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December 10, 2012

Environmental Protection Agency
Region III
Attn: Stephen Platt, (3WP22)
1650 Arch St.
Philadelphia PA 19103-2029

RE: Underground Injection Control Permit #PAS2D020BCLE
Authorization to Operate a Class IID Injection Well
by Windfall Oil & Gas, 63 Hill St., Falls Creek PA 15840
Injection Well Zellman #1
Brady Twp., Clearfield PA

Gentlemen:

On behalf of Brady Township and my professional review of the submittals specific to the above reference, I add the following inquiry and observations.

1. Injecting oil & gas well frac water flowback by injecting into the ground is primitive and not consistent with the federal Clean Water Act objectives of "zero" discharge. It does not aid a better solution to the problem by providing a less expensive option than more technologically advanced methods of redeeming the quality of the water. Recent advances of distillation, reverse osmosis and ultra-filtration to mention a few, have been used singularly or in combination to beneficiate flowback frac water to a high degree.
2. A quarter mile review area appears to be very conservative. There are traditional gas wells just beyond the quarter mile; there is significant coal mining within the general area; there are more private residential water supplies which would be in the area of review if appropriately extended.
3. The casing and cementing of the first groundwater protective string, surface to depth, is planned for 170'. I recommend that the first groundwater protective string should be to a depth of at least 350', given that the elevation of the injection well is approximately 150' above the homes in the nearby valley and their private water supplies, some of which reach to almost 200'. This would provide a greater degree of protection to their water wells.

I also recommend that the long string casing, which extends from the surface to the total depth of approximately 7300', be cemented back to the surface, instead of 5000' below land surface. This would provide more complete cement isolation around the well steels.

4. The fault zones which are mapped are described as creating a confining zone. There appears to be no specific data or evaluation to draw that conclusion. That lack of information creates uncertainty as to the conclusions derived thereof which is that the faults act as an impermeable barrier to the transmission of the injected fluids. General geologic knowledge of faults is that they are typically zones of water transmission due to the fractured rock along the slip planes of the fault. Additionally, increases in hydrostatic or hydrodynamic pressure and/or stresses due to plate movement can cause the faults to move. Such movement is exacerbated and/or lubricated by fluids in or about the fault.
5. Pennsylvania law and regulation have an automatic presumption of liability when a private water supply is negatively impacted by mining or gas and oil drilling. That distance is ½ mile from the mine and/or well. Extensive baseline monitoring is undertaken by the industries in order to insure that they have good comprehensive baseline data.
 - a. Continuous monitoring around the injection well should be comprehensive to ½ mile from the injection well.
 - b. The analysis should include cadmium, strontium, oil & grease, sulfate, methane and ethane, radium 226, lead, and total dissolved solids in addition to those planned.
 - c. Additionally, a complete chemistry workup of the fluids being injected is critical to the determination of impact relative to the water supplies in the area. Is this raw flowback frac water or has it been concentrated, partially or totally? These are key questions relating to the elements being analyzed and a determination by virtue of their concentration whether they constitute a certified hazardous substance per 40 CFR 261.
6. This query goes to the legality of the injection fluids moving under adjoining properties. Does the company performing the injection have the legal right, by way of a lease or other instrument, from all the adjoining subsurface mineral and gas & oil owners? If not, criminal trespass and/or unlawful taking of rights by contamination of resources that would be prohibitive to recover by the rightful owner if and when they elect to do that. No lease appears to have been provided.
7. EPA is the regulatory in charge of issuing the permit. Does EPA bear the responsibility for inspecting the construction to insure the public health and safety?
8. What groundwater protection measures are planned or provided to protect against the potential of faulty well construction, surface spills of frac fluids, well blowback, and fuel spills?
9. Given the high injection pressure, it is reasonable to assume that rock fracturing, in order to provide greater storage capacity of injected fluids, will occur? How far will the microfractures propagate?
10. The assumptions with regard to the porosity and permeability of the two formations (Onondaga Chert and the Oriskany sandstone) being the same is inappropriate. The two formations are mineralogically different; hence, so are their characteristics.
11. Given the variability of geology and lithology from one location to another and despite the fact that the formations may be named the same, it is scientifically inappropriate to utilize

characteristics from well locations that are significantly removed to extrapolate to this planned injection well. Appropriately, a pilot well should be drilled, sampled and analyzed to discern the appropriate variables.

12. Whenever a construction project is undertaken and/or an industrial activity of significance, a performance bond is required. I see that none has been asked or offered in this particular case. It is only appropriate as an industry standard to compel a performance bond. The bond's characteristic would be specific to a financial guarantee that 1) the well is developed consistent with the plan; 2) if the well fails, there are adequate resources to repair or seal it; 3) private water supply owners have a source of funds, if necessary, to build a public water line extension to their homes; and 4) that nearby public water wells owned by the Brady/Troutville Water Association are adequately protected (financially).
13. With regard to the maps presented with the application, I did not see the public drinking water wells marked.
14. Given the public and the municipality concern and anxiety as well as a diminishment in value of the nearby private properties, one would have to question "Why here?"
15. Pennsylvania has thousands of acres of public lands that have no human dwellings. These properties are much more suitable to this type of frac water disposal.
16. There was a failed injection well in nearby Bell Township, Clearfield County. What was the basis of the failure? Has it been evaluated relative to the proposed well?
17. The Pennsylvania Clean Water Act specifies threshold concentrations beyond which no discharge is allowed to surface waters. Pennsylvania also specifies that these standards apply to ground waters of the Commonwealth. How has EPA reconciled Pennsylvania's standards to injection wells?

Wilson Fisher, Jr., P.E., P.G.
Brady Township Engineer

