



June 22, 2017

CERTIFIED MAIL NO. [REDACTED]

[REDACTED]

Re: Water Supply Request for Investigation ID: 324291
58 Pa.C.S. § 3218 Determination
Wilmot Township, Bradford County

Dear [REDACTED]

The Pennsylvania Department of Environmental Protection is investigating the possible degradation of your water supply well located at the above referenced address ("Water Supply"), in response to a complaint received on December 29, 2016 that recent gas well activities may have affected the Water Supply well. The Department's investigation to this point indicates that oil and gas activities are the cause of pollution of the Water Supply.

Summary of Investigation

On December 29, 2016, you contacted a nearby oil and gas operator to complain about the condition of the Water Supply. The Department was subsequently notified of that complaint and contacted you on December 30, 2016. At that time, you indicated that you were able to ignite gases coming from your kitchen faucet. The Department initiated an investigation of the possible degradation of the Water Supply and collected samples from the Water Supply on December 30, 2016. Those samples were submitted to the Department's laboratory for analysis, and the analytical reports were previously submitted to you. Table 1 summarizes those water sample results.

The sample results show that manganese was present at 0.177 mg/L, which exceeded the Secondary Maximum Contaminant Level (SMCL) of 0.05 mg/L. The manganese concentrations present in samples collected during the Department's investigation were higher than manganese concentrations from samples collected prior to the complaint. Primary MCLs are intended to reflect potential dangers to human health, while SMCLs reflect the aesthetics of the water (i.e. taste, smell, etc.).

Additionally, a sample collected from the Water Supply in response to the complaint detected dissolved methane at 18.5 mg/L. Dissolved methane was detected at 0.413 mg/L on July 25, 2011 and 0.577 mg/L on July 21, 2014 in samples collected by a 3rd party contractor and analyzed by an accredited 3rd party lab. The change in dissolved methane warranted additional

investigation.

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, and documented changes in methane concentration indicate that the stray gas in the Water Supply is most likely associated with oil and gas drilling activity.

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 DEP'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.

It is the DEP's understanding that a water treatment system is currently installed on the Water Supply. The DEP is continuing to work towards resolving this issue. If you have any questions about any of the above, please contact Caleb Woolever, a Geologic Specialist on my staff at 570.327.0546.

Sincerely,



Jennifer W. Means
Eastern District Oil and Gas Manager
District Oil and Gas Operations

CID 324291

June 22, 2017

Enclosures:

How to Interpret a Water Analysis Report

Methane Gas and Your Water Well

Isotope Sample Results 0973-W-20161230-001

Table 1: Table of Water Quality Results

Cc: Caleb Woolever
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Michael O'Donnell
Sharon Steinbacher