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Treatment of coal seam gas produced water for beneficial use in Australia: A review of best practices

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ABSTRACT

There has been an exponential increase in both the production and exploration of coal seam gas (CSG) in Australia and many other regions in the world. A major issue associated with the production of CSG is the management of produced water. CSG is usually mixed with water in the coal seam, to recover the gas, the water must be first extracted from the coal seam to reduce pressure. This water — known as co-produced water or CSG water — is typically quite saline, large in volume and may contain heavy metals and other trace elements of concern. The management of this produced water is of paramount importance to the oil and gas industry. This paper reviews the key characteristics of CSG water and its possible beneficial uses. A specific focus is on the role of reverse osmosis (RO) membranes in the treatment of produced water for beneficial uses or safe discharge into the environment. Recent examples involving the use of RO membranes for the treatment of produced water are systematically summarised and discussed. Opportunities and challenges associated with sustainable management of produced water currently presented to the water industry are also highlighted and discussed in detail.

Keywords: Reverse osmosis; Produced water; Coal seam gas (CSG); Coal bed methane (CBM); Saline water

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