

Environmental and Water Resources Engineering Seminar Series Presents:

Thursday, November 30th, 2023, 3:30-4:30pm, on Zoom



Thermal Desalination of Produced Water: An Analysis of the Partitioning of Constituents into Product Streams and Its Implications for Beneficial Use Outside the O&G Industry

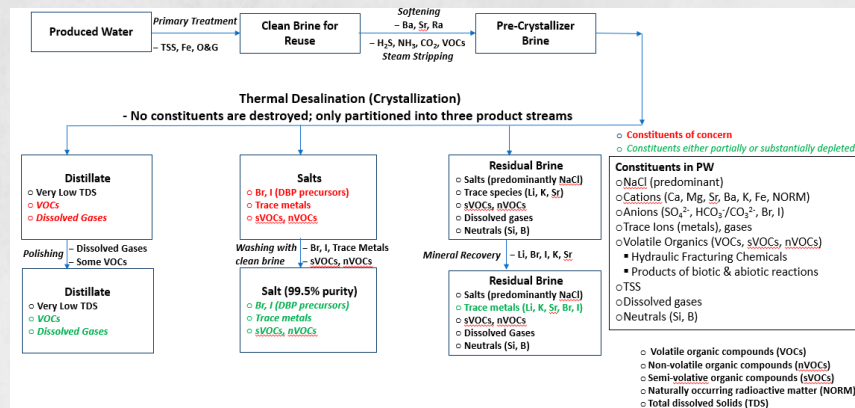
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Abstract

To understand partitioning of produced water (PW) constituents using thermal desalination, PW from the Delaware Basin was desalinated using a crystallization process and modeled using OLI Systems, Inc. (OLI, Parsippany, NJ, USA) chemistry software. As evaporation progressed, sparingly soluble compounds such as gypsum and celestite precipitated first and overall solids production at this stage was low (<1% of total solids).

Further evaporation resulted in saturation of the residual brine with respect to NaCl, which started to precipitate in bulk up to a practical desalination limit of approximately 68% by mass (approximately 80% by volume). Experimental results showed two major challenges to beneficial use of desalinated PW – the presence of organics in distillate which could require additional polishing treatment to a level appropriate for intended beneficial use and the generation of large quantities of solid waste (predominantly highly soluble NaCl).



Background

Ganesh Ghurve is a senior researcher for Unconventional Produced Water Management for ExxonMobil. Ganesh has over 27 years of experience in various upstream, refinery, and research roles within the oil & gas industry, consulting, and academia. Ganesh has had several assignments within ExxonMobil the Upstream (U/S), Downstream, and Central SSHE organizations. Previously Ganesh worked in consulting with CDM Smith in Houston as a technical SME developing processes for drinking water and wastewater treatment. In between his M.S. and Ph.D. degrees, he also worked as a full-time field researcher for the University of Houston (UH) researching various aspects of arsenic removal from groundwater. Ganesh has a BSc majoring in Chemistry (1988) and a B.Sc. majoring in Chemical Technology (1991) from the University of Bombay in India followed by an M.S. and PhD in Environmental Engineering from UH in 1993 and 2003, respectively.

