MarcellusGas.Org

Document Disclaimer

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

July 17, 2017

CERTIFIED MAIL NO. [redacted]

[redacted]

Re: 58 Pa. C.S. § 3218 Determination
Water Supply Request for Investigation No. 276069
Terry Township, Bradford County

Dear [redacted]

The Department has completed its investigation of your water supply located at the above address ("Water Supply"). Based on the sample results reviewed and supplementary information obtained to date, the Department has determined that the Water Supply was temporarily affected by oil and gas activities but has returned to background conditions. Nevertheless, please note that your water quality does not meet (*i.e.*, is worse than) the following health and/or aesthetic statewide standards unrelated to oil and gas activities:

Parameters	Unit	Statewide Standards or Recommended Levels	Your Sample Results that Are Above Statewide Standards/Levels
Arsenic	mg/L	0.01	**0.015**
Manganese	mg/L	0.05	**0.572**
Turbidity	NTU	1	**7.71**

You may consider exploring remedial actions regarding the levels of the above results. The Department's investigation into your complaint is set forth below.

Summary of Investigation

On October 1, 2010, you complained to the Department that methane gas had impacted your Water Supply. During inspections conducted by the Department, methane gas was observed in the water and the headspace of the Water Supply. Samples from the Water Supply were collected as shown in the attached table, and submitted to a Pennsylvania-accredited laboratory or the Department's laboratory in Harrisburg for analysis. Those analytical results are shown on the attached table.

Initial results of samples from the Water Supply showed that the Water Supply had levels of methane above expected background conditions. However, additional sampling results revealed

that those levels have returned to expected background conditions. The enclosed table compares those results.

As detailed in the table above, several tested parameters remain above their respective health and/or aesthetic statewide standards. Turbidity ranged from 2.6 nephelometric turbidity units (NTU) to 865 NTU. Although, notably, the highest sample was collected after prolonged non-use of the Water Supply and prior to redevelopment activities. Turbidity is caused by the presence of suspended matter such as sediment, nonliving organic particulates, plankton, or other microscopic organisms. In the case of your Water Supply, it appears the turbidity detected is mainly related to sediment and is also partially responsible for the detected concentrations of manganese and arsenic.

Arsenic was detected throughout the course of the investigation at concentrations at, below, or above its primary maximum contaminant level (MCL). Arsenic is a naturally occurring trace element in rock. Arsenic was detected at a high of 0.049 mg/L in the November 2016 sampling event, which is above its MCL of 0.01 mg/L. However, most samples collected during the course of the investigation contained arsenic at concentrations ranging between <0.01 and 0.015 mg/L, which are equal to, or slightly above, the MCL. Additionally, the sample that was collected during the November 2016 sampling event was collected from the Water Supply at a time when it had been out of service for approximately 5 years and contained excessive turbidity that has been absent post Water Supply redevelopment activities.

Manganese, another common metal associated with groundwater in the region, remains above its secondary maximum contaminant level (SMCL) in water samples collected from the Water Supply. The most likely source of the manganese detected in the Water Supply is from the bedrock from which the Water Supply derives its water.

While not above any health based standards, toluene was detected during sampling events on 3 occasions. The highest detection (100 ug/L) was observed during the October 2010 sampling event, and most recently during the December 28, 2016 sampling event (1.17 ug/L). The most common use of toluene is as an additive to gasoline to improve octane ratings. Toluene is also used to produce benzene and as a solvent in paints, coatings, synthetic fragrances, adhesives, inks, and cleaning agents.

The Department has found that detections of volatile organic compounds (VOCs), like toluene, tend to be localized to the vicinity of their source. VOCs do not move as freely in a groundwater system as methane. As a result, the Department's investigation finds it unlikely that the toluene detected in your Water Supply was caused by oil and gas activities given the distance from such activities and the intervening hydrogeology. Surface spills of gasoline, cleaning solvents, paint or other compounds near the Water Supply could cause the low levels of toluene that have been detected during sampling activities. It is recommended that care be taken when using these types of compounds near your Water Supply.

Based on the Department's investigation, the Department has determined that the impacts on the Water Supply were temporary and that the quality of the Water Supply has now returned to background conditions. Because the Water Supply has returned to background conditions, the Department does not plan to require further action regarding the Water Supply. Accordingly, our prior correspondence to you regarding impacts to the Water Supply, dated December 7, 2010, is superseded by this letter.

Please contact William J. Kosmer, P.G. at 570-974-2613 should you have any questions concerning this matter.

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

Enclosures:
Laboratory Analytical Table
"How to Interpret A Water Analysis Report"

cc:
William J. Kosmer, P.G.
Matt Nuss
Sharon Steinbacher
[redacted]

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION
NORTHCENTRAL REGIONAL OFFICE

12/7/2010

[redacted]

CERTIFIED MAIL NO [redacted]

Re: Act 223, Section 208 Determination
Complaint No. 276069
Terry Twp., Bradford County

Dear [redacted]

The Department has investigated the possible degradation of your water supply in response to a 10/1/2010 complaint that recent gas well drilling activities may have affected your water well. On 10/14/2010, the Department collected samples from your home water supply. The samples were submitted to the Department's laboratory in Harrisburg for analysis. The analytical reports for the samples are included, as well as documents that will assist you with interpreting the sample results. The sample results from 10/14/2010 showed methane was present at 15 mg/l in your water supply. Methane gas was also detected in the headspace of your water well. The Department investigation indicates that gas well drilling has impacted your home water supply.

Methane is the predominant component of natural gas. Drinking water standard limitations have not been established for methane gas and the Department is not aware of any associated health risks. The true level of concern begins above 28 mg/l methane, which is refered to as the saturation level. At this level, under normal atmospheric pressure, the water cannot hold additional methane in solution. The potential hazard occurs when the water is used for extended periods of time. 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 3 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 with Chesapeake in order to resolve this issue. Should you have any questions concerning this matter, please feel free to contact William J. Kosmer, P.G. at 570-974-2613.

Sincerely,

Jennifer W. Means
Environmental Program Manager
Oil and Gas Management

Enclosures:
Laboratory Analytical Results
"How to Interpret A Water Analysis Report"

cc:
Jennifer Means
John Ryder
Caleb Woolever
Chesapeake Energy
Complaint File
Kosmer