07/12/05	kwg0511436	
Ethylbenzene	ND	U	0.50	1	07/12/05	07/12/05	kwg0511436	
m,p-Xylenes	ND	U	0.50	1	07/12/05	07/12/05	kwg0511436	
o-Xylene	ND	U	0.50	1	07/12/05	07/12/05	kwg0511436	
1,2-Dichloroethane (EDC)	ND	U	0.50	1	07/12/05	07/12/05	kwg0511436	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	90	80-119	07/12/05	Acceptable
Toluene-d8	99	83-113	07/12/05	Acceptable
4-Bromofluorobenzene	94	72-114	07/12/05	Acceptable

Comments:

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

Service Request: K0501600
Date Collected: 06/28/2005
Date Received: 07/01/2005

Volatile Organic Compounds

Sample Name: RH-B-006
Lab Code: K0501600-005

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	07/12/05	07/12/05	kwg0511436	
Methyl tert-Butyl Ether	ND	U	0.50	1	07/12/05	07/12/05	kwg0511436	
Toluene	ND	U	0.50	1	07/12/05	07/12/05	kwg0511436	
Ethylbenzene	ND	U	0.50	1	07/12/05	07/12/05	kwg0511436	
m,p-Xylenes	ND	U	0.50	1	07/12/05	07/12/05	kwg0511436	
o-Xylene	ND	U	0.50	1	07/12/05	07/12/05	kwg0511436	
1,2-Dichloroethane (EDC)	ND	U	0.50	1	07/12/05	07/12/05	kwg0511436	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	92	80-119	07/12/05	Acceptable
Toluene-d8	99	83-113	07/12/05	Acceptable
4-Bromofluorobenzene	94	72-114	07/12/05	Acceptable

Comments:

Analytical Results

Client:	Dawson Group, Incorporated	**Service Request:**	K0501600
Project:	Red Hill GW Sampling/2001022.013	**Date Collected:**	06/28/2005
Sample Matrix:	Water	**Date Received:**	07/01/2005

Volatile Organic Compounds

Sample Name:	Trip Blank	**Units:**	ug/L
Lab Code:	K0501600-006	**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	07/06/05	07/06/05	KWG0511093	
Methyl tert-Butyl Ether	ND	U	0.50	1	07/06/05	07/06/05	KWG0511093	
Toluene	**0.54**		0.50	1	07/06/05	07/06/05	KWG0511093	
Ethylbenzene	ND	U	0.50	1	07/06/05	07/06/05	KWG0511093	
m,p-Xylenes	ND	U	0.50	1	07/06/05	07/06/05	KWG0511093	
o-Xylene	ND	U	0.50	1	07/06/05	07/06/05	KWG0511093	
1,2-Dichloroethane (EDC)	ND	U	0.50	1	07/06/05	07/06/05	KWG0511093	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	88	80-119	07/06/05	Acceptable
Toluene-d8	96	83-113	07/06/05	Acceptable
4-Bromofluorobenzene	92	72-114	07/06/05	Acceptable

Comments:

Analytical Results

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

Service Request: K0501600
Date Collected: NA
Date Received: NA

Volatile Organic Compounds

Sample Name: Method Blank
Lab Code: KWG0511093-4

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	07/06/05	07/06/05	KWG0511093	
Methyl tert-Butyl Ether	ND	U	0.50	1	07/06/05	07/06/05	KWG0511093	
Toluene	ND	U	0.50	1	07/06/05	07/06/05	KWG0511093	
Ethylbenzene	ND	U	0.50	1	07/06/05	07/06/05	KWG0511093	
m,p-Xylenes	ND	U	0.50	1	07/06/05	07/06/05	KWG0511093	
o-Xylene	ND	U	0.50	1	07/06/05	07/06/05	KWG0511093	
1,2-Dichloroethane (EDC)	ND	U	0.50	1	07/06/05	07/06/05	KWG0511093	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	88	80-119	07/06/05	Acceptable
Toluene-d8	95	83-113	07/06/05	Acceptable
4-Bromofluorobenzene	91	72-114	07/06/05	Acceptable

Comments:

Analytical Results

Client:	Dawson Group, Incorporated	**Service Request:**	K0501600
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:	KWG0511436-2	**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	07/12/05	07/12/05	KWG0511436	
Methyl tert-Butyl Ether	ND	U	0.50	1	07/12/05	07/12/05	KWG0511436	
Toluene	ND	U	0.50	1	07/12/05	07/12/05	KWG0511436	
Ethylbenzene	ND	U	0.50	1	07/12/05	07/12/05	KWG0511436	
m,p-Xylenes	ND	U	0.50	1	07/12/05	07/12/05	KWG0511436	
o-Xylene	ND	U	0.50	1	07/12/05	07/12/05	KWG0511436	
1,2-Dichloroethane (EDC)	ND	U	0.50	1	07/12/05	07/12/05	KWG0511436	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	90	80-119	07/12/05	Acceptable
Toluene-d8	98	83-113	07/12/05	Acceptable
4-Bromofluorobenzene	94	72-114	07/12/05	Acceptable

Comments:

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

Service Request: K0501600

Surrogate Recovery Summary
Volatile Organic Compounds

Extraction Method: EPA 5030B
Analysis Method: 8260B

Units: PERCENT
Level: Low

Sample Name	Lab Code	Sur1	Sur2	Sur3
RH-W-003	K0501600-001	87	97	95
RH-W-004	K0501600-002	89	97	97
RH-B-004	K0501600-003	89	97	90
RH-B-005	K0501600-004	90	99	94
RH-B-006	K0501600-005	92	99	94
Trip Blank	K0501600-006	88	96	92
Method Blank	KWG0511093-4	88	95	91
Method Blank	KWG0511436-2	90	98	94
RH-B-006MS	KWG0511436-3	93	101	96
RH-B-006DMS	KWG0511436-4	96	102	97
Lab Control Sample	KWG0511093-3	91	97	97
Lab Control Sample	KWG0511436-1	92	100	97

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.

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

Service Request: K0501600
Date Extracted: 07/12/2005
Date Analyzed: 07/12/2005

Matrix Spike/Duplicate Matrix Spike Summary
Volatile Organic Compounds

Sample Name: RH-B-006
Lab Code: K0501600-005

Units: ug/L
Basis: NA

Extraction Method: EPA 5030B
Analysis Method: 8260B

Level: Low
Extraction Lot: KWG0511436

Analyte Name	Sample Result	RH-B-006MS KWG0511436-3 Matrix Spike			RH-B-006DMS KWG0511436-4 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
Benzene	ND	10.9	10.0	109	10.9	10 0	109	75-130	0	30
Methyl tert-Butyl Ether	ND	9.55	10.0	96	10 4	10.0	104	50-152	9	30
Toluene	ND	10 2	10.0	102	10 1	10 0	101	72-132	1	30
Ethylbenzene	ND	10.5	10 0	105	10 4	10.0	104	83-130	1	30
m,p-Xylenes	ND	20.9	20 0	104	20.7	20 0	103	84-132	1	30
o-Xylene	ND	10.2	10.0	102	10.0	10.0	100	83-128	2	30
1,2-Dichloroethane (EDC)	ND	8 92	10.0	89	9.49	10.0	95	74-122	6	30

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

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

Service Request: K0501600
Date Extracted: 07/06/2005
Date Analyzed: 07/06/2005

Lab Control Spike Summary
Volatile Organic Compounds

Extraction Method: EPA 5030B
Analysis Method: 8260B

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG0511093

Analyte Name	Lab Control Sample KWG0511093-3 Lab Control Spike Result	Expected	%Rec	%Rec Limits
Benzene	9.08	10.0	91	78-121
Methyl tert-Butyl Ether	9.33	10.0	93	63-132
Toluene	8.53	10.0	85	76-122
Ethylbenzene	9.88	10.0	99	84-122
m,p-Xylenes	19.9	20.0	99	83-125
o-Xylene	9.81	10.0	98	83-122
1,2-Dichloroethane (EDC)	8.58	10.0	86	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.

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

Service Request: K0501600
Date Extracted: 07/12/2005
Date Analyzed: 07/12/2005

Lab Control Spike Summary
Volatile Organic Compounds

Extraction Method: EPA 5030B
Analysis Method: 8260B

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG0511436

Analyte Name	Lab Control Sample KWG0511436-1 Lab Control Spike Result	Expected	%Rec	%Rec Limits
Benzene	9.48	10.0	95	78-121
Methyl tert-Butyl Ether	9.33	10.0	93	63-132
Toluene	8.78	10.0	88	76-122
Ethylbenzene	9.09	10.0	91	84-122
m,p-Xylenes	18.0	20.0	90	83-125
o-Xylene	9.00	10.0	90	83-122
1,2-Dichloroethane (EDC)	8.42	10.0	84	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
EPA Method 8270C

Client:	Dawson Group, Incorporated	**Service Request:**	K0501600
Project:	Red Hill GW Sampling/2001022.013	**Date Collected:**	06/28/2005
Sample Matrix:	Water	**Date Received:**	07/01/2005

Polynuclear Aromatic Hydrocarbons

Sample Name:	RH-W-003	**Units:**	ug/L
Lab Code:	K0501600-001	**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	**0.073**		0 020	1	07/05/05	07/07/05	KWG0511037	
2-Methylnaphthalene	**0.054**		0 020	1	07/05/05	07/07/05	KWG0511037	
Acenaphthylene	ND	U	0 020	1	07/05/05	07/07/05	KWG0511037	
Acenaphthene	**0.061**		0 020	1	07/05/05	07/07/05	KWG0511037	
Dibenzofuran	**0.12**		0.020	1	07/05/05	07/07/05	KWG0511037	
Fluorene	**0.041**		0.020	1	07/05/05	07/07/05	KWG0511037	
Phenanthrene	**0.14**		0.020	1	07/05/05	07/07/05	KWG0511037	
Anthracene	ND	U	0.020	1	07/05/05	07/07/05	KWG0511037	
Fluoranthene	**0.093**		0.020	1	07/05/05	07/07/05	KWG0511037	
Pyrene	**0.11**		0.020	1	07/05/05	07/07/05	KWG0511037	
Benz(a)anthracene	**0.047**		0.020	1	07/05/05	07/07/05	KWG0511037	
Chrysene	**0.062**		0 020	1	07/05/05	07/07/05	KWG0511037	
Benzo(b)fluoranthene	**0.040**		0 020	1	07/05/05	07/07/05	KWG0511037	
Benzo(k)fluoranthene	**0.051**		0.020	1	07/05/05	07/07/05	KWG0511037	
Benzo(a)pyrene	**0.045**		0 020	1	07/05/05	07/07/05	KWG0511037	
Indeno(1,2,3-cd)pyrene	**0.037**		0.020	1	07/05/05	07/07/05	KWG0511037	
Dibenz(a,h)anthracene	ND	U	0.020	1	07/05/05	07/07/05	KWG0511037	
Benzo(g,h,i)perylene	**0.034**		0 020	1	07/05/05	07/07/05	KWG0511037	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	76	24-111	07/07/05	Acceptable
Fluoranthene-d10	88	26-123	07/07/05	Acceptable
Terphenyl-d14	92	25-146	07/07/05	Acceptable

Comments:

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

Service Request: K0501600
Date Collected: 06/28/2005
Date Received: 07/01/2005

Polynuclear Aromatic Hydrocarbons

Sample Name: RH-W-004
Lab Code: K0501600-002

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	0.055		0.020	1	07/05/05	07/07/05	KWG0511037	
2-Methylnaphthalene	0.051		0 020	1	07/05/05	07/07/05	KWG0511037	
Acenaphthylene	ND	U	0.020	1	07/05/05	07/07/05	KWG0511037	
Acenaphthene	0.061		0.020	1	07/05/05	07/07/05	KWG0511037	
Dibenzofuran	0.12		0 020	1	07/05/05	07/07/05	KWG0511037	
Fluorene	0.039		0 020	1	07/05/05	07/07/05	KWG0511037	
Phenanthrene	0.10		0 020	1	07/05/05	07/07/05	KWG0511037	
Anthracene	ND	U	0.020	1	07/05/05	07/07/05	KWG0511037	
Fluoranthene	0.064		0.020	1	07/05/05	07/07/05	KWG0511037	
Pyrene	0.072		0 020	1	07/05/05	07/07/05	KWG0511037	
Benz(a)anthracene	0.033		0.020	1	07/05/05	07/07/05	KWG0511037	
Chrysene	0.044		0.020	1	07/05/05	07/07/05	KWG0511037	
Benzo(b)fluoranthene	0.028		0.020	1	07/05/05	07/07/05	KWG0511037	
Benzo(k)fluoranthene	0.035		0.020	1	07/05/05	07/07/05	KWG0511037	
Benzo(a)pyrene	0.031		0.020	1	07/05/05	07/07/05	KWG0511037	
Indeno(1,2,3-cd)pyrene	0.024		0.020	1	07/05/05	07/07/05	KWG0511037	
Dibenz(a,h)anthracene	ND	U	0 020	1	07/05/05	07/07/05	KWG0511037	
Benzo(g,h,i)perylene	0.022		0.020	1	07/05/05	07/07/05	KWG0511037	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	76	24-111	07/07/05	Acceptable
Fluoranthene-d10	83	26-123	07/07/05	Acceptable
Terphenyl-d14	85	25-146	07/07/05	Acceptable

Comments:

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

Service Request: K0501600
Date Collected: 06/28/2005
Date Received: 07/01/2005

Polynuclear Aromatic Hydrocarbons

Sample Name: RH-B-004
Lab Code: K0501600-003

Units: ug/L
Basis: NA

Extraction Method: EPA 3535
Analysis Method: 8270C SIM

Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	0.020	1	07/05/05	07/07/05	KWG0511037	
2-Methylnaphthalene	ND	U	0.020	1	07/05/05	07/07/05	KWG0511037	
Acenaphthylene	ND	U	0.020	1	07/05/05	07/07/05	KWG0511037	
Acenaphthene	ND	U	0 020	1	07/05/05	07/07/05	KWG0511037	
Dibenzofuran	ND	U	0.020	1	07/05/05	07/07/05	KWG0511037	
Fluorene	ND	U	0.020	1	07/05/05	07/07/05	KWG0511037	
Phenanthrene	ND	U	0.020	1	07/05/05	07/07/05	KWG0511037	
Anthracene	ND	U	0 020	1	07/05/05	07/07/05	KWG0511037	
Fluoranthene	ND	U	0.020	1	07/05/05	07/07/05	KWG0511037	
Pyrene	ND	U	0.020	1	07/05/05	07/07/05	KWG0511037	
Benz(a)anthracene	ND	U	0.020	1	07/05/05	07/07/05	KWG0511037	
Chrysene	ND	U	0.020	1	07/05/05	07/07/05	KWG0511037	
Benzo(b)fluoranthene	ND	U	0.020	1	07/05/05	07/07/05	KWG0511037	
Benzo(k)fluoranthene	ND	U	0 020	1	07/05/05	07/07/05	KWG0511037	
Benzo(a)pyrene	ND	U	0 020	1	07/05/05	07/07/05	KWG0511037	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	1	07/05/05	07/07/05	KWG0511037	
Dibenz(a,h)anthracene	ND	U	0.020	1	07/05/05	07/07/05	KWG0511037	
Benzo(g,h,i)perylene	ND	Ui	0.024	1	07/05/05	07/07/05	KWG0511037	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	79	24-111	07/07/05	Acceptable
Fluoranthene-d10	85	26-123	07/07/05	Acceptable
Terphenyl-d14	86	25-146	07/07/05	Acceptable

Comments:

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

Service Request: K0501600
Date Collected: 06/28/2005
Date Received: 07/01/2005

Polynuclear Aromatic Hydrocarbons

Sample Name: RH-B-005
Lab Code: K0501600-004

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	ND	U	0.020	1	07/05/05	07/07/05	KWG0511037	
2-Methylnaphthalene	ND	U	0.020	1	07/05/05	07/07/05	KWG0511037	
Acenaphthylene	ND	U	0.020	1	07/05/05	07/07/05	KWG0511037	
Acenaphthene	ND	U	0.020	1	07/05/05	07/07/05	KWG0511037	
Dibenzofuran	ND	U	0.020	1	07/05/05	07/07/05	KWG0511037	
Fluorene	ND	U	0.020	1	07/05/05	07/07/05	KWG0511037	
Phenanthrene	ND	U	0.020	1	07/05/05	07/07/05	KWG0511037	
Anthracene	ND	U	0.020	1	07/05/05	07/07/05	KWG0511037	
Fluoranthene	ND	U	0.020	1	07/05/05	07/07/05	KWG0511037	
Pyrene	ND	U	0.020	1	07/05/05	07/07/05	KWG0511037	
Benz(a)anthracene	ND	U	0.020	1	07/05/05	07/07/05	KWG0511037	
Chrysene	ND	U	0.020	1	07/05/05	07/07/05	KWG0511037	
Benzo(b)fluoranthene	ND	U	0.020	1	07/05/05	07/07/05	KWG0511037	
Benzo(k)fluoranthene	ND	U	0.020	1	07/05/05	07/07/05	KWG0511037	
Benzo(a)pyrene	ND	U	0.020	1	07/05/05	07/07/05	KWG0511037	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	1	07/05/05	07/07/05	KWG0511037	
Dibenz(a,h)anthracene	ND	Ui	0.026	1	07/05/05	07/07/05	KWG0511037	
Benzo(g,h,i)perylene	ND	U	0.020	1	07/05/05	07/07/05	KWG0511037	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	82	24-111	07/07/05	Acceptable
Fluoranthene-d10	86	26-123	07/07/05	Acceptable
Terphenyl-d14	85	25-146	07/07/05	Acceptable

Comments:

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

Service Request: K0501600
Date Collected: 06/28/2005
Date Received: 07/01/2005

Polynuclear Aromatic Hydrocarbons

Sample Name: RH-B-006
Lab Code: K0501600-005

Units: ug/L
Basis: NA

Extraction Method: EPA 3535
Analysis Method: 8270C SIM

Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	0 021	1	07/05/05	07/07/05	KWG0511037	
2-Methylnaphthalene	ND	U	0 021	1	07/05/05	07/07/05	KWG0511037	
Acenaphthylene	ND	U	0 021	1	07/05/05	07/07/05	KWG0511037	
Acenaphthene	ND	U	0.021	1	07/05/05	07/07/05	KWG0511037	
Dibenzofuran	ND	U	0.021	1	07/05/05	07/07/05	KWG0511037	
Fluorene	ND	U	0.021	1	07/05/05	07/07/05	KWG0511037	
Phenanthrene	ND	U	0 021	1	07/05/05	07/07/05	KWG0511037	
Anthracene	ND	U	0.021	1	07/05/05	07/07/05	KWG0511037	
Fluoranthene	ND	U	0.021	1	07/05/05	07/07/05	KWG0511037	
Pyrene	ND	U	0 021	1	07/05/05	07/07/05	KWG0511037	
Benz(a)anthracene	ND	U	0 021	1	07/05/05	07/07/05	KWG0511037	
Chrysene	ND	U	0.021	1	07/05/05	07/07/05	KWG0511037	
Benzo(b)fluoranthene	ND	U	0 021	1	07/05/05	07/07/05	KWG0511037	
Benzo(k)fluoranthene	ND	U	0.021	1	07/05/05	07/07/05	KWG0511037	
Benzo(a)pyrene	ND	U	0.021	1	07/05/05	07/07/05	KWG0511037	
Indeno(1,2,3-cd)pyrene	ND	U	0 021	1	07/05/05	07/07/05	KWG0511037	
Dibenz(a,h)anthracene	ND	U	0.021	1	07/05/05	07/07/05	KWG0511037	
Benzo(g,h,i)perylene	ND	U	0 021	1	07/05/05	07/07/05	KWG0511037	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	72	24-111	07/07/05	Acceptable
Fluoranthene-d10	71	26-123	07/07/05	Acceptable
Terphenyl-d14	81	25-146	07/07/05	Acceptable

Comments:

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

Service Request: K0501600
Date Collected: NA
Date Received: NA

Polynuclear Aromatic Hydrocarbons

Sample Name: Method Blank
Lab Code: KWG0511037-3

Units: ug/L
Basis: NA

Extraction Method: EPA 3535
Analysis Method: 8270C SIM

Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	0.020	1	07/05/05	07/07/05	KWG0511037	
2-Methylnaphthalene	ND	U	0.020	1	07/05/05	07/07/05	KWG0511037	
Acenaphthylene	ND	U	0.020	1	07/05/05	07/07/05	KWG0511037	
Acenaphthene	ND	U	0.020	1	07/05/05	07/07/05	KWG0511037	
Dibenzofuran	ND	U	0.020	1	07/05/05	07/07/05	KWG0511037	
Fluorene	ND	U	0.020	1	07/05/05	07/07/05	KWG0511037	
Phenanthrene	ND	U	0.020	1	07/05/05	07/07/05	KWG0511037	
Anthracene	ND	U	0.020	1	07/05/05	07/07/05	KWG0511037	
Fluoranthene	ND	U	0.020	1	07/05/05	07/07/05	KWG0511037	
Pyrene	ND	U	0.020	1	07/05/05	07/07/05	KWG0511037	
Benz(a)anthracene	ND	U	0.020	1	07/05/05	07/07/05	KWG0511037	
Chrysene	ND	U	0.020	1	07/05/05	07/07/05	KWG0511037	
Benzo(b)fluoranthene	ND	U	0.020	1	07/05/05	07/07/05	KWG0511037	
Benzo(k)fluoranthene	ND	U	0.020	1	07/05/05	07/07/05	KWG0511037	
Benzo(a)pyrene	ND	U	0.020	1	07/05/05	07/07/05	KWG0511037	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	1	07/05/05	07/07/05	KWG0511037	
Dibenz(a,h)anthracene	ND	U	0.020	1	07/05/05	07/07/05	KWG0511037	
Benzo(g,h,i)perylene	ND	U	0.020	1	07/05/05	07/07/05	KWG0511037	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	78	24-111	07/07/05	Acceptable
Fluoranthene-d10	72	26-123	07/07/05	Acceptable
Terphenyl-d14	79	25-146	07/07/05	Acceptable

Comments:

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

Service Request: K0501600

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-W-003	K0501600-001	76	88	92
RH-W-004	K0501600-002	76	83	85
RH-B-004	K0501600-003	79	85	86
RH-B-005	K0501600-004	82	86	85
RH-B-006	K0501600-005	72	71	81
Method Blank	KWG0511037-3	78	72	79
Lab Control Sample	KWG0511037-1	100	97	91
Duplicate Lab Control Sample	KWG0511037-2	92	86	81

Surrogate Recovery Control Limits (%)

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

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

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

Service Request: K0501600
Date Extracted: 07/05/2005
Date Analyzed: 07/07/2005

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: KWG0511037

Analyte Name	Lab Control Sample KWG0511037-1 Lab Control Spike Result	Expected	%Rec	Duplicate Lab Control Sample KWG0511037-2 Duplicate Lab Control Spike Result	Expected	%Rec	%Rec Limits	RPD	RPD Limit
Naphthalene	2.44	2.50	98	2 20	2 50	88	32-124	10	30
2-Methylnaphthalene	2.54	2 50	102	2.34	2.50	93	19-133	8	30
Acenaphthylene	2.39	2.50	95	2.10	2.50	84	36-128	13	30
Acenaphthene	2.58	2.50	103	2 29	2.50	92	36-126	12	30
Dibenzofuran	2.75	2.50	110	2.48	2.50	99	10-167	10	30
Fluorene	2.79	2 50	112	2 53	2 50	101	41-130	10	30
Phenanthrene	2.61	2 50	104	2 30	2.50	92	43-129	13	30
Anthracene	2.55	2.50	102	2.28	2.50	91	36-131	11	30
Fluoranthene	2.52	2.50	101	2.25	2.50	90	45-139	11	30
Pyrene	2.58	2.50	103	2 37	2.50	95	38-143	8	30
Benz(a)anthracene	2.54	2.50	102	2 31	2 50	92	45-131	10	30
Chrysene	2.59	2.50	103	2.35	2.50	94	47-132	10	30
Benzo(b)fluoranthene	2.62	2.50	105	2.41	2.50	97	51-135	8	30
Benzo(k)fluoranthene	2.58	2.50	103	2.38	2.50	95	46-139	8	30
Benzo(a)pyrene	2.67	2.50	107	2.47	2.50	99	40-138	8	30
Indeno(1,2,3-cd)pyrene	2.72	2.50	109	2 35	2.50	94	35-148	15	30
Dibenz(a,h)anthracene	2.86	2.50	114	2 62	2.50	105	42-143	9	30
Benzo(g,h,i)perylene	2 81	2.50	112	2 34	2.50	94	42-139	18	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 C

Confined-Space Entry Permit

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CONFINED SPACE ENTRY PERMIT

INSTRUCTIONS (** *Nobody will enter a confined space until permit is complete)*

1) Complete permit before entry begins 2) Post permit at entrance to confined space until work in the confined space is complete 3) Send permit to safety coordinator for review within 24 hours of completion of the work in the confined space.

GENERAL INFORMATION

JOBSITE: Red Hill Fuel Storage Facility

PERMIT BEGINS Date 6/28/05 Time 0800 AM / PM PERMIT EXPIRES: Date 6/28/05 Time: 1800 AM / (PM)

LOCATION & DESCRIPTION OF CONFINED SPACE
PWC potable water stilling basin 100' ladder to catwalk below

PURPOSE OF ENTRY Install temporary 2" PVC well conduit for sampling

NAMES OF AUTHORIZED INDIVIDUALS (Please print)

AUTHORIZED ENTRY SUPERVISOR: Heather Kerr / Bryan Graham WILL HE/SHE SUPERVISE ENTRY: (YES) NO

AUTHORIZED ATTENDANTS	AUTHORIZED ENTRANTS
1) Bryan Graham	1) Bryan Graham
2) Heather Kerr	2) Heather Kerr
3)	3)
4)	4)

METHOD OF COMMUNICATION

DESCRIBE: 2-way radios

EQUIPMENT REQUIRED FOR ENTRY

Hard Hats	YES	(NO)
Coveralls	YES	(NO)
Boots	(YES)	NO
Safety Glasses	YES	(NO)
Safety Goggles	YES	(NO)
Face Shield	YES	(NO)
Ear Protection	YES	(NO)
Encapsulated Suit	YES	(NO)
Gloves	(YES)	NO
Safety Lights	YES	(NO)
Lockout Devices	(YES)	NO
Warning Signs	YES	(NO)
Fire Extinguisher	YES	(NO)
Ventilator/Blower	YES	(NO)
Non-Spark Tools	YES	(NO)
Rescue Equipment	(YES)	NO
Other_____	YES	NO
Other_____	YES	NO

RESPIRATORS REQUIRED FOR ENTRY

ARE RESPIRATORS REQUIRED? YES (NO) IF YES, WHAT TYPE

AIR-PURIFYING Half Mask_____ Full Face_____

Type of Filters:_____

AIR-SUPPLIED _____ and/or _____ and/or _____

Air Bottles Compressor Egress Bottles

SELF-CONTAINED BREATHING APPARATUS (SCBA): _____

*** *NOTE: Air-supplied respirators with egress bottle or SCBA respirators are required for atmospheres that are immediately Dangerous To Life Or Health (IDLH)*

RESCUE EQUIPMENT REQUIRED FOR ENTRY

SCBA	YES	NO
Harness/Lifeline	(YES)	NO
Wristlets	YES	NO
Tripod/Manlift	(YES)	NO
Winch	(YES)	NO
First-Aid Kit	(YES)	NO
Stretcher	YES	NO

EMERGENCY SERVICES:
Federal Fire Department
Identify
Telephone
Method of Communication
471-HH 7117
Phone Number

ISOLATION REQUIREMENTS (Please circle appropriate method, circle YES or NO, and initial.)

			COMPLETED BY:
Electrical: DISCONNECT - LOCKOUT - TAGGED - Other:_____	YES	(NO)	HK
Mechanical Moving Parts LATCH - CHAIN - CHOCK - BLOCK - Other _____	YES	(NO)	
Hydraulics. BLANKED - BLEED - DISCONNECT - Other:_____	YES	(NO)	
Pipelines: BLANKED - BLEED - DISCONNECT - Other:_____	YES	(NO)	
Valves: LOCKOUT - DISCONNECT - TAG - Other:_____	YES	(NO)	
Belt Drives DISCONNECT - TAG - Other:_____	YES	(NO)	
Chain Drives. DISCONNECT - TAG - Other:_____	YES	(NO)	
Shaft Drives DISCONNECT - TAG - Other:_____	YES	(NO)	
Space Purged INERT GAS - WATER - Other _____	YES	(NO)	
Other:_____	YES	NO	
Other:_____	YES	NO	

ACCEPTABLE ENTRY CONDITIONS

OXYGEN 19.5 21 %	FLAMMABLE / COMBUSTIBLES Ø % LEL	OTHER
HYDROGEN SULFIDE Ø PPM	CARBON MONOXIDE 0-1 PPM	OTHER

TESTING AND MONITORING CHECKLIST

MAKE MODEL & SERIAL NUMBER OF TESTING EQUIPMENT: Impact 4-gas

DATE EQUIPMENT CALIBRATED: 6/05 | PERIODIC TESTING: no | CONTINUOUS MONITORING: yes

	TEST 1	TEST 2	TEST 3	TEST 4	TEST 5	TEST 6	TEST 7	TEST 8
Date	6/28/05	6/28/05	6/28/05	6/28/05				
Time	0814 (AM)/PM	0830 (AM)/PM	0930 (AM)/PM	1000 (AM)/PM	AM.PM	AM.PM	AM PM	AM PM
Oxygen	20.9 %	22.9 %	20.9 %	20.9 %	%	%	%	%
LEL	Ø %	Ø %	Ø %	Ø %	%	%	%	%
CO	1 PPM	Ø PPM	Ø PPM	Ø PPM	PPM	PPM	PPM	PPM
H2S	Ø PPM	Ø PPM	Ø PPM	Ø PPM	PPM	PPM	PPM	PPM
Tox								
Tested by	BG/HK top of well	BG	BG	BG				

CONFINED SPACE HAZARDS CHECKLIST (Please circle YES or NO)

			IF YES HOW IS HAZARD CONTROLLED
Oxygen Deficiency (<19.5%)	YES	(NO)	
Oxygen Enriched (>22%)	YES	(NO)	
Toxic Atmosphere	YES	(NO)	
Flammable / Combustible Atmosphere	YES	(NO)	
Electrical	YES	(NO)	
Mechanical	YES	(NO)	
Entrapment	YES	(NO)	
Pipelines	YES	(NO)	
Bacteria / Infectious	YES	(NO)	
Insects / Rodents	YES	(NO)	
Temperature	YES	(NO)	
Falls	(YES)	NO	Tripod w/ winch & retrieval lifeline & harness
Other:	YES	NO	
Other	YES	NO	

HOT WORK PERMIT

IS A HOT WORK PERMIT REQUIRED? YES (NO) IF YES, IS IT ATTACHED TO THIS PERMIT? YES NO

SIGNATURE OF ATTENDANTS AND ENTRANTS

The confined space job and it's safety aspects have been explained to us and we have read and understand the above permit. We consider it safe to proceed with the confined space entry work (Please sign, date and initial below)

ATTENDANTS			ENTRANTS		
1) Heather Jensen	Date 6/28/05	Initials HK	1) Heather Jensen	Date 6/28/05	Initials HK
2) BG	Date 6/28/05	Initials BG	2) BG	Date 6/28/05	Initials BG
3)	Date	Initials	3)	Date	Initials
4)	Date	Initials	4)	Date	Initials

SIGNATURE OF ENTRY SUPERVISOR

SIGNATURE Heather Jensen | DATE 6/28/05 | TIME 0805 (AM)/PM

CANCELLATION OF PERMIT

DATE CANCELLED	TIME CANCELLED AM / PM	CANCELLED BY (Signature)
REASON PERMIT WAS CANCELLED:		

EVALUATION (Review within 24 hours of completion of the work in the confined space.)

EVALUATED BY (Signature)	DATE	TIME AM / PM

APPENDIX D

Monitoring Well Sampling Logs

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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: 6/28/2005 TIME: 11:45 CLIMATIC CONDITIONS: overcast
PERSONNEL: B Graham and H. Kerr

WELL INFORMATION

Well Name/Number: MW-V1D
Well Location: *
Casing Diameter (inches): 1 (d_c)
Total Well Depth (feet): 100
Initial Depth to Water (feet): 83.56
Depth to Product (feet): NMP
Height of Water Column (feet): 16.44 (h)

PURGE VOLUME

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

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

Minimum Purge Volume (gallons): 2.01

EQUIPMENT

Instrument(s): YSI (Pine rental)
Calibration Time: 11:37
Calibration Result / Comments: OK

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 (mS/cm)	TURBIDITY (NTU)	DISSOLVED O_2 (mg/L)	REDOX (mV)
6/28/2005	11:58	0	24.81	7.94	0.216	944	3 00	297.0
6/28/2005	12:11	0.5	23.81	8.9	0 201	938	3.15	277.1
6/28/2005	12:22	1	23.67	8.26	0.005	936	2.26	306.8
6/28/2005	12:33	1.5	23 54	8.02	0.232	968	4.08	345.2
6/28/2005	12:47	2	23.74	7.79	0.005	962	2.40	312.1

SAMPLE INFORMATION

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

SAMPLE ID	P, QC, OR QA	TIME COLLECTED	DATE COLLECTED	NOTES
RH-W-003	P	12:52	6/28/2005	
RH-W-004	QC	13:27	6/28/2005	

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

APPEARANCE OF SAMPLE Color: beige Temp: DO:
Turbidity: pH: Redox:
Sediment: lots of sediment Sp Cond:

LAB ANALYSIS PARAMETERS
(1) BTEX, MtBE, 1,2-DCA - EPA Method 8260B (2) EDB - EPA DW Method 504.1
(3) TPH as gasoline - EPA Method 8015B (4) TPH as diesel - EPA Method 8015B
(5) PAHs - EPA Method 8270C or SIM-PAHs (6) Total lead - EPA Method 6020

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

DECONTAMINATION PROCEDURES: see PACDIV IRP procedures

SAMPLES DELIVERED TO: T. Sober, CAS DATE: 6/29/2005
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: 6/28/2005 TIME: 16:22 CLIMATIC CONDITIONS: sunny
PERSONNEL: B. Graham, H Kerr

WELL INFORMATION

Well Name/Number	Stilling Basin	
Well Location	*	
Casing Diameter (inches)	NA	(d_c)
Total Well Depth (feet)	NA	
Initial Depth to Water (feet)	87 00	
Depth to Product (feet)	NA	
Height of Water Column (feet)	NA	(h)

PURGE VOLUME

$V_c = (d_c)^2 \times (h) \times 0\ 041$

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

Minimum Purge Volume (gallons): NA

EQUIPMENT

Instrument(s): GeoTech Interface Probe
Calibration Time: NA
Calibration Result / Comments: NA

PURGE LOG

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

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

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

SAMPLE INFORMATION

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

SAMPLE ID	P, QC, OR QA	TIME COLLECTED	DATE COLLECTED	NOTES
RH-B-004	P	16:34	6/28/2005	Pumps were offline 24 hours prior to sample
RH-B-005	QC	16:36	6/28/2005	Pumps were offline 24 hours prior to sample
RH-B-006	P	18:03	6/28/2005	Pumps online for 15-20 minutes (turned on at 17:34)

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: 6/29/2005
TRANSPORTER: FedEx - TIME: