First Quarter 2005

Groundwater Sampling RED HILL FUEL STORAGE FACILITY, HAWAII

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April 2005

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



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

First Quarter 2005

Groundwater Sampling RED HILL FUEL STORAGE FACILITY, HAWAII

April 2005

Prepared for:



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Groundwater Sampling Red Hill Fuel Storage Facility, Hawaii

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EXECUTIVE SUMMARY

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

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

Site Background

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

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

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

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

Field Activities

Three surface water samples (two primary and one duplicate) were collected from the PWC potable water stilling basin and analyzed for TPH as diesel, TPH as gasoline, 1,2-DCA, BTEX, methyl-tert-butyl ether (MtBE), total lead, and EDB on 16 February 2005.

Two groundwater samples (one primary and one duplicate) were collected from the sentinel well, MW-V1D and analyzed for TPH-D, TPH-G, 1,2-DCA, BTEX, Total Lead, and EDB on 17 February 2005.

Conclusions and Recommendations

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

Stilling Basin

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

Sentinel Well

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

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

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

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ACRONYMS AND ABBREVIATIONS

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

ACRONYMS AND ABBREVIATIONS

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

1. INTRODUCTION

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

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

1.1 Project Objectives

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

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

1.2 Scope of Work

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

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

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

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

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

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

2. BACKGROUND

2.1 Site Location

The Red Hill FSF project site is located in Halawa Heights on Oahu, Hawaii. Access is via Halawa Valley Road, located north of the project site. Primary highways in the vicinity of the project site are Interstate Highways H-1 and H-3.

Land adjacent to the north of the project site is occupied by Halawa High and Medium Security Facility and private businesses. Land to the south and west of the project site includes the Coast Guard Reservation. Moanalua Valley is located east of the facility (Figure 1, Site Vicinity Map).

2.2 Facility Description

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

2.3 Previous Environmental Actions/Studies

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

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

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

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

3. PROJECT ORGANIZATION

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

NAVFAC PACIFIC

Administrative Contracting Officer	Ms. Bernie Julian	(808) 474-0514
Project Contract Specialist	Ms. Sharon Tsuru	(808) 471-9473
Contracting Officer's Technical	Ms. Debbie Loo	(808) 472-1234
Representative (COTR)		1
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 /	Ms. Heather Kerr	(808) 536-5500 ext. 341
Environmental Scientist		<u> </u>
Operations Manager / QC Manager	Mr. James Frifeldt	(808) 536-5500 ext. 305
Project Superintendent / Site Safety		
and Health Officer (SSHO)	Mr. Royce Ynigues	(808) 536-5500 ext. 331

SUBCONTRACTORS

Columbia Analytical			
Services	Laboratory Services	Ms. Tracie Sober	(808) 682- <u>1</u> 767
Pacific Commercial	Soil/Water		
Services	Disposal Services	Mr. Jingbo Chang	(808) 545-4599

4. DATA QUALITY OBJECTIVES

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

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

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

To evaluate the absence or presence of contaminants, the following quality criteria will be followed: 1) laboratory analytical methods will provide reporting limits that are lower than regulatory action levels, 2) chemical analyses of COPC will be performed using EPA publication SW-846, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, Third Edition* methodology (EPA, 1998), and 3) laboratory chemical data will be used to assess each analyte's concentration exceeding HDOH Tier 1 GWALs.

5. GENERAL WORK PROCEDURES

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

5.1 Health and Safety Procedures

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

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

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

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

5.2 Equipment Decontamination

All water-level measuring and water sampling equipment were decontaminated at the start and end of the project, as well as between locations, to reduce possibility of cross-contamination. The equipment was first washed in potable water and non-phosphate detergent. Then it was rinsed in potable water, rinsed in deionized/distilled water, sprayed with isopropyl alcohol, and rinsed with deionized/distilled water. Decontamination washwater was placed in a Department of Transportation (DOT)-approved, open-head, steel, 15-gallon drum and handled appropriately as described in detail in Section 5.3, *Investigation Derived Waste*.

5.3 Investigation Derived Waste

5.3.1 Storage and Sampling

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

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

5.3.2 IDW Disposal

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

6. SAMPLING METHODOLOGIES AND PROCEDURES

6.1 Laboratory Analysis

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

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

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

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

6.2 Stilling Basin Sampling Methodology

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

6.2.1 Non-Entry Sampling in the Stilling Basin

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

6.2.2 Surface Water Sampling Methodology

The samples were collected using a new weighted, disposable, single-check valve bailer that remained sealed in plastic (by the manufacturer) until use. These bailers are equipped with bottom-discharging devices. The sampling system was a combination of a polyvinyl chloride (PVC) casing and a disposable bailer, where the bailer was inserted inside the PVC casing, and an IP probe was attached to the outside of the PVC casing. Together, the assembly was lowered to approximately six inches above the water surface, and then the bailer was lowered into the

water to collect a sample. Once full, the bailer was raised into the PVC casing and the assembly was raised up through the entrance hatch, where the sample bottles were filled.

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

6.2.3 Field Quality Control Sampling

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

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

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

6.3 Sentinel Well Sampling Methodology

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

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

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

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

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

6.3.2 Well Purging Methodology

Purging was accomplished by removing groundwater from the well using a dedicated bailer approximately 12 feet in length and 0.5 inch in diameter attached to a new, dedicated rope. The bailer was lowered into the well with as little disturbance of the water as possible to minimize aeration of the water in the well. Once the bailer was full, it was slowly brought out of the water and the water was transferred to a clean container for evaluation of field parameters. The purge water was evaluated on a regular basis during purging and analyzed in the field for temperature, pH, specific conductivity, salinity, dissolved oxygen, redox potential, and turbidity using a YSI® water quality meter. At least four readings were taken during the purging process. The purging procedure was repeated until the calculated purge volume was removed or when three consecutive field parameter measurements had stabilized to within approximately 10 percent. All information was recorded on the Monitoring Well Field Sampling Log (Appendix B). The purge water was placed in a 5-gallon plastic bucket with lid and stored onsite inside a 15-gallon, open-head, steel drum (i.e., secondary containment).

6.3.3 Sample Collection Procedures

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

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

6.3.4 Field Quality Control Sampling

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

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

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

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7. INVESTIGATION RESULTS

7.1 Stilling Basin Water Sample Results

Three surface water samples (two primary and one duplicate) were collected from the PWC potable water stilling basin and analyzed for TPH-D, TPH-G, 1,2-DCA, BTEX, MtBE, Total Lead, and EDB on 16 February 2005. The results are presented in *Table 1, Summary of Groundwater Sample Results* of this report. The laboratory analytical reports are presented in *Appendix A, Laboratory Reports and Chain-of-Custody Records for Primary and QC Groundwater and Stilling Basin Samples*.

7.1.1 Total Lead

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

7.1.2 Total Petroleum Hydrocarbons (TPH)

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

7.1.3 1,2-Dibromoethane (EDB)

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

7.1.4 Volatile Organic Compounds (VOCs)

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

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

7.1.5 Polynuclear Aromatic Hydrocarbons (PAHs)

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

7.2 Sentinel Well Groundwater Sample Results

Two groundwater samples (one primary and one duplicate) were collected from the sentinel well, MW-V1D and analyzed for TPH-D, TPH-G, 1,2-DCA, BTEX, MtBE, Total Lead, and EDB on 17 February 2005. The results are presented in Table 2 of this report. The laboratory analytical reports are presented in Appendix A.

7.2.1 Total Lead

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

7.2.2 Total Petroleum Hydrocarbons (TPH)

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

7.2.3 1,2-Dibromoethane (EDB)

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

7.2.4 Volatile Organic Compounds (VOCs)

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

7.2.5 Polynuclear Aromatic Hydrocarbons (PAHs)

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

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

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

7.3 Trip Blank Analytical Results

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

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

7.4 Data Quality Review

7.4.1 Field Quality Assurance/Quality Control

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

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

7.4.2 Laboratory/Quality Control Data Assessment

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

Data Discrepancies

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

8. CONCLUSIONS AND RECOMMENDATIONS

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

Stilling Basin

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

Sentinel Well

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

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

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

9. REFERENCES

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FIGURES

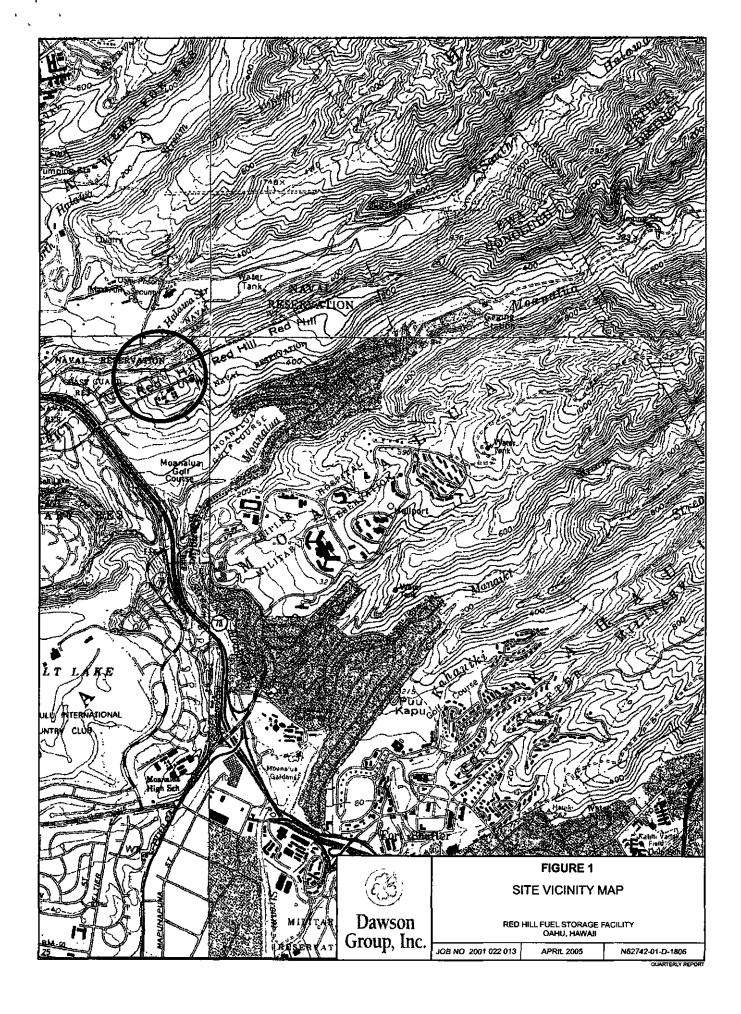
Site Vicinity Map - Figure 1

Site Plan-Figure 2

Red Hill	1Q05 GW
	Page Q-2

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NAVFAC PACIFIC
Contract No.: N62742-01-D-1806, CTO 0013



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

				Pumps Offline	Pumps	Online		
-		SAI	IPLE IDENTIFICATION	RH-B-001	RH-B-002	RH-B-003		
			SAMPLE TYPE	Primary	Pnmary	Duplicate		
-			DATE COLLECTED	02/16/2005	02/16/2005	02/16/2005	REGULATORY ACTION	
	ANALYSIS	EPA METHOD	MRL		则性 多物形式有		LEVELS	UNITS
Metals	Total Lead	6020	0.00002	0.00033	0.00006	0.00005	0 0056	mg/L
Hydrocarbons	TPH as Diesel	8015M	0 05	ND	ND ^[0 053]	ND	NE	mg/L
	TPH as Residual Range	8015M	01	ND	ND ^[011]	ND	NE	mg/L
	TPH as Gasoline	8015M	0 05	ND	ND	ND	NE	mg/L
EDB	1,2-Dibromoethane (EDB)	504 1	0 0000083	ND	ND 0 00000811	ND [0:0000082]	NE	mg/L
VOCs	Benzene	8260B	0 0005	ND	ND	ND	1 70 ①	mg/L
	Methyl tert-Butyl Ether	8260B	0 0005	ND	ND	ND	0 02 ①	mg/L
	Toluene	8260B	0.0005	0.001	0.0012	0.00081	21 ①	mg/L
	Ethylbenzene	8260B	0 0005	ND	ND	ND	0 14 ①	mg/L
	m,p-Xylenes	8260B	0.0005	ND	ND	ND	100 ①	mg/L
	o-Xylene	8260B	0 0005	ND	ND	ND	100 Œ	mg/L
	1,2-Dichloroethane (DCA)	8260B	0 0005	ND	ND	ND	0 005 ②	mg/L
PAHs	Naphthalene	8270C SIM	0 00002	ND	ND	ND	0 24	mg/L
	2-Methylnaphthalene	8270C SIM	0 00002	ND	ND	ND	NE	mg/L
	Acenaphthylene	8270C SIM	0 00002	ND	ND	ND	NE	mg/L
	Acenaphthene	8270C SIM	0 00002	ND	ND	ND	0 32	mg/L
	Dibenzofuran	8270C SIM	0 00002	ND	ND	ND	NE	mg/L
	Fluorene	8270C SIM	0 00002	ND	ND	ND	NE	mg/L
	Phenanthrene	8270C SIM	0 00002	ND	ND	ND	NE	mg/L
	Anthracene	8270C SIM	0 00002	ND	ND	ND	NE	mg/L
	Fluoranthene	8270C SIM	0 00002	ND	ND	ND	001	mg/L
	Pyrene	8270C SIM	0 00002	ND	ND	ND	NE	mg/L
	Benz(a)anthracene	8270C SIM	0 00002	ND	ND	ND	NE	mg/L
	Chrysene	8270C SIM	0 00002	ND	ND	ND	NE	mg/L

TABLE 1

Summary of Groundwater Sample Results Stilling Basin

Red Hill Fuel Storage Facility

Red Hill, Oahu, Hawaii

			Pumps Offilne	Pumpe	Online			
	SAI	MPLE IDENTIFICATION	RH-B-001	RH-B-002	RH-B-003		İ	
<u></u>	SAMPLE TYPE DATE COLLECTED				Duplicate		Į.	
					02/16/2005	REGULATORY	ĺ	
ANALYSIS	EPA METHOD	MRL	經過增少學			ACTION LEVELS	UNITS	
Benzo(b)fluoranthene	8270C SIM	0 00002	ND	ND	ND	NE	mg/L	
Benzo(k)fluoranthene	8270C SIM	0.00002	ND	ND	ND	NE	mg/L	
Benzo(a)pyrene	8270C SIM	0 00002	ND	ND	ND	0 0002	mg/L	
Indeno(1,2,3-cd)pyrene	8270C SIM	0 00002	ND	ND	ND	NE	mg/L	
Dibenz(a,h)anthracene	8270C SIM	0 00002	ND	ND	ND	NE	mg/L	
Benzo(g,h,1)perylene	8270C SIM	0 00002	ND	ND	ND	NE	mg/L	

Notes	EPA [0 0001]	United States Environmental Protection Agency method reporting limit is other than stated
	PAHs	polyaromatic hyrdocarbons
	mg/L	milligrams per liter
	MRL	method reporting limit

ND

RH Red Hill Fuel Station Facility

Bold, Italic value is greater than laboratory MRL

Bold value is greater than regulatory action level

NE none established

Stilling Basin

method reporting limit

Not detected at or above the MRL

Not detected at or above the MRL

NOCs volatile organic carbons

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

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

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

				M	N-1VD		
		SAI	MPLE IDENTIFICATION	RH-W-001 ③	RH-W-002		
			SAMPLE TYPE	Primary	Duplicate		•
			DATE COLLECTED	02/17/2005	02/17/2005	REGULATORY ACTION	
	ANALYSIS	EPA METHOD	MRL	T. Like Lind	Lucia de la companya della companya de la companya de la companya della companya	LEVELS	UNITS
Metals	Total Lead	6020	0 00002	0.0102	0.0119	0 0056	mg/L
Hydrocarbons	TPH as Diesel	8015M	0 05	1.4 Y	1.5	NE	mg/L
	TPH as Residual Range	8015M	0 1	0.77 °	0.89	NE	mg/L
	TPH as Gasoline	8015M	0.05	ND	ND	NE	mg/L
EDB	1,2-Dibromoethane (EDB)	504 I	0 0000083	ND	ND [0 0000082]	NE	mg/L
BTEX	Benzene	8260B	0 0005	ND	ND	1 70 ①	mg/L
	Methyl tert-Butyl Ether	8260B	0 0005	ND	ND -	002 ①	mg/L
	Toluene	8260B	0 0005	ND	ND .	21 ①	mg/L
	Ethylbenzene	8260B	0 0005	ND	ND	0 14 ①	mg/L
	m,p-Xylenes	8260B	0 0005	ND	ND	100 ①	mg/L
	o-Xylene	8260B	0 0005	ND	ND.	100 D	mg/L
	1,2-Dichloroethane (DCA)	8260B	0 0005	ND	ND	0 005 ②	mg/L
PAHs	Naphthalene	8270C SIM	0 00002	0.00025	0.00021	0 24	mg/L
	2-Methylnaphthalene	8270C SIM	0 00002	0.00014	0.000057	NE	mg/L
	Acenaphthylene	8270C SIM	0 00002	ND	ND	NE	mg/L
	Acenaphthene	8270C SIM	0 00002	0.000052	0.000054	0 32	mg/L
	Dibenzofuran	8270C SIM	0 00002	0.00013	0.00011	NE	mg/L
	Fluorene	8270C SIM	0 00002	0.000053	0.000043	NE	mg/L
	Phenanthrene	8270C SIM	0 00002	0.00012	0.000082	NE	mg/L
	Anthracene	8270C SIM	0 00002	ND	ND	NE	mg/L
	Fluoranthene	8270C SIM	0 00002	0.000035	0.000021	001	mg/L
	Pyrene	8270C SIM	0 00002	0.000056	0.000029	NE	mg/L
	Benz(a)anthracene	8270C SIM	0 00002	ND	ND	NE	mg/L
	Chrysene	8270C SIM	0 00002	0.00002	ND	NE	mg/L

TABLE 2 **Summary of Groundwater Sample Results** MW-V1D

Red Hill Fuel Storage Facility Red Hill, Oahu, Hawaii

-		- · · -		W	N-1VD		
		SAM	PLE IDENTIFICATION	RH-W-001 ③	RH-W-002		
			Primary	Duplicate			
			02/17/2005	02/17/2005	REGULATORY ACTION		
·	ANALYSIS EPA METHOD		MRL		手を持つない (本語)	LEVELS	UNITS
	Benzo(b)fluoranthene	8270C SIM	0 00002	0.000025	ND	NE	mg/L
	Benzo(k)fluoranthene	8270C SIM	0.00002	ND	ND	NE	mg/L
	Benzo(a)pyrene	8270C SIM	0.00002	0.000022	ND	0 0002	mg/L
	Indeno(1,2,3-cd)pyrene	8270C SIM	0 00002	ND	ND	NE	mg/L
	Dibenz(a,h)anthracene	8270C SIM	0 00002	ND	ND	NÉ	mg/L
	Benzo(g,h,1)perylene	8270C SIM	0 00002	ND	ND	NE _	mg/L

Notes	EPA	United States Environmental Protection Agency	В	Stilling Basin at PWC Potable Water Facility
	[0 0001]	method reporting limit is other than stated	RH	Red Hill Fuel Station Facility
	PAHs	polyaromatic hyrdocarbons	Bold, Italic	value is greater than laboratory MRL
	mg/L	milligrams per liter	Bold	value is greater than regulatory action level
	MRL	method reporting limit	NE	none established
	ND	None detected at or above the MRL	VOCs	volatile organic carbons
	Y	The chromatographic fingerpoint of the sample res	embles a petr	pleum product eluting in approximately the correc
		carbon range, but the elution pattern does not may	tch the calibrat	tion standard
	٥	The chromatographic fingerprint of the sample res	embles an oil,	but does not match the calibration standard

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

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

⁽⁾ (2) (3) Sample RH-B-001 was received with a pH above the method preservation criteria of pH <2

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

		Trip Blank *				
			SAMPLE TYPE	Tnp Blank		
		02/17/2005	REGULATORY			
	ANALYSIS	EPA METHOD	MRL	C. C. T. A. De l	ACTION LEVELS	UNITS
BTEX	Benzene	8260B	0 0005	ND	1 70 ①	mg/L
	Methyl tert-Butyl Ether	8260B	0 0005	ND	0 02 ①	mg/L
	Toluene	8260B	0 0005	0.0014	2 1 ①	mg/L
	Ethylbenzene	8260B	0 0005	ND	0 14 ①	mg/L
	m,p-Xylenes	8260B	0.0005	ND	100 ①	mg/L
	o-Xylene	8260B	0.0005	ND	10 0 D	mg/L
	1,2-Dichloroethane (DCA)	8260B	0.0005	ND	0 005 ②	mg/L

Notes

EPA United States Environmental Protection Agency method reporting limit is other than stated

2

PAHs polyaromatic hyrdocarbons Bold, Italic value is greater than laboratory MRL mg/L milligrams per liter Bold value is greater than regulatory actions.

MRL method reporting limit NE
ND None detected at or above the MRL VOCs

Bold value is greater than regulatory action level NE none established VOCs volatile organic carbons

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

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

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

Red H	ill 1Q05 GW
	Appendix A

NAVFAC PACIFIC Contract No.: N62742-01-D-1806, CTO 0013

APPENDIX A

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



1317 Smith 13th Acouse PO Box 474 Kelso, Washington 98626 (360) 577-7222 ph (360) 636 (068 fux

March 15, 2005

Service Request No K2501266

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

RE: Red Hill GW Sampling / 2001022.013

Dear Heather

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

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

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

Respectfully submitted.

Columbia Analytical Services, Inc.

Harvey Jacky /

HJ/jeb

Page Lof

Acronyms

	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
М	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of
	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

than or equal to the MDL

Trace level is the concentration of an analyte that is less than the PQL but greater

Inorganic Data Qualifiers

- The result is an outlier. For case purporting
- The committent that went upplicable See case normative
- The maker was tound in the constant director defeats at a level that to against an elektro to the sumple result
- The result is an estimate instruct because the value executed the institution testionation range
- The result is an estimated some entrained that is less than the MRL but prester than or equal to the MD!
 - The companies was an sixted for but was not detected ("Non-detect") at an above the MRL/MDL.
- The MRI MDL has been also atted due to a matrix interference
- See case approprie

Metaly Data Quabilers

- The country Innit enterior not applicable. See case numbers
- The result was extensively concentration that is less than the MRL but grouter than or equal to the MDL
- The pertent deflores the terral delution was greater than 10% indicating a possible maints interference in the sample
- The duplic, are anyequen precusion to to rust their
- The Main is spirke suitiffer recovered in the within control limits. See cube nationing Σzv⊃
- The rejected value was determined by the Method of Shaudurd Additions (MSA)
- The companied was an about for, but was not detacted ("Non-dotest") at newbove the MRLANDL
- The provide strong spile for tomace AA markets a rout of control limits, white sample obsorbance as fore than 50% at spile
- the Mill MIN has been cleared due to a manny interference
- See case narraine
- The duplicate analysis as ast within control limits. See case agreetive
- The correlation coefficient for the MNA is less than 0.995

Organic Data Qualiflers

- The result to me mether you have narrative
- The eventual limit emient is not applicable. Nee case narrative
- A tentain of relegized compound a supported aldol-construction product
- The analysis is as found in the investment method blank at a level that a agasticant relative to the wapple result
- The unable was qualitated by continued using GOMS behingua, pottern recognition, or by comparing to historical data
- The reported result is from a dilution
- The result at an estimate anticount because the value expected the instrument calibration rungs
- The result is an established concentration that is less than the MIKL but greater than or equal to the MIM.
- The result is presumptive. The unalive was tentatively identitied, but a confirmation analysis was not performed
- The GC in 1119, C contour along entending was exceeded. The relative persont difference is greater than 40% backween the two
 - amplyted results (25% for CLP Pedestes)
- The compound was unalveed for had was not defected ("Non-defect") of or above the MRLMDL
- The MRI MINL has been cleasted due to a chromatographic interference
- Soc our, Mithure

Additional Petroleum Hydrocarbon Specific Qualifiera

- The charactery raphy to heavy and the sample matches the cluton pattern of the cultivation standard
- The chronitiographs incomprint of the sample meetables a periodour product, but the cluson pattern indicates the presence of a greatern constitute the clusteries than the calibration standard.
- The chronouspeptic time grant of the sungle resembles a puroleum product, but the chron pattern indicates the presence of a grant transfer to a grant transfer than the eatherston standard.
- I
- The Jacon doposition through and the sample resembles a pullpleum product elibrur in approximately the correct carbon range has the Junean pala and as not match the estimation abandard The chromatographic torganisms of the sample resembles an oil, but does not match the calibration standard 0
 - The chromatographic lines opinit does not resemble a petroleum product

00003

Case Narrative

Client: Project: Dawson Group, Inc.

Red Hill GW Sampling / 2001022 013

Service Request No.: Date Received:

K2501266 2/19/05

00065

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), Marrix Spike (MS), Matrix/Duplicate Matrix Spike (MS/DMS), and Laboratory Control Sample (LCS)

Sample Receipt

Six water samples were received for analysis at Columbia Analytical Services on 2/19/05 The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory

No anomalies associated with the analysis of these samples were observed

Diesel Range Organics by EPA Method 8015B

No anomalies associated with the analysis of these samples were observed

Gasoline Range Organics by EPA Method 8015B

Sample Notes and Discussion:

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

EDB by EPA Method 504

No anomalies associated with the analysis of these samples were observed

Volatile Organic Compounds by EPA Method 8260B

Initial Calibration (ICAL) Exceptions:

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

Approved by	Date 3/16/65
	

Surrogate Exceptions:

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

Sample Notes and Discussion

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

Polynuclear Aromatic Hydrocarbons by EPA Method \$270C

Notes of Discussion

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

Approved by	Date	3/1/65	

Columbia Analytical					Cł	Αŀ	IN	OF	C	US	STC)D	Y						•		-	#			5012L
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20000 -

Chain of Custody Documentation

			Analytical Servic eipt and Preserv		PC	_/	/	
Project/Client	1418	n (160	.,) w	ork Order K250	1240			
Cooler received on <u>//</u>	9/03	_ and opens	d on 4/1/15	by	54			
Were custody seals on o	utside of cool	ers?	1 / 1	., ,			Y N	
If yes, how many a	ad where?		1-int	C), ne a est			1	
Were custody seals inta-	:17		/	C			Y N	
Were signature and date	-						Y N	
Is the shipper's autil a	vailable and fi	iled" If no, re	cord authill number _				Y N	
COC#				~ ,				
Temperature of cooler	r(s) upon rece	ipt: (°C)	11.8	-31/				
Temperature Blank:	(°C)		11	9.4		_	_ /	•
Were samples hand deliv							X N	ノ
Were custody papers pro	operly filled o	ur (znk, signed	i, etc)?	+ 11	11		N (Y)	ĺ
. Type of packing materia	. —		L HÁLL	10 /4/2	HIN LERCY	']	C)	
Did all bottles arrive u	good condit	ion (unbroke	n)?		•		N	
Were all bottle labels on	mplete (ne an	alysis, preserv	/ation, etc)?				У	
Did all bottle labels an	d tags agree w	nth custody pa	mers?				Y N	
1. Were the correct type	s of bottles us	ed for the tes	ts indicated?				(Y) M	١,
	11							
Z Were all of the preserve	a pouries rece	ived at the lab	with the appropriate	pH?			X (M	_')
•				=			Y N	
3 Were VOA vials check	ed for absence	of air bubble	s, and if present, note	=				
Were VOA vials check Did the bottles originate	ed for absence e from CAS/K	of air bubble or a branch l	s, and if present, note aboratory ⁹	d below?	om collection?		Y N	
Were VOA vials checkDid the bottles originateAre CWA Microbiolo	ed for absence e from CAS/K gy samples re	of air bubble or a branch l	s, and if present, note aboratory ⁹	d below?	om collection?		Y N	
Were VOA vials check Did the bottles originat Are CWA Microbiolo Was C12/Res negative	ed for absence e from CAS/K gy samples re	of air bubble or a branch l	s, and if present, note aboratory ⁹	d below?	om collection?		X X X	
Were VOA vials check Did the bottles originat Are CWA Microbiolo Was C12/Res negative	ed for absence e from CAS/K gy samples re	of air bubble or a branch l	s, and if present, note aboratory ⁹	d below?	om collection?		X X X	
Were VOA vials check Did the bottles originat Are CWA Microbiolo Was C12/Res negative	ed for absence e from CAS/K gy samples re	of air bubble or a branch l	s, and if present, note aboratory ⁹	d below?	om collection?		X X X	
Were VOA vials check Did the bottles originat Are CWA Microbiolo Was C12/Res negative	ed for absence e from CAS/K gy samples re	of air bubble or a branch l	s, and if present, note aboratory ⁹	d below?	om collection?		X X X	
Were VOA vials check Did the bottles originat Are CWA Microbiolo Was C12/Res negative	ed for absence e from CAS/K gy samples re	of air bubble or a branch l	s, and if present, note aboratory ⁹	d below?	om collection?		X X X	
3 Were VOA vials check 4. Did the bottles originat 5. Are CWA Microbiolo 6 Was C12/Res negative Explain any discrepancies	ed for absence e from CAS/K gy samples re	of air bubble or a branch h seelved with >	s, and if present, note aboratory ⁹	d below?	om collection?		X X X	
3 Were VOA vials check 4. Did the bottles originat 5. Are CWA Microbiolo 6 Was C12/Res negative Explain any discrepancies	ed for absence e from CAS/K gy samples re	of air bubble or a branch h seceived with >	s, and if present, note aboratory? -1/2 the 24hr. hold ti	d below?	om collection?		X X X	
3 Were VOA vials check 4. Did the bottles originat 15. Are CWA Microbiolo 16 Was C12/Res negative Explain any discrepancies	ed for absence e from CAS/K gy samples re	of air bubble or a branch h seceived with >	s, and if present, note aboratory? -1/2 the 24hr. hold ti	d below?	om collection?		X X X	
3 Were VOA vials check 4. Did the bottles originat 5. Are CWA Microbiolo 6 Was C12/Res negative Explain any discrepancies RESOLUTION Samples that required pres	ed for absence c from CAS/K gy samples re	of air bubble or a branch h sectived with >	s, and if present, note aboratory? -1/2 the 24hr. hold to	d below?	Rec'd out of		X X X	
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3 Were VOA vials check 4. Did the bottles original 5. Are CWA Microbiolo 6 Was C12/Res negative explain any discrepancies RESOLUTION samples that required pres	ed for absence e from CAS/K gy samples re	of air bubble or a branch la scelved with >	s, and if present, note aboratory? -1/2 the 24hr. hold to	d below?	Rec'd out of	Inklate	X X X	
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3 Were VOA vials check 4. Did the bottles original 5. Are CWA Microbiolo 6 Was C12/Res negative explain any discrepancies RESOLUTION samples that required pres	ed for absence e from CAS/K gy samples re	of air bubble or a branch la scelved with >	s, and if present, note aboratory? -1/2 the 24hr. hold to	d below?	Rec'd out of	Inklate	X X X	
3 Were VOA vials check 4. Did the bottles originat 5. Are CWA Microbiolo 6 Was C12/Res negative Explain any discrepancies RESOLUTION Samples that required pres	ed for absence e from CAS/K gy samples re	of air bubble or a branch la scelved with >	s, and if present, note aboratory? -1/2 the 24hr. hold to	d below?	Rec'd out of	Initials	X X X	
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Metals

- Cover Page - IC ANALYSIS DATA PACKAGE
Service Request. K2501266
Lab Sample ID
K2501266-001
K2501266-002
x2501266-003
K2501266-004
K2501266-005
K2501266-MB
K2501269-001D K2501269-0013
-

Here	ICF background corrections applied?		Yes/No	YES	
	If yes-were raw data generated before application of background corrections?		Yes/No	NO	
Comm	ents:				_
					_
					_
	8	/ /			
Sign	aturo: Sila marrel	Date: 3/10/05			

00011

Yes/No YES

Columbia Analytical Services

METALS

-1-INORGANIC ANALYSIS DATA SHEET

Client:

Dawson Group, Inc.

Service Request: K2501266

Project No . 2001022.013

Date Collected: 02/16/05

Project Name: Red Hill GW Sampling

Date Received: 02/19/05

Matrix. WATER

Units pG/L

Basts NA

Sample Name: RH-B-CO1

Lab Code: K2501266-001

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

% Solids: 0 0

Comments:

00012

Form I - IN

Were ICP interelement corrections applied?

COVER PAGE - IN

METALS

-1-

INORGANIC ANALYSIS DATA SHEET

Client.

Dawson Group, Inc.

Service Request: K2501266

Project No : 2001022.013

Date Collected: 02/16/05 Date Received: 02/19/05

Project Name: Red Hill GW Sampling Matrix

WATER

Units pG/L

Basis MA

Sample Namo : RH-B-002

Lab Code: K2501266-002

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

Columbia Analytical Services

METALS

-1-

INORGANIC ANALYSIS DATA SHEET

Client:

Dawson Group, Inc.

Service Request: K2501266

Project No. 2001022,013

Date Collected: 02/16/05

Project Name. Red Hill GW Sampling

Date Received: 02/19/05

WATER Matrix:

Units pG/L Basis NA

Sample Name: RH-B-003

Lab Code, K2501266-003

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

9 Solids. 0.0

Comments:

00013

Comments:

* Solids: 0 0

00014

Form I - IN

Form I - IN

METALS

-1-

INORGANIC ANALYSIS DATA SHEET

Dawson Group, Inc Client.

Service Request: K2501266

Project No.: 2001022 013

Date Collected. 02/17/05

Project Name: Red Hill GW Sampling

Date Received: 02/19/05

WATER Matrix.

Units pG/L

Basis NA

Sample Name: RH-W-001

Lab Code: K2501266-004

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

Columbia Analytical Services

METALS

-l-

INORGANIC ANALYSIS DATA SHEET

Client. Dawson Group, Inc. Service Request: K2501266

Project No.: 2001022.013

Date Collected: 02/17/05

Date Received: 02/19/05

Project Name: Red Hill GW Sampling NATER Matrix

Units uG/L

Basis NA

Sample Name: RH-W-002

Lab Code: K2501266-005

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

% Solids: 0 0

Comments:

00015

% Solids: 0.0

Comments

Form I - IW

00016

Form I - IN

METALS

-1-

INORGANIC ANALYSIS DATA SHEET

Client

Dawson Group, Inc

Service Request: K2501266

Project No.: 2001022.013

Date Collected: NA

Matrix:

=----

Project Name Red Hill GW Sampling WATER

Date Received NA Units pG/L

Basis NA

Sample Name: Method Baink

Lab Code: K2501266-MB

Analyte	Analysis Method	MRI.	Dilution Factor	Date Extracted	Date Analyzed	Result	c	Q
Lead	6020	0 02	1	3/3/05	3/9/05	0.02	υ	l

Columbia Analytical Services

METALS - 5a -SPIKE SAMPLE RECOVERY

Client:

Dawson Group, Inc.

Service Request: K2501266

Project No · 2001022 013

Units: pg/L

Project Name Red Hill GW Sampling

Basis. NA

Matrix.

WATER

& Solids, 0 0

Sample Name, Batch QC

Lab Code: K2501269-0019

Analy	ė	Control Limit %R	Spike Result	С	Sample Result	С	Spike Added	9R	ō	Method
Lead		59 - 127	18.9	Ţ	0.23		20.0	93		6020

% Solids: 0.0

Comments:

00017

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

Form V (PART 1) - IN

- 00018

Form I - IN

METALS - 6 DUPLICATES

Client. Dawson Group, Inc.

Sorvice Request: K2501266

Project No : 2001022.013

Units: µg/L

Project Name: Red Hill GW Sampling

Basis: NA

Matrix:

t Solids: 0 0

Sample Name:Batch QC

Lab Code: K2501269-001D

Analyte	Control Limit(4)	Sample (S)	С	Duplicate (D)	С	RPD	Q	Method
Lead	20	0.2		0.23		1		6020

Diesel & Residual Range Organics

An empty field in the Control Limit column indicates the control limit is not applicable. 00019

Form VI - IN

Analytical Results

Chent: Project: Dawson Group Inc. Red Hill GW Sampling/2001022 013

Sample Matrix.

Water

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

Date Received: 02/19/2005

Diesel and Residual Range Organics

Sample Name Lab Code:

RH-B-001 K2501266-001

Units. ug/L Basis: NA

EPA 3510C Extraction Method

M2108

Level: Low

Analysis Method

Analyte Name	Result Q	MRL,	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	ט מא	50	1	02/22/05	03/02/05	KWQ0502781	
Residual Range Organius (RRO)	ND U	100	1	02/22/05	03/02/05	KWG0502781	

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

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:

Dawson Group, Inc.

Project: Sample Matrix:

Water

Red Hill GW Sampling/2001022 013

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

Date Received: 02/19/2005

Diesel and Residual Range Organics

Sample Name: Lah Code:

RH-B-02

K2501266-002

Units: ug/L Basis: NA

Level: Low

Extraction Method: EPA 3510C Analysu Method:

8015M

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

Surregate Name	%Rec	Control Limits	Date Analyzed	Note
[Cerphenyl	82	52-128	03/02/05	Acceptable
n-Triacontane	89	50-150	03/02/05	Acceptable

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Page 1 of 1

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Form 1A - Organic

00022 Page 1 of 1

SuperSet Reference RR46079

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Form 1A - Organic

SuperSet Ruference RR46079

Analytical Results

Client:

Unwson Group Inc

Project: Sample Matrix: Red Hill GW Sampling/2001022 013 Water

Date Collected: 02/16/2005

Diesel and Residual Range Organics

Sample Name: Lab Code

RH-B-003

Extraction Method TPA 3310C

Analysis Method SUBM

K2501266-003

Unite: ug/L Basis: NA

Level: Low

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

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

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Service Request: K2501266

Date Received: 02/19/2005

Diesel and Residual Range Organics

Sample Name Lab Code:

Sample Matrix

Cheat:

Project:

RH-W-001

Water

K2501266-004

Dawson Group, Inc.

Red Hill GW Sampling/2001022 013

Extraction Method, EPA 1510C 8015M Analysis Method:

Unity ug/L Basis. NA

Service Request. K2501266

Date Collected: 02/17/2005

Date Received: 02/19/2005

Level. Low

Date Dilution Date Extraction Analyte Name Result O MRL Factor Extracted Analyzed Lot Diesel Range Organius (PRO) 1400 Y 50 02/22/05 03/02/05 KWC0502781 01/02/05 KWG0502781 Residual Range Organics (RRO) 100 02/22/05 770 Q

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

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Form 1A - Organic

SuperSet Reference RR46079

00023 Page 1 of 1

Printed 03/07/2005 10 17 31

Form IA - Organic

00024 Page [of 1 Superder Reference RR46079

Analytical Results

Client: Dayson Group, Inc.

Project: Sample Matrix.

Water

Red Hill GW Sampling/2001022 013

Service Request: K2501266

Date Collected: 02/17/2005 Date Received: 02/19/2005

Diesel and Residual Range Organics

Sample Name: Lab Code:

Analysis Method.

RH-W-002 K2501266-005

Extraction Method. I PA 3510C 8015M

Units: ug/L Baxis; NA

Level: Low

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

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

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Chept: Project. Dawson Group Inc.

Sample Matrix:

Rod Hill GW Sampling/2001022 013

Water

Service Request: K2501266 Date Collected: NA

Date Received: NA

Diesel and Residual Range Organics

Sample Name: Lab Code:

Method Blank KWG0502781-3 Units. ug/L Basis, NA

Extraction Method: EPA 3510C Analysis Method

8015M

Level. Low

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

Surrugute Name	%Rec	Control Lumits	Date Analyzed	Nate	
o-Terphenyl	77	52-128	03/02/05	Acceptable	•••
n-Triacoulane	84	50-150	03/02/05	Acceptable	

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Form 1A - Organic

Superior Reference RR46079

Page 1 of 1

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Form IA - Organic

SuperSci Reference RR46079

00026 Page | of |

QA/QC Report

Client: Project:

Sample Matrix:

Dawson Group, Inc.

Red Hill GW Sampling/2001022 013

Water

Surrogate Recovery Summary Diesel and Residual Range Organics

Extraction Method: EPA 3510C

Analysis Method: MISM

Units. PERCENT Level: Low

Service Request: K2501266

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

Surrogate Recovery Control Limits (%)

Sur1 = o-Terphenyl Sur2 = n-Triacontane

52-128 50-150

Results flagged with an asterick (*) indicate value a outside control criteria. Results fingard with a pound (4) indicate the control criterio is not applicable

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Form 2A - Organic

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:

Project: Sample Matrix.

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Dawson Group Inc Red Hill GW Sampling/2001022 011

Service Request: K2501266 Date Extracted. 02/22/2005

Date Analyzed: 03/02/2005

Matrix Spike Summary Diesel and Residual Range Organics

Sample Name: Lab Code:

RH-B-001

K2501266-001 Extraction Method: EPA 1510C

Units: ug/L Basis: NA

Level: Low

Analysis Method: KOLSM

Extraction Lot: KWG0502781

RH-B-001MS

	Sample		VG0502781- Vatrix Spike	4	%Rec	
Analyte Name	Result	Result	Expected	%Rec	Limits	
Diesel Range Organics (DRO)	ND	3040	3200	95	57-158	
Residual Range Organics (RRO)	ND	1540	1600	96	45-157	

Results flammed with an automak (*) automate values outrade control criteria.

Results (lagged with a pound (#) indicate the central criteria is not applicable.

Percent recovering and relative purcent differences (RFD) are determined by the unflivare using values in the calculation which have not been sounded

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Form 3A - Organic

SuperSci Reference R R46079

QA/QC Report

Client:

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Project: Sample Matrix:

Dawson Group, Inc Red Hall GW Sampling/2001022 013

Water

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

Lab Control Spike/Duphcate Lab Control Spike Summary Diesel and Revidual Range Organica

Extraction Method LPA 3510C Analysis Method:

Units: ug/L Bane: NA

Level: Low

Extraction Lot: KWG0502781

Lab Control Sample KWG0502781-1

Duplicate Lab Control Sample KWG0502781-2

Analyte Name	Lab	ab Control Spike Duplicate Lab Control Spike			Spike	%Rec		RPD	
	Result	Expected	%Rec	Result	Expected	%Rec	Limits		Limit
Diesel Range Organius (DRO)	2940	1200	92	2990	1200	93	67-151	1	30
Residual Ruige Organics (RRO)	1530	1600	95	1490	1600	93	59-146	2	30

Gasoline Range Organics

Results flagged with an external (*) make sie volus a netaide control criteria

Personal reconstruct and set that personal differences (RPD) are determined by the software using values in the calculation which have not been rounded

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Form 3C - Organic

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SuperSet Reference RR46079

Analytical Results

Client: Project: Dayson Group, Inc.

Sample Matrix.

Water

Red Hill GW Sampling/2001022 013

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

Date Received: 02/19/2005

Gasoline Range Organics

Sample Name: Lab Code:

RH-B-001

Extraction Method: FPA 5030B Analysis Method: 3015B

K2501266-001

Units ug/L Basis: NA Level: Low

Note

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

Surrogate Nume	%Roį	Control Lamits	Date Analyzed	Nate	
1.4-Diffuorobenzene	95	75-120	02/25/05	Acceptable	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Project Dawson Group, Inc.

Sample Matrix

Red Hill GW Sampling/2001022 013

Water

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

Gasoline Range Organics

Sample Name: Lab Code:

RH-B-002 K2501266-002

Units: ug/L Baxis: NA Level: Low

Extraction Method. EPA 5030B Analysis Method:

8015B

Date Extraction

Dilution Date Analyzed Let Note Analyte Name Result Q MRL Factor Extracted 02/25/05 02/25/05 KWC0501107 Gasoline Rauge Organics (GRO) ND U 50

Surregale Name	%Rec	Control Limits	Date Analyzed	Note	 _
1.4-Diffuorobenzene	95	75-120	02/25/05	Acceptable	

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Form 1A - Organic

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Analytical Results

Chent. Project: Dawson Group, Inc

Sample Matrix:

Water

Red Hill GW Sampling/2001022 013

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

Unata ug/L

Gasoline Range Organics

Sample Nume: Lab Code

RH-B-003 K2501266-003

Bans: NA Level: Low

Extraction Method: EPA 5030B Analysis Method. X015B

			Dilution	Date	Date	Extraction	
Analyte Name	Rewit Q	MRL	Factor	Extracted	Analyzed	Lot	Note
Gasoline Range Organics (ORO)	ט סא	50	<u> </u>	02/25/05	02/25/05	KWG0503107	

Surrogate Nunc	%Rec	Control Limits	Date Analyzed	Note	
1.4-Difluorobenzene	95	75-120	02/25/05	Acceptable	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client^{*}

Project. Sample Matrix

Water

Dawson Group, Inc Red Hill GW Sampling/2001022 013

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

Date Received: 02/19/2005

Gasoline Range Organics

Sample Name: Lab Code:

RH-W-001

K2501266-004

Units ug/L Basis, NA Level, Low

Extraction Method: EPA 5030B Analysis Method.

Date Extraction

Dilution Date Analyte Name Result Q MRL FACIOT Extracted Analyzed 02/25/05 KWG0503107 02/25/05 Gasoline Range Organics (GRO) ND U

Date Cuntrol Note %Rec Limits Surrogate Name Analyzed 02/25/05 1,4-Diffuorobenzene Acceptable 75-120

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Analytical Results

Client: Project: Dawson Group, Inc.

Sample Matrix

Water

Red Hill GW Sampling/2001022 013

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

Date Received: 02/19/2005

Gasoline Range Organica

Sample Name: Lab Code

RH-W-002

N2501266-005

Cinits: ug/L Basis: NA

EPA 5030B Extraction Method Analysis Method:

Level: Low

Analyte Name Onsolme Range Organics (GRO) Result Q

ע מא

Dilution MRL 50

Date Date Extracted Analyzed 02/25/05

Factor

Extraction

Lot Note 02/25/05 KWG0503107

Control Date Surrogate Name Limits Analyzed Note 1,4-Difluorobenzene 93 75-120 02/25/05 Acceptable COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Chent:

Dawson Group Inc.

Project^e Sample Matrix: Red Hill GW Sampling/2001022 013

Water

Service Request. K2501266 Date Collected: NA

Date Received. NA

Gasoline Range Organics

Sample Name: Lab Code:

Method Blank

KWG0503107-5

Units: ug/L Basis: NA

Extraction Method. EPA 5030B Analysis Method:

Surrogate Name

1.4-Diffuorobenzene

8015B

Level. Low

Analyte Name

MRL.

Date Date Extracted Analyzed

Extraction

Gasoline Range Organics (GRO)

Result Q ND U

Difution Factor 02/25/05

Lot 02/25/05 KWG05i3107

Control

75-120

Date Lamata Analyzed

Note

02/25/05 Acceptable

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Form 1A - Organic

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SuperSci Reference RR46078

QA/QC Report

Client: Project: Dawson Group, Inc.

Red Hill GW Sampling/2001022 013

Sample Matrix:

Water

Surrogate Recovery Summary Gasoline Range Organics

Extraction Method: LPA 5030B Analysis Method:

Units: PERCENT Level. Low

Service Request: K2501266

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

Surrogate Recovery Control Limits (%)

Surl = 1 4-Diffuoroben/enc

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75-120

Results flagged with an asterick (*) and anter values not sale control criteria Results il arged with a annual (#) crain at the cupied criteria is not applicable

Form 2A - Organic

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COLUMBIA ANALYTICAL SERVICES, INC

QA/QC Report

Client:

Dawson Group, Inc.

Project Sample Mainx:

Lab Code

Red Hill GW Sampling/2001022 013

Water

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

Matrix Spike/Duplicate Matrix Spike Summary Gasoline Range Organics

Sample Name:

RH-B-001

K2501266-001

Units: ug/L Basis: NA

Level: Low Extraction Lot: KWG0503107

Extraction Method: EPA 5030B Analysis Method: KOLSB

RH-B-001DMS RH-B-001MS KWG0503107-2 KWG0503107-3 Duplicate Matria Spike

Matrix Splke %Rec RPD RPD Limit Result Result Expected %Rec Expected %Rec Camits Result Analyte Name 69-128 30 Gasoline Range Organius (GRO) ND

Results (lagged with an asterisk (*) indicate vidues outside control criteria. Results (lagged with a possed (#) indicate the captrol criteria is not applicable.

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Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which tuve and been rounded

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Form 3A - Organic

SuperSct Reference

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QA/QC Report

Client. Project:

Dawson Group, Inc Red Hill GW Sampling/2001022 013

Sample Matrix

Water

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

Date Analyzed: 02/25/2005

Lab Control Spike Summary Gasoline Range Organics

Extraction Method: EPA 5030B Analysis Method: 8015B

Units: ug/L Basis: NA Level: Low

Extraction Lot: KWG0503107

Lab Control Sample KWG0503107-4

Lab Control Spike

%Rec

Result Expected %Rec Analyte Name

Gasoline Range Organics (GRO) 491 500 71-128

EPA Method 504.1

Results Happen with an asterisk (*) limitente valum outside cuntral critatia.

Percent respective and petitive percent differences (RPD) are determined by the suffware using values in the calculation which have not been rounded.

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Form 3C - Organic

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Superiori Reference RR46078

Anniyucal Results

Client: Project. Dawson Group Inc

Sample Matrix:

Red Hill GW Sampling/2001022 013

Water

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

Date Received: 02/19/2005

Units: ug/L

Basis: NA

Level: Low

EPA Method 504.1

Sample Name: Lab Code:

RH-B-001 K2501266-001

Extraction Method: METHOD

Analysis Method: 504 l

Dilution Date Date Extraction Factor Lot

Analyte Name Result Q 1,2-Dibromoethane (EDB) ND U

MRL 0 0083

Extracted Analyzed 02/28/05

Note

02/28/05 KWG05032R2

%Rez Surrogate Name

Cuntral Lamits

Note

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:

Dawson Group, Inc.

Project: Sample Matrix:

Water

Red Hill GW Sampling/2001022 013

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

Date Received: 02/19/2005

EPA Method 504.1

Sample Name Lab Code:

RH-B-002

K2501266-002

Extraction Method: METHOD Analysis Method: 504 L

linits ug/L Basis: NA

Level: Low

Dilution Date Date Extraction MRL Lot Analyte Name Result Q Factor Extracted Analyzed 1,2-Dibromoethane (EDB) ND U 0 0081 02/28/05 02/28/05 KWG0503282

Control %Rec Limits Surrogate Name

Note

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Analytical Results

Cllent. Project: Dawson Group, Inc.

Sample Matrix:

Water

Red Hill GW Sampling/2001022 013

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

Date Received: 02/19/2005

Units ng/L

EPA Method 504.1

Sample Name Lab Code:

Surrogute Numo

RH-B-003

Extraction Method: METHOD

K2501266-003

Busis: NA Level: Low

Analysis Method:

504 1

Dilution Date MRL Factor Extracted Analyzed

Analyte Name 1,2-Dibromoethane (EDB) Result O ND U 0.0082

02/28/05

Extraction

Lot

Note 02/28/05 KWG0503282

Control %Ret Limits

Note

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Project: Dawson Group, Inc

Sample Matrix.

Red Hill GW Sampling/2001022 013

Water

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

Date Received: 02/19/2005

EPA Method 504.1

Sample Name Lab Code:

RH-W-001

K2501266-004

Units' ug/L Bass: NA

Extraction Method: METHOD Analysis Method: 504 1

Level. Low

Analyte Name 1,2-Dibromoethane (EDB)

Surrogate Name

Result Q

MRL

Date Date Factor Extracted Analyzed

Extraction

ע מע

0.0083

Dilution

Lot 02/28/05 02/28/05 KWG0503282

%Rec

Control

Nate

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Analytical Results

Client: Project:

Dawson Group, Inc Red Hill GW Sampling/2001022 013

Sample Matrix:

Water

Service Request: K2501266 Date Collected, 02/17/2005

Date Received: 02/19/2005

EPA Method 504.1

Sample Name: Lab Code:

RH-W-002 K2501266-005

Units: ug/L Basis: NA

Extraction Method: METHOD Analysis Method

Level: Low

Date Dilution Analyte Name Result Q

MRL

Factor

Date Extraction

Lot

02/28/05

0.0082

Extracted Analyzed 02/28/05

KWG05032R2

Surrogate Name

1,2-Dibromoethane (EDB)

Control %Rec

ND U

Note

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Chest Project:

Lab Code.

Analyte Name

Surrogate Name

Sample Matrix:

Davison Group, Inc Red Hill GW Sampling/2001022 013

Water

Service Request: K2501266 Date Collected: NA

Date Received: NA

EPA Method 504.1

Sample Name:

Method Blank

KWG0503282-3

Units: ug/L Basis: NA

Extraction Method: METHOD Analysis Method: 504 1

Level: Low

Result Q

%Rec

ND U

Dilution Date Date Extraction MRL Lot Factor Extracted Analyzed Noic 02/28/05 02/28/05 KWG0503282 0 011

1,2-Dibromoethane (EDB)

Control

Limits

Note

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QA/QC Report

Client: Project: Dawson Group, Inc.

Sample Matrix:

Sample Name:

Analyte Name

1 2-Dibromoethane (EDB)

Lab Code

Red Hill GW Sampling/2001022 013

Matrix Spike Summary EPA Method 504.1

RH-B-003 K2501266-001

Extraction Method: METHOD Analysis Method: 504 l

Units, ug/L Basis: NA

Service Request: K2501266

Date Extracted: 02/28/2005

Date Analyzed: 02/28/2005

Level: Low

Extraction Lot: KWG0503282

RH-B-003MS KWG0503282-1

Matrix Spike %Rec

Sample Result Expected %Rec Limite 0 0596 0.0591 65-135

COLUMBIA ANALYTICAL SERVICES, INC

OA/OC Report

Client: Project: Dawson Group, Inc.

Sample Matrix.

Red Hill GW Sampling/2001022 013

Water

Service Request: K2501266 Date Extracted: 02/28/2005

Date Analyzed: 02/28/2005

Lab Control Spike Summary EPA Method 504.1

Extraction Vethod: METHOD Analysis Method: 504 1

Units: ue/L Basis: NA Level: Low

Extraction Let KWG0503282

Lab Control Sample KWG0503282-2

Lab Control Spike %Ret Result Expected %Rec Limits Analyte Name 70-130

0.0744 0 0714 1,2-Dibromocthane (EDB)

Hatults flamed with an axiorak (*) and cate values outside control critera.

Results flagged with a pound (#) indicate the control unterm is out applicable

Percent recovering and relative percent differences (RPD) are determined by the suffering using values in the calculation which have not been re-

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

Percent recovered and relative percent differences (RPI)) are determined by the software using values in the ententation which have not been reunded

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Form 3C - Organic

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Form 3A - Organic

SuperSet Relationer. RR45929

Analytical Results

Client: Project: Dawson Group, Inc Red Hull GW Samphing/2001022 013

Sample Matrix:

Water

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

Volatile Organic Compounds

Sample Name: Lab Code:

RH-B-001 K2501266-001 Units: ug/L Basis: NA

Extraction Method: EPA 5030B Analysis Method:

8260B

Level: Low

			Dilution	Date	Date	Extraction	
Analyte Name	Result Q	MRL	Factor	Extracted	Analyzed	Lot	Note
Benzene	ND U	0 50	1	03/02/05	03/02/05	KWG0503506	
Methyl tert-Butyl Ether	ND U	0.50	1	03/02/05	03/02/05	KWG0503506	
Toluene	1,0	0 50	1	03/02/05	03/02/05	KWG0503506	
Ethylbenzene	ND U	0 50	1	03/02/05	03/02/05	KWG0503506	
m,p-Xylenes	ND U	0.50	1	03/02/05	03/02/05	KW00503506	
o-Xylene	ND U	0.50	1	03/02/05	03/02/05	KWG0503506	
1,2-Dichloroethane (EDC)	NTD U	0.50	ı	03/02/05	03/02/05	KWG0503506	

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

Volatile Organic Compounds EPA Method 8260B

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SuperSet Reference R R46317

Analytical Results

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

Sample Matrix: Water

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

Date Received: 02/19/2005

Volatile Organic Compounds

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

Analysis Method:

EPA 5030B

8260B

Units: ng/L Basis: NA Level: Low

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

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

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:

Project: Sample Matrix:

Dawson Group, Inc Red Hill GW Sampling/2001022 013

Water

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

Volatile Organic Compounds

Sample Name: Lab Code:

RH-B-003 K2501266-003 Units: ug/L Basis: NA

Extraction Method: EPA 5030B Analysis Method:

Level: Low

				Dilution	Date	Date	Extraction	
Analyte Name	Result	Q	MRL	Factor	Extracted	Analyzed	Lat	Note
Benzene	ND	U	0,50	1	03/01/05	03/01/05	KWO0503498	
Methyl tert-Butyl Ether	ND	ΰ	0 50	1	03/01/05	03/01/05	KWG0503498	
Toluene	0.81		0 50	l	03/01/05	03/01/05	KWO0503498	
Ethylbenzene	ND	U	0.50	1	03/01/05	03/01/05	KWG0503498	
m,p-Xylenes	ND	U	0 50	1	03/01/05	03/01/05	KWG0503498	
o-Xylone	ND	U	0.50	1	03/01/05	03/01/05	KWG0503498	
1,2-Dichloroethane (EDC)	ND	Ü	0.50	1.	03/01/05	03/01/05	KWG0503498	

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

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SuperSet Reference RR46317

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Analytical Results

Client: Project: Dawson Group, Inc.

Sample Matrix:

Water

Red Hill GW Sampling/2001022 013

ND U

Date Collected: 02/17/2005

Service Request: K2501266

Date Received: 02/19/2005

Dawson Group, Inc

ND U

Project: Sample Matrix:

Client:

Red Hill GW Sampling/2001022 013

Water

03/02/05

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

Volatile Organic Compounds

Sample Name: Lab Code:

RH-W-001 K2501266-004 Units: ug/L Basis: NA

03/02/05 KWG0503498

Extraction Method: EPA 5030B Analysis Method:

1.2-Dichloroethane (EDC)

8260B

03/02/05

Level: Low

Extraction Method: EPA 5030B Analysis Method:

1,2-Dichloroethane (EDC)

Sample Name:

Lab Code:

8260B

RH-W-002

K2501266-005

03/02/05

Units: ug/L Basis: NA

Level: Low

KWG0503498

Dilution Date Date Extraction Analyzed **Analyte Name** Result Q MRL Factor Extracted Lot KWG0503498 Benzene ND U 0.50 03/02/05 03/02/05 Methyl tert-Butyl Ether ND II 0.50 03/02/05 03/02/05 KWG0503498 KWG0503498 Toluene ND U 0.50 03/02/05 03/02/05 Ethylbenzene 03/02/05 03/02/05 KWG0503498 ND U 0.50 KWG0503498 m o-Xylenes ND U 0.50 03/02/05 03/02/05 o-Xylene 03/02/05 KWG0503498 ND U 0.50 03/02/05

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Volatile Organic Compounds

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

0.50

Analyte Name	Result	0	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND		0.50	1	03/02/05	03/02/05	KWG0503498	
Methyl tert-Butyl Ether	ND	_	0.50	ī	03/02/05	03/02/05	KWG0503498	
Toluene	ND	Ü	0.50	ī	03/02/05	03/02/05	KWQQ503498	
Ethylbenzene	ND	U	0.50	1	03/02/05	03/02/05	KWG0503498	
m,p-Xylenes	ND	Ü	0 50	ī	03/02/05	03/02/05	KWG0503498	
o-Xylene	ND	Ū	0.50	1	03/02/05	03/02/05	KWG0503498	

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

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Form 1A - Organic

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Form 1A - Organic

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SuperSet Reference RR46317

Analytical Results

Client: Project: Dawson Group, Inc Red Hull GW Samplang/2001022 013

Sample Matrix:

Water

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

Date Received: 02/19/2005

Volatile Organic Compounds

Sample Name: Lab Code:

Trip Blank K2501266-006

Extraction Method: EPA 5030B

Units: ug/L Basis: NA Level: Low

Analysis Method: 8260B

			Dilution	Date	Date	Extraction	
Analyte Name	Result Q	MRL	Factor	Extracted	Analyzed	Lot	Note
Benzene	ND U	0.50	ī	03/02/05	03/02/05	KWG0503498	
Methyl tert-Butyl Ether	ND U	0.50	1	03/02/05	03/02/05	KWG0503498	
Tolucae	1.4	0 50	1	03/02/05	03/02/05	KWG0503498	
Ethylbenzene	ND U	0.50	ı	03/02/05	03/02/05	KWG0503498	
m.p-Xylenes	ND U	0.50	1	03/02/05	03/02/05	KWG0503498	
o-Xylene	ND U	0 50	1	03/02/05	03/02/05	KWG0503498	
1,2-Dichloroethane (EDC)	ND U	0.50	1	03/02/05	03/02/05	KWG0503498	

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

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:

Project: Sample Matrix:

Dawson Group, Inc Red Hill GW Sampling/2001022 013

Water

Service Request: K2501266
Date Collected: NA

Date Received: NA

Volatile Organic Compounds

Sample Name: Lab Code:

Method Blank

KWG0503391-4

Units: ug/L Basis: NA

Extraction Method: EPA 5030B Analysis Method:

8260B

Level: Low

			Dilution	Date	Date	Extraction	
Analyte Name	Result Q	MRL	Factor	Extracted	Analyzed	Lot	Note
Benzene	ND U	0.50	1	03/01/05	03/01/05	KWG0503391	
Methyl tert-Butyl Ether	ND U	0.50	1	03/01/05	03/01/05	KWG0503391	
Toluene	ND U	0 50	1	03/01/05	03/01/05	KWG0503391	
Ethylbenzene	ND U	0.50	1	03/01/05	03/01/05	KWG0503391	
m,p-Xylenes	ND U	0.50	1	03/01/05	03/01/05	KWG0503391	
o-Xylene	ND U	0 50	3	03/01/05	03/01/05	KW00503391	
1,2-Dichioroethane (EDC)	ND U	0.50	1	03/01/05	03/01/05	KWC0503391	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note	
Dibromofluoromethane	101	80-119	03/01/05	Acceptable	
Toluene-d8	113	83-L13	03/01/05	Acceptable	
4-Bromofluorobenzene	99	72-l 14	03/01/05	Acceptable	

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Form 1A - Organic

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Form IA - Organic

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SuperSet Reference RR46317

Analytical Results

Client: Project: Dawson Group, Inc

Sample Matrix:

Water

Red Hill GW Sampling/2001022 013

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

Volatile Organic Compounds

Sample Name: Lab Code:

Method Blank KWG0503498-4

Extraction Method: EPA 5030B

Units: us/L Banis: NA Level: Low

Analysis Method:

8260B

			Dibution	Date	Date	Extraction	
Analyte Name	Result Q	MRL	Factor	Extracted	Analyzed	Lot	Note
Benzene	ND U	0.50	1	03/01/05	03/01/05	KWG0503498	
Methyl tert-Butyl Ether	ND U	0 50	1	03/01/05	03/01/05	KWG0503498	
Toiuene	ט מא	0 50	1	03/01/05	03/01/05	KWG0503498	
Ethylbenzene	ND U	0 50	1	03/01/05	03/01/05	KWG0503498	
m,p-Xylenes	ND U	0.50	1	03/01/05	03/01/05	KWG0503498	
o-Xylene	ND U	0 50	1	03/01/05	03/01/05	KW00503498	
1,2-Dichloroethane (EDC)	ND U	0 50	1	03/01/05	03/01/05	KWG0503498	

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

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Project: Dawson Group, Inc.

Sample Matrix:

Red Hill GW Sampling/2001022 013

Water

Service Request: K2501266 Date Collected: NA

Date Received: NA

Volatile Organic Compounds

Sample Name: Lab Code:

Method Blank

KWG0503506-3

Units; ug/L Basis: NA Level: Low

Extraction Method: EPA 5030B Analysis Method:

Analyte Name

Methyl tert-Butyl Ether

Benzene

8260B

Date Date Extraction Extracted Analyzed Lot 03/02/05 KWG0503506 03/02/05 KWG0503506 03/02/05 03/02/05 KWG0503506 03/02/05

Toluene ND U 0.50 03/02/05 Ethylbenzene ND U 0.50 03/02/05 03/02/05 KWQ0503506 1. m.p-Xylenes ND U 0.50 03/02/05 03/02/05 KWG0503506 o-Xylene ND U 0.50 KWG0503506 03/02/05 03/02/05 1,2-Dichloroethane (EDC) ND U 0.50 03/02/05 03/02/05 KWQ0503506

MRL

0.50

0.50

Dilution

Factor

Control Date %Rec Surrogate Name Limits Analyzed Dibromofluoromethane 80-L19 03/02/05 Acceptable 106 Toluene-d8 113 Acceptable 83-113 03/02/05 4-Bromofluorobenzene 104 72-114 03/02/05 Acceptable

Result O

ND U

ND U

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Form 1A - Organic

SeperSet Reference RR46317

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Form 1A - Organic

SuperSet Reference RR46317

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QA/QC Report

Client: Project: Dawson Group, Inc.

Red Hill GW Sampling/2001022 013

Water

Surrogate Recovery Summary Volatile Organic Compounds

Extraction Method: EPA 5030B Analysis Method: 8260B

Lab Control Sample

Sample Matrix:

Units: PERCENT

Service Request: K2501266

Level: Low

Sample Name Lab Code Sur2 Sur3 Sur1 RH-B-001 K2501266-001 105 113 99 RH-B-002 K2501266-002 95 91 93 K2501266-003 RH-B-003 94 91 92 RH-W-001 K2501266-004 93 89 92 95 RH-W-002 K2501266-005 92 93 Trip Blank K2501266-006 94 91 92 101 113 Method Blank KWG0503391-4 99 Method Blank KWG0503498-4 91 91 Method Blank KWG0503506-3 113 104 Batch QC K2501197-001 101 98 113 Batch OCMS 103 KWG0503391-1 106 112 Batch QCDMS 113 104 KWG0503391-2 106 Lab Control Sample KWG0503391-3 103 111 100 Lab Control Sample KWG0503498-3 93 97 102

KWG0503506-1

107

114 * 103

Surrogate Recovery Control Limits (%)

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

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

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Form 2A - Organic

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SuperSet Reference RR46317

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Project: Dawson Group, Inc.

Sample Matrix:

Red Hill GW Sampling/2001022 013

Water

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

Date Analyzed: 03/01/2005

Matrix Spike/Duplicate Matrix Spike Summary Volatile Organic Compounds

Sample Name: Lab Code:

Analysis Method:

Batch OC

K2501197-001

Extraction Method: EPA 5030B 8260B

Units: ug/L Basis: NA

Level: Low

Extraction Lot: KWG0503391

	Samule	KV	latch QCIMS VG0503391- Matrix Spika	1	KV	ntch QCDMS VG0503391- rate Matrix S	2	%Rec		RPD
Analyte Name	Result	Result	Expected	%Rec	Result	Expected	%Rec	Lamits	RPD	Limit
Benzene	ND	108	100	108	108	10 0	108	75-130	0	30
Methyl tert-Butyl Ether	ND	9 96	100	100 -	9 84	100	98	50-152	i	30
Toluene	0 98	11 9	100	109	11.8	100	109	72-132	0	30
Ethylbenzene	ND	11.5	100	115	11.5	100	115	83-130	0	30
m_p-Xylenes	ND	22.7	20 0	113	22 3	20 0	112	84-132	2	30
o-Xvlene	ND	112	100	112	11 2	10 0	112	83-128	0	30
1,2-Dichloroethane (EDC)	ND	10 5	100	105	103	100	103	74-122	2	30

Heroita Ragged with an autorisk (*) orderste valous entode control ordern. Results flagged with a pound (6) indicate the control criteris is not applicable

Persons recoveries and relative persons differences (RFD) are determined by the software using values in the calculation which have not been recorded.

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Form 3A - Organic

SuperSci Reference RR46317

Page 1 of 1

QA/QC Report

Cllent: Project: Sample Matrix: Dawson Group, Inc.

Red Hill GW Sampling/2001022 013 Water

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

Lab Control Spike Summary Volatile Organic Compounds

Extraction Method: EPA 5030B Analysis Method: 8260B

Units: ug/L Basis: NA Level: Low

Extraction Lot: KWG0503391

Lab Control Sample KWG0503391-3 Lab Control Soike

		Control obse		%Rec
Analyte Name	Result	Expected	%Rec	Limits
Benzene	10 3	100	103	78-121
Methyl tert-Butyl Ether	9 69	100	97	63-132
Toluene	10 9	100	109	76-122
Ethylbenzene	9.96	100	100	84-122
m,p-Xylenes	198	200	99	83-125
o-Xylene	9 83	100	98	83-122
1,2-Dichloroethane (EDC)	100	100	100	74-121

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Project: Dawson Group, Inc.

Sample Matrix: Water

Red Hill GW Sampling/2001022 013

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

Lab Control Spike Summary Volatile Organic Compounds

Extraction Method: EPA 5030B Analysis Method: 8260B

Units: ug/L Basis: NA

Level: Low Extraction Lot: KWG0503498

Lab Control Sample KWG0503498-3

	Lab	Control Spik	<u> </u>	%Rec	
Analyte Name	Result	Expected	%Rec	Limits	
Benzene	8 91	10 0	89	78-121	
Methyl tert-Butyl Ether	9 06	10 O	91	63-132	
Toluene	8 58	10 0	86	76-122	
Ethylbenzene	8 81	100	88	84-122	
m,p-Xylenes	179	20 0	90	83-125	
o-Xylene	8 94	10 0	89	83-122	
1,2-Dichloroethane (EDC)	9 44	10 0	94	74-123	

Results flagged with an exterisk (*) indicate values outside central criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software many values or the calculation which have not been retunded

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Form 3C - Organic

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SuperSet Reference RR46317

Results (lagged with an asterist (*) indicate values outside control criteria.

Percent recovering and relative percent differences (RPD) are determined by the authors using values in the calculation which have not been restricted

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Form 3C - Organic

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SuperSet Reference RR46317

QA/QC Report

Client: Dawson of Project: Red Hill Sample Matrix: Water

Dawson Group, Inc Red Hull GW Sampling/2001022 013 Water Service Request: K2501266
Date Extracted: 03/02/2005
Date Analyzed: 03/02/2005

Lab Control Spike Summary Volatile Organic Compounds

Extraction Method: EPA 5030B Analysis Method: 8260B

Coson

Bauls: NA Level: Low

Extraction Lot: KWG0503506

Units: ug/L

Lab Control Sample KWG0503506-1

	Lab	Control Spik	<u>. </u>	%Rec	
Analyte Name	Result	Expected	%Rec	Limite	
Benzene	10 2	10 0	102	78-121	
Methyl tert-Butyl Ether	9 42	10 0	94	63-132	
Toluene	10 7	10 0	107	76-122	
Ethylbenzene	10 7	10 0	107	84-122	
m.p-Xylenes	21 2	20 0	106	83-125	
o-Xylene	104	100	104	83-122	
1,2-Dichloroethane (EDC)	10 5	100	105	74-121	

Polynuclear Aromatic Hydrocarbons

Results (lagged with an asteriak (*) indicate values outside control criteria.

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

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Form 3C - Organic

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SuperSei Reference RR46317

00064

Analytical Results

Chent: Dawson Group, Inc Project:

Sample Matrix:

Red Hill GW Sampling/2001022 013

Water

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

Polynuclear Aromatic Hydrocarbons

Sample Name: RH-B-001 Lab Code: K2501266-001 Extraction Method: EPA 3535

Units: ug/L Basis: NA Level: Low

Analysis Method: 8270C SIM

Analyte Name	Result	0	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND		0 020	1	02/22/05	03/01/05	KWG0502797	
2-Methylnaphthalene	ND	_	0.020	ī	02/22/05	03/01/05	KWG0502797	
Acenaphthylene	ND	_	0 020	i	02/22/05	03/01/05	KWG0502797	
Acenaphthene	ND	Ų	0 020	1	02/22/05	03/01/05	KWG0502797	
Dibenzofuran	ND	U	0 020	1	02/22/05	03/01/05	KWO0502797	
Fluorene	ND	U	0 020	1	02/22/05	03/01/05	KWG0502797	
Phenambrene	ND	υ	0 020	1	02/22/05	03/01/05	KWG0502797	
Anthracene	ND	Ų	0 020	1	02/22/05	03/01/05	KWG0502797	
Fluoranthene	ND	υ	0 020	1	02/22/05	03/01/05	KWG0502797	
Pyrene	ND	U	0 020	1	02/22/05	03/01/05	KW00502797	
Benz(a)anthracene	ND	U	0 020	1	02/22/05	03/01/05	KWG0502797	
Chrysene	ND	υ	0 020	1	02/22/05	03/01/05	KWG0502797	
Benzo(b)fluoranthene	ND	Ū	0 020	1	02/22/05	03/01/05	KWG0502797	
Benzo(k)fluoranthene	ND	U	0 020	1	02/22/05	03/01/05	KWG0502797	
Benzo(a)pyrene	ND	U	0,020	1	02/22/05	03/01/05	KWG0502797	
Indeno(1,2,3-cd)pyrene	ND	U	0 020	1	02/22/05	03/01/05	KWG0502797	
Dibenz(a,h)anthracene	ND	U	0 020	1	02/22/05	03/01/05	KWG0502797	
Benzo(g,h,ı)perylene	ND	U	0 020	1	02/22/05	03/01/05	KWG0502797	

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

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Form IA - Organic

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SuperSca Reference. RR46215

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Project: Dawson Group, Inc.

Sample Matrix:

Red Hill GW Sampling/2001022 013

Water

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

Polynoclear Aromatic Hydrocarbons

Sample Name: Lab Code:

RH-B-002 K2501266-002

Units: ug/L Basis: NA

Extraction Method: EPA 3535 Analysis Method:

8270C SIM

Level: Low

				Dilution	Date	Date	Extraction	
Analyte Name	Result	Q	MRL	Factor_	Extracted	Analyzed	Lot	Note
Naphthalene	ND	Ü	0 022	1	02/22/05	03/01/05	KWG0502797	
2-Methylnaphthalene	ND	Ü	0 022	1	02/22/05	03/01/05	KWG0502797	
Acenaphthylene	ND	U	0 022	1	02/22/05	03/01/05	KWG0502797	
Acenaphtheae	ND	U	0 022	1	02/22/05	03/01/05	KWG0502797	
Dibenzofuran	ND	บ	0 022	1	02/22/05	03/01/05	KWG0502797	
Fluorene	ND	U	0 022	1	02/22/05	03/01/05	KWG0502797	
Phenanthrene	ND	υ	0 022	1	02/22/05	03/01/05	KWG0502797	
Anthracene	ND	U	0 022	1	02/22/05	03/01/05	KWG0502797	
Fluoranthene	ND	U	0 022	L	02/22/05	03/01/05	KWG0502797	
Pyrene	ND	Ü	0 022	1	02/22/05	03/01/05	KWG0502797	
Benz(a)anthracene	ND	U	0 022	1	02/22/05	03/01/05	KWG0502797	
Chrysene	ND	U	0 022	1	02/22/05	03/01/05	KW00502797	
Benzo(b)fluoranthene	ND	U	0 022	ı	02/22/05	03/01/05	KWG0502797	
Benzo(k)flucranthene	ND	Ų	0 022	1	02/22/05	03/01/05	KWG0502797	
Benzo(a)pyrene	ND	U	0 022	1	02/22/05	03/01/05	KWG0502797	
indeno(1,2,3-cd)pyrene	ND	Ü	0 022	1	02/22/05	03/01/05	KWG0502797	
Dibenz(a,h)anthracene	ND	Ų	0 022	1	02/22/05	03/01/05	KWG0502797	
Benzo(g.h.i)perylene	ND	U	0 022	1	02/22/05	03/01/05	KWG0502797	

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

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Form 1A - Organic

Page 1 of 1 SuperSet Reference RR46215

Analytical Results

Cilent: Project: Dawson Group, Inc

Sample Matrix:

Water

Red Hill GW Sampling/2001022 013

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

Polynuclear Aromatic Hydrocarbons

Sample Name: Lab Code:

Analysis Method:

RH-B-003 K2501266-003

Extraction Method: EPA 3535 8270C SIM

Units: ug/L Basis: NA Level: Low

Analyte Name	Result	0	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND		0 021	1	02/22/05	03/01/05	KWG0502797	
2-Methylnaphthalene	ND	Ŭ	0 021	1	02/22/05	03/01/05	KWG0502797	
Acenaphthylene	ND		0 021	ī	02/22/05	03/01/05	KWG0502797	
Acenaphthene	ND	Ū	0 021	1	02/22/05	03/01/05	KWG0502797	
Dibenzofuran	ND	U	0 021	ı	02/22/05	03/01/05	KWG0502797	
Fluorene	ND	Ū	0 02 1	Ĺ	02/22/05	03/01/05	KWG0502797	
Phenanthrene	מא	U	0 021	1	02/22/05	03/01/05	KWG0502797	
Anthracene	ND	Ū	0 021	l	02/22/05	03/01/05	KWG0502797	
Fluoranthene	ND	U	0 021	ı	02/22/05	03/01/05	KWG0502797	
Pyrene	ND	U	0 021	i i	02/22/05	03/01/05	KWQ0502797	
Benz(a)anthracene	ND	U	0 021	1	02/22/05	03/01/05	KWG0502797	
Chrysene	ND	Ū	0 021	1	02/22/05	03/01/05	KWG0502797	
Benzo(b)fluoranthene	ND	Ū	0 021	1	02/22/05	03/01/05	KWG0502797	
Benzo(k)fluoranthene	ND	υ	0 021	1	02/22/05	03/01/05	KW00502797	
Benzo(a)pyrene	ND	υ	0.021	1	02/22/05	03/01/05	KWG0502797	
Indeno(1,2,3-cd)pyrene	ND	U	0 021	1	02/22/05	03/01/05	KWG0502797	
Dibenz(a,h)anthracene	ND	υ	0 021	ì	02/22/05	03/01/05	KWG0502797	
Benzo(g.h.t)perviene	ND	Ü	0.021	i	02/22/05	03/01/05	KWG0502797	

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

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Form IA - Organic

SuperSet Reference RR46215

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COLUMBIA ANALYTICAL SERVICES, INC

Analytical Results

Client: Project: Dawson Group, Inc.

Sample Matrix:

Water

Red Hill GW Sampling/2001022 013

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

Date Received: 02/19/2005

Polynuclear Aromatic Hydrocarbons

Sample Name: Lab Code:

RH-W-001

K2501266-004

Units: ug/L Basis: NA Level: Low

Extraction Method: EPA 3535 Analysis Method: 8270C SIM

Analyte Name	Rerult Q	MRL	Pactor	Date Extracted	Date Analyzed	Estraction	Note
Naphthalene	0.25	0 O2O	1	02/22/05	03/01/05	KWG0502797	
2-Methylnaphthalene	0,14	0 020	1	02/22/05	03/01/05	KWQ0502797	
Acenaphthylene	ND U	0 020	1	02/22/05	03/01/05	KWG0502797	
Acenaphthene	0.052	0 020	ı	02/22/05	03/01/05	KWG0502797	
Dibenzofuran	0.13	0 020	1	02/22/05	03/01/05	KWG0502797	
Fluorene	0.053	0 020	1	02/22/05	03/01/05	KWG0502797	
Phenanthrene	0.12	0 020	1	02/22/05	03/01/05	KWG0502797	
Anthracene	ND U	0 020	1	02/22/05	03/01/05	KWG0502797	
Kluoranthene	0 A24	0.020	1	02/22/05	03/01/05	KWG0502797	

Anthracene	ND U	0 020	1	02/22/05	03/01/05	KWG0302797
Fluoranthene	0.035	0 020	1	02/22/05	03/01/05	KWG0502797
Pyrene	0.056	0 020	1	02/22/05	03/01/05	KW00502797
Benz(a)anthracene	ND U	0 020	ì	02/22/05	03/01/05	KWG0502797
Chrysene	0.020	0 020	ı	02/22/05	03/01/05	KWG0502797
Benzo(b)finoranthene	0,025	0 020		02/22/05	03/01/05	KWG0502797
Benzo(k)fluoranthene	ND U	0 020	1	02/22/05	03/01/05	KW00502797
Benzo(a)pyrene	0,022	0 020	1	02/22/05	03/01/05	KWG0502797
Indeno(1,2,3-od)pyrene	ND U	0 020		02/22/05	03/01/05	KWG0502797
Dibenz(a,h)anihracene	ND U	0.020	1	02/22/05	03/01/05	KWG0502797
Benzo(g,h,ı)perylene	ND U	0 020	1	02/22/05	03/01/05	KWQ0502797

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

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Form 1A - Organic

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SuperSet Reference RR46215

Analytical Results

Clieat: Dawson Group, Inc Project:

Sample Matrix:

Red Hill GW Sampling/2001022 013 Water

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

Polynuciear Aromatic Hydrocarbons

RH-W-002 Sample Name: Lab Code: K2501266-005 Extraction Method: EPA 3535 Analysis Method: 8270C SIM

Units: ug/L Basis: NA Level: Low

			Dilution	Date	Date	Extraction	
Analyte Name	Result (MRL	Factor	Extracted	Analyzed	Lot	Note
Naphthalene	0.21	0 020	1	02/22/05	03/01/05	KWG0502797	
2-Methylnaphthalese	0.057	0 020	1	02/22/05	03/01/05	KWG0502797	
Acenaphthylene	ND U	0 020	1	02/22/05	03/01/05	KWG0502797	
Acenaphthene	0.054	0 020	1	02/22/05	03/01/05	KWG0502797	
Dibenzoforan	0.11	0 020	1	02/22/05	03/01/05	KWG0502797	
Fluorene	0.043	0 020	1	02/22/05	03/01/05	KWG0502797	
Phenanthreue	0.082	0 020	i	02/22/05	03/01/05	KWG0502797	
Anthracene	ט סא	0 020	ı	02/22/05	03/01/05	KWG0502797	
Pluoranthene	0.021	O Q20	l l	02/22/05	03/01/05	KWG0502797	
Pyrene	0,029	0,020	ı	02/22/05	03/01/05	KWG0502797	
Benz(a)anthracene	ND U	0 020	- 1	02/22/05	03/01/05	KWG0502797	
Chrysene	ND U	0.020	J.	02/22/05	03/01/05	KWG0502797	
Benzo(b)fluoranthene	ND U	0.020	l	02/22/05	03/01/05	KWG0502797	
Benzo(k)fluoranthene	ND U	0 020	1	02/22/05	03/01/05	KWG0502797	
Benzo(a)pyrene	ND U	0.020	1	02/22/05	03/01/05	KWG0502797	
Indeno(1,2,3-cd)pyrene	ND U	0 020	1	02/22/05	03/01/05	KWG0502797	
Dibenz(a,h)anthracene	ND U	0 020	1	02/22/05	03/01/05	KWG0502797	
Benzo(g,h,i)perylene	ND U	0 020	1	02/22/05	03/01/05	KWG0502797	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-di0	65	37-107	03/01/05	Acceptable
Fluoranthene-d10	56	18-137	03/01/05	Acceptable
Terphenyl-d14	51	18-153	03/01/05	Acceptable

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Form 1A - Organic

SuperSet Reference. RR46215

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

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

Water

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

Polynucicar Arometic Hydrocarbons

Sample Name: Method Blank KWG0502797-3 Lab Code: Extraction Method: EPA 3535

Unsts: ug/L. Basis: NA Level: Low

Analysis Method: 8270C SIM

				Dflution	Date	Date	Extraction	
Analyte Name	Result	Q	MRL	Factor	Extracted	Analyzed	Lot	Note
Naphthalene	ND	U	0 020	1	02/22/05	02/28/05	KWG0502797	_
2-Methylnaphthalene	ND	υ	0 020	1	02/22/05	02/28/05	KWG0502797	
Acenaphthylene	ND	U	0 020	1	02/22/05	02/28/05	KWG0502797	
Acenaphthene	ND	υ	0 020	1	02/22/05	02/28/05	KWQ0502797	
Dibenzofuran	ND	U	0 020	ı	02/22/05	02/28/05	KWG0502797	
Fluorene	ND	υ	0 020	1	02/22/05	02/28/05	KWG0502797	
Phenanthrene	ND	U	0 020	i	02/22/05	02/28/05	KWG0502797	
Anthracene	ND	U	0 020	1	02/22/05	02/28/05	KWG0502797	
Fluoranthene	ND	U	0 020	1	02/22/05	02/28/05	KWG0502797	
Pyrene	ND	Ü	0 020	1	02/22/05	02/28/05	KWG0502797	
Benz(a)anthracene	ND	U	0 020	1	02/22/05	02/28/05	KWG0502797	
Chrysene	ND	U	0 020	1	02/22/05	02/28/05	KWG0502797	
Benzo(b)fluoranthene	ND	Ü	0 020	1	02/22/05	02/28/05	KWQ0502797	
Benzo(k)fluoranthene	ND	Ŭ	0 020	1	02/22/05	02/28/05	KWG0502797	
Велго(а)ругене	ND	U	0 020	1	02/22/05	02/28/05	KWG0502797	
Indeno(1,2,3-cd)pyrene	ND	Ū	0 020	1	02/22/05	02/28/05	KWG0502797	
Dibenz(a,h)anthracene	ND	U	0 020	1	02/22/05	02/28/05	KWG0502797	
Benzo(g,h,t)perylene	ND	บ	0 020	1	02/22/05	02/28/05	KWG0502797	

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

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Form 1A - Organic

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SuperSet Reference RR46215

QA/QC Report

Client: Project:

Sample Matrix:

Dawson Group, Inc.

Red Hill GW Sampling/2001022 013

Water

Surrogate Recovery Summary

Polynucicar Aromatic Hydrocarbons

Extraction Method: EPA 3535 Analysis Method: 8270C SIM

Units: PERCENT Level: Low

Service Request: K2501266

Sample Name Lab Code <u>Sur1</u> Sur2 Sur3 RH-B-001 K2501266-001 77 85 RH-B-002 K2501266-002 66 75 86 RH-B-003 K2501266-003 70 RH-W-001 K2501266-004 73 72 88 RH-W-002 K2501266-005 65 56 51 Method Blank KWG0502797-3 63 73 83 KWQ0502797-1 Lab Control Sample 74 74 Duplicate Lab Control Sample 73 KWG0502797-2

Surrogate Recovery Control Limits (%)

Surt = Fivorene-d10 37-107 18-137 Sur2 = Pluoranthene-d10 18-153 Sur3 = Terphenyl-d14

Results flagged with an asterial (*) indicate values catalde control criteria. Results flugged with a pound (ii) indicate the central criteria is not applicable

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Form 2A - Organic

SuperSet Reference RR46215

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Project:

Dawson Group, Inc.

Red Hill GW Sampling/2001022 013

Sample Matrix:

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

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

Extraction Method: EPA 3535 Analysis Method: 8270C SIM

Units: ug/L Bauls: NA Level: Low

Extraction Lot: KWG0502797

	KV	Control Samp /G0502797-1 Control Spile		Duplicate Lab Control Sample KWG0502797-2 Duplicate Lab Control Spike			%Rec		RPD
Analyte Name	Result	Expected	%Rec	Result	Expected	%Ret	Limits	RPD	Limit
Naphthalene	2 24	2 50	90	2 27	2 50	91	42-108	1	30
2-Methylnauhthalene	2 10	2 50	84	2 16	2 50	87	29-121	3	30
Acenaphthylene	2 33	2 50	93	2 33	2 50	93	40-112	0	30
Accuaphthene	2 41	2 50	96	2 42	2 50	97	42-115	ì	30
Dibenzofuran	2 34	2 50	94	2 38	2 50	95	34-121	2	30
Fluorene	2 39	2 50	96	2 43	2 50	97	47-117	2	30
Phenanthrene	2 36	2 50	94	2 36	2 50	94	50-115	0	30
Anthracene	2 41	2 50	96	2 4 1	2 50	96	54-118	0	30
Fluorambene	2 80	2 50	112	2 69	2 50	108	50-127	4	30
Pyrene	2 46	2 50	99	2 47	2 50	99	45-133	0	30
Benz(a)anthracene	2 33	2 50	93	2 35	2.50	94	44-127	1	30
Chrysene	2 47	2 50	99	2 48	2 50	99	36-137	0	30
Benzo(b)fluoranthene	2 54	2.50	102	2 55	2 50	102	47-127	0	30
Benzo(k)fluoranthene	2 54	2 50	102	2 52	2.50	101	30-144	i	30
Benzo(a)pyrene	2 38	2 50	95	2 38	2.50	95	36-136	0	30
Indeno(1,2,3-cd)pyrene	2 29	2 50	92	2 30	2 50	92	20-150	0	30
Dibenz(a, h)anthracene	2 22	2 50	89	2 26	2.50	90	50-127	2	30
Benzo(g,h,ı)perylene	2 27	2 50	91	2 31	2 50	92	56-119	1	30

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

Persons recovering and relative persons differences (RPD) are determined by the software using values in the calculation which have not been rounded

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Form 3C - Organic

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APPENDIX B

Monitoring Well Sampling Forms

NAVFAC PACIFIC Contract No.: N62742-01-D-1806, CTO 0013

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MONITORING WELL FIELD SAMPLING LOG

	/	PROJECT Gre	oundwater Samol	mo Red Hill Fuel	l Storage Facili	tv. Hawan - dov	vngradient of USTs *	
Daws	on	CONTRACT NO	N62742-01-I	D-1806, CTO 001	3	JOB	NO 2001_022 013	
roup,		DATE 2/17. PERSONNEL	/2005 J Borr, H K		9 35	CLIMATIC CO	ONDITIONS overcas	<u>t</u>
								
LL INFORM	ATION		'	PURGE VOLU			EQUIPMENT	
	ne/Number	MW-V11	<u> </u>	$V_c = (d_c)^2$	2 x (h) x 0.041		Instrument(s) Y	′SI
	ell Location . ameter (inche	es) 1	(d _c)	Volume of water in			Calibration Time	7:30
•	eli Depth (fe			casing (gallons)		(V _c)	Calibration Result / Co	
initial Depth	to Water (fe	et) 82 64					ОК	
-	Product (fe		— ",	Minimum Purge	2.135			
Height of Water	r Column (fe	et) 17 36	— ^(h)	Volume (gallons)				
RGE LOG	volumne	ements of temperate removed, and at to Dedicated B	he end	conductivity, turbidi	ty, dissolved ox		will be collected initially	r, after every well
		CUMULATIV	E TEMP.		SP. COND.	TURBIDITY	DISSOLVED O ₂	REDOX
DATE	TIME	REMOVED	(℃)	pH	(uS/cm)	(NTU)	(mg/L)	(mV)
2/17/2005	9:35	0	24.0	9.33	1.477	2.68	9.42	37.1
2/17/2005 2/17/2005	9:50 10:14	0.25	22.32	9.18	1.559 1.499	53.2	11.8	25.9 9
2/17/2005	10:26	0.75	23.3	9.39	1.523	96.4	11.9	4.6
				<u> </u>	 		 	
								
MPLE INFO		-	ıler Dedicated				SAMPLED BY	JB, HK
SAMPLE	ID	P, QC, OR QA	TIME COLLECT	TED DATE CO	LLECTED		NOTES	
RH-W-		P	10:42		/2005	· · · · · · · · · · · · · · · · · · ·		
RH-W-		QC = quality control (da	12:35 uplicate) sample, QA		/2005 (tnplicate) sample	<u> </u>	· <u> </u>	·
PPEARANÇE (OF SAMPLE	Color	yellow-beige		Temp	22 85	DO _	7 64 mg/L
		Turbidity			. ^{pH}	8 11	Redox	-117 4 mV
		Sediment	slight		. Sp Cond	1 596		
AB ANALYSIS	PARAMETE	RS (I) BT	EX, MiBE, 1,2-DC	A - EPA Method 82	60B	(2) EDB - E	PA DW Method 504 1	
		(3) TPI	H as gasoline - EPA	Method 8015B		(4) TPH as	diesel - EPA Method 801	5B
		(5) PA	Hs - EPA Method 8	270C or SIM-PAHs		(6) Total lea	ad - EPA Method 6020	
IUMBER & TYP	PE OF SAME	PLE CONTAINERS	USED (include p	reservatives, if any)(1)	3 40-mL VOAs	with HCL	
2) 3 40-mL VO				mL VOAs with HCI	L (4)	2 500-mL Glass	Amber with HCL	
5) 2 1-L Glass /			(6) 1 500-mL plas				<u>-</u> .	
DECONTAMINA	TION PROC	EDURES	see PACDIV II	RP procedures				<u> </u>
AMPLES DELI	VERED TO	T. Sober	CAS				DATE _	2/18/2005
TRANSPORTER	R FedEx						TIME	

13_1Q05 GW Sampling Form.xls

SURFACE WATER FIELD SAMPLING LOG

	PROJECT G	roundwater Samplir	ig, Red Hill	Fuel Storage Fa	acılıty, Hawaıı - Potable Water Ini	filtration Tunnel *
Dawcon	CONTRACT NO	N62742-01-D	-1806, CTO	0013	JOB NO 2001_02	2 013
Dawson	DATE 2	/16/2005	TIME	9 27	CLIMATIC CONDITIONS	sunny
Group, Inc.	PERSONNEL	Ј Вот, Н Кеп	-		<u> </u>	
Ozonp,						-

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

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

SAMPLE INFORMATION

DECONTAMINATION PROCEDURES

SAMPLE WITHDRAWAL METHOD	New, disposable, polyethylene bailer
--------------------------	--------------------------------------

SAMPLED BY

JB, HK

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

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

SAMPLES DELIVERED TO T. Sober, Columbia Analytical Services DATE 2/18/2005
TRANSPORTER FedEx - TIME

see PACDIV IRP Procedures

13_1Q05 GW Sampling Form xls