



# Opportunities and Challenges for Potential Reuse of Oil and Gas Produced Water

D. Mueller

## ABSTRACT

During oil and gas exploration and continuing through production, water returns to the surface along with the petroleum reserves. In many cases the volume of this produced water exceeds the oil and gas extracted; in some areas upwards of 10 times the oil and gas produced. Currently the vast majority of this produced water is disposed via deep well injection. However, with heighten focus on water resource resilience and stewardship other options are being considered that includes reuse of treated produced water outside oil and gas operations, or discharge to surface water.

Produced water consists of a range constituents including total dissolved solids (typically at levels well in excess of sea water), other inorganics, organics, and sometimes radionuclides. These constituents can be both difficult and expenses to remove, especially to levels potentially acceptable for reuse or surface discharge. Complicating the design and monitoring required for the robust treatment processes for potential reuse or discharge are constituents potentially present that lack analytical methods to detect and/or toxicological information to access potential impacts to human health or the environment.

There are a number of research efforts (both recently completed and ongoing) focused on the chemical and toxicological characterization of produced water, and treatment technologies to treat the constituents of concern prior to reuse or discharge. Presented will be current research addressing known and unknown aspects of constituents of concern in produced water, and pilot testing efforts to assess treatment process capabilities required to meet appropriate treated effluent quality targets for potential reuse or discharge of this complex fluid.

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## NOTES