

March 7, 2014

Ms. Annette Garrigues  
Environmental Specialist  
Williams Midstream (Bargath, LLC)  
4289 County Road 215  
Parachute, CO 81635

**RE: Callahan Sampling Schedule**

Dear Ms. Garrigues:

Groundwater data has been collected from 17 monitoring wells installed up-gradient, in the source area and down-gradient of the Callahan Compressor Station to characterize groundwater conditions. Samples have been collected monthly since March 2012 for monitoring wells MW-1 through MW-8; MW-9 through MW-17 have been sampled monthly since July 2012. Currently, groundwater samples are analyzed for the presence and concentration of Benzene, Toluene, Ethylbenzene and Total Xylenes (BTEX) as well as Gasoline and Diesel Range Organic compounds (GRO and DRO respectively). In addition, the samples are analyzed for chloride, sulfate and Total Dissolved Solids (TDS), which are all associated with the degradation of natural petroleum. Field parameters associated with groundwater quality are also measured, which include dissolved oxygen, temperature, specific conductivity and pH.

To date impacted groundwater as observed in monitoring wells MW-1, MW-2, MW-3, MW-5 and MW-17 have the following characteristics:

- A pH range from 6.55 to 7.68.
- A specific conductivity between .92 and 13.42 milliSiemens/centimeter.
- Dissolved oxygen levels between 4.74 and 11.26.
- Average seasonal groundwater temperature ranges between 15.5 and 18 degrees Celsius (°C).
- A groundwater benzene concentration of 2,800 micrograms per liter ( $\mu\text{g/l}$ ) was observed in the groundwater sample collected from the source area (MW-1) in August 2013 and 2,900  $\mu\text{g/L}$  in a downgradient well (MW-3).

A table summarizing the groundwater analytical data collected to date is attached.

Based on the subsequent two (2) years of groundwater well data and comments received from the Colorado Oil and Gas Conservation Commission (COGCC) regarding the site conditions, InterTech Environmental & Engineering, LLC (InterTech) proposes the following changes to the sampling schedule.

The first month of each quarter (January, April, July, October) the following wells would be sampled for the following listed parameters:

Sampling Point	Rationale	Parameters		
MW-1	Source Well	BTEX, GRO, DRO	Inorganics	Field Parameters
MW-2	Plume Well	BTEX, GRO, DRO	Inorganics	Field Parameters
MW-3	Plume Well	BTEX, GRO, DRO	Inorganics	Field Parameters
MW-4	Plume Edge	BTEX, GRO, DRO	Inorganics	Field Parameters
MW-5	Plume Well	BTEX, GRO, DRO	Inorganics	Field Parameters
MW-8	Plume Edge	BTEX, GRO, DRO	Inorganics	Field Parameters
MW-9	POC Well	BTEX, GRO, DRO	Inorganics	Field Parameters
MW-10	POC Well	BTEX, GRO, DRO	Inorganics	Field Parameters
MW-11	POC Well	BTEX, GRO, DRO	Inorganics	Field Parameters
MW-12	POC Well	BTEX, GRO, DRO	Inorganics	Field Parameters
MW-13	POC Well	BTEX, GRO, DRO	Inorganics	Field Parameters
MW-17	Plume Well	BTEX, GRO, DRO	Inorganics	Field Parameters

\*POC Well – Point of Compliance (POC) Well

The second and third month of each quarter would have an abbreviated sampling schedule. Depth to water readings would be collected from all wells, but samples would only be collected from the following wells and analyzed for the listed parameters:

Sampling Point	Rationale	Parameters	
MW-4	Plume Edge	BTEX, GRO, DRO	Field Parameters
MW-10	POC Well	BTEX, GRO, DRO	Field Parameters
MW-11	POC Well	BTEX, GRO, DRO	Field Parameters
MW-12	POC Well	BTEX, GRO, DRO	Field Parameters
MW-13	POC Well	BTEX, GRO, DRO	Field Parameters

\*POC Well – Point of Compliance (POC) Well

Groundwater data would continue to be evaluated monthly and should any hydrocarbons be detected in the Point of Compliance (POC) wells identified above, MW-14, -15 and -16 would be reintroduced to the sampling schedule. Should you have any questions, concerns or would like to discuss the above recommendations, please do not hesitate to contact me.

Thank you,



Jana D. Nilsen  
JN:sb  
Cc: File



# Bargath, LLC Callahan Compressor Station Benzene Plume

March 10, 2014

## Explanation

Monitoring Well

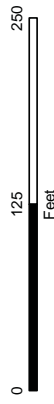
Benzene (ug/L)

0 - 0.01

0.01 - 5.0

> 5.0

Non-Detect  
locations,  
as shown  
in  
Analytical  
Table



1:1,000



InterTech, Inc. LLC  
Newington, VA  
www.intertech.com  
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