



Appendix I

Sampling and Analysis Plan for the Enterprise Natural Gas Pipeline Trench Garfield County, CO

Form 27

Site Investigation and Remediation Workplan Colorado Oil and Gas Conservation Commission State of Colorado

Submitted to:

*Williams Production RMT Company
1515 Arapahoe Street
Tower 3, Suite 1000
Denver, CO 80202*

Submitted by:

*Daub & Associates, Inc.
2241 S. Broadway
Grand Junction, Colorado
81507*

September 2009

Table of Contents

<u>Introduction</u>	<u>3</u>
<u>Figure 1</u>	<u>5</u>
<u>Objective</u>	<u>6</u>
<u>Pre-Sampling Procedures</u>	<u>6</u>
<u>Sampling Procedures</u>	<u>8</u>
<u>Table 1</u>	<u>10</u>
<u>Post Sampling Procedures</u>	<u>11</u>

INTRODUCTION

In response to a Notice of Alleged Violation (NOAV) issued to Williams Production RMT Company (Williams) by the Colorado Oil and Gas Conservation Commission (COGCC) for contamination found in Prather Spring in Garfield County, Colorado, Williams plans to take advantage of a pipeline trench opened by the Enterprise Gas Company (Enterprise) by direct observation, field sampling and documentation of the trench for contaminants. Williams has gone above and beyond what the COGCC requested and will take advantage of this unique opportunity to support the investigation of the source of contamination of the Prather Spring. Williams has tasked Daub & Associates, Inc. (Daub) with the sampling event. The Sampling and Analysis Plan (SAP) was developed by Daub for Williams in response to that request. The Enterprise gas line trench will be located down slope of the WGV 21-23 pad, in Section 23, Township 6 South, Range 97 West, Garfield County, Colorado (Figure 1).

Williams and three other companies were issued NOAVs by the COGCC for contamination found in two springs. Two NOAVs were issued to Williams in the summer of 2008 and two more in the winter of 2008 related to Prather Spring and Spring 2. Three wells on two different drilling pads are listed, which are currently owned and operated by Williams. These wells are called MV 1-23 (MV Pad), and WGV 21-23-697 and WGV 22-23-697 (WGV Pad), and are 24 years old and 1½ years old, respectively. Williams, together with the Petroleum Development Corporation, Marathon Oil Company, and Nonsuch Natural Gas, hired URS Corporation to conduct a Phase I Environmental Assessment. The Phase I investigation was conducted during the Fall of 2008. URS produced a draft Phase I report in November of 2008. Williams conducted independent site-specific investigations the Fall of 2008. Recently, the COGCC's NOAVs for all of the Williams' locations in the Prather Spring area have been revoked except for the WGV 21-23 drill pad.

Prather Spring is a small perennial spring that forms at the exposed contact between unconsolidated sediments and underlying weathered bedrock. Prather spring has a unique recharge area that is defined by the upslope topographic basin in which it resides. Dissolved hydrocarbons, high total dissolved solids (TDS), and chloride typical of petroleum operations were detected in Prather Spring in 2008.

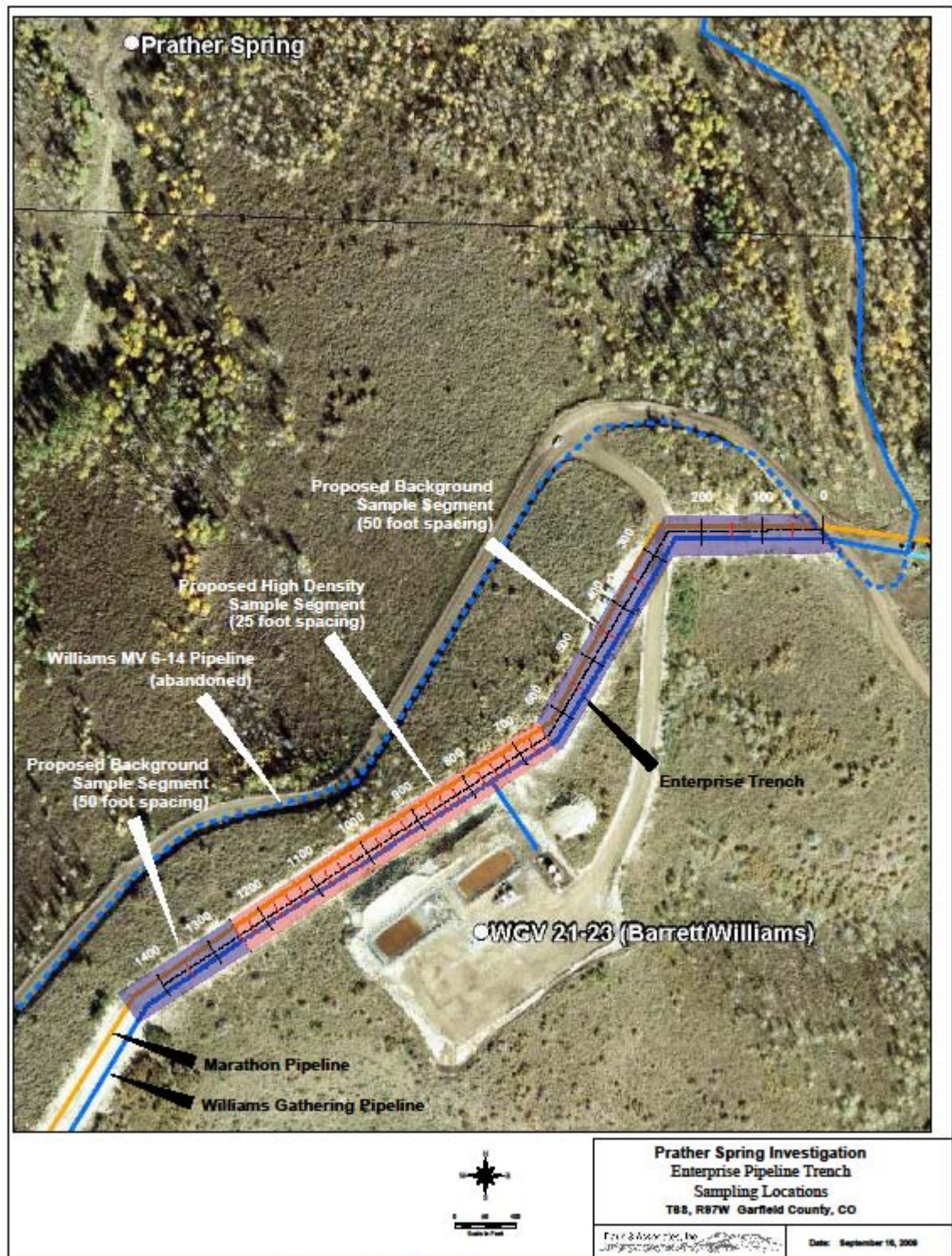


Figure 1. General location map and sampling locations.

Enterprise plans to install a twenty inch diameter natural gas pipeline adjacent to and downgradient of the WGV pad (Figure 1). It is assumed that Williams will be successful in obtaining permission to enter and sample the trench while it is open. In a conference call with COGCC, Williams, Daub and others on September 9, 2009, it was agreed by all parties that the open trench would provide an opportunity to inspect the area immediately below the WGV Pad, perform field screening activities, collect soil samples, monitor for the presence of vapors/hydrocarbon fluids and document area conditions down gradient of the WGV pad. The SAP is based on COGCC objectives and expectations discussed during the conference call.

OBJECTIVE

The objective of the sampling effort is to evaluate the possibility of migration of petroleum hydrocarbon compounds (PHC) down slope from the WGV pad and to determine the presence of vapors, fluids and staining in the open trench. Samples will be obtained for liquid, solid and gas phases within the area of suspicion. The sampling program will ensure that the samples are representative of current conditions within the subsurface exposed by the trench. Therefore, the sampling approach must allow for retention of any PHCs, volatile organic compounds (VOC), and semi-volatile organic compounds (SVOC) that may be present.

PRE-SAMPLING PROCEDURES

The Enterprise trench will be used to collect solid subsurface samples downgradient of the WGV pad. Trench exposures facilitate the evaluation of subsurface contamination because of the large subsurface area and undisturbed nature of the material exposed. Trenches offer the opportunity to visually observe the lithology and inspect for fluids, odors and staining. Enterprise has indicated that the trench will be a total of approximately eight feet deep including the appropriate angle of repose. The specific sample collection procedure, Surface Soil Sampling for Chemical Analyses, is provided in Appendix A.

Approximately 1250 feet of the trench will be inspected, documented and selectively sampled by Daub. There are two areas of interest for inspection, documentation, and sampling along the trench: the background sample area at both ends and the high density sample area (700 feet in length) in the center above the WGV Pad. Samples will be collected from the background sample area at both ends of the trench. Samples will be collected from the high density sample area in the center of the trench along the road down gradient of the WGV pad. The sample locations are shown in Figure 1.

Safety training, layout map, reconnaissance scan and field screening shall be performed prior to sampling as follows:

- The Williams Health and Safety Plan (HSP) shall be used for the duration of the sampling project and shall include but not be limited to specialized Trenching/Shoring training. Safety training shall be provided in accordance with the HSP by the Williams Health and Safety Officer (HSO) or an approved qualified person. Training shall be documented and shall be submitted to Daub upon request.
- The designated footage of the portion of the trench to be sampled shall be laid out completely using fiberglass measuring tapes incremented in tenths of a foot. Marker flags shall be placed to designate the zero point, the two contacts between the background and high density areas and the end point. The four points shall be surveyed and recorded by a licensed surveyor.
- Two individuals will walk the entire length of the trench, and inspect and document the soil conditions. Photo Ionization Detector (PID) measurements and a photographic record will be taken. Representative background PID readings, elevated PID readings and areas of organic soil staining will be recorded in the field log book and marked on the surface with designated flags for follow-up sampling.

SAMPLING PROCEDURES

Because of the nature of volatile chemicals, it is important that the sampling occur soon after the soil is removed when the trench is safe and practical for entry. Volatile compounds will start to dissipate as soon as soil is removed, therefore the more elapsed time between opening and sampling, the less likelihood of finding volatile contamination.

Soil samples will be collected from the bottom and sides of the trench. The spacing of sample locations in the background density area will be one every 50 feet. The spacing of sample locations in the high density area will be one every 25 feet. A flag will be labeled with the sample number and used to mark each sample location. A digital camera shall be used to photograph the sample location and associated surface lithology. The sample number shall be visible in each photograph. The date, individual's name, sample location, sample number, photo number, lithology description and significant comments shall be recorded in the field notebook.¹ Additional samples may be collected at the discretion of the sample technician, i.e. where staining and/or elevated PID measurements, strong hydrocarbon odors or organic stains are detected.

For each sample location, the sample name shall include the sequential trench footage (using the beginning point as zero) and the sample depth (using the surface as zero). Duplicate samples shall be taken every fifth sample and identified with the designation *DUP*. Samples to be submitted for laboratory testing will be placed in laboratory-supplied containers (Table 1) and stored in a cooler at the proper temperature prior to shipping.

Portions of each sample shall be placed in sealable plastic bags or glass jars for field headspace testing using a PID. The PID used for field headspace testing shall be capable

-
- ¹ Detailed descriptions of lithology, moisture content, fracturing and other pertinent information (e.g. textural changes or calcite cement) shall be recorded in the field logbook along with the number of a representative photograph of each lithologic unit. If possible, approximately 0.3 cu. ft. (2.5 gallons) of contaminant free sample for each lithologic unit shall be collected for archival purposes. The samples shall be stored for one year at the Daub facility.

of detecting volatile organic compounds at approximate concentrations of 1 part per million (1 ppm). Field headspace measurements will be made after samples have been in closed plastic bags for approximately 10 minutes. Sample numbers, retention times and instrument readings shall be recorded in the field logbook.

Analytical test samples will be selected based on the following criteria:

- The six samples with the highest PID measurements shall be submitted for analytical testing as primary samples.
- Four representative samples with the highest PID measurements shall be collected as duplicates.
- In the event that PID measurements do not exceed background values, only one bedrock sample and one sample representative of each lithologic unit shall be collected.
- Disposable sampling equipment will be used to collect samples. To avoid cross contamination, non-dedicated sampling equipment will be thoroughly cleaned prior to initiation of sampling activities, and as necessary based on specific sampling procedures.

Samples for off-site analytical testing will be shipped under chain-of-custody procedures to:

Accutest Laboratories
4405 Vineland Road, C-15
Orlando, FL 32811
407-425-6700 Phone
407-425-0707 Fax

Samples shall be analyzed using a gas chromatograph (GC) for total volatile and extractable petroleum hydrocarbons (TVPH and TEPH) using USEPA SW846 Modified Method 8015A, and aromatic and halogenated volatiles using USEPA SW846 Method 8021B (Table 1). The laboratory shall take and retain extract splits of the samples for potential testing based upon the results of the preliminary analyses. After the initial analyses, the elevated samples (>100 ppm TVPH or TEPH) will be evaluated. A decision will be made to analyze the split extract samples for VOCs using USEPA SW846 Method

8260B and for SVOCs using USEPA SW846 Method 8270 (Table 1).² The additional data shall be evaluated.

Analysis	Bottle Requirements	Preservation Requirements	Holding Time
TEPH Modified Method 8015A	1 4 oz or 8 oz jar	<6 deg. C	14 days
TVPH Modified Method 8015A	1 4 oz or 8 oz jar	<6 deg. C	14 days
VOC Method 8260B *	1 4 oz or 8 oz jar	<6 deg. C	14 days
SVOC Method 8270C*	1 4 oz or 8 oz jar	<6 deg. C	14 days

Table 1. Analytical Methods and Sample Requirements

*If initial sampling results from 8015A and/or 8021B exceed the threshold limits.

Duplicate samples will be shipped under chain-of-custody procedures to a designated independent laboratory. These duplicate sample analyses will provide quality assessment/quality control (QA/QC), and may facilitate further evaluation of hydrocarbon contamination undetected in the field.

The duplicate samples will be sent to an independent laboratory at the address below:

Sample Management
Accutest Labs of New England
495 Technology Center West, Bldg 1
Marlborough, MA 01752
Office: 1-508-481-6200 X212
Fax: 1-508-481-7753

² Note: Holding times will vary depending on threshold limits, data evaluation and method used.

POST SAMPLING PROCEDURES

The laboratories shall provide the analytical data results in both electronic and hard copy format. Daub shall verify the electronic data against the hard copy report at frequency of ten percent.

Daub shall prepare the final report on *Sampling and Analysis of the Enterprise Trench below the WGV pad, Garfield County, Colorado*. The report shall include documentation of safety training, field activities (written and photographic evidence of SAP implementation), and analytical results with verification. The report will be submitted to Williams within three weeks after all of the analytical results (initial analyses and split sample analyses if necessary) has been received. Williams is responsible for submitting the final report to the COGCC.