



ALBERTA INNOVATES

AGRICULTURE & ENVIRONMENT

ENVIRONMENTAL INNOVATION

WATER INNOVATION PROGRAM

FUNDING
DETAILS

Study of Water Impacts of CCUS in Alberta

In Alberta, carbon capture, utilization, and storage (CCUS) is expected to play a crucial role in realizing collective net-zero ambitions by 2050. However, the potential water impacts of broad CCUS deployment are often overlooked. This project will examine these potential water impacts as well as the water-related risks which CCUS projects may face. Building on previous analysis of hydrogen’s water impacts, the project aims to understand freshwater availability and the water demands of CCUS projects across Alberta. By comparing anticipated CCUS water demands to available supply, the project will highlight watershed-specific challenges and potential trade-offs within the water-energy-food nexus context.



RECIPIENT:

**WaterSMART
Solutions Ltd.**



PARTNERS:

**Emissions
Reduction Alberta,
Suncor Energy,
Lafarge Canada**



TOTAL BUDGET:

\$105,000



AI FUNDING:

\$55,000



PROJECT DATES:

JUL 2024 –

JAN 2025

APPLICATION

This project will provide vital insights into the potential water impacts and risks associated with CCUS deployment in Alberta. Policy- and decision-makers, including project developers, are expected to use this work to inform policies, regulations, and investments which will enable the widespread deployment of CCUS in Alberta while balancing water-energy-food nexus tradeoffs. As Alberta deploys CCUS in pursuit of net-zero ambitions, it will be essential to better understand the sector’s potential impact on Alberta’s water resources, as well as how context-specific water availability may limit development.

Learn how albertainnovates.ca



ALBERTA INNOVATES

AGRICULTURE & ENVIRONMENT

ENVIRONMENTAL INNOVATION

WATER INNOVATION PROGRAM

PROJECT GOALS

Through a science-based, two-step approach, WaterSMART will assess and document the potential water impacts of CCUS development in Alberta, building on the work previously done in WaterSMART’s hydrogen study. First, the water available for new uses associated with CCUS throughout the province will be determined using hydrologic modelling, climate forecasts, and existing licence databases. Second, the water requirements of CCUS development will be assessed and compared to Alberta’s water availability through analysis of several scenarios. This will identify the water risks, limitations, and trade-offs of CCUS development to 2050 in key watersheds where CCUS interest is high and/or water availability is low. The work will also layer on the water impacts of CCUS with hydrogen production to understand the cumulative impacts of the energy transition.

BENEFITS TO ALBERTA

This work will enable water managers, policy makers, and project developers to better manage Alberta’s water resources, ensuring sustainable use amidst climate change pressures. Quantifying the water needs for CCUS technologies and assessing potential impacts in key watersheds will help manage the risks to CCUS deployment, balancing environmental and economic goals. Developing strategies for managing CCUS water risks and applying these findings to other sectors will support informed decision-making, fostering sustainable growth and positioning Alberta as a leader in innovative resource management.



2 Publications



1 New Policy Informed



1 Project Job



3 Future Jobs



5+ CCUS Project Investment Decisions Informed



5 – 20% Projected Improvement of overall water use efficiency

CURRENT STATUS

SEP 2024

The team has executed a project kickoff meeting with project funders and completed preliminary research on currently planned and active CCUS projects in Alberta. This foundational work has been crucial for understanding Alberta’s CCUS project and technology landscape and will inform how the water demands for various types of projects will be estimated. Next, the team will be assessing water availability throughout Alberta using hydrologic models, regulatory guidance, and licence data.