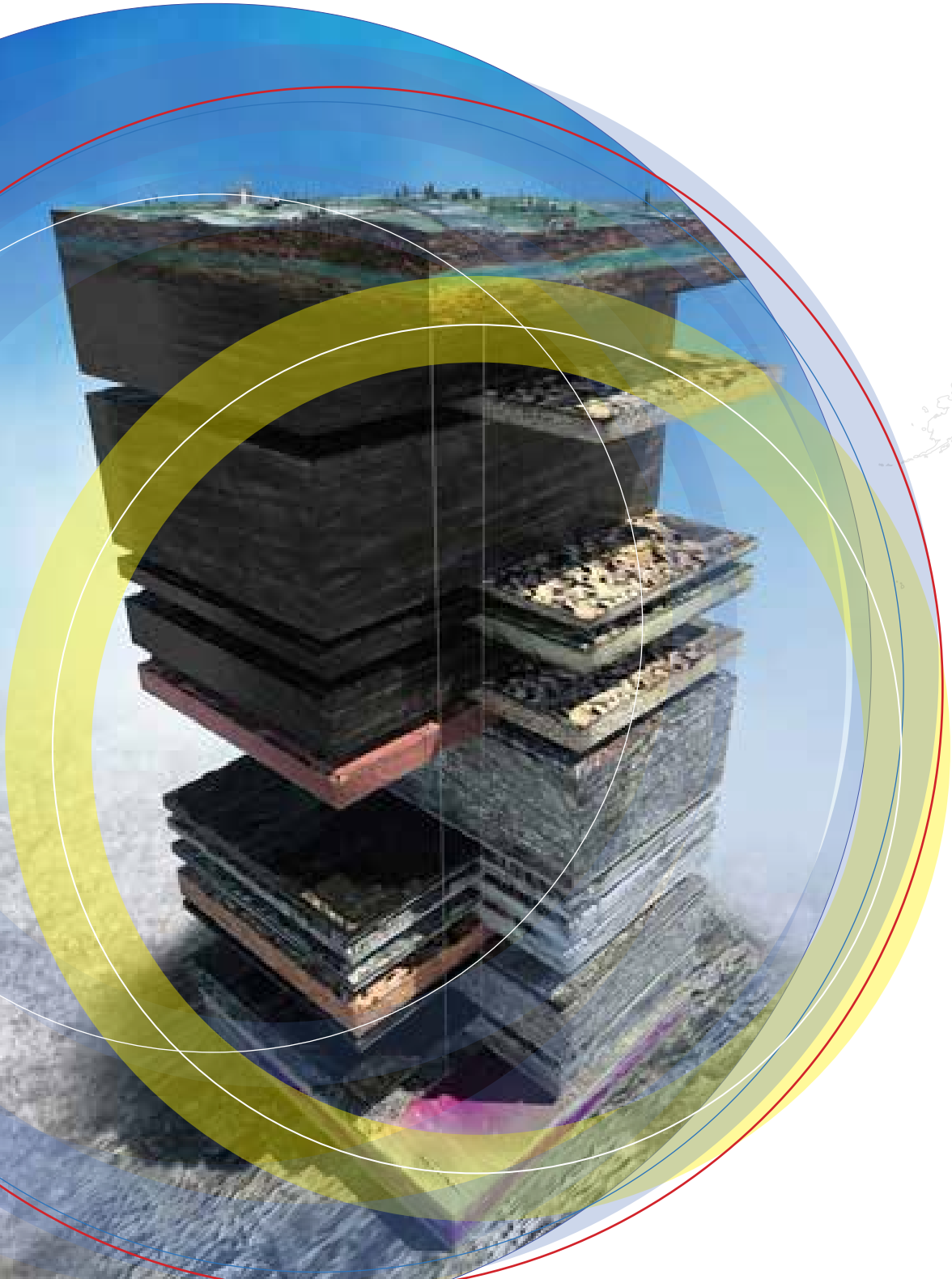

Aquistore®

AQUISTORE PROJECT

ANNUAL REPORT 2016

Next

CONTENT

- Passive Seismic
- Vertical Seismic Profile Using Distributed Acoustic Sensing & Geophones
- 4D Seismic with Permanent Array
- Crosswell
- Fluid Recovery System
- Borehole Gravity
- Accurately Controlled, Routinely Operated Signal System
- Pulsed Neutron Decay & Cross-Dipole Sonic Logging
- Magnetotelluric & Controlled Electromagnetic Source
- Coupled Reservoir Modelling / Seismic Simulation
- Inherent Tracers
- Groundwater & Soil Gas
- InSAR, GPS, and Tiltmeters

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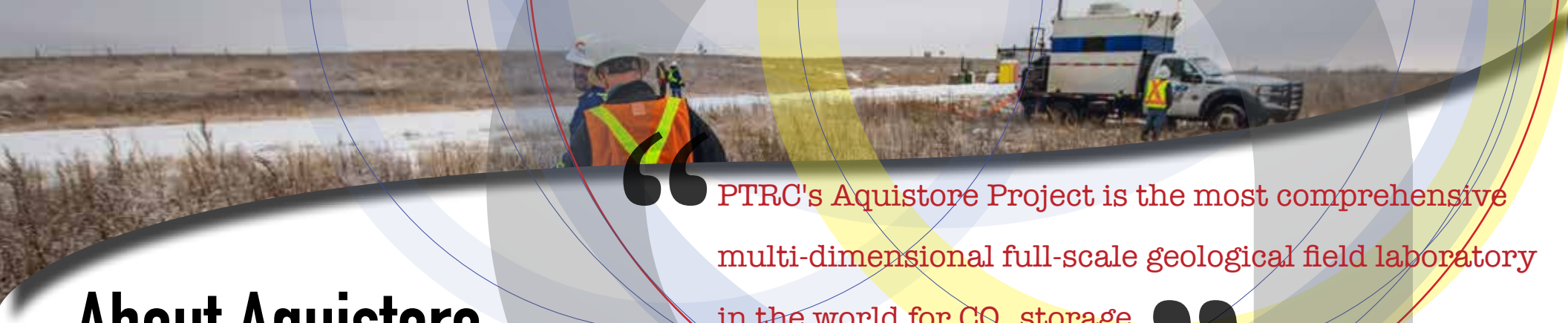

> PTRC's Aquistore Project is the most comprehensive multi-dimensional full-scale geological field laboratory in the world for CO_2 storage.

About Aquistore

PTRC's Aquistore Project is the most comprehensive multi-dimensional full-scale geological field laboratory in the world for CO_2 storage.

With leading edge technology, Aquistore is demonstrating the safe, reliable and economic advantages of injecting captured CO_2 into a 3400m deep saltwater-infused sandstone.

By optimizing CO_2 storage, Aquistore has the ingenuity to significantly advance clean technology and reduce greenhouse gas (GHG) emissions.

Aquistore Project Aims:

- to advance surface and subsurface monitoring technologies
- to advance understanding and answer uncertainties of longterm stored CO_2, globally
- to demonstrate storage as a safe and viable strategy to reduce CO_2 emissions
- to reduce operational costs for emerging commercial operations via Aquistore's integration in full chain CCS at an industrial scale

Aquistore's Initiation

PTRC's Aquistore is an independent research and monitoring project that was initiated by the Science, Engineering and Research Committee (SERC). With over a decade in expertise at the IEAGHG Weyburn-Midale CO_2 Monitoring & Storage Project (Weyburn Project), SERC has been well positioned to demonstrate the scientific and economic feasibility of long-term CO_2 storage.

Located near the community of Estevan, Saskatchewan, Aquistore, in 2012, drilled two state-of-the-art 'smart' wells - an injection and an observation well located 150m apart. An extensive risk assessment and public engagement process informed the project development.

Aquistore has been receiving intermittent CO_2 from SaskPower's Boundary Dam Capture facility since 2015. With over 30 monitoring technologies collecting real-time data, the project is making significant strides in the validation of predictive long-term modelling.

CONTENT

Back | Next

INTRODUCTION

Welcome to Aquistore's first Annual Report. Since the Project's initiation in 2011, Aquistore has been a continuous centre of learning and a key driver in accelerating the world's understanding of CO_2 storage. The Project has over 50 international publications. Two of Aquistore's many technical achievements since the commencement of injection in 2015, include: recording the impact of variable rates of injected CO_2 on both temperature and pressure fluctuations; and being the world's first project to seismically image a CO_2 plume through the use of a permanent array and DAS. Today with over 20 active projects currently underway in the field, we anticipate more firsts and milestones.

> "Aquistore has been a continuous centre of learning and a key driver in accelerating the world's understanding of CO_2 storage."

Role & Impact of Aquistore

Through the demonstration of conformance of CO_2 underground, analyzing how it reacts, assessing its predictability, and verifying it, scientists and engineers are adapting modelling to increase accuracy of predictions and understanding. Striving to continually advance innovation in clean technology with science-based facts, Aquistore is uniquely positioned to assist governments and regulators to reduce liabilities and meet targets for safer, cleaner, sustainable industries.

Application Beyond Energy Sector

Through the Aquistore Project, CO_2 storage is being proven as essential to help industries that have few other options to manage compliance-quality offsets of their GHG emissions. CO_2 storage is a viable option for steel manufacturing that is used to build wind turbines, for petroleum producers that make products for solar panels, for cement plants helping to build hydroelectric and nuclear power stations that in turn fuel electric vehicles, and for fertilizer plants that support the growth of food.

If you'd like to learn more about Aquistore, or collaborate with this dynamic project, contact us at info@ptrc.ca.

CONTENT

Back | Next

18 Years of CCUS Expertise

2000 to 2004

Baseline study to prove the suitability of the field for the long-term storage of injected CO_2.

- Site characterization
- Determination of storage capacity
- Recommendations on appropriate Measurement, Monitoring and Verification program (MMV)
- Risk assessment characterization

2005 to 2015

A ten year program of the Weyburn-Midale field to demonstrate CO_2-EOR and develop best practices for validating CO_2 geological storage in the deep subsurface.

- Enactment of MMV program, including seismic monitoring
- Comparison of site performance with computer predictions
- History matching of results with data from other projects
- Public assurance through ground water, soil gas monitoring
- Well integrity analyses and recommendations for future containment
- Risk assessment and mitigation strategy
- Public outreach and consultation best practices
- Amalgamating results from over 30 research partners worldwide

2005 to PRESENT

From well design through to measurement and monitoring, a project examining the safe storage of CO_2 in a deep saline geologic formation using the largest dedicated field laboratory in the world to test the latest technologies and methods for monitoring CO_2.

- Extensive comparison of different seismic technologies, some never before used for CO_2 detection
- Innovative new methods for investigation of ground deformation, ground water and soil gas monitoring
- Downhole fluid, temperature and pressure monitoring in the reservoir
- Determination of minimum data sets required for safe storage
- Ongoing partnership opportunities, with 30 research projects already in place
- Dissemination of results globally

CONTENT

Back | Next

Aquistore – Innovation Overview

A fundamental requirement for CO_2 storage is geological suitability of the site. It must be able to receive the CO_2 at the rate of its supply, have sufficient capacity to store the delivered CO_2 over the lifetime of the operations, and then must provide secure containment of the CO_2 for the long-term.

Site Characterization

In selecting the Aquistore site, well and core data were studied, multiple layers of petrophysical analyses were completed, and then reservoir simulations considering injection parameters were performed. These computer models create predictions that are crucial for comparison to data collected throughout the injection life of the well.

Learnings

Aquistore has been an ideal site for the injection of CO_2 because the Deadwood Formation met the requirements for long-term storage, such as suitable caprock above the injection zone and appropriate permeability and porosity in the reservoir to permit high volumes of CO_2 injection. Results from MMV continue to be correlated with predictive models to assure secure storage.

Capacity

CO_2 storage capacity is an estimate of the amount of CO_2 that can be stored in a reservoir. For Aquistore the interconnected pore volume of the reservoir rock and the nature of the formation fluids helped determine the target formation's capacity.

Learnings

Aquistore's Deadwood Formation extends across southern Saskatchewan and into the province of Alberta. The estimated volumes of CO_2 able to be stored in this formation are in the gigatonnes. As injection continues at Aquistore and data is collected on the location and lateral movement of the CO_2, the capacity of the near well area will be determined.

Injectivity

Injectivity is the ability of the target formation to receive fluids, in this case, dense-phase CO_2. For Aquistore an examination of core samples taken from depth in the reservoir followed by injectivity tests conducted once the wells were drilled confirmed the site's suitability.

Learnings

With an injection zone thickness of over 100 m, Aquistore has demonstrated that injection rates of up to 2100 tonnes of CO_2 per day can be accepted by the deadwood formation proving that the site has appropriate permeability and porosity.

Conformance

Conformance is the verification that CO_2 is behaving in a manner as predicted from computer modelling by comparing real-time injection data from the site with those models.

Learnings

For Aquistore the MMV at the site is primarily there to provide assurance of conformance. This includes ground-water and soil gas sampling, seismic imaging of the CO_2 plume and surrounding formation, and various other deep sub-surface and near surface MMV.

CONTENT

Back | Next

Aquistore's Technical Highlights

Aquistore's MMV program supports a risk management strategy that:

- measures for reduction of GHGs
- monitors for assurance of the integrity of CO_2 storage and
- verifies by comparing predictions to measured performance and adapting models.

The status, scope, and future focus of 15 (of the over 30) active surface and subsurface MMV technologies at Aquistore are highlighted below.

- Passive Seismic
- Vertical Seismic Profile Using Distributed Acoustic Sensing & Geophones
- 4D Seismic with Permanent Array
- Crosswell
- Fluid Recovery System
- Borehole Gravity
- Accurately Controlled, Routinely Operated Signal System
- Pulsed Neutron Decay & Cross-Dipole Sonic Logging
- Magnetotelluric & Controlled Electromagnetic Source
- Coupled Reservoir Modelling / Seismic Simulation
- Inherent Tracers
- Groundwater & Soil Gas
- InSAR, GPS, and Tiltmeters

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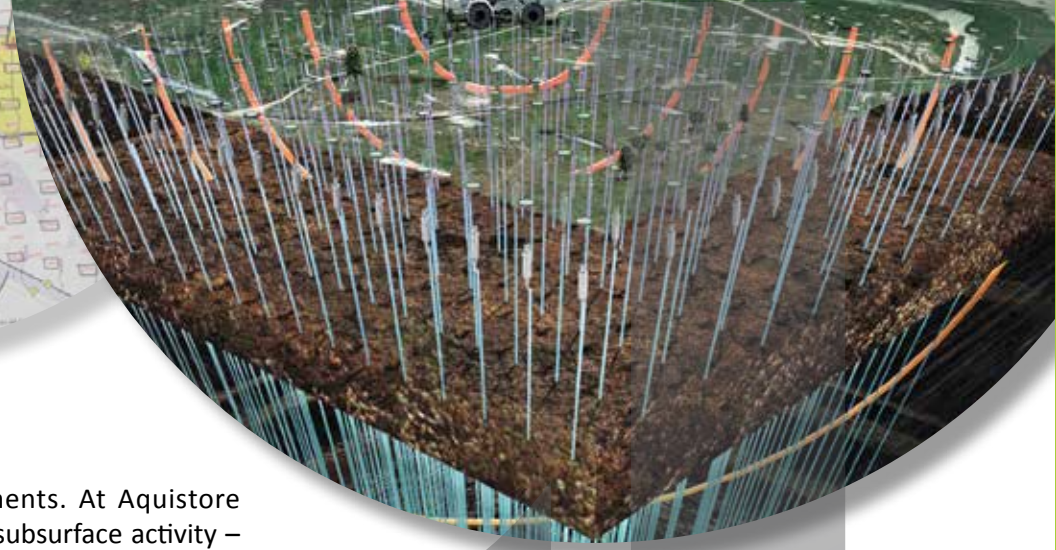
CONTENT

Back | Next



1.0 Passive Seismic

Scope of Work

Passive seismic is the detection of natural low frequency earth movements. At Aquistore continuous passive monitoring allows the project to differentiate sources of subsurface activity – whether they are naturally occurring, induced by the project, or sourced from other industrial processes. At Aquistore, passive seismic data is collected through technologies both at the surface and downhole. On the surface there are five broadband 3-component (3C) seismographs and a permanent 2.5 x 2.5 km grid seismic array of 630 geophones. There are a combination of 1C and 3C geophones of which a subset is used for continuous passive seismic monitoring. In the subsurface a geophone array was deployed for six months in the observation well.

Status

Passive seismic monitoring has been active prior to and during CO_2 injection. Data is recorded continuously and analyzed monthly through the Geological Survey of Canada. The downhole monitoring has been conducted by the University of Alberta. This permanent array aims to demonstrate a significantly more-cost-effective seismic acquisition method than other traditional 3D seismic. To date the passive seismic monitoring at Aquistore has not recorded any induced seismicity due to the injection of CO_2 although local and farther afield events (natural earthquakes) have been detected.

Further details about this program see annexed bibliography items # 43, 45

CONTENT

Back | Next

2.0 Vertical Seismic Profile Using Distributed Acoustic Sensing & Geophones

Scope of Work

Vertical seismic profiles (VSP) at Aquistore were recorded using both casing conveyed distributed acoustic sensing (DAS) and a downhole geophone array in the observation well. DAS data was acquired on two co-deployed fibers, one single-mode (SM) and one multi-mode (MM), simultaneously with a 60-level 3- component wireline geophone array. VSP measurements are used for correlation with surface seismic data to obtain higher resolution images.

Status

A baseline VSP survey was conducted in November 2013 using dynamite as the energy source. Following 36 kT of CO_2 injection, a second VSP survey was conducted in February 2016 (DAS and geophone) using both vibroseis and dynamite. A third survey in November 2016 (DAS only) using dynamite solely was conducted at 100kT. VSP research is jointly led by the Geological Survey of Canada and Lawrence Berkeley National Laboratory. Results of the baseline VSP survey showed the DAS data to be of sufficient quality for subsurface imaging. The two VSP surveys in 2016 showed excellent repeatability and detected changes in the reservoir.

Further details about this program see annexed bibliography items # 12, 16, 17

CONTENT

Back | Next

3.0 4D Seismic with Permanent Array

Scope of Work

Aquistore's permanent seismic array, composed of 630 geophones, is used as a time-lapse measurement tool to optimize the subsurface seismic image and its repeatability between the pairs of 3D seismic data sets. It is also being tested as a way to improve the cost effectiveness of CO_2 monitoring.

Status

In March 2012 the permanent array was installed (over a six square kilometre grid) and a baseline 3D seismic survey was conducted. In May and then again in November 2013, pre-CO_2 monitoring surveys were conducted thereby creating time-lapse 4D data sets. Further surveys were done post CO_2 injection at 36 kT (February 2016) and at 100 kT (November 2016). This research is led by the Geological Survey of Canada. Results to date indicate that the subsurface plume can be imaged with as little as 36 kT of CO_2 and shows how the plume has evolved from 36 kT to 100 kT of injected CO_2.

Further details about this program see annexed bibliography items # 1, 2, 3, 4, 6, 26, 18, 32, 31, 33, 43, 44, 45, 46, 49

Back | Next

4.0 Crosswell

Scope of Work

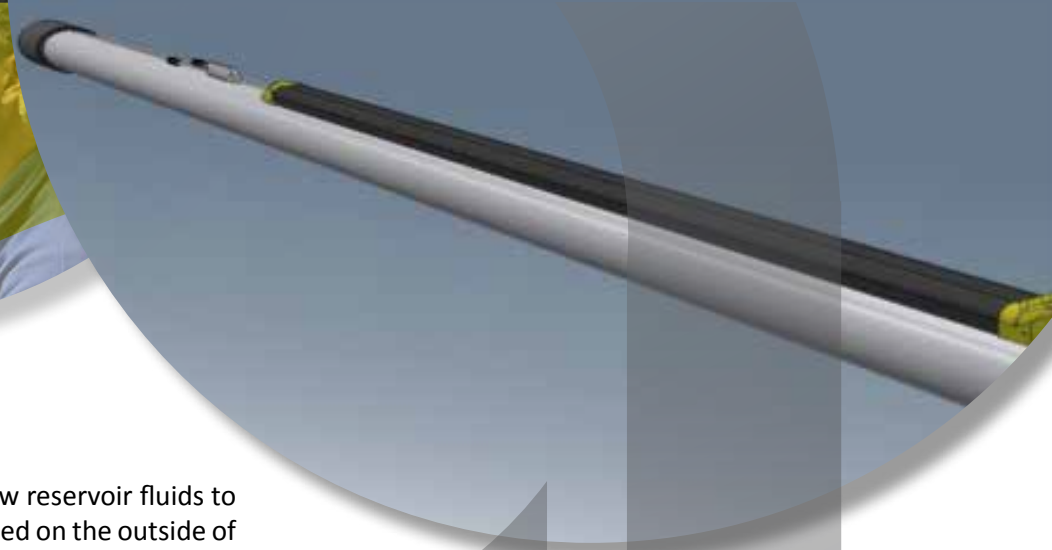
A crosswell seismic profile is used to produce a high resolution image of the reservoir formation in order to assess reservoir heterogeneity. At Aquistore, the observation well was used as the source well for the project, while the injection well was used to house the receiver array.

Status

A crosswell baseline survey was completed in 2013 (pre-injection) to provide a velocity image reflecting the area between the wells. It is anticipated that this survey could be used to compare future time-lapse differences in monitoring the CO_2 injection process.

CONTENT

Back | Next



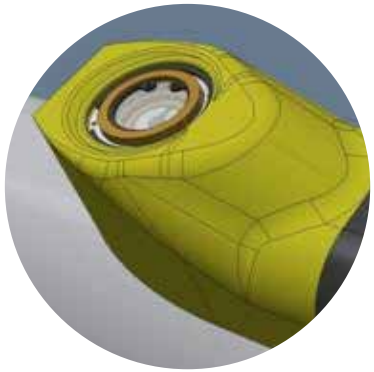
5.0 Fluid Recovery System

Scope of Work

A fluid recovery system (FRS) is a downhole device specifically designed to allow reservoir fluids to be sampled and brought to the surface. At Aquistore the FRS housing was installed on the outside of the casing of the observation well to a depth of 3227m. The FRS has allowed for the detection and validation of the injected CO_2 at the observation well.

Status

Four baseline flushing operations were conducted prior to CO_2 injection with five sampling operations conducted after CO_2 injection. The FRS research program is being conducted by the researchers at the University of Alberta. Fluids from the formation have been sampled and analyzed for evidence of the CO_2 plume evolution.



CONTENT

Back | Next

6.0 Borehole Gravity

Scope of Work

Borehole gravity (BHG) technology is integrated at Aquistore to detect the changes in the gravity field throughout the life of the project. BHG measurements are sensitive to the distribution of mass surrounding a well. The change in measured borehole gravity density will vary according to the density, shape and size of the CO_2 plume.

Status

Time lapse BHG surveys were conducted in Aquistore's observation well in 2013 and 2014 as pre-injection baseline and then in August 2015 following initial injections. Results of the August 2015 survey produced density formation between 3355m and 3100m that are suitable for use as a baseline survey for future borehole gravity monitoring of the Aquistore observation well.

CONTENT

Back | Next

7.0 Accurately Controlled, Routinely Operated Signal System

Scope of Work

The Accurately Controlled, Routinely Operated Signal System (ACROSS) utilizes centrifugal force to produce a continuous and repeatable seismic signal that can identify any small changes in seismic properties. Our time-lapse results showed high potential of a permanent monitoring system using ACROSS by presenting highly repeatable reflections and seasonal variations of near-surface velocity estimated from surface wave analysis.

Status

Baseline ACROSS data was conducted prior to injection of CO_2 and the system has operated regularly throughout the year as well as during each 3D/3C VSP survey. While operating, high repeatability of the ACROSS was confirmed with 1ms time-shift accuracy at target reflections. The source has also been able to demonstrate a time-lapse surface-wave analysis for the Aquistore CO_2 storage site with hourly variation of phase velocities monitored within a 1% accuracy in the frequency range of 4.5-6 Hz. This system is owned and operated by Japan Oil, Gas and Metals National Corporation (JOGMEC) researchers. Since the last survey in November 2016, the ACROSS source was relocated to improve the signal-to-noise ratio.

Further details about this program see annexed bibliography item # 27

CONTENT

Back | Next

8.0 Pulsed Neutron Decay & Cross-Dipole Sonic Logging

Scope of Work

Aquistore has deployed time-lapse Pulsed Neutron (PND) and cross-dipole sonic technology in the observation well to track CO_2 saturation changes in the reservoir. The aim of the PND analysis is to use the thermal decay porosity (TPHI) output from the PND logging data to produce interpretive products of CO_2 saturation (Sg) over time.

Status

Baseline logs were conducted for both technologies in advance of CO_2 injection. Between April 2015 and December 2016 Aquistore ran 16 PND and 7 sonic logs. Preliminary findings of time-lapse logs indicate arrival and saturation changes of CO_2 at the observation well.

CONTENT

Back | Next

9.0 Magnetotelluric & Controlled Electromagnetic Source

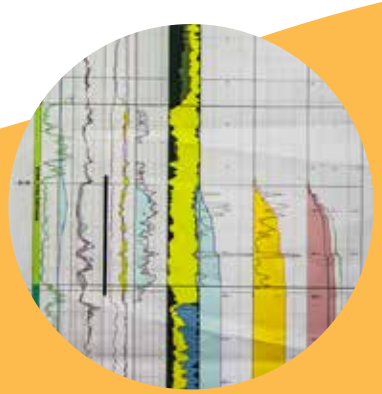
Scope of Work

Electromagnetic (EM) surveys are a non-invasive surface monitoring technique utilized at Aquistore to complement other geophysical methods tracking CO_2 underground. There are two types of EM surveys at Aquistore, passive-source magnetotelluric (MT) and controlled-source electromagnetic (CSEM) components.

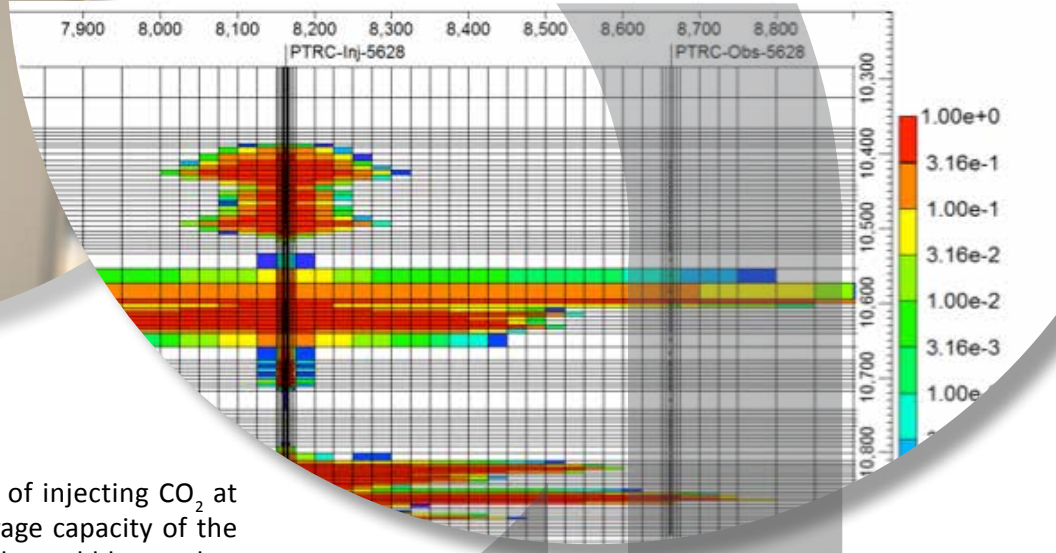
Status

Baseline EM surveys have included three pre-injection field campaigns (collection of MT and CSEM data) in August 2013 and November 2014 (MT only) with additional MT and CSEM collection post-injection in November 2015. EM research is jointly conducted by the University of Manitoba and Natural Resources Canada. Full processing has been run on the 2013 and 2014 MT datasets. The remaining data has undergone a preliminary characterization.

Further details about this program see annexed bibliography items # 11, 52



Back | Next



10.0 Coupled Reservoir Modelling / Seismic Simulation

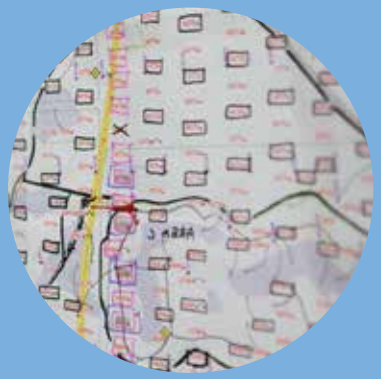
Scope of Work

Reservoir modelling is used to better understand the storage implications of injecting CO_2 at Aquistore. The model was developed to determine both the static CO_2 storage capacity of the reservoir as well as provide a basis to run detailed reservoir simulation, which would be used to determine injectivity, dynamic storage capacity and anticipated arrival time of the CO_2 at the observation well.

Status

Prior to any CO_2 injection a regional scale model was constructed to determine the regional stratigraphic reservoir and non-reservoir zones. Integration of the data from the regional model along with real time data from Aquistore helps to revise the model, thereby reducing uncertainty. The reservoir modelling program is conducted by researchers at the Energy & Environment Research Center, University of North Dakota. The project will be integrating geotechnical, geochemical, and geothermal behaviours in the modeling and simulation processes in order to determine the role of these variables in the overall CO_2 storage estimation.

Further details about this program see annexed bibliography items # 21, 22, 29, 40



CONTENT

Back | Next

11.0 Inherent Tracers

Scope of Work

The inherent natural isotopic and trace gas composition of captured CO_2 has the potential to provide powerful monitoring information for CCS. Anthropogenically produced CO_2 derived from fossil fuels has a distinct signature that can act as a fingerprint to help identify leakage and seepage from the CO_2 reservoir.

Status

CO_2 stable isotopes and noble gases were analyzed from the captured CO_2 stream and compared to the measured (where available) and estimated baseline values of relevant reservoirs (storage formation, shallow aquifers, surface water and atmosphere). Leading this research are the researchers at the University of Edinburgh and the University of Glasgow. At Aquistore, given the uniqueness of the field test site being located on a reclaimed coal mine, further work may be needed to uniquely distinguish the carbon isotope fingerprint between the anthropogenic CO_2 injected for storage and the naturally occurring, near-surface CO_2, in the unlikely event of a leak. In such a case, noble gases inherited from the storage formation will indicate a deep origin for the gases of any suspected leak.

Further details about this program see annexed bibliography item # 14

Images courtesy Stephanie Flude

CONTENT

Back | Next

12.0 Groundwater & Soil Gas

Scope of Work

Two components of the MMV program are the characterization of both shallow hydrogeology and soil gas. In order to understand concentrations and properties of the site, physical and chemical data are collected from an installed network of 21 dedicated ground water wells and 49 soil gas monitoring wells.

Status

A baseline hydrogeological and soil gas characterization of the site was undertaken in advance of injection of CO_2. This data has provided a framework in which to assess changes in both hydrogeological and soil gas, specifically related to the presence of CO_2. Groundwater sampling is conducted through researchers at the University of Alberta. Soil gas sampling is conducted by researchers from Saint Francis Xavier University. Results from both of these monitoring projects remain consistent with the baseline with the exception of changes associated with seasonal variations.

Further details about this program see annexed bibliography item # 24

CONTENT

Back | Next

13.0 InSAR, GPS, and Tiltmeters

Scope of Work

Interferometric Synthetic Aperture Radar (InSAR) and GPS are technologies that collect data by satellite to monitor earth surface deformation to assess whether there are changes attributable to CO_2 injection and storage. Tiltmeters are very sensitive instruments that are used to monitor extremely small changes in inclination of the ground surface resulting from subsurface activities, such as CO_2 injection.

Status

Prior to the injection of CO_2, baseline readings were established for each of tiltmeters, InSAR and GPS projects. The data from these technologies are remotely collected and downloaded. Data from tiltmeters is collected by researchers at the University of Alberta and researchers at Natural Resources Canada collect InSAR and GPS data. Results demonstrate uplift due to glacial rebound and not due to CO_2 injection and have highlighted the role of subtle surface environmental variables that influence the long term measurements required for CO_2 storage projects.

Further details about this program see annexed bibliography items # 9, 38, 39

Back | Next

2016 Dissemination and Communications

2016 Annual General Meeting in Ottawa Highlights First Year of Full MMV Results

A special keynote address from Dr. Julio Friedmann of the USDOE's Lawrence Livermore National Laboratory detailed Aquistore's significance as a project providing crucial data well beyond the hydrocarbon industry. The AGM's 14 presentations and a poster session allowed researchers and sponsors to share findings, network, and expand project data integration.

Aquistore Agreements Reach All Corners of the Globe

Aquistore extended its network of scientific research and collaboration around the world in 2016, with the signing of MOUs and knowledge sharing agreements with the South African National Energy Development Institute, South African Centre for CCS, Australian National Low Emissions Coal R&D Program, the CO_2 Commonwealth Research Centre in Melbourne, and the Illinois State Geological Survey. With existing partnerships and agreements in Japan, the United Kingdom, and Germany, Aquistore continues to span the globe.

13th Greenhouse Gas Technology Conference (GHGT-13)

Aquistore had a significant presence at the biennial GHGT Conference in Lausanne, Switzerland on November 10-14th 2016. Five presentations and several posters were presented over the four days. Fifteen Aquistore researchers networked at the event attended by over 1000 of the world's leading experts on CCS.

Ongoing Public Engagement and Site Visits

Aquistore has hosted three public open houses in the Estevan area since the start of the project. Some of the many site tours in 2016 were made by Canada's Minister of Natural Resources, the Honourable Jim Carr, by visiting United States congressmen and state officials, and by over 50 international and local university students as part of the IEAGHG's Carbon Capture and Storage Summer School.

52 Peer Reviewed Papers and Presentations

Aquistore researchers continue to publish widely in peer-reviewed journals and conference proceedings, including such journals as Economic and Environmental Geology, Geophysical Journal International, the International Journal of Greenhouse Gas Control, and Geophysics. Presentations have been made at no fewer than nine conferences in Europe and North America.

CONTENT

Back | Next

Collaborations

Investment in Results (Project Sponsors)

- SaskEnergy
- OYO-RITE (Oyo Corporation & Research Institute of Innovative Technology for the Earth) – Japan
- Sustainable Development Technology Canada
- Enbridge
- SaskPower
- Saskatchewan Ministry of the Environment – Go Green Fund
- Deep Earth Energy Production (DEEP)
- Consumers Cooperative Refineries Ltd. (CCRL)
- Korean National Oil Company
- Australian National Low Emissions Coal R&D (ANLEC)
- SaskPower
- Natural Resources Canada – EcoETI Fund
- Mosaic

Doing the Work (Researchers)

- Energy and Environmental Research Centre (EERC)
- GeoForschungsZentrum (GFZ) – German National Earth Science Research Centre
- Japan Oil, Gas and Metals National Corporation (JOGMEC)
- Geological Survey of Canada
- Carbon Capture Project (CCP4)
- Lawrence Berkley National Labs
- GroundMetrics
- Scottish Carbon Capture and Storage (SCCS)
- United Kingdom Carbon Capture and Storage (UKCCS)
- Schlumberger Carbon Services
- Weatherford
- Chevron Corporation
- University of Alberta
- University of Saskatchewan
- St. Francis Xavier University
- University of Bristol
- University of Strathclyde
- University of Manitoba
- Optasense
- Silixa

Knowledge Sharing and Capacity Building

- South African National Energy Development Institute and the South African Centre for Carbon Capture and Storage (SANEDI, SACCCS)
- Global Carbon Capture and Storage Institute
- CO_2CRC (Australia)
- Illinois State Geological Survey (Decatur Project)
- University of Edinburgh
- PCOR
- Midwest Geological Sequestration Consortium
- CSIRO

CONTENT

Back | Next

Annex pg.1

Aquistore Peer Reviewed Articles and Conference Proceedings

1. Birnie C, Chambers K, Angus D, Stork AL. (2016). Effect of noise on microseismic detection and imaging procedures using ICOVA statistical noise modelling method. Presented at 86th SEG International Exposition and Annual Meeting. In: SEG Technical Program Expanded Abstracts 2016:2622-2626.

2. Birnie C, Chambers K, Angus D. (2017). Seismic arrival enhancement through the use of noise whitening. Physics of the Earth and Planetary Interiors. Volume 262:80-89.

3. Birnie C, Chambers K, Angus DA, Stork AL. (2016). Analysis and models of pre-injection surface seismic array noise recorded at the Aquistore carbon storage site. Geophysical Journal International 206(2):ggw203.

4. Birnie CE, Stork A, Roach L, Rost S. (2015). Spatial temporal properties of noise from the Aquistore CCS pilot permanent surface array. 3rd Sustainable Earth Sciences Conference and Exhibition: Use of the Sub-Surface to Serve the Energy Transition. European Association of Geoscientists and Engineers, EAGE, 2015:161-165.

5. Black A, Hare J, Macqueen J. (2016). Borehole gravity monitoring in the Aquistore CO_2 sequestration well. Presented at 86th SEG Annual Meeting Technical Program. SEG Technical Program Expanded Abstracts 2016:768-772.

6. Cheong S, Kim B-Y, Bae J. (2013). Baseline survey seismic attribute analysis for CO_2 monitoring on the Aquistore CCS project, Canada. Economic and Environmental Geology 46 (6):485-494.

7. Cheong S, Kim B-Y, Shinn YJ. Park M-H. (2014). Aquifer characterization using seismic data on the Aquistore CCS project, Canada. Economic and Environmental Geology 47 (6):625-633

8. Cocker JD, Herkenhoff EF, Craven ME, Strudley A. (2014). Simultaneous acquisition of DAS and conventional down-hole geophone array at Aquistore, Canada. Presented at: 76th EAGE Conference and Exhibition. Amsterdam, Netherlands, 16-19 June 2014.

9. Czarnogorska M, Samsonov S, White DJ. (2014). Ground deformation monitoring using radarsat-2 Dinsar-MSBAS at the Aquistore CO_2 storage site in Saskatchewan, Canada. International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences. Vol XL-1.:81-87.

10. Czarnogorska M, Samsonov SV, White DJ. (2016). Airborne and space borne remote sensing characterization for Aquistore carbon capture and storage site. Canadian Journal of Remote Sensing 42(3):274-291.

11. Daley TM, Smith TJ, Beyer JH, LaBrecque D. (2016). Borehole EM monitoring at Aquistore: Final report to the Carbon Capture Project (CCP). CCP and supported by Lawrence Berkeley National Laboratory and USDOE contract DE-AC02-05CH11231. Report Number: LBNL-6238E.

12. Daley TM, White D, Miller DE, Robertson M, Freifeld BM, Herkenhoff F, Cocker J. (2014). Simultaneous acquisition of distributed acoustic sensing VSP with multi-mode and single-mode fiber optic cables and 3-component geophones at the Aquistore CO_2 storage site. Presented at: SEG Annual General Meeting, Denver, Colorado. Conference proceedings:5014-5018.

Back to CONTENT | Back | Next

Annex pg. 2

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Back to CONTENT | Back | Next

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Back to CONTENT | Back | Next

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Back to CONTENT | Back | Next

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Back to CONTENT | Back

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