

## TAGD Produced Water Subcommittee

### BSEACD Comments

1. EPA's own report not only outlined concerns from scientists and environmentalists about the toxins in the hundreds of billions of gallons of wastewater produced each year by oil and gas drilling, but also from oil companies themselves. <https://www.epa.gov/sites/production/files/2020-05/documents/oil-gas-final-report-2020.pdf> One large company, the report noted, was troubled by proposals to allow treated wastewater to irrigate crops or get dumped into public waterways, citing "a lack of science around treatment efficacy and associated liability risks." Companies across the board said that disposal wells that store wastewater underground remain a far cheaper option.
2. **Disposal capacity seems to be driver**
  - a. RRC is starting to limit number of injection wells due to concerns over seismic activity. The oil and gas industry are concerned about further limitations on injection wells.
3. **Produced water characterization is an evolving science.**
  - a. EPA approved analytical methods do not exist for many constituents found in oil and gas extraction wastes. In addition, some constituents (such as total dissolved solids) found in oil and gas extraction wastes can interfere with EPA approved analytical methods and significantly affect the ability to detect and quantify the level of some analytes.
  - b. The current ELGs at 40 CFR Part 437 do not contain limitations for many of the pollutants commonly found in oil and gas extraction wastes. Many of these pollutants are not included on the current list of priority pollutants.
  - c. In collecting data for its 2016 hydraulic fracturing study, the U.S. Environmental Protection Agency (EPA) found literature reports showing the detection of about 600 different chemicals in some produced water samples. Some of these chemicals are monitored routinely, while others may rarely be measured.
  - d. Oil and gas extraction wastes can contain a variety of constituents, including biochemical oxygen demand (BOD), bromide, chloride, chemical oxygen demand (COD), specific conductivity, sulfate, total dissolved solids (TDS), total suspended solids (TSS), barium, potassium, sodium, strontium, benzene, ethylbenzene, toluene, xylenes, sulfide, gross alpha, gross beta, radium 226, and radium 228.
  - e. The pollutants present in and characteristics of oil and gas extraction wastes can vary greatly.
4. **Water quality concerns related to discharge**
  - a. Studies indicate produced water effluents may have elevated levels of TDS, halides, metals, and technologically enhanced naturally occurring radioactive materials (TENORM) relative to the receiving streams into which they are discharged
  - b. Documented and potential impacts to both aquatic life and human health related to discharges from facilities treating oil and gas extraction wastewater exist due to the prevalence of some pollutants. Levels of pollutants downstream from these facility

discharges have been reported to exceed applicable thresholds, such as primary and secondary drinking water standards and acute and chronic water quality criteria for protection of aquatic life.

- c. In a number of cases, produced water effluents have been shown to adversely affect downstream aquatic life
- d. In 2011, the Pennsylvania Department of Environmental Protection found levels of radium were still elevated in samples collected 20 meters downstream from the point of discharge.
- e. Drinking water intakes can be situated downstream of produced water discharge.
- f. Surface water/groundwater interactions are of concern

## **5. Require or incentivize more produced water to be reused within industry before looking at alternatives**

- a. Less than half of produced water is reused within the industry
  - i. Less in Texas 5-20%
  - ii. Possible – Pennsylvania is reusing up to 70% within industry (no disposal)
- b. Industry in TX needs to identify why more produced water isn't being reused
  - i. Treatment cost vs freshwater
- c. Research is needed to facilitate produced water reuse
  - i. Problems may relate to scale buildup or a specific analyte such as barium, sulfate, iron, or some other component. Research by universities and water treatment companies to improve solutions for specific treatment problems could help reduce costs for reuse and increase reuse volumes.
  - ii. Mindset – is there already data to suggest there could minimal treatment requirements
- d. Generally, beneficial reuse outside the oil and gas industry will be less economically attractive than reuse within the industry, since the produced water usually must be transported greater distances and treated more extensively

## **6. Treatment**

- a. A major water quality consideration is the feasibility and cost of treating the produced water to be fit for the intended purpose.
- b. High level of treatment via thermal distillation is likely necessary to adequately remove pollutants for discharge or reuse outside of industry
  - i. Very expensive
- c. In contrast, beneficial reuse within the oil and gas operations eliminates or reduces treatment and some transportation of the produced water
- d. A central challenge will be researching and designing effective and economical treatment trains for specific reuse scenarios, which can entail analyzing the complex character of a specific produced water; managing variability; significantly reducing high total dissolved solid levels, organic constituents, metals, and naturally occurring radioactive material; and handling residuals.
- e. Management of treatment residuals is a major cost factor and can present a substantial barrier to water treatment

7. **More transparency and studies are needed. Potential risks to health and the environment must be well understood and appropriately managed in order to prevent unintended consequences of reuse and discharge.**
- a. The level of treatment and transportation necessary to reuse outside of the industry or discharge is currently cost prohibited, so there should be no rush by politicians and TCEQ to start rulemaking.
  - b. **TCEQ should conduct a study of all produced water management and reuse option as a precursor to any rulemaking that would allow discharge into waters of the state. The objectives of the study should define minimum standards and numerical criteria for produced water management and reuse strategies that are protective of existing water uses.**
  - c. Produced water is complex, and in most cases further research and analysis is needed to better understand and define the “fit for purpose” quality goals for treatment and permitting programs.

Sources: 2015 Groundwater Protection Council Report

USGS