



# Pathways CO<sub>2</sub> Transportation Network and Storage Hub Project

**Project Overview**

**August 2023**

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## Pathways Alliance

The Pathways Alliance consists of Canada's six largest oil sands producers, who operate facilities accounting for approximately 95% of Canada's oil sands production. The Pathways Alliance consists of Canadian Natural Resources Limited (Canadian Natural), Cenovus Energy, ConocoPhillips Canada, Imperial, MEG Energy and Suncor Energy.

representing

**95%**

of Canadian  
oil sands  
production

### ***What are the goals of the Pathways Alliance?***

The Pathways Alliance goal, working collectively with all levels of government, is to achieve net zero greenhouse gas (GHG) emissions from oil sands operations by 2050. The Pathways Alliance will help Canada meet its climate goals, including its Paris Agreement commitments and 2050 net zero aspirations, and support Alberta's Emissions Reduction and Energy Development Plan.

Specifically, the Pathways Alliance's plan includes reducing current oil sands operational emissions by about 22 megatonnes (Mt) of carbon dioxide equivalents per year (CO<sub>2</sub>e/yr) by 2030 and to achieve net zero by 2050.

### ***How does the Pathways Alliance intend to meet GHG emission reductions?***

There is no single path or solution to achieve net zero GHG emissions from oil sands operations by 2050. Multiple pathways and multiple technologies and approaches must, and are, being pursued to achieve this goal. These pathways include research, investment, and the development of emerging technologies, such as direct air capture technology, solvent injection in thermal operations, and electrification, to name a few.

A major component of the Pathways Alliance's plan to reduce GHG emissions and help meet Canada's climate goals is the implementation of a proposed Carbon Capture and Storage (CCS) project. CCS was selected based on the following factors:

- CCS technology provides oil sands operations with a long-term, safe solution to reducing CO<sub>2</sub> emissions;
- demonstrated significant CO<sub>2</sub> emission reductions through projects, such as the Shell Quest Carbon Capture Project in Alberta, and the SaskPower Boundary Dam Capture Project in Saskatchewan; and
- can be implemented by 2030, pending provincial and federal frameworks, as well as your support.

Canadian Natural, on behalf of the Pathways Alliance, is planning to apply for regulatory approval to construct and operate the Pathways CO<sub>2</sub> Transportation Network and Storage Hub Project (the "Project"). The proposed Project will connect 13 oil sands facilities in the Fort McMurray, Christina Lake and Cold Lake regions to a CO<sub>2</sub> storage hub. The proposed Project is expected to achieve net reductions from oil sands operations of approximately 10-12 Mt of CO<sub>2</sub>e/yr by 2030.

## ***Why am I receiving this Project Overview?***

Based on extensive experience, the Pathways Alliance members recognize the importance of working collaboratively with Indigenous groups, local landowners and other interested parties in the region. The Project Overview has been prepared to share clear and concise information regarding the proposed Project to:

- enhance the reviewers understanding of the Project scope as the basis to embark on the consultation and engagement process;
- promote dialogue throughout the consultation and engagement process for the proposed Project;
- support Pathways Alliance and reviewers in jointly identifying potential concerns, impacts in relation to the proposed Project, and options for resolving or mitigating concerns and impacts; and
- support Pathways Alliance and reviewers in jointly exploring potential opportunities and benefits.

Specifically for the remainder of 2023, the Project Overview is intended to be the basis for the consultation and engagement process at the planning stage of the Project and the preparation of regulatory applications. Further, the input received from Indigenous groups, local landowners, and other interested parties at this stage is valuable, particularly in relation to confirming the routing of the Pathways CO<sub>2</sub> Transportation Network.

To that end, input on the Pathways CO<sub>2</sub> Transportation Network is requested by early Q4 2023 to ensure all feedback is considered and incorporated to the extent possible prior to the submission of regulatory applications to the Alberta Energy Regulator (AER).

# 1 Carbon Capture and Storage

## What is CCS and how does it work?

There are three primary elements to a CCS project.

1. **Capture** of GHG (CO<sub>2</sub>) at the source
2. **Transportation** of the CO<sub>2</sub> via pipeline
3. Permanent CO<sub>2</sub> **Storage** underground in deep geologic formations

The first large-scale CCS project, the Terrell natural gas processing facility (TNG Project), was established in 1972 and remains the oldest operating industrial CCS project worldwide.<sup>1</sup> The TNG Project, located in Terrell, Texas, employed capture technology to separate CO<sub>2</sub> from produced natural gas.

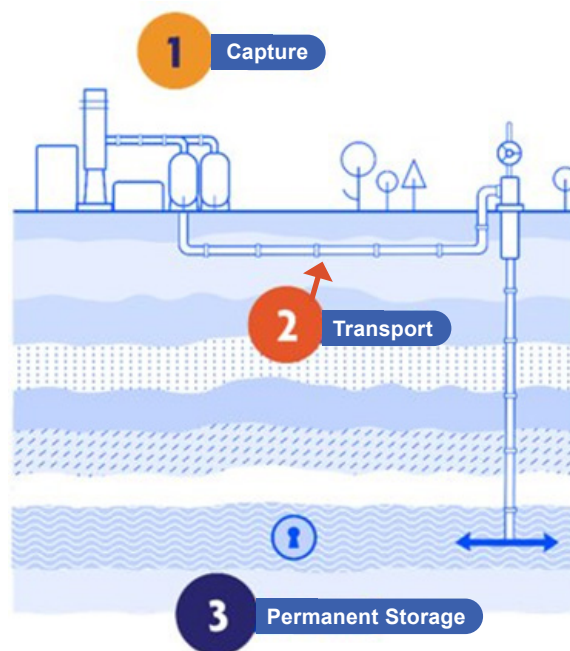
The captured CO<sub>2</sub> was then transported to the Sharon Ridge oil field in the Permian oil basin for enhanced oil recovery (EOR) and storage. Since then, CCS has expanded globally, with more than 30 operational facilities that have collectively captured and safely stored 300 million metric tonnes of CO<sub>2</sub>.<sup>2</sup>

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<sub>2</sub> in the Utsira aquifer;
2. The **Equinor SnØhvit project, an EOR project located in Norway**, is an integrated offshore liquefied natural gas (LNG) project with gas processing onshore and CO<sub>2</sub> 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; and
3. The **Shell Quest Project near Edmonton, Alberta** is one of the operating CCS projects in Canada (Canadian Natural is a 70% owner of the project). It takes CO<sub>2</sub> from the Scotford Refinery's hydrogen manufacturing units and injects it in the Basal Cambrian Sandstone (BCS) — which is the same zone as the proposed Project — approximately two kilometres below surface. The project began capturing and storing CO<sub>2</sub> in 2015 and has surpassed 7 million tonnes of injected CO<sub>2</sub> since project start-up.

The success of CCS can be seen in the establishment of large-scale projects around the world and has demonstrated the technical feasibility and efficiency of capturing and storing CO<sub>2</sub>. As CCS technology continues to advance, it holds the potential to play a crucial role in achieving Canada's and the world's climate goals and facilitating the transition to a low-carbon future.

Simplified CCS Diagram



<sup>1</sup> *Meeting Dual Challenge: A Roadmap to At-Scale Deployment of Carbon Capture, Use and Storage*, National Petroleum Council, December 12, 2019, [Link](#).

<sup>2</sup> *Lessons captured from 50 years of CCS Projects*, Global CCS Institute, July 23, 2021, [Link](#)

# 1 Carbon Capture and Storage



*Amine-based CO<sub>2</sub> capture unit at the Quest Carbon Capture project*

## Capture

Pathways Alliance members are proposing to install CO<sub>2</sub> capture facilities at 13 of their existing oil sands facilities to collect flue gas<sup>3</sup> from stationary combustion equipment (e.g. furnaces, steam generators) that produce CO<sub>2</sub> emissions. Flue gas containing CO<sub>2</sub> will be diverted into vessels where a chemical, such as amine, will be used to separate and capture the CO<sub>2</sub>.

Amine is commonly used in gas separation processes, such as when hydrogen sulphide (H<sub>2</sub>S) is removed from natural gas. After separation, the captured CO<sub>2</sub> will be compressed and converted to a fluid where it will be transported to the oil sands facility boundary and then connected to the Pathways CO<sub>2</sub> Transportation Network.

## Transportation

The Pathways CO<sub>2</sub> Transportation Network begins at the boundary of each of the 13 oil sands facilities. The CO<sub>2</sub> will then move through Pathways Laterals to the main Pathways CO<sub>2</sub> Transportation Line and Pathways Hub Distribution Line, and finally to the Pathways CO<sub>2</sub> Storage Hub.

To minimize the area of new land disturbance required, the Pathways CO<sub>2</sub> Transportation Network will parallel existing pipeline rights-of-way (ROW) to the greatest extent possible.

*Surveying for Pathways transportation line in existing rights-of-way*



<sup>3</sup> Flue gas exiting to the atmosphere via a stack is primarily nitrogen (67 - 72%), water (18 - 20%) and CO<sub>2</sub> (8 - 10%) for natural gas fired steam boilers.

# 1 Carbon Capture and Storage

## Storage

The CO<sub>2</sub> will move via the Pathways CO<sub>2</sub> Transportation Network to associated hub piping (tie-ins) where it will be transferred to the Pathways CO<sub>2</sub> injection wells within the Pathways CO<sub>2</sub> Storage Hub. Each Pathways CO<sub>2</sub> injection well will be drilled and completed to inject CO<sub>2</sub> into the BCS. The BCS is regionally large with an extensive seal (cap rock), and exists between 1 - 2 km below the surface.

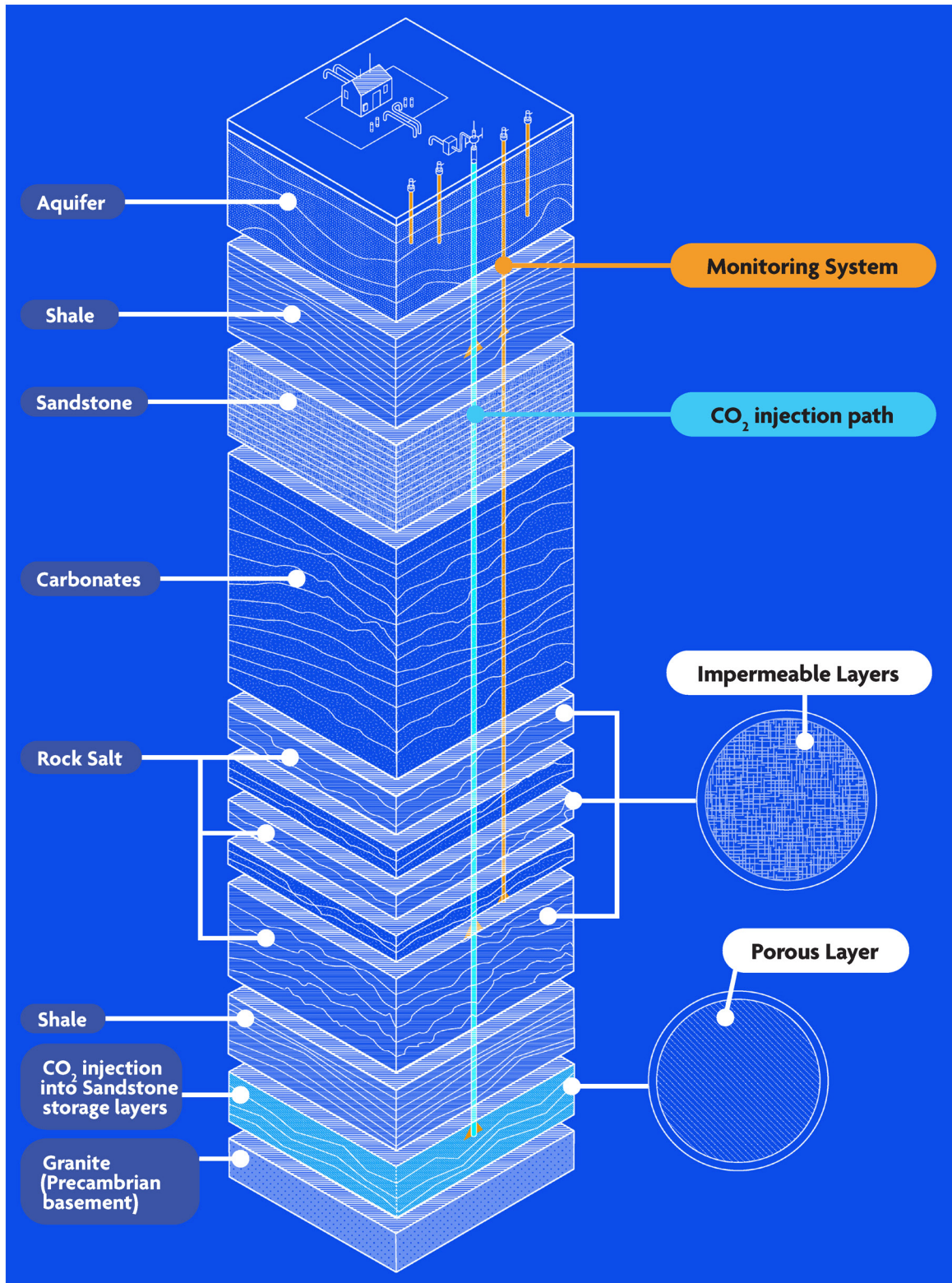
CO<sub>2</sub> sequestration will occur 1 - 2 km below ground; the geographic location of the Pathways CO<sub>2</sub> Storage Hub has ideal geological properties that will contain the CO<sub>2</sub> deep underground in the BCS. Furthermore, to provide assurance of safe, permanent CO<sub>2</sub> storage, a site specific Monitoring, Measurement and Verification (MMV) Plan and Closure Plan will be developed and submitted for approval, and will be implemented prior to commencing CO<sub>2</sub> injection. These Plans will remain in place during all stages of operation and closure, and will be regularly updated.

Quest CO<sub>2</sub> injection well



# 1 Carbon Capture and Storage

The geologic cross-section, including the subsurface formation where CO<sub>2</sub> will be injected and safely sequestered is shown below.



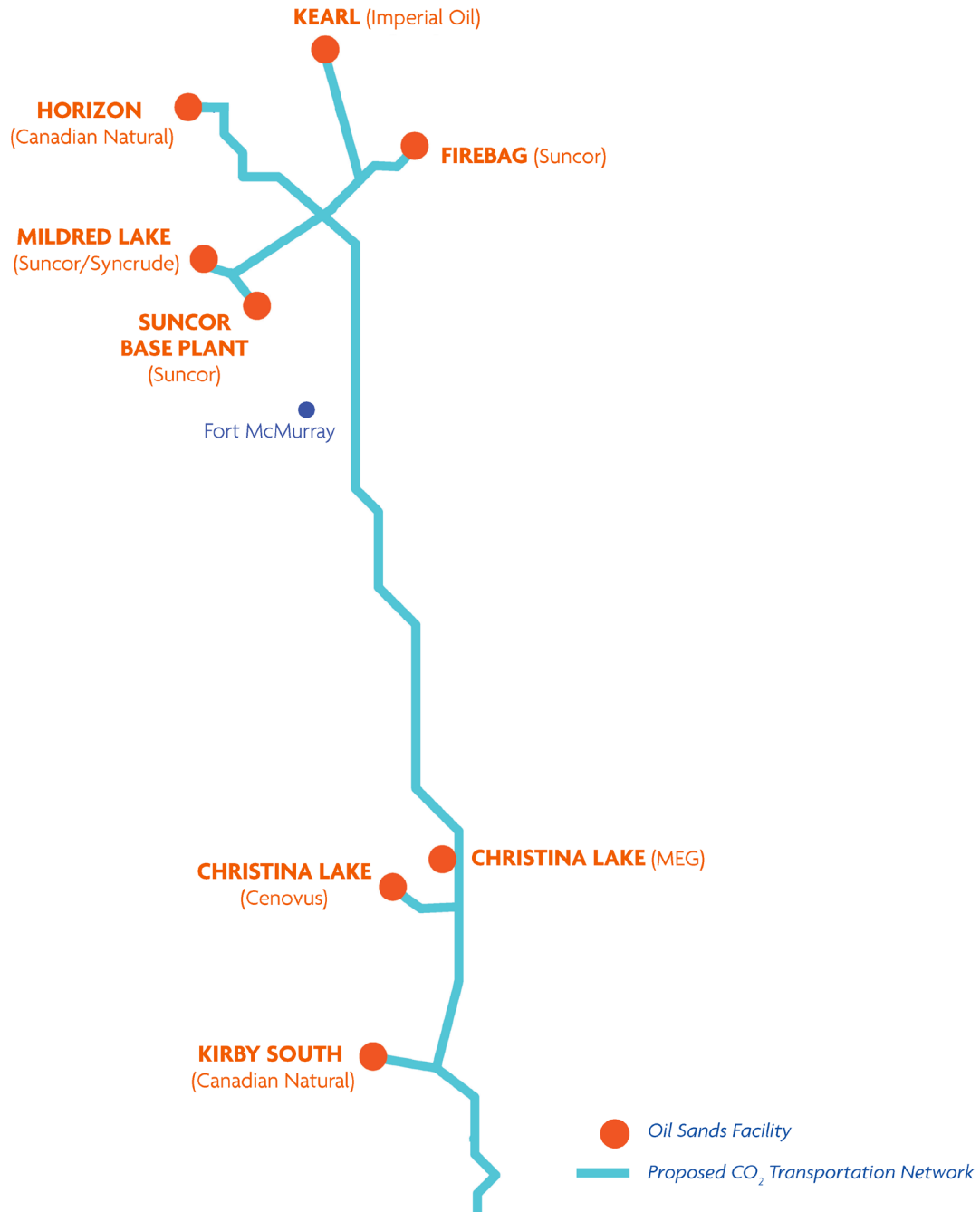


# 1 Carbon Capture and Storage

## Project Location

The figure below presents an overview of the location and proposed routing for the Pathways CO<sub>2</sub> Transportation Network, which includes the Pathways CO<sub>2</sub> Transportation Line, the Pathways Hub Distribution Line, and 16 Pathways Laterals. The subsurface boundary of the proposed Pathways CO<sub>2</sub> Storage Hub for the Project is also shown (next page).

### Proposed Pathways CO<sub>2</sub> Transportation Network

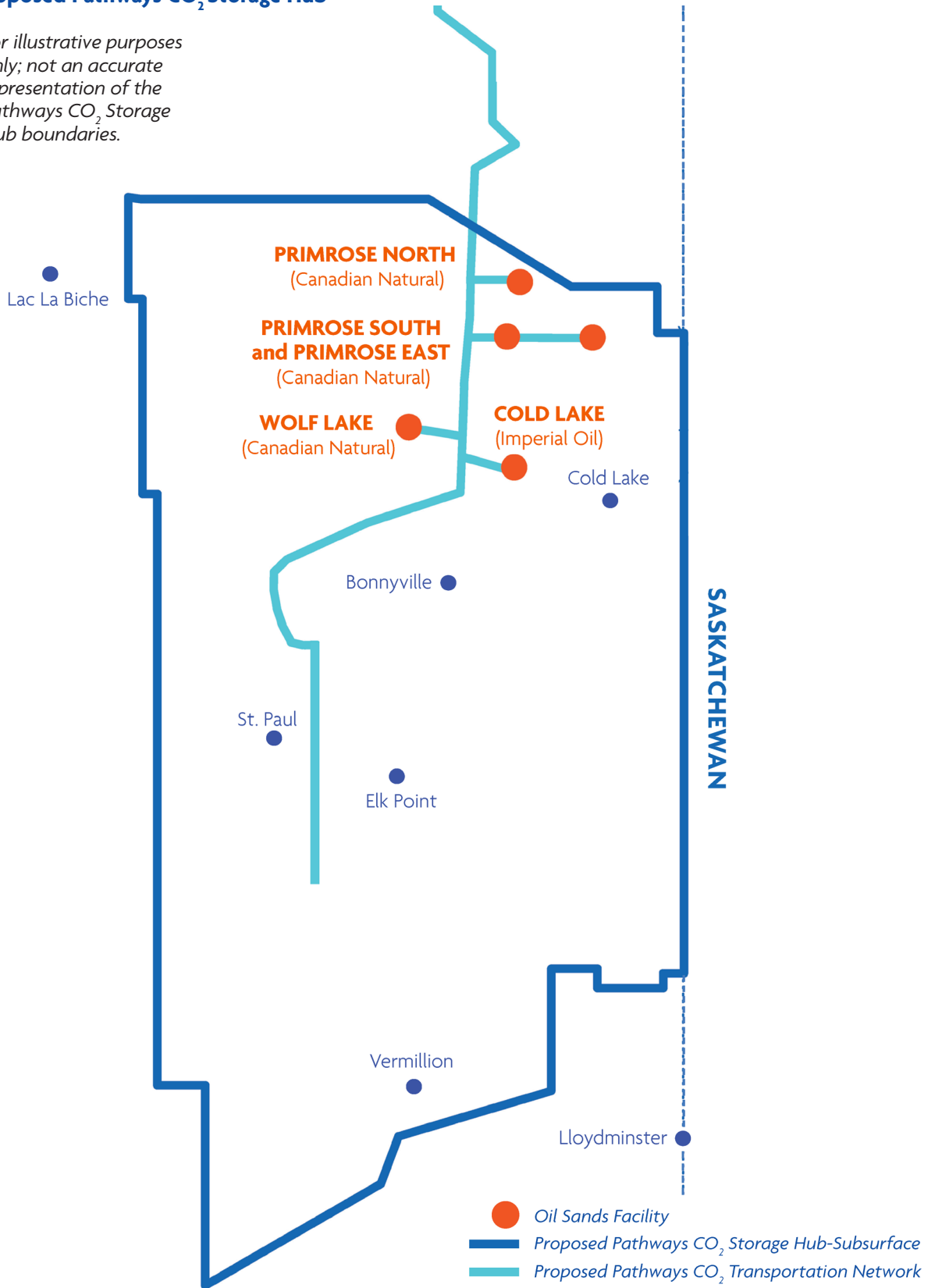


Map continued on next page

# 1 Carbon Capture and Storage

## Proposed Pathways CO<sub>2</sub> Storage Hub

*For illustrative purposes only; not an accurate representation of the Pathways CO<sub>2</sub> Storage Hub boundaries.*



# 1 Carbon Capture and Storage

The routing and development of the Pathways CO<sub>2</sub> Transportation Network was influenced by considering the following criteria:

- Safety;
- Parallel existing ROW to reduce new surface disturbance footprint;
- Environmental features;
- Known historical or paleontological sites;
- Regulatory requirements;
- Engineering design; and
- Construction constraints.

The routing of the Pathways CO<sub>2</sub> Transportation Network is preliminary and adjustments are made as engineering and design progresses, and important input is received from Indigenous groups, local landowners, and other interested parties. Additionally, the feedback received will be carefully considered and incorporated to the extent 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.

## 2 Project Scope

An overview of the Pathways CO<sub>2</sub> Transportation Network and Storage Hub Project, and the associated surface and subsurface equipment and infrastructure, is described below.

### Pathways CO<sub>2</sub> Transportation Network

The Pathways CO<sub>2</sub> Transportation Network includes:

- Pathways Laterals (16) – these pipeline segments connect the 13 oil sands facilities to the Pathways CO<sub>2</sub> Transportation Line
  - » Diameter ranges from 8" to 30", pending CO<sub>2</sub> volumes
  - » Length ranges from 1 - 49 km
- Pathways CO<sub>2</sub> Transportation Line (1) – this is a proposed 24" to 36" diameter pipeline connecting 13 oil sands facilities via 16 Pathways Laterals in the Fort McMurray, Christina Lake and Cold Lake regions to the Pathways Hub Distribution Line and further to the Pathways CO<sub>2</sub> Storage Hub.
  - » Approximately 400 km in length
- Pathways Hub Distribution Line (1) – this is a proposed 24" to 36" diameter pipeline connecting the Pathways CO<sub>2</sub> Transportation Line to the Pathways CO<sub>2</sub> Storage Hub.
  - » Approximately 170 km in length

### Pathways CO<sub>2</sub> Storage Hub – Surface Infrastructure

The Pathways CO<sub>2</sub> Storage Hub surface infrastructure consists 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<sub>2</sub>, as well as the requirements of the MMV Plan
- Associated Hub Piping – these are pipeline segments (tie-ins) connecting the Pathways Hub Distribution Line to CO<sub>2</sub> injection well sites within the Pathways CO<sub>2</sub> Storage Hub

The Pathways Alliance is currently evaluating the subsurface characteristics of the BCS to determine the number of injection well sites that will be required to support net emission reductions of 10 - 12 MtCO<sub>2</sub>e/yr by 2030. At this time, it is anticipated that approximately 16 - 19 injection wells will be required.

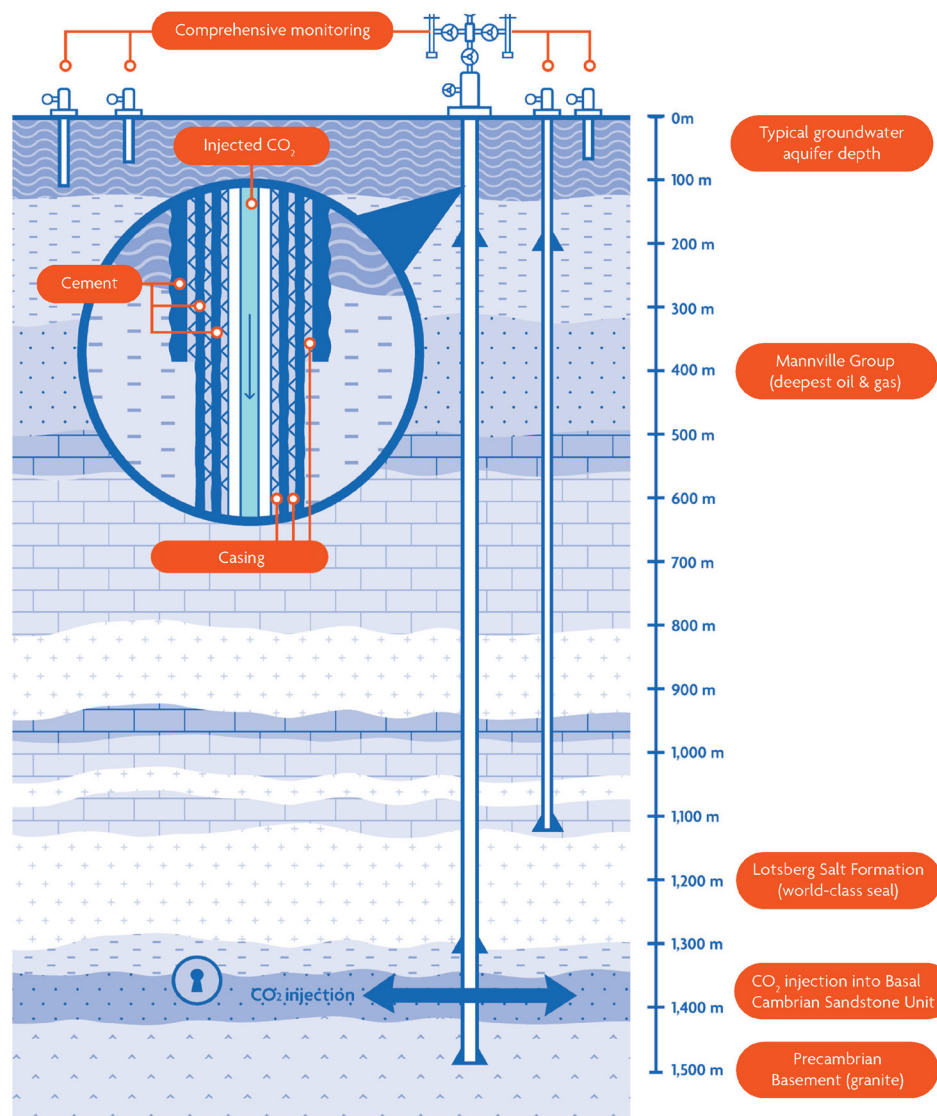
## 2 Project Scope

### Pathways CO<sub>2</sub> Storage Hub – Subsurface Operation and Performance Monitoring

Pathways Alliance intends to engage on sequestration activities and the input received will be considered and incorporated into the MMV and Closure Plans.

- MMV Plan – this plan will require the installation of monitoring equipment to track and monitor CO<sub>2</sub> in the BCS once injected, providing assurance of safe, permanent storage of CO<sub>2</sub>
  - » As part of the MMV Plan, a groundwater monitoring program will be implemented for the protection of non-saline groundwater, and to monitor and minimize impacts on other pore space users.
- Closure Plan – this plan will demonstrate the continued safe and predictable performance of the captured CO<sub>2</sub>

Furthermore, these two plans will be updated as operation of the Pathways CO<sub>2</sub> Storage Hub progresses. Pathways Alliance members intend to engage with Indigenous groups, local landowners, and other interested parties throughout the development and operation of the Pathways CO<sub>2</sub> Storage Hub. The figure below presents a conceptual overview of the proposed injection scheme.



### Environmental Stewardship

Environmental stewardship is incorporated through all phases of the Project to avoid, reduce or mitigate environmental impact. From planning to design, construction, and final reclamation, careful consideration is given to reducing the footprint of the Project activities as well as reducing potential impacts. Approximately 95% of the proposed Pathways CO<sub>2</sub> Transportation Network will parallel existing ROW. The Pathways CO<sub>2</sub> Transportation Network will be installed below surface. During construction, efforts will be undertaken to:

- Avoid sensitive landscape features and wildlife habitats;
- Minimize impacts to wildlife and aquatic species (particularly during pipeline construction);
- Identify and catalogue historic resources and avoid and/or mitigate to reduce disruption of historic resources;
- Identify, avoid and/or mitigate traditional sites;
- Manage access to minimize disruption to existing activities and/or arrange for alternate access on a short-term basis, to the extent possible;
- Reduce impediments to wildlife movement during construction;
- Conserve soils by minimizing soil erosion, compaction, and admixing;
- Build Environmental Protection Plans (EPPs);
- Prevent the spread of non-native invasive species;
- Minimize dust, noise, and traffic during construction; and
- Monitor to ensure compliance with regulatory requirements.

Following construction and commissioning of the Pathways CO<sub>2</sub> Transportation Network, reclamation efforts will promote the timely re-establishment of natural ecosystems that are similar to pre-construction conditions and support existing land uses.

### Environmental Mitigation Measures

Environmental surveys are currently being conducted. The environmental data collection underway for the Project will help inform the development of the Environmental Protection Plan (EPP) to be used during construction, operation, and reclamation. The EPP is a Project-specific plan that will detail 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. The Pathways Alliance intends to share and discuss the key elements of the EPP as part of the consultation and engagement process.

Implementation of the EPP, plus adherence to the design and construction practices presented in regulatory plans, submissions (including the MMV Plan), and regulatory applications will serve to reduce or avoid potential for adverse environmental effects that may result from the Project.

### Environmental Protection Plan (EPP)

The purpose of the EPP will be to demonstrate that the Project has been designed to avoid, minimize or mitigate potential environmental impacts during construction, operation and reclamation phases. The EPP will include both general and site-specific mitigation measures, which will be refined based on past project experience and input received through the consultation and engagement process.

Specifically, the EPP will:

- Present mitigation measures related to Project construction and post-construction reclamation activities;
- Present management plans and contingency plans as guidance for unplanned or non-typical occurrences that may arise during Project construction;
- Serve as reference information to construction personnel to support decision making; and
- Define roles and responsibilities of key personnel responsible for implementation and management of the EPP such as the Project manager, construction manager, environmental coordinator, environmental inspectors, and resource specialists (wildlife biologists, aquatic biologists, archaeologists, etc.).

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

## 4 Potential Adverse Impacts

The Pathways Alliance recognizes the importance of mitigating and reducing the potential short and long-term impacts in the Project area. Through the consultation and engagement process, we will be seeking feedback on the Project and working collaboratively to resolve concerns and identify suitable mitigations. The table below presents the potential adverse impacts that may arise from the Project, and the proposed mitigations. Additional details will be presented in the EPP.

### Potential Adverse Impacts of the Project and Proposed Mitigations

	Potential Adverse Impact	Proposed Mitigation
<b>Soils</b>	Potential for soil erosion, admixing, compaction, and rutting.	The EPP and Environmental Alignment Sheets (EAS) will include measures to address erosion, compaction, or admixing of soils.
<b>Vegetation</b>	Change in vegetation cover type distribution. Introduction or spread of weeds and non-native species.	Parallel existing disturbances, where available, in an effort to reduce potential of new disturbance. 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.
<b>Wetlands</b>	Temporary alternation 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.
<b>Wildlife</b>	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.
<b>Aquatic Resources</b>	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.
<b>Noise</b>	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 operated in accordance with AER requirements of Directive 38: <i>Noise Control</i> .
<b>Traffic</b>	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.
<b>Historic Resources</b>	Disturbance or loss of historic resources (archaeology and palaeontology).	Canadian Natural, on behalf of the Pathways Alliance, is applying to Alberta Culture for <i>Historical Resources Act</i> clearance. Canadian Natural will follow the conditions of the approval, including any additional follow-up actions required.
<b>Traditional Land and Resource Use</b>	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.	Pathways Alliance will work through the consultation and engagement process to coordinate access in an effort to reduce impacts during construction. Mitigation measures to reduce or avoid impacts to vegetation, wildlife, wetlands and fish and fish habitat.



Safety is a core value to all Pathways Alliance members and will guide the development of the Project. Technical experience will be leveraged from each of the Pathways Alliance members.

### Pathways CO<sub>2</sub> Transportation Network

The proposed Pathways CO<sub>2</sub> Transportation Network will be designed, constructed, and operated safely and in accordance with regulations and industry standards. Examples of safety measures include, but are not limited to, the following:

- Robust asset integrity plans to ensure CO<sub>2</sub> containment and prevent failures such as ensuring the specifications for the CO<sub>2</sub> entering the Pathways CO<sub>2</sub> Transportation Network, utilization of leak detection systems, installation of intermediate isolation valves, system-specific safety procedures, and Emergency Response Plan;
- Predictions from CO<sub>2</sub> dispersion modelling will be incorporated into the development of ERPs; and
- Utilization of technology in all aspects of metering, monitoring, and control.

### Pathways CO<sub>2</sub> Storage Hub

The proposed Pathways CO<sub>2</sub> Storage Hub has ideal geology for the safe and permanent storage of CO<sub>2</sub> underground in geologic formations, such as the BCS. Captured CO<sub>2</sub> will be stored between 1 - 2 km below surface.

By comparison, fresh groundwater in the area is typically around 150 m below surface, as outlined in the graphic on page 13. The BCS, the target zone for storing the CO<sub>2</sub>, has multiple overlying layers of impermeable rock formations that act as natural seals. Careful site selection and extensive monitoring will serve to ensure injected CO<sub>2</sub> remains safely stored underground.

A critical part of ensuring safe, permanent CO<sub>2</sub> storage will be the development and implementation of a MMV Plan applicable to all stages of the Project that must be approved prior to CO<sub>2</sub> injection. The MMV plan will also present the risk management approach that will be applied to identify and address potential environmental and safety risks associated with the CO<sub>2</sub> sequestration activities proposed for the project.

The MMV Plan will be in place to address key aspects related to CO<sub>2</sub> storage.

1. Demonstrate that the accuracy of the sequestered CO<sub>2</sub> volumes will comply with regulations and protocols;
2. Monitor to confirm containment, i.e. CO<sub>2</sub> storage remains within the storage complex; and
3. Demonstrate conformance and compliance with permit conditions by comparing actual CO<sub>2</sub> storage performance with predicted performance for injectivity, capacity, and CO<sub>2</sub> behaviour inside the storage complex.

## 6 Consultation and Engagement

The Pathways Alliance is committed to engaging early and often with interested parties and those parties who may be potentially impacted by the Project. The Pathways Alliance values its long-standing relationships in the communities in which we operate and are committed to the transparent sharing of information related to the Project. Throughout the Project lifecycle, the Pathways Alliance will focus on understanding concerns, addressing issues, and collaboratively developing mitigations related to the Project and its operations.

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

- Continue to 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 lifecycle;
- Ensure interested parties, including, Indigenous groups, local landowners, and other interested parties are consulted and engaged in a meaningful manner;
- Ensure Indigenous Knowledge and Traditional Land Use information is identified early to appropriately incorporate into the Project's planning cycle;
- Provide clear and concise information; and
- Fulfill regulatory requirements.

Over many years of working together, each of the Pathways Alliance members have endeavoured to develop positive and mutually beneficial relationships in the communities where we operate. Because of these unique relationships, the Pathways Alliance has taken the initiative to engage early on this Project.

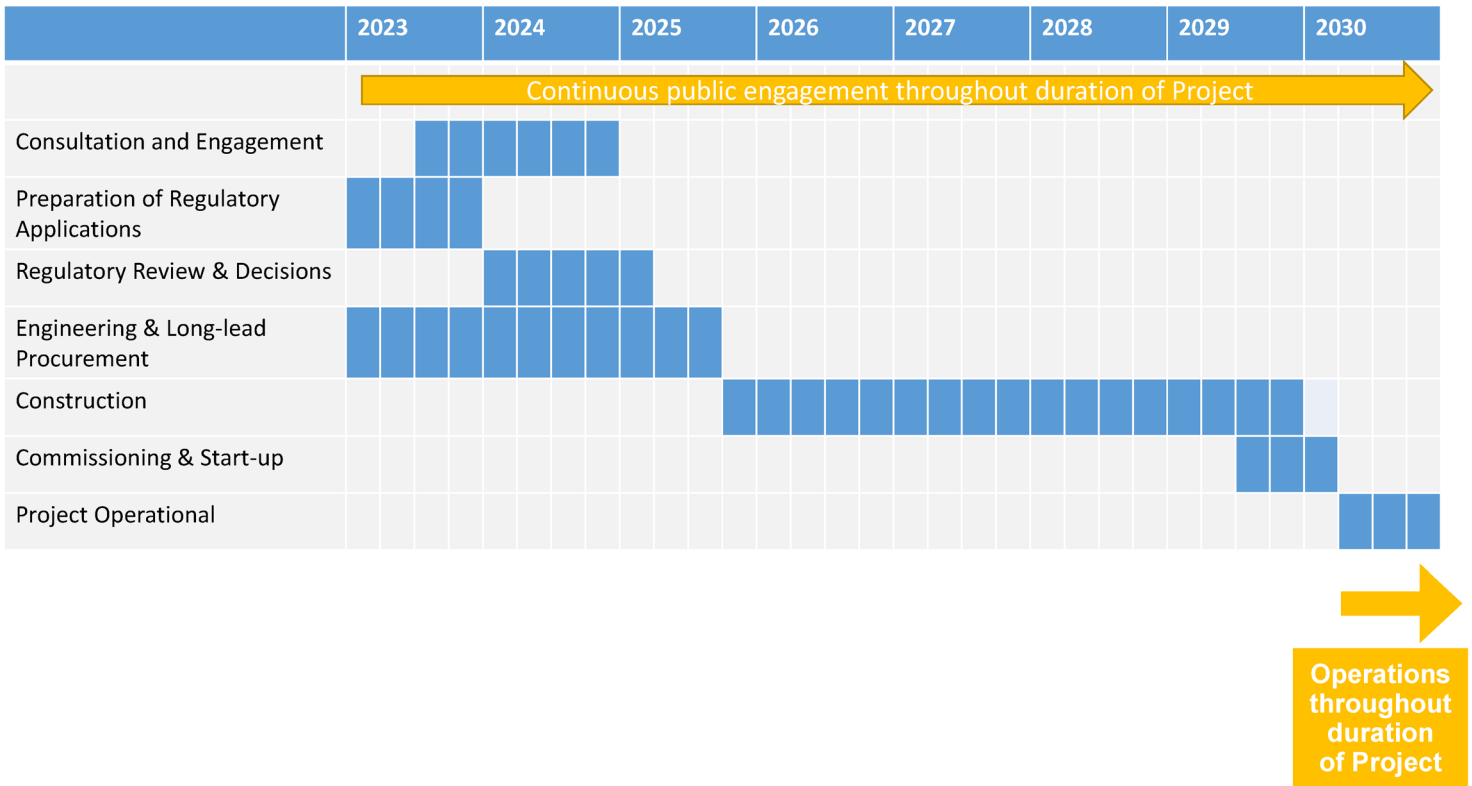
Sharing information in a timely, open, and transparent manner with Indigenous groups, local landowners, and other interested parties is important to the Pathways Alliance.

# 7 Project Schedule

It is anticipated that Canadian Natural, on behalf of the Pathways Alliance, will be submitting the Project's regulatory applications for the Pathways CO<sub>2</sub> Transportation Network and Storage Hub Project in the fourth quarter of 2023, with regulatory approval anticipated by the second quarter of 2025. ROW clearing and construction activities are planned to begin in late 2025, pending regulatory approvals.

An anticipated in-service date for the Project is the second quarter of 2030. Pathways is committed to keeping Indigenous groups, local landowners, and other interested parties apprised with the most recent information and schedule. A high-level Project Schedule is provided below.

## Project Schedule



## 8 Regulatory

In order to construct and operate the proposed Project, a variety of regulatory decisions are required. The 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 Project are outlined in the table below.

### Key Regulatory Requirements Anticipated to be Required for the Project

Anticipated Regulatory Requirement	Description	Planned Submission
<b>Pipeline Dispositions (PLA)</b>	Pipeline ROW on Crown Land	December 2023
<b>Pipeline – Conservation and Reclamation (EPEA; White Area only)</b>	Pipeline and associated infrastructure in White Area only; includes EPP and Environmental Alignment Sheets (EAS)	December 2023
<b>Pipeline Act &amp; Regulation Approval Supplemented by Directive 077 (2011) and Canadian Standards Association (CSA Z662)</b>	Technical requirements applicable to the design, construction, and operation of oil and gas pipelines in Alberta	December 2023
<b>Pipeline, Facility and Injection Wells – Directive 056 Licences (Supplemented by Directive 71)</b>	Licenses for pipelines, valve sites, metering stations and wells	December 2023
<b>Injection Wells – Directive 065 (Resource Application)/Directive 051 (Injection)</b>	Subsurface approvals for CO <sub>2</sub> injection	December 2023
<b>Pipeline – Alberta Historical Resources Act</b>	Archaeology and Palaeontology Evaluation and Reports	Q1 2024
<b>Pipeline Installation Leases (PIL)</b>	Above ground facilities (e.g. metering stations, valve sites) on Crown Land	Q2 2024
<b>Pipeline – Code of Practice Notification (Water Act)</b>	Vehicle and pipeline crossings of watercourses and wetlands; hydrostatic testing water withdrawals	Q4 2025
<b>Pipeline – Approval (Water Act)</b>	Valve sites or facilities that intersect a wetland	Pending location selection
<b>Pipeline – Temporary Diversion Licenses (Water Act)</b>	Short-term water withdrawals for purposes other than hydrostatic testing	As required
<b>Pipeline – Regulator Temporary Field Authorization (RTF)</b>	Additional temporary activities such as workspace, borrow, access, log decks, sump sites, etc. on Crown land	As required
<b>Pipeline – Federal Fisheries Act</b>	Request for Review (RFR) under Federal <i>Fisheries Act</i> (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. <b>No Fisheries Act authorizations anticipated.</b>	Q1 2024 (start; ongoing/multiple submissions)
<b>Pipeline – Federal Navigable Waters Act</b>	Notification for pipeline crossings, vehicle crossings, water intakes, and temporary works on navigable waters that comply with the Minor Works Order. <b>No Navigable Waters Act authorizations anticipated.</b>	Q2 2025

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 frameworks in place that enable the Pathways Alliance to proceed with the proposed Project.

## 9 Working Together

The Pathways Alliance values its neighbours and the relationships we have established in the communities where we operate. Pathways Alliance is committed to meaningfully engaging and consulting throughout the regulatory process. Early efforts throughout the Project's lifecycle are focused on understanding concerns, responding to issues and jointly identifying suitable mitigation measures. We strive to engage and consult regularly, invite feedback, and provide updates.

By doing our part to help Canada reduce emissions, our country can support energy security and be the preferred supplier of responsibly produced oil to the world. This will help preserve the jobs and long-term economic stability that come from Canada's energy sector, while helping Canada meet its climate goals by reducing CO<sub>2</sub> emissions. The Pathways Alliance recognizes that your support is required to achieve this goal.

### Contact us:

Inquiries related to the proposed Project are welcome, and should be directed to [ccsproject@pathwaysalliance.ca](mailto:ccsproject@pathwaysalliance.ca). You can also visit the Pathways Alliance website at [PathwaysAlliance.ca](http://PathwaysAlliance.ca).

Cautionary Statement: Statements of future events or conditions on this presentation, including projections, targets, expectations, estimates, and business plans are forward-looking statements. Forward-looking statements can be identified by words such as achieve, aspiration, believe, anticipate, intend, propose, plan, goal, seek, project, predict, target, estimate, expect, forecast, vision, strategy, outlook, schedule, future, continue, likely, may, should, will and/or similar references to outcomes in future periods.

Forward-looking statements on this presentation include, but are not limited to, references to the viability, timing and impact of the net zero plan and the development of pathways in support of a net-zero future; support for the pathways from the Government of Alberta and the Government of Canada; the ability to enable net zero emissions from oil production and preserve economic contribution from the industry; the deployment of technologies to reduce GHG emissions; the ability to create jobs, accelerate development of the clean tech sector, provide benefits for other sectors and help maintain Canadians' quality of life; and making economic investments to ensure a successful transition to a net zero world and delivering long term value to shareholders. All net-zero references on this website apply to emissions from oil sands operations (defined as scope 1 and scope 2 emissions).

Forward-looking statements are based on current expectations, estimates, projections and assumptions at the time the statements are made. Actual future results, including expectations and assumptions concerning: demand growth and energy source, supply and mix; amount and timing of emissions reductions; the adoption and impact of new facilities or technologies, including on reductions to GHG emissions; project plans, timing, costs, technical evaluations and capacities, and the ability to effectively execute on these plans and operate assets; that any required support for the pathways from the Government of Alberta and the Government of Canada will be provided; applicable laws and government policies, including climate change and restrictions in response to COVID-19; production rates, growth and mix; general market conditions; and capital and environmental expenditures, could differ materially depending on a number of factors.

These factors include global, regional or local changes in supply and demand for oil, natural gas, and petroleum and petrochemical products and the resulting price, differential and margin impacts; political or regulatory events, including changes in law or government policy and actions in response to COVID-19; the receipt, in a timely manner, of regulatory and third-party approvals including for new technologies; lack of required support from the Government of Alberta and the Government of Canada; environmental risks inherent in oil and gas exploration and production activities; environmental regulation, including climate change and GHG regulation and changes to such regulation; availability and allocation of capital; availability and performance of third-party service providers; unanticipated technical or operational difficulties; project management and schedules and timely completion of projects; reservoir analysis and performance; unexpected technological developments; the results of research programs and new technologies, and ability to bring new technologies to commercial scale on a cost-competitive basis; operational hazards and risks; general economic conditions, including the occurrence and duration of economic recessions; and other factors referenced by the companies' in their most recent respective annual reports and management's discussion and analysis, as applicable.

Forward-looking statements are not guarantees of future performance and involve a number of risks and uncertainties, some that are similar to other oil and gas companies and some that are unique to the companies. Actual results may differ materially from those expressed or implied by its forward-looking statements and readers are cautioned not to place undue reliance on them. Pathways Alliance Inc. and its member companies undertake no obligation to update any forward-looking statements contained on this presentation, except as required by applicable law.





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