



March 12, 2018

CERTIFIED MAIL NO. [REDACTED]

Re: 58 Pa. C.S. § 3218 Determination  
Water Supply Request for Investigation No. 326420  
Hepburn Township, Lycoming County

Dear [REDACTED]

The Department has completed an investigation of the possible degradation (reported increase in turbidity) of your water supply (Water Supply) located at the above referenced address, in response to an April 25, 2017 complaint that gas well drilling activities may have affected your Water Supply. On April 25 and June 12, 2017, the Department collected samples from your Water Supply and submitted samples to the Department's laboratory in Harrisburg for analysis. The analytical results for those samples were previously provided to you, along with documents to assist you in interpreting those sample results.

The determination letter previously sent to you indicated that your Water Supply was presumed to have been impacted by oil and gas activity pursuant to Section 3218 of the 2012 Oil and Gas Act. Section 3218 of the 2012 Oil and Gas Act allows an oil and gas operator the opportunity to rebut this presumption. Based on the water samples and other information obtained to date, including the review of a technical report submitted in rebuttal to the Department's Notice of Presumption Letter to Inflection Energy (Inflection), the Department has determined that the Water Supply was adversely affected by oil and gas activities including, but not limited to, the drilling, alteration or operation of an oil and gas well. The information upon which this determination is based is summarized below.

You reported that your Water Supply contained sediment and was slightly cloudy at the tap. Subsequently, water quality samples were collected by the Department and others, and were submitted to the Department's laboratory or a third party laboratory for analysis. Laboratory analytical data indicated that turbidity was present as high as 45 Nephelometric Turbidity Units (NTU). This value was higher than observed during pre-drill sampling of the Water Supply (0.5 NTU). 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 was mainly related to sediment.

Additionally, iron was detected at a concentration as high as 1.6 mg/L. This value is above its Secondary Maximum Contaminant Level (SMCL) and higher than the value detected during pre-drill sampling (0.015 mg/L). Aluminum was also detected as high as 2.55 mg/L, above its SMCL of 0.2 mg/L. The increase in iron and aluminum appears related to sediment (turbidity).

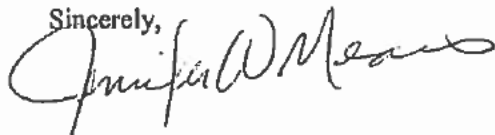
A Hydrogeologic evaluation of the Water Supply and its relation to the nearby gas wells reveal that the Water Supply is located in a valley which appears to be hydrogeologically down-gradient of the Hensler pad. Shallow groundwater in the area is anticipated to flow in a direction from the gas wells towards the Water Supply. Disturbances during shallow drilling operations can cause a mobilization of sediment in

secondary porosity features (i.e. fractures), and if connected with nearby water supply wells and springs, can lead to observable turbidity increases. It is reasonable to conclude that shallow aquifer disturbances in the area of the Hensler pad could have had a deleterious effect on the Water Supply given the nature of activities that were being conducted at the time of the complaint.

Subsequent sampling of the Water Supply by the Department indicates that the current water quality is similar to the conditions observed during pre-drill sampling and that all analyzed constituents except bacteria met their respective health and/or aesthetic based standards. Bacteria, including E. Coli, was detected above their respective MCLs during the course of the investigation, including during pre-drill sampling. If it is desired to continue to use the water supply, it is highly recommend that the supply be properly disinfected on a regular basis and that treatment for bacteria is installed. Information regarding proper disinfection procedures has been included for your reference.

The Department considers this complaint closed and does not anticipate any further action. Please contact William Kosmer, P.G. at 570-974-2613 if you have any questions about the Department's determination regarding the Water Supply.

Sincerely,



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

Enclosures:

Laboratory Analytical Table  
"How to Interpret A Water Analysis Report"  
"Disinfection of Home Wells and Springs"

cc:

William J. Kosmer, P.G.  
Stephanie Wharton  
Ben Bahner  
Sharon Steinbacher  
Complaint File # 326420