



August 7, 2008

Mr. Chris Canfield, P.G.  
Environmental Protection Specialist, Northwest Region  
Colorado Oil and Gas Conservation Commission  
707 Wapiti Ct. Suite 204  
Rifle, CO 81650

Subject: Interim Prather Spring Phase One Site Investigation Drilling Report, Parachute,  
Colorado

Dear Mr. Canfield:

This letter report presents a description of the field activities and the validated laboratory analytical data from the initial phase of drilling and sampling activities described in the Revised Phase 1 Site Investigation Work Plan, dated July 31, 2008. This investigation included drilling six boreholes; installing temporary groundwater monitoring wells in each borehole; and collecting and analyzing subsurface soil and groundwater samples to investigate shallow groundwater contamination in the vicinity of Prather Spring, located in the SE quarter of the SW quarter of Section 14, Township 6 South, Range 97 West (the "Site").

This investigation has been performed on behalf of Williams Production RMT Company (Williams), Petroleum Development Corporation (PDC), Marathon Oil Company (Marathon), and Nonsuch Natural Gas, Inc. (Nonsuch), hereafter referred to as the Companies, under a recently completed Joint Defense Agreement. URS Corporation (URS) has been designated by the Companies as the Joint Consultant.

The results of this initial investigation are insufficient to determine the origin of the impacts to groundwater in the area, and additional drilling and sampling is planned in the near future. Therefore, this is an interim report and the Companies would like to discuss the scope of future investigative work at your earliest convenience.

## **BACKGROUND**

The Prather Spring is located in an upland area above Garden Gulch, in the SE quarter of the SW quarter of Section 14, Township 6 South, Range 97 West, north of Parachute, Colorado (the "Site"). Water impacted by the presence of petroleum hydrocarbons was discovered in Prather Spring on or around May 31, 2008 when cabin owner, Mr. Ned Prather, turned on the cabin water tap while opening up the cabin for the summer season. In response to the alleged contaminant release, on June 19, 2008, COGCC issued each of the Companies a Notice of Alleged Violation (NOAV), and directed the Companies to provide an alternate drinking water supply for the cabin. The NOAV also included a requirement to provide a suitable alternate

water supply for livestock consumption. The Companies have complied with these directives and have initiated a hydrogeologic investigation to delineate the contamination source(s).

### **Previous Sampling Activities**

In addition to this study, representatives from the Companies also responded to the NOAV, performing internal investigations, and collecting water samples in the area for laboratory analysis. Available water quality data from these recent sampling events were considered in the development of the Phase 1 work plan.

Prior to the commencement of the Phase 1 Site Investigation, Williams and their consultant, HRL Compliance Solutions, Inc. (HRL), collected nine samples from the cabin tap and the Prather spring. Marathon, PDC, and the Colorado Oil and Gas Conservation Commission (COGCC) have also collected samples (or their consultants have collected samples) from the Prather spring and other nearby springs and surface water bodies. These include surface water samples collected from a stock pond fed by the affected spring and from nearby McKay Gulch for analysis. To comply with COGCC's request in a letter dated July 10, 2008, URS has requested electronic copies of the laboratory results from these other parties to be compiled into a common database using uniform site location names for the various sites sampled by the parties. URS has not yet received all of the data and therefore the data is not fully summarized in this interim report.

Volatile organic compounds (VOCs) including benzene, toluene, and xylenes have been reported in laboratory analysis from water samples collected from the spring and cabin tap. Benzene concentrations were measured above the State of Colorado primary drinking water standard at both Prather spring and the Prather cabin tap. Reported laboratory data representative of subsequent water samples from springs in adjacent drainages have not resulted in contaminant concentrations above their respective reporting limits, until recently. Review of the reported laboratory data prior to last week suggests a localized source or sources of contaminants in the McKay Gulch area. Last week the Companies learned that benzene had been detected at low concentrations, in Spring #2, located west of the Prather cabin in an adjacent drainage to the Prather Spring within McKay Gulch.

### **INVESTIGATION SCOPE AND OBJECTIVES**

The objective of Phase 1 is to identify the probable contamination source(s) impacting the colluvial flow zone where the Prather Spring has been developed. The initial drilling program was designed to evaluate the presence or absence of shallow groundwater in the colluvium upstream from the Prather Spring, and obtain water quality samples from the colluvium- bedrock contact at the confluence of several small tributary drainages located below the natural gas well pads identified in the NOAVs. The initial borehole locations were staked in the field by URS along three surface drainages that could contribute groundwater to the colluvium upstream of the Prather spring.

The remainder of the report presents a summary of field activities and final analytical results from the Phase 1 investigation completed to date.

## **PHASE 1 INITIAL FIELD INVESTIGATION**

Drilling locations were cleared for subsurface utilities. URS contacted the Utility Notification Center of Colorado (UNCC) on July 7, 2008. Due to the remote location of the Site, URS met the underground utility representatives in the field on July 9, 2008 prior to drilling. URS was notified that the Site was clear of utilities.

URS also completed Form GWS-51 "Notice of Intent to Construct Monitoring Hole(s)" as required by the State Engineers Office's (SEO). Monitoring hole (MH) numbers 048003 and 048004 were established by the SEO for the Prather and Puckett properties, respectively.

Field activities were performed at the Site on July 15-18, and July 21, 2008. These activities included advancing six soil borings to collect subsurface soil samples, installing six temporary groundwater monitoring wells in the soil bore locations, and collecting four groundwater samples. The locations of the monitoring wells are shown on Figure 1. As of August 4, groundwater had not accumulated in two of the monitoring wells (PSMW-5 and -6). As a result, only four groundwater samples were collected.

At the time of the initial drilling activities, permission to drill had not been granted by the owners of the property adjoining the Site to the south (Puckett). The Puckett property includes the originally proposed locations of borehole locations PSBH 1, 2, and 3. It was decided in the field that the proposed drilling locations for PSBH-3 and PSBH-4 would be moved north of the staked locations, and north of the fence believed to mark the property line.

### **Drilling and Soil Sampling**

Geotechnical Engineering Group (GEG) of Grand Junction, Colorado mobilized a track-mounted Central Mining Equipment (CME) drill rig to the Site for the purpose of collecting soil samples and constructing the monitoring wells. URS observed the drilling of six boreholes, which were subsequently constructed as monitoring wells, (PS-BH3, -4, -5, -6, -11S, and -11D) at the Site between July 15 and July 18, 2008. With the exception of PS-BH11D, each boring was advanced with a 7-inch outside diameter hollow stem auger. PS-BH11D was installed using a 4-inch solid-stem continuous flight auger. Subsurface soil samples were collected from borings using a split-spoon sampler. Soil samples were taken by URS personnel during the drilling of each borehole, and soil samples were also split with personnel from LT Environmental at each borehole. Sampling equipment (i.e., split spoons) was decontaminated between samples with an Alconox solution and triple rinsed with de-ionized water. The drill augers were decontaminated between sampling locations using high pressure water.

Soils encountered during the investigation generally consisted of colluvium overlying bedrock. The depth to bedrock ranged from 13 to 22 feet below ground surface (bgs). The colluvium was visually classified in the field as clayey sand to sandy clay, medium dense, moist, and yellow

brown to dark brown in color. The colluvium contained fragments of shale and sandstone bedrock. Bedrock consisted of gray to reddish brown shale and occasionally sandstone. The bedrock was dense and fractures were noted at location PS-MW03. Depths to ground water ranged from 10 to 15 feet bgs. Boring logs are presented in Attachment 1.

Soil samples were collected for field headspace screening at 4-foot intervals in shallow soils, and 2-foot intervals in deeper zones closer to groundwater. Soil samples were placed in a plastic bag and the headspace within the bag was screened for VOCs using a Mini-Rae Classic Plus photo-ionization detector (PID) and for methane using a Land Tec GEM 2000 Gas Analyzer and Extraction Monitor. PID and methane readings are summarized on the boring logs in Attachment 1. Evidence of petroleum hydrocarbon staining or odors was not observed in any drill cuttings or samples. Methane was not detected in any screening samples. PID readings from screening samples for colluvial soils were generally below 6 PID units (ppm). A soil sample from each boring except PS-BH11D was collected from just above the colluvial/bedrock interface and submitted to the laboratory for analysis.

A field decision was made to complete a deeper boring and groundwater monitoring well to obtain soil and groundwater samples from an elevation corresponding to the inferred elevation of the base of the Prather spring. PS-BH11D was advanced south of Prather spring with solid-stem augers to a depth of approximately 49 feet bgs. This borehole was advanced approximately 30 feet into bedrock based on the lithologies noted at PS-BH11S. A subsurface soil sample was collected from a depth of approximately 49 feet bgs for laboratory analysis. This depth interval corresponds to a higher PID reading (17.7 ppm) from a field headspace analysis of a soil sample.

The soil samples were placed in laboratory-supplied containers and stored in a cooler containing ice under chain-of-custody procedures. Primary soil samples were submitted to Evergreen Analytical in Wheat Ridge, Colorado. Duplicate split soil samples were submitted to Test America Laboratories in Nashville, Tennessee.

### **Monitoring Well Construction and Groundwater Sampling**

Each boring was advanced into the saturated zone and a monitoring well was installed at each location (PS-MW3, -4, -5, -6, -11S, and -11D, see Figure 1). The groundwater monitoring wells were completed using 2-inch nominal diameter schedule 40 threaded PVC pipe. Well construction details for each well are included in Attachment 1. With the exception of PS-MW11D, wells were installed through the hollow-stem augers to prevent collapse of the borehole wall during well construction. Well PS-MW11D, which was installed within a 4-inch diameter borehole, was constructed by placing 2-inch nominal PVC pipe in the open borehole. During installation however, the borehole walls became unstable, and the seal in the well could not be constructed per work plan specifications.

### **Well Development and Sampling**

Prior to collection of groundwater samples, the depth to water inside the well casing was measured from the top of the PVC well casing and recorded on field forms for each well. PS-



MW5 and PS-MW6 were dry. As a result, PS-MW 5 and 6 could not be developed or sampled. These two well locations were drilled along the west edge of the valley. These two dry wells are evidently located beyond the edge of the colluvial saturated flow zone that is present along the lower and more central portion of the gulch.

PS-MW3, -4, -11S were developed and subsequently purged using both a disposable polyethylene bailer and a low flow rate peristaltic pump with the pump intake suspended approximately 1 foot off of the bottom of each well.

Groundwater samples were collected by personnel from HRL Compliance Solutions (HRL) following purging each well of three or more well casing volumes of water. During well purging, the HRL field geologist sampled the purge water for water quality indicator parameters pH, temperature, and specific conductance using a Hanna multi-parameter water quality meter. Other observations (i.e., color, odor and clarity) were recorded after the removal of each well casing volume. Purging was considered complete when three casing volumes had been removed from each well and the indicator parameters had stabilized. Stabilization was considered to be achieved when three consecutive readings of the primary field parameters (pH, temperature, and specific conductance) were within the following limits: specific conductance  $\pm 3\%$ ; temperature  $\pm 10\%$ ; and pH  $\pm 0.1$  units. The last recorded values for field water quality parameters prior to sample collection are summarized on Table 1.

Table 1 – Groundwater Field Water Quality Parameters

Well Number	Date	Static Water Level (ft btoc)	Temperature (°C)	pH	Specific Conductance
					(mS/cm)
PS-MW03	07/17/08	17.48	8.70	8.05	0.50
PS-MW04	07/17/08	15.80	7.00	7.37	0.50
PS-MW11S	07/18/08	11.70	9.2	7.34	0.48
PS-MW11D	07/21/08	31.10	8.3	7.65	0.63

ft btoc = feet below top of well casing

°C = degrees Celsius

mS/cm = milliSiemens per centimeter

The groundwater samples were placed into appropriate containers supplied by the laboratory and logged on appropriate chain-of-custody (COC) forms. Groundwater samples were stored in the field in a cooler containing ice until the coolers were prepared for shipment, and were subsequently submitted to their respective laboratories for analysis. The COC forms were used to track possession of the groundwater samples from the Site to the laboratory.

As specified in the work plan, soil samples were analyzed for VOCs using Method 8260B, and Total Volatile Petroleum Hydrocarbons (TVPH) and Total Extractable Petroleum Hydrocarbons (TEPH) using Method 8015B. Additional analysis for semi-volatile organic compounds (SVOCs) using Method 8270 will be conducted on soil samples if the initial soil sample contains TEPH concentrations greater than 100 mg/kg.

Groundwater samples were analyzed for VOCs using USEPA SW846 Method 8260B and dissolved methane using the RSK-175 method. Primary groundwater samples were submitted to Evergreen Analytical in Wheat Ridge, Colorado. Duplicate split soil samples were submitted to Test America Laboratories in Nashville, Tennessee.

### **SUMMARY OF REPORTED LABORATORY DATA**

URS chemists completed validation of the analytical data as described in the Work Plan following receipt of final lab data packages from Evergreen Analytical on July 31<sup>st</sup>. Tables 2 and 3 summarize the analytes detected in laboratory analytical data for subsurface soil and groundwater samples. Attachment 2 contains a complete listing of the analytical results for the soil and groundwater samples. Analytical data packages, including a data validation summary, are included in Attachment 3.

All data were found to be usable as qualified with the exception of 2-chloroethylvinyl ether (2-CEVE) results for groundwater samples. The 2-CEVE results were rejected during data validation because all four matrix spike recoveries (two MS/MSD pairs) were 0%. This is not considered to affect project objectives because 2-CEVE is not considered to be an analyte of interest. Some other results were qualified as estimate based on low surrogate recoveries or detected values that are above the method detection limit (MDL) but below the reporting limit (RL).

Split samples of four groundwater samples and four soil samples were submitted to Test America for analysis. In general, the split sample results showed good agreement (see data validation reports for evaluation criteria). The exception is the dissolved methane results for 2 of the 4 groundwater samples which did not agree within 2 times the RL for the primary samples. For PS-MW11D, the primary and split sample dissolved methane results were 0.050 mg/l and <0.015 mg/l (i.e., nondetect), respectively. For PS-MW03, the primary and split sample results were <0.0008 mg/l (i.e. nondetect) and 0.0030 mg/l, respectively. At these very low levels for dissolved methane, a highly volatile analyte, the disparity could be the result of field sampling techniques and the differing RL between the two laboratories.

Benzene, toluene, xylenes, TVPH and TEPH were detected in the soil sample from PSBH-11D-49'. Petroleum hydrocarbons and/or VOCs were not detected in other soil samples. This sample corresponds to the depth interval where an elevated PID reading was obtained from a field headspace analysis. The concentration of TEPH exceeded 100 milligrams per kilogram (mg/Kg), so the sample was subsequently analyzed for semi-volatile organic compounds (SVOCs) by USEPA Method 8270. None of the SVOC analytes were detected for this sample above the reporting limit.

**Table 2 – Soil Sample Results from Primary Samples – Detected Constituents**

Sample ID	Depth (ft bgs)	Sample Date	Acetone (ug/Kg)	Benzene (ug/Kg)	Toluene (ug/Kg)	Total Xylenes (ug/Kg)	TVPH (mg/Kg)	TEPH (mg/Kg)
PS-BH03	20-21.5	07/16/08	<130	<6.6	<13	<33	<1.0	<14
PS-BH04	14-16	07/16/08	<130	<6.7	<13	<34	<1.0	<14
PS-BH05	12.5-13.5	07/15/08	<140J	<7.1	<14	<36	<1.0	<14
PS-BH06	15-16	07/15/08	<130J	<6.7	<13	<34	<1.0	<14
PS-BH11S	17.5-19	07/17/08	<130	<6.7	<13	<34	<1.0	<14
PS-BH11D	49	07/17/08	<260J	6.9J	46J	30J	1.5J	620

Concentrations reported corrected for percent moisture (dry weight)

J indicates that the associated value is an estimate

< indicates that the analyte was not detected above the associated reporting limit

mg/Kg = milligrams per kilogram

ug/Kg = micrograms per kilogram

**Table 3 – Groundwater Sample Results from Primary Samples – Detected Constituents**

Sample ID	Screened Interval (ft bgs)	Sample Date	Acetone (ug/L)	Benzene (ug/L)	2-Butanone (ug/L)	Toluene (ug/L)	Total Xylenes (ug/L)	Methane (ug/L)
PS-MW03	9-29	07/17/08	7.1 J	<1.0	<5.0	<2.0	<4.0	<0.80
PS-MW04	8-18	07/17/08	5.5 J	<1.0	<5.0	<2.0	<4.0	<0.80
PS-MW05	9-14	Dry	NA	NA	NA	NA	NA	NA
PS-MW06	7.5-17.5	Dry	NA	NA	NA	NA	NA	NA
PS-MW11S	9-19	07/18/08	4.7 J	<1.0	<5.0	<2.0	<4.0	<0.80
PS-MW11D	29-39	07/21/08	39 J	0.97	12	1.1 J	<4.0	50

NA indicates not analyzed

J indicates that the associated value is an estimate

< indicates that the analyte was not detected above the associated reporting limit

mg/L = milligrams per liter

ug/L = micrograms per liter

## FINDINGS

Petroleum hydrocarbon compounds were not detected in laboratory analytical results from subsurface soil or groundwater samples taken within the saturated colluvial zone. Petroleum

hydrocarbons were detected in one subsurface soil sample and the groundwater sample from location PS-MW11D, which corresponds to the approximate elevation of Prather Spring.

These results are interpreted as evidence that hydrocarbon contamination is not likely migrating through the colluvial flow zone. There were no petroleum hydrocarbons detected in the groundwater sample collected from the shallow well at this location, PS-MW11S, indicating that the constituents detected from the sample in well PS-MW11D originate from the bedrock aquifer and not the overlying colluvial saturated flow zone.

An alternate conceptual Site model has been developed, in which groundwater in a bedrock aquifer (not the colluvial saturated flow zone beneath the gulch) flows through higher permeability geologic materials overlying lower permeability material, and/or through a fracture network in the bedrock. This groundwater would then discharge as springs where the geologic contact and/or fractures either daylight at the ground surface or intersect the alluvial/colluvial materials.

## **RECOMMENDATIONS**

The Companies would like to discuss the scope of the next phase of the field investigation with the COGCC at your earliest convenience. The Companies are prepared to drill deeper into the bedrock and install bedrock monitoring wells at existing colluvial monitoring well locations, and possibly in additional locations based on information developed while in the field.

Recommendations for future Phase 1 investigation activities will be presented in an addendum to the Work Plan. A supplemental surface water monitoring work plan is in the process of being finalized by the Companies. The surface water work plan contains a longer list of analytical constituents, and would also be submitted as an addendum to the existing work plan.

## **LIMITATIONS**

This report has been prepared in accordance with generally accepted environmental engineering practices in the area to evaluate the nature of subsurface contamination. Information submitted in this report is based upon reported laboratory data obtained from samples collected at the Site. The laboratory data obtained from these samples are indicative of conditions only at the locations where they were collected. The nature and extent of subsurface variations between sampling locations has not been defined by the data collected during this investigation. It is possible that additional testing and sampling could alter the conclusions of this report.

This assessment provides an indication of the status of the Site at this time. A complete definition of the Site conditions would require substantial testing and more detailed investigation. Because of uncertainties related to subsurface conditions and the changing nature of soil conditions as well as the current uses of the Site, it is not possible for URS to provide guarantees with this assessment.

If you have any questions concerning this information please feel free to contact me or any of the Company representatives.

Respectfully,



Mark K. Levorsen  
Principal Hydrogeologist

Figure 1 – Boring and Monitoring Well Location Map

Attachment 1 – Boring Logs

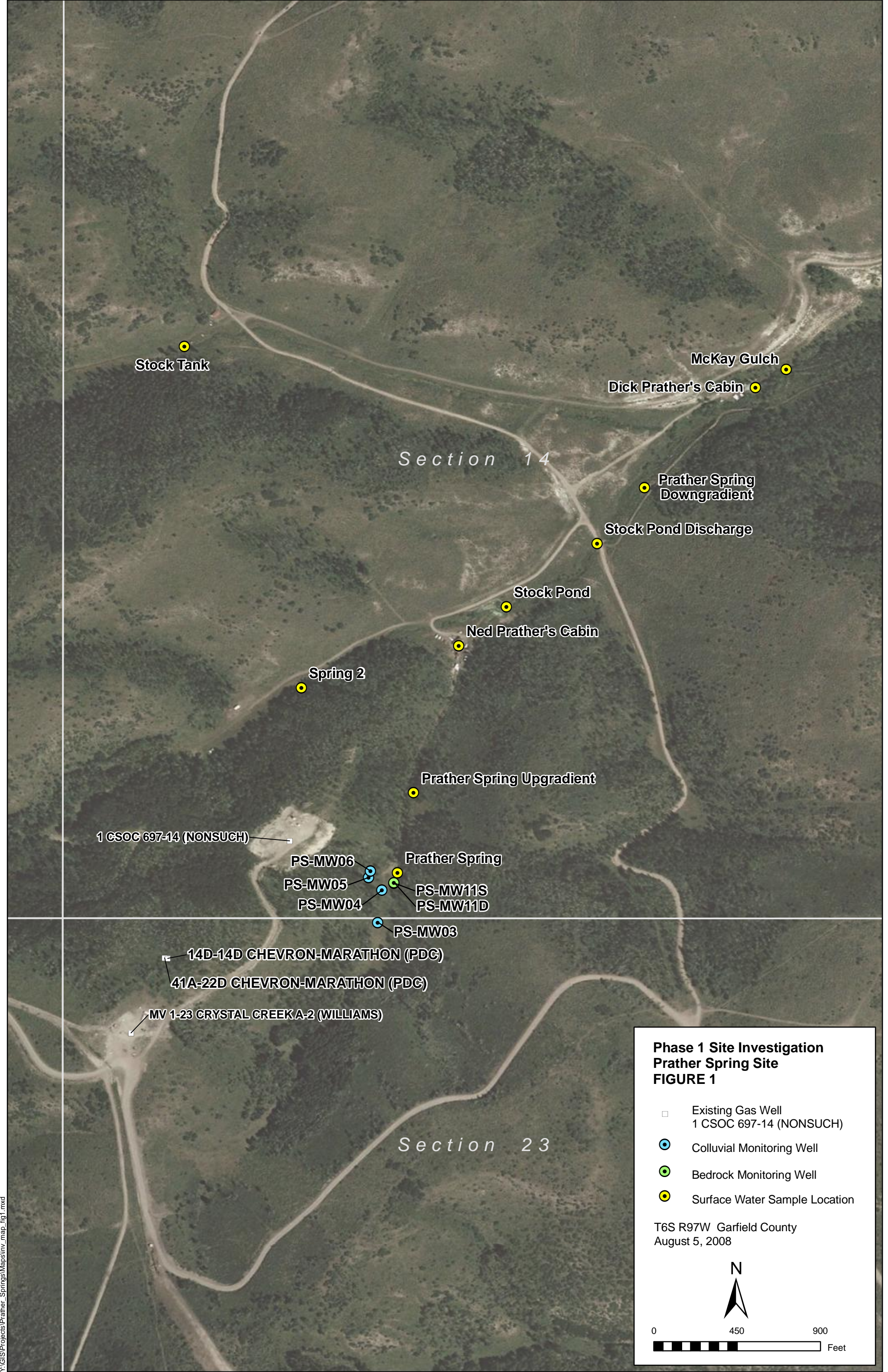
Attachment 2 – Soil and Groundwater Analytical Results Tables

Attachment 3 –Data Validation Summaries and Qualified Lab Data Sheets

cc: Mr. Mike Paules, Williams Production RMT Company  
Mr. David Lee, Nonsuch Natural Gas, Inc.  
Mr. John Nussbaumer, Petroleum Development Corporation  
Mr. Bob Coleman, Marathon Oil Company

Mr. David Cox, URS Corporation  
Mr. Craig Heydenberk, URS Corporation





Y:\GIS\Projects\Prather\_Springs\MapInv\_map\_fig1.mxd

**Phase 1 Site Investigation  
Prather Spring Site  
FIGURE 1**

- Existing Gas Well  
1 CSOC 697-14 (NONSUCH)
- Colluvial Monitoring Well
- Bedrock Monitoring Well
- Surface Water Sample Location

T6S R97W Garfield County  
August 5, 2008

N

0 450 900  
Feet





## **Attachment 1 – Boring Logs**



**URS Corporation**  
8181 East Tufts  
Avenue  
Denver, CO 80237

**Borehole ID: PS-MW03**

**Project Name:** Prather Spring Investigation

**Hydrogeologist:** C. Heydenberk

**Drilling Equipment:** CME-55

**Borehole Diameter:** 7"

**Date/Time Drilling Started:** 7/16/08

**Vertical Datum:**

**Horizontal Datum:**

**Water Level (ft bgs):** 10

**Location:** Parachute, CO

**Project Number:** 22239335

**Drilling Company/Driller:** GEG

**Drilling Method:** HSA

**Date/Time Total Depth Reached:** 7/16/08

**Total Depth Drilled:** 30'

**Ground Elevation:** TBD

**Easting:** TBD

**Northing:** TBD

Depth (ft)	PID (ppm)	Blows/6"	Recovery	Lithologic Symbol	Lithologic Description	USCS Code	Well Construction Diagram	Remarks
2.0					<b>SILTY CLAY</b> Top soil, dark brown, silty clay, few sand with organics, roots, very soft, moist			
4.0	2.7	2/6"				CL		No PHC Odor
6.0								
8.0								
10.0	2.5	17/2"			<b>SANDY CLAY</b> tan/orange, sandy clay, medium stiff, some shale and sandstone fragments, moist	CL		No PHC Odor, Colluvium
12.0	1.3	15/23"			<b>SANDY CLAY</b> tan/orange, sandy clay, medium dense, some shale and sandstone fragments, wet	CL		No PHC Odor
14.0								
1.3	16/							Water at 15'





**URS Corporation**  
8181 East Tufts  
Avenue  
Denver, CO 80237

**Borehole ID: PS-MW04**

**Project Name:** Prather Spring Investigation

**Hydrogeologist:** C. Heydenberk

**Drilling Equipment:** CME-55

**Borehole Diameter:** 7"

**Date/Time Drilling Started:** 7/16/08

**Vertical Datum:**

**Horizontal Datum:**

**Water Level (ft bgs):** 10

**Location:** Parachute, CO

**Project Number:** 22239335

**Drilling Company/Driller:** GEG

**Drilling Method:** HSA

**Date/Time Total Depth Reached:** 7/16/08

**Total Depth Drilled:** 18'

**Ground Elevation:** TBD

**Easting:** TBD

**Northing:** TBD

Depth (ft)	PID (ppm)	Blows/6"	Recovery	Lithologic Symbol	Lithologic Description	USCS Code	Well Construction Diagram	Remarks
2.0					<b>SILTY CLAY</b> Top soil, dark brown, silty clay, few sand with organics, roots, moist			
4.0	1.6	4/4"				CL		
6.0								
8.0								
10.0	1.8	8/18"			<b>SANDY CLAY</b> tan/orange, sandy clay, medium dense, some shale and sandstone fragments, moist	CL		No PHC Odor, Colluvium
12.0	1.7	11/24"			<b>SANDY CLAY</b> tan/orange, sandy clay, medium dense, some shale and sandstone fragments, wet			Water at 13'
14.0	1.3					CL		Large shale clast at 13.5' BGS, Colluvium, No PHC odor, some oxidation on clasts



URS Corporation  
8181 East Tufts  
Avenue  
Denver, CO 80237

**Borehole ID: PS-MW04**

**Project Name:** Prather Spring Investigation

**Hydrogeologist:** C. Heydenberk

**Drilling Equipment:** CME-55

**Borehole Diameter:** 7"

**Date/Time Drilling Started:** 7/16/08

**Vertical Datum:**

**Horizontal Datum:**

**Water Level (ft bgs):** 10

**Location:** Parachute, CO

**Project Number:** 22239335

**Drilling Company/Driller:** GEG

**Drilling Method:** HSA

**Date/Time Total Depth Reached:** 7/16/08

**Total Depth Drilled:** 18'

**Ground Elevation:** TBD

**Easting:** TBD

**Northing:** TBD

Depth (ft)	PID (ppm)	Blows/6"	Recovery	Lithologic Symbol	Lithologic Description	USCS Code	Well Construction Diagram	Remarks
17.0	5.6	15/ 2" 30/ 22"			<b>SANDY CLAY</b> tan/orange, sandy clay, stiff, some shale and sandstone fragments, very wet	CL		No structure in matrix  Fractured shale, some oxidation, No PHC odor, Bedrock
19.0					<b>SHALE</b> gray, shale, dense, wet			Total Depth at 18'
21.0								
23.0								
25.0								
27.0								
29.0								



**URS Corporation**  
8181 East Tufts  
Avenue  
Denver, CO 80237

**Borehole ID: PS-MW05**

**Project Name:** Prather Spring Investigation

**Hydrogeologist:** D. Cox

**Drilling Equipment:** CME-55

**Borehole Diameter:** 7"

**Date/Time Drilling Started:** 7/15/08

**Vertical Datum:**

**Horizontal Datum:**

**Water Level (ft bgs):**

**Location:** Parachute, CO

**Project Number:** 22239335

**Drilling Company/Driller:** GEG

**Drilling Method:** HSA

**Date/Time Total Depth Reached:** 7/15/08

**Total Depth Drilled:** 15'

**Ground Elevation:** TBD

**Easting:** TBD

**Northing:** TBD

Depth (ft)	PID (ppm)	Blows/6"	Recovery	Lithologic Symbol	Lithologic Description	USCS Code	Well Construction Diagram	Remarks
2.0					<b>SILTY CLAY</b> dark brown, silty clay with light brown to olive silt and clay, some sand and lithics, organics, wood fragments, slightly moist	CL		
4.0					<b>SILTY CLAY</b> dark brown, silty clay with light brown to olive silt and clay, few sands and lithics, organics, moist	CL		
6.0	1.1	1			<b>SILTY CLAY</b> dark brown, silty clay with light brown-olive silt and clay, few sands and lithics, organics, moist to very moist	CL		
8.0	1.2	2			<b>SILTY CLAY</b> light to yellow brown, silty clay, few to some sand, lithic fragments (shale), very moist	CL		
10.0		2						
12.0	1.1	3			<b>SILTY SAND</b> yellow brown, coarse lithics, clay, wet in sand, sub-angular	SM		Wet at 11' in pores Oxidized zone, collected sample at 12.5-13.0' BGS at 12:25
14.0	1.2	4			<b>SILTY CLAY</b> silty clay with sand and rock fragments, wet, clasts are angular to sub-angular	CL		Bedrock at 13' BGS
16.0		6			<b>SANDY CLAY</b> reddish brown, clay and sand alternating, shale fragments, wet	CL/SC		
18.0		15			<b>SHALE</b> gray to olive, weathered shale, wet			
20.0		50/12						Total Depth at 15' BGS





**URS Corporation**  
8181 East Tufts  
Avenue  
Denver, CO 80237

**Borehole ID: PS-MW06**

**Project Name:** Prather Spring Investigation

**Hydrogeologist:** D. Cox

**Drilling Equipment:** CME-55

**Borehole Diameter:** 7"

**Date/Time Drilling Started:** 7/16/08

**Vertical Datum:**

**Horizontal Datum:**

**Water Level (ft bgs):**

**Location:** Parachute, CO

**Project Number:** 22239335

**Drilling Company/Driller:** GEG

**Drilling Method:** HSA

**Date/Time Total Depth Reached:** 7/16/08

**Total Depth Drilled:** 17'

**Ground Elevation:** TBD

**Easting:** TBD

**Northing:** TBD

Depth (ft)	PID (ppm)	Blows/6"	Recovery	Lithologic Symbol	Lithologic Description	USCS Code	Well Construction Diagram	Remarks
2.0					<b>SILTY CLAY</b> dark to yellow brown, silty clay with sand, roots, organics, few lithics fragments, slightly moist	CL		
4.0		W			<b>SILTY CLAY</b> dark to yellow brown, silty clay with sand, organics, few lithics fragments, slightly moist	CL		
2.8								
6.0		W						
1.6								
8.0		1			<b>SILTY CLAY</b> yellow brown, silty clay with sand, subangular lithic clasts, moist	CL		
1.8		1			<b>SILTY CLAY</b> red to yellow brown, silty clay with sand, roots, subangular lithic clasts, moist	CL		
10.0		3			<b>CLAYEY SAND</b> red to yellow brown, clayey sand, small gravel sized clasts in clay/silt matrix, wet	SM		Colluvium
11.2		9			<b>SANDY CLAY</b> red to yellow brown, sandy clay, small gravel sized clasts in clay/silt matrix, varying amounts of silt/clay with lithic fragments (shale and sandstone), wet	CL/SM		
8.8		18						
3.8		20				CL		Wet at 10' in pores
14.0								
4.2		22						Sample 15-16' BGS-16:05, Split
4.0								



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**Borehole ID: PS-MW06**

**Project Name:** Prather Spring Investigation

**Hydrogeologist:** D. Cox

**Drilling Equipment:** CME-55

**Borehole Diameter:** 7"

**Date/Time Drilling Started:** 7/16/08

**Vertical Datum:**

**Horizontal Datum:**

**Water Level (ft bgs):**

**Location:** Parachute, CO

**Project Number:** 22239335

**Drilling Company/Driller:** GEG

**Drilling Method:** HSA

**Date/Time Total Depth Reached:** 7/16/08

**Total Depth Drilled:** 17'

**Ground Elevation:** TBD

**Easting:** TBD

**Northing:** TBD

Depth (ft)	PID (ppm)	Blows/6"	Recovery	Lithologic Symbol	Lithologic Description	USCS Code	Well Construction Diagram	Remarks
17.0	3.8	22			<b>SANDY CLAY</b> red to yellow brown, sandy clay, small gravel sized clasts in clay/silt matrix, varying amounts of silt/clay with lithic fragments, large shale and sandstone fragments, wet	CL		Bedrock at 15.7' BGS
19.0		30			<b>CLAYEY SAND</b> red to yellow brown, clayey sand, small gravel sized clasts in clay/silt matrix, varying amounts of silt/clay with increasing lithic fragments, large shale and sandstone fragments, wet			Total Depth at 17' BGS
21.0					<b>SANDSTONE AND SHALE</b> reddish yellow, sandstone and shale, subhorizontal with interstitial clay and silt			
23.0								
25.0								
27.0								
29.0								



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**Borehole ID: PS-MW11S**

**Project Name:** Prather Spring Investigation

**Hydrogeologist:** C. Heydenberk

**Drilling Equipment:** CME-55

**Borehole Diameter:** 7"

**Date/Time Drilling Started:** 7/17/08

**Vertical Datum:**

**Horizontal Datum:**

**Water Level (ft bgs):** 10

**Location:** Parachute, CO

**Project Number:** 22239335

**Drilling Company/Driller:** GEG

**Drilling Method:** HSA

**Date/Time Total Depth Reached:** 7/17/08

**Total Depth Drilled:** 19'

**Ground Elevation:** TBD

**Easting:** TBD

**Northing:** TBD

Depth (ft)	PID (ppm)	Blows/6"	Recovery	Lithologic Symbol	Lithologic Description	USCS Code	Well Construction Diagram	Remarks
2.0					<b>SILTY CLAY</b> Top soil, silty clay, few sand with organics	CL		No PHC Odor
4.0	2.0	12/2"			<b>SILTY CLAY</b> tan, orange, and brown, silty clay with angular sandstone, claystone, and shale fragments, clay and sand interlayered, moist	CL		No PHC Odor, Colluvium
6.0								
8.0								
10.0	0.8	14/2"			<b>SILTY CLAY</b> tan, orange, and brown, silty clay with angular sandstone, claystone, and shale fragments, clay and sand interlayered with thicker clay lenses, moist	CL		No PHC Odor
12.0								
14.0	1.0	28/2"				CL		No PHC Odor



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**Borehole ID: PS-MW11S****Project Name:** Prather Spring Investigation**Hydrogeologist:** C. Heydenberk**Drilling Equipment:** CME-55**Borehole Diameter:** 7"**Date/Time Drilling Started:** 7/17/08**Vertical Datum:****Horizontal Datum:****Water Level (ft bgs):** 10**Location:** Parachute, CO**Project Number:** 22239335**Drilling Company/Driller:** GEG**Drilling Method:** HSA**Date/Time Total Depth Reached:** 7/17/08**Total Depth Drilled:** 19'**Ground Elevation:** TBD**Easting:** TBD**Northing:** TBD

Depth (ft)	PID (ppm)	Blows/6"	Recovery	Lithologic Symbol	Lithologic Description	USCS Code	Well Construction Diagram	Remarks
17.0					<b>SILTY CLAY</b> tan, orange, and brown, silty clay with angular sandstone, claystone, and shale fragments, clay and sand interlayered with thicker clay lenses, moist			
18.0		20/10"						
19.0		20/2"			<b>SHALE</b> gray, fractured shale, dense, very wet			Water at 18'
20.0		17/5"						Total Depth at 19', Bedrock
21.0								
23.0								
25.0								
27.0								
29.0								



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**Borehole ID: PS-MW11D**

**Project Name:** Prather Spring Investigation

**Hydrogeologist:** C. Heydenberk

**Drilling Equipment:** CME-55

**Borehole Diameter:** 4"

**Date/Time Drilling Started:** 7/17/08

**Vertical Datum:**

**Horizontal Datum:**

**Water Level (ft bgs):**

**Location:** Parachute, CO

**Project Number:** 22239335

**Drilling Company/Driller:** GEG

**Drilling Method:** HSA

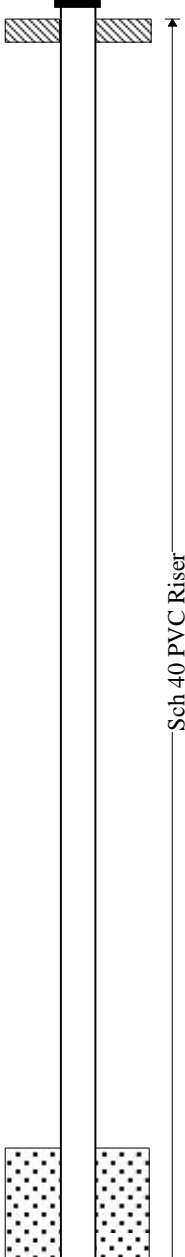
**Date/Time Total Depth Reached:** 7/17/08

**Total Depth Drilled:** 49'

**Ground Elevation:** TBD

**Easting:** TBD

**Northing:** TBD

Depth (ft)	PID (ppm)	Blows/6"	Recovery	Lithologic Symbol	Lithologic Description	USCS Code	Well Construction Diagram	Remarks
2.0					No Lithologic information available			
4.0								
6.0								
8.0								
10.0								
12.0								
14.0								
16.0								
18.0								
20.0								
22.0								
24.0								
26.0								



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**Borehole ID: PS-MW11D**

**Project Name:** Prather Spring Investigation

**Hydrogeologist:** C. Heydenberk

**Drilling Equipment:** CME-55

**Borehole Diameter:** 4"

**Date/Time Drilling Started:** 7/17/08

**Vertical Datum:**

**Horizontal Datum:**

**Water Level (ft bgs):**

**Location:** Parachute, CO

**Project Number:** 22239335

**Drilling Company/Driller:** GEG

**Drilling Method:** HSA

**Date/Time Total Depth Reached:** 7/17/08

**Total Depth Drilled:** 49'

**Ground Elevation:** TBD

**Easting:** TBD

**Northing:** TBD

Depth (ft)	PID (ppm)	Blows/6"	Recovery	Lithologic Symbol	Lithologic Description	USCS Code	Well Construction Diagram	Remarks
29.0								
31.0								
33.0								
35.0								
37.0								
39.0								
41.0								
43.0								
45.0								
47.0								
49.0								
51.0								
53.0								





**Attachment 2 – Analytical Result Tables for Soil and Groundwater Samples**

**Table 1**  
**Summary of Groundwater Analytical Results**

Analyte	Analytical Method	UNITS	MATRIX	PS- MW11D	PS-MW11S	PS-MW3	PS-MW4
				21-Jul-08	18-Jul-08	17-Jul-08	17-Jul-08
METHANE	RSK175	mg/L	WG	0.05 :	<0.0008 :	<0.0008 :	<0.0008 :
1,1,1-TRICHLOROETHANE	SW8260B	ug/L	WG	<2 :	<2 :	<2 :	<2 :
1,1,2,2-TETRACHLOROETHANE	SW8260B	ug/L	WG	<2 :	<2 :	<2 :	<2 :
1,1,2-TRICHLOROETHANE	SW8260B	ug/L	WG	<2 :	<2 :	<2 :	<2 :
1,1-DICHLOROETHANE	SW8260B	ug/L	WG	<2 :	<2 :	<2 :	<2 :
1,1-DICHLOROETHENE	SW8260B	ug/L	WG	<2 :	<2 :	<2 :	<2 :
1,2-DICHLOROBENZENE	SW8260B	ug/L	WG	<2 :	<2 :	<2 :	<2 :
1,2-DICHLOROETHANE	SW8260B	ug/L	WG	<2 :	<2 :	<2 :	<2 :
1,2-DICHLOROPROPANE	SW8260B	ug/L	WG	<2 :	<2 :	<2 :	<2 :
1,3-DICHLOROBENZENE	SW8260B	ug/L	WG	<2 :	<2 :	<2 :	<2 :
1,4-DICHLOROBENZENE	SW8260B	ug/L	WG	<2 :	<2 :	<2 :	<2 :
2-HEXANONE	SW8260B	ug/L	WG	<2 :	<2 :	<2 :	<2 :
ACETONE	SW8260B	ug/L	WG	39 J	4.7 J	7.1 J	5.5 J
BENZENE	SW8260B	ug/L	WG	0.97 :	<1 :	<1 :	<1 :
BROMODICHLOROMETHANE	SW8260B	ug/L	WG	<2 :	<2 :	<2 :	<2 :
BROMOFORM	SW8260B	ug/L	WG	<4 :	<4 :	<4 :	<4 :
BROMOMETHANE	SW8260B	ug/L	WG	<4 :	<4 :	<4 :	<4 :
CARBON DISULFIDE	SW8260B	ug/L	WG	<2 :	<2 :	<2 :	<2 :
CARBON TETRACHLORIDE	SW8260B	ug/L	WG	<2 :	<2 :	<2 :	<2 :
CHLOROBENZENE	SW8260B	ug/L	WG	<2 :	<2 :	<2 :	<2 :
CHLOROETHANE	SW8260B	ug/L	WG	<4 :	<4 :	<4 :	<4 :
CHLOROFORM	SW8260B	ug/L	WG	<2 :	<2 :	<2 :	<2 :
CHLOROMETHANE	SW8260B	ug/L	WG	<4 :	<4 :	<4 :	<4 :
cis-1,2-DICHLOROETHYLENE	SW8260B	ug/L	WG	<2 :	<2 :	<2 :	<2 :
cis-1,3-DICHLOROPROPENE	SW8260B	ug/L	WG	<2 :	<2 :	<2 :	<2 :
DIBROMOCHLOROMETHANE	SW8260B	ug/L	WG	<2 :	<2 :	<2 :	<2 :
ETHYLBENZENE	SW8260B	ug/L	WG	<2 :	<2 :	<2 :	<2 :
METHYL ETHYL KETONE (2-BUTANONE)	SW8260B	ug/L	WG	12 :	<5 :	<5 :	<5 :
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)	SW8260B	ug/L	WG	<2 :	<2 :	<2 :	<2 :
METHYLENE CHLORIDE	SW8260B	ug/L	WG	<5 :	<5 :	<5 :	<5 :
STYRENE	SW8260B	ug/L	WG	<4 :	<4 :	<4 :	<4 :
TETRACHLOROETHYLENE (PCE)	SW8260B	ug/L	WG	<2 :	<2 :	<2 :	<2 :
TOLUENE	SW8260B	ug/L	WG	1.1 J	<2 :	<2 :	<2 :
trans-1,2-DICHLOROETHENE	SW8260B	ug/L	WG	<2 :	<2 :	<2 :	<2 :
trans-1,3-DICHLOROPROPENE	SW8260B	ug/L	WG	<2 :	<2 :	<2 :	<2 :
TRICHLOROETHYLENE (TCE)	SW8260B	ug/L	WG	<2 :	<2 :	<2 :	<2 :
VINYL ACETATE	SW8260B	ug/L	WG	<4 :	<4 :	<4 :	<4 :
VINYL CHLORIDE	SW8260B	ug/L	WG	<2 :	<2 :	<2 :	<2 :
XYLENES, TOTAL	SW8260B	ug/L	WG	<4 :	<4 :	<4 :	<4 :

J indicates that the associated values is an estimate.

< indicates that the analyte was not detected above the associated reporting limit.

: indicates that the results are usable without data qualification.

mg/l = milligrams per liter

ug/l = micrograms per liter

WG = groundwater

**Table 2**  
**Summary of Soil Analytical Results**

Analyte	Analytical Method	UNITS	MATRIX	BH-5	BH-6	PS-BH3	PS-BH4	PS BH11D	PS BH11S
				12.5' to 13.5'	15' to 16'	20' to 21.5'	14' to 16'	49'	17.5' to 19'
				15-Jul-08	15-Jul-08	16-Jul-08	16-Jul-08	17-Jul-08	17-Jul-08
PHC as DIESEL FUEL	M8015D	mg/Kg	SO	<14 :	<14 :	<14	<14	620 :	<14 :
TOTAL VOLATILE PETROLEUM HYDROCARBONS	M8015V	mg/Kg	SO	<1 :	<1 :	<1	<1	1.5 J	<1 :
1,1,1-TRICHLOROETHANE	SW8260B	ug/kg	SO	<36 :	<33 :	<33	<34	<28 J	<34 :
1,1,2,2-TETRACHLOROETHANE	SW8260B	ug/kg	SO	<71 :	<66 :	<66	<67	<55 J	<67 :
1,1,2-TRICHLOROETHANE	SW8260B	ug/kg	SO	<36 :	<33 :	<33	<34	<28 J	<34 :
1,1-DICHLOROETHANE	SW8260B	ug/kg	SO	<36 :	<33 :	<33	<34	<28 J	<34 :
1,1-DICHLOROETHENE	SW8260B	ug/kg	SO	<36 :	<33 :	<33	<34	<28 J	<34 :
1,2-DICHLOROBENZENE	SW8260B	ug/kg	SO	<36 :	<33 :	<33	<34	<28 J	<34 :
1,2-DICHLOROETHANE	SW8260B	ug/kg	SO	<36 :	<33 :	<33	<34	<28 J	<34 :
1,2-DICHLOROPROPANE	SW8260B	ug/kg	SO	<36 :	<33 :	<33	<34	<28 J	<34 :
1,3-DICHLOROBENZENE	SW8260B	ug/kg	SO	<36 :	<33 :	<33	<34	<28 J	<34 :
1,4-DICHLOROBENZENE	SW8260B	ug/kg	SO	<36 :	<33 :	<33	<34	<28 J	<34 :
2-CHLOROETHYL VINYL ETHER	SW8260B	ug/kg	SO	<140 J	<130 J	<130	<130	<110 J	<130 :
2-HEXANONE	SW8260B	ug/kg	SO	<140 :	<130 :	<130	<130	<110 J	<130 :
ACETONE	SW8260B	ug/kg	SO	<140 J	<130 J	<130	<130	<260 J	<130 :
BENZENE	SW8260B	ug/kg	SO	<7.1 :	<6.6 :	<6.6	<6.7	6.9 J	<6.7 :
BROMODICHLOROMETHANE	SW8260B	ug/kg	SO	<36 :	<33 :	<33	<34	<28 J	<34 :
BROMOFORM	SW8260B	ug/kg	SO	<36 :	<33 :	<33	<34	<28 J	<34 :
BROMOMETHANE	SW8260B	ug/kg	SO	<36 :	<33 :	<33	<34	<28 J	<34 :
CARBON DISULFIDE	SW8260B	ug/kg	SO	<36 :	<33 :	<33	<34	<28 J	<34 :
CARBON TETRACHLORIDE	SW8260B	ug/kg	SO	<36 :	<33 :	<33	<34	<28 J	<34 :
CHLOROBENZENE	SW8260B	ug/kg	SO	<36 :	<33 :	<33	<34	<28 J	<34 :
CHLOROETHANE	SW8260B	ug/kg	SO	<36 :	<33 :	<33	<34	<28 J	<34 :
CHLOROFORM	SW8260B	ug/kg	SO	<36 :	<33 :	<33	<34	<28 J	<34 :
CHLOROMETHANE	SW8260B	ug/kg	SO	<36 :	<33 :	<33	<34	<28 J	<34 :
cis-1,2-DICHLOROETHYLENE	SW8260B	ug/kg	SO	<36 :	<33 :	<33	<34	<28 J	<34 :
cis-1,3-DICHLOROPROPENE	SW8260B	ug/kg	SO	<36 :	<33 :	<33	<34	<28 J	<34 :
DIBROMOCHLOROMETHANE	SW8260B	ug/kg	SO	<36 :	<33 :	<33	<34	<28 J	<34 :
ETHYLBENZENE	SW8260B	ug/kg	SO	<36 :	<33 :	<33	<34	<28 J	<34 :
METHYL ETHYL KETONE (2-BUTANONE)	SW8260B	ug/kg	SO	<140 :	<130 :	<130	<130	<110 J	<130 :
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)	SW8260B	ug/kg	SO	<140 :	<130 :	<130	<130	<110 J	<130 :
METHYLENE CHLORIDE	SW8260B	ug/kg	SO	<36 :	<33 :	<33	<34	<28 J	<34 :
STYRENE	SW8260B	ug/kg	SO	<36 :	<33 :	<33	<34	<28 J	<34 :
TETRACHLOROETHYLENE (PCE)	SW8260B	ug/kg	SO	<36 :	<33 :	<33	<34	<28 J	<34 :
TOLUENE	SW8260B	ug/kg	SO	<14 :	<13 :	<13	<13	46 J	<13 :
trans-1,2-DICHLOROETHENE	SW8260B	ug/kg	SO	<36 :	<33 :	<33	<34	<28 J	<34 :

**Table 2**  
**Summary of Soil Analytical Results**

Analyte	Analytical Method	UNITS	MATRIX	BH-5	BH-6	PS-BH3	PS-BH4	PS BH11D	PS BH11S
				12.5' to 13.5'	15' to 16'	20' to 21.5'	14' to 16'	49'	17.5' to 19'
				15-Jul-08	15-Jul-08	16-Jul-08	16-Jul-08	17-Jul-08	17-Jul-08
trans-1,3-DICHLOROPROPENE	SW8260B	ug/kg	SO	<36 :	<33 :	<33	<34	<28 J	<34 :
TRICHLOROETHYLENE (TCE)	SW8260B	ug/kg	SO	<36 :	<33 :	<33	<34	<28 J	<34 :
VINYL ACETATE	SW8260B	ug/kg	SO	<140 :	<130 :	<130	<130	<110 J	<130 :
VINYL CHLORIDE	SW8260B	ug/kg	SO	<36 :	<33 :	<33	<34	<28 J	<34 :
XYLENES, TOTAL	SW8260B	ug/kg	SO	<36 :	<33 :	<33	<34	<b>30 J</b>	<34 :
1,2,4-TRICHLOROBENZENE	SW8270C	ug/kg	SO	NA	NA	NA	NA	<350 :	NA
1,2-DICHLOROBENZENE	SW8270C	ug/kg	SO	NA	NA	NA	NA	<350 :	NA
1,3-DICHLOROBENZENE	SW8270C	ug/kg	SO	NA	NA	NA	NA	<350 :	NA
1,4-DICHLOROBENZENE	SW8270C	ug/kg	SO	NA	NA	NA	NA	<350 :	NA
2,4,5-TRICHLOROPHENOL	SW8270C	ug/kg	SO	NA	NA	NA	NA	<350 :	NA
2,4,6-TRICHLOROPHENOL	SW8270C	ug/kg	SO	NA	NA	NA	NA	<350 :	NA
2,4-DICHLOROPHENOL	SW8270C	ug/kg	SO	NA	NA	NA	NA	<350 :	NA
2,4-DIMETHYLPHENOL	SW8270C	ug/kg	SO	NA	NA	NA	NA	<350 :	NA
2,4-DINITROPHENOL	SW8270C	ug/kg	SO	NA	NA	NA	NA	<1700 :	NA
2,4-DINITROTOLUENE	SW8270C	ug/kg	SO	NA	NA	NA	NA	<350 :	NA
2,6-DINITROTOLUENE	SW8270C	ug/kg	SO	NA	NA	NA	NA	<350 :	NA
2-CHLORONAPHTHALENE	SW8270C	ug/kg	SO	NA	NA	NA	NA	<350 :	NA
2-CHLOROPHENOL	SW8270C	ug/kg	SO	NA	NA	NA	NA	<350 :	NA
2-METHYLNAPHTHALENE	SW8270C	ug/kg	SO	NA	NA	NA	NA	<350 :	NA
2-METHYLPHENOL (o-CRESOL)	SW8270C	ug/kg	SO	NA	NA	NA	NA	<350 :	NA
2-NITROANILINE	SW8270C	ug/kg	SO	NA	NA	NA	NA	<350 :	NA
2-NITROPHENOL	SW8270C	ug/kg	SO	NA	NA	NA	NA	<350 :	NA
3,3'-DICHLOROBENZIDINE	SW8270C	ug/kg	SO	NA	NA	NA	NA	<700 :	NA
3-NITROANILINE	SW8270C	ug/kg	SO	NA	NA	NA	NA	<700 :	NA
4,6-DINITRO-2-METHYLPHENOL	SW8270C	ug/kg	SO	NA	NA	NA	NA	<1700 :	NA
4-BROMOPHENYL PHENYL ETHER	SW8270C	ug/kg	SO	NA	NA	NA	NA	<350 :	NA
4-CHLORO-3-METHYLPHENOL	SW8270C	ug/kg	SO	NA	NA	NA	NA	<350 :	NA
4-CHLOROANILINE	SW8270C	ug/kg	SO	NA	NA	NA	NA	<350 :	NA
4-CHLOROPHENYL PHENYL ETHER	SW8270C	ug/kg	SO	NA	NA	NA	NA	<350 :	NA
4-METHYLPHENOL (p-CRESOL)	SW8270C	ug/kg	SO	NA	NA	NA	NA	<350 :	NA
4-NITROANILINE	SW8270C	ug/kg	SO	NA	NA	NA	NA	<1700 :	NA
4-NITROPHENOL	SW8270C	ug/kg	SO	NA	NA	NA	NA	<700 :	NA
ACENAPHTHENE	SW8270C	ug/kg	SO	NA	NA	NA	NA	<350 :	NA
ACENAPHTHYLENE	SW8270C	ug/kg	SO	NA	NA	NA	NA	<350 :	NA
ANTHRACENE	SW8270C	ug/kg	SO	NA	NA	NA	NA	<350 :	NA
BENZO(a)ANTHRACENE	SW8270C	ug/kg	SO	NA	NA	NA	NA	<350 :	NA
BENZO(a)PYRENE	SW8270C	ug/kg	SO	NA	NA	NA	NA	<350 :	NA
BENZO(B+K)FLUORANTHENE TOTAL	SW8270C	ug/kg	SO	NA	NA	NA	NA	<350 :	NA
BENZO(g,h,i)PERYLENE	SW8270C	ug/kg	SO	NA	NA	NA	NA	<350 :	NA

**Table 2**  
**Summary of Soil Analytical Results**

Analyte	Analytical Method	UNITS	MATRIX	BH-5	BH-6	PS-BH3	PS-BH4	PS BH11D	PS BH11S
				12.5' to 13.5'	15' to 16'	20' to 21.5'	14' to 16'	49'	17.5' to 19'
				15-Jul-08	15-Jul-08	16-Jul-08	16-Jul-08	17-Jul-08	17-Jul-08
BENZOIC ACID	SW8270C	ug/kg	SO	NA	NA	NA	NA	<3300 :	NA
BENZYL ALCOHOL	SW8270C	ug/kg	SO	NA	NA	NA	NA	<700 :	NA
BENZYL BUTYL PHTHALATE	SW8270C	ug/kg	SO	NA	NA	NA	NA	<1700 :	NA
bis(2-CHLOROETHOXY) METHANE	SW8270C	ug/kg	SO	NA	NA	NA	NA	<700 :	NA
bis(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	SW8270C	ug/kg	SO	NA	NA	NA	NA	<350 :	NA
bis(2-CHLOROISOPROPYL) ETHER	SW8270C	ug/kg	SO	NA	NA	NA	NA	<350 :	NA
bis(2-ETHYLHEXYL) PHTHALATE	SW8270C	ug/kg	SO	NA	NA	NA	NA	<1700 :	NA
CHRYSENE	SW8270C	ug/kg	SO	NA	NA	NA	NA	<350 :	NA
DIBENZ(a,h)ANTHRACENE	SW8270C	ug/kg	SO	NA	NA	NA	NA	<400 :	NA
DIBENZOFURAN	SW8270C	ug/kg	SO	NA	NA	NA	NA	<350 :	NA
DIETHYL PHTHALATE	SW8270C	ug/kg	SO	NA	NA	NA	NA	<350 :	NA
DIMETHYL PHTHALATE	SW8270C	ug/kg	SO	NA	NA	NA	NA	<700 :	NA
DI-n-BUTYL PHTHALATE	SW8270C	ug/kg	SO	NA	NA	NA	NA	<350 :	NA
DI-n-OCTYLPHTHALATE	SW8270C	ug/kg	SO	NA	NA	NA	NA	<350 :	NA
FLUORANTHENE	SW8270C	ug/kg	SO	NA	NA	NA	NA	<700 :	NA
FLUORENE	SW8270C	ug/kg	SO	NA	NA	NA	NA	<350 :	NA
HEXACHLOROBENZENE	SW8270C	ug/kg	SO	NA	NA	NA	NA	<1700 :	NA
HEXACHLOROBUTADIENE	SW8270C	ug/kg	SO	NA	NA	NA	NA	<350 :	NA
HEXACHLOROCYCLOPENTADIENE	SW8270C	ug/kg	SO	NA	NA	NA	NA	<1700 :	NA
HEXACHLOROETHANE	SW8270C	ug/kg	SO	NA	NA	NA	NA	<350 :	NA
INDENO(1,2,3-c,d)PYRENE	SW8270C	ug/kg	SO	NA	NA	NA	NA	<350 :	NA
ISOPHORONE	SW8270C	ug/kg	SO	NA	NA	NA	NA	<350 :	NA
NAPHTHALENE	SW8270C	ug/kg	SO	NA	NA	NA	NA	<700 :	NA
NITROBENZENE	SW8270C	ug/kg	SO	NA	NA	NA	NA	<1700 :	NA
N-NITROSODI-n-PROPYLAMINE	SW8270C	ug/kg	SO	NA	NA	NA	NA	<1700 :	NA
N-NITROSODIPHENYLAMINE	SW8270C	ug/kg	SO	NA	NA	NA	NA	<1700 :	NA
PENTACHLOROPHENOL	SW8270C	ug/kg	SO	NA	NA	NA	NA	<1700 :	NA
PHENANTHRENE	SW8270C	ug/kg	SO	NA	NA	NA	NA	<700 :	NA
PHENOL	SW8270C	ug/kg	SO	NA	NA	NA	NA	<700 :	NA
PYRENE	SW8270C	ug/kg	SO	NA	NA	NA	NA	<350 :	NA

PHC = Petroleum hydrocarbons

J indicates that the associated values is an estimate.

< indicates that the analyte was not detected above the associated reporting limit.

:

 indicates that the results are usable without data qualification.

mg/kg = milligrams per kilogram

ug/kg = micrograms per kilogram

SO = soil

NA = Not Analyzed (detection thresholds to trigger subsequent SVOCs analysis not met)



**Attachment 3 – Data Validation Summaries and Qualified Lab Data Sheets**



## PRATHER SPRINGS DATA REVIEW SUMMARY

Data Package Number: Evergreen Analytical Laboratory 08-5065

Sampling Event: July 15, 2008

Sample-specific Parameter Review? **Yes**

Laboratory Performance Parameters? **Yes**

Data Reviewer: Liz Kraak

Date Completed: 07/31/08

Peer Reviewer: Sheri O'Connor

Date Completed: 08/01/08

The table below summarizes the results presented in this data package.

Field ID	Sample Type	Lab ID	Matrix	Analyses			
				VOCs (8260B)	TVH – Gasoline (8015B)	TEH – Diesel (8015B)	SVOCs (8270C) <sup>1</sup>
BH-5 @ 12 ½ - 13 ½	SA	08-5065-01	Soil	X	X <sup>m</sup>	X	---
BH-6 @ 15-16	SA	08-5065-02	Soil	X	X	X	---
Trip Blank	TB	08-5065-04	Water	X	---	---	---

Analyses:

<sup>1</sup> Per URS request, the SVOC analysis was placed on hold.

VOCs – Volatile Organic Compounds

SVOCs – Semivolatile Organic Compounds

QC Type: SA - Sample

TB - Trip Blank

m - Matrix Spike/Matrix Spike Duplicate

--- Sample not analyzed for this parameter.

The data review was conducted in accordance with the Phase I Site Investigation Work Plan – Prather Spring Investigation dated July 31, 2008.

### General Overall Assessment:

\_\_\_\_\_ Data are usable without qualification.  
  X   Data are usable with qualification (noted below).

**Case Narrative Summary:** Except as noted below, any of the issues noted in the laboratory case narrative potentially affecting data quality are addressed in the appropriate sections in the table below.

Review Parameter	Criteria Met?	Comments
<b>Sample-specific Parameters</b>	Complete with "Yes", "No", or "Not Applicable (N/A)".	For each "No" response, list what was out, associated acceptance limits, all qualified data, and bias direction or reference associated table with pertinent details.
COC & Sample Receipt	Yes	Samples were received intact and the cooler temperature was 5.5°C upon arrival at the laboratory, within the ≤6°C temperature criterion.
Holding Times	Yes	All samples were analyzed within the holding time requirements specified in the Work Plan. Further action was not necessary.
Method Blanks	Yes	Target analytes were not reported as detected within the associated method blanks. Therefore, data qualification based on method blank contamination was not necessary.
Matrix QC <ul style="list-style-type: none"> <li>MS/MSD PS-BH3 20-21.5</li> <li>LD N/A</li> </ul>	Yes	The recoveries and RPDs for the matrix spike (MS) and matrix spike duplicate (MSD) analyses were within the laboratory-determined acceptance range. Therefore, data qualification was not necessary.

Review Parameter	Criteria Met?	Comments
Field QC <ul style="list-style-type: none"> <li>Field Blanks (Ambient, Rinsate, or Trip)</li> <li>Trip Blank</li> <li>Field Duplicate</li> <li>None</li> </ul>	No	With the exception of acetone, target analytes were reported as non-detect in the trip blank. Acetone was detected in the trip blank at a concentration of 5.9 µg/L. All associated acetone results were reported as non-detect. Therefore, data qualification was not necessary.
Surrogates	No	With the exceptions summarized below in Table 1, all surrogate recoveries were within the laboratory acceptance limits.
Laboratory Control Sample/ Laboratory Control Sample Duplicate (LCS/LCSD)	Yes	LCS and LCSD recoveries were within the laboratory determined acceptance limits. Therefore, data qualification was not necessary.
Non-detect Results w/ Elevated RLs?	No	The VOC and TVH -Gasoline analyses were performed at dilutions. Several results were reported as non-detect at elevated RLs. Therefore, these results that were reported as non-detect at elevated RLs will need to be evaluated with respect to the project objectives.
Package Completeness	Yes	
Other Parameters	Yes	<p>Detected analytes with concentrations between the Instrument Detection Limit (IDL) and the Reporting Limit (RL) were qualified as estimated (J). A qualifier code of "SQL-I" (Sample Quantitation Limit) was assigned to reflect the greater uncertainty in quantitative values below the RL.</p> <p><b>Split Samples</b></p> <p>Split sample evaluation criteria were not included in the Work Plan. As such, the following concentration-dependent criteria were used:</p> <ul style="list-style-type: none"> <li>If both results were <math>\leq 5 \times \text{RL}</math>, then the absolute difference between the results should agree within <math>\pm 2 \times \text{RL}</math> (Waters) and <math>\pm 3.5 \times \text{RL}</math> (Soils)</li> <li>If both results were <math>\geq 5 \times \text{RL}</math>, then the RPD should be <math>\leq 30\%</math> (Waters) and <math>\leq 50\%</math> (Soils)</li> </ul> <p>The following split samples were collected:</p> <ul style="list-style-type: none"> <li>BH-6 @ 15-16 (VOCs, TVH – Gasoline, TEH – Diesel)</li> </ul> <p>All split sample results and parent sample results were reported as non-detect for these analyses. As such the split sample results demonstrate acceptable agreement.</p>
<b>Laboratory Performance Review</b>		

Review Parameter	Criteria Met?	Comments
Initial Calibration	No	<p><b>Method 8260B (VOCs)</b></p> <p>All the minimum relative response factors (RRFs) for the system performance check compounds (SPCCs) were met, satisfying method requirements. For all other target analytes, a minimum RRF of 0.05 was used and all target analytes met this criterion. The percent relative standard deviations (%RSDs) over the initial calibration RRFs for all calibration check compounds (CCCs) satisfied the method requirement of &lt;30%. For all other target compounds, a requirement of 15% RSD was used. The mean of the %RSD values for all target analytes in the calibrations was less than 15%. Therefore, the initial calibrations met method acceptance criteria by satisfying the mean %RSD exception. Although the %RSDs for several target analytes did not meet the 15% RSD criterion, data qualification was not necessary because alternate calibration models (i.e. linear and quadratic regression) were used and the correlation coefficients (r) for the first order curves were &gt;0.995.</p> <p>For the linear curve fit, the laboratory forced the line through 0,0 which is allowed per Method 8000C as long as the absolute value of the percent difference between the calculated and expected concentration for every calibration level is less than or equal to 20%. For acetone, the %D was evaluated for the calibration point at the LQL (Lab Quantitation Limit). The %D between the calculated using the laboratory equation and the true value was 84%, which is greater than the criterion of ≤20%. Therefore, all acetone results less than or equal to the LQL were qualified as estimated (J/UJ ICAL – I) to reflect the imprecision at the low end of the calibration curve.</p> <p><b>TPH (GRO and DRO)</b></p> <p>The relationship between instrument response and concentration was established with a blank and at least five standards. All initial calibrations were verified, as applicable. Data qualification on the basis of initial calibrations was not necessary.</p>
Tuning (as applicable to the method)	Yes	<p><b>Method 8260B (VOCs)</b></p> <p>A satisfactory tuning event was conducted at the beginning of every 12 hours of sample analysis. No errors in calculation of ion abundance ratios were found and all were within the required acceptance ranges. Data qualification on the basis of instrument tuning was not necessary.</p>
Initial/ Continuing Calibration Verification (ICV/CCV)	No	<p><b>ICV/CCV</b></p> <p>With the exceptions listed below, The %Ds for all CCCs in the ICV and CCV were less than 20%, satisfying method requirements, and other target analytes satisfied the %D criterion of 25%.</p> <p>The analyte 2-chloroethylvinyl ether (+81.2%) was outside the requirements for the CCV associated with the trip blank. The associated trip blank result was reported as non-detect and the potential bias indicated by the CCV was considered high; therefore, qualification of data was not considered necessary.</p> <p>The analyte 2-chloroethylvinyl ether (-29.6%) was outside the requirements for the CCV associated with the soil samples reported in this data package. Therefore, the 2-chloroethylvinyl ether results for the soil samples were qualified as estimated (UJ CCAL – L) to reflect the potential low bias.</p>
Laboratory Control Sample/ Laboratory Control Sample Duplicate (LCS/LCSD)	Yes	<p>LCS and LCSD recoveries were within the laboratory determined acceptance limits. Therefore, data qualification was not necessary.</p>

Review Parameter	Criteria Met?	Comments
Target Compound Identification	Yes	The quantitation sheets and total ion chromatograms were reviewed to assure that compounds reported as identified meet the criteria contained in the method. The mass spectra were reviewed for compounds reported as identified to assure that the reported mass spectral data meet the mass spectral identification criteria contained in the analytical method. No errors in compound identification were found and data qualification was not necessary.
Transcription Errors	Yes	No transcription errors were found in this data package. Data qualification was not necessary.
Recalculation	Yes	No calculation or sample quantitation errors were found in this data package. Data qualification was not necessary.

**Table 1: Surrogate Recovery Outliers and Resultant Data Qualification**

Associated Sample	Surrogate	Recovery (Limits)	Qualification
TVH – Gasoline LCS	1,2,4-Trichlorobenzene	148 (60-140)	None. As these are QC samples, data qualification based on surrogate recovery failure is not necessary.
TVH – Gasoline MSD	1,2,4-Trichlorobenzene	151 (60-140)	

LCS – Laboratory Control Sample

MSD – Matrix Spike Duplicate

QC – Quality Control

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**Evergreen Analytical, Inc.**  
4036 Youngfield Street, Wheat Ridge, Colorado 80033-3862  
(303) 425-6021

**Client Sample ID:** BH-5 @12 1/2-13 1/2  
**Client Project ID:** 22239335.0001  
**Date Collected:** 7/15/08  
**Date Received:** 7/17/08  
**Date Prepared:** 7/19/08  
**Date Analyzed:** 7/19/08  
**Percent Moisture** 29.76

**Lab Work Order** 08-5065  
**Lab Sample ID:** 08-5065-01A  
**Sample Matrix:** Soil  
**Lab File ID:** VOA20719\2301023.D  
**Method Blank:** MB2071908-S  
**Prep Factor:** 1.000  
**Dilution Factor:** 5.00

**Method:** SW8260B  
**Prep Method:** SW5035

**VOLATILE ORGANICS**

			Units: µg/Kg-dry
Analytes	CAS Number	Result	LQL
Acetone	67-64-1	U	140 UJ ICAL-I
Benzene	71-43-2	U	7.1
Bromodichloromethane	75-27-4	U	36
Bromoform	75-25-2	U	36
Bromomethane	74-83-9	U	36
2-Butanone	78-93-3	U	140
Carbon disulfide	75-15-0	U	36
Carbon tetrachloride	56-23-5	U	36
Chlorobenzene	108-90-7	U	36
Chloroethane	75-00-3	U	36
2-Chloroethylvinylether	110-75-8	U	140 UJ CCAL-ZL
Chloroform	67-66-3	U	36
Chloromethane	74-87-3	U	36
Dibromochloromethane	124-48-1	U	36
1,2-Dichlorobenzene	95-50-1	U	36
1,3-Dichlorobenzene	541-73-1	U	36
1,4-Dichlorobenzene	106-46-7	U	36
1,1-Dichloroethane	75-34-3	U	36
1,2-Dichloroethane	107-06-2	U	36
1,1-Dichloroethene	75-35-4	U	36
cis-1,2-Dichloroethene	156-59-2	U	36
trans-1,2-Dichloroethene	156-60-5	U	36
1,2-Dichloropropane	78-87-5	U	36
cis-1,3-Dichloropropene	10061-01-5	U	36
trans-1,3-Dichloropropene	10061-02-6	U	36
Ethylbenzene	100-41-4	U	36

  
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Analyst

EQ 7/31/00

  
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**Qualifiers:** See the case narrative for a discussion

B - Analyte detected in the Method Blank, value not subtracted from result  
E - Extrapolated value. Value exceeds calibration range  
H - Prep or Analytical holding time exceeded  
S - Spike Recovery outside acceptance limits  
X - See case narrative  
\* - Value exceeded the Maximum Contamination Level (MCL), TCLP limit, or if compound is undetected, LQL exceeds MCL.

**Qualifiers:** U - Analyte not detected at or above the reporting limit

J - Estimated value below the LQL

**Definitions:** NA - Not Applicable  
LQL - Lower Quantitation Limit  
MDL - Method Detection Limit  
Surr - Surrogate Standard

Print Date: 7/21/08

**Evergreen Analytical, Inc.**  
4036 Youngfield Street, Wheat Ridge, Colorado 80033-3862  
(303) 425-6021

**Client Sample ID:** BH-5 @12 1/2-13 1/2  
**Client Project ID:** 22239335.0001  
**Date Collected:** 7/15/08  
**Date Received:** 7/17/08  
**Date Prepared:** 7/19/08  
**Date Analyzed:** 7/19/08  
**Percent Moisture** 29.76


**Lab Work Order** 08-5065  
**Lab Sample ID:** 08-5065-01A  
**Sample Matrix:** Soil  
**Lab File ID:** VOA20719\2301023.D  
**Method Blank:** MB2071908-S  
**Prep Factor:** 1.000  
**Dilution Factor:** 5.00

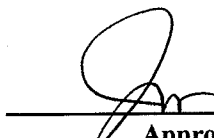
**Method:** SW8260B  
**Prep Method:** SW5035

**VOLATILE ORGANICS**

Analytes	CAS Number	Result	Units: µg/Kg-dry LQL
2-Hexanone	591-78-6	U	140
Methylene chloride	75-09-2	U	36
4-Methyl-2-pentanone	108-10-1	U	140
Styrene	100-42-5	U	36
1,1,2,2-Tetrachloroethane	79-34-5	U	71
Tetrachloroethene	127-18-4	U	36
Toluene	108-88-3	U	14
1,1,1-Trichloroethane	71-55-6	U	36
1,1,2-Trichloroethane	79-00-5	U	36
Trichloroethene	79-01-6	U	36
Vinyl acetate	108-05-4	U	140
Vinyl chloride	75-01-4	U	36
Xylene, Total	1330-20-7	U	36
Surr: 1,2-Dichloroethane-d4	17060-07-0	114	<b>QC Limits:</b> 70-130 %REC
Surr: 4-Bromofluorobenzene	460-00-4	112	<b>QC Limits:</b> 70-130 %REC
Surr: Toluene-d8	2037-26-5	108	<b>QC Limits:</b> 70-130 %REC

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Analyst

  
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**Qualifiers:** See the case narrative for a discussion

B - Analyte detected in the Method Blank, value not subtracted from result  
E - Extrapolated value. Value exceeds calibration range  
H - Prep or Analytical holding time exceeded  
S - Spike Recovery outside acceptance limits  
X - See case narrative  
\* - Value exceeded the Maximum Contamination Level (MCL), TCLP limit, or if compound is undetected, LQL exceeds MCL.

**Qualifiers:** U - Analyte not detected at or above the reporting limit

J - Estimated value below the LQL

**Definitions:** NA - Not Applicable  
LQL - Lower Quantitation Limit  
MDL - Method Detection Limit  
Surr - Surrogate Standard

Print Date: 7/21/08

**Evergreen Analytical, Inc.**  
4036 Youngfield Street, Wheat Ridge, Colorado 80033-3862  
(303) 425-6021

Client Sample ID: BH-6 @15-16  
Client Project ID: 22239335.0001  
Date Collected: 7/15/08  
Date Received: 7/17/08  
Date Prepared: 7/19/08  
Date Analyzed: 7/19/08  
Percent Moisture 24.16

Lab Work Order 08-5065  
Lab Sample ID: 08-5065-02A  
Sample Matrix: Soil  
Lab File ID: VOA20719\2401024.D  
Method Blank: MB2071908-S  
Prep Factor: 1.000  
Dilution Factor: 5.00

Method: SW8260B  
Prep Method: SW5035

**VOLATILE ORGANICS**

Analytes	CAS Number	Result	Units: µg/Kg-dry LQL
Acetone	67-64-1	U	130 <i>VS ICAL-I</i>
Benzene	71-43-2	U	6.6
Bromodichloromethane	75-27-4	U	33
Bromoform	75-25-2	U	33
Bromomethane	74-83-9	U	33
2-Butanone	78-93-3	U	130
Carbon disulfide	75-15-0	U	33
Carbon tetrachloride	56-23-5	U	33
Chlorobenzene	108-90-7	U	33
Chloroethane	75-00-3	U	33
2-Chloroethylvinylether	110-75-8	U	130 <i>VS CCAL-IL</i>
Chloroform	67-66-3	U	33
Chloromethane	74-87-3	U	33
Dibromochloromethane	124-48-1	U	33
1,2-Dichlorobenzene	95-50-1	U	33
1,3-Dichlorobenzene	541-73-1	U	33
1,4-Dichlorobenzene	106-46-7	U	33
1,1-Dichloroethane	75-34-3	U	33
1,2-Dichloroethane	107-06-2	U	33
1,1-Dichloroethene	75-35-4	U	33
cis-1,2-Dichloroethene	156-59-2	U	33
trans-1,2-Dichloroethene	156-60-5	U	33
1,2-Dichloropropane	78-87-5	U	33
cis-1,3-Dichloropropene	10061-01-5	U	33
trans-1,3-Dichloropropene	10061-02-6	U	33
Ethylbenzene	100-41-4	U	33

  
\_\_\_\_\_  
Analyst

*EQ 7/31/08*

  
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**Qualifiers:** See the case narrative for a discussion

B - Analyte detected in the Method Blank, value not subtracted from result  
E - Extrapolated value. Value exceeds calibration range  
H - Prep or Analytical holding time exceeded  
S - Spike Recovery outside acceptance limits  
X - See case narrative  
\* - Value exceeded the Maximum Contamination Level (MCL), TCLP limit, or if compound is undetected, LQL exceeds MCL.

**Qualifiers:** U - Analyte not detected at or above the reporting limit

J - Estimated value below the LQL

**Definitions:** NA - Not Applicable  
LQL - Lower Quantitation Limit  
MDL - Method Detection Limit  
Surr - Surrogate Standard

Print Date: 7/21/08



**Evergreen Analytical, Inc.**  
4036 Youngfield Street, Wheat Ridge, Colorado 80033-3862  
(303) 425-6021

**Client Sample ID:** BH-6 @15-16  
**Client Project ID:** 22239335.0001  
**Date Collected:** 7/15/08  
**Date Received:** 7/17/08  
**Date Prepared:** 7/19/08  
**Date Analyzed:** 7/19/08  
**Percent Moisture** 24.16

**Lab Work Order** 08-5065  
**Lab Sample ID:** 08-5065-02A  
**Sample Matrix:** Soil  
**Lab File ID:** VOA20719\2401024.D  
**Method Blank:** MB2071908-S  
**Prep Factor:** 1.000  
**Dilution Factor:** 5.00

**Method:** SW8260B  
**Prep Method:** SW5035

**VOLATILE ORGANICS**

Analytes	CAS Number	Result	Units: µg/Kg-dry LQL
2-Hexanone	591-78-6	U	130
Methylene chloride	75-09-2	U	33
4-Methyl-2-pentanone	108-10-1	U	130
Styrene	100-42-5	U	33
1,1,2,2-Tetrachloroethane	79-34-5	U	66
Tetrachloroethene	127-18-4	U	33
Toluene	108-88-3	U	13
1,1,1-Trichloroethane	71-55-6	U	33
1,1,2-Trichloroethane	79-00-5	U	33
Trichloroethene	79-01-6	U	33
Vinyl acetate	108-05-4	U	130
Vinyl chloride	75-01-4	U	33
Xylene, Total	1330-20-7	U	33
Surr: 1,2-Dichloroethane-d4	17060-07-0	121	QC Limits: 70-130 %REC
Surr: 4-Bromofluorobenzene	460-00-4	115	QC Limits: 70-130 %REC
Surr: Toluene-d8	2037-26-5	110	QC Limits: 70-130 %REC

ER 7/31/08



Analyst



Approved

**Qualifiers:** See the case narrative for a discussion

B - Analyte detected in the Method Blank, value not subtracted from result  
E - Extrapolated value. Value exceeds calibration range  
H - Prep or Analytical holding time exceeded  
S - Spike Recovery outside acceptance limits  
X - See case narrative  
\* - Value exceeded the Maximum Contamination Level (MCL), TCLP limit, or if compound is undetected, LQL exceeds MCL.

**Qualifiers:** U - Analyte not detected at or above the reporting limit

J - Estimated value below the LQL

**Definitions:** NA - Not Applicable  
LQL - Lower Quantitation Limit  
MDL - Method Detection Limit  
Surr - Surrogate Standard

Print Date: 7/21/08

**Evergreen Analytical, Inc.**  
4036 Youngfield Street, Wheat Ridge, Colorado 80033-3862  
(303) 425-6021

Client Sample ID: Trip Blank  
Client Project ID: 22239335.0001  
Date Collected: 7/15/08  
Date Received: 7/17/08  
Date Prepared: 7/17/08  
Date Analyzed: 7/17/08  
Percent Moisture NA

Lab Work Order 08-5065  
Lab Sample ID: 08-5065-04A  
Sample Matrix: Water  
Lab File ID: VOA20717/2101021.D  
Method Blank: MB2071708-W  
Prep Factor: 1.000  
Dilution Factor: 1.00


Method: SW8260B  
Prep Method: SW5030B

**VOLATILE ORGANICS**

Analytes	CAS Number	Result	Units: µg/L LQL
Acetone	67-64-1	5.9 J	10 J SOLITICAL-I
Benzene	71-43-2	U	1.0
Bromodichloromethane	75-27-4	U	2.0
Bromoform	75-25-2	U	4.0
Bromomethane	74-83-9	U	4.0
2-Butanone	78-93-3	U	5.0
Carbon disulfide	75-15-0	U	2.0
Carbon tetrachloride	56-23-5	U	2.0
Chlorobenzene	108-90-7	U	2.0
Chloroethane	75-00-3	U	4.0
2-Chloroethylvinylether	110-75-8	U	4.0
Chloroform	67-66-3	U	2.0
Chloromethane	74-87-3	U	4.0
Dibromochloromethane	124-48-1	U	2.0
1,2-Dichlorobenzene	95-50-1	U	2.0
1,3-Dichlorobenzene	541-73-1	U	2.0
1,4-Dichlorobenzene	106-46-7	U	2.0
1,1-Dichloroethane	75-34-3	U	2.0
1,2-Dichloroethane	107-06-2	U	2.0
1,1-Dichloroethene	75-35-4	U	2.0
cis-1,2-Dichloroethene	156-59-2	U	2.0
trans-1,2-Dichloroethene	156-60-5	U	2.0
1,2-Dichloropropane	78-87-5	U	2.0
cis-1,3-Dichloropropene	10061-01-5	U	2.0
trans-1,3-Dichloropropene	10061-02-6	U	2.0
Ethylbenzene	100-41-4	U	2.0

  
\_\_\_\_\_  
Analyst

EQ 7/31/08

  
\_\_\_\_\_  
Approved

**Qualifiers:** See the case narrative for a discussion

B - Analyte detected in the Method Blank, value not subtracted from result  
E - Extrapolated value. Value exceeds calibration range  
H - Prep or Analytical holding time exceeded  
S - Spike Recovery outside acceptance limits  
X - See case narrative  
\* - Value exceeded the Maximum Contamination Level (MCL), TCLP limit, or if compound is undetected, LQL exceeds MCL.

**Qualifiers:** U - Analyte not detected at or above the reporting limit

J - Estimated value below the LQL

**Definitions:** NA - Not Applicable  
LQL - Lower Quantitation Limit  
MDL - Method Detection Limit  
Surr - Surrogate Standard

Print Date: 7/18/08

**Evergreen Analytical, Inc.**  
4036 Youngfield Street, Wheat Ridge, Colorado 80033-3862  
(303) 425-6021

<b>Client Sample ID:</b> Trip Blank <b>Client Project ID:</b> 22239335.0001 <b>Date Collected:</b> 7/15/08 <b>Date Received:</b> 7/17/08 <b>Date Prepared:</b> 7/17/08 <b>Date Analyzed:</b> 7/17/08 <b>Percent Moisture:</b> NA	<b>Lab Work Order:</b> 08-5065 <b>Lab Sample ID:</b> 08-5065-04A <b>Sample Matrix:</b> Water <b>Lab File ID:</b> VOA20717\2101021.D <b>Method Blank:</b> MB2071708-W <b>Prep Factor:</b> 1.000 <b>Dilution Factor:</b> 1.00
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**Method: SW8260B**  
**Prep Method: SW5030B**

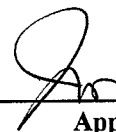
**VOLATILE ORGANICS**

Analytes	CAS Number	Result	Units: µg/L
			LQL
2-Hexanone	591-78-6	U	2.0
Methylene chloride	75-09-2	U	5.0
4-Methyl-2-pentanone	108-10-1	U	2.0
Styrene	100-42-5	U	4.0
1,1,2,2-Tetrachloroethane	79-34-5	U	2.0
Tetrachloroethene	127-18-4	U	2.0
Toluene	108-88-3	U	2.0
1,1,1-Trichloroethane	71-55-6	U	2.0
1,1,2-Trichloroethane	79-00-5	U	2.0
Trichloroethene	79-01-6	U	2.0
Vinyl acetate	108-05-4	U	4.0
Vinyl chloride	75-01-4	U	2.0
Xylene, Total	1330-20-7	U	4.0
Surr: 1,2-Dichloroethane-d4	17060-07-0	113	QC Limits: 70-130 %REC
Surr: 4-Bromofluorobenzene	460-00-4	114	QC Limits: 70-130 %REC
Surr: Toluene-d8	2037-26-5	108	QC Limits: 70-130 %REC

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**Qualifiers:** See the case narrative for a discussion

B - Analyte detected in the Method Blank, value not subtracted from result  
E - Extrapolated value. Value exceeds calibration range  
H - Prep or Analytical holding time exceeded  
S - Spike Recovery outside acceptance limits  
X - See case narrative  
\* - Value exceeded the Maximum Contamination Level (MCL), TCLP limit, or if compound is undetected, LQL exceeds MCL.

**Qualifiers:** U - Analyte not detected at or above the reporting limit  
J - Estimated value below the LQL

**Definitions:** NA - Not Applicable  
LQL - Lower Quantitation Limit  
MDL - Method Detection Limit  
Surr - Surrogate Standard

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005

**Evergreen Analytical, Inc.**  
4036 Youngfield Street, Wheat Ridge, Colorado 80033-3862  
(303) 425-6021

**Client Sample ID:** BH-5 @12 1/2-13 1/2  
**Client Project ID:** 22239335.0001  
**Date Collected:** 7/15/08  
**Date Received:** 7/17/08

**Lab Work Order** 08-5065  
**Lab Sample ID:** 08-5065-01B  
**Sample Matrix:** Soil

**TOTAL VOLATILE HYDROCARBONS**

**Method:** SW8015B MOD

**Prep Method:** SW5035

**Date Prepared:** 7/17/08

**Lab File ID:** TVB40717\005F

**Dilution Factor:** 5

**Date Analyzed:** 7/17/08

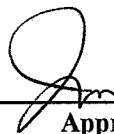
**Method Blank:** MB4071708

Analytes	CAS Number	Result	LQL	Units
TVH-Gasoline	86290-81-5	U	1.0	mg/Kg
Surr: 1,2,4-Trichlorobenzene (S)	120-82-1	108	<b>QC Limits:</b> 60-140	%REC

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**Analyst**



**Approved**

**Notes:** Total Xylenes consist of three isomers, two of which co-elute. The Xylene RL is for a single peak. Confirmation analysis was not performed.

**Qualifiers:** B - Analyte detected in the associated Method Blank, value not subtracted from result  
E - Extrapolated value. Value exceeds calibration range  
H - Sample analysis exceeded analytical holding time  
J - Indicates an estimated value when the compound is detected, but is below the LQL  
S - Spike Recovery outside accepted limits  
U - Compound analyzed for but not detected  
X - See case narrative  
\* - Value exceeded the Maximum Contamination Level (MCL), TCLP limit, or if compound is undetected, LQL exceeds MCL.

**Definitions:** LQL - Lower Quantitation Limit  
Surr - Surrogate

Print Date: 7/17/08

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**Evergreen Analytical, Inc.**  
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(303) 425-6021

Client Sample ID: BH-6 @15-16  
Client Project ID: 22239335.0001  
Date Collected: 7/15/08  
Date Received: 7/17/08

Lab Work Order 08-5065  
Lab Sample ID: 08-5065-02B  
Sample Matrix: Soil

**TOTAL VOLATILE HYDROCARBONS**

**Method: SW8015B MOD**

**Prep Method: SW5035**

Date Prepared: 7/17/08

Lab File ID: TVB40717\008F

Dilution Factor: 5

Date Analyzed: 7/17/08

Method Blank: MB4071708

Analytes	CAS Number	Result	LQL	Units
TVH-Gasoline	86290-81-5	U	1.0	mg/Kg
Surr: 1,2,4-Trichlorobenzene (S)	120-82-1	126	QC Limits: 60-140	%REC

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Analyst

  
\_\_\_\_\_  
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Notes: Total Xylenes consist of three isomers, two of which co-elute. The Xylene RL is for a single peak. Confirmation analysis was not performed.

**Qualifiers:** B - Analyte detected in the associated Method Blank, value not subtracted from result  
E - Extrapolated value. Value exceeds calibration range  
H - Sample analysis exceeded analytical holding time  
J - Indicates an estimated value when the compound is detected, but is below the LQL  
S - Spike Recovery outside accepted limits  
U - Compound analyzed for but not detected  
X - See case narrative  
\* - Value exceeded the Maximum Contamination Level (MCL), TCLP limit, or if compound is undetected, LQL exceeds MCL.

**Definitions:** LQL - Lower Quantitation Limit  
Surr - Surrogate

Print Date: 7/17/08

# Evergreen Analytical, Inc.

4036 Youngfield Street, Wheat Ridge, Colorado 80033-3862  
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Lab Order: 08-5065  
Client Project ID: 22239335.0001  
Matrix: Soil

Date Received: 7/17/08  
Date Prepared: 7/17/08  
Prep Batch ID: 16088  
Units: mg/Kg

## Total Extractable Hydrocarbons Diesel Fuel (No. 2)

Method: SW8015B Mod

Prep Method: SW3550B

Lab ID	Client Sample ID	File ID	Date Collected	Date Analyzed	DF	Surr REC	Sample Results	LQL
08-5065-01C	BH-5 @12 1/2-13 1/2	FID50717\005F0501	7/15/08	7/17/08	1	64%	U	14
08-5065-02C	BH-6 @15-16	FID50717\006F0601	7/15/08	7/17/08	1	58%	U	14

Surrogate QC Limits 39-130 %REC

Surr: TBB

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*ms*

Analyst

*Jr*

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**Qualifiers:** B - Analyte detected in the associated Method Blank, value not subtracted from result  
E - Extrapolated value. Value exceeds calibration range  
H - Sample analysis exceeded analytical holding time  
J - Indicates an estimated value when the compound is detected, but is below the LQL  
S - Spike Recovery outside accepted limits  
U - Compound analyzed for but not detected  
X - See case narrative  
\* - Value exceeded the Maximum Contamination Level (MCL), TCLP limit, or if compound is undetected, LQL exceeds MCL.

**Definitions:** DF - Dilution Factor  
LQL - Lower Quantitation Limit  
Surr - Surrogate

Print Date: 7/18/08

## PRATHER SPRINGS DATA REVIEW SUMMARY

Data Package Number: Evergreen Analytical Laboratory 08-5101

Sampling Event: July 16, 2008

Sample-specific Parameter Review? **Yes**

Laboratory Performance Parameters? **No**

Data Reviewer: Liz Kraak

Date Completed: 07/31/08

Peer Reviewer: Sheri O'Connor

Date Completed: 08/01/08

The table below summarizes the results presented in this data package.

Field ID	Sample Type	Lab ID	Matrix	Analyses			
				VOCs (8260B)	TVH – Gasoline (8015B)	TEH – Diesel (8015B)	SVOCs (8270C) <sup>1</sup>
PS-BH3 20-21.5	SA	08-5101-01	Soil	X <sup>m</sup>	X <sup>m</sup>	X <sup>m</sup>	---
PS-BH4 14-16	SA	08-5101-02	Soil	X	X	X	---

Analyses:

<sup>1</sup> Per URS request, the SVOC analysis was placed on hold.

VOCs – Volatile Organic Compounds

SVOCs – Semivolatile Organic Compounds

QC Type: SA - Sample

TB - Trip Blank

m - Matrix Spike/Matrix Spike Duplicate

--- Sample not analyzed for this parameter.

The data review was conducted in accordance with the Phase I Site Investigation Work Plan – Prather Spring Investigation dated July 31, 2008.

### General Overall Assessment:

☒ Data are usable without qualification.  
☐ Data are usable with qualification (noted below).

**Case Narrative Summary:** Except as noted below, any of the issues noted in the laboratory case narrative potentially affecting data quality are addressed in the appropriate sections in the table below.

Review Parameter	Criteria Met?	Comments
<b>Sample-specific Parameters</b>	Complete with "Yes", "No", or "Not Applicable (N/A)".	For each "No" response, list what was out, associated acceptance limits, all qualified data, and bias direction or reference associated table with pertinent details.
COC & Sample Receipt	Yes	Samples were received intact and the cooler temperature was 4.2°C upon arrival at the laboratory, within the ≤6°C temperature criterion.  The sampler inadvertently listed the sampling date for the split samples as 7/15/08. However, the samples were collected 7/16/08. The correct sampling date for the split samples has been updated in the database. Further action was not necessary.
Holding Times	Yes	All samples were analyzed within the holding time requirements specified in the Work Plan. Further action was not necessary.
Method Blanks	Yes	Target analytes were not reported as detected within the associated method blanks. Therefore, data qualification based on method blank contamination was not necessary.



Review Parameter	Criteria Met?	Comments
<b>Matrix QC</b> <ul style="list-style-type: none"> <li>MS/MSD PS-BH3 20-21.5</li> <li>LD N/A</li> </ul>	Yes	The recoveries and RPDs for the matrix spike (MS) and matrix spike duplicate (MSD) analyses were within the laboratory-determined acceptance range. Therefore, data qualification was not necessary.
<b>Field QC</b> <ul style="list-style-type: none"> <li>Field Blanks (Ambient, Rinsate, or Trip) None</li> <li>Field Duplicate None</li> </ul>	N/A	A trip blank was inadvertently not submitted with this set of samples. Data quality was not adversely affected because all the associated results were reported as non-detect.
<b>Surrogates</b>	No	With the exceptions summarized below in Table 1, all surrogate recoveries were within the laboratory acceptance limits.
<b>Laboratory Control Sample/ Laboratory Control Sample Duplicate (LCS/LCSD)</b>	Yes	LCS and LCSD recoveries were within the laboratory determined acceptance limits. Therefore, data qualification was not necessary.
<b>Non-detect Results w/ Elevated RLs?</b>	No	The VOC and TVH -Gasoline analyses were performed at dilutions. Several results were reported as non-detect at elevated RLs. Therefore, these results that were reported as non-detect at elevated RLs will need to be evaluated with respect to the project objectives.
<b>Package Completeness</b>	Yes	
<b>Other Parameters</b>	Yes	<p>Detected analytes with concentrations between the Instrument Detection Limit (IDL) and the Reporting Limit (RL) were qualified as estimated (J). A qualifier code of "SQL-I" (Sample Quantitation Limit) was assigned to reflect the greater uncertainty in quantitative values below the RL.</p> <p><b>Split Samples</b></p> <p>Split sample evaluation criteria were not included in the Work Plan. As such, the following concentration-dependent criteria were used:</p> <ul style="list-style-type: none"> <li>If both results were <math>\leq 5 \times \text{RL}</math>, then the absolute difference between the results should agree within <math>\pm 2 \times \text{RL}</math> (Waters) and <math>\pm 3.5 \times \text{RL}</math> (Soils)</li> <li>If both results were <math>\geq 5 \times \text{RL}</math>, then the RPD should be <math>\leq 30\%</math> (Waters) and <math>\leq 50\%</math> (Soils)</li> </ul> <p>The following split samples were collected:</p> <ul style="list-style-type: none"> <li>PS-BH3 20-21.5 (VOCs, TVH – Gasoline, TEH – Diesel)</li> <li>PS-BH4 14-16 (VOCs, TVH – Gasoline)</li> </ul> <p>All split sample results and parent sample results were reported as non-detect for these analyses. As such, the split sample results demonstrate acceptable agreement.</p>

**Table 1: Surrogate Recovery Outliers and Resultant Data Qualification**

Associated Sample	Surrogate	Recovery (Limits)	Qualification
TVH – Gasoline LCS	1,2,4-Trichlorobenzene	145 (60-140)	None. As these are QC samples, data qualification based on surrogate recovery failure is not necessary.
PS-BH3 20-21.5 MSD	1,2,4-Trichlorobenzene	150 (60-140)	

LCS – Laboratory Control Sample

MSD – Matrix Spike Duplicate

QC – Quality Control

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Client Sample ID: PS-BH3 20-21.5  
Client Project ID: 22239335.00001  
Date Collected: 7/16/2008  
Date Received: 7/17/2008  
Date Prepared: 7/22/2008  
Date Analyzed: 7/22/2008  
Percent Moisture 23.86

Lab Work Order 08-5101  
Lab Sample ID: 08-5101-01A  
Sample Matrix: Soil  
Lab File ID: VO30722X\0601006.D  
Method Blank: MB3072208-S  
Prep Factor: 1.000  
Dilution Factor: 5.00

Method: SW8260B  
Prep Method: SW5035

## VOLATILE ORGANICS

Analytes	CAS Number	Result	Units: µg/Kg-dry LQL
Acetone	67-64-1	U	130
Benzene	71-43-2	U	6.6
Bromodichloromethane	75-27-4	U	33
Bromoform	75-25-2	U	33
Bromomethane	74-83-9	U	33
2-Butanone	78-93-3	U	130
Carbon disulfide	75-15-0	U	33
Carbon tetrachloride	56-23-5	U	33
Chlorobenzene	108-90-7	U	33
Chloroethane	75-00-3	U	33
2-Chloroethylvinylether	110-75-8	U	130
Chloroform	67-66-3	U	33
Chloromethane	74-87-3	U	33
Dibromochloromethane	124-48-1	U	33
1,2-Dichlorobenzene	95-50-1	U	33
1,3-Dichlorobenzene	541-73-1	U	33
1,4-Dichlorobenzene	106-46-7	U	33
1,1-Dichloroethane	75-34-3	U	33
1,2-Dichloroethane	107-06-2	U	33
1,1-Dichloroethene	75-35-4	U	33
cis-1,2-Dichloroethene	156-59-2	U	33
trans-1,2-Dichloroethene	156-60-5	U	33
1,2-Dichloropropane	78-87-5	U	33
cis-1,3-Dichloropropene	10061-01-5	U	33
trans-1,3-Dichloropropene	10061-02-6	U	33
Ethylbenzene	100-41-4	U	33

  
Analyst

  
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**Qualifiers:** See the case narrative for a discussion

B - Analyte detected in the Method Blank, value not subtracted from result  
E - Extrapolated value. Value exceeds calibration range  
H - Prep or Analytical holding time exceeded  
S - Spike Recovery outside acceptance limits  
X - See case narrative  
\* - Value exceeded the Maximum Contamination Level (MCL), TCLP limit, or if compound is undetected, LQL exceeds MCL.

**Qualifiers:** U - Analyte not detected at or above the reporting limit  
J - Estimated value below the LQL

**Definitions:** NA - Not Applicable  
LQL - Lower Quantitation Limit  
MDL - Method Detection Limit  
Surr - Surrogate Standard

Print Date: 7/23/2008

EQ 7/31/08

# Evergreen Analytical, Inc.

4036 Youngfield Street, Wheat Ridge, Colorado 80033-3862  
(303) 425-6021

Client Sample ID: PS-BH3 20-21.5  
Client Project ID: 22239335.00001  
Date Collected: 7/16/2008  
Date Received: 7/17/2008  
Date Prepared: 7/22/2008  
Date Analyzed: 7/22/2008  
Percent Moisture 23.86

Lab Work Order 08-5101  
Lab Sample ID: 08-5101-01A  
Sample Matrix: Soil  
Lab File ID: VO30722X0601006.D  
Method Blank: MB3072208-S  
Prep Factor: 1.000  
Dilution Factor: 5.00

Method: SW8260B  
Prep Method: SW5035

## VOLATILE ORGANICS

Analytes	CAS Number	Result	Units: µg/Kg-dry LQL
2-Hexanone	591-78-6	U	130
Methylene chloride	75-09-2	U	33
4-Methyl-2-pentanone	108-10-1	U	130
Styrene	100-42-5	U	33
1,1,2,2-Tetrachloroethane	79-34-5	U	66
Tetrachloroethene	127-18-4	U	33
Toluene	108-88-3	U	13
1,1,1-Trichloroethane	71-55-6	U	33
1,1,2-Trichloroethane	79-00-5	U	33
Trichloroethene	79-01-6	U	33
Vinyl acetate	108-05-4	U	130
Vinyl chloride	75-01-4	U	33
Xylene, Total	1330-20-7	U	33
Surr: 1,2-Dichloroethane-d4	17060-07-0	107	QC Limits: 70-130 %REC
Surr: 4-Bromofluorobenzene	460-00-4	99	QC Limits: 70-130 %REC
Surr: Toluene-d8	2037-26-5	98	QC Limits: 70-130 %REC

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Analyst

  
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**Qualifiers:** See the case narrative for a discussion

B - Analyte detected in the Method Blank, value not subtracted from result  
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S - Spike Recovery outside acceptance limits  
X - See case narrative  
\* - Value exceeded the Maximum Contamination Level (MCL), TCLP limit, or if compound is undetected, LQL exceeds MCL.

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J - Estimated value below the LQL

**Definitions:** NA - Not Applicable  
LQL - Lower Quantitation Limit  
MDL - Method Detection Limit  
Surr - Surrogate Standard

Print Date: 7/23/2008

# Evergreen Analytical, Inc.

4036 Youngfield Street, Wheat Ridge, Colorado 80033-3862  
(303) 425-6021

Client Sample ID: PS-BH4 14-16  
Client Project ID: 22239335.00001  
Date Collected: 7/16/2008  
Date Received: 7/17/2008  
Date Prepared: 7/22/2008  
Date Analyzed: 7/22/2008  
Percent Moisture 25.54


Lab Work Order 08-5101  
Lab Sample ID: 08-5101-02A  
Sample Matrix: Soil  
Lab File ID: VO30722X0901009.D  
Method Blank: MB3072208-S  
Prep Factor: 1.000  
Dilution Factor: 5.00

Method: SW8260B  
Prep Method: SW5035

## VOLATILE ORGANICS

Analytes	CAS Number	Result	Units: µg/Kg-dry LQL
Acetone	67-64-1	U	130
Benzene	71-43-2	U	6.7
Bromodichloromethane	75-27-4	U	34
Bromoform	75-25-2	U	34
Bromomethane	74-83-9	U	34
2-Butanone	78-93-3	U	130
Carbon disulfide	75-15-0	U	34
Carbon tetrachloride	56-23-5	U	34
Chlorobenzene	108-90-7	U	34
Chloroethane	75-00-3	U	34
2-Chloroethylvinylether	110-75-8	U	130
Chloroform	67-66-3	U	34
Chloromethane	74-87-3	U	34
Dibromochloromethane	124-48-1	U	34
1,2-Dichlorobenzene	95-50-1	U	34
1,3-Dichlorobenzene	541-73-1	U	34
1,4-Dichlorobenzene	106-46-7	U	34
1,1-Dichloroethane	75-34-3	U	34
1,2-Dichloroethane	107-06-2	U	34
1,1-Dichloroethene	75-35-4	U	34
cis-1,2-Dichloroethene	156-59-2	U	34
trans-1,2-Dichloroethene	156-60-5	U	34
1,2-Dichloropropane	78-87-5	U	34
cis-1,3-Dichloropropene	10061-01-5	U	34
trans-1,3-Dichloropropene	10061-02-6	U	34
Ethylbenzene	100-41-4	U	34

  
Analyst

  
Approved

**Qualifiers:** See the case narrative for a discussion

B - Analyte detected in the Method Blank, value not subtracted from result  
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J - Estimated value below the LQL

**Definitions:** NA - Not Applicable  
LQL - Lower Quantitation Limit  
MDL - Method Detection Limit  
Surr - Surrogate Standard

Print Date: 7/23/2008

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Client Sample ID: PS-BH4 14-16  
Client Project ID: 22239335.00001  
Date Collected: 7/16/2008  
Date Received: 7/17/2008  
Date Prepared: 7/22/2008  
Date Analyzed: 7/22/2008  
Percent Moisture 25.54

Lab Work Order 08-5101  
Lab Sample ID: 08-5101-02A  
Sample Matrix: Soil  
Lab File ID: VO30722X\0901009.D  
Method Blank: MB3072208-S  
Prep Factor: 1.000  
Dilution Factor: 5.00

Method: SW8260B  
Prep Method: SW5035

## VOLATILE ORGANICS

Analytes	CAS Number	Result	Units: µg/Kg-dry LQL
2-Hexanone	591-78-6	U	130
Methylene chloride	75-09-2	U	34
4-Methyl-2-pentanone	108-10-1	U	130
Styrene	100-42-5	U	34
1,1,2,2-Tetrachloroethane	79-34-5	U	67
Tetrachloroethene	127-18-4	U	34
Toluene	108-88-3	U	13
1,1,1-Trichloroethane	71-55-6	U	34
1,1,2-Trichloroethane	79-00-5	U	34
Trichloroethene	79-01-6	U	34
Vinyl acetate	108-05-4	U	130
Vinyl chloride	75-01-4	U	34
Xylene, Total	1330-20-7	U	34
Surr: 1,2-Dichloroethane-d4	17060-07-0	109	QC Limits: 70-130 %REC
Surr: 4-Bromofluorobenzene	460-00-4	96	QC Limits: 70-130 %REC
Surr: Toluene-d8	2037-26-5	97	QC Limits: 70-130 %REC

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Analyst

Approved

### Qualifiers: See the case narrative for a discussion

B - Analyte detected in the Method Blank, value not subtracted from result  
E - Extrapolated value. Value exceeds calibration range  
H - Prep or Analytical holding time exceeded  
S - Spike Recovery outside acceptance limits  
X - See case narrative  
\* - Value exceeded the Maximum Contamination Level (MCL), TCLP limit, or if compound is undetected, LQL exceeds MCL.

Qualifiers: U - Analyte not detected at or above the reporting limit  
J - Estimated value below the LQL

Definitions: NA - Not Applicable  
LQL - Lower Quantitation Limit  
MDL - Method Detection Limit  
Surr - Surrogate Standard

Print Date: 7/23/2008

**Evergreen Analytical, Inc.**  
 4036 Youngfield Street, Wheat Ridge, Colorado 80033-3862  
 (303) 425-6021

**Client Sample ID:** PS-BH3 20-21.5  
**Client Project ID:** 22239335.00001  
**Date Collected:** 7/16/08  
**Date Received:** 7/17/08

**Lab Work Order** 08-5101  
**Lab Sample ID:** 08-5101-01A  
**Sample Matrix:** Soil

**TOTAL VOLATILE HYDROCARBONS**

**Method:** SW8015B MOD

**Prep Method:** SW5035

**Date Prepared:** 7/18/08  
**Date Analyzed:** 7/18/08

**Lab File ID:** TVB40718\005F  
**Method Blank:** MB4071808

**Dilution Factor:** 5

Analytes	CAS Number	Result	LQL	Units
TVH-Gasoline	86290-81-5	U	1.0	mg/Kg
Surr: 1,2,4-Trichlorobenzene (S)	120-82-1	113	<b>QC Limits:</b> 60-140	%REC

EQ 7/31/08

  
 \_\_\_\_\_  
**Analyst**

  
 \_\_\_\_\_  
**Approved**

**Notes:** Total Xylenes consist of three isomers, two of which co-elute. The Xylene RL is for a single peak. Confirmation analysis was not performed.

**Qualifiers:** B - Analyte detected in the associated Method Blank, value not subtracted from result  
 E - Extrapolated value. Value exceeds calibration range  
 H - Sample analysis exceeded analytical holding time  
 J - Indicates an estimated value when the compound is detected, but is below the LQL  
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 \* -Value exceeded the Maximum Contamination Level (MCL), TCLP limit, or if compound is undetected, LQL exceeds MCL.

**Definitions:** LQL - Lower Quantitation Limit  
 Surr - Surrogate

**Print Date:** 7/18/08

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4036 Youngfield Street, Wheat Ridge, Colorado 80033-3862  
(303) 425-6021

Client Sample ID: PS-BH4 14-16  
Client Project ID: 22239335.00001  
Date Collected: 7/16/08  
Date Received: 7/17/08

Lab Work Order 08-5101  
Lab Sample ID: 08-5101-02A  
Sample Matrix: Soil

## TOTAL VOLATILE HYDROCARBONS

Method: SW8015B MOD

Prep Method: SW5035

Date Prepared: 7/18/08

Lab File ID: TVB40718\008F

Dilution Factor: 5

Date Analyzed: 7/18/08

Method Blank: MB4071808

Analytes	CAS Number	Result	LQL	Units
TVH-Gasoline	86290-81-5	U	1.0	mg/Kg
Surr: 1,2,4-Trichlorobenzene (S)	120-82-1	118	QC Limits: 60-140	%REC

EQ 7/31/08

*MS*

Analyst

*Jim*

Approved

Notes: Total Xylenes consist of three isomers, two of which co-elute. The Xylene RL is for a single peak. Confirmation analysis was not performed.

**Qualifiers:** B - Analyte detected in the associated Method Blank, value not subtracted from result  
E - Extrapolated value. Value exceeds calibration range  
H - Sample analysis exceeded analytical holding time  
J - Indicates an estimated value when the compound is detected, but is below the LQL  
S - Spike Recovery outside accepted limits  
U - Compound analyzed for but not detected  
X - See case narrative  
\* - Value exceeded the Maximum Contamination Level (MCL), TCLP limit, or if compound is undetected, LQL exceeds MCL.

**Definitions:** LQL - Lower Quantitation Limit  
Surr - Surrogate

Print Date: 7/18/08



**Evergreen Analytical, Inc.**  
4036 Youngfield Street, Wheat Ridge, Colorado 80033-3862  
(303) 425-6021

Lab Order: 08-5101  
Client Project ID: 22239335.00001  
Matrix: Soil

Date Received: 7/17/08  
Date Prepared: 7/18/08  
Prep Batch ID: 16095  
Units: mg/Kg

**Total Extractable Hydrocarbons**  
**Diesel Fuel (No. 2)**

Method: SW8015B Mod

Prep Method: SW3550B

Lab ID	Client Sample ID	File ID	Date Collected	Date Analyzed	DF	Surr REC	Sample Results	LQL
08-5101-01B	PS-BH3 20-21.5	FID50718\006F0601	7/16/08	7/18/08	1	45%	U	14
08-5101-02B	PS-BH4 14-16	FID50718\007F0701	7/16/08	7/18/08	1	51%	U	14
Surrogate QC Limits 39-130 %REC			Surr: TBB					

ER 7/31/08

*MPS*

Analyst

*Jm*

Approved

**Qualifiers:** B - Analyte detected in the associated Method Blank, value not subtracted from result  
E - Extrapolated value. Value exceeds calibration range  
H - Sample analysis exceeded analytical holding time  
J - Indicates an estimated value when the compound is detected, but is below the LQL  
S - Spike Recovery outside accepted limits  
U - Compound analyzed for but not detected  
X - See case narrative  
\* - Value exceeded the Maximum Contamination Level (MCL), TCLP limit, or if compound is undetected, LQL exceeds MCL.

**Definitions:** DF - Dilution Factor  
LQL - Lower Quantitation Limit  
Surr - Surrogate

Print Date: 7/18/08

## PRATHER SPRINGS DATA REVIEW SUMMARY

Data Package Number: Evergreen Analytical Laboratory 08-5116

Sampling Event: July 18, 2008

Sample-specific Parameter Review? **Yes**

Laboratory Performance Parameters? **Yes**

Data Reviewer: Liz Kraak

Date Completed: 07/31/08

Peer Reviewer: Sheri O'Connor

Date Completed: 08/01/08

The table below summarizes the results presented in this data package.

Field ID	Sample Type	Lab ID	Matrix	Analyses	
				VOCs (8260B)	Methane (RSK 175-M)
PS-MW4	SA	08-5116-01	Water	X <sup>m</sup>	X <sup>m</sup>
PS-MW3	SA	08-5116-01	Water	X	X

Analyses:

VOCs – Volatile Organic Compounds

SVOCs – Semivolatile Organic Compounds

QC Type: SA - Sample

TB - Trip Blank

m - Matrix Spike/Matrix Spike Duplicate

--- Sample not analyzed for this parameter.

The data review was conducted in accordance with the Phase I Site Investigation Work Plan – Prather Spring Investigation dated July 31, 2008.

### General Overall Assessment:

\_\_\_\_\_ Data are usable without qualification.  
  X   With the exception of two results, data are usable with qualification (noted below).

**Case Narrative Summary:** Except as noted below, any of the issues noted in the laboratory case narrative potentially affecting data quality are addressed in the appropriate sections in the table below.

Review Parameter	Criteria Met?	Comments
<b>Sample-specific Parameters</b>	Complete with "Yes", "No", or "Not Applicable (N/A)".	For each "No" response, list what was out, associated acceptance limits, all qualified data, and bias direction or reference associated table with pertinent details.
COC & Sample Receipt	Yes	Samples were received intact and the cooler temperature was 3.0°C upon arrival at the laboratory, within the ≤6°C temperature criterion.
Holding Times	Yes	All samples were analyzed within the holding time requirements specified in the Work Plan. Further action was not necessary.
Method Blanks	Yes	Target analytes were not reported as detected within the associated method blanks. Therefore, data qualification based on method blank contamination was not necessary.
Matrix QC • MS/MSD PS-MW4 (VOCs, Methane) • LD N/A	No	With the exceptions summarized below in Table 1, the recoveries and RPDs for the matrix spike (MS) and matrix spike duplicate (MSD) analyses were within the laboratory-determined acceptance range.

Review Parameter	Criteria Met?	Comments
Field QC <ul style="list-style-type: none"> <li>Field Blanks (Ambient, Rinsate, or Trip) None</li> <li>Field Duplicate None</li> </ul>	N/A	A trip blank was inadvertently not submitted with this set of samples.
Surrogates	Yes	All surrogate recoveries were within the laboratory acceptance limits. Therefore, data qualification was not considered necessary.
Non-detect Results w/ Elevated RLs?	Yes	
Package Completeness	Yes	
Other Parameters	Yes	<p>Detected analytes with concentrations between the Instrument Detection Limit (IDL) and the Reporting Limit (RL) were qualified as estimated (J). A qualifier code of "SQL-I" (Sample Quantitation Limit) was assigned to reflect the greater uncertainty in quantitative values below the RL.</p> <p><b>Split Samples</b></p> <p>Split sample evaluation criteria were not included in the Work Plan. As such, the following concentration-dependent criteria were used:</p> <ul style="list-style-type: none"> <li>If both results were <math>\leq 5 \times \text{RL}</math>, then the absolute difference between the results should agree within <math>\pm 2 \times \text{RL}</math> (Waters) and <math>\pm 3.5 \times \text{RL}</math> (Soils)</li> <li>If both results were <math>\geq 5 \times \text{RL}</math>, then the RPD should be <math>\leq 30\%</math> (Waters) and <math>\leq 50\%</math> (Soils)</li> </ul> <p>The following split samples were collected:</p> <ul style="list-style-type: none"> <li>PS-MW4 (VOCs, Methane)</li> <li>PS- MW3 (VOCs, Methane)</li> </ul> <p>A comparison of detected split sample results and detected parent sample results is summarized below in Table 2.</p>
<b>Laboratory Performance Review</b>		

Review Parameter	Criteria Met?	Comments
Initial Calibration	No	<p><b>Method 8260B (VOCs)</b></p> <p>All the minimum relative response factors (RRFs) for the system performance check compounds (SPCCs) were met, satisfying method requirements. For all other target analytes, a minimum RRF of 0.05 was used and all target analytes met this criterion. The percent relative standard deviations (%RSDs) over the initial calibration RRFs for all calibration check compounds (CCCs) satisfied the method requirement of &lt;30%. For all other target compounds, a requirement of 15% RSD was used. The mean of the %RSD values for all target analytes in the calibrations was less than 15%. Therefore, the initial calibrations met method acceptance criteria by satisfying the mean %RSD exception. Although the %RSDs for several target analytes did not meet the 15% RSD criterion, data qualification was not necessary because alternate calibration models (i.e. linear and quadratic regression) were used and the correlation coefficients (r) for the first order curves were &gt;0.995.</p> <p>For the linear curve fit, the laboratory forced the line through 0,0 which is allowed per Method 8000C as long as the absolute value of the percent difference between the calculated and expected concentration for every calibration level are less than or equal to 20%. For acetone, the %D was evaluated for the calibration point at the LQL (Laboratory Quantitation Limit). The %D between the calculated using the laboratory equation and the true value was 84%. Therefore, all acetone results less than or equal to the LQL were qualified as estimated (J/UJ ICAL – I) to reflect the imprecision at the low end of the calibration curve.</p> <p><b>Dissolved Methane</b></p> <p>The relationship between instrument response and concentration was established with a blank and at least five standards. All initial calibrations were verified, as applicable. Data qualification on the basis of initial calibrations was not necessary.</p>
Tuning (as applicable to the method)	Yes	<p><b>Method 8260B (VOCs)</b></p> <p>A satisfactory tuning event was conducted at the beginning of every 12 hours of sample analysis. No errors in calculation of ion abundance ratios were found and all were within the required acceptance ranges. Data qualification on the basis of instrument tuning was not necessary.</p>
Initial/ Continuing Calibration Verification (ICV/CCV)	No	<p><b>ICV/CCV</b></p> <p>With the exceptions listed below, The %Ds for all CCCs in the ICV and CCV were less than 20%, satisfying method requirements, and other target analytes satisfied the %D criterion of 25%.</p> <p>The analyte tetrachloroethane (+26.2%) was outside the requirements for the CCV associated with the samples reported in this data package. These results in the associated samples were reported as non-detect and the potential bias indicated by the CCV was considered high; therefore, qualification of data was not considered necessary.</p> <p>.</p>
Laboratory Control Sample/ Laboratory Control Sample Duplicate (LCS/LCSD)	Yes	<p>LCS and LCSD recoveries were within the laboratory determined acceptance limits. Therefore, data qualification was not necessary.</p>

Review Parameter	Criteria Met?	Comments
Target Compound Identification	Yes	<b>Organic Methods</b> The quantitation sheets and total ion chromatograms were reviewed to assure that compounds reported as identified meet the criteria contained in the method. The mass spectra were reviewed for compounds reported as identified to assure that the reported mass spectral data meet the mass spectral identification criteria contained in the analytical method. No errors in compound identification were found and data qualification was not necessary.
Transcription Errors	Yes	No transcription errors were found in this data package. Data qualification was not necessary.
Recalculation	Yes	No calculation or sample quantitation errors were found in this data package. Data qualification was not necessary.

**Table 1: MS/MSD Recovery and RPD Outliers and Resultant Data Qualification**

Sample	Analyte	MS/MSD %R (Limits)	RPD (Limit)	Qualification
PS-MW4	2-Chloroethylvinylether	0/0 (20-168)	NC (30)	As the percent recoveries were <10%, the 2-chloroethylvinylether result for sample PS-MW4 was qualified as unusable (R). Data qualification was extended to site MW-3, as all MS/MSD recoveries for 2-chloroethylvinylether in this data package and data package 08-5175 were 0%.

MS/MSD – Matrix Spike/ Matrix Spike Duplicate

%R – Percent Recovery

RPD – Relative Percent Difference

R - Rejected

**Table 2: Split Sample Comparison**

Sample	Detected Analytes	Primary Sample Result (µg/L)	Split Sample Result (µg/L)	RL <sup>1</sup> (µg/L)	Qualification
PS-MW4	Acetone	5.5	ND	10	None. The absolute difference between the split sample results and parent sample results agrees within 2xRL.
PS-MW3	Acetone	7.1	ND	10	
	Methane	ND	0.003 mg/L	0.00080 mg/L	As the absolute difference between the split sample methane result and parent sample methane result exceeded 2xRL, the methane result was qualified as estimated (J D-I).

<sup>1</sup> RL is for primary sample.

ND – Non-detect

J = Estimated

D = Duplicate analysis evaluation criteria not met.

I = Indeterminate Bias



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**Client Sample ID:** PS-MW4  
**Client Project ID:** Prather Stream  
**Date Collected:** 7/17/08  
**Date Received:** 7/18/08  
**Date Prepared:** 7/20/08  
**Date Analyzed:** 7/20/08  
**Percent Moisture** NA

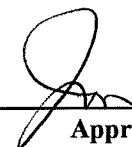
**Lab Work Order** 08-5116  
**Lab Sample ID:** 08-5116-01A  
**Sample Matrix:** Groundwater  
**Lab File ID:** VOA20720\0701007.D  
**Method Blank:** MB2072008-W  
**Prep Factor:** 1.000  
**Dilution Factor:** 1.00

**Method:** SW8260B  
**Prep Method:** SW5030B

**VOLATILE ORGANICS**

Analytes	CAS Number	Result	Units: µg/L LQL
Acetone	67-64-1	5.5 J	10 J SQL, ICCAL-I
Benzene	71-43-2	U	1.0
Bromodichloromethane	75-27-4	U	2.0
Bromoform	75-25-2	U	4.0
Bromomethane	74-83-9	U	4.0
2-Butanone	78-93-3	U	5.0
Carbon disulfide	75-15-0	U	2.0
Carbon tetrachloride	56-23-5	U	2.0
Chlorobenzene	108-90-7	U	2.0
Chloroethane	75-00-3	U	4.0
2-Chloroethylvinylether R	<del>110-75-8</del>	<del>U</del>	<del>4.0</del>
Chloroform	67-66-3	U	2.0
Chloromethane	74-87-3	U	4.0
Dibromochloromethane	124-48-1	U	2.0
1,2-Dichlorobenzene	95-50-1	U	2.0
1,3-Dichlorobenzene	541-73-1	U	2.0
1,4-Dichlorobenzene	106-46-7	U	2.0
1,1-Dichloroethane	75-34-3	U	2.0
1,2-Dichloroethane	107-06-2	U	2.0
1,1-Dichloroethene	75-35-4	U	2.0
cis-1,2-Dichloroethene	156-59-2	U	2.0
trans-1,2-Dichloroethene	156-60-5	U	2.0
1,2-Dichloropropane	78-87-5	U	2.0
cis-1,3-Dichloropropene	10061-01-5	U	2.0
trans-1,3-Dichloropropene	10061-02-6	U	2.0
Ethylbenzene	100-41-4	U	2.0

  
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Analyst

  
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Approved

**Qualifiers:** See the case narrative for a discussion

B - Analyte detected in the Method Blank, value not subtracted from result  
E - Extrapolated value. Value exceeds calibration range  
H - Prep or Analytical holding time exceeded  
S - Spike Recovery outside acceptance limits  
X - See case narrative  
\* - Value exceeded the Maximum Contamination Level (MCL), TCLP limit, or if compound is undetected, LQL exceeds MCL.

**Qualifiers:** U - Analyte not detected at or above the reporting limit

J - Estimated value below the LQL

**Definitions:** NA - Not Applicable  
LQL - Lower Quantitation Limit  
MDL - Method Detection Limit  
Surr - Surrogate Standard

Print Date: 7/21/08

ER 7/31/08

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4036 Youngfield Street, Wheat Ridge, Colorado 80033-3862  
(303) 425-6021


**Client Sample ID:** PS-MW4  
**Client Project ID:** Prather Stream  
**Date Collected:** 7/17/08  
**Date Received:** 7/18/08  
**Date Prepared:** 7/20/08  
**Date Analyzed:** 7/20/08  
**Percent Moisture** NA

**Lab Work Order** 08-5116  
**Lab Sample ID:** 08-5116-01A  
**Sample Matrix:** Groundwater  
**Lab File ID:** VOA20720\0701007.D  
**Method Blank:** MB2072008-W  
**Prep Factor:** 1.000  
**Dilution Factor:** 1.00

**Method:** SW8260B  
**Prep Method:** SW5030B

**VOLATILE ORGANICS**

Analytes	CAS Number	Result	Units: µg/L LQL
2-Hexanone	591-78-6	U	2.0
Methylene chloride	75-09-2	U	5.0
4-Methyl-2-pentanone	108-10-1	U	2.0
Styrene	100-42-5	U	4.0
1,1,2,2-Tetrachloroethane	79-34-5	U	2.0
Tetrachloroethene	127-18-4	U	2.0
Toluene	108-88-3	U	2.0
1,1,1-Trichloroethane	71-55-6	U	2.0
1,1,2-Trichloroethane	79-00-5	U	2.0
Trichloroethene	79-01-6	U	2.0
Vinyl acetate	108-05-4	U	4.0
Vinyl chloride	75-01-4	U	2.0
Xylene, Total	1330-20-7	U	4.0
Surr: 1,2-Dichloroethane-d4	17060-07-0	123	<b>QC Limits:</b> 70-130 %REC
Surr: 4-Bromofluorobenzene	460-00-4	130	<b>QC Limits:</b> 70-130 %REC
Surr: Toluene-d8	2037-26-5	113	<b>QC Limits:</b> 70-130 %REC

  
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Analyst

  
\_\_\_\_\_  
Approved

**Qualifiers:** See the case narrative for a discussion

B - Analyte detected in the Method Blank, value not subtracted from result  
E - Extrapolated value. Value exceeds calibration range  
H - Prep or Analytical holding time exceeded  
S - Spike Recovery outside acceptance limits  
X - See case narrative  
\* - Value exceeded the Maximum Contamination Level (MCL), TCLP limit, or if compound is undetected, LQL exceeds MCL.

**Qualifiers:** U - Analyte not detected at or above the reporting limit  
J - Estimated value below the LQL

**Definitions:** NA - Not Applicable  
LQL - Lower Quantitation Limit  
MDL - Method Detection Limit  
Surr - Surrogate Standard

Print Date: 7/21/08

ER 7/31/08

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**Evergreen Analytical, Inc.**  
4036 Youngfield Street, Wheat Ridge, Colorado 80033-3862  
(303) 425-6021

**Client Sample ID:** PS-MW3  
**Client Project ID:** Prather Stream  
**Date Collected:** 7/17/08  
**Date Received:** 7/18/08  
**Date Prepared:** 7/20/08  
**Date Analyzed:** 7/20/08  
**Percent Moisture** NA

**Lab Work Order** 08-5116  
**Lab Sample ID:** 08-5116-02A  
**Sample Matrix:** Groundwater  
**Lab File ID:** VOA20720\1001010.D  
**Method Blank:** MB2072008-W  
**Prep Factor:** 1.000  
**Dilution Factor:** 1.00

**Method:** SW8260B  
**Prep Method:** SW5030B

**VOLATILE ORGANICS**

Analytes	CAS Number	Result	Units: µg/L LQL
Acetone	67-64-1	7.1 J	10 J SQL, ICCAL-I
Benzene	71-43-2	U	1.0
Bromodichloromethane	75-27-4	U	2.0
Bromoform	75-25-2	U	4.0
Bromomethane	74-83-9	U	4.0
2-Butanone	78-93-3	U	5.0
Carbon disulfide	75-15-0	U	2.0
Carbon tetrachloride	56-23-5	U	2.0
Chlorobenzene	108-90-7	U	2.0
Chloroethane	75-00-3	U	4.0
2-Chloroethylvinylether R	<del>110-75-8</del>	<del>U</del>	<del>4.0</del>
Chloroform	67-66-3	U	2.0
Chloromethane	74-87-3	U	4.0
Dibromochloromethane	124-48-1	U	2.0
1,2-Dichlorobenzene	95-50-1	U	2.0
1,3-Dichlorobenzene	541-73-1	U	2.0
1,4-Dichlorobenzene	106-46-7	U	2.0
1,1-Dichloroethane	75-34-3	U	2.0
1,2-Dichloroethane	107-06-2	U	2.0
1,1-Dichloroethene	75-35-4	U	2.0
cis-1,2-Dichloroethene	156-59-2	U	2.0
trans-1,2-Dichloroethene	156-60-5	U	2.0
1,2-Dichloropropane	78-87-5	U	2.0
cis-1,3-Dichloropropene	10061-01-5	U	2.0
trans-1,3-Dichloropropene	10061-02-6	U	2.0
Ethylbenzene	100-41-4	U	2.0

  
\_\_\_\_\_  
Analyst

  
\_\_\_\_\_  
Approved

**Qualifiers:** See the case narrative for a discussion

B - Analyte detected in the Method Blank, value not subtracted from result  
E - Extrapolated value. Value exceeds calibration range  
H - Prep or Analytical holding time exceeded  
S - Spike Recovery outside acceptance limits  
X - See case narrative  
\* - Value exceeded the Maximum Contamination Level (MCL), TCLP limit, or if compound is undetected, LQL exceeds MCL.

**Qualifiers:** U - Analyte not detected at or above the reporting limit  
J - Estimated value below the LQL

**Definitions:** NA - Not Applicable  
LQL - Lower Quantitation Limit  
MDL - Method Detection Limit  
Surr - Surrogate Standard

Print Date: 7/21/08

EE 7/31/08

**Evergreen Analytical, Inc.**  
4036 Youngfield Street, Wheat Ridge, Colorado 80033-3862  
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Client Sample ID: PS-MW3  
Client Project ID: Prather Stream  
Date Collected: 7/17/08  
Date Received: 7/18/08  
Date Prepared: 7/20/08  
Date Analyzed: 7/20/08  
Percent Moisture NA

Lab Work Order 08-5116  
Lab Sample ID: 08-5116-02A  
Sample Matrix: Groundwater  
Lab File ID: VOA20720\1001010.D  
Method Blank: MB2072008-W  
Prep Factor: 1.000  
Dilution Factor: 1.00

Method: SW8260B  
Prep Method: SW5030B

**VOLATILE ORGANICS**

Analytes	CAS Number	Result	Units: µg/L LQL
2-Hexanone	591-78-6	U	2.0
Methylene chloride	75-09-2	U	5.0
4-Methyl-2-pentanone	108-10-1	U	2.0
Styrene	100-42-5	U	4.0
1,1,2,2-Tetrachloroethane	79-34-5	U	2.0
Tetrachloroethene	127-18-4	U	2.0
Toluene	108-88-3	U	2.0
1,1,1-Trichloroethane	71-55-6	U	2.0
1,1,2-Trichloroethane	79-00-5	U	2.0
Trichloroethene	79-01-6	U	2.0
Vinyl acetate	108-05-4	U	4.0
Vinyl chloride	75-01-4	U	2.0
Xylene, Total	1330-20-7	U	4.0
Surr: 1,2-Dichloroethane-d4	17060-07-0	110	QC Limits: 70-130 %REC
Surr: 4-Bromofluorobenzene	460-00-4	121	QC Limits: 70-130 %REC
Surr: Toluene-d8	2037-26-5	109	QC Limits: 70-130 %REC

  
\_\_\_\_\_  
Analyst

  
\_\_\_\_\_  
Approved

**Qualifiers:** See the case narrative for a discussion

B - Analyte detected in the Method Blank, value not subtracted from result  
E - Extrapolated value. Value exceeds calibration range  
H - Prep or Analytical holding time exceeded  
S - Spike Recovery outside acceptance limits  
X - See case narrative  
\* - Value exceeded the Maximum Contamination Level (MCL), TCLP limit, or if compound is undetected, LQL exceeds MCL.

**Qualifiers:** U - Analyte not detected at or above the reporting limit

J - Estimated value below the LQL

**Definitions:** NA - Not Applicable  
LQL - Lower Quantitation Limit  
MDL - Method Detection Limit  
Surr - Surrogate Standard

Print Date: 7/21/08

ER 7/31/08

## Evergreen Analytical, Inc.

4036 Youngfield Street, Wheat Ridge, Colorado 80033-3862

(303) 425-6021

Client Project ID Prather Stream

Lab Order: 08-5116

Units: mg/L

## RSKSOP-175M Headspace

## Methane

Method: RSKSOP175M

Prep Method: RSKSOP175M

Lab ID	Client ID	Matrix	Date Received	Collection Date	Date Prepared	Date Analyzed	Results	LQL	DF
08-5116-01B	PS-MW4	Groundwater	7/18/08	7/17/08	7/21/08	7/21/08	U	0.00080	1
08-5116-02B	PS-MW3	Groundwater	7/18/08	7/17/08	7/21/08	7/21/08	U	0.00080	1

UJ D-I

Comments:

EQ 7/31/08

  
\_\_\_\_\_  
Analyst  
\_\_\_\_\_  
Approved

**Qualifiers:** J - Indicates an estimated value when the compound is detected, but is below the LQL  
H - Sample analysis exceeded analytical holding time  
U - Compound analyzed for but not detected  
X - See case narrative  
\*-Value exceeds Maximum Contamination Level(MCL), TCLP limit, or if compound is undetected, LQL exceeds MCL.

**Definitions:** DF - Dilution Factor  
LQL - Lower Quantitation Limit

Print Date: 7/21/08

## PRATHER SPRINGS DATA REVIEW SUMMARY

Data Package Number: Evergreen Analytical Laboratory 08-5151

Sampling Event: July 17<sup>th</sup> and 18<sup>th</sup>, 2008

Sample-specific Parameter Review? **Yes**

Laboratory Performance Parameters? **No**

Data Reviewer: Liz Kraak

Date Completed: 07/31/08

Peer Reviewer: Sheri O'Connor

Date Completed: 08/01/08

The table below summarizes the results presented in this data package.

Field ID	Sample Type	Lab ID	Matrix	Analyses			
				VOCs (8260B)	TVH – Gasoline (8015B)	TEH – Diesel (8015B)	SVOCs (8270C) <sup>1</sup>
PS BH-11S 17.5-19	SA	08-5151-01	Soil	X	X <sup>m</sup>	X	---
PS BH-11D @ 49'	SA	08-5151-02	Soil	X	X	X	X
Trip Blank	TB	08-5151-03	Water	X	---	---	---

Analyses:

<sup>1</sup> Per URS request, the SVOC analysis was placed on hold. The SVOC analysis for sample PS BH-11D @ 49' was conducted because there were detections in the VOC and TVH analyses.

VOCs – Volatile Organic Compounds

SVOCs – Semivolatile Organic Compounds

QC Type: SA - Sample

TB - Trip Blank

m - Matrix Spike/Matrix Spike Duplicate

--- Sample not analyzed for this parameter.

The data review was conducted in accordance with the Phase I Site Investigation Work Plan – Prather Spring Investigation dated July 31, 2008.

### General Overall Assessment:

\_\_\_\_\_ Data are usable without qualification.  
  X   Data are usable with qualification (noted below).

**Case Narrative Summary:** Except as noted below, any of the issues noted in the laboratory case narrative potentially affecting data quality are addressed in the appropriate sections in the table below.

Review Parameter	Criteria Met?	Comments
<b>Sample-specific Parameters</b>	Complete with "Yes", "No", or "Not Applicable (N/A)".	For each "No" response, list what was out, associated acceptance limits, all qualified data, and bias direction or reference associated table with pertinent details.
COC & Sample Receipt	Yes	Samples were received intact and the cooler temperature was 4.5°C upon arrival at the laboratory, within the ≤6°C temperature criterion.
Holding Times	Yes	All samples were analyzed within the holding time requirements specified in the Work Plan. Further action was not necessary.
Method Blanks	Yes	Target analytes were not reported as detected within the associated method blanks. Therefore, data qualification based on method blank contamination was not necessary.
Matrix QC <ul style="list-style-type: none"> <li>MS/MSD PS-BH-11S 17.5-19 (TVH – Gasoline)</li> <li>LD N/A</li> </ul>	Yes	The recoveries and RPDs for the matrix spike (MS) and matrix spike duplicate (MSD) analyses were within the laboratory-determined acceptance range. Therefore, data qualification was not necessary.

Review Parameter	Criteria Met?	Comments
Field QC <ul style="list-style-type: none"> <li>Field Blanks (Ambient, Rinsate, or Trip)</li> <li>Trip Blank</li> <li>Field Duplicate</li> <li>None</li> </ul>	No	With the exception of acetone, target analytes were reported as non-detect in the trip blank. Acetone was detected in the trip blank at a concentration of 4.7 µg/L. Associated acetone results reported at a concentration <10x the trip blank contamination were qualified as non-detect at the reporting limit or reported value, whichever was greater (U TB-I).
Surrogates	No	With the exceptions summarized below in Table 1, all surrogate recoveries were within the laboratory acceptance limits.
Laboratory Control Sample/ Laboratory Control Sample Duplicate (LCS/LCSD)	No	With the exceptions summarized below in Table 2, LCS and LCSD recoveries were within the laboratory determined acceptance limits.
Non-detect Results w/ Elevated RLs?	No	The VOC, TVH – Gasoline, and SVOC analyses were performed at dilutions. Several results were reported as non-detect at elevated RLs. Therefore, these results that were reported as non-detect at elevated RLs will need to be evaluated with respect to the project objectives.
Package Completeness	Yes	
Other Parameters	Yes	<p>Detected analytes with concentrations between the Instrument Detection Limit (IDL) and the Reporting Limit (RL) were qualified as estimated (J). A qualifier code of “SQL-I” (Sample Quantitation Limit) was assigned to reflect the greater uncertainty in quantitative values below the RL.</p> <p><b>Split Samples</b></p> <p>Split sample evaluation criteria were not included in the Work Plan. As such, the following concentration-dependent criteria were used:</p> <ul style="list-style-type: none"> <li>If both results were <math>\leq 5 \times \text{RL}</math>, then the absolute difference between the results should agree within <math>\pm 2 \times \text{RL}</math> (Waters) and <math>\pm 3.5 \times \text{RL}</math> (Soils)</li> <li>If both results were <math>\geq 5 \times \text{RL}</math>, then the RPD should be <math>\leq 30\%</math> (Waters) and <math>\leq 50\%</math> (Soils)</li> </ul> <p>The following split samples were collected:</p> <ul style="list-style-type: none"> <li>PS BH-11S 17.5-19 (VOCs, TVH – Gasoline, TEH – Diesel)</li> </ul> <p>A comparison of detected split sample results and detected parent sample results is summarized below in Table 3.</p>

Table 1: Surrogate Recovery Outliers and Resultant Data Qualification

Associated Sample	Surrogate	Recovery (Limits)	Qualification
<b>VOCs</b>			
PS BH-11D @ 49'	4-Bromofluorobenzene	64 (70-130)	As the potential bias was considered to be low, all VOC results for sample PS BH-11D @ 49' were qualified as estimated (J/UJ SUR-L).
<b>TVH - Gasoline</b>			
PS BH-11D @ 49'	1,2,4-Trichlorobenzene	32 (60-140)	As the potential bias was considered to be low, the TVH – Gasoline result for sample PS BH-11D @ 49' was qualified as estimated (J/UJ SUR-L).

LCS – Laboratory Control Sample

MSD – Matrix Spike Duplicate

QC – Quality Control

**Table 2: LCS/LCSD Recovery Outliers and Resultant Data Qualification**

Associated Sample	Analyte	Recovery (Limits)	Qualification
<b>SVOCs</b>			
PS BH-11D @ 49'	2,4-Dinitrotoluene	149/ 146 (62-130)	As the potential bias was considered to be high and all associated results were reported as non-detect, data qualification was not necessary.
	2,6-Dinitrotoluene	134/ 134 (61-130)	
	2-Nitroaniline	138/ 137 (57-130)	
	3-Nitroaniline	137/ 134 (62-130)	
	4-Nitroaniline	154/ 151 (57-130)	
	4-Nitrophenol	133/ 130 (50-130)	

**Table 3: Split Sample Comparison**

Sample	Detected Analytes	Primary Sample Result (µg/Kg-wet)	Split Sample Result (µg/Kg-wet)	RL <sup>1</sup> (µg/Kg-wet)	Qualification
PS BH-11S 17.5-19	Benzene	ND	1.13	9.98	None. The absolute difference between the split sample results and parent sample results agrees within 3.5xRL.
	Methylene Chloride	ND	4.51	25.25	
	Toluene	ND	1.20	9.65	

<sup>1</sup> RL is for primary sample. ND – Non-detect

Primary sample results were reported in dry weight and converted to weight wet for comparison purposes.



# Evergreen Analytical, Inc.

4036 Youngfield Street, Wheat Ridge, Colorado 80033-3862  
(303) 425-6021

Client Sample ID: PS BH-11S 17.5-19  
Client Project ID: 22239335.00001  
Date Collected: 7/17/2008  
Date Received: 7/18/2008  
Date Prepared: 7/22/2008  
Date Analyzed: 7/23/2008  
Percent Moisture 25.74

Lab Work Order 08-5151  
Lab Sample ID: 08-5151-01A  
Sample Matrix: Soil  
Lab File ID: VO30722X\1501015.D  
Method Blank: MB3072208-S  
Prep Factor: 1.000  
Dilution Factor: 5.00

Method: SW8260B  
Prep Method: SW5035

## VOLATILE ORGANICS

Analytes	CAS Number	Result	Units: µg/Kg-dry LQL
Acetone	67-64-1	U	130
Benzene	71-43-2	U	6.7
Bromodichloromethane	75-27-4	U	34
Bromoform	75-25-2	U	34
Bromomethane	74-83-9	U	34
2-Butanone	78-93-3	U	130
Carbon disulfide	75-15-0	U	34
Carbon tetrachloride	56-23-5	U	34
Chlorobenzene	108-90-7	U	34
Chloroethane	75-00-3	U	34
2-Chloroethylvinylether	110-75-8	U	130
Chloroform	67-66-3	U	34
Chloromethane	74-87-3	U	34
Dibromochloromethane	124-48-1	U	34
1,2-Dichlorobenzene	95-50-1	U	34
1,3-Dichlorobenzene	541-73-1	U	34
1,4-Dichlorobenzene	106-46-7	U	34
1,1-Dichloroethane	75-34-3	U	34
1,2-Dichloroethane	107-06-2	U	34
1,1-Dichloroethene	75-35-4	U	34
cis-1,2-Dichloroethene	156-59-2	U	34
trans-1,2-Dichloroethene	156-60-5	U	34
1,2-Dichloropropane	78-87-5	U	34
cis-1,3-Dichloropropene	10061-01-5	U	34
trans-1,3-Dichloropropene	10061-02-6	U	34
Ethylbenzene	100-41-4	U	34

  
Analyst

  
Approved

**Qualifiers: See the case narrative for a discussion**

B - Analyte detected in the Method Blank, value not subtracted from result  
E - Extrapolated value. Value exceeds calibration range  
H - Prep or Analytical holding time exceeded  
S - Spike Recovery outside acceptance limits  
X - See case narrative  
\* - Value exceeded the Maximum Contamination Level (MCL), TCLP limit, or if compound is undetected, LQL exceeds MCL.

**Qualifiers:** U - Analyte not detected at or above the reporting limit  
J - Estimated value below the LQL

**Definitions:** NA - Not Applicable  
LQL - Lower Quantitation Limit  
MDL - Method Detection Limit  
Surr - Surrogate Standard

Print Date: 7/23/2008

EE 7/31/08

**Evergreen Analytical, Inc.**  
 4036 Youngfield Street, Wheat Ridge, Colorado 80033-3862  
 (303) 425-6021

**Client Sample ID:** PS BH-11S 17.5-19  
**Client Project ID:** 22239335.00001  
**Date Collected:** 7/17/2008  
**Date Received:** 7/18/2008  
**Date Prepared:** 7/22/2008  
**Date Analyzed:** 7/23/2008  
**Percent Moisture** 25.74

**Lab Work Order** 08-5151  
**Lab Sample ID:** 08-5151-01A  
**Sample Matrix:** Soil  
**Lab File ID:** VO30722X\1501015.D  
**Method Blank:** MB3072208-S  
**Prep Factor:** 1.000  
**Dilution Factor:** 5.00

**Method:** SW8260B  
**Prep Method:** SW5035

**VOLATILE ORGANICS**

Analytes	CAS Number	Result	Units: µg/Kg-dry LQL
2-Hexanone	591-78-6	U	130
Methylene chloride	75-09-2	U	34
4-Methyl-2-pentanone	108-10-1	U	130
Styrene	100-42-5	U	34
1,1,2,2-Tetrachloroethane	79-34-5	U	67
Tetrachloroethene	127-18-4	U	34
Toluene	108-88-3	U	13
1,1,1-Trichloroethane	71-55-6	U	34
1,1,2-Trichloroethane	79-00-5	U	34
Trichloroethene	79-01-6	U	34
Vinyl acetate	108-05-4	U	130
Vinyl chloride	75-01-4	U	34
Xylene, Total	1330-20-7	U	34
Surr: 1,2-Dichloroethane-d4	17060-07-0	106	QC Limits: 70-130 %REC
Surr: 4-Bromofluorobenzene	460-00-4	89	QC Limits: 70-130 %REC
Surr: Toluene-d8	2037-26-5	96	QC Limits: 70-130 %REC

EV 7/31/08

  
 Analyst

  
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**Qualifiers:** See the case narrative for a discussion

B - Analyte detected in the Method Blank, value not subtracted from result  
 E - Extrapolated value. Value exceeds calibration range  
 H - Prep or Analytical holding time exceeded  
 S - Spike Recovery outside acceptance limits  
 X - See case narrative  
 \* - Value exceeded the Maximum Contamination Level (MCL), TCLP limit, or if compound is undetected, LQL exceeds MCL.

**Qualifiers:** U - Analyte not detected at or above the reporting limit  
 J - Estimated value below the LQL

**Definitions:** NA - Not Applicable  
 LQL - Lower Quantitation Limit  
 MDL - Method Detection Limit  
 Surr - Surrogate Standard

Print Date: 7/23/2008

# Evergreen Analytical, Inc.

4036 Youngfield Street, Wheat Ridge, Colorado 80033-3862  
(303) 425-6021

Client Sample ID: PS BH-11D @ 49'  
Client Project ID: 22239335.00001  
Date Collected: 7/17/2008  
Date Received: 7/18/2008  
Date Prepared: 7/23/2008  
Date Analyzed: 7/23/2008  
Percent Moisture 9.82

Lab Work Order 08-5151  
Lab Sample ID: 08-5151-02A  
Sample Matrix: Soil  
Lab File ID: VOA30723\1801018.D  
Method Blank: MB3072308-S  
Prep Factor: 1.000  
Dilution Factor: 5.00

Method: SW8260B  
Prep Method: SW5035

## VOLATILE ORGANICS

Analytes		CAS Number	Result	Units: µg/Kg-dry LQL	
Acetone	UJ MTB, I SUR-L	67-64-1	260	260 110	J SUR-L
Benzene		71-43-2	6.9	5.5	J SUR-L
Bromodichloromethane		75-27-4	U	28	UJ SUR-L
Bromoform		75-25-2	U	28	
Bromomethane		74-83-9	U	28	
2-Butanone		78-93-3	U	110	
Carbon disulfide		75-15-0	U	28	
Carbon tetrachloride		56-23-5	U	28	
Chlorobenzene		108-90-7	U	28	
Chloroethane		75-00-3	U	28	
2-Chloroethylvinylether		110-75-8	U	110	
Chloroform		67-66-3	U	28	
Chloromethane		74-87-3	U	28	
Dibromochloromethane		124-48-1	U	28	
1,2-Dichlorobenzene		95-50-1	U	28	
1,3-Dichlorobenzene		541-73-1	U	28	
1,4-Dichlorobenzene		106-46-7	U	28	
1,1-Dichloroethane		75-34-3	U	28	
1,2-Dichloroethane		107-06-2	U	28	
1,1-Dichloroethene		75-35-4	U	28	
cis-1,2-Dichloroethene		156-59-2	U	28	
trans-1,2-Dichloroethene		156-60-5	U	28	
1,2-Dichloropropane		78-87-5	U	28	
cis-1,3-Dichloropropene		10061-01-5	U	28	
trans-1,3-Dichloropropene		10061-02-6	U	28	
Ethylbenzene		100-41-4	U	28	

Analyst

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### Qualifiers: See the case narrative for a discussion

B - Analyte detected in the Method Blank, value not subtracted from result  
E - Extrapolated value. Value exceeds calibration range  
H - Prep or Analytical holding time exceeded  
S - Spike Recovery outside acceptance limits  
X - See case narrative  
\* - Value exceeded the Maximum Contamination Level (MCL), TCLP limit, or if compound is undetected, LQL exceeds MCL.

Qualifiers: U - Analyte not detected at or above the reporting limit  
J - Estimated value below the LQL

Definitions: NA - Not Applicable  
LQL - Lower Quantitation Limit  
MDL - Method Detection Limit  
Surr - Surrogate Standard

Print Date: 7/24/2008

EE 7/31/08

# Evergreen Analytical, Inc.

4036 Youngfield Street, Wheat Ridge, Colorado 80033-3862  
(303) 425-6021

Client Sample ID: PS BH-11D @ 49'  
Client Project ID: 22239335.00001  
Date Collected: 7/17/2008  
Date Received: 7/18/2008  
Date Prepared: 7/23/2008  
Date Analyzed: 7/23/2008  
Percent Moisture 9.82

Lab Work Order 08-5151  
Lab Sample ID: 08-5151-02A  
Sample Matrix: Soil  
Lab File ID: VOA30723\1801018.D  
Method Blank: MB3072308-S  
Prep Factor: 1.000  
Dilution Factor: 5.00

Method: SW8260B  
Prep Method: SW5035

## VOLATILE ORGANICS

Analytes	CAS Number	Result	Units: µg/Kg-dry LQL
2-Hexanone	591-78-6	U	110 UJ SUR-L
Methylene chloride	75-09-2	U	28
4-Methyl-2-pentanone	108-10-1	U	110
Styrene	100-42-5	U	28
1,1,2,2-Tetrachloroethane	79-34-5	U	55
Tetrachloroethene	127-18-4	U	28
Toluene	108-88-3	46	11 J SUR-L
1,1,1-Trichloroethane	71-55-6	U	28 UJ SUR-L
1,1,2-Trichloroethane	79-00-5	U	28
Trichloroethene	79-01-6	U	28
Vinyl acetate	108-05-4	U	110
Vinyl chloride	75-01-4	U	28
Xylene, Total	1330-20-7	30	28 J SUR-L
Surr: 1,2-Dichloroethane-d4	17060-07-0	110	QC Limits: 70-130 %REC
Surr: 4-Bromofluorobenzene	460-00-4	64 S	QC Limits: 70-130 %REC
Surr: Toluene-d8	2037-26-5	95	QC Limits: 70-130 %REC

EE 7/31/08

Analyst

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**Qualifiers:** See the case narrative for a discussion

B - Analyte detected in the Method Blank, value not subtracted from result  
E - Extrapolated value. Value exceeds calibration range  
H - Prep or Analytical holding time exceeded  
S - Spike Recovery outside acceptance limits  
X - See case narrative  
\* - Value exceeded the Maximum Contamination Level (MCL), TCLP limit, or if compound is undetected, LQL exceeds MCL.

**Qualifiers:** U - Analyte not detected at or above the reporting limit  
J - Estimated value below the LQL

**Definitions:** NA - Not Applicable  
LQL - Lower Quantitation Limit  
MDL - Method Detection Limit  
Surr - Surrogate Standard

Print Date: 7/24/2008

# Evergreen Analytical, Inc.

4036 Youngfield Street, Wheat Ridge, Colorado 80033-3862  
(303) 425-6021

Client Sample ID: Trip Blank  
Client Project ID: 22239335.00001  
Date Collected: 7/18/08  
Date Received: 7/18/08  
Date Prepared: 7/23/08  
Date Analyzed: 7/23/08  
Percent Moisture NA

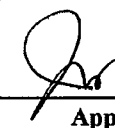
Lab Work Order 08-5151  
Lab Sample ID: 08-5151-03A  
Sample Matrix: Trip Blank  
Lab File ID: VOA20723\0801008.D  
Method Blank: MB2072308-W  
Prep Factor: 1.000  
Dilution Factor: 1.00

Method: SW8260B  
Prep Method: SW5030B

## VOLATILE ORGANICS

Analytes	CAS Number	Result	Units: µg/L LQL
Acetone	67-64-1	4.7 J	10 J SQL-I
Benzene	71-43-2	U	1.0
Bromodichloromethane	75-27-4	U	2.0
Bromoform	75-25-2	U	4.0
Bromomethane	74-83-9	U	4.0
2-Butanone	78-93-3	U	5.0
Carbon disulfide	75-15-0	U	2.0
Carbon tetrachloride	56-23-5	U	2.0
Chlorobenzene	108-90-7	U	2.0
Chloroethane	75-00-3	U	4.0
2-Chloroethylvinylether	110-75-8	U	4.0
Chloroform	67-66-3	U	2.0
Chloromethane	74-87-3	U	4.0
Dibromochloromethane	124-48-1	U	2.0
1,2-Dichlorobenzene	95-50-1	U	2.0
1,3-Dichlorobenzene	541-73-1	U	2.0
1,4-Dichlorobenzene	106-46-7	U	2.0
1,1-Dichloroethane	75-34-3	U	2.0
1,2-Dichloroethane	107-06-2	U	2.0
1,1-Dichloroethene	75-35-4	U	2.0
cis-1,2-Dichloroethene	156-59-2	U	2.0
trans-1,2-Dichloroethene	156-60-5	U	2.0
1,2-Dichloropropane	78-87-5	U	2.0
cis-1,3-Dichloropropene	10061-01-5	U	2.0
trans-1,3-Dichloropropene	10061-02-6	U	2.0
Ethylbenzene	100-41-4	U	2.0

  
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**Qualifiers:** See the case narrative for a discussion.

B - Analyte detected in the Method Blank, value not subtracted from result  
E - Extrapolated value. Value exceeds calibration range  
H - Prep or Analytical holding time exceeded  
S - Spike Recovery outside acceptance limits  
X - See case narrative  
\* - Value exceeded the Maximum Contamination Level (MCL), TCLP limit, or if compound is undetected, LQL exceeds MCL.

**Qualifiers:** U - Analyte not detected at or above the reporting limit  
J - Estimated value below the LQL

**Definitions:** NA - Not Applicable  
LQL - Lower Quantitation Limit  
MDL - Method Detection Limit  
Surr - Surrogate Standard

Print Date: 7/23/08

EQ 7/31/08

# Evergreen Analytical, Inc.

4036 Youngfield Street, Wheat Ridge, Colorado 80033-3862  
(303) 425-6021

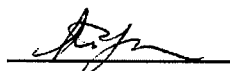
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<b>Client Project ID:</b> 22239335.00001	<b>Lab Sample ID:</b> 08-5151-03A
<b>Date Collected:</b> 7/18/08	<b>Sample Matrix:</b> Trip Blank
<b>Date Received:</b> 7/18/08	<b>Lab File ID:</b> VOA20723\0801008.D
<b>Date Prepared:</b> 7/23/08	<b>Method Blank:</b> MB2072308-W
<b>Date Analyzed:</b> 7/23/08	<b>Prep Factor:</b> 1.000
<b>Percent Moisture</b> NA	<b>Dilution Factor:</b> 1.00

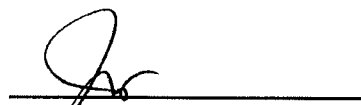
**Method:** SW8260B

## VOLATILE ORGANICS

**Prep Method:** SW5030B

Analytes	CAS Number	Result	Units: µg/L LQL
2-Hexanone	591-78-6	U	2.0
Methylene chloride	75-09-2	U	5.0
4-Methyl-2-pentanone	108-10-1	U	2.0
Styrene	100-42-5	U	4.0
1,1,2,2-Tetrachloroethane	79-34-5	U	2.0
Tetrachloroethene	127-18-4	U	2.0
Toluene	108-88-3	U	2.0
1,1,1-Trichloroethane	71-55-6	U	2.0
1,1,2-Trichloroethane	79-00-5	U	2.0
Trichloroethene	79-01-6	U	2.0
Vinyl acetate	108-05-4	U	4.0
Vinyl chloride	75-01-4	U	2.0
Xylene, Total	1330-20-7	U	4.0
Surr: 1,2-Dichloroethane-d4	17060-07-0	122	QC Limits: 70-130 %REC
Surr: 4-Bromofluorobenzene	460-00-4	115	QC Limits: 70-130 %REC
Surr: Toluene-d8	2037-26-5	106	QC Limits: 70-130 %REC

  
\_\_\_\_\_  
Analyst

  
\_\_\_\_\_  
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**Qualifiers:** See the case narrative for a discussion

B - Analyte detected in the Method Blank, value not subtracted from result  
E - Extrapolated value. Value exceeds calibration range  
H - Prep or Analytical holding time exceeded  
S - Spike Recovery outside acceptance limits  
X - See case narrative  
\* - Value exceeded the Maximum Contamination Level (MCL), TCLP limit, or if compound is undetected, LQL exceeds MCL.

**Qualifiers:** U - Analyte not detected at or above the reporting limit

J - Estimated value below the LQL

**Definitions:** NA - Not Applicable  
LQL - Lower Quantitation Limit  
MDL - Method Detection Limit  
Surr - Surrogate Standard

Print Date: 7/23/08

EE 7/31/08

# Evergreen Analytical, Inc.

4036 Youngfield Street, Wheat Ridge, Colorado 80033-3862  
(303) 425-6021

Client Sample ID: PS BH-11S 17.5-19  
Client Project ID: 22239335.00001  
Date Collected: 7/17/08  
Date Received: 7/18/08

Lab Work Order 08-5151  
Lab Sample ID: 08-5151-01B  
Sample Matrix: Soil

## TOTAL VOLATILE HYDROCARBONS

Method: SW8015B MOD

Prep Method: SW5035

Date Prepared: 7/19/08

Lab File ID: TVB40719\007F

Dilution Factor: 5

Date Analyzed: 7/19/08

Method Blank: MB4071908

Analytes	CAS Number	Result	LQL	Units
TVH-Gasoline	86290-81-5	U	1.0	mg/Kg
Surr: 1,2,4-Trichlorobenzene (S)	120-82-1	105	QC Limits: 60-140	%REC

EE 7/31/08



Analyst



Approved

Notes: Total Xylenes consist of three isomers, two of which co-elute. The Xylene RL is for a single peak. Confirmation analysis was not performed.

**Qualifiers:** B - Analyte detected in the associated Method Blank, value not subtracted from result  
E - Extrapolated value, Value exceeds calibration range  
H - Sample analysis exceeded analytical holding time  
J - Indicates an estimated value when the compound is detected, but is below the LQL  
S - Spike Recovery outside accepted limits  
U - Compound analyzed for but not detected  
X - See case narrative  
\* - Value exceeded the Maximum Contamination Level (MCL), TCLP limit, or if compound is undetected, LQL exceeds MCL.

**Definitions:** LQL - Lower Quantitation Limit  
Surr - Surrogate

Print Date: 7/21/08

**Evergreen Analytical, Inc.**  
 4036 Youngfield Street, Wheat Ridge, Colorado 80033-3862  
 (303) 425-6021

**Client Sample ID:** PS BH-11D @ 49'  
**Client Project ID:** 22239335.00001  
**Date Collected:** 7/17/08  
**Date Received:** 7/18/08

**Lab Work Order** 08-5151  
**Lab Sample ID:** 08-5151-02B  
**Sample Matrix:** Soil

**TOTAL VOLATILE HYDROCARBONS**

**Method:** SW8015B MOD

**Prep Method:** SW5035

**Date Prepared:** 7/19/08

**Lab File ID:** TVB40719\010F

**Dilution Factor:** 5

**Date Analyzed:** 7/19/08

**Method Blank:** MB4071908

Analytes	CAS Number	Result	LQL	Units
TVH-Gasoline	86290-81-5	1.5	1.0	mg/Kg
Surr: 1,2,4-Trichlorobenzene (S)	120-82-1	32 S	QC Limits: 60-140	%REC

J SUR-L

ER 7/31/08



Analyst



Approved

**Notes:** Total Xylenes consist of three isomers, two of which co-elute. The Xylene RL is for a single peak. Confirmation analysis was not performed.

**Qualifiers:** B - Analyte detected in the associated Method Blank, value not subtracted from result  
 E - Extrapolated value. Value exceeds calibration range  
 H - Sample analysis exceeded analytical holding time  
 J - Indicates an estimated value when the compound is detected, but is below the LQL  
 S - Spike Recovery outside accepted limits  
 U - Compound analyzed for but not detected  
 X - See case narrative  
 \* - Value exceeded the Maximum Contamination Level (MCL), TCLP limit, or if compound is undetected, LQL exceeds MCL.

**Definitions:** LQL - Lower Quantitation Limit  
 Surr - Surrogate

Print Date: 7/21/08



**Evergreen Analytical, Inc.**  
 4036 Youngfield Street, Wheat Ridge, Colorado 80033-3862  
 (303) 425-6021

Lab Order: 08-5151  
 Client Project ID: 22239335.00001  
 Matrix: Soil

Date Received: 7/18/08  
 Date Prepared: 7/21/08  
 Prep Batch ID: 16107  
 Units: mg/Kg

**Total Extractable Hydrocarbons**  
**Diesel Fuel (No. 2)**

Method: SW8015B Mod

Prep Method: SW3550B

Lab ID	Client Sample ID	File ID	Date Collected	Date Analyzed	DF	Surr REC	Sample Results	LQL
08-5151-01C	PS BH-11S 17.5-19	FID50721\009F0901	7/17/08	7/21/08	1	61%	U	14
08-5151-02C	PS BH-11D @ 49'	FID50721\010F1001	7/17/08	7/21/08	5	64%	620	70
Surrogate QC Limits 39-130 %REC			Surr: TBB					

ER 7/31/08

  
 Analyst

  
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**Qualifiers:** B - Analyte detected in the associated Method Blank, value not subtracted from result  
 E - Extrapolated value. Value exceeds calibration range  
 H - Sample analysis exceeded analytical holding time  
 J - Indicates an estimated value when the compound is detected, but is below the LQL  
 S - Spike Recovery outside accepted limits  
 U - Compound analyzed for but not detected  
 X - See case narrative  
 \* - Value exceeded the Maximum Contamination Level (MCL), TCLP limit, or if compound is undetected, LQL exceeds MCL.

**Definitions:** DF - Dilution Factor  
 LQL - Lower Quantitation Limit  
 Surr - Surrogate

Print Date: 7/22/08

**Evergreen Analytical, Inc.**  
4036 Youngfield Street, Wheat Ridge, Colorado 80033-3862  
(303) 425-6021

014

**Client Sample ID:** PS BH-11D @ 49'  
**Client Project ID:** 22239335.00001  
**Date Collected:** 7/17/08  
**Date Received:** 7/18/08  
**Date Prepared:** 7/23/08  
**Date Analyzed:** 7/26/08  
**Percent Moisture:** NA

**Lab Work Order:** 08-5151  
**Lab Sample ID:** 08-5151-02C  
**Sample Matrix:** Soil  
**Lab File ID:** \GCMS10725\3401034.D  
**Method Blank:** MB-16148  
**Prep Factor:** 66.445  
**Dilution Factor:** 5.00

**Method:** SW8270C  
**Prep Method:** SW3540C

**SEMIVOLATILE ORGANICS**

Units: µg/Kg

Analytes	CAS Number	Result	MDL	LQL
Acenaphthene	83-32-9	U	250	350
Acenaphthylene	208-96-8	U	250	350
Anthracene	120-12-7	U	250	350
Benzo(a)anthracene	56-55-3	U	250	350
Benzo(b&k)fluoranthene	205-99-2 & 207-08-9	U	250	350
Benzoic acid	65-85-0	U	1800	3300
Benzo(g,h,i)perylene	191-24-2	U	250	350
Benzo(a)pyrene	50-32-8	U	250	350
Benzyl alcohol	100-51-6	U	350	700
4-Bromophenyl phenyl ether	101-55-3	U	250	350
Butyl benzyl phthalate	85-68-7	U	1000	1700
4-Chloroaniline	106-47-8	U	250	350
Bis(2-chloroethoxy)methane	111-91-1	U	250	700
Bis(2-chloroethyl)ether	111-44-4	U	250	350
4-Chloro-3-methylphenol	59-50-7	U	250	350
2-Chloronaphthalene	91-58-7	U	250	350
2-Chlorophenol	95-57-8	U	250	350
4-Chlorophenyl phenyl ether	7005-72-3	U	250	350
Chrysene	218-01-9	U	250	350
Dibenz(a,h)anthracene	53-70-3	U	300	400
Dibenzofuran	132-64-9	U	250	350
Di-n-butyl phthalate	84-74-2	U	250	350
1,2-Dichlorobenzene	95-50-1	U	250	350
1,3-Dichlorobenzene	541-73-1	U	250	350
1,4-Dichlorobenzene	106-46-7	U	250	350
3,3'-Dichlorobenzidine	91-94-1	U	400	700
Dichlorodiisopropyl ether	108-60-1	U	250	350
2,4-Dichlorophenol	120-83-2	U	250	350
Diethyl phthalate	84-66-2	U	250	350
2,4-Dimethylphenol	105-67-9	U	250	350
Dimethyl phthalate	131-11-3	U	350	700
4,6-Dinitro-2-methylphenol	534-52-1	U	1200	1700
2,4-Dinitrophenol	51-28-5	U	1200	1700
2,4-Dinitrotoluene	121-14-2	U	250	350
2,6-Dinitrotoluene	606-20-2	U	250	350
Di-n-octyl phthalate	117-84-0	U	250	350
Bis(2-ethylhexyl)phthalate	117-81-7	U	1000	1700
Fluoranthene	206-44-0	U	350	700
Fluorene	86-73-7	U	250	350
Hexachlorobenzene	118-74-1	U	1000	1700

  
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**Qualifiers:** See case narrative for a discussion

B - Analyte detected in the Method Blank, value not subtracted from result  
E - Extrapolated value. Value exceeds calibration range  
H - Prep or Analytical holding time exceeded  
S - Spike Recovery outside acceptance limits  
X - See case narrative  
\* - Value exceeded the Maximum Contamination Level (MCL), TCLP limit, or if compound is undetected, LQL exceeds MCL.

**Qualifiers:** U - Analyte not detected at or above the reporting limit  
J - Estimated value below the LQL

**Definitions:** NA - Not Applicable  
LQL - Lower Quantitation Limit  
MDL - Method Detection Limit  
Surr - Surrogate Standard

Print Date: 7/28/08

EQ 7/31/08

**Evergreen Analytical, Inc.**  
4036 Youngfield Street, Wheat Ridge, Colorado 80033-3862  
(303) 425-6021

015

**Client Sample ID:** PS BH-11D @ 49'  
**Client Project ID:** 22239335.00001  
**Date Collected:** 7/17/08  
**Date Received:** 7/18/08  
**Date Prepared:** 7/23/08  
**Date Analyzed:** 7/26/08  
**Percent Moisture:** NA

**Lab Work Order:** 08-5151  
**Lab Sample ID:** 08-5151-02C  
**Sample Matrix:** Soil  
**Lab File ID:** \GCMS10725\3401034.D  
**Method Blank:** MB-16148  
**Prep Factor:** 66.445  
**Dilution Factor:** 5.00

**Method:** SW8270C  
**Prep Method:** SW3540C

**SEMIVOLATILE ORGANICS**

Units: µg/Kg

Analytes	CAS Number	Result	MDL	LQL
Hexachlorobutadiene	87-68-3	U	250	350
Hexachlorocyclopentadiene	77-47-4	U	1000	1700
Hexachloroethane	67-72-1	U	250	350
Indeno(1,2,3-cd)pyrene	193-39-5	U	250	350
Isophorone	78-59-1	U	250	350
2-Methylnaphthalene	91-57-6	U	250	350
2-Methylphenol	95-48-7	U	250	350
4-Methylphenol	106-44-5	U	250	350
Naphthalene	91-20-3	U	250	700
2-Nitroaniline	88-74-4	U	250	350
3-Nitroaniline	99-09-2	U	400	700
4-Nitroaniline	100-01-6	U	800	1700
Nitrobenzene	98-95-3	U	500	1700
2-Nitrophenol	88-75-5	U	250	350
4-Nitrophenol	100-02-7	U	400	700
N-Nitrosodi-n-propylamine	621-64-7	U	500	1700
N-Nitrosodiphenylamine	86-30-6	U	500	1700
Pentachlorophenol	87-86-5	U	1000	1700
Phenanthrene	85-01-8	U	350	700
Phenol	108-95-2	U	500	700
Pyrene	129-00-0	U	250	350
1,2,4-Trichlorobenzene	120-82-1	U	250	350
2,4,5-Trichlorophenol	95-95-4	U	250	350
2,4,6-Trichlorophenol	88-06-2	U	250	350
Surr: 2,4,6-Tribromophenol	118-79-6	71	<b>QC Limits:</b>	50-130 %REC
Surr: 2-Fluorobiphenyl	321-60-8	97	<b>QC Limits:</b>	37-130 %REC
Surr: 2-Fluorophenol	367-12-4	90	<b>QC Limits:</b>	26-130 %REC
Surr: Nitrobenzene-d5	4165-60-0	97	<b>QC Limits:</b>	33-130 %REC
Surr: Phenol-d6	13127-88-3	97	<b>QC Limits:</b>	30-130 %REC
Surr: Terphenyl-d14	1718-51-0	111	<b>QC Limits:</b>	48-130 %REC

  
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**Qualifiers:** See case narrative for a discussion

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H - Prep or Analytical holding time exceeded  
S - Spike Recovery outside acceptance limits  
X - See case narrative  
\* - Value exceeded the Maximum Contamination Level (MCL), TCLP limit, or if compound is undetected, LQL exceeds MCL.

**Qualifiers:** U - Analyte not detected at or above the reporting limit  
J - Estimated value below the LQL

**Definitions:** NA - Not Applicable  
LQL - Lower Quantitation Limit  
MDL - Method Detection Limit  
Surr - Surrogate Standard

Print Date: 7/28/08

## PRATHER SPRINGS DATA REVIEW SUMMARY

Data Package Number: Evergreen Analytical Laboratory 08-5175

Sampling Event: July 22, 2008

Sample-specific Parameter Review? **Yes**

Laboratory Performance Parameters? **No**

Data Reviewer: Liz Kraak

Date Completed: 07/31/08

Peer Reviewer: Sheri O'Connor

Date Completed: 08/01/08

The table below summarizes the results presented in this data package.

Field ID	Sample Type	Lab ID	Matrix	Analyses	
				VOCs (8260B)	Methane (RSK 175-M)
PS-MW11S	SA	08-5175-01	Water	X <sup>m</sup>	X <sup>m</sup>
PS-MW11S Duplicate	FD	08-5175-02	Water	X	X
Trip Blank	TB	08-5175-03	Water	X	X
PS-MW11d	SA	08-5175-04	Water	X	X

Analyses:

VOCs – Volatile Organic Compounds

SVOCs – Semivolatile Organic Compounds

QC Type: SA - Sample

TB - Trip Blank

m - Matrix Spike/Matrix Spike Duplicate

--- Sample not analyzed for this parameter.

The data review was conducted in accordance with the Phase I Site Investigation Work Plan – Prather Spring Investigation dated July 31, 2008.

### General Overall Assessment:

       Data are usable without qualification.

  X   With the exception of three results, data are usable with qualification (noted below).

**Case Narrative Summary:** Except as noted below, any of the issues noted in the laboratory case narrative potentially affecting data quality are addressed in the appropriate sections in the table below.

Review Parameter	Criteria Met?	Comments
<b>Sample-specific Parameters</b>	Complete with "Yes", "No", or "Not Applicable (N/A)".	For each "No" response, list what was out, associated acceptance limits, all qualified data, and bias direction or reference associated table with pertinent details.
COC & Sample Receipt	Yes	Samples were received intact and the cooler temperature was 1.9°C upon arrival at the laboratory, within the ≤6°C temperature criterion.
Holding Times	Yes	All samples were analyzed within the holding time requirements specified in the Work Plan. Further action was not necessary.
Method Blanks	Yes	Target analytes were not reported as detected within the associated method blanks. Therefore, data qualification based on method blank contamination was not necessary.
Matrix QC <ul style="list-style-type: none"> <li>MS/MSD PS-MW11S (VOCs, Methane)</li> <li>LD N/A</li> </ul>	No	With the exceptions summarized below in Table 1, the recoveries and RPDs for the matrix spike (MS) and matrix spike duplicate (MSD) analyses were within the laboratory-determined acceptance range.

Review Parameter	Criteria Met?	Comments
Field QC <ul style="list-style-type: none"> <li>Field Blanks (Ambient, Rinsate, or Trip) Trip Blank</li> <li>Field Duplicate PS-MW11S Duplicate</li> </ul>	Yes	<p>Target analytes were reported as non-detect in the trip blank. Therefore, data qualification was not necessary.</p> <p>The following criteria from the Prather Springs SOP were used to evaluate field duplicate pairs:</p> <ul style="list-style-type: none"> <li>If both results were <math>\leq 5 \times \text{RL}</math>, then the absolute difference between the results should agree within <math>\pm 2 \times \text{RL}</math> (Waters) and <math>\pm 3.5 \times \text{RL}</math> (Soils)</li> <li>If both results were <math>\geq 5 \times \text{RL}</math>, then the RPD should be <math>\leq 30\%</math> (Waters) and <math>\leq 50\%</math> (Soils)</li> </ul> <p>The field duplicate pair PS-MW11S/ PS-MW11S Duplicate met the above criteria. Therefore, data qualification was not necessary.</p>
Surrogates	Yes	All surrogate recoveries were within the laboratory acceptance limits. Therefore, data qualification was not considered necessary.
Laboratory Control Sample/ Laboratory Control Sample Duplicate (LCS/LCSD)	Yes	LCS and LCSD recoveries were within the laboratory determined acceptance limits. Therefore, data qualification was not necessary.
Non-detect Results w/ Elevated RLs?	Yes	
Package Completeness	Yes	
Other Parameters	Yes	<p>Detected analytes with concentrations between the Instrument Detection Limit (IDL) and the Reporting Limit (RL) were qualified as estimated (J). A qualifier code of "SQL-I" (Sample Quantitation Limit) was assigned to reflect the greater uncertainty in quantitative values below the RL.</p> <p><b>Split Samples</b></p> <p>Split sample evaluation criteria were not included in the Work Plan. As such, the following concentration-dependent criteria were used:</p> <ul style="list-style-type: none"> <li>If both results were <math>\leq 5 \times \text{RL}</math>, then the absolute difference between the results should agree within <math>\pm 2 \times \text{RL}</math> (Waters) and <math>\pm 3.5 \times \text{RL}</math> (Soils)</li> <li>If both results were <math>\geq 5 \times \text{RL}</math>, then the RPD should be <math>\leq 30\%</math> (Waters) and <math>\leq 50\%</math> (Soils)</li> </ul> <p>The following split samples were collected:</p> <ul style="list-style-type: none"> <li>PS-MW11S (VOCs, Methane)</li> <li>PS-MW11d (VOCs, Methane)</li> </ul> <p>A comparison of detected split sample results and detected parent sample results is summarized below in Table 2.</p>

**Table 1: MS/MSD Recovery and RPD Outliers and Resultant Data Qualification**

Sample	Analyte	MS/MSD %R (Limits)	RPD (Limit)	Qualification
PS-MW11S	2-Chloroethylvinylether	0/ 0 (20-168)	NC (30)	As the percent recoveries were <10%, the 2-chloroethylvinylether results for the parent sample (MW-11S) and its field duplicate were qualified as unusable (R). Data qualification was extended to site MW-11d, because the MS/MSD recoveries for 2-chloroethylvinylether in data package 08-5116 were also 0%.

MS/MSD – Matrix Spike/ Matrix Spike Duplicate

%R – Percent Recovery

RPD – Relative Percent Difference

R – Rejected

NC – Not Calculated

**Table 2: Split Sample Comparison**

Sample	Detected Analytes	Primary Sample Result (µg/L)	Split Sample Result (µg/L)	RL <sup>1</sup> (µg/L)	Qualification
PS-MW11S	Acetone	4.7	ND	10	None. The absolute difference between the split sample results and parent sample results agrees within 2xRL.
PS-MW11d	Acetone	39	57.9	10	
	Benzene	0.97	1.21	1	
	2-Butanone	12	18.8	5	
	Toluene	1.1	1.34	2	As the absolute difference between the split sample methane result and parent sample methane result exceeded 2xRL, the methane result was qualified as estimated (J D-I).
	Methane	0.050 mg/L	ND	0.00080 mg/L	

<sup>1</sup> RL is for primary sample.

ND – Non-detect

J = Estimated

D = Duplicate analysis criteria not met.

I = Indeterminate Bias

**Evergreen Analytical, Inc.**  
4036 Youngfield Street, Wheat Ridge, Colorado 80033-3862  
(303) 425-6021

**Client Sample ID:** PS-MW11S  
**Client Project ID:** Prather Spring  
**Date Collected:** 7/18/08  
**Date Received:** 7/22/08  
**Date Prepared:** 7/22/08  
**Date Analyzed:** 7/22/08  
**Percent Moisture** NA

**Lab Work Order** 08-5175  
**Lab Sample ID:** 08-5175-01A  
**Sample Matrix:** Water  
**Lab File ID:** VOA20722\1901019.D  
**Method Blank:** MB2072208-W  
**Prep Factor:** 1.000  
**Dilution Factor:** 1.00

**Method:** SW8260B  
**Prep Method:** SW5030B

**VOLATILE ORGANICS**

Analytes	CAS Number	Result	Units: µg/L LQL
Acetone	67-64-1	4.7 J	10 J SQL-I
Benzene	71-43-2	U	1.0
Bromodichloromethane	75-27-4	U	2.0
Bromoform	75-25-2	U	4.0
Bromomethane	74-83-9	U	4.0
2-Butanone	78-93-3	U	5.0
Carbon disulfide	75-15-0	U	2.0
Carbon tetrachloride	56-23-5	U	2.0
Chlorobenzene	108-90-7	U	2.0
Chloroethane	75-00-3	U	4.0
2-Chloroethylvinylether R	110-75-8	U	4.0
Chloroform	67-66-3	U	2.0
Chloromethane	74-87-3	U	4.0
Dibromochloromethane	124-48-1	U	2.0
1,2-Dichlorobenzene	95-50-1	U	2.0
1,3-Dichlorobenzene	541-73-1	U	2.0
1,4-Dichlorobenzene	106-46-7	U	2.0
1,1-Dichloroethane	75-34-3	U	2.0
1,2-Dichloroethane	107-06-2	U	2.0
1,1-Dichloroethene	75-35-4	U	2.0
cis-1,2-Dichloroethene	156-59-2	U	2.0
trans-1,2-Dichloroethene	156-60-5	U	2.0
1,2-Dichloropropane	78-87-5	U	2.0
cis-1,3-Dichloropropene	10061-01-5	U	2.0
trans-1,3-Dichloropropene	10061-02-6	U	2.0
Ethylbenzene	100-41-4	U	2.0

  
\_\_\_\_\_  
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**Qualifiers:** See the case narrative for a discussion

B - Analyte detected in the Method Blank, value not subtracted from result  
E - Extrapolated value. Value exceeds calibration range  
H - Prep or Analytical holding time exceeded  
S - Spike Recovery outside acceptance limits  
X - See case narrative  
\* - Value exceeded the Maximum Contamination Level (MCL), TCLP limit, or if compound is undetected, LQL exceeds MCL.

**Qualifiers:** U - Analyte not detected at or above the reporting limit

J - Estimated value below the LQL

**Definitions:** NA - Not Applicable  
LQL - Lower Quantitation Limit  
MDL - Method Detection Limit  
Surr - Surrogate Standard

Print Date: 7/23/08

99

**Evergreen Analytical, Inc.**  
4036 Youngfield Street, Wheat Ridge, Colorado 80033-3862  
(303) 425-6021

**Client Sample ID:** PS-MW11S  
**Client Project ID:** Prather Spring  
**Date Collected:** 7/18/08  
**Date Received:** 7/22/08  
**Date Prepared:** 7/22/08  
**Date Analyzed:** 7/22/08  
**Percent Moisture** NA

**Lab Work Order** 08-5175  
**Lab Sample ID:** 08-5175-01A  
**Sample Matrix:** Water  
**Lab File ID:** VOA20722\1901019.D  
**Method Blank:** MB2072208-W  
**Prep Factor:** 1.000  
**Dilution Factor:** 1.00

**Method:** SW8260B  
**Prep Method:** SW5030B

**VOLATILE ORGANICS**

Analytes	CAS Number	Result	Units: µg/L
			LQL
2-Hexanone	591-78-6	U	2.0
Methylene chloride	75-09-2	U	5.0
4-Methyl-2-pentanone	108-10-1	U	2.0
Styrene	100-42-5	U	4.0
1,1,2,2-Tetrachloroethane	79-34-5	U	2.0
Tetrachloroethene	127-18-4	U	2.0
Toluene	108-88-3	U	2.0
1,1,1-Trichloroethane	71-55-6	U	2.0
1,1,2-Trichloroethane	79-00-5	U	2.0
Trichloroethene	79-01-6	U	2.0
Vinyl acetate	108-05-4	U	4.0
Vinyl chloride	75-01-4	U	2.0
Xylene, Total	1330-20-7	U	4.0
Surr: 1,2-Dichloroethane-d4	17060-07-0	109	<b>QC Limits:</b> 70-130 %REC
Surr: 4-Bromofluorobenzene	460-00-4	109	<b>QC Limits:</b> 70-130 %REC
Surr: Toluene-d8	2037-26-5	105	<b>QC Limits:</b> 70-130 %REC

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\_\_\_\_\_  
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**Qualifiers:** See the case narrative for a discussion

B - Analyte detected in the Method Blank, value not subtracted from result  
E - Extrapolated value. Value exceeds calibration range  
H - Prep or Analytical holding time exceeded  
S - Spike Recovery outside acceptance limits  
X - See case narrative  
\* - Value exceeded the Maximum Contamination Level (MCL), TCLP limit, or if compound is undetected, LQL exceeds MCL.

**Qualifiers:** U - Analyte not detected at or above the reporting limit

J - Estimated value below the LQL

**Definitions:** NA - Not Applicable  
LQL - Lower Quantitation Limit  
MDL - Method Detection Limit  
Surr - Surrogate Standard

Print Date: 7/23/08



**Evergreen Analytical, Inc.**  
4036 Youngfield Street, Wheat Ridge, Colorado 80033-3862  
(303) 425-6021

**Client Sample ID:** PS-MW11S Duplicate  
**Client Project ID:** Prather Spring  
**Date Collected:** 7/18/08  
**Date Received:** 7/22/08  
**Date Prepared:** 7/22/08  
**Date Analyzed:** 7/22/08  
**Percent Moisture** NA

**Lab Work Order** 08-5175  
**Lab Sample ID:** 08-5175-02A  
**Sample Matrix:** Water  
**Lab File ID:** VOA20722\2201022.D  
**Method Blank:** MB2072208-W  
**Prep Factor:** 1.000  
**Dilution Factor:** 1.00

**Method: SW8260B**  
**Prep Method: SW5030B**

**VOLATILE ORGANICS**

Analytes	CAS Number	Result	Units: µg/L LQL
Acetone	67-64-1	6.9 J	10 <b>J SQL-I</b>
Benzene	71-43-2	U	1.0
Bromodichloromethane	75-27-4	U	2.0
Bromoform	75-25-2	U	4.0
Bromomethane	74-83-9	U	4.0
2-Butanone	78-93-3	U	5.0
Carbon disulfide	75-15-0	U	2.0
Carbon tetrachloride	56-23-5	U	2.0
Chlorobenzene	108-90-7	U	2.0
Chloroethane	75-00-3	U	4.0
2-Chloroethylvinylether	<del>110-75-8</del>	<del>U</del>	<del>4.0</del>
Chloroform	67-66-3	U	2.0
Chloromethane	74-87-3	U	4.0
Dibromochloromethane	124-48-1	U	2.0
1,2-Dichlorobenzene	95-50-1	U	2.0
1,3-Dichlorobenzene	541-73-1	U	2.0
1,4-Dichlorobenzene	106-46-7	U	2.0
1,1-Dichloroethane	75-34-3	U	2.0
1,2-Dichloroethane	107-06-2	U	2.0
1,1-Dichloroethene	75-35-4	U	2.0
cis-1,2-Dichloroethene	156-59-2	U	2.0
trans-1,2-Dichloroethene	156-60-5	U	2.0
1,2-Dichloropropane	78-87-5	U	2.0
cis-1,3-Dichloropropene	10061-01-5	U	2.0
trans-1,3-Dichloropropene	10061-02-6	U	2.0
Ethylbenzene	100-41-4	U	2.0

  
Analyst

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7/31/08

  
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**Qualifiers: See the case narrative for a discussion**

B - Analyte detected in the Method Blank, value not subtracted from result  
E - Extrapolated value. Value exceeds calibration range  
H - Prep or Analytical holding time exceeded  
S - Spike Recovery outside acceptance limits  
X - See case narrative  
\* - Value exceeded the Maximum Contamination Level (MCL), TCLP limit, or if compound is undetected, LQL exceeds MCL.

**Qualifiers:** U - Analyte not detected at or above the reporting limit  
J - Estimated value below the LQL

**Definitions:** NA - Not Applicable  
LQL - Lower Quantitation Limit  
MDL - Method Detection Limit  
Surr - Surrogate Standard

Print Date: 7/23/08

1007

**Evergreen Analytical, Inc.**  
4036 Youngfield Street, Wheat Ridge, Colorado 80033-3862  
(303) 425-6021

**Client Sample ID:** PS-MW11S Duplicate  
**Client Project ID:** Prather Spring  
**Date Collected:** 7/18/08  
**Date Received:** 7/22/08  
**Date Prepared:** 7/22/08  
**Date Analyzed:** 7/22/08  
**Percent Moisture** NA


**Lab Work Order** 08-5175  
**Lab Sample ID:** 08-5175-02A  
**Sample Matrix:** Water  
**Lab File ID:** VOA20722\2201022.D  
**Method Blank:** MB2072208-W  
**Prep Factor:** 1.000  
**Dilution Factor:** 1.00

**Method: SW8260B**  
**Prep Method: SW5030B**

**VOLATILE ORGANICS**

Analytes	CAS Number	Result	Units: µg/L LQL
2-Hexanone	591-78-6	U	2.0
Methylene chloride	75-09-2	U	5.0
4-Methyl-2-pentanone	108-10-1	U	2.0
Styrene	100-42-5	U	4.0
1,1,2,2-Tetrachloroethane	79-34-5	U	2.0
Tetrachloroethene	127-18-4	U	2.0
Toluene	108-88-3	U	2.0
1,1,1-Trichloroethane	71-55-6	U	2.0
1,1,2-Trichloroethane	79-00-5	U	2.0
Trichloroethene	79-01-6	U	2.0
Vinyl acetate	108-05-4	U	4.0
Vinyl chloride	75-01-4	U	2.0
Xylene, Total	1330-20-7	U	4.0
Surr: 1,2-Dichloroethane-d4	17060-07-0	109	<b>QC Limits:</b> 70-130 %REC
Surr: 4-Bromofluorobenzene	460-00-4	111	<b>QC Limits:</b> 70-130 %REC
Surr: Toluene-d8	2037-26-5	105	<b>QC Limits:</b> 70-130 %REC

EQ 7/31/08

  
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**Qualifiers:** See the case narrative for a discussion

B - Analyte detected in the Method Blank, value not subtracted from result  
E - Extrapolated value. Value exceeds calibration range  
H - Prep or Analytical holding time exceeded  
S - Spike Recovery outside acceptance limits  
X - See case narrative  
\* - Value exceeded the Maximum Contamination Level (MCL), TCLP limit, or if compound is undetected, LQL exceeds MCL.

**Qualifiers:** U - Analyte not detected at or above the reporting limit

J - Estimated value below the LQL

**Definitions:** NA - Not Applicable  
LQL - Lower Quantitation Limit  
MDL - Method Detection Limit  
Surr - Surrogate Standard

Print Date: 7/23/08

**Evergreen Analytical, Inc.**  
4036 Youngfield Street, Wheat Ridge, Colorado 80033-3862  
(303) 425-6021


**Client Sample ID:** Trip Blank  
**Client Project ID:** Prather Spring  
**Date Collected:** 7/21/08  
**Date Received:** 7/22/08  
**Date Prepared:** 7/22/08  
**Date Analyzed:** 7/23/08  
**Percent Moisture** NA

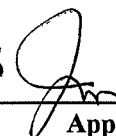
**Lab Work Order** 08-5175  
**Lab Sample ID:** 08-5175-03A  
**Sample Matrix:** Water  
**Lab File ID:** VOA20722\2301023.D  
**Method Blank:** MB2072208-W  
**Prep Factor:** 1.000  
**Dilution Factor:** 1.00

**Method: SW8260B**  
**Prep Method: SW5030B**

**VOLATILE ORGANICS**

Analytes	CAS Number	Result	Units: µg/L LQL
Acetone	67-64-1	U	10
Benzene	71-43-2	U	1.0
Bromodichloromethane	75-27-4	U	2.0
Bromoform	75-25-2	U	4.0
Bromomethane	74-83-9	U	4.0
2-Butanone	78-93-3	U	5.0
Carbon disulfide	75-15-0	U	2.0
Carbon tetrachloride	56-23-5	U	2.0
Chlorobenzene	108-90-7	U	2.0
Chloroethane	75-00-3	U	4.0
2-Chloroethylvinylether	110-75-8	U	4.0
Chloroform	67-66-3	U	2.0
Chloromethane	74-87-3	U	4.0
Dibromochloromethane	124-48-1	U	2.0
1,2-Dichlorobenzene	95-50-1	U	2.0
1,3-Dichlorobenzene	541-73-1	U	2.0
1,4-Dichlorobenzene	106-46-7	U	2.0
1,1-Dichloroethane	75-34-3	U	2.0
1,2-Dichloroethane	107-06-2	U	2.0
1,1-Dichloroethene	75-35-4	U	2.0
cis-1,2-Dichloroethene	156-59-2	U	2.0
trans-1,2-Dichloroethene	156-60-5	U	2.0
1,2-Dichloropropane	78-87-5	U	2.0
cis-1,3-Dichloropropene	10061-01-5	U	2.0
trans-1,3-Dichloropropene	10061-02-6	U	2.0
Ethylbenzene	100-41-4	U	2.0

  
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**Qualifiers:** See the case narrative for a discussion

B - Analyte detected in the Method Blank, value not subtracted from result  
E - Extrapolated value. Value exceeds calibration range  
H - Prep or Analytical holding time exceeded  
S - Spike Recovery outside acceptance limits  
X - See case narrative  
\* - Value exceeded the Maximum Contamination Level (MCL), TCLP limit, or if compound is undetected, LQL exceeds MCL.

**Qualifiers:** U - Analyte not detected at or above the reporting limit  
J - Estimated value below the LQL

**Definitions:** NA - Not Applicable  
LQL - Lower Quantitation Limit  
MDL - Method Detection Limit  
Surr - Surrogate Standard

Print Date: 7/23/08

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**Evergreen Analytical, Inc.**  
4036 Youngfield Street, Wheat Ridge, Colorado 80033-3862  
(303) 425-6021

**Client Sample ID:** Trip Blank  
**Client Project ID:** Prather Spring  
**Date Collected:** 7/21/08  
**Date Received:** 7/22/08  
**Date Prepared:** 7/22/08  
**Date Analyzed:** 7/23/08  
**Percent Moisture** NA

**Lab Work Order** 08-5175  
**Lab Sample ID:** 08-5175-03A  
**Sample Matrix:** Water  
**Lab File ID:** VOA20722\2301023.D  
**Method Blank:** MB2072208-W  
**Prep Factor:** 1.000  
**Dilution Factor:** 1.00

**Method: SW8260B**  
**Prep Method: SW5030B**

**VOLATILE ORGANICS**

Analytes	CAS Number	Result	Units: µg/L LQL
2-Hexanone	591-78-6	U	2.0
Methylene chloride	75-09-2	U	5.0
4-Methyl-2-pentanone	108-10-1	U	2.0
Styrene	100-42-5	U	4.0
1,1,2,2-Tetrachloroethane	79-34-5	U	2.0
Tetrachloroethene	127-18-4	U	2.0
Toluene	108-88-3	U	2.0
1,1,1-Trichloroethane	71-55-6	U	2.0
1,1,2-Trichloroethane	79-00-5	U	2.0
Trichloroethene	79-01-6	U	2.0
Vinyl acetate	108-05-4	U	4.0
Vinyl chloride	75-01-4	U	2.0
Xylene, Total	1330-20-7	U	4.0
Surr: 1,2-Dichloroethane-d4	17060-07-0	112	<b>QC Limits:</b> 70-130 %REC
Surr: 4-Bromofluorobenzene	460-00-4	110	<b>QC Limits:</b> 70-130 %REC
Surr: Toluene-d8	2037-26-5	104	<b>QC Limits:</b> 70-130 %REC

EE 7/31/08

  
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**Qualifiers:** See the case narrative for a discussion

B - Analyte detected in the Method Blank, value not subtracted from result  
E - Extrapolated value. Value exceeds calibration range  
H - Prep or Analytical holding time exceeded  
S - Spike Recovery outside acceptance limits  
X - See case narrative  
\* - Value exceeded the Maximum Contamination Level (MCL), TCLP limit, or if compound is undetected, LQL exceeds MCL.

**Qualifiers:** U - Analyte not detected at or above the reporting limit  
J - Estimated value below the LQL

**Definitions:** NA - Not Applicable  
LQL - Lower Quantitation Limit  
MDL - Method Detection Limit  
Surr - Surrogate Standard

Print Date: 7/23/08

**Evergreen Analytical, Inc.**  
4036 Youngfield Street, Wheat Ridge, Colorado 80033-3862  
(303) 425-6021

**Client Sample ID:** PS- MW-11d  
**Client Project ID:** Prather Spring  
**Date Collected:** 7/21/08  
**Date Received:** 7/22/08  
**Date Prepared:** 7/22/08  
**Date Analyzed:** 7/23/08  
**Percent Moisture** NA

**Lab Work Order** 08-5175  
**Lab Sample ID:** 08-5175-04A  
**Sample Matrix:** Water  
**Lab File ID:** VOA20722\2401024.D  
**Method Blank:** MB2072208-W  
**Prep Factor:** 1.000  
**Dilution Factor:** 1.00

**Method:** SW8260B  
**Prep Method:** SW5030B

**VOLATILE ORGANICS**

Analytes	CAS Number	Result	Units: µg/L LQL
Acetone	67-64-1	39	10
Benzene	71-43-2	0.97 J	1.0 <b>J SQL-I</b>
Bromodichloromethane	75-27-4	U	2.0
Bromoform	75-25-2	U	4.0
Bromomethane	74-83-9	U	4.0
2-Butanone	78-93-3	12	5.0
Carbon disulfide	75-15-0	U	2.0
Carbon tetrachloride	56-23-5	U	2.0
Chlorobenzene	108-90-7	U	2.0
Chloroethane	75-00-3	U	4.0
2-Chloroethylvinylether <b>R-MS</b>	<del>110-75-8</del>	<del>U</del>	<del>4.0</del>
Chloroform	67-66-3	U	2.0
Chloromethane	74-87-3	U	4.0
Dibromochloromethane	124-48-1	U	2.0
1,2-Dichlorobenzene	95-50-1	U	2.0
1,3-Dichlorobenzene	541-73-1	U	2.0
1,4-Dichlorobenzene	106-46-7	U	2.0
1,1-Dichloroethane	75-34-3	U	2.0
1,2-Dichloroethane	107-06-2	U	2.0
1,1-Dichloroethene	75-35-4	U	2.0
cis-1,2-Dichloroethene	156-59-2	U	2.0
trans-1,2-Dichloroethene	156-60-5	U	2.0
1,2-Dichloropropane	78-87-5	U	2.0
cis-1,3-Dichloropropene	10061-01-5	U	2.0
trans-1,3-Dichloropropene	10061-02-6	U	2.0
Ethylbenzene	100-41-4	U	2.0

  
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Analyst

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**Qualifiers:** See the case narrative for a discussion

B - Analyte detected in the Method Blank, value not subtracted from result  
E - Extrapolated value. Value exceeds calibration range  
H - Prep or Analytical holding time exceeded  
S - Spike Recovery outside acceptance limits  
X - See case narrative  
\* - Value exceeded the Maximum Contamination Level (MCL), TCLP limit, or if compound is undetected, LQL exceeds MCL.

**Qualifiers:** U - Analyte not detected at or above the reporting limit

J - Estimated value below the LQL

**Definitions:** NA - Not Applicable  
LQL - Lower Quantitation Limit  
MDL - Method Detection Limit  
Surr - Surrogate Standard

Print Date: 7/23/08

**Evergreen Analytical, Inc.**  
4036 Youngfield Street, Wheat Ridge, Colorado 80033-3862  
(303) 425-6021

Client Sample ID: PS- MW-11d  
Client Project ID: Prather Spring  
Date Collected: 7/21/08  
Date Received: 7/22/08  
Date Prepared: 7/22/08  
Date Analyzed: 7/23/08  
Percent Moisture NA

Lab Work Order 08-5175  
Lab Sample ID: 08-5175-04A  
Sample Matrix: Water  
Lab File ID: VOA20722\2401024.D  
Method Blank: MB2072208-W  
Prep Factor: 1.000  
Dilution Factor: 1.00

Method: SW8260B  
Prep Method: SW5030B

**VOLATILE ORGANICS**

Analytes	CAS Number	Result	Units: µg/L LQL
2-Hexanone	591-78-6	U	2.0
Methylene chloride	75-09-2	U	5.0
4-Methyl-2-pentanone	108-10-1	U	2.0
Styrene	100-42-5	U	4.0
1,1,2,2-Tetrachloroethane	79-34-5	U	2.0
Tetrachloroethene	127-18-4	U	2.0
Toluene	108-88-3	1.1 J	2.0 J SAL-I
1,1,1-Trichloroethane	71-55-6	U	2.0
1,1,2-Trichloroethane	79-00-5	U	2.0
Trichloroethene	79-01-6	U	2.0
Vinyl acetate	108-05-4	U	4.0
Vinyl chloride	75-01-4	U	2.0
Xylene, Total	1330-20-7	U	4.0
Surr: 1,2-Dichloroethane-d4	17060-07-0	109	QC Limits: 70-130 %REC
Surr: 4-Bromofluorobenzene	460-00-4	110	QC Limits: 70-130 %REC
Surr: Toluene-d8	2037-26-5	105	QC Limits: 70-130 %REC

ER 7/31/08

  
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Analyst

  
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Approved

**Qualifiers:** See the case narrative for a discussion

B - Analyte detected in the Method Blank, value not subtracted from result  
E - Extrapolated value. Value exceeds calibration range  
H - Prep or Analytical holding time exceeded  
S - Spike Recovery outside acceptance limits  
X - See case narrative  
\* - Value exceeded the Maximum Contamination Level (MCL), TCLP limit, or if compound is undetected, LQL exceeds MCL.

**Qualifiers:** U - Analyte not detected at or above the reporting limit

J - Estimated value below the LQL

**Definitions:** NA - Not Applicable  
LQL - Lower Quantitation Limit  
MDL - Method Detection Limit  
Surr - Surrogate Standard

Print Date: 7/23/08

**Evergreen Analytical, Inc.**  
4036 Youngfield Street, Wheat Ridge, Colorado 80033-3862  
(303) 425-6021

Client Project ID Prather Spring

Lab Order: 08-5175  
Units: mg/L

**RSKSOP-175M Headspace  
Methane**


Method: RSKSOP175M

Prep Method: RSKSOP175M

Lab ID	Client ID	Matrix	Date Received	Collection Date	Date Prepared	Date Analyzed	Results	LQL	DF
08-5175-01B	PS-MW11S	Drinking Water	7/22/08	7/18/08	7/22/08	7/22/08	U	0.00080	1
08-5175-02B	PS-MW11S Duplicate	Drinking Water	7/22/08	7/18/08	7/22/08	7/22/08	U	0.00080	1
08-5175-03B	Trip Blank	Drinking Water	7/22/08	7/18/08	7/22/08	7/22/08	U	0.00080	1
08-5175-04B	MW-11d	Drinking Water	7/22/08	7/21/08	7/22/08	7/22/08	0.050	0.00080	1

Comments:

ER 7/31/08

  
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**Qualifiers:** J - Indicates an estimated value when the compound is detected, but is below the LQL  
H - Sample analysis exceeded analytical holding time  
U - Compound analyzed for but not detected  
X - See case narrative  
\*-Value exceeds Maximum Contamination Level(MCL), TCLP limit, or if compound is undetected, LQL exceeds MCL.

**Definitions:** DF - Dilution Factor  
LQL - Lower Quantitation Limit

Print Date: 7/22/08

To: Mark Levorsen

From: Jeff Dawson

Office: Denver URS Office

Date: October 3, 2008

Subject: DRAFT Field Evaluation for Stressed Vegetation on Prather Property

In response to a request from Williams Production RMT Company (Williams), Petroleum Development Corporation (PDC), Marathon Oil Company (Marathon) and Nonsuch Natural Gas, Inc. (Nonsuch) (the "Companies"), URS personnel conducted a field evaluation for stressed vegetation at the Prather stock pond, the creek connecting Prather spring to the Prather stock pond, and aspen groves between the spring and a gas production wellpad (well nos. 14D-14D and 41A-22D). The pond, spring and creek are located in the southwest quarter of Section 14, Township 6 South, Range 97 West, and the aspen stand in the northwest quarter of Section 23.

The field visit was made on July 30, 2008. Personnel in attendance were Mike Gardner and John Suchar of the Williams office in Parachute, CO, Ned Prather (one of the property owners), and Jeff Dawson, Doug Kibbe, and Whitney Wimer of URS Corporation (URS). The evaluation of the stock pond was done in the company of the Williams representatives and Ned Prather, and the remaining areas were evaluated only by Jeff Dawson (URS Senior Botanist), accompanied by other URS personnel.

The purpose of the visit was to evaluate reports of stressed vegetation at the stock pond and the Prather Spring, as requested by the Colorado Oil and Gas Conservation Commission (COGCC) in a letter dated July 10, 2008 and subsequent verbal communication from Chris Canfield of the COGCC. During the visit, Mr. Prather reported that the pond "looked dead" around the first of June, and had not developed the duckweed (*Lemna minor*) cover that he considered normal for the pond. In addition, he reported not observing mudpuppies (tiger salamander larvae, *Ambystoma tigrinum*) that he expected to be present. However, he also indicated that the pond looked much healthier at the time of the site visit (July 30<sup>th</sup>) than it did earlier in the year, including development of some cattails (*Typha latifolia*) and presence of mudpuppies. Mr. Prather did not appear to have specific concerns about its current condition.

No evidence of unusual vegetation stress was observed. The remainder of the report describes the study methods and the conditions present at the site during the field visit. Photographs are attached. The July 30<sup>th</sup> site visit was supplemented with photographs of the area recorded earlier in the season by Mike Gardner, and field notes and photographs recorded by Jeff Dawson during a visit to the PDC and Marathon well pad in October 2007.



## METHODS

The goal of this reconnaissance-level field investigation was to determine whether there was visible evidence of stressed vegetation that would require a more detailed study in a follow-up visit. Visual observations were made while walking through the study area, and included observations of the presence or absence of visual symptoms of vegetation stress, plant community structure and composition, and general ecological conditions. The symptoms that were looked for are general indicators of plant stress that could be caused by various environmental factors, and the study did not consider symptoms relative to specific chemicals. Symptoms considered included dead and/or dying vegetation, bare patches (areas lacking herbaceous vegetation), early leaf fall, unusual colors (such as chlorosis or bronzing), unusual growth patterns, misshapen leaves, wilting, stunted growth, necrotic lesions, and browning. The survey looked for areas, species, or groups of plants where one or more of these symptoms were present in unusual amounts or unusual patterns. Normal vegetation can exhibit these symptoms because of insect damage, herbivory, disease, plant competition, and plant growth cycles, and minor and sporadic occurrence of these symptoms was not considered to be evidence of vegetation stress for the purposes of this study.

## RESULTS

**Stock Pond.** The Prather stock pond is located about 200 feet northeast of the Prather Cabin. It is approximately 100 feet in width, and occupies about 0.2 acre. It is formed by an embankment at the junction of two small drainages, the south fork flowing from Prather Spring, and the west fork from Spring #2. The leach field for the cabin's septic system is located between the cabin and the pond.

The stock pond is shallow, but has deeper water (several feet) in the center. About 90 percent of the stock pond had rooted aquatic vegetation, and about 30 percent of the surface was occupied by floating filamentous algae at the time of the survey. Duckweed occupied only 1 or 2 percent of the pond surface but was observed floating on the algae and in other areas. Wetlands occur at the mouth of the south fork and along the west fork, and continue around much of the pond. Unlike most ponds in this area, the Prather stock pond is fenced to exclude livestock. There is also more lush vegetation along the banks. At least a dozen mudpuppies were observed in the west fork of the pond, in an area with a relatively open bottom. Several water-striders (*Gerris* sp.) were observed.

Dominant species in wetlands around the pond were common spikerush (*Eleocharis palustris*) and willow-leaved dock (*Rumex salicilifolius*) which grew on the shore and in shallows. Other species present in wetland areas around the pond included western wheatgrass (*Elymus smithii*), meadow barley (*Hordeum brachyantherum*), western dock (*Rumex aquaticus*), water speedwell (*Veronica anagallis-aquatica*) and Macoun's buttercup (*Ranunculus macounii*). Rooted submerged vegetation included common mare's-tail

(*Hippurus vulgaris*), pondweed (*Potamogeton* sp.), and two unidentified species. A small patch of cattails was present.

The peninsula between the two arms of the pond had wetland vegetation within several feet of the shore, and tall herbaceous species in moist areas. Species present in the mesic areas included Kentucky bluegrass (*Poa pratensis*), yarrow (*Achillea millefolium*), common plantain (*Plantago major*), quackgrass (*Elymus repens*), cinquefoil (*Potentilla* sp.), wild lettuce (*Lactuca* sp.), rubber rabbitbrush (*Chrysothamnus nauseosus*), snowberry (*Symphoricarpos rotundifolius*), and pennycress (*Thlaspi arvense*).

Species observed upstream of the pond in wetlands along the west fork included a tall shrub willow (stapleleaf willow, *Salix eriocephala*), common spikerush, rush (*Juncus* sp.) fowl mannagrass (*Glyceria striata*), and meadow barley.

In the course of other work during the week of July 28 – August 1, URS looked at over a dozen ponds on the plateau and within several miles of the Prather spring. Compared to the other ponds, the Prather stock pond had the following conditions:

- It was one of few ponds that was fenced to exclude livestock, and had much taller and more lush bank vegetation, as well as a larger amount of emergent aquatic vegetation in shallow areas.
- It had a higher proportion of rooted aquatic vegetation along its bottom than any of the other ponds.
- It had substantially more filamentous algae.
- It had more cattails than other ponds, although only a small portion of the Prather stock pond was occupied by cattails.
- Although some ponds had more duckweed, the amount observed at the Prather stock pond was in the typical range.
- It has mudpuppies, which were observed in about half of the ponds, but may have been present in more. One of the other ponds observed had fish.

No evidence of vegetation stress was observed during the July 30<sup>th</sup> field visit. This does not discount the possibility that stress may have been present earlier in the growing season, as reported by Mr. Prather.

A photograph of the pond was taken earlier in the season on June 24, 2008, by Mike Gardner of Williams and is presented as Photo 14. The peninsula in the foreground of Photo 14 is generally the same area as shown in Photos 5 and 6, but taken from the opposite direction. No obvious vegetation damage can be observed in the June photograph. The vegetation was shorter in June than at the end of July, and there is more bare ground visible on the June photograph, but these are conditions that can be expected based on normal seasonal changes.

**Creek Below Prather Spring.** URS personnel walked upstream along the creek that connects the stock pond to the Prather spring. The stream is small, about 18-24 inches wide and typically 1-2 inches deep. The banks were several feet high with dense herbaceous vegetation covering the water surface. A fence protects the creek and spring area from use by livestock and therefore there is excellent vegetation cover along the creek banks. Common plant species observed along the banks included western coneflower (*Rudbeckia occidentalis*), cow parsnip (*Heracleum sphondylium*), sweet cicely (*Osmorhiza occidentalis*), white geranium (*Geranium richardsonii*), Kentucky bluegrass, spike bentgrass (*Agrostis exarata*), small-wing sedge (*Carex microptera*), snowberry, stinging nettle (*Urtica dioica*), fowl mannagrass, monkshood (*Aconitum columbianum*), water speedwell, and willowherb (*Epilobium ciliatum*). About 40 percent of the stream and bank vegetation was shaded by aspen (*Populus tremuloides*). Vegetation along the creek appeared very healthy; no evidence of vegetation stress was observed.

Two photographs of the creek were taken by Mike Gardner of Williams in late June and early July, 2008. Photo 15 was taken on July 3, 2008, and shows the lower portion of the creek near the cabin. Photo 16 was taken on June 26, 2008, and shows the upper portion just below the spring. No evidence of vegetation stress is visible in these photographs. The vegetation was much taller in late July 2008 (Photos 8 and 9), which is expected based on normal seasonal changes.

**Prather Spring.** The spring daylights through a PVC pipe, approximately 1,250 feet from the stock pond. The water day-lighting at the spring was clear. Vegetation around the spring appeared healthy and dense, except for the area behind the PVC pipe. The vegetation behind the pipe is healthy but not as abundant, because the banks behind the PVC pipe are nearly vertical, there is evidence of livestock grazing, and the area is developing stormwater run-off channels from the surrounding upland areas. The vegetation around the spring outlet is the same as the vegetation observed along the creek. Vegetation at the spring appeared very healthy; no evidence of vegetation stress was observed.

Three photographs of Prather Spring were taken by Mike Gardner of Williams on June 26, 2008, and are shown as Photos 17, 18 and 19. The wet area around the spring discharge appears to have been wider and less vegetated earlier in the season than in late July (Photos 10 and 11). Trampling by livestock or big game is evident in the June photographs, but not in photographs from the late July visit. It appears that the fencing around the spring outlet and creek was improved sometime between the two visits, based on fencing visible in Photos 17 and 18 (a small barbed wire enclosure around the spring outlet, and observations of a fence along the entire creek in late July). Photo 10 shows the new gate at the spring. No evidence of vegetation stress is evident in the June photographs, with the exception of the trampling of the spring outlet area.

**Aspen Grove.** The lower and upper portions of the aspen grove between the Marathon/PDC well pad and adjacent to the Nonsuch well pad were visited on July 30<sup>th</sup>. The lower portions

of the aspen grove had a relatively healthy aspen overstory, with about 10 percent standing dead aspen trees. The upper portion of the grove had a very large number of standing dead aspen trees as well as a number of down trees. Both areas had a healthy understory including snowberry (the principal species), osha (*Ligusticum porteri*), young aspen, perennial brome (*Bromus* sp.), giant hyssop (*Agastache urticifolia*), Kentucky bluegrass, wild rye (*Elymus* sp.), serviceberry (*Amelanchier* sp.), sweet cicely, chokecherry (*Prunus virginianus*), peavine (*Lathyrus* sp.), red elderberry (*Sambucus racemosa*), and northern bedstraw (*Galium septentrionale*). Young aspen trees were observed in both areas.

While the amount of dead aspen in the upper area was very evident, examination of the area showed that most of the aspen were already dead before construction of the PDC/Marathon well in 2007-2008. About 80% of the standing dead trees in the upper area had no bark and about 15% had loose bark, indicating that mortality had occurred over a period of several years. Aspen trees that had recently died (within 1-2 years) would still have most of their bark.

I made a previous visit to the Marathon/PDC well pad on October 19, 2007, after the well pad area had been cleared but before the well pad was constructed. The purpose of the visit was to assess conditions in the adjoining aspen grove in order to prepare a revegetation plan to restore an aspen community on the well pad site, if needed. A wide traverse was made through both the upper and middle parts of the aspen stand to gain an understanding of the species present and structure of the stand. The aspen grove was noted as being decadent, with about 50% standing dead trees and numerous down trees that made it hard to walk in some areas. There was a well-developed understory of snowberry, forbs, and grasses. Photo 20 shows a dense aspen stand with a mix of both living and dead aspens taken on October 19, 2007.

Because most of the aspen trees appeared to have died prior to the construction of the nearby well pads, and because the understory of the aspen stand was lush, diverse and similar to other stands and included young aspens, the presence of dead aspen trees was considered to be a natural condition not likely related to construction or operation of the well pad in the past couple of years. As discussed in more detail below, aspen stands with significant die-off have been observed in other locations on the Roan Plateau.

There are a large number of aspen stands on the plateau between the Parachute and Roan Creek drainages. Most of the aspen stands observed by URS during the week of July 28-August 1 had a noticeable component of standing dead trees, but generally the dead trees represented only about 10 to 20 percent of the overall number of standing trees. The aspen grove near the Marathon/PDC well was notable in that 90 percent or more of the mature trees were dead. While uncommon, this level of mortality was observed in two other areas on the plateau, at sites that were not located near or down gradient of well pads. Complete die-off of an even aged stand appears to be part of a continuum of aspen loss. Areas were also observed that are dominated by snowberry but, based on the number of downed aspen,

appeared to have been aspen groves in the past. In these areas, natural die off of the entire stand has now virtually eliminated aspen.

The aspen mortality observed on the plateau has been observed in many other areas in Colorado and the western United States. Aspen is undergoing dieback across much of its range in the western United States. In some cases this appears suddenly, a condition called Sudden Aspen Decline (SAD), while in other areas it appears to be more gradual. It appears to have several causes, including recent droughts, natural successional processes (most of the aspen in the western United States was established 100 years ago and the trees have reached the end of their normal life span), warming temperatures, and cattle grazing in some areas which prevents regeneration. Aspen dieback appears to be most prevalent at lower elevations and on south-facing slopes. Aspen dieback is a major management concern for land managing agencies.

## **CONCLUSION**

A reconnaissance-level survey of the stock pond, peninsula at the stock pond, creek below Prather Spring, and nearby aspen groves found no evidence of unusual vegetation stress. Herbaceous and shrub vegetation appeared to be very healthy. Large numbers of dead or dying aspen trees were present in the aspen groves but appeared to be a natural condition. Because no evidence of unusual vegetation stress was observed, follow-up vegetation studies are not recommended.





Photo 1 – Looking southeast with an overview of Prather stock pond. Prather cabin is to the right of the pond but not shown in this photograph.



Photo 2 – Looking southeast at closer view of Prather stock pond. The two inlets are visible on the right side of the photograph.





Photo 3 – Looking west and upstream of the west fork inlet of Prather stock pond.



Photo 4 – Close up of the west fork, one mudpuppy is visible in this photograph.





Photo 5 – Looking northeast at the center of Prather stock pond. Cattails and algae are present in the center of the stock pond, while additional emergent wetland vegetation is visible along the edge.





Photo 6 – Looking northeast at the peninsula between the two branches of the stock pond.



Photo 7 – Looking northeast at the south fork of Prather stock pond.





Photo 8 – Looking north and downstream along the creek. The overflow water discharge pipe from Prather cabin is visible in the bottom right corner.





Photo 9 – Looking south and upstream along the creek.





Photo 10 – Looking south at where Prather Spring daylights.



Photo 11 – Looking north and downstream from the Prather Spring.





Photo 12 – Looking west at the lower portion of the aspen grove located south west of Prather Spring.



Photo 13 – Looking northeast at the upper portion of the aspen grove, which is adjacent to Marathon/PDC well pad.





Photo 14 – View of pond and peninsula photograph taken on June 24, 2008, by Mike Gardner.



Photo 15 – Lower portion of the creek adjacent to Prather Cabin photograph taken on July 3, 2008, by Mike Gardner.





Photo 16 – Upper portion of the creek below Prather Spring photograph taken on June 26, 2008 by Mike Gardner.





Photo 17 – Prather Spring photograph taken on June 26, 2008, by Mike Gardner.





Photo 18 – Prather Spring close up view photograph taken on June 26, 2008 by Mike Gardner.





Photo 19 – Prather Spring side view photograph taken on June 26, 2008, by Mike Gardner.



Photo 20 – Aspen grove on October 19, 2007 with standing dead trees.  
Photograph by Jeffery Dawson



## SUMMARY OF KNOWN DATA FOR PRATHER SPRING INVESTIGATION

Collected By?	Lab	Pkg #	Contents	Collection Period	Analyses
COGCC	Test America	D8F050387	6 SFW 1 Produced Water 1 SED	4-Jun-08	soil: GRO, DRO aqueous: VOCs, CH <sub>4</sub> , major cations, trace metals, major anions, SC, pH
LTE/PDC	Evergreen	08-4070	2 SOIL 1 SFW (NPS)	12-Jun-08	soil: GRO, DRO, MRO sfw: GRO, CH <sub>4</sub> , major cations, trace metals, major anions, SC, pH, O&G
Marathon	Key Laboratory	060608-1382	4 AQ (NP and DP cabin taps, NP cistern, Spring 2)	6-Jun-08	VOCs
Marathon	Key Laboratory	062008-1382	2 SFW (NPS, NP stock pond)	20-Jun-08	VOCs
Marathon	Key Laboratory	062308-1668	1 SFW (NP stock pond DS-440)	23-Jun-08	VOCs.
URS	Evergreen	08-5065	<b>1st Drilling Field Effort</b> 6 SOIL 6 GRW	7/15, 7/16, 7/17 for soils; 7/17, 7/18, 7/21 for water	GRO, DRO, VOCs; methane for GRW; 1 soil for SVOCs also
		08-5101			
		08-5151			
		08-5175			
		08-5116			
LTE/PDC	Test America	NRG-1655	<b>1st Drilling Field Effort Splits</b> SOIL GRW	same as above	GRO, DRO, VOCs; methane for GRWs
		NRG-1800			
		NRG-1903			
HRL/Williams	Evergreen	08-3744	Cabin Tap and Spring	5-31-08 6-01-08 6-02-08	GRO, BTEX, Anions, TDS, CH <sub>4</sub>
HRL/Williams	Evergreen	08-3842	Cabin Tap and Spring	3-Jun-08	GRO, BTEX, Anions, TDS, CH <sub>4</sub>
HRL/Williams	Evergreen	08-4235	3 locations	18-Jun-08	BTEX
HRL/Williams	Evergreen	08-4339	6 SFWs	23-Jun-08	BTEX, NO <sub>2</sub> , NO <sub>3</sub> , Cl
HRL/Williams	Evergreen	08-4611	6 SFWs	1-Jul-08	BTEX, NO <sub>2</sub> , NO <sub>3</sub> , Cl
HRL/Williams	Evergreen	08-4774	6 SFWs	8-Jul-08	BTEX, NO <sub>2</sub> , NO <sub>3</sub> , Cl
HRL/Williams	Evergreen	08-5011	9 SFW	15-Jul-08	VOCs-Short; some anions
HRL/Williams	Evergreen	08-5117	9 SFW	17-Jul-08	VOCs-Short; some anions
HRL/Williams	Evergreen	08-5218	9 SFW	22-Jul-08	VOCs-Short; some anions CH <sub>4</sub> for Prather Spg
HRL/Williams	Evergreen	08-5309	9 SFW	24-Jul-08	VOCs-Short; some anions
HRL/Williams	Evergreen	08-5418	9 SFW	29-Jul-08	VOCs-Short; some anions
HRL/Williams	Evergreen	08-5544	10 SFW	1-Aug-08	VOCs-Short; some anions
HRL/Williams	Evergreen	08-5576	10 SFW	4-Aug-08	VOCs-Short, some anions
HRL/Williams	Evergreen	08-5777	11 SFW	7-Aug-08	VOCs-Short, some anions
LTE/PDC	Test America	NRH-0688	3 SFW	7-Aug-08	VOCs-Long, some metals, some anions and wet chemistry

# SUMMARY OF KNOWN DATA FOR PRATHER SPRING INVESTIGATION

Collected By?	Lab	Pkg #	Contents	Collection Period	Analyses
HRL/Williams	Evergreen	08-5833	10 SFW	11-Aug-08	VOCs; some anions
HRL/Williams	Evergreen	08-6048	10 SFW	14-Aug-08	VOCs-Long; some anions
HRL/Williams	Evergreen	08-6082	4 GRW	14-Aug-08	VOCs-Long, methane
HRL/Williams	Evergreen	08-6168	10 SFW	18-Aug-08	VOCs-Long; some anions
HRL/Williams	Evergreen	08-6291	11 SFW	21-Aug-08	VOCs-Long; some anions
HRL/Williams	Evergreen	08-6359	11 SFW	25-Aug-08	VOCs-Long; some anions
HRL/Williams	Evergreen	08-6596	11 SFW	29-Aug-08	Addendum #2 List
URS	ChemSol	URS037	3 GRW	29-Aug-08	VOCs and GRO
URS	ChemSol	URS038	5 GRW 2 SOIL	3-Sep-08	VOCs, GRO, DRO
URS	ChemSol	URS039	5 GRW 1 SOIL	4-Sep-08	VOCs, GRO, DRO
URS	ChemSol	URS040	7 GRW	5-Sep-08	VOCs
HRL/Williams	Evergreen	08-6745	11 SFW	4-Sep-08	Addendum #2 List
HRL/Williams	Evergreen	08-6749	Potable Water Tank	4-Sep-08	Addendum #2 List
HRL/Williams	Evergreen	08-6780	Potable Water Hydrant	5-Sep-08	Addendum #2 List
HRL/Williams	Evergreen	08-6809	1 GRW (08R pre-development), 2 SOIL	7-Sep-08	VOCs, GRO, DRO
HRL/Williams	Paragon	0809060	7 GRW (5D, 8S, 8D, 4S, 4D, 3S, 3D)	8-Sep-08	Addendum #2 List
HRL/Williams	Paragon	0809076	11 SFW	10-Sep-08	Addendum #2 List
HRL/Williams	Paragon	0809093	2 GRW (2S [vocs only], 2D)	10-Sep-08	Addendum #2 List
LTE/PDC	Test America	NRI0466	3 SOIL (6R 17-21, 8S 10-12, 7S 14-16)	3-Sep-08, 4-Sep-08	VOCs-Long, GRO
LTE/PDC	Test America	NRI0729	3 GRW (5D, 8S, 8D)	7-Sep-08, 8-Sep-08	VOCs-Long, GRO, DRO, Methane, Cations, Anions, Alkalinity, TDS, Sulfide
LTE/PDC	Test America	NRI0779	3 GRW (10S, 3D, 4D, 6R) 1 SOIL (10S 10-12)	8-Sep-08	VOCs-Long, GRO, DRO, Methane, Cations, Anions, Alkalinity, TDS, Sulfide
LTE/PDC	Test America	NRI1054	2 GRW (10S, 10D)	9-Sep-08	VOCs-Long, Alkalinity, Anions, Dissolved Metals, Methane
LTE/PDC	Test America	NRI1060	2 GRW (7S, 9S)	9-Sep-08	VOCs-Long, Alkalinity, Anions, Dissolved Metals, Methane
LTE/PDC	Test America	NRI1052	3 GRW (12D, 13D, 7D)	9-Sep-08	VOCs-Long, Alkalinity, Anions, Dissolved Metals, Methane VOCs-Long, Methane for PS-13D and PS07D
LTE/PDC	Test America	NRI1696	1 GRW (2D)	17-Sep-08	VOCs-Long, Alkalinity, Anions, Dissolved Metals, Methane VOCs-Long, Methane for PS-13D and PS07D

**SUMMARY OF KNOWN DATA  
FOR PRATHER SPRING INVESTIGATION**

Collected By?	Lab	Pkg #	Contents	Collection Period	Analyses
HRL/Williams	Paragon	0809141	2 GRW (2S [vocs only], 2D)	17-Sep-08	Addendum #2 List

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TA = Test America

EAL = Evergreen Analytical

HRL = HRL Compliance Solutions

LTE = LT Environmental

URS = URS Corporation

GRO = Gasoline Range Organics

DRO = Diesel Range Organics

BTEX = benzene, toluene, ethylbenzene, xylenes

CH<sub>4</sub> = methaneNO<sub>2</sub> = NitriteNO<sub>3</sub> = Nitrate

Cl = Chloride

## SUMMARY OF GROUNDWATER SAMPLING FOR VOLATILE ORGANIC ANALYTES

Report Date: 09-29-08

Monitoring Well	COGCC Facility ID	VOCs and Methane			
		Number of Data Points	Comment on Results	Proposed Revision <sup>3</sup>	Justification for Modification
PS-MW02D		2	split naphthalene 3.48 J	1x/month (VOCs only)	Hydrocarbon concentrations low relative to spring concentrations
PS-MW02S		1	common lab contaminants only		
PS-MW03D		4	common lab contaminants only		
PS-MW03S	705438	6	1,2,4-TMB (9.1), X (4.2 J), in 9-03-08 sample		
PS-MW04D		3	T (0.17 J) in 8-08-09 sample		
PS-MW04S	705439	5	common lab contaminants only		
PS-MW05D		3	T (0.8 J), E (0.21 J), X (0.8 J) in 8-08-08 sample; split T (0.93 J) only		
PS-MW06R		3	X (0.33 J) and T (0.21 J) in 8-07-08 sample		
PS-MW07D		3	common lab contaminants only		
PS-MW07S		4	B (4x), X (2x), T (4x), with highest B (2.6 J) and T (2.9 J) on 9-05-08		
PS-MW08D		3	single detection of methane and chloroform		
PS-MW08S		3	common lab contaminants only		
PS-MW09S		2	single methane detection		
PS-MW10D		2	single detection of methane and other lab contaminants		
PS-MW10S		2	B (0.37 J, 0.76 J), T (1.01, 1.3), X (0.73 J)		
PS-MW11D	705442	4	B (3x), T (3x), X (1x), methane		
PS-MW11S	705443	5	common lab contaminants only		
PS-MW12M		2	no VOCs detected		
PS-MW13D		2	T (0.33 J and 0.23 J)		

	Indicator hydrocarbons detected over 5 ppb.
	Indicator hydrocarbons detected over 2 ppb.
	Trace levels of indicator hydrocarbons detected.
	No indicator hydrocarbons detected.

osl = on-site laboratory (i.e., ChemSolutions)

all results presented in ug/l (i.e., parts per billion)

J indicates and estimated value

Split samples are included in total number of data points.

<sup>1</sup> VOCs only; no methane analysis.<sup>2</sup> TVPH and TEPH also requested.<sup>3</sup> Due to hazardous winter conditions and concern for the safety of field personnel, routine sampling will be discontinued between Nov. 1 and Mar. 1.

# SUMMARY OF GROUNDWATER SAMPLING FOR MAJOR CATIONS AND ANIONS, TRACE METALS, AND OTHER WATER QUALITY PARAMETERS

Report Date: 09-29-08

Monitoring Well	COGCC Facility ID	Major Cations and Anions, Trace Metals, and Other Water Quality Parameters			
		Sampling Dates <sup>1</sup>	Number of Data Points <sup>1</sup>	Proposed Revision	Justification for Modification
PS-MW02S		NA	0	NA	insufficient sample volume
PS-MW06R		NA	0		
PS-MW11D	705442	NA	0		non-target screen interval
PS-MW02D		09/17/08 (+split)	2	1x/month until 3 sets of results generated <sup>2</sup>  (NA if insufficient sample volume)	3 sets of data are considered sufficient to establish Baseline Water Quality
PS-MW03D		09/08/08 (+split)	2		
PS-MW03S	705438	09/08/08	1		
PS-MW04D		09/08/08 (+split)	2		
PS-MW04S	705439	09/08/08	1		
PS-MW05D		09/08/08 (+split)	2		
PS-MW07D		09/10/08	1		
PS-MW07S		09/09/08 (split only) 09/10/08	2		
PS-MW08D		09/08/08 (+split)	2		
PS-MW08S		09/08/08 (+split)	2		
PS-MW09S		09/09/08 (split only) 09/10/08	2		
PS-MW10D		09/09/08 (split only) 09/10/08	2		
PS-MW10S		09/09/08 (split only) 09/10/08	2		
PS-MW11S	705443	09/10/08	1		
PS-MW12M		09/09/08 (split only) 09/10/08	2		
PS-MW13D		09/10/08	1		

NA = Not Applicable

Split samples are included in total number of data points.

<sup>1</sup> Does not account for sampling on September 17 and 24, 2008 because those results have not been received.<sup>2</sup> If extended list analyzed for outstanding samples, then sampling program is complete.<sup>3</sup> **Due to hazardous winter conditions and concern for the safety of field personnel, routine sampling will be discontinued between Nov. 1 and Mar. 1.**

Monitoring Well	COGCC Facility ID		
		Sampling Dates	# data pts
PS-MW02D		09/17/08 (+split)	2
PS-MW02S		09/17/08	1
PS-MW03D		08/29/08 (osl) 09/03/08 (osl) 09/08/08 (+split)	4
PS-MW03S	705438	07/17/08 (+split) 08/15/09 09/03/08 <sup>1</sup> (osl) 09/04/08 <sup>1</sup> (osl) 09/08/08	6
PS-MW04D		09/05/09 <sup>1</sup> (osl) 09/08/08 (+split)	3
PS-MW04S	705439	07/17/08 (+split) 08/14/09 09/03/08 <sup>1</sup> (osl) 09/08/08	5
PS-MW05D		09/05/09 <sup>1</sup> (osl) 09/08/08 (+split)	3
PS-MW06R		09/07/08 <sup>1,2</sup> 09/08/08 (+split)	3
PS-MW07D		09/05/09 <sup>1</sup> (osl) 09/09/08 (split only) 09/10/08	3
PS-MW07S		09/05/09 <sup>1</sup> (osl) 09/06/09 <sup>1</sup> (osl) 09/09/08 (split only) 09/10/08	4
PS-MW08D		09/05/09 <sup>1</sup> (osl) 09/08/08 (+split)	3
PS-MW08S		09/05/09 <sup>1</sup> (osl) 09/08/08 (+split)	3
PS-MW09S		09/09/08 (split only) 09/10/08	2
PS-MW10D		09/09/08 (split only) 09/10/08	2
PS-MW10S		09/09/08 (split only) 09/10/08	2
PS-MW11D	705442	07/21/08 (+split) 08/15/08 09/03/08 <sup>1</sup> (osl)	4
PS-MW11S	705443	07/08/08 (+split) 08/15/08 09/03/08 <sup>1</sup> (osl) 09/10/08	5
PS-MW12M		09/09/08 (split only) 09/10/08	2



PS-MW13D		09/09/08 (split only) 09/10/08	2
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	Indicator hydrocarbons detected over 5 ppb.
	Indicator hydrocarbons detected over 2 ppb.
	Trace levels of indicator hydrocarbons detected.
	No indicator hydrocarbons detected.

osl = on-site laboratory (i.e., ChemSolutions)

all results presented in ug/l (i.e., parts per billion)

Split samples are included in total number of data points.

<sup>1</sup> VOCs only; no methane analysis.

<sup>2</sup> TVPH and TEPH also requested.

<sup>3</sup> **Due to hazardous winter conditions and concern for the safe**  
**Mar. 1.**

VOCs and Methane		
Comment on Results	Proposed Revision <sup>3</sup>	Justification for Modification
split naphthalene 3.48 J	1x/month (VOCs only)	Hydrocarbon concentrations low relative to spring concentrations
common lab contaminants only		
common lab contaminants only		
1,2,4-TMB (9.1), X (4.2 J), in 9-03-08 sample		
T (0.17 J) in 8-08-09 sample		
common lab contaminants only		
T (0.8 J), E (0.21 J), X (0.8 J) in 8-08-08 sample; split T (0.93 J) only		
X (0.33 J) and T (0.21 J) in 8-07-08 sample		
common lab contaminants only		
B (4x), X (2x), T (4x), with highest B (2.6 J) and T (2.9 J) on 9-05-08		
single detection of methane and chloroform		
common lab contaminants only		
single methane detection		
single detection of methane and other lab contaminants		
B (0.37 J, 0.76 J), T (1.01, 1.3), X (0.73 J)		
B (3x), T (3x), X (1x), methane		
common lab contaminants only		
no VOCs detected		

T (0.33 J and 0.23 J)		
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ety of field personnel, routine sampling will be discontinued between Nov. 1 and

## VOCS SAMPLING SUMMARY FOR SPRINGS AND STREAM SAMPLES

09-29-08

Surface Water Sampling Stations	COGCC Facility ID	VOCs			
		Sampling Frequency <sup>1</sup>	# VOC data pts <sup>1</sup>	Proposed Revision <sup>2</sup>	Justification for Modification
Ned Prather Spring	705381	~1x/wk Jun (5x) 2x/wk Jul/Aug (14x) 1x/wk Sep (2x)	21	2x/month	Condition established
Ned Prather Spring DS 440	705436	1x/wk early July (2x) 2x/wk Jul/Aug (14x) 1x wk Sep (2x)	18		
Spring 2	705382	2x/wk Jul/Aug (14x) 1x/wk Sep (2x)	16		
Spring 2 DS 100	705444	1x/wk (3x)	3		
Spring 2 DS 350	705445	2x/wk Aug (8x) (replaced by Spring 2 DS100)	8	NA, location discontinued	Monitoring point moved to end of fence line
Ned Prather Cabin	705394 (in) 705386 (out)	2x/wk Jul/Aug (14x) 1x/wk Sep (2x)	16	1x/month while on city water	Cabin supplied by city water
Ned Prather Stock Pond	705390 (general) 705384 (outlet)	various times Jun (2x) 2x/wk Jul/Aug (14x) 1x/wk Sep (2x)	18	Collect and hold; analyze only if HCs detected in the upgradient stream sample	No HC detections to date
Ned Prather Stock Pond DS 500	705437	once Jun (1x) 2x/wk Jul/Aug (14x) 1x/wk Sep (2x)	17		
Donna Stock Tank	705433 (upper) 705385 (lower)	2x/wk Jul/Aug (14x) 1x/wk Sep (2x)	16		
Dick Prather Cabin	705383 (in) 705395 (out)	1x/wk early July (2x) 2x/wk Jul/Aug (14x) 1x wk Sep (2x)	18		
McKay Gulch	705434	2x/wk Jul/Aug (14x) 1x/wk Sep (2x)	16		

<sup>1</sup> Does not include sampling event on September 17, 2008 because those surface water data have not been received as of 09-29-08.

<sup>2</sup> **Due to hazardous winter conditions and concern for the safety of field personnel, routine sampling will be discontinued between Nov. 1 and Mar. 1.**

Split samples not included in total number of data points.

Working Draft **MAJOR CATIONS AND ANIONS, TRACE METALS, AND OTHER WATER QUALITY PARAMETER  
SAMPLING SUMMARY FOR SPRINGS AND STREAM SAMPLES  
09-29-08**

Surface Water Sampling Stations	COGCC Facility ID	Major Cations and Anions, Trace Metals, and Other Water Quality Parameters			
		Sampling Frequency <sup>1</sup>	# data pts	Proposed Revision <sup>2</sup>	Justification for Modification
Ned Prather Spring	705381	08-29-08 09-04-09 09-10-08	3	Discontinue	Baseline Water Quality Established
Ned Prather Spring DS 440	705436				
Spring 2	705382				
Spring 2 DS 100	705444				
Spring 2 DS 350	705445				
Ned Prather Cabin	705394 (in) 705386 (out)				
Ned Prather Stock Pond	705390 (general) 705384 (outlet)				
Ned Prather Stock Pond DS 500	705437				
Donna Stock Tank	705433 (upper) 705385 (lower)				
Dick Prather Cabin	705383 (in) 705395 (out)				
McKay Gulch	705434				

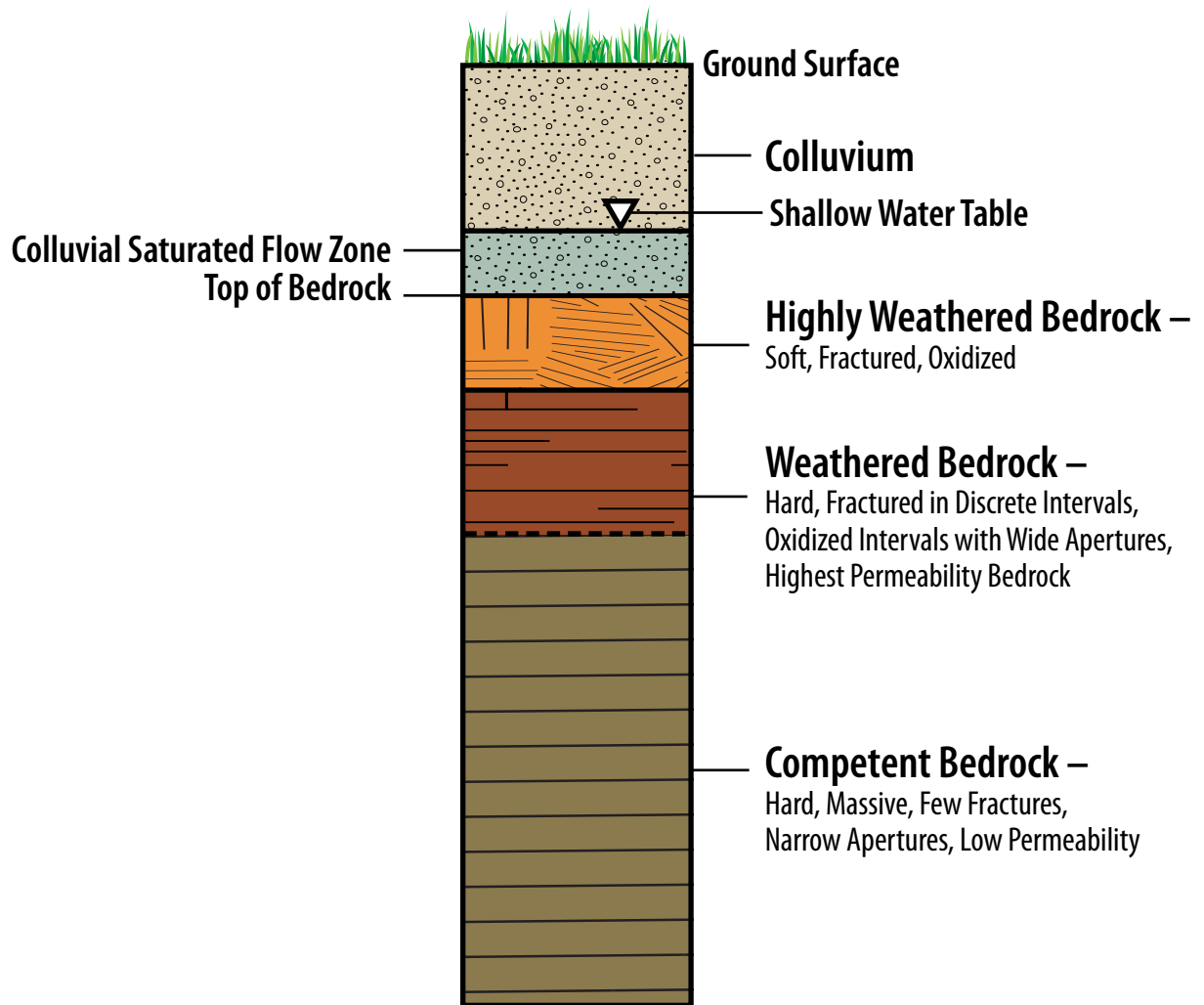
<sup>1</sup> Does not include sampling event on September 17, 2008 because those surface water data have not been received as of 09-29-08.

<sup>2</sup> **Due to hazardous winter conditions and concern for the safety of field personnel, routine sampling will be discontinued between Nov. 1 and Mar. 1.**

Split samples not included in total number of data points.

# Unloading Stress Rock Properties

Working Draft

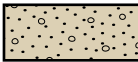
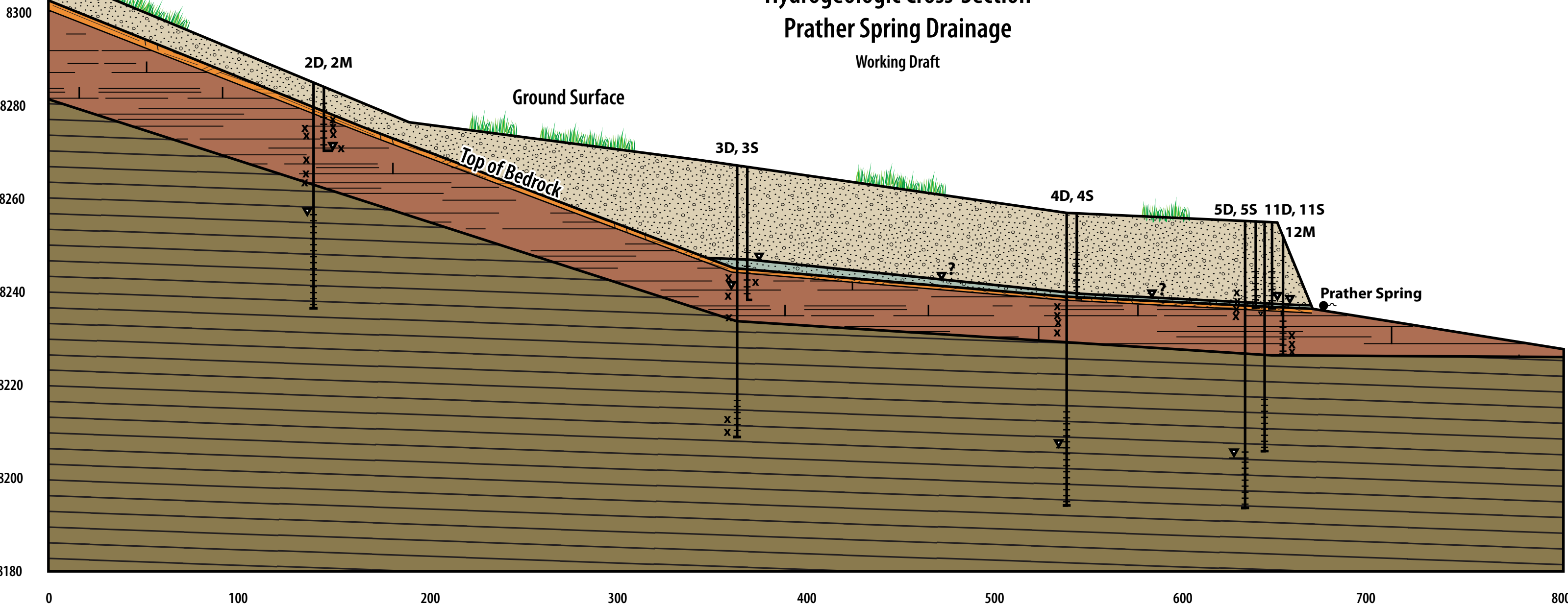


South

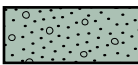
North

# Hydrogeologic Cross-Section Prather Spring Drainage

Working Draft



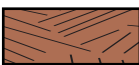
**Colluvium**



**Colluvial Saturated  
Flow Zone**



**Highly Weathered Bedrock –**  
Soft, Fractured, Oxidized



**Weathered Bedrock –**  
Hard, Fractured in Discrete Intervals,  
Oxidized Intervals with Wide Apertures,  
Highest Permeability Bedrock



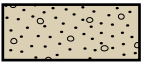
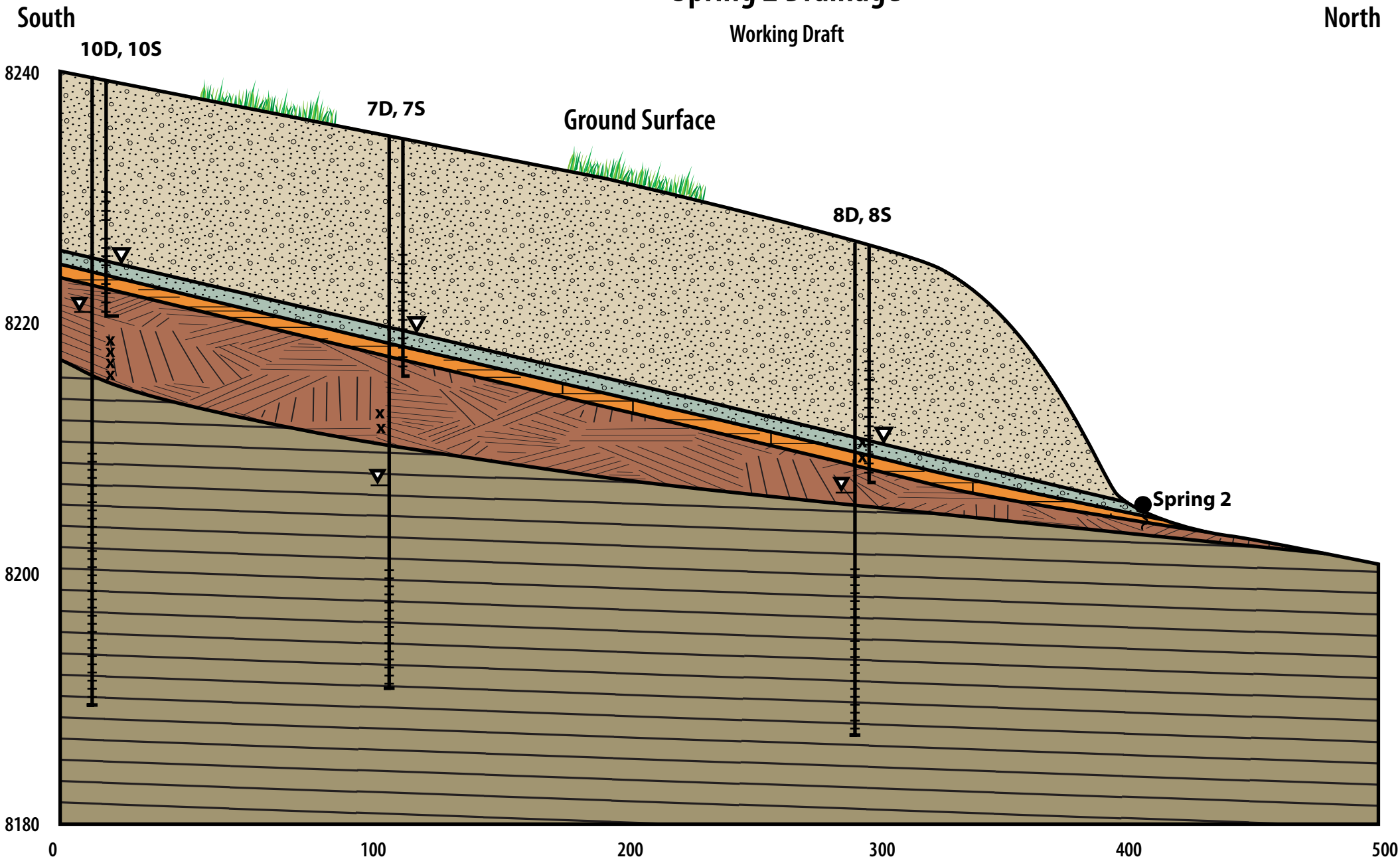
**Competent Bedrock –**  
Hard, Massive, Few Fractures,  
Narrow Apertures, Low Permeability

**x x** **Bedrock Fractures**

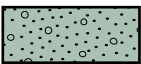
**▽** **Water Level in Well**

Hydrogeologic Cross-Section  
Spring 2 Drainage

Working Draft



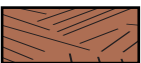
**Colluvium**



**Colluvial Saturated  
Flow Zone**



**Highly Weathered Bedrock –**  
Soft, Fractured, Oxidized



**Weathered Bedrock –**  
Hard, Fractured in Discrete Intervals,  
Oxidized Intervals with Wide Apertures,  
Highest Permeability Bedrock



**Competent Bedrock –**  
Hard, Massive, Few Fractures,  
Narrow Apertures, Low Permeability

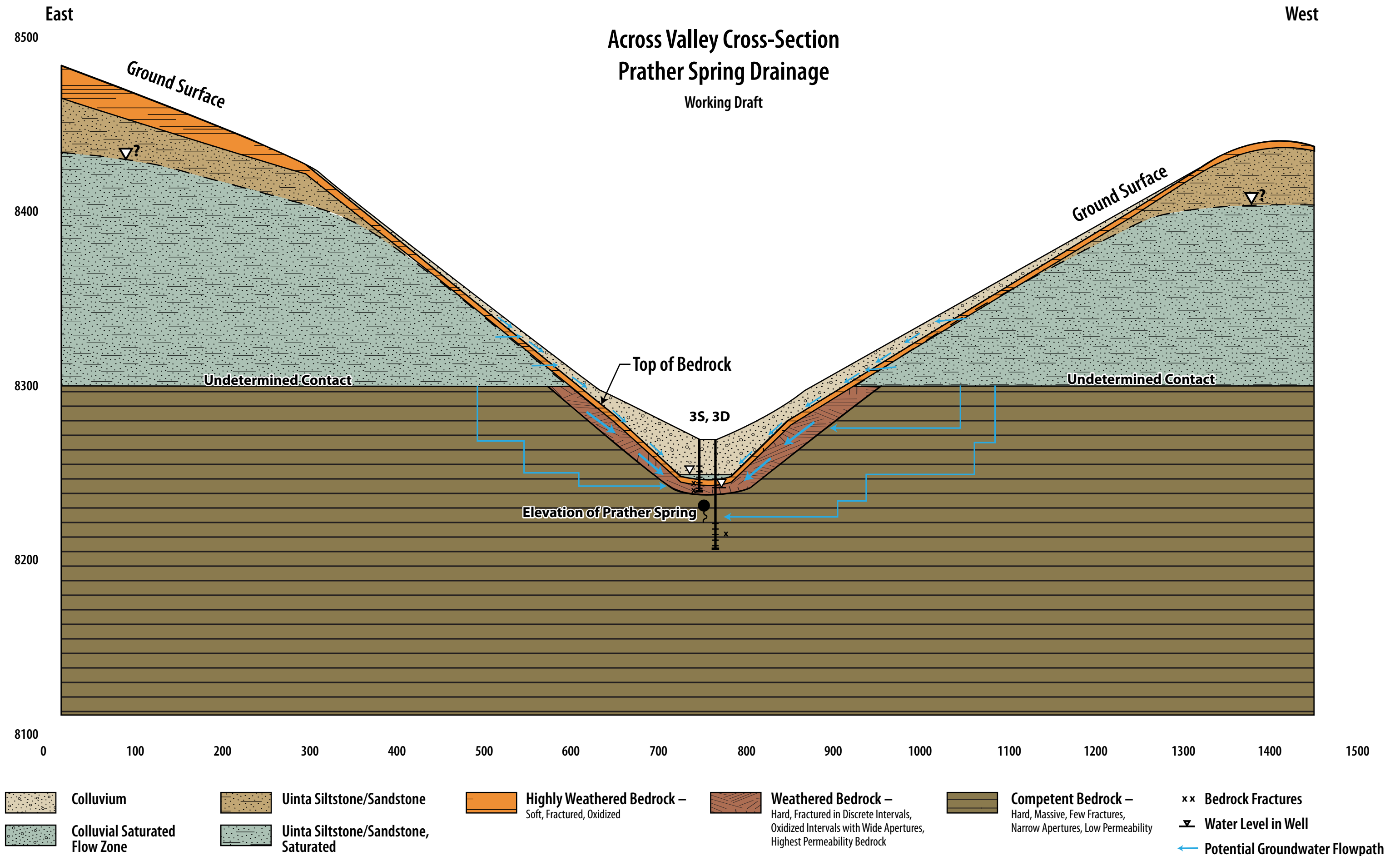
**x x**

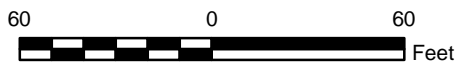
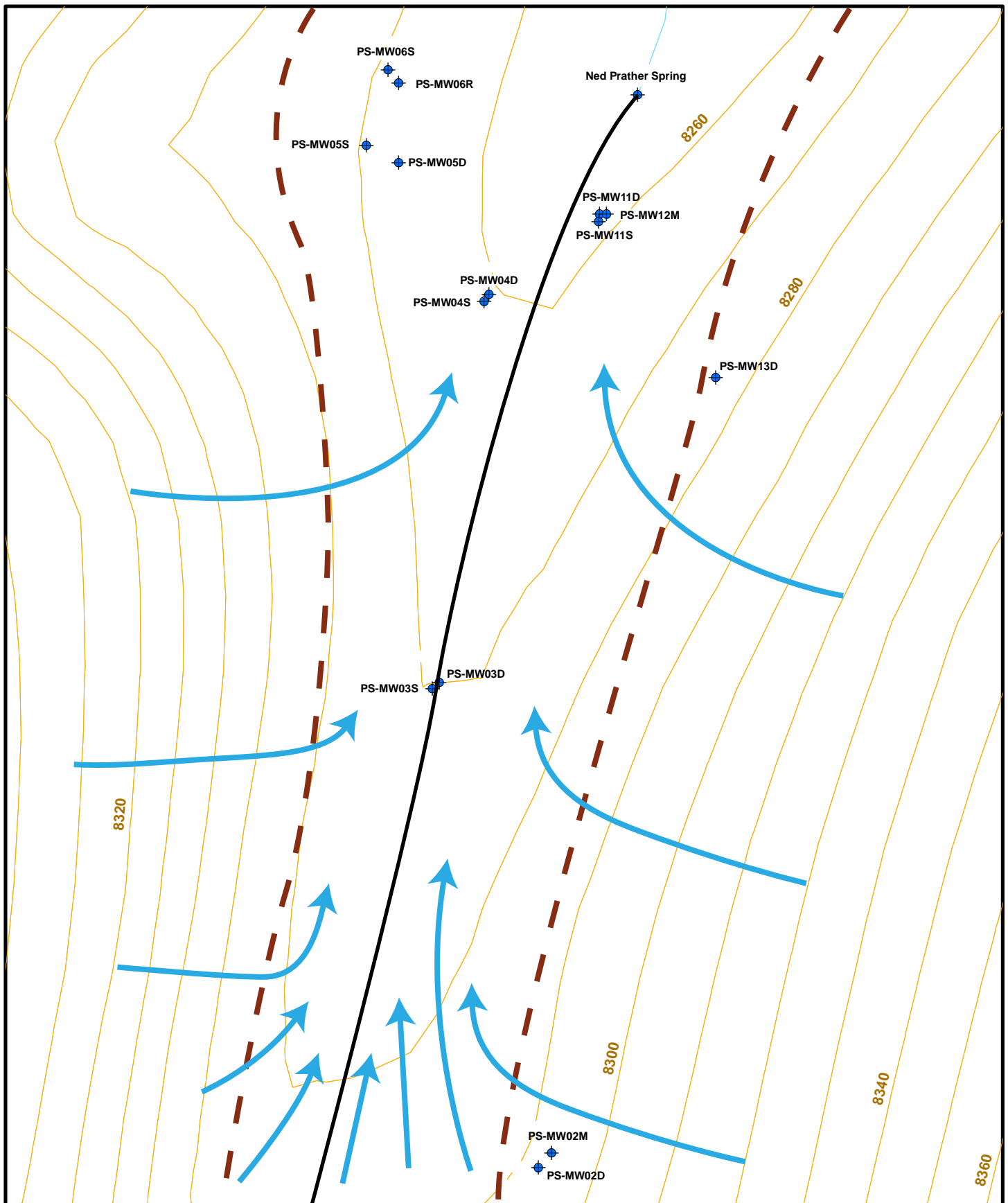
**Bedrock Fractures**



**Water Level in Well**







NOTES:  
 1. Horizontal Datum: UTM, NAD83, Zone 13N, meters  
 2. Vertical Datum: NAVD29

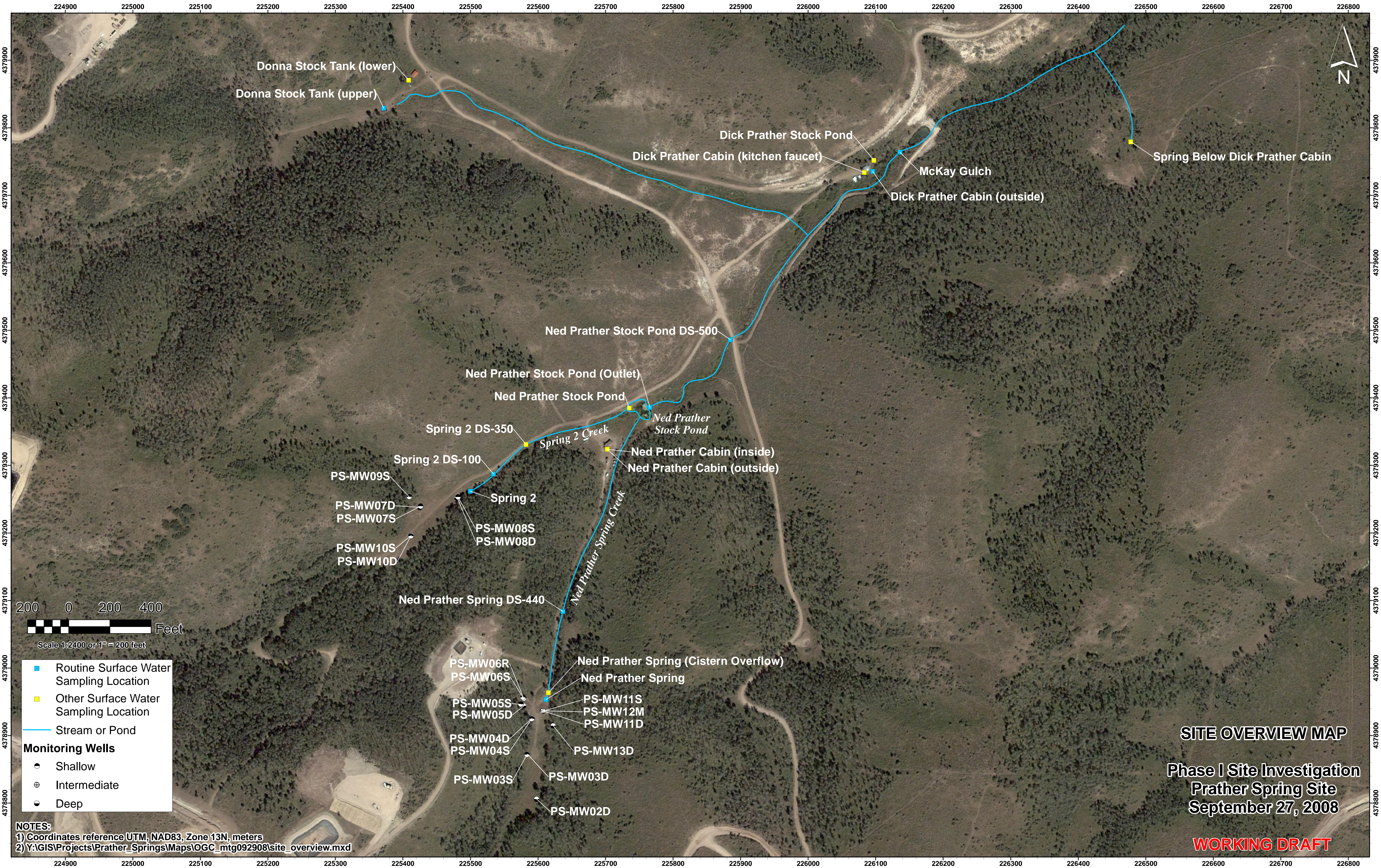
- Groundwater Flow Divide
- Edge of Colluvial Valley
- Groundwater Flow Direction
- Monitoring Well
- Creek
- Topographic Contour (10-ft.)



**FIGURE X-X** Ned Prather Spring Area  
Potential Groundwater  
Flow Paths

Phase I Prather Spring Site Investigation  
Working Draft









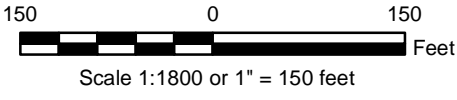
Creek

Monitoring Wells

● Shallow

⊕ Intermediate

● Deep



NOTES:  
1. Horizontal Datum: UTM,  
NAD83, Zone 13N, meters  
2. Vertical Datum: NAVD29



FIGURE X-X Well Location Map

WORKING DRAFT

Phase I Prather Spring Site Investigation

File Name mw_locs.mxd	Rev. Date 09/27/08	Dr. By GCK
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File Path: Y:\GIS\Projects\Prather\_Springs\Maps\OGC\_mtg092908\Overview of Chloride Results.mxd



**FIGURE X-X** Overview of Chloride Results

**WORKING DRAFT**

Phase I Prather Spring Site Investigation

File Name  
Overview of Chloride Results.mxd

Rev. Date  
09/27/08

Dr. By  
GCK

**URS**

NOTES:  
1. Horizontal Datum: UTM,  
NAD83, Zone 13N, meters  
2. Vertical Datum: NAVD29



File Path: Y:\GIS\Projects\Prather\_Springs\Maps\OGC\_mtg092908\Overview of Hydrocarbon Results.mxd



■ Surface Water  
Sampling Locations

— Creek

**Monitoring Wells**

- Shallow
- ⊕ Intermediate
- Deep

**Orange Symbols** One or more indicator hydrocarbon analytes exceed the Colorado Basic Groundwater Standard or other standard for the constituent

**Yellow Symbols** One or more indicator hydrocarbon analytes were detected, but no results exceeds an associated standard.

**Green Symbols** No indicator hydrocarbon analytes were detected

NOTES:  
1. Horizontal Datum: UTM,  
NAD83, Zone 13N, meters  
2. Vertical Datum: NAVD29



**FIGURE X-X** Overview of  
Hydrocarbon Results

**WORKING DRAFT**

Phase I Prather Spring Site Investigation

File Name  
Overview of Hydrocarbon Results.mxd

Rev. Date  
09/27/08

Dr. By  
GCK

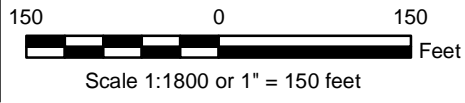




— Creek  
— Topographic Contour (10-ft.)

**Monitoring Wells**

- Shallow
- ⊕ Intermediate
- Deep



NOTES:  
1. Horizontal Datum: UTM,  
NAD83, Zone 13N, meters  
2. Vertical Datum: NAVD29



**FIGURE X-X** Condensate Tank Area

Phase I Prather Spring Site Investigation

File Name  
condensate\_tank.mxd

Rev. Date  
09/27/08

Dr. By  
GCK