Pathways Alliance

Pathways CO_2 Transportation Network and Storage Hub – Project Overview

Pathways Alliance is made up of Canadian Natural, Cenovus, ConocoPhillips Canada, Imperial, MEG Energy and Suncor Energy, representing about 95% of Canada's oil sands production.

Working together for Canada's energy future

Our country has long benefitted from a strong energy sector. The sector supports Canada's high standard of living by creating thousands of jobs and generating critical revenue for governments, which helps fund essential services including health care, education and roads.

To ensure our industry can continue to provide these benefits for decades to come, we're focused on advancing environmental innovation and projects, including carbon capture and storage.

PREPARED BY

Canadian Natural

ON BEHALF OF

Pathways Alliance

Introduction: The Project

We're proposing a project that, when operational, will transport and store captured CO_2 from multiple oil sands facilities in northeast Alberta.

The proposed Pathways CO_2 Transportation Network and Storage Hub (the "Project") is critical infrastructure. It will provide necessary transportation and storage infrastructure for CO_2 captured from oil sands facilities.

Canadian Natural is the proponent for the Project on behalf of Pathways Alliance members. Each individual oil sands operator will manage carbon capture activities at its own facilities. For this reason, carbon capture facilities aren't included in the Project.

Based on extensive experience, Pathways Alliance members recognize the importance of working collaboratively with Indigenous groups, local landowners and other interested parties in the region.

This Project Overview has been prepared to share clear and concise information regarding the proposed Project in order to:

- Enhance the reviewers' understanding of the Project, in order to form a basis for consultation and engagement.
- Promote dialogue throughout the consultation and engagement process for the proposed Project.
- Support Pathways Alliance and reviewers in jointly identifying concerns and potential impacts in relation to the proposed Project, and options for resolving or mitigating concerns and potential impacts.
- Support Pathways Alliance and reviewers in jointly exploring potential opportunities and benefits.

This Project Overview is intended to be the basis for the consultation and engagement process for the Project.

Filing of regulatory submissions for the CO_2 Transportation Network began at the end of the first quarter of 2024. With advanced engineering and evaluation work underway, Canadian Natural is planning public information sessions. These sessions will be for communities and Indigenous groups in the area, and are currently planned to be held in late 2025 and into 2026.

What is Carbon Capture and Storage (CCS)

There are three primary elements to CCS:

1. Capture of CO_2 at the source.
2. Transportation of CO_2 via pipeline.
3. CO_2 storage in deep geologic formations underground.

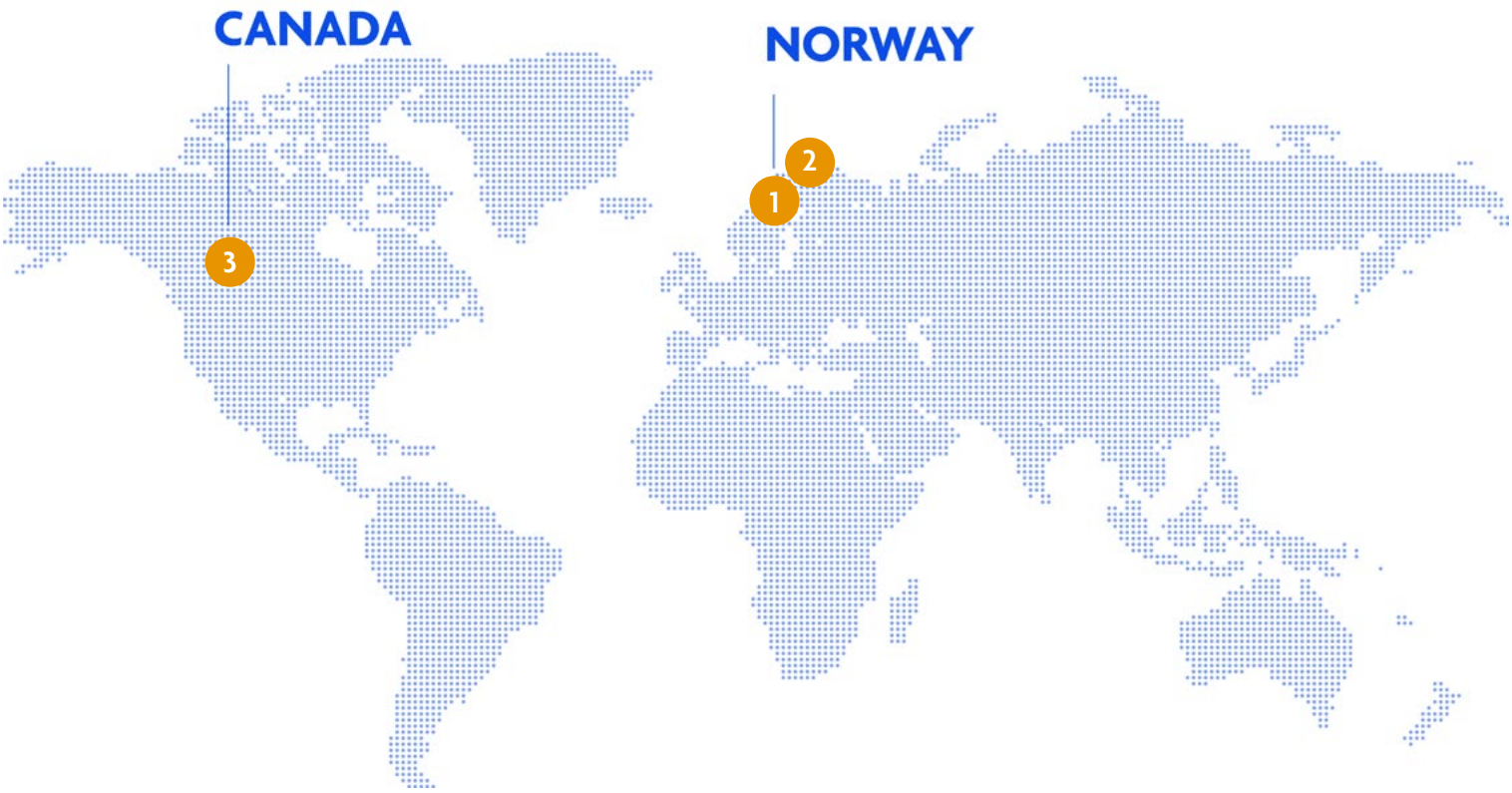
The Project focuses on the transportation and storage of CO_2. The capture part of the process will be undertaken independently by each individual oil sands operator at its own oil sands facility.

CCS technology around the world

CCS is a technology used around the world, including here in Canada. The first large-scale CCS project, the Terrell natural gas processing facility (TNG Project),[1] was established in 1972 and remains the oldest operating industrial CCS project in the world.* Captured CO_2 was transported to the Sharon Ridge oil field in the Permian oil basin for enhanced oil recovery (EOR) and storage. Since then, CCS has expanded globally. According to a 2024 report by the Global CCS Institute,[2] there are more than 50 commercial carbon capture and storage projects in operation, 44 under construction and more than 500 in development.

[1,2] "Global Status of CCS 2024: Collaborating for a Net-Zero Future." *Global CCS Institute*, 2024. GlobalCCSInstitute.com

* The TNG Project, located in Terrell, Texas, employs capture technology to separate CO_2 from produced natural gas.



Other successful CCS projects around the world include:

1. **The Equinor Sleipner Project** in Norway, which began operation in 1996 and has safely stored more than 20 million tonnes of CO_2 in the Utsira aquifer.[3]
2. **The Equinor Snøhvit project**, located in Norway, is an integrated offshore liquefied natural gas (LNG) project, with gas processing onshore and CO_2 returned offshore to be injected in the Snøhvit field 2,600 metres beneath the seabed. The project was commissioned in 2007 and began injection in 2008.[4]
3. **The Quest Project** near Edmonton, Alberta, is one of the operating CCS projects in Canada (Canadian Natural is a 90% owner of the Quest project).* It takes CO_2 from the Scotford Upgrader's hydrogen manufacturing units and injects it approximately 2,000 m below the surface in the Basal Cambrian Sandstone (BCS).** The project began capturing and storing CO_2 in 2015 and has surpassed nine million tonnes of injected CO_2 since project start-up.[5]

The success of CCS can be seen in the establishment of large-scale projects around the world, which have demonstrated the technical feasibility and efficiency of capturing and storing CO_2.[6]

[3] "Meeting Dual Challenge: A Roadmap to At-Scale Deployment of Carbon Capture, Use and Storage." *National Petroleum Council*, December 12, 2019.
[4] Loria, Patricia and Bright, Matthew. "Lessons Captured from 50 Years of CCS Projects." *The Electricity Journal*, August–September 2021.
[5] "Quest 2023 Annual Status Report." *Alberta Energy Regulator*, 2023.
[6] "Global Status of CCS 2024: Collaborating for a Net-Zero Future." *Global CCS Institute*, 2024. GlobalCCSInstitute.com

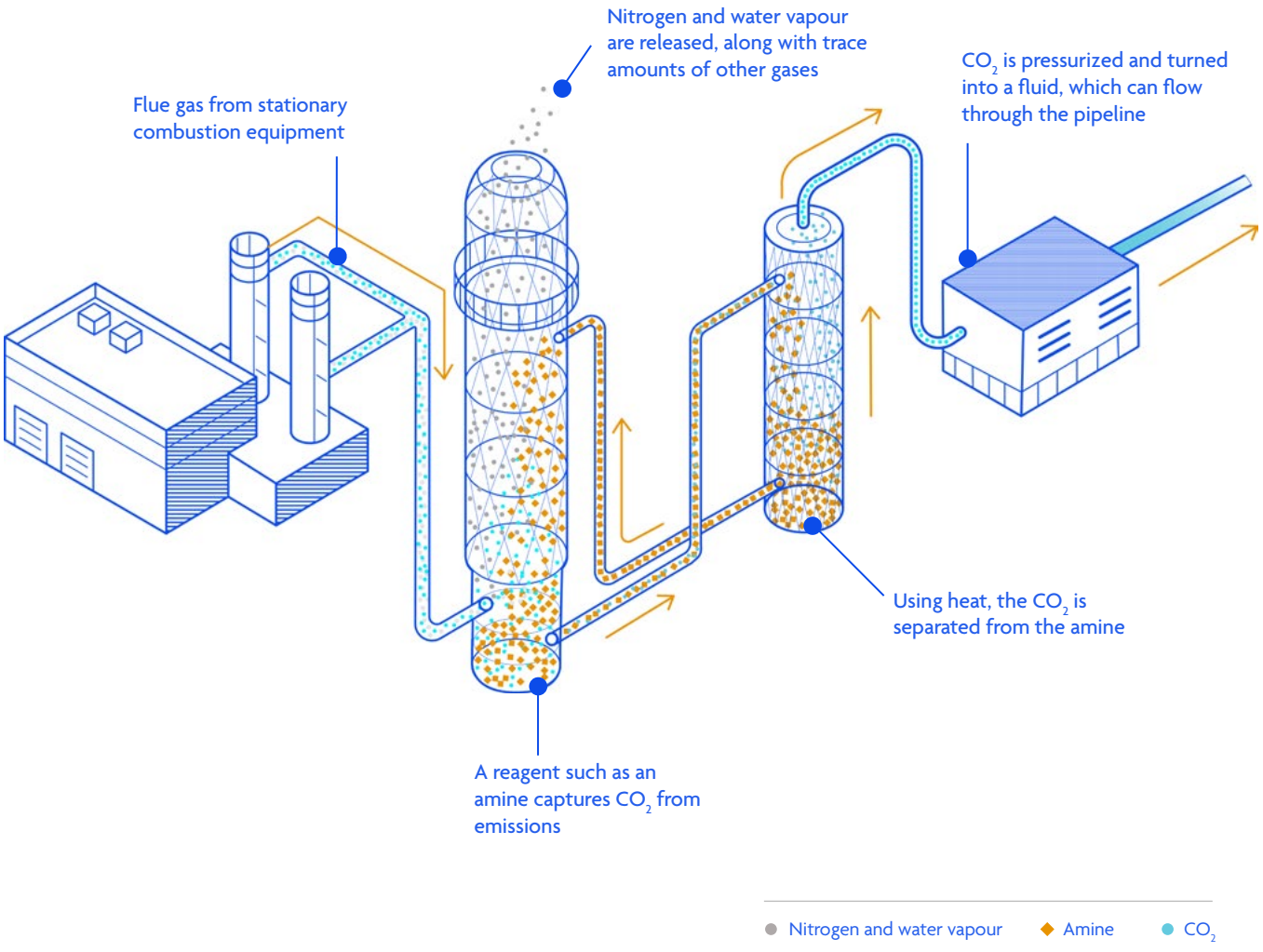
* At the time of publishing, Canadian Natural and Shell are transacting an asset swap that will result in Canadian Natural ownership in Quest shifting to 80% pending closure. Find more information at CNRL.com.
** The BCS is the same zone as the proposed Project.

Carbon Capture and Storage

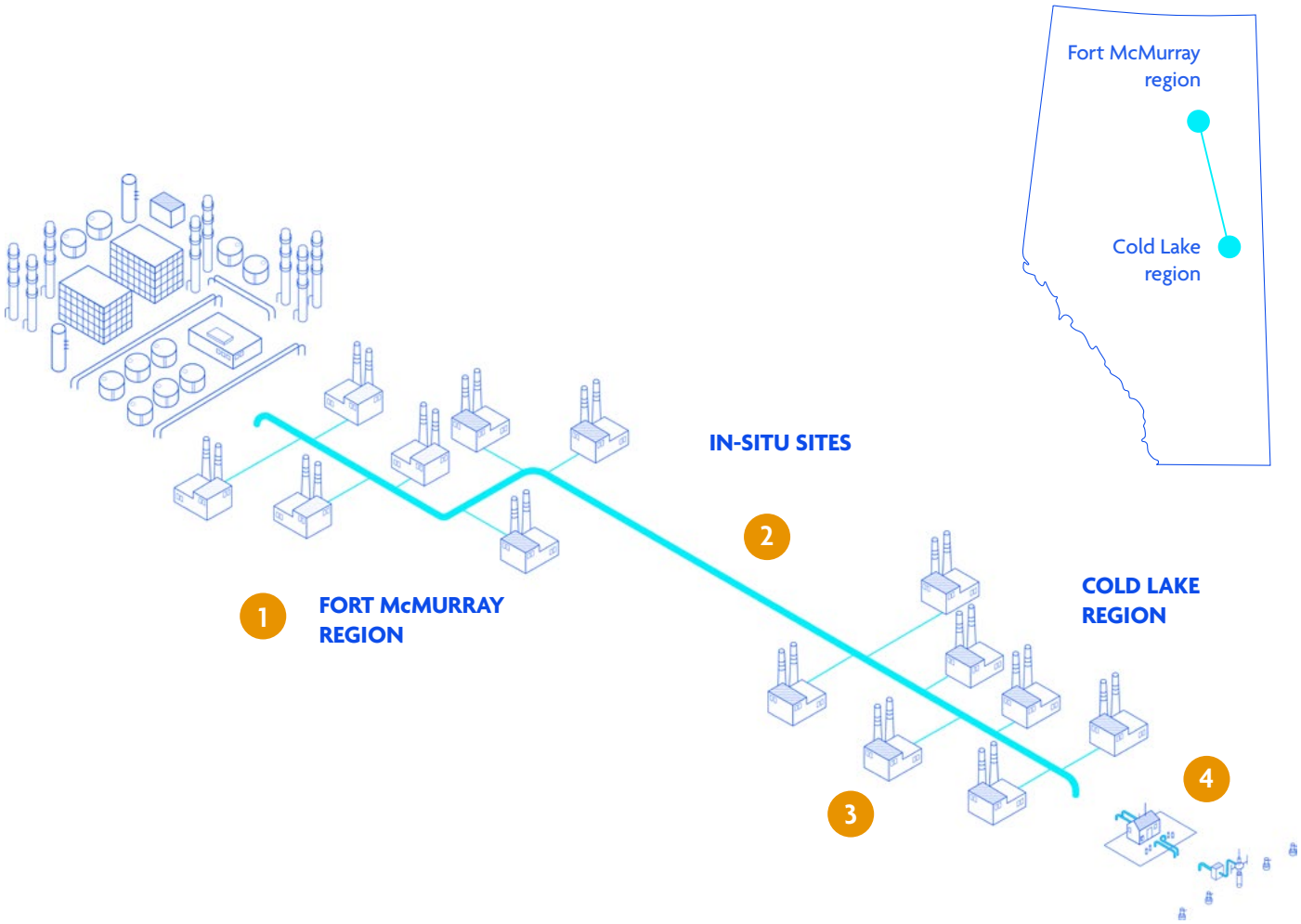
Capture

The proposed Project doesn't include CO_2 capture. It's a CO_2 Transportation Network and Storage Hub that will connect to future CO_2 capture facilities. Pathways Alliance members are proposing to install CO_2 capture facilities at their existing oil sands facilities to collect flue gas[7] from stationary combustion equipment (e.g. boilers, steam generators) that produce CO_2 emissions. Flue gas containing CO_2 would be diverted into vessels where a reagent, such as amine, would be used to separate and capture the CO_2.

Amine is commonly used in gas separation processes, such as when hydrogen sulphide (H_2S) is removed from natural gas. After separation, the captured CO_2 would be compressed and converted to a fluid. The fluid would be transported to the oil sands facility boundary before connecting to the proposed Pathways CO_2 Transportation Network.



[7] Flue natural gas exiting to the atmosphere via a stack is primarily nitrogen (67–72%), water (18–20%) and CO_2 (8–10%) for gas-fired steam boilers.



Transportation

The proposed Pathways CO_2 Transportation Network would begin at the boundary of each of the oil sands facilities. The CO_2 would then move through a series of pipelines (i.e., CO_2 Transportation Network) to the proposed Pathways Storage Hub.

To minimize the area of new land disturbance required, the proposed Pathways CO_2 Transportation Network parallels rights-of-way (ROW) to the greatest extent possible.

1. Oil sands upgraders, mining and in-situ area
2. 650+ km CO_2 transportation network
3. Oil sands in-situ recovery area
4. Storage hub

Emission source

CO_2 transportation network

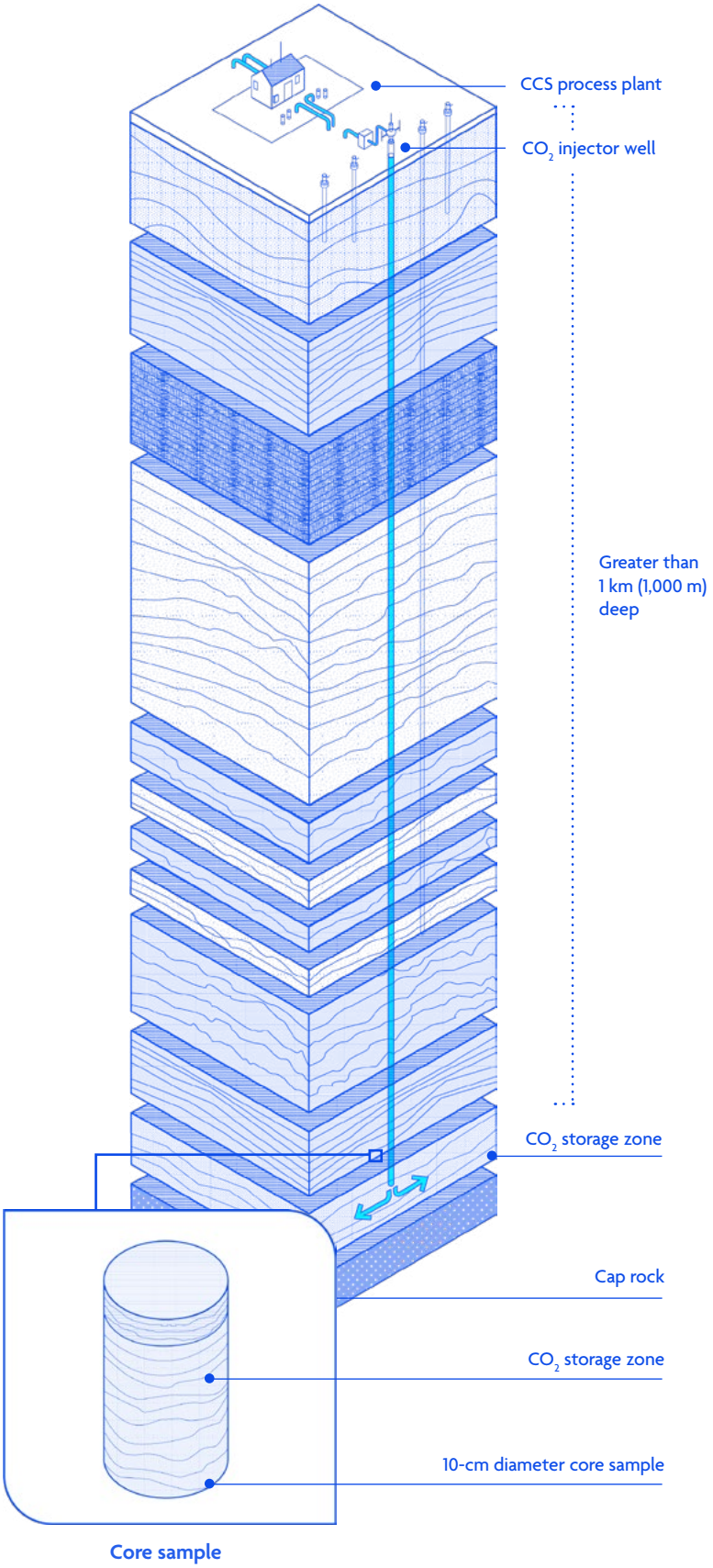
Storage

Once it arrives at the proposed Pathways Storage Hub, CO_2 would move from the Pathways CO_2 Transportation Network to wells, where the CO_2 would then be injected deep underground.

The geological location of the proposed Pathways CO_2 Storage Hub is the Basal Cambrian Sandstone (BCS) formation, located between 1,000 and 2,000 m (one and two kilometres) below the surface. This sandstone formation has geological properties suitable for containing CO_2 deep underground. Each Pathways CO_2 injection well would be drilled and completed to inject CO_2 into the BCS. The BCS is a porous rock (sandstone) that contains small spaces, similar to a sponge, that can be filled with CO_2. Above the porous rock lie thick layers of salt rock formations. Unlike the BCS, these salt rock formations are not porous, meaning fluids cannot pass through them. Referred to as the cap rock, the salt rock formations act as an impermeable barrier—a natural seal to keep the stored CO_2 from migrating upwards.

CO_2 storage would occur more than 1,000 m below ground. A site-specific Monitoring, Measurement and Verification (MMV) Plan and Closure Plan would be developed, submitted for approval by the Alberta Energy Regulator (AER), and implemented before CO_2 is injected. These plans would remain in place during all stages of the project, and would be updated regularly.

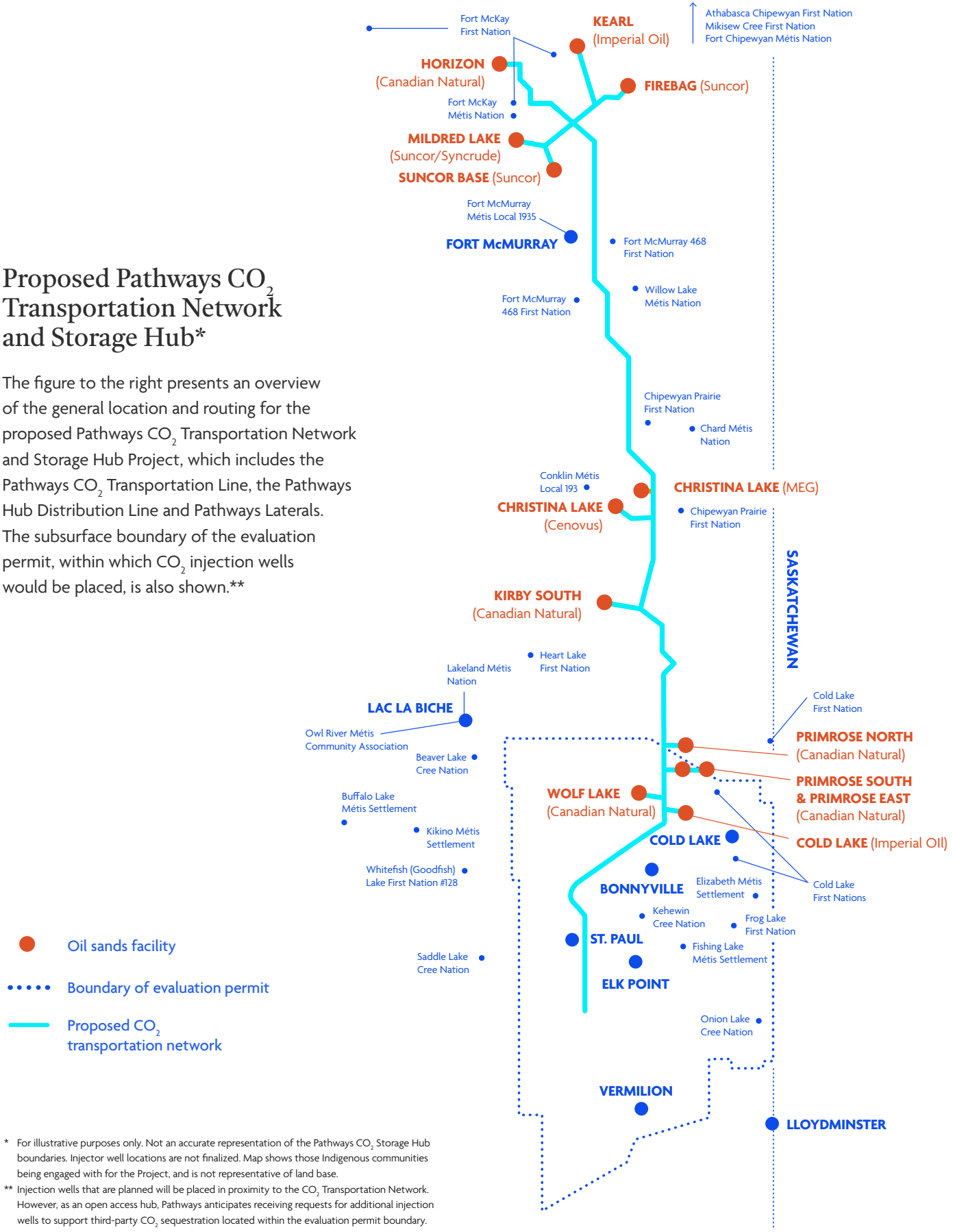
The geologic cross-section, including the subsurface formation where CO_2 would be injected and sequestered, is shown to the right.



ABOVE: These multiple overlying layers of impermeable rock formations act as a natural seal. For illustrative purposes only, not to scale.

Proposed Pathways CO_2 Transportation Network and Storage Hub*

The figure to the right presents an overview of the general location and routing for the proposed Pathways CO_2 Transportation Network and Storage Hub Project, which includes the Pathways CO_2 Transportation Line, the Pathways Hub Distribution Line and Pathways Laterals. The subsurface boundary of the evaluation permit, within which CO_2 injection wells would be placed, is also shown.**



* For illustrative purposes only. Not an accurate representation of the Pathways CO_2 Storage Hub boundaries. Injector well locations are not finalized. Map shows those Indigenous communities being engaged with for the Project, and is not representative of land base.

** Injection wells that are planned will be placed in proximity to the CO_2 Transportation Network. However, as an open access hub, Pathways anticipates receiving requests for additional injection wells to support third-party CO_2 sequestration located within the evaluation permit boundary.

The routing and development of the proposed Pathways CO_2 Transportation Network was influenced by considering the following criteria:

- Safety
- Parallel existing right-of-ways to reduce new surface-disturbance footprint
- Environmental features
- Known historical or paleontological sites
- Regulatory requirements
- Engineering design
- Construction constraints

Adjustments to the proposed CO_2 Transportation Network may be made as engineering and design work progresses and important input is received from Indigenous groups, local landowners and other interested parties. Feedback will be carefully considered and incorporated to the extent reasonably possible.

Project changes

Changes to a project of this scale and scope are not only possible, but likely. Our commitment is to keep Indigenous groups, local landowners and other interested parties apprised of Project updates, including opportunities to meaningfully discuss potential concerns about proposed changes to the Project.

Project scope

An overview of the proposed Pathways CO_2 Transportation Network and Storage Hub Project, and the associated surface and subsurface equipment and infrastructure, is described below.

Proposed Pathways CO_2 Transportation Network

The proposed Pathways CO_2 Transportation Network would include:

Pathways Laterals
These 16 proposed pipeline segments would connect carbon capture facilities at oil sands sites in the Fort McMurray, Christina Lake and Cold Lake regions to the Pathways CO_2 Transportation Line.

- Diameter ranges from 8–20 inches (pending CO_2 volumes)
- Length ranges from 1–49 km

Pathways CO_2 Transportation Line
A proposed 16- to 30-inch diameter pipeline would connect Pathways Laterals at multiple oil sands facilities to the Pathways Hub Distribution Line, and farther to the Pathways Storage Hub.

- Approximately 330 km long

Pathways Hub Distribution Line
A proposed 16- to 30-inch diameter pipeline would connect the Pathways CO_2 Transportation Line to the Pathways Storage Hub.

- Approximately 120 km long

Pathways Storage Hub surface infrastructure

This infrastructure would consist of:

Injection well sites
These sites are anticipated to have a surface footprint of approximately 130 m by 130 m for the following equipment installed at surface:

- Meter station
- Well head
- Communications and control systems
- Emergency shutdown systems
- Equipment to support subsurface monitoring and surveillance of the injected CO_2, as per the requirement of the Measurement, Monitoring and Verification (MMV) Plan

Subsurface evaluation is currently underway to assess the subsurface characteristics of the BCS, in order to determine the number of injection well sites required to support a range of injection volumes. At this time, the proposed Project anticipates up to 19 injection wells, most of which will be on private land.

Associated hub piping
These are pipeline segments (tie-ins) that would connect the Pathways Hub Distribution Line to CO_2 injection well sites within the Pathways Storage Hub.

The Government of Alberta requires sequestration hubs to have open access to third-party CO_2 emitters who wish to sequester CO_2. As a result, Pathways anticipates receiving requests for additional injection wells to support third-party CO_2 sequestration.

Did you know?
Alberta is home to two established, commercial-scale CCS networks. Quest Carbon Capture and Storage has been operational since 2015, and the 240-km Alberta Carbon Trunk Line began transporting CO_2 in 2020.[7]

[7] "Global Status of CCS 2024: Collaborating for a Net-Zero Future." *Global CCS Institute*, 2024. GlobalCCSInstitute.com

Proposed Pathways Storage Hub subsurface operation and performance monitoring

Canadian Natural will engage with Indigenous groups, local landowners and other interested parties on storage activities. The input received will be considered carefully and incorporated into the Measurement, Monitoring and Verification (MMV) and Closure Plans, to the extent reasonably possible.

These plans are required to be developed and regulated under AER Directive 065 and must be approved by the regulator prior to commencing CO_2 injection. These plans are required to remain in place during all stages of development and operation and must be regularly updated.

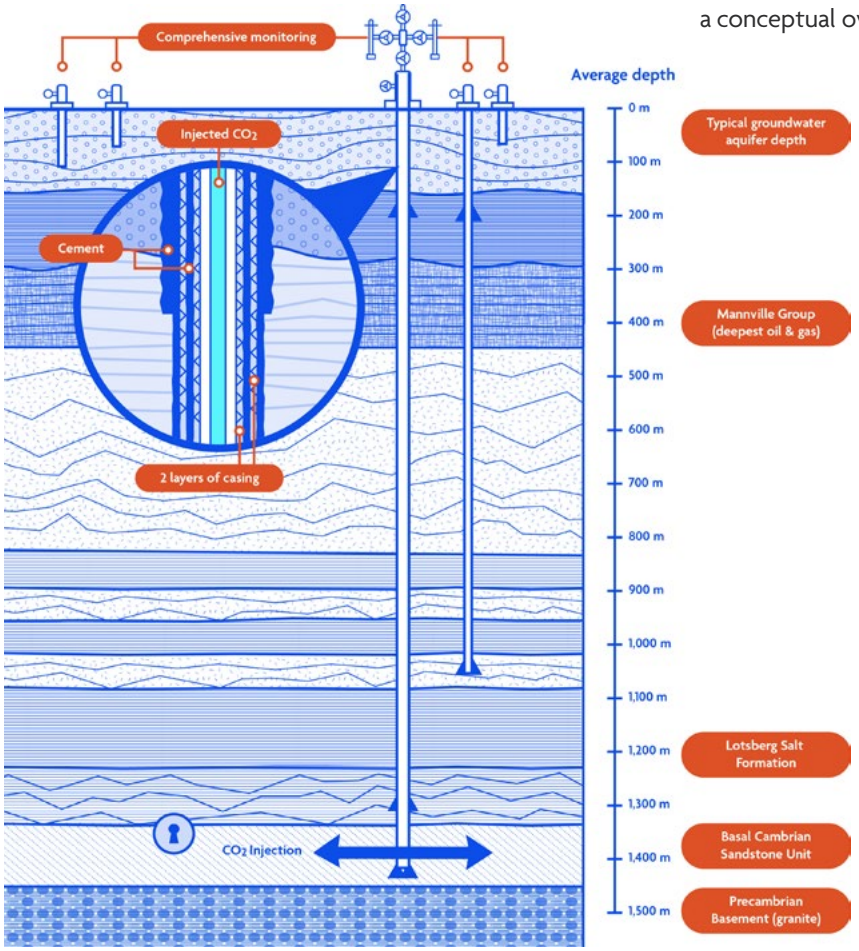
MMV Plan

An MMV plan requires the installation of monitoring equipment to track and monitor CO_2 in the BCS once it's injected. A groundwater monitoring program would be implemented for the protection of non-saline groundwater.

Closure Plan

A Closure Plan is a monitoring plan that must be implemented after CO_2 injection is finished within the Storage Hub. This is to establish continuous monitoring following closure of the Storage Hub, in order to monitor the CO_2 in the reservoir long term.

These two plans must be periodically updated and approved by the regulator as operation of the proposed Pathways Storage Hub progresses. Pathways Alliance would continue to engage with Indigenous groups, local landowners and other interested parties throughout the development and operation of the proposed Pathways Storage Hub. The figure below presents a conceptual overview of the proposed injection scheme.



Environmental performance

Environmental management

Evaluating and working to mitigate the potential impact of construction and future operations is a key aspect of our work. Approximately 82% of the proposed Pathways CO_2 Transportation Network parallels existing right-of-ways, based on current routing. The proposed Pathways CO_2 Transportation Network would be installed below surface.

During construction, efforts would be undertaken to:

- Avoid sensitive landscape features and wildlife habitats.
- Minimize impacts to wildlife and aquatic species (particularly during pipeline construction).
- Reduce impediments to wildlife movement.
- Identify and catalogue historic resources and manage and/or mitigate potential impacts.
- Conserve soils by minimizing soil erosion, compaction and admixing.
- Prevent the spread of non-native invasive species.
- Minimize dust, noise and traffic.

Following construction and commissioning of the proposed Pathways CO_2 Transportation Network, reclamation efforts for the right-of-way would promote the timely re-establishment of natural ecosystems that are similar to pre-construction conditions and support existing land uses, as per regulatory requirements.

Environmental surveys

Key environmental surveys for the CO_2 Transportation Network include the following activities:

- Water sampling to examine water quality and living conditions for fish at crossing locations.
- Identifying and cataloguing archaeological artifacts and paleontological sites within the Project area.
- Sampling soils, mapping vegetation and documenting site conditions prior to construction.
- Mapping wetland locations within the Project area.
- Identifying, mapping and monitoring wildlife and wildlife habitats.

Did you know?
As a result of investments by Pathways member companies in new technologies, innovations and operational improvements, CO_2 emissions per barrel of oil produced have dropped about 22% in the Canadian oil sands since 2011, according to analysis by the Government of Alberta.[8]

[8] "Alberta Oil Sands Greenhouse Gas Emission Intensity Analysis." *Government of Alberta*, June 4, 2025. Open.Alberta.ca

Environmental Protection Plans (EPP)

An EPP is a project-specific plan that details accepted and industry standard mitigations, best management practices, applicable standards, and guidelines mandated by provincial and federal authorities, as well as site-specific mitigations to protect known sensitive features. EPPs have been shared as part of the consultation and engagement process.

Implementation of the EPPs, plus adherence to the design and construction practices presented in regulatory plans, submissions (including the MMV Plan), regulatory applications and subsequent approval conditions are intended to help reduce or avoid potential for adverse environmental effects that may result from the Project.

EPPs outline measures to protect the environment and reduce or avoid impacts during construction, operation and reclamation based on the known environmental constraints and conditions present at the time, including:

- Describing how the Project will comply with regulatory standards.
- Identifying applicable best practices to reduce or mitigate the potential for environmental impact.
- Restoring the construction area to pre-construction condition or equivalent.
- Fulfilling environmental commitments made during the design and planning of the Project.

Following completion of construction, the EPP will be maintained as a reference during Project operation and reclamation of the pipeline right-of-way.

Pathways Alliance members recognize the importance of mitigating and reducing the potential short- and long-term impacts in the proposed Project area. Through the consultation and engagement process, we will be seeking feedback on the proposed Project and working collaboratively to resolve concerns and identify suitable mitigations.

The table on the next two pages presents potential adverse land impacts that may arise from the Project, along with proposed mitigations based on key regulatory requirements. The list is not exhaustive. Additional details are provided in the EPP.

Potential adverse impacts of the Project and proposed mitigations

	Potential Adverse Impact	Proposed Mitigation
Soils	Potential for soil erosion, admixing, compaction and rutting.	The EPP and Environmental Alignment Sheets (EAS) include measures to address erosion, compaction or admixing of soils. Top soils will be salvaged and stored during construction to facilitate reclamation and natural recovery of vegetation in right-of-ways.
Vegetation	Change in vegetation cover type distribution. Introduction or spread of weeds and non-native species.	To reduce the potential of new disturbance, the Project will parallel existing pipeline right-of-ways to the greatest extent possible. All clearing will be restricted to the approved construction footprints and appropriate setbacks. All equipment will be cleaned and maintained in accordance with Project-specific weed management protocols. Clearing and stripping of vegetation and topsoil will retain the existing seed bank to facilitate natural recovery of the right-of-ways following reclamation.
Wetland	Temporary alteration of wetland function. Temporary loss of wetland habitat.	Wetland features will be identified and field verified prior to construction, including flagging wetland boundaries for avoidance, use of corduroy or rig matting and encouraging natural recovery of wetland habitat.
Wildlife	Change in wildlife habitat and wildlife movement patterns for the duration of construction.	Applicable wildlife and wildlife habitat surveys will be undertaken by qualified resource specialists prior to construction to identify wildlife habitat features that may require site-specific or project-specific mitigation. Natural recovery of the right-of-way is expected to support the return of wildlife habitat temporarily affected by construction.
Aquatic Resources	Potential alteration of fish and fish habitat for watercourse crossings.	As much as feasible and practicable, watercourse crossings will be constructed using trenchless methods. For pipeline crossings conducted using an open cut or trenchless crossing methods, works will be conducted in accordance with the applicable provincial and federal Codes of Practice for Pipelines.

Noise	Temporary increase in noise during construction. Noise from operating compressors pending timing of installation.	Noise emissions during construction will be temporary and eliminated once construction is complete. Compressors will be designed and, when commissioned, will be operated in accordance with AER requirements of Directive 38: Noise Control.
Traffic	Temporary increase in traffic during construction.	Construction traffic will be limited to designated access roads. All traffic safety and road closure regulations will be adhered to.
Historical Resources	Disturbance or loss of historic resources (archaeology and paleontology).	Applications will be made to Alberta Arts, Culture and Status of Women for Historical Resources Act clearance. Any conditions of an approval will be adhered to, including required follow-up actions.
Traditional Land and Resource Use	Access to utilize the land will be temporarily limited during the construction phase. Disruption to hunting, trapping and plant harvesting activities due to temporary alteration of land. Potential for temporary changes to species availability.	The consultation and engagement process will be used to coordinate access in an effort to reduce impacts during construction. Mitigation measures will be in place to reduce or avoid impacts to vegetation, wildlife, wetlands, fish and fish habitats.

Safety

Across Pathways Alliance members' operations, safety of community, workers and infrastructure is incorporated into our operations and planning processes.

Proposed Pathways CO_2 Transportation Network

The proposed Pathways CO_2 Transportation Network will be designed, constructed and operated in accordance with regulations and industry standards. Examples of safety measures include, but are not limited to, the following:

- Developing robust asset integrity plans for CO_2 containment and failure prevention.
- Identifying CO_2 specifications entering the proposed Pathways CO_2 Transportation Network.
- Using leak detection systems.
- Installing intermediate isolation valves.
- Creating system-specific safety procedures.
- Developing an Emergency Response Plan (ERP) for operations that uses CO_2 dispersion modelling to determine the Emergency Planning Zones (EPZs).
- Using technology in all aspects of metering, monitoring and control.

Proposed Pathways Storage Hub

The proposed Pathways Storage Hub has suitable geology for CO_2 storage. It has a deep, porous layer that can contain CO_2 underneath many layers of impermeable rock that act as natural seals. This combined area is called the storage complex. Captured CO_2 will be stored deep below the Earth's surface, typically between 1,000 to 2,000 m. By comparison, non-saline groundwater (e.g. groundwater from wells used for agricultural purposes) in the area are typically around 150 m below the surface, as outlined in the graphic on page 11. Careful site selection and extensive monitoring are key to help ensure injected CO_2 remains stored.

A critical part of maintaining safe, long-term CO_2 storage is the development and implementation of an MMV Plan, applicable to all stages of the proposed Project, that must be approved by the regulator prior to CO_2 injection. The MMV Plan would also include the risk management approach that will be applied to identify and address potential environmental and safety risks associated with the Project's proposed CO_2 storage activities.

An MMV Plan is aimed at addressing key factors related to CO_2 storage:

- Demonstrate that the accuracy of the stored CO_2 volumes will comply with regulations and protocols.
- Monitor containment, i.e., stored CO_2 remains within the storage complex.
- Demonstrate conformance and compliance with permit conditions by comparing actual CO_2 storage performance with predicted performance for injectivity, capacity and CO_2 behaviour inside the storage complex.

Consultation and engagement

Pathways Alliance members value their long-standing relationships in the communities where they operate and are committed to the transparent sharing of information related to the Project. Throughout the proposed Project life cycle, Pathways Alliance will focus on understanding concerns, addressing issues and developing mitigations related to the Project and its operations.

In support of this objective, consultation and engagement for the proposed Project will be guided by the following practices:

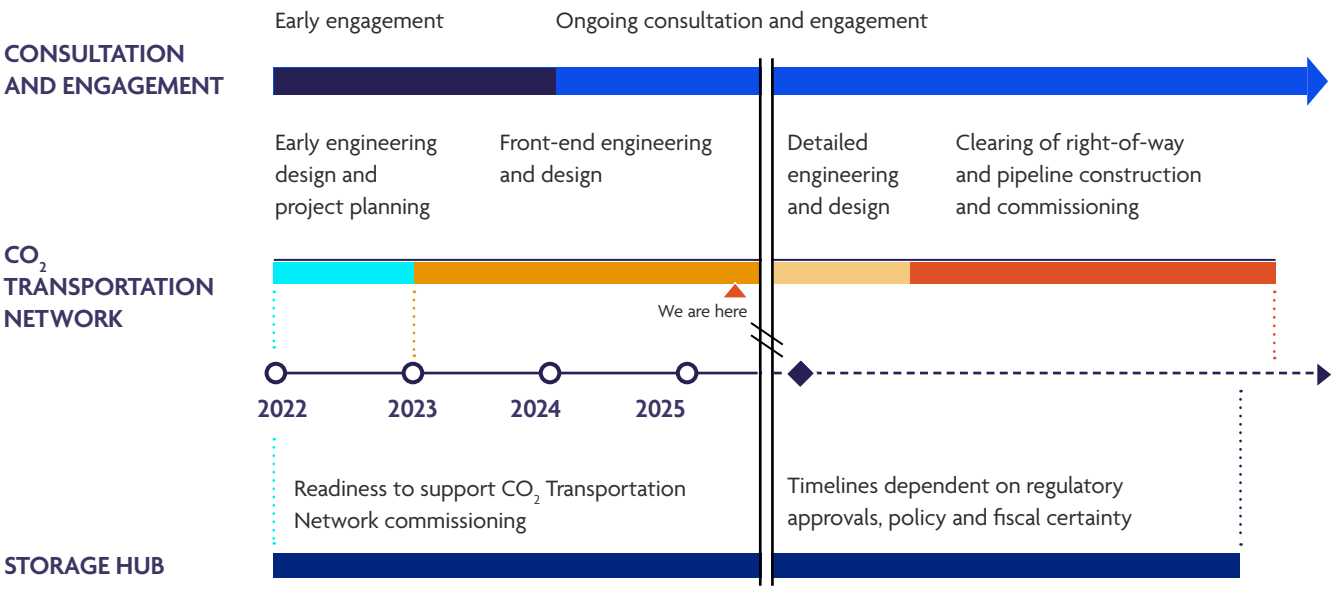
- Build upon established relationships in the region.
- Understand values, concerns and viewpoints expressed by Indigenous groups, local landowners and other interested parties.
- Foster open, transparent and respectful dialogue regarding the Project throughout its life cycle.
- Ensure interested parties, including Indigenous groups, local landowners and other affected people, are consulted and engaged in a meaningful manner.
- Develop and implement work plans with Indigenous groups to support meaningful consultation and engagement, reviewing project material, identifying concerns and potential impacts and recommending mitigation measures.
- Provide clear and concise information.

Over many years of working together, each of the Pathways Alliance members has endeavoured to develop positive and mutually beneficial relationships in the communities where we operate. Because of these unique relationships and the importance we place on them, Pathways Alliance members have taken the initiative to engage early on this Project, sharing information in a timely, open and transparent manner with Indigenous groups, local landowners and other interested parties.

Proposed project schedule*

Filing of regulatory submissions for the CO_2 Transportation Network began at the end of the first quarter of 2024. The CO_2 Transportation Network is the critical path driving the project schedule, as it will take longer to build than other components of the Project. At this stage, development and construction of the Storage Hub (e.g. injection well drilling and facility construction) is not anticipated to impact overall Project timelines.

Pathways is committed to keeping Indigenous groups, local landowners and other interested parties apprised with the most recent information and schedule. We're working with governments to obtain sufficient levels of fiscal support and required regulatory approvals that will be necessary to make this project a reality. A high-level Project schedule is provided below.



◆ Key decisions

* Proposed schedule is subject to regulatory approval timing. Dates indicated are an estimate and could vary significantly.

Regulatory

In order to construct and operate the proposed Project, a variety of regulatory decisions are required. Pathways Alliance has confirmed that the provincial regulatory bodies are the primary decision-makers for the proposed Project and decisions will be made consistent with provincial legislation, regulations, guidelines and policies. Key anticipated regulatory requirements and permits for the proposed Project are outlined in the table below.

Key regulatory submissions and applications	
Anticipated regulatory requirement	Description
CO_2 Transportation Network - Submitted	
Pipeline Agreement (PLA) applications *Public Lands Act*	Majority of pipeline right-of-way applications (or PLA applications) on Crown Land have been filed.
Pipeline - Conservation and Reclamation Plan (White Area only) *Environmental Protection and Enhancement Act*	Plan identifies the practices for clearing and soil conservation during construction and requirements for reclaiming the pipeline right-of-way in the White Area. Plan is supplemented by the EPP for the White Area and Environmental Alignment Sheets (EAS).
Pipeline right-of-way *Historical Resources Act*	Archaeology and Paleontology Evaluation and Reports submission to seek clearance from the Alberta Ministry of Arts, Culture and Status of Women.
CO_2 Transportation Network - Currently under development	
PLA Applications - Remaining *Public Lands Act*	Pipeline right-of-way on Crown Land is currently being finalized.
Pipeline Act and Pipeline Rules Supplemented by Directive 077 (2011) and Canadian Standards Association (CSA Z662)	Technical requirements applicable to the design, construction and operation of oil and gas pipelines in Alberta.
Pipeline - Directive 056 Licences (Supplemented by Directive 71 prior to operation)	Licences for pipeline construction.
Pipeline - Installation Leases (PIL) Applications *Public Lands Act*	Above ground facilities (e.g. metering stations, valve sites) on Crown Land.
Pipeline - Regulator Temporary Field Authorization (RTF) *Public Lands Act*	Additional temporary activities such as workspace, borrow, access, log decks, sump sites, etc. on Crown land.
Pipeline - Code of Practice Notification *Water Act*	Vehicle and pipeline crossings of watercourses and wetlands; hydrostatic testing water withdrawals.
Pipeline Approval *Water Act*	Valve sites or facilities that intersect a wetland.
Pipeline - Temporary Diversion Licences *Water Act*	Short-term water withdrawals for purposes other than hydrostatic testing.
Pipeline - Requirements under *Fisheries Act*	Request for Review (RFR) under Federal Fisheries Act (water withdrawals for pipeline construction, temporary or permanent vehicle crossings, ice bridges). Anything below a high water mark of a stream. Seek Letter of Advice from DFO.

Continued on next page

Key regulatory submissions and applications (continued)	
Anticipated regulatory requirement	Description
Pipeline - Requirements under Canadian Navigable Waters Act	Notification for pipeline crossings, vehicle crossings, water intakes, and temporary works on navigable waters that comply with the Minor Works Order. No Navigable Waters Act authorizations are anticipated from Transport Canada.
Storage Hub - Currently under development	
Injection Scheme - Directive 065 (Resource Application)/Directive 051 (Injection)	Subsurface approval and requirements for CO_2 injection including MMV and Closure Plans.
Well Facilities and Injection Wells - Directive 056 Licences (Supplemented by Directive 71 prior to operation)	Licences for well pad facilities and wells.

Although regulatory decisions, approvals and permits are primarily deemed to be required from provincial regulatory bodies, it is also imperative that both provincial and federal governments have regulatory and fiscal frameworks in place that enable Pathways Alliance to proceed with the proposed Project.

Committed to working together

The oil sands industry is a key economic driver for Alberta and Canada, contributing billions to the economy annually while helping to provide a secure source of energy here and to the world. Pathways Alliance is committed to ensuring our industry can continue providing these benefits for decades to come, by advancing environmental innovation and projects like the proposed CO_2 Transportation Network and Storage Hub.

Throughout this Project, Pathways Alliance members will seek ongoing input from Indigenous leaders and communities who have a strong historical connection to the land, air and water. Engagement with local Indigenous groups on the proposed project began in 2022 and continues today.

Advanced engineering and evaluation work is currently underway. On behalf of Pathways Alliance, Canadian Natural is planning public information sessions with communities and Indigenous groups in the area in late 2025 and into 2026.

Contact us:
Inquiries related to the proposed Project are welcome and should be directed to **ccsproject@pathwaysalliance.ca**. You can also visit the Pathways Alliance website at **PathwaysAlliance.ca**.