

CLEAN RESOURCES

ENVIRONMENTAL INNOVATION

WATER INNOVATION PROGRAM

FUNDING DETAILS

Ultra High Recovery Industrial Wastewater Desalination

This project supported development of a world's first ultra high recovery industrial desalination plant that will enable economic and sustainable treatment of cooling tower blowdown and other challenging saline industrial wastewaters.

The project advanced Saltworks' high recovery, low waste, non-thermal desalination system for treating impaired saline wastewaters with organics, oils and grease, and higher concentrations of scaling ions such as silica and gypsum. The technology desalts impaired wastewaters using a novel membrane system at much lower cost than thermal systems.

The project built on two years of off-site testing with oil & gas supermajors and successful field pilots in an Albertan oil field and an Albertan fertilizer facility.



RECIPIENT:
**Saltworks
Technologies Inc.**



PARTNERS:
Nutrien, NRCan



TOTAL BUDGET:
\$3,907,561



AI FUNDING:
\$500,000



PROJECT DATES:
**AUG 2018 –
MAY 2022**



PROJECT TRL:
**Start: 5
End: 7**

APPLICATION

The project application was for treatment of cooling tower blowdown desalination. The technology also applies to treating produced water from enhanced oil recovery, where it can improve hydrocarbon recovery and lower operating costs by reducing polymer consumption. Additional applications include treating mine water, oil sands tailings, factory discharge water, and improving lithium extraction.

ALBERTA INNOVATES CLEAN RESOURCES

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PROJECT GOALS

- Field pilots of cooling tower blowdown treatment and produced water desalination, proving the technology and guiding scaled-up design and economics.
- Commercialization of ultra high recovery process water desalination technology through the construction of a demonstration plant.
- Validating the economic and environmental benefits of produced water desalination using operational data from the demonstration plant.

BENEFITS TO ALBERTA

- Water savings by recycling process water instead of withdrawing freshwater and disposing wastewater, thereby lowering freshwater demand and withdrawal from aquatic ecosystems. The first commercial unit, which will be in Alberta, will save (recycle) 220 million litres of water per year.
- Reduced Greenhouse gas (GHG) emissions where produced water is transported for disposal.
- Minimizing land disturbance from trucking wastewater to disposal wells.
- Development of a clean technology industry in Canada focused on Canadian water innovations proven in Alberta, resulting in first mover advantage and high skill clean tech jobs for Albertans.



2 Publications



3 Patents



15-20 HQP
Trained



150-250 Future
Jobs



1 New
Product/Service



200-300 kT/yr
Future GHGs

CURRENT STATUS

JUN 2022

The project is complete. Saltworks has successfully completed two field pilots, one treating enhanced oil recovery (EOR) produced water and one treating cooling tower blowdown at a fertilizer facility. All success metrics were met with up to 99% recovery and continuous 60 day operation. Due to economic factors, the commercial scale demonstration plant was not built, however, a commercial unit was installed and is operational at a petrochemical facility in Alberta (outside of this project).