



December 10, 2018



**CERTIFIED MAIL NO.** [REDACTED]

Re: Water Supply Request for Investigation ID: 333470  
58 Pa.C.S. § 3218 Determination  
Ridgebury Township, Bradford County

Dear [REDACTED]

The Department of Environmental Protection (Department) has been investigating the possible degradation of your water supply located at the above referenced address (“Water Supply”), in response to a complaint received on April 6, 2018, that recent oil and gas activities may have affected your Water Supply. The Department’s investigation, prompted by information you provided, has determined that your Water Supply was adversely affected by oil and gas activities, including but not limited to the drilling, alteration, or operation of an oil or gas well. The information upon which this determination is based is summarized below.

**Summary of Investigation**

On April 6, 2018, the Department was notified of discoloration and a foul odor in the water supply. The Department conducted sampling of your Water Supply on April 9, 2018. The Department’s sample results indicated methane was present in your Water Supply at concentrations below Department action levels. The Department collected additional samples from your Water Supply on April 26, 2018, May 1, 2018, and May 23, 2018. Methane levels were elevated above Department action levels during the May 1 and May 23, 2018 sampling events. The Department’s samples were collected as shown in the enclosed table, and submitted to the Department’s laboratory in Harrisburg for analysis. The attached sample results table shows that the following analytes also exceeded Department standards during one or more of the sampling events: aluminum, iron, manganese, turbidity, and total coliform bacteria. Note that Primary Maximum Contaminant Levels (MCLs) are intended to reflect potential dangers to human health, while secondary Maximum Contaminant Levels (SMCLs) reflect the aesthetics of the water (i.e. taste, smell, etc.). Sampling conducted by the Department also indicated the presence of iron-reducing bacteria, sulfate-reducing bacteria, and slime-forming bacteria, for which there are no standards. Pre-drill samples had not been collected from your Water Supply prior to any oil and gas activity in the area.

CID 333470 WS Exceedances and Bacteria Detections					
Results in mg/L unless otherwise noted.	DEP Sample	DEP Sample	DEP Sample	DEP Sample	MCL
	0935 384-386	3243-354	3243-358 & 359	3243-372 & 373	(mg/L)
	9-Apr-18	26-Apr-18	1-May-18	23-May-18	* Denotes Primary MCL
Aluminum	<0.200	<0.2	0.86	1.16	0.2
Iron	9.78	0.76	43.05	22.66	0.3
Manganese	1.01	0.44	6.05	2.96	0.05
Turbidity	82.90 NTU	6.25 NTU	212 NTU	157 NTU	* 1 NTU
Iron-related bacteria	~9,000 cfu/mL	~2,200 cfu/mL	~500 cfu/mL	25 cfu/mL	No Standard
Sulfate-reducing bacteria	~6,000 cfu/mL	~20 cfu/mL	~6,000 cfu/mL	75 cfu/mL	No Standard
Slime-forming bacteria	~13,000 cfu/mL	~67,000 cfu/mL	~67,000 cfu/mL	<20 cfu/mL	No Standard
Total Coliform bacteria	<1/100 mL	1/100 mL	<1/100 mL	>200/100 mL	1/100 mL
Methane	6.55	3.2	10.4	17.3	**7 mg/L

\*\* 7 mg/L represents the Department's unofficial action level for dissolved methane in groundwater.  
**BOLD = Exceeds Standard**

The post-complaint laboratory analytical results from your water supply indicated dissolved methane concentrations ranging from 3.2 mg/L to 17.3 mg/L in the samples collected by the Department.

Samples of the methane from the Water Supply were collected and sent to a specialized laboratory for isotopic and compositional analysis. These analyses allowed for a more detailed characterization of gas present in the Water Supply. The results are attached for your records. The water quality analysis, isotope and compositional analyses, elevated concentration of dissolved methane, and presence of combustible gas in the headspace of your water well indicate that the stray gas in your Water Supply is most likely associated with oil and gas activities.

Methane is the predominant component of natural gas. Federal water standard limitations have not been established for methane gas. The level of concern begins above 28 mg/l methane, which is referred to as the saturation level. At this level, under normal atmospheric pressure, the water cannot hold additional methane in solution. This may allow the gas to come out of the water and concentrate in the air space of your home or building. There is a physical danger of fire or explosion due to the migration of natural gas into water wells or through soils into dwellings where it could be ignited by sources that are present in most homes/buildings. Natural gas can also cause a threat of asphyxiation, although this is extremely rare.

When the Department is made aware of methane levels greater than 7 mg/l, we notify the water supply owner of the hazards associated with methane in their water supply. Please be aware however, that the methane levels can fluctuate. This means that even with a relatively low level of methane, you should be vigilant of changes in your water that could indicate an increase in methane concentration.

It is the Department's recommendation that all water wells should be equipped with a working vent. This will help alleviate the possibility of concentrating these gases in areas where ignition would pose a threat to life or property. Please note that it is not possible to completely eliminate the hazards of having natural gas in your water supply by simply venting your well.

The Department is continuing to work to permanently resolve this issue. Should you have any questions regarding this investigation, please contact Caleb Woolever at 570-327-0546.

Sincerely,



Jennifer W. Means  
Environmental Program Manager  
Eastern Oil and Gas District

Enclosures:

Laboratory Analytical Results Table

cc:

Stephanie Wharton (email)

Caleb Woolever (email)

Matt Nuss (email)

Complaint File # 333470