

Beneficial Use of Pre-treated Produced Water and Related Salt Impacted Waters Using Advanced Ceramic Membranes

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In the conventional oil and gas operations, produced water is associated with drillings and completions, pressure maintenance, enhanced oil recovery and various types of advanced stimulation technologies. In the unconventional gas operations produced water is encountered in coal bed methane, shallow gas, deep-tight gas, and shale gas. In unconventional oil sands operations produced water is associated with the production of bitumen extracted from both surface mining of shallow hydrocarbon deposits (from about 20% of Alberta's bitumen reserves), and from in-situ methods such as Cyclic Steam Stimulation (CSS), Steam Flooding (SF), Steam Assisted Gravity Drainage (SAGD), hybrid Expanding solvent (ES-SAGD) and other novel processes, for the extraction of deeper hydrocarbon deposits (from about 80% of Alberta's bitumen reserves)1

Given the energy demand worldwide, the potential for substantial oil sands and shale gas developments will put significant pressures on water requirements within the Western Canadian provinces of Alberta, British Columbia, and Saskatchewan. While government and industry have key roles in establishing sustainable measures on water withdrawals an increase in the beneficial reuse of produced water and related salt impacted water is critically necessary to support sustainable energy production and growth.

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