Public comment on Epiphany Permit:

To whom it may concern,

The proposed brine treatment plant by Epiphany has me concerned for several reasons. The first is the well documented fact that waste water from unconventional gas and oil wells is high in total dissolved solids (TDS), salts, metals, and NORMS, in addition to complex organics. Thus any treatment must involve a multiple step process, as well as, constant monitoring of the inflow and effluent. Epiphany has been marketing a solar powered on site waste treatment system for some time. This current facility, however, marks a dramatic increase in size and alteration of design. Matter of scale is important. Even if the facility is able to theoretically lower the level of contaminants, given the volumes and the fact that radioactivity will increase over time, the discharge may still be significant. The Allegheny River is the water source for many municipalities, including the city of Pittsburgh, for a variety of uses including industry and public drinking water. The proposed treatment plant is at the headwaters. We saw what happened when POTWs were first allowed to take waste water from unconventional drilling activities, with the increase in TDS and bromide. The latter also impacted public drinking water as the increased bromide levels were connected to the increase in disinfectant by-products (trihalomethanes). Even when this practice was discontinued, the Allegheny River still had residual high levels due to the still active brine treatment plants. Recent studies have shown that these treatment plants have been the source of the increase in salts, alkaline earth metals, and organics (Burgos et al., 2017) as well as radium in the basin (Lauer et al., 2018). Thus adding yet another brine treatment plant to the basin may contribute to a further decline in water quality. As someone who lives and works in the Pittsburgh area, I am concerned that what is allowed in Coudersport will affect us downstream.

The second concerns the permit. The stated goal is to produce 42,000 gal/d of “clean water”. The permit states, however, that there will be three (3) 16,800 gal waste water (e.g., untreated brine) tanks, three (3) 16,800 gal “clean brine” storage tanks, and two (2) 16,800 gal distilled water storage tanks. That’s a total volume of over 130,000 gallons. The distillate will either be discharged directly or piped to the adjacent POTW (CAWA) depending on how clean it is. But it isn’t made clear what the cut off is. More important is the design of the corewater chemical treatment. This is a flow through system of 10 components, with 7 tanks (although Tank 6 is not identified). If it is determined that a particular treatment is not required, the load will be allowed to “freely flow through the unused chambers without chemical treatment”. Furthermore, the “detention” time in each of the tanks is only 20 minutes. Thus there is potential for a load to pass through the system either partially treated or untreated and sent directly to the POTW.

The third concerns the radioactivity. Given what happened at the Hart brine facility in Josephine PA (radioactive discharge and levels 200 times background, Warner et al., 2013), proper monitoring of radioactivity is essential. The sample results provided in the permit indicate that the “typical” sample is

indeed hot (Radium 226 4,968 pCi; Radium 228 3,308 pCi). The sludge produced by this plant is produced by chemical precipitation and will be enriched in NORM (thus technically TENORM), based on the chemistry (Zhang et al., 2015). Radium 226 has a half life of 1,600 years. It should also be noted that sealed stored materials will result in the in growth of decay products, potentially increasing total radioactivity (Nelson et al., 2015). Any equipment exposed to these radioactive materials can and will become contaminated. Hand held devices are prone to operator error. There are Gamma spectrophotometric (NaI) devices available with a fixed distance for real time measurement. This should be required for measuring the brine and effluent. There is no indication in the permit as to how the facility itself would be monitored for radiation build up. Regularly scheduled monitoring (swabbing of surfaces with measurement by scintillation) should be required. It is also not clear who, if anyone, will be provided with dosimeters. I have served on my institutions radiation safety committee for almost three decades. The evidence that these workers should be exempt has not been established.

Lastly, this will be a fully automated facility with only “1-2” employees and remote monitoring. This is a 24/7 operation with hazardous materials including volatile organics and flammable compounds. The emergency response is left up to the local community (the two company contacts are in Pittsburgh).

Given these concerns the permit should be rejected.

Burgos et al., 2017 Environ Sci Technol doi/10.1021/acs.est.7b01696

Lauer et al., 2018, Environ Sci Technol doi/10.1021/acs.est.7b04952

Nelson et al., 2015 doi.org/10.1289/ehp.1408855

Warner et al., 2013 Environ Sci Technol 47:11849-11857.

Zhang et al., 2015 Environ Sci Technol 48:4596-4603.

Sincerely,

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