

# CLEAN RESOURCES

## ENVIRONMENTAL INNOVATION

### WATER INNOVATION PROGRAM

## FUNDING DETAILS

## Continuous Sweetening of Sour Produced Water

The reuse of produced and flowback water from hydraulic fracturing operations is challenged by high concentrations of hydrogen sulfide. CSV Midstream is one of Alberta's premier Oil & Gas sector developers focused on Creating Shared Value in our community and sustainable ESG initiatives. Effective and economical treatment options for hydrogen sulfide is one focus which CSV Midstream has to enhance the competitiveness of Alberta's Oil & Gas sector and overall environmental performance of the industry, saving millions of m<sup>3</sup> of freshwater and lowering GHG emissions from operations. This project will take the lessons learned from a 1/200th scale water sweetening prototype and demonstrate a commercially viable continuous produced water sweetening technology.



**RECIPIENT:**  
CSV Midstream  
Solution Corp.



**PARTNERS:**  
CSV Midstream  
Solution Corp.



**TOTAL BUDGET:**  
\$2,064,497



**AI FUNDING:**  
\$342,818



**PROJECT DATES:**  
JAN 2021 –  
OCT 2021



**TIER**  
**PROJECT TRL:**  
Start: 8  
End: 10+



## APPLICATION

The target market for water sweetening are mid-sized producers of sour natural gas sites in the Montney Basin in Alberta, where a single fracking operation can consume 100,000 m<sup>3</sup> of water. Chemical treatments to remove hydrogen sulfide are expensive and often cause plugging when used for fracking. The introduction of this technology will help address a central water treatment challenge for the industry that will enable water reuse. Creating Shared Value is CSV's mission as responsible stewards of the environment and our community. This project serves to benefit Alberta's water conservation while increasing the sustainability and competitiveness of Alberta's Oil and Gas Sector.

## PROJECT GOALS

The main objectives of this project are:

- test individual components at a prototype scale;
- design and fabricate a commercial demonstration unit;
- commercially and technically prove the water sweetening technology in its final form at an operating facility;
- change industry attitudes related to produced water reuse as an economical and sustainable solution.

The deliverables are:

- a proven commercial scale unit capable of operating in a commercial setting and can sweetening sour water with a 3,000 mg/L H<sub>2</sub>S concentration to a level below 1 mg/L at a rate above 1,000 m<sup>3</sup>/day.

## BENEFITS TO ALBERTA

This project will benefit Alberta by

- lower emissions through reduced trucking, disposal pumping and gas pneumatic pipeline controls and pumps;
- increased oil and gas sector competitiveness through reduction in water management costs and an ability to meet future water regulatory requirements;
- added jobs through the fabrication of new equipment and the operators required to run the equipment.

This enables continued economic growth of Alberta's oil and gas sector and its supporting communities.



1 New Product/Service



31,000 T/yr Future  
GHGs Reduced



8 Project Jobs



24 Future Jobs

## CURRENT STATUS

### OCT 2021

The project successfully completed a commercial scale water sweetening demonstration at a gas compression facility near Grande Prairie using produced water separated from the raw gas inlet flows with an initial H<sub>2</sub>S concentration of ~2,000 mg/L. Wastewater was sweetened to below detection limits (0.01 mg/L H<sub>2</sub>S) without additional treatments. The treated waters were successfully utilized in a hydraulic fracture and were found to be suitable for reuse both with and without blending with freshwater.