

# Project Description Summary

## Moraine Power Generation Project

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## Acronyms / Abbreviations

AC	Alberta Ministry of Culture (formerly Alberta Culture and Status of Women [ACSW])
AEPA	Alberta Ministry of Environment and Protected Areas (formerly Alberta Environment and Parks [AEP])
AER	Alberta Energy Regulator
AESO	Alberta Electric System Operator
AIES	Alberta Interconnected Electric System
CCGT	Combined Cycle Gas Turbine
CCS	carbon capture and storage
DFO	Fisheries and Oceans Canada
ECCC	Environment Canada and Climate Change
EPEA	<i>Environmental Protection and Enhancement Act</i>
HADD	harmful alteration, disruption or destruction
HRA	<i>Historical Resources Act</i>
HRIA	Historic Resources Impact Assessment
IA	impact assessment
IAA	<i>Impact Assessment Act</i>
ICCF	Integrated CO <sub>2</sub> Capture Facility
LEG	Low-Emitting Generation
MD	Municipal District
MIL	Moraine Initiatives Limited
NGTL	Nova Gas Transmission Ltd.
PGF	Power Generation Facility
RAP	restricted activity period

PROJECT DESCRIPTION SUMMARY

Moraine Power Generation Project

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ROW	Right-of-Way
SARA	<i>Species at Risk Act</i>
SOMC	species of management concern
STG	steam turbine generator
the Agency	Impact Assessment Agency of Canada
the Project	Moraine Power Generation Project
W5M	west of the fifth meridian

# Table of Contents

<b>Acronyms / Abbreviations.....</b>	<b>i</b>
<b>1.0 General Information and Contact(s).....</b>	<b>5</b>
<b>2.0 Engagement and Consultation .....</b>	<b>6</b>
2.1 Indigenous Engagement .....	6
2.2 Engagement with the Public, Stakeholders, Government, and Other Parties .....	7
<b>3.0 Project Information .....</b>	<b>8</b>
3.1 Project Overview .....	8
3.2 Purpose of and Need for the Project .....	9
3.3 Alternatives To and Alternative Means of Carrying Out the Project .....	9
3.4 Project Activities.....	11
3.4.1 Construction .....	11
3.4.2 Operations .....	11
3.4.3 Decommissioning.....	11
3.4.4 Physical Activities Incidental to the Project .....	12
3.4.5 Accidents and Malfunctions .....	12
3.5 Project Schedule .....	12
3.6 Project Emissions, Discharges and Waste .....	12
3.7 Project Location, Land and Water Use .....	14
3.7.1 Project Location and Land Use.....	14
3.7.2 Project Water Use.....	14
<b>4.0 Regulatory Context .....</b>	<b>15</b>
<b>5.0 Environmental Setting.....</b>	<b>15</b>
5.1 Natural Setting .....	15
5.1.1 Atmospheric Environment.....	15
5.2 Biological Setting .....	16
5.2.1 Geology and Hydrogeology .....	16
5.2.2 Surface Water and Fish and Fish Habitat.....	16
5.2.3 Vegetation and Wetland Resources .....	17
5.2.4 Wildlife and Wildlife Habitat .....	18
5.3 Human Environment .....	19
5.3.1 Socio-Economic Setting.....	19

5.3.2 Indigenous Groups Setting .....	20
5.3.3 Historical Resource Setting .....	20
5.3.4 Human Health Setting.....	20
5.4 Potential Effects in Relation to Impact Assessment Act Requirements .....	21
5.4.1 Project-related Effects to Indigenous Groups .....	21
5.5 Other Potential Environmental, Economic, Social Heritage and Health Effects.....	22
<b>6.0 Regulatory Requirements .....</b>	<b>26</b>
6.1 Federal Regulatory Requirements .....	26
6.2 Provincial Regulatory Requirements .....	26
6.3 Municipal Regulatory Requirements.....	26
<b>7.0 Figures .....</b>	<b>27</b>
<b>8.0 References .....</b>	<b>36</b>
8.1 Literature Cited .....	36
8.2 Personal Communications .....	37

**LIST OF TABLES**

Table 1	Estimated Maximum Project GHG Emissions Associated with Operation .....	13
Table 2	Fish Species at Risk and Species of management Concern Noted within the Watercourses in the Project Vicinity .....	17
Table 3	Summary of Potential Project Effects and Mitigation Measures .....	23

**LIST OF FIGURES**

Figure 1	Project Overview .....	28
Figure 2	Location of Indigenous Nations and Nearby Federal Lands.....	29
Figure 3	Plot Plan .....	30
Figure 4	Noise Baseline Assessment Area and Receptor Locations .....	31
Figure 5	2023 Early and Late Rare Plant Surveys.....	32
Figure 6	2023 Wildlife Survey Stations and Observations.....	33
Figure 7	Potential Sites Overview .....	34
Figure 8	2023 Alternate Carbon Storage Hub Locations Near the Project.....	35

## 1.0 General Information and Contact(s)

The Moraine Power Generation Project (the Project) is a 465 megawatt (MW) natural gas-fueled power generation facility (PGF), consisting of combined cycle gas turbine (CCGT) electricity generation equipped with a post-combustion integrated CO<sub>2</sub> capture facility (ICCF), all on a common central site located in Woodlands County, west of the town of Whitecourt, Alberta. The Project will include a 240 kV transmission line interconnection between the PGF and existing Alberta Interconnected Electric System (AIES) 240 kV infrastructure, a CO<sub>2</sub> pipeline to convey CO<sub>2</sub> captured by the ICCF to the third-party CO<sub>2</sub> injection site, and a natural gas pipeline connecting the PGF to a natural gas transmission network. The proponent is Moraine Initiatives Limited (MIL).

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The Project is being reviewed by the Impact Assessment Agency of Canada (the Agency) based on the Physical Activities Regulations, which list the activities and types of projects (designated projects) that potentially require an impact assessment (IA). Section 30 of the Regulations states:

*The construction, operation, decommissioning and abandonment of a new fossil fuel-fired power generating facility with a production capacity of 200 MW or more.*

The Agency has deemed the Project to be a designated physical activity, potentially subject to an IA (see Appendix B). An Initial Project Description, followed by a Detailed Project Description will be prepared and submitted to the Agency for its review and to inform its determination as to whether an IA is required.

## 2.0 Engagement and Consultation

Since June of 2022, MIL has been engaging with Indigenous nations and locally elected officials and regulatory agencies to inform them of the Project and answer questions. The following sections include a summary of the engagement that has occurred up to the time of completing the DPD. The DPD and this summary has been updated to include additional details based on feedback from the Agency and the comments identified in the Summary of Issues based on submissions from Indigenous nations, regulatory agencies, stakeholders, and the public.

### 2.1 Indigenous Engagement

MIL acknowledges and respects the Rights of Indigenous people. In the fourth quarter of 2021, MIL began identifying which Indigenous nations are located in proximity to the Project using both federal and provincial resources, including through discussion with IAAC. Once an initial contact list was created, MIL began the engagement process through sending letters of introduction, offering meetings, participating in meetings, and sharing Project information.

MIL conducted the following engagement activities to share Project information, answer questions, and listen to concerns with Indigenous nations:

- sent letters of introduction between June and December 2022;
- added additional Indigenous nations to the engagement list as and when self-identified by a nation or identified by the Agency
- set up a Project website with Project information;
- participated in 26 one-on-one meetings with 19 nations either virtually or in-person;
- circulated a Project information package to all Indigenous nations that provides similar information as the Initial Project Description (IPD) without the technical references and was suggested as a companion piece to the IPD;
- followed up after sending Project information was emailed with phone calls to confirm information was received;
- invited all 30 Indigenous nations identified by the Agency to a Project information session and site visit in Whitecourt, AB on June 27, 2023;
- emailed Project updates regarding DPD to all Indigenous nations in August 2023.

Key themes emerging from engagement included requests for more detailed Project information, potential Project effects and benefits, traditional land use studies, Indigenous procurement and equity opportunities, capacity funding, as well as ongoing meaningful engagement and consultation.

MIL recognizes that meaningful engagement has a different meaning for each Indigenous nation. MIL will seek to accomplish meaningful engagement throughout the life of the Project by establishing

opportunities for two-way conversations to share information. MIL anticipates learning that each Indigenous nation may be affected differently and to a different extent, which may result in engagement activities varying across the Indigenous nations

A total of 28 Indigenous groups have been identified to be engaged and consulted on this Project through the Landscape Analysis Indigenous Relations Tool (LAIRT) and the Agency, however MIL continues to engage with the following 30 Indigenous nations

- Alexis Nakota Sioux Nation
- Paul First Nation
- Kehewin Cree Nation
- Enoch Cree Nation
- Whitefish\Goodfish Lake First Nation
- Sturgeon Lake Cree Nation
- Sucker Creek First Nation
- Driftpile Cree Nation
- Swan River First Nation
- Alexander First Nation
- Sawridge First Nation
- Kapawe'no First Nation
- East Prairie Métis Settlement
- O'Chiese First Nation
- Montana First Nation
- Louis Bull Tribe
- Ermineskin Cree Nation
- Samson Cree Nation
- Horse Lake First Nation
- Kelly Lake First Nation
- Métis Nation of Alberta, Region 4
- Métis Nation of Alberta, Region 5
- Michel First Nation (Friends of Michel Society)
- Aseniwuche Winewak First Nation
- Lac Ste. Anne Métis Community Association
- Nakcowinewak Nation
- Descendants of Michel First Nation Association
- Kelly Lake Cree Nation Society
- Métis Community Society of Kelly Lake
- Foothills First Nation Heritage Society

## **2.2 Engagement with the Public, Stakeholders, Government, and Other Parties**

MIL continues to engage with the public and other stakeholders, including all levels of government representatives regarding the Project since early 2022. This includes meetings with the Agency, Alberta Electrical System Operator, the Aboriginal Consultation Office, Woodlands County, and the town of Whitecourt to provide general Project details and an introduction of early-stage development activities underway. A public open house was held in the town of Whitecourt on June 28, 2023 to communicate the Project to the general public and answer questions. Subject matter experts from the Project team interacted with participants to explain information and answer questions. Facilitators and note takers interacted with participants to help people feel comfortable and encourage questions and comments, which were documented.

MIL will continue to engage with the public and other stakeholders. The Project website will be updated with Project information after important milestones such as filing of the DPD or other regulatory approval document filings or open houses.



## 3.0 Project Information

### 3.1 Project Overview

The Project is located in central Alberta, approximately 10 km west of the town of Whitecourt and consists of four principal components:

- natural gas-fueled power generation facility (PGF), consisting of combined cycle gas turbine (CCGT) electricity generation equipped with a post-combustion integrated CO<sub>2</sub> capture facility (ICCF), all on a common central site;
- 240 kV transmission line interconnection between the PGF and existing Alberta Interconnected Electric System (AIES) 240 kV infrastructure in the vicinity of the Project;
- pipeline to convey CO<sub>2</sub> captured by the ICCF to a third-party CO<sub>2</sub> sequestration hub injection site (Athabasca Banks CO<sub>2</sub> Carbon Hub is the preferred location) that is not part of the Project; and
- natural gas pipeline connecting the PGF to the NOVA Gas Transmission Ltd (NGTL) natural gas transmission network.

The Project will use natural gas from the NGTL pipeline network for power generation at the PGF, which will generate approximately 465 megawatts (MW) of electricity for delivery to the Alberta Interconnected Electric System (AIES) via the transmission line interconnect. Captured CO<sub>2</sub> will be collected and transported via a CO<sub>2</sub> pipeline for injection into a subsurface storage reservoir in a deep underground geological formation.

The PGF includes two main components; power generation, and the post-combustion integrated CO<sub>2</sub> capture. The power generation is a CCGT system that includes a gas turbine generator (GTG), a heat recovery steam generator (HRSG), and a steam turbine generator (STG). Other sub-components of the CCGT include an air-cooled condenser (ACC), natural gas compressor, two generator step-up transformers (GSU) and auxiliary systems. To minimize the exposure to ambient conditions, the gas and steam turbine sub-components of the CCGT will be installed within a building that is suitable for Alberta weather conditions. The CCGT also includes interconnecting water, steam, compressed air, and natural gas supply lines to facilitate the operations of process equipment.

The second component of the PGF is the ICCF, which will process the exhaust gas from the CCGT to capture up to 95% of the CO<sub>2</sub> emissions from the operation of the CCGT.

The CO<sub>2</sub> pipeline will run from the PGF to the CO<sub>2</sub> sequestration hub injection site currently proposed for northwest of Whitecourt, AB and will be approximately 12 km in length. The pipeline routing is in development; however, it is anticipated that the CO<sub>2</sub> pipeline will parallel existing pipeline rights-of-way (ROW).

Natural gas will be provided by a new pipeline built as a component of the Project, to deliver approximately 85,000 GJ/d of sweet pipeline-specification natural gas from the NGTL network to the PGF (approximately 30 km in length). The full length of this new natural gas pipeline is anticipated to be parallel to existing ROWs for other pipelines.

The PGF will be connected to the AIES by a new 240 kV transmission interconnection. Two interconnection options are being explored and discussed with the existing 240kV transmission line owners and the AESO. Both options are anticipated to be parallel to existing transmission ROWs and potentially on existing power line structures.

## 3.2 Purpose of and Need for the Project

The Project will:

- supply reliable, affordable, and on-demand low-emitting generation (LEG) to Albertans
- produce near-zero emissions baseload electricity to meet the needs of Alberta electricity customers based on the carbon capture component
- be planned so that it is compliant with the proposed Canada's Clean Electricity Regulations, and thus is aligned with Canada's objectives of achieving net-zero emissions from the electricity grid by 2035

In Alberta's competitive wholesale electricity market structure, the need for new electricity generation sources is established by a combination of regulatory and market (commercial) forces.

From a regulatory perspective, both provincial and federal environmental regulations are driving the decarbonization of Alberta's electricity generation, through the commitments to retire coal-fired power generation by 2030, and now the proposed Canada Clean Electricity Regulations.

In addition, increased electrification on an economy-wide basis – in particular transportation, building heating and cooling, and industry – is a crucial enabler of Canada's ability to achieve its net-zero by 2050 objectives. This drives the need for new LEG reliable sources such as the Project to provide adequate supplies of near-zero emissions electricity to meet this incremental electrification demand and load growth generally.

## 3.3 Alternatives To and Alternative Means of Carrying Out the Project

Alternative means of carrying out the Project were considered in respect of:

- Facility siting
- Power transmission and pipeline routing
- Selection of gas-fired combined cycle power generation technology – configuration and sizing
- Selection of post-combustion CO<sub>2</sub> capture process technology
- Alternatives to meet Project cooling duties – water versus air
- Location of CO<sub>2</sub> sequestration hub storage project

MIL evaluated several other potential sites to develop the Project, but based on its initial screening analysis, concluded that the selected area for the PCF best served its purpose. All sites considered offer: proximity to required off-site infrastructure, including electric and gas interconnections; potential water resources; and importantly, a suitable destination for the captured CO<sub>2</sub>. Given federal and provincial goals to achieve a net-zero electricity grid, CO<sub>2</sub> capture and sequestration are necessary features to achieve a low-carbon intensity power generation. MIL did not consider alternative power generation projects (e.g., solar, wind) which are intermittent generation sources and are not technically and economically feasible of providing baseload and dispatchable net generation of 465 MW within a footprint similar to the Project.

Project planning is ongoing, including refined routing for the power transmission line, natural gas pipeline, and CO<sub>2</sub> pipeline. Inputs to route refinement include considerations of safety, constructability, cost, land use, environment and stakeholder input. Wherever possible, the selected pipeline and power transmission routes will be parallel to existing disturbances (e.g., existing pipeline ROWs, transmission lines, roads), which helps to reduce potential environmental and socio-economic effects by reducing the area of new disturbance and potential ecological fragmentation. Of particular interest are potential impacts of routing on key environmental features including the Athabasca River, as well as on existing infrastructure such as Highway 43, the town of Whitecourt, and nearby Indigenous communities.

For dispatchable baseload natural gas-fired power generation, CCGT configurations offer the best available technical and economic solutions, considering installed capital cost, operating costs, and plant efficiency. CCGT consists of both a combustion gas turbine generator and a steam turbine generator, where the steam for the steam turbine generator is raised from the heat contained in the combustion gas turbine generator exhaust gases.

There are several technologies capable of removing CO<sub>2</sub> from natural gas-fired power generation plant exhaust (i.e., post-combustion CO<sub>2</sub> capture, or PCCC), such as membranes, solid and liquid absorbents, and freezing/phase-change precipitation. However, among this range of technologies, only the amine-based regenerative liquid absorbent process has been technically and economically proven in commercial applications at a scale similar to, or larger than, that of the Project. Therefore, the Project will incorporate an amine-based ICCF unit to remove up to 95% of the CO<sub>2</sub> from the gas turbine exhaust stream, as the best technically and economically feasible process for the Project.

Various process steps and equipment in the PGF require cooling, which is provided by heat exchange with either air or cooling water.

In air or aerial cooling, ambient air is blown through heat exchangers, and heat is transferred from the process to the air.

In water-based cooling, water is circulated through heat exchangers, and heat is transferred to the water as a result. This warm water is typically routed to a cooling tower, where the evaporation of most of the water cools the rest, which is then recirculated back through the Project.

For the PGF, air cooling has been chosen to provide the principal cooling duties. Air cooling offers significant environmental advantages relative to water-based cooling:

- No need for a large-scale source of makeup water, as is the case in a water-based system, to compensate for water evaporated or otherwise removed from the cooling water circuit
- No need for large-scale water supply infrastructure (e.g., a river water intake facility, with its attendant impacts on the riparian environment, principally during construction)
- No need for a large make-up water storage pond to ensure that adequate quantities of surplus water are available in the event of limitations on withdrawing river water

MIL is planning to transport the captured CO<sub>2</sub> to a third-party CO<sub>2</sub> sequestration hub storage project. While the Athabasca Banks Carbon Hub is MIL's preferred CO<sub>2</sub> sequestration hub storage project, there are several other hubs under development within 100 km of the Project for consideration.

## 3.4 Project Activities

### 3.4.1 Construction

Construction activities will include site preparation, as well as the construction and installation of Project components and are estimated to occur over a three-year time period. Construction activities will be refined as design progresses, but are currently anticipated to consist of the following:

- Clearing of vegetation and site grading
- Access road construction
- Installation of major equipment that arrives onsite as separate components or skids of preconstructed components
- Connection of process and ancillary equipment such as utility lines, site power lines, fuel lines and waterlines
- Construction of the water supply system, including groundwater wells and potential disposal wells
- Installation of stormwater management, erosion prevention, and sediment control measures
- Construction of the CO<sub>2</sub> and NG pipeline through primarily trenched methods, using trenchless (e.g., open cut and horizontal directional drill) techniques where specifically required
- Construction of electric transmission line
- Connection of utilities (e.g., electrical, communications, gas, water) to the PGF
- Potential rehabilitation or stabilization of areas not required for the operations phase
- Waste disposal and recycling in accordance with applicable legislation
- Decommissioning of any temporary facilities

### 3.4.2 Operations

The Project will be owned by MIL and operated by an experienced third-party operator. Day to day operation and maintenance will be provided by a staff of operators, engineers and support staff totaling approximately 32 persons.

The turbine and generator manufacturer will provide major maintenance and inspection work.

### 3.4.3 Decommissioning

The Project is expected to operate for approximately 40 years. Precise timing for the decommissioning of the facility cannot be predicted at this time. However, all relevant environmental regulations in existence at the time of decommissioning will be adhered to. A decommissioning and reclamation plan will be developed for the Project prior to facility closure and will include habitat restoration in the Project area. Pipelines would be abandoned in place at the end of the Project life. Transmission lines and structures would be removed from the ROWs. Reclamation on the ROWs would be completed where disturbance is necessary to remove any infrastructures.

### 3.4.4 Physical Activities Incidental to the Project

Potential physical activities incidental to the Project are anticipated to include laydown areas and temporary workspace for the pipelines and transmission line.

### 3.4.5 Accidents and Malfunctions

MIL will incorporate monitoring, safety and response measures into the design of the Project; details on some of these key features are provided above in Section 9.1. In addition, MIL will develop a site-specific emergency management plan that incorporates all aspects of the Project, including the PGF, natural gas and CO<sub>2</sub> pipelines and transmission line and associated infrastructure. This plan will be developed prior to construction of the Project and will address construction, operation and decommissioning phases and will follow similar emergency management plans implemented by existing power plant plants that are owned by subsidiaries of the General Electric Company, MIL's parent company. The emergency management plan will also conform with conditions included in the EPEA and AUC approvals, as well as AER requirements. All Project components will adhere to all governing power industry codes and standards. Where no formal standards exist, engineering and operation of all Project components will at a minimum be in accordance with prudent industry practices.

## 3.5 Project Schedule

Project construction is planned to occur in one phase scheduled to start in 2024 and continue until 2027. This schedule is contingent on regulatory approvals and Indigenous nation engagement. Construction may include some activities occurring 24 hours a day, seven days a week. MIL expects operation of the PGF to begin in 2027 and continue for the Project's lifespan of 40 years or more.

## 3.6 Project Emissions, Discharges and Waste

MIL will manage construction and operation emissions, discharges and wastes to meet requirements of applicable guidelines, policies, and regulations for all phases of the Project. The emissions, discharges, and wastes from the Project are expected to include:

- Atmospheric emissions, including:
  - Fugitive dust and fine particulate emissions will be generated from land clearing, site preparation, earth moving and material handling, and vehicles creating dust by traveling on land
  - Construction equipment (dozers, compressors, etc.) will release combustion emissions of primarily nitrogen (N<sub>2</sub>), CO<sub>2</sub>, and water vapour (H<sub>2</sub>O) with trace amounts of contaminants such as oxides of nitrogen (NO<sub>x</sub>), SO<sub>2</sub>, CO, particulate matter (PM) including diesel combustion particulate matter, volatile organic compounds (VOCs), and polycyclic aromatic hydrocarbons (PAHs). These gases and particles are common by-products of fossil fuel combustion.

- Combustion of natural gas in the proposed CCGT and trace amounts of volatile organic compounds associated with the solvent-based absorption process in the ICCF (NO<sub>x</sub>, SO<sub>2</sub>, CO, and PM)
- GHG emissions during operations expressed as carbon dioxide equivalent (CO<sub>2</sub>e) are associated with carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>) and nitrous oxides (N<sub>2</sub>O) emissions.
- Noise emissions during construction would be primarily related to the use of heavy equipment and trucks to clear vegetation, prepare the ground surface and install equipment; during operations, noise will be generated from rotating equipment including inlet exhaust, ventilation openings, coolers, compressors, and transformers
- Liquid discharges from the Project will include process water, stormwater and sewage wastewater during operations. Optimization of process water generated during operations of the PGF will reduce the amount to be stored onsite in a storage tank with secondary containment and removed via third-party hauling for disposal to an approved off-site facility or through the use of new or existing disposal wells; surface water runoff will be directed to an appropriately sized pond to meet the 1 in 100-year 24-hr storm requirement. Stormwater runoff will be tested to meet approval conditions prior to release to a natural drainage pathway in a controlled manner; no liquid discharges will occur directly to the Athabasca River
- Solid waste from the Project will include domestic waste and industrial garbage, recyclables (wood, paper, metal), waste oil, hazardous waste (paint, solvents, batteries, fluorescent light bulbs, herbicides, etc.), relief valve discharges, exhausted resin from condensate polisher

During Project construction and operation, GHG emissions expressed as carbon dioxide equivalent (CO<sub>2</sub>e) are associated with CO<sub>2</sub>, methane (CH<sub>4</sub>) and nitrous oxides (N<sub>2</sub>O) emissions. The Project will be designed to achieve 95% CO<sub>2</sub> removal during operations. Net Project GHG emissions are calculated consistent with equation 1 of the Strategic Assessment of Climate Change and are summarized in Table 1, below.

**Table 1 Estimated Maximum Project GHG Emissions Associated with Operation**

Pollutant	GHG Emissions (tonne/year)	GHG Emission Intensity (kg/MWh)
CO <sub>2</sub>	79,881 (79,881)	20.6 (20.6)
CH <sub>4</sub>	118 (3,305)	0.0305 (0.854)
N <sub>2</sub> O	42.2 (11,173)	0.0109 (2.89)
CO <sub>2</sub> e	94,359	24.4
Notes: CO <sub>2</sub> e calculated based upon AR5 GWP as CO <sub>2</sub> e = CO <sub>2</sub> + 28 x CH <sub>4</sub> + 265 x N <sub>2</sub> O. Values in brackets express individual component emissions in form of CO <sub>2</sub> e.		

## 3.7 Project Location, Land and Water Use

### 3.7.1 Project Location and Land Use

The PGF is located at NW-7-60-12-W5 and SW-18-60-12-W5; Latitude 54°10' 55" N (54.181944) Longitude 115°47'46" W (-115.796111).

The CO<sub>2</sub> pipeline will run for about 12 km from the PGF to the selected CO<sub>2</sub> sequestration hub injection site (approximately at Latitude 54°14' 27" N (54.241081) Longitude 116°0'2" W (-116.000724)) currently proposed for northwest of Whitecourt, AB. Natural gas will be provided by a pipeline from the NGTL network at the NGTL Windfall Meter Station, located at NW8-60-15 W5M (Latitude 54°10' 50" N (54.18051) and Longitude 116°12'58" W (-116.215414)) to the PGF (approximately 30 km in length).

The PGF location is zoned by the Woodlands County as *Natural Resources Extraction – Direct Control*. The location is a brownfield site that currently serves as a gravel pit for natural resources extraction and processing.

The PGF will be connected to the AIES by a new 240 kV transmission interconnection. Two options are being explored, as follows:

- Adding a 240 kV circuit, approximately 10 km in length, to connect the PGF to the existing 240 kV transmission line 9L938 at approximately Latitude 54°10' 38" N (54.177329), Longitude 115°35'34" W (-115.592992). This new 240 kV circuit would be located in a new right-of-way adjacent to the right-of-way of the existing 240 kV circuit 907L.
- Adding a 240 kV circuit, approximately 20 km in length to connect the PGF to the existing Sagitawah 77S switchyard located at Latitude 54°4' 58" N (54.082816), Longitude 115°34'30" W (-115.575013). This new 240 kV circuit would be installed in the same right of way as described in the option above for the first 10 km from the PGF; thereafter, the new circuit would likely be installed in an existing right-of-way to the Sagitawah 77S switchyard on a currently open side of existing double-circuit tower structures for this remaining 10 km, eliminating the need for both a new right-of-way and new tower structures for this 10 km portion of the new circuit.

The Project will be located on provincial public land and will not overlap any federally owned lands, as the nearest federal lands to the Project include Jasper National Park (approximately 170 km) and CFB Edmonton Garrison (approximately 160 km).

### 3.7.2 Project Water Use

Water supply for the PGF is expected to be sourced from groundwater wells. Water wells will be installed at or near the PGF site. Preliminary analysis of the region indicates that there is significant aquifer potential near the PGF, particularly in the floodplain areas downstream (south and east) of the PGF.

The maximum raw water use for the PGF is estimated to be 883 m<sup>3</sup>/d (162 US gpm). However, this estimate does not consider optimization and recycling of water streams produced in the ICCF process at the PFG, which will be used to offset raw water supply needs once the PGF is fully operational, reducing the total water the facility's supply demands.

## 4.0 Regulatory Context

The PGF will generate up to 465 MW. As such, and pursuant to sections 30 of Physical Activities Regulations under the federal *Impact Assessment Act* (IAA), the Project meets the criteria of a designated project. The Agency has deemed the Project to be a designated physical activity, potentially subject to an IA (see Appendix B). An Initial Project Description (IPD), followed by a Detailed Project Description (DPD) will be prepared and submitted to the Agency for its review and to inform its determination as to whether an IA is required.

The Project is listed provincially under the *Environmental Protection and Enhancement Act* (EPEA) Physical Activities Regulations as a “power plant”, where a plant that has a rated peak production output of greater than one megawatt under peak load. However, the Project is not listed in the Environmental Assessment (Mandatory and Exempted Activities) Regulation (Alberta Regulation 111/1993). The Project will require an approval under Schedule 1 Division 2, Part 9 of EPEA for the construction, operation, or reclamation of a power plant. However, an EIA (Environmental Impact Assessment) is not mandatory under the Act.

The Project is not located in an area that has been the subject of a Federal regional environmental study or strategic assessment as defined in the *Impact Assessment Act* (IAA). In addition, no federal funding is anticipated for the Project.

In addition to an EPEA approval, the Project will require a range of other permits and approvals, from both federal and provincial agencies.

## 5.0 Environmental Setting

The following sections provide an overview of the natural, biological and human environment setting in the vicinity of the Project.

### 5.1 Natural Setting

#### 5.1.1 Atmospheric Environment

The Project is located in the Woodlands County, a rural municipality, approximately 7,668 km<sup>2</sup> in area, located 150 km northwest of Edmonton, Alberta. The region experiences warm summers, from May to September with an average temperature of 17 degrees Celsius and cold, snowy and mostly cloudy winters with an average low of -14 degrees C and high of -5 degrees C. The region is wetter between May and September and drier for the remaining 8 months of the year, with an average precipitation of 79 millimetres (mm) of rain in June, and 101 mm of average snowfall in November.

The Project is located in a rural area with few nearby industrial emission sources other than the adjacent pulp and newsprint mill that is a source of combustion emissions associated with paper production and a natural gas-fired peaking electricity generation facility. The Project is located within the West Central Airshed Society (WCAS), a multi-stakeholder, not-for-profit organization responsible for collecting and sharing air quality monitoring data information on ambient air quality. The WCAS includes 12 continuous ambient air quality monitoring stations that measure a wide range of substances near both industrial



facilities and communities. The 2021 WCAS annual report (WCAS 2022) indicates that most of the time, air quality was good, or “low risk” at all the monitoring stations.

The existing acoustic environment is characterized by sound from the natural environment such as wind, and terrestrial wildlife, as well as anthropogenic sound (e.g., vehicle traffic, air traffic, and other human activity). In-air noise levels in the area are generally comparable with rural areas.

## **5.2 Biological Setting**

### **5.2.1 Geology and Hydrogeology**

The Project is located in the Upper Athabasca Planning region, a region that starts at the upper reaches of the Athabasca River from the Columbia Icefield in Jasper National Park, centred largely along the Athabasca River, into Athabasca County towards the northeastern part of the province. The town of Whitecourt is approximately in the centre of the planning region and is located on the eastern border of the foothills of the Rocky Mountains, in a valley at the confluence of the Athabasca River, the McLeod River, the Sakwatamau River, and Beaver Creek. The landscape is dominated by rolling hills of the Lower Foothills and Central Mixedwood Natural Subregions of Alberta (Natural Regions Committee 2006).

The facility overlies the Scollard Formation as the sub-cropping (i.e., uppermost) bedrock unit below the unconsolidated sediment of eolian sands. The groundwater yield capacity at the site is mapped at 10 – 136 m<sup>3</sup>/d (5 – 25 US gpm) (Tokarsky 1977) and is assumed to be an unconfined surficial aquifer.

The base of groundwater protection, defined as the depth at which groundwater would have greater than 4,000 ppm total dissolved solids, is estimated at approximately 100 m across the area.

Desktop evaluation of the on-site aquifer potential is limited but based on existing information likely yields are expected to be approximately 9 m<sup>3</sup>/hr (40 US gpm). This constitutes approximately a quarter of the overall system requirements of approximately 36 m<sup>3</sup>/hr (160 US gpm). Therefore, off-site groundwater exploration/development is necessary to obtain the water requirements via a groundwater source well or wells. Preliminary analysis of the region indicates that there is significant aquifer potential nearby to the PGF, particularly in the floodplain areas downstream (south and east) of the PGF.

### **5.2.2 Surface Water and Fish and Fish Habitat**

The Project falls within the Upper Athabasca sub-watershed of the Athabasca watershed. The PGF site is located approximately 800 m north of the Athabasca River. The proposed pipelines and transmission line routes may cross the Athabasca River and its tributaries. The Athabasca River and its tributaries in this area are identified within the Edson Management Area Water Act Code of Practice (COP) Map as Class C waterbodies with a RAP from September 1 to July 15 (AENV 2006).

Fisheries and Ocean Canada (DFO) has identified the Athabasca River and its tributaries in this area as being within range of distribution for bull trout, and as critical habitat for rainbow trout (DFO 2022). Critical habitat for this species includes the watercourses, a 30 m-wide riparian area on either bank, and areas of groundwater recharge within 100 m of the watercourses.

Several fish species at risk and species of management concern have been observed in watercourses in this portion of the Athabasca River watershed and there is potential habitat for (AEP 2022; Table 2). No federally-listed aquatic invertebrate species at risk (e.g., aquatic plants, molluscs) are known to exist in this area.

**Table 2 Fish Species at Risk and Species of management Concern Noted within the Watercourses in the Project Vicinity**

Species Name	Scientific Name	Alberta General Status <sup>1</sup>	Alberta Wildlife Act Status <sup>2</sup>	SARA Status <sup>3</sup>
Bull trout (Western Arctic population)	<i>Salvelinus confluentus</i>	At Risk	Threatened	Special Concern
Arctic grayling	<i>Thymallus arcticus</i>	May Be at Risk	Special Concern	-
Athabasca rainbow trout (Athabasca River population)	<i>Oncorhynchus mykiss</i>	At Risk	Threatened	Endangered
largescale sucker	<i>Catostomus macrocheilus</i>	Sensitive	-	-
spoonhead sculpin	<i>Cottus ricei</i>	May Be at Risk	-	-
pygmy whitefish	<i>Prosopium coulterii</i>	At Risk	Threatened	-
Sources:				
<sup>1</sup> AEP 2020b				
<sup>2</sup> GOA 1997				
<sup>3</sup> GOC 2023				

### 5.2.3 Vegetation and Wetland Resources

Vegetation in the area surrounding the Project components contain a variety of upland and wetland plant communities, as well as many existing disturbed areas including roads, forestry cut blocks and industrial sites. Upland vegetation types include coniferous, deciduous and mixedwood forest, shrubland and riparian vegetation. Wetland types include bog and fen which have organic (muskeg) soils at least 40 cm deep and marsh, swamp, and shallow open water which have mineral soils or organic soils less than 40 cm deep.

The Project is not within the geographical range of any plant species protected under the *Species at Risk Act* (SARA) or the *Alberta Wildlife Act*. Six species of management concern that are tracked by the Alberta Conservation Information Management System (ACIMS) may be found in the area near the Project components; none of these species are protected by provincial or federal regulations. One vascular plant species tracked by ACIMS was found during the early rare plant survey in 2023 and confirmed in the late rare plant survey in 2023. Ten individual trees of Stika willow (*Salix sitchensis*), a provincially ranked S2 (ACIMS ranking) were identified along the transmission line ROW. Mitigation measures will be considered during construction to address or limit potential effects on rare plants.

The PGF site is mostly disturbed with the potential for natural vegetation occurring on approximately 0.73 ha (out of a total area of 15.05 ha) along northern portion of the site. Wetlands are not present within the site boundary.

The natural gas pipeline, CO<sub>2</sub> pipeline, and power transmission line will cross a variety of upland vegetation types, including coniferous, deciduous and mixedwood forest, shrubland and riparian vegetation associated with watercourses. They may also intersect with a variety of wetlands, largely fens and swamps. As the pipelines will be parallel to pipeline ROWs and powerline easements and roads to the maximum extent possible, it is likely that areas of open, regenerating, and non-native vegetation will also be encountered. All three Project components (two pipelines and transmission line) are expected to parallel existing disturbance (e.g., existing ROW) for much of their respective routes.

#### **5.2.4 Wildlife and Wildlife Habitat**

The Project falls within the range of distribution of species protected under SARA (GOC 2023), indicating that there is potential for interactions with species at risk during Project construction and operation if suitable habitat is available. Generally, potential sites that are undeveloped are more likely to support species at risk, and previously heavily disturbed sites are unlikely to support species at risk.

The presence of wildlife features that might require restricted activity setbacks or any other wildlife-related constraints were not noted during roadside observations of the PGF site. As the site is largely disturbed by aggregate operations, it is unlikely that it contains high quality habitat for wildlife, including species at risk.

The PGF site, CO<sub>2</sub> pipeline route and portions of the natural gas pipeline and power transmission line routes occur within a Key Wildlife Biodiversity Zone (KWBZ). A KWBZ is a provincial land use designation that is meant to protect biodiversity values and, in this case, ungulate winter ranges. There is a restricted activity period from January 15 to April 30 wherein only certain activities are permissible (GOA 2021), as a result of the KWBZ. The Alberta Master Schedule of Standards and Conditions (MSSC; GOA 2021) specifies construction timing requirements and other mitigation measures for activities on Crown lands within KWBZs.

Portions of the pipelines and power transmission line route may occur within the edge of the Swan Hills core and secondary grizzly bear ranges, which are provincially designated. As part of the Grizzly Bear Recovery Plan (AEP 2020a), the Government of Alberta identified core and secondary access management areas within the recovery zone for the conservation of grizzly bear. Core areas contain high quality grizzly bear habitat and low road density (AEP 2020a) and are buffered by secondary zones to help connect core conservation areas. The MSSC (GOA 2021) specifies construction siting and timing requirements and other mitigation measures for activities on Crown lands within grizzly bear zones.

The natural gas pipeline may pass within 500 m of a provincially-designated trumpeter swan waterbody. The MSSC (GOA 2021) specifies construction activity and timing requirements and other mitigation measures for activities on Crown lands within a 500 m and 800 m buffer around trumpeter swan waterbodies. Development of new infrastructure within this area requires government approval and could require additional mitigation measures.

The Project is within Migratory Bird Nesting Zone B5 with a primary nesting period<sup>1</sup> from May 1 to August 31 (ECCC 2018). The active nests of migratory birds are protected under the *Migratory Birds Convention Act*.

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<sup>1</sup> Defined as the period when >10% of total nesting species are engaged in breeding activities plus the recommended extended RAP for migratory bird species at risk (Gregoire 2020, pers comm).

As such, activities that could potentially interact with active nests are subject to a restricted activity period that is based on ECCC's nesting calendar and is specific to the location of the activity (ECCC 2018).

Two wildlife surveys were completed within 100 m of the natural gas pipeline and CO<sub>2</sub> pipeline routes and the transmission line route in June and July 2023 to capture mid- to late-season breeding birds. Surveys included the deployment of autonomous recording units (ARUs) to record vocalizations of target species, including western toad (*Anaxyrus boreas*), common nighthawk (*Chordeiles minor*), and yellow rail (*Coturnicops noveboracensis*). There were no incidental observations of western toad or tadpoles, common nighthawk, or yellow rail during the survey.

A total of forty breeding bird point count stations were surveyed twice for the Project. Seventy-two bird species (59 songbirds, 2 woodpeckers, 7 waterbirds, 1 upland game bird and 3 shorebirds), comprised of 1,020 individual bird observations, were recorded within the 100 m survey point-count radii (plots) during the two survey visits. Seven additional species comprised of 374 individuals were recorded incidentally outside of the 100 m plots. A total of 72 species of migratory birds were observed either systematically or incidentally during breeding bird surveys in 2023.

A total of fourteen SOMC<sup>2</sup> (trumpeter swan, pied-billed grebe, sora, sandhill crane, great gray owl, great blue heron, pileated woodpecker, western wood-pewee, eastern kingbird, barn swallow, evening grosbeak, common yellowthroat, Canada warbler, and western tanager) were observed systematically during the surveys (i.e., within the 100 m survey point-count radii) and incidentally (i.e., outside of the 100 m plots).

The Project does not intercept areas that are mapped for sensitive amphibians, sensitive snake habitat, sensitive raptors, caribou ranges or federally-designated critical habitat for SARA-listed wildlife species. Similarly, the Project does not intersect areas that are mapped for bird conservation (Bird Studies Canada and Nature Canada 2015).

## 5.3 Human Environment

### 5.3.1 Socio-Economic Setting

The town of Whitecourt is located on Highway 43 at the confluence of the McLeod River and the Athabasca River and is surrounded by Woodlands County (which includes the Project location statistics). The town covers a 10.22 km<sup>2</sup> area and includes a population of 9,195 people as of the 2021 census; a 3.4% decline over the past 5 years (Statistics Canada, Census 2021). The age composition of the Town shows the largest population in the 15 to 64 years age group at 68.6% followed by the under 14 years at 21.9%. Of the largest age group, men make up 69.3% and women 67.9% of the population, and children under 14 are similar as 22% are male and 21.8% are female (as listed). Median household income for a two-or-more person household was \$85,000 in 2020 (Statistics Canada, Census 2021). Indigenous identification in the 2021 census included 725 Métis and 450 First Nations, while there were no Inuit identified for Whitecourt. The largest racialized groups population (non-indigenous) are that of Filipino,

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<sup>2</sup> SOMC for the Project are defined as those listed: under Schedule 1 of the *Species at Risk Act* (SARA) as endangered, threatened, or special concern (GOC 2023), under the Alberta *Wildlife Act* as endangered or threatened by the Alberta Endangered Species Conservation Committee (ESCC) and its Scientific Subcommittee (SSC) (GOA 2023), by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as endangered, threatened, or special concern (GOC 2023), as special concern by the ESCC and its SSC (GOA 2023b), or as at risk, may be at risk, or sensitive by the General Status of Alberta Wild Species (AEP 2022).

making up 6.6% of the total population, followed by that of Black, representing 1.2% of the total population as reported by Statistics Canada (Census 2021). The employment rate in Whitecourt is declining at a rate of 0.58% per year from 2001 to 2016; however, in 2021, the employment rate was 72.7% and unemployment rate was 12.3% (Statistics Canada, Census 2021). The highest labour force for the town is in the mining, quarrying and oil and gas extraction sector at 12.3%, followed by retail at 13% and manufacturing at 12.1% (Statistics Canada, Census 2021). The local geographic area (LGA) referred to as Whitecourt, includes most of Woodlands County, the Town of Whitecourt and the Alexis Nakota Sioux Nation, Whitecourt #232 (Government of Alberta 2019)

### 5.3.2 Indigenous Groups Setting

The Project is located in Treaty 6 Territory within Métis Region 4, which is the traditional home, meeting grounds, and travelling routes to the Cree, Saulteaux, Blackfoot, Nakota Sioux, Dene', and Métis People. The Project is adjacent to the Alexis Whitecourt 232 reserve, part of the Alexis Nakota Sioux Nation.

Alexis Nakota Sioux Nation's (Band No. 437) traditional territory extends from Cardinal River in the south along the foothills and Rocky Mountains beyond Whitecourt and the Swan Hills in the north and reaches east past Barrhead (ANSN 2023). Alexis Nakota Sioux Nation (ANSN) is composed of four reserves covering an area of approximately 14,479 ha (CIRNAC 2022):

- Alexis 133
- Alexis Cardinal River 234
- Alexis Elk River 233
- Alexis Whitecourt 232

### 5.3.3 Historical Resource Setting

The Listing of Historic Resources (AC 2021) was reviewed relative to the Project. Sites are classified as having a potential for archaeological (a), palaeontological (p) or cultural (traditional land use) (c). The PGF site does not have Historical Resource Values but does require an Historical Resources Application be filed with Alberta Arts, Culture and Status of Women (AACSW) to obtain *Historical Resources Act* clearance. The Project pipelines and power transmission line may cross quarter sections with designated historical resource values (HRV) of 4 (contains a historic resource that may require avoidance or assessment) and 5 (high potential to contain a historic resource). It is possible that the areas near the Athabasca River crossing could have additional historical importance, which would be determined during AACSW review.

### 5.3.4 Human Health Setting

The health status of people in the Whitecourt area is typical of suburban regions in Alberta. The overall health status in the Whitecourt area is similar to the average for Alberta, which is influenced by proximity of available health care services typically experienced in suburban regions of the province (e.g., shortage of doctors and related professions). The air and water quality in the Whitecourt region are characterized as very good.

Receptor locations have been identified and include straight line distances to the nearest recreational facility includes the Eagle River Casino and Travel Plaza 1 km north of the PGF and 1.3 km to the Eagle River Tourism RV Park, all of which are located on the Alexis Sioux Nation lands. The Whitecourt Airport is approximately 4 km south of the PGF and there are rural residences adjacent to the airport also approximately 4 km south-southwest of the PGF, which are the closest residences to the PGF. The town of Whitecourt limits are approximately 6.8 km southeast of the PGF.

## 5.4 Potential Effects in Relation to Impact Assessment Act Requirements

Carrying out of the Project has the potential to result in changes to fish and fish habitat and migratory birds. Although the Project is not located on federal lands, it is possible that some environmental effects (e.g., air emissions) may extend to federal lands (Indigenous reserves). Because the Project is located more than 200 km from the British Columbia border and 1,000 km from the United States border trans-boundary effects on lands outside of Alberta or Canada are not anticipated. Additionally, changes to aquatic species as defined in subsection 2(1) of the *Species at Risk Act* are not anticipated.

- Fish and Fish Habitat—The Project has the potential to cause adverse effects to fish, as defined in the *Fisheries Act*, including:
  - Harmful alteration, disruption or destruction of fish habitat due to the Project infrastructure and changes in water quality and quantity
  - Fish mortality
- Migratory Birds—Potential Project-related effects to migratory birds, as defined in the *Migratory Birds Convention Act*, include:
  - Direct loss of habitat and potential habitat due to the Project footprint
  - Indirect loss of habitat and potential habitat due to sensory disturbance
  - Behavioral response due to sensory disturbance
  - Mortality (direct and indirect)

### 5.4.1 Project-related Effects to Indigenous Groups

Under the IAA, Schedule 1, sections 3 (21)(22), the Project may result in potential impacts to Indigenous peoples, including:

- Changes to health and socio-economic conditions:
  - changes to health are expected to be related to changes to air quality and noise at the PGF site; however, these changes are within the respective guidelines for air quality and noise within the site and therefore, within guidelines for nearby receptors, including the traditional lands of Indigenous groups and their uses (e.g., hunting, fishing, plant harvesting), when mitigation measures are employed
  - Socio-economic effects are anticipated to be positive for Indigenous nations based to opportunities for employment during construction and operations of the PGF

- Physical and cultural heritage:
  - Currently there are no sites or structures of historical, archaeological, paleontological, or historical significance on record in the proposed PGF site; however, the potential exists for Traditional Land Use sites to be discovered
  - linear components of the Project are anticipated to be within or adjacent to existing infrastructure (roadways, transmission lines, pipelines) for much of their routing; however, the routes do traverse areas of high historical resource potential, based both on landscape attributes (such as watercourse crossings) and/or inclusion in the Alberta *Listing of Historic Resources*. Engagement with Indigenous groups relative to the *Historical Resources Act* may be triggered to discuss traditional and cultural use and potential effects.
- The current use of lands and resources for traditional purposes
  - Currently the PGF site is used for natural resource extraction, void of vegetation and cultural resources; therefore there is no area of overlap for land and resources for traditional purposes at this location
  - Traditional land and resource use that currently is practiced by Indigenous groups in the vicinity of the Project include hunting, fishing, trapping, traditional plant uses and cultural transmission (e.g., spiritual growth).
- Any structure, site, or thing that is of historical, archaeological, or architectural significance
  - Portions of the linear components of the Project may cross known structure, site or thing of historical, archaeological, or architectural significance; which may result in temporary access restrictions during construction

## 5.5 Other Potential Environmental, Economic, Social Heritage and Health Effects

Construction, operation and decommissioning of the Project have the potential to result in environmental effects through land clearing for temporary workspace and installation of permanent infrastructure, air emissions from construction activities and operation of the PGF. To support the IAAC in determining the need for and potential scope of an environmental assessment under IAA, a summary of the potential environmental, economic, social, heritage, and health effects of the Project has been prepared based on general knowledge of the Project and the existing natural and human environment (Table 3).

Best practices and mitigation measures to avoid and reduce potential effects of the Project will be incorporated and considered in Project design. As the Project progresses through the design process, additional or revised mitigation measures will be incorporated into the Project design. Mitigation measures will be developed in accordance with applicable provincial and federal regulations and permit requirements, best management practices, and specific measures identified through the environmental assessment process.

The Project has the potential to contribute cumulatively to potential effects on the environment associated with past, present and reasonably foreseeable future projects and activities in the region. These may include forestry, power, and oil and gas projects and activities. No regional studies as defined by the IAA have occurred within the Project area.

**Table 3 Summary of Potential Project Effects and Mitigation Measures**

Component	Potential Project Effects	Project Activities and Anticipated Pathway of Effects
<b>Environmental Effects</b>		
Air Quality	<ul style="list-style-type: none"> <li>• Increase in ambient concentrations of criteria air contaminants, including SO<sub>2</sub>, NO<sub>x</sub>, CO, VOC and particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>)</li> <li>• Increase the emission of GHGs including CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O expressed as CO<sub>2</sub>e</li> </ul>	Construction: land clearing, power generation, fuel combustion and vehicle traffic; Operation: fuel combustion, fugitive emissions, and vehicle traffic. Decommissioning: fuel combustion, demolition, backfilling, and removal of infrastructure
Noise	<ul style="list-style-type: none"> <li>• Increased noise levels causing nuisance; displacement and sensory disturbance to wildlife.</li> </ul>	Construction: operation of equipment and vehicles during earthworks and construction, installation of piles (if required); Operation: operation of the PGF; Decommissioning: operation of equipment
Groundwater	<ul style="list-style-type: none"> <li>• Change in groundwater quality or quantity</li> </ul>	Construction: land clearing, dewatering, groundwater extraction well installations, accidental spills from vehicles and equipment; Operation: alteration of shallow groundwater levels or flow rates through extraction, accidental spills from pipeline ruptures, equipment; Decommissioning: reclamation activities
Soils	<ul style="list-style-type: none"> <li>• Change in soil quality or quantity</li> </ul>	Construction: land clearing, site preparation, equipment/vehicle leaks, vehicle traffic, wind/water erosion; Decommissioning: reclamation and erosion
Freshwater Fish and Fish Habitat	<ul style="list-style-type: none"> <li>• Serious harm to fisheries through fish mortality and altering or destructing instream and riparian habitat.</li> </ul>	Construction of the pipelines at watercourse crossings could disturb stream beds and banks, alter riparian vegetation and release deleterious substances (e.g., sediment, hydrocarbons). Decommissioning will have similar impacts as those during construction.
Surface Water	<ul style="list-style-type: none"> <li>• Change in surface water quality or quantity</li> </ul>	Construction: land adjacent to waterbodies resulting in increase sediment transport, flow pattern changes, temporary diversions or release of water, increased erosion; Operation: water discharge from the stormwater management pond
Vegetation Resources	<ul style="list-style-type: none"> <li>• Change in the abundance of plant species of interest</li> <li>• Change in the abundance of ecological communities of interest</li> <li>• Change in wetland functions</li> </ul>	<p>Construction and Decommissioning: direct loss or alteration of vegetation, which may potentially include plant species at risk, traditionally used plant species, and native plant communities including provincially listed ecological communities, and wetland communities. Invasive plant species may be introduced or spread as a result of Project activities which disturb the ground. Project construction could potentially change wetland soils, hydrology, or vegetation that may affect the potential for a wetland to provide certain ecological functions during pipeline construction.</p> <p>No anticipated pathways of effects during operation of the PGF, pipelines and transmission line</p>



**Table 3 Summary of Potential Project Effects and Mitigation Measures**

Component	Potential Project Effects	Project Activities and Anticipated Pathway of Effects
Wildlife and Wildlife Habitat	<ul style="list-style-type: none"> <li>• Change in the availability and/or suitability of wildlife habitat, increased mortality risk, and changes to movement patterns</li> </ul>	<p>Project activities have potential to affect migratory and non-migratory birds and wildlife. Construction of Project components will remove habitat and alter habitat suitability for some wildlife species. Mortality risk for wildlife may increase during construction due to increased human presence, use of heavy equipment, vegetation clearing, and collision with vehicles or infrastructure. Movement of wildlife may change during construction in response to perceived barriers or increased sensory disturbance. No anticipated pathways of effects during operation of the PGF, pipelines and transmission line. Decommissioning activities are expected to result in similar effects pathways to wildlife.</p>
<b>Effects to Indigenous Groups</b>		
Land Use	<ul style="list-style-type: none"> <li>• Change in non-tenured land use</li> </ul>	<p>The presence of construction and operational workforces and mobile equipment (including associated noise and emissions) may result in short-term changes in the quality of experience of engaging in existing traditional land uses near the Project.</p>
Socio-Community	<ul style="list-style-type: none"> <li>• Change in community infrastructure and services</li> <li>• Change in accommodation availability</li> <li>• Change in transportation infrastructure</li> <li>• Change in community health and wellness</li> </ul>	<p>Construction, operation, decommissioning of the Project could increase demand for accommodations, community infrastructure and services, and demand on transportation infrastructure. The Project may adversely affect the social and cultural wellbeing of Indigenous groups as a result of the presence of a temporary workforce, which could disrupt community life. Workers who secure employment with the Project may benefit from increased disposable income and skillsets. Indigenous groups may benefit from increased services from the temporary workforce presence (e.g., housing, food service).</p>
Economy and Employment	<ul style="list-style-type: none"> <li>• Change in regional labour force</li> <li>• Change in regional business</li> <li>• Change in provincial economy</li> </ul>	<p>Project expenditures and employment during construction, operation, and decommissioning of the Project could result in changes to the regional labour force and business activity as well as the provincial economy. The Project will require an estimated peak workforce in the Whitecourt area of approximately 600 to 700 people at the peak of construction. During operations, the Project will directly employ an estimated 32 people in ongoing full-time roles. Socio-economic effects are anticipated to be positive for Indigenous groups due to opportunities for employment during construction and operations of the PGF.</p>
Indigenous Health	<ul style="list-style-type: none"> <li>• Changes to human health</li> </ul>	<p>Construction, operation, and decommissioning activities may release chemicals of concern into the environment. People who are exposed to chemicals of concern through air inhalation, food and water ingestion, and dermal contact may experience a change in their health risk. Effects on the environment are expected to be limited to changes to air quality and noise at the PGF site; however, these changes are within the respective guidelines for air quality and noise within the site (see Sections 19.1 and 19.2 for specific guidelines) and therefore, within guidelines for nearby receptors, including the traditional lands of Indigenous groups and their uses (e.g., hunting, fishing, plant harvesting).</p>

**Table 3 Summary of Potential Project Effects and Mitigation Measures**

Component	Potential Project Effects	Project Activities and Anticipated Pathway of Effects
<b>Socio-Economic Effects</b>		
Land Use	<ul style="list-style-type: none"> <li>• Change in non-tenured land use</li> </ul>	The presence of construction and operational workforces and mobile equipment (including associated noise and emissions) may result in short-term changes in the quality of experience of engaging in existing land uses near the Project.
Socio-Community	<ul style="list-style-type: none"> <li>• Change in community infrastructure and services</li> <li>• Change in accommodation availability</li> <li>• Change in transportation infrastructure</li> <li>• Change in community health and wellness</li> </ul>	Construction, operation, decommissioning of the Project could increase demand for accommodations, community infrastructure and services, and demand on transportation infrastructure. The Project may adversely affect the social and cultural wellbeing of residents as a result of the presence of a temporary workforce, which could disrupt community life. Workers who secure employment with the Project may benefit from increased disposable income and skillsets. Local community may benefit from increased services from the temporary workforce presence (e.g., housing, food service).
Economy and Employment	<ul style="list-style-type: none"> <li>• Change in regional labour force</li> <li>• Change in regional business</li> <li>• Change in provincial economy</li> </ul>	Project expenditures and employment during construction, operation, and decommissioning of the Project could result in changes to the regional labour force and business activity as well as the provincial economy. The Project will require an estimated peak workforce in the Whitecourt area of approximately 600 to 700 people at the peak of construction. During operations, the Project will directly employ an estimated 32 people in ongoing full-time roles.
<b>Heritage Effects</b>		
Cultural and Heritage Resources	<ul style="list-style-type: none"> <li>• Loss of information about or alteration to site contents or context</li> </ul>	Construction will involve tree clearing and ground disturbing activities that could adversely affect archaeological and historical resources.
<b>Human Health Effects</b>		
Human Health	<ul style="list-style-type: none"> <li>• Changes to human health</li> </ul>	Construction, operation, and decommissioning activities may release chemicals of concern into the environment. People who are exposed to chemicals of concern through air inhalation, food and water ingestion, and dermal contact may experience a change in their health risk.

## 6.0 Regulatory Requirements

### 6.1 Federal Regulatory Requirements

The following federal regulatory approvals/adherence are required for construction of the Project:

- Environment and Climate Change Canada (ECCC) – *Migratory Birds Convention Act*
- ECCC - *Species at Risk Act*

Other federal acts that could be relevant to the Project components and planned during construction methods, include the following acts:

- Fisheries and Oceans Canada (DFO) - *Fisheries Act*
- *Canadian Navigable Water Act* (all crossings of navigable watercourses will be completed based on, and the Minor Works Order)
- *Aeronautics Act* - Whitecourt Airport is a non-certified aerodrome, based on current designation, and the *Aeronautics Act* does not apply to the airport

### 6.2 Provincial Regulatory Requirements

Provincial regulatory requirements that may affect the Project are those associated with the following acts:

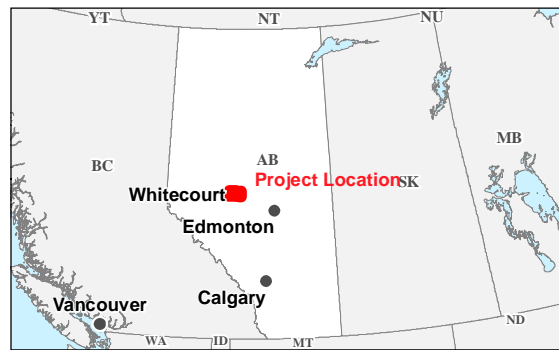
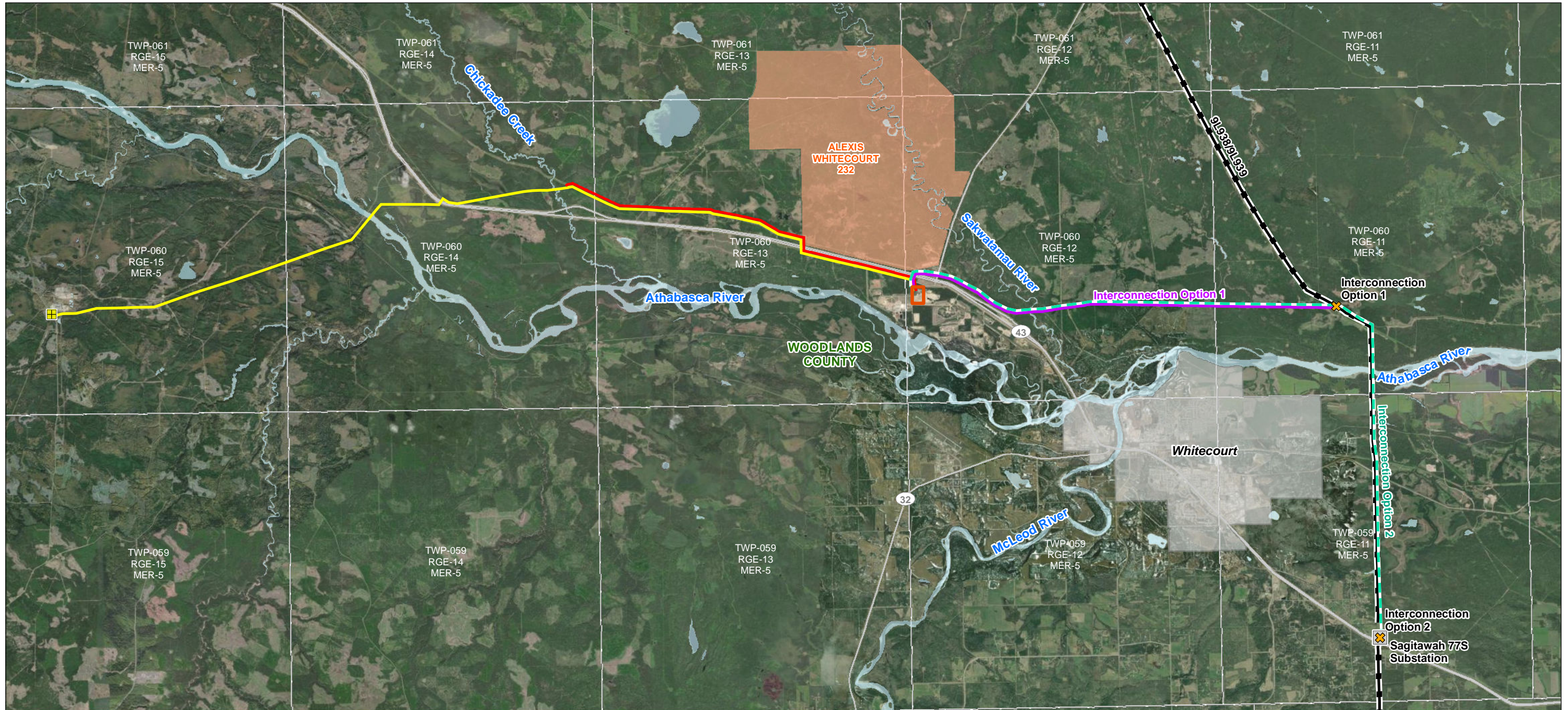
- Province of Alberta - *Hydro and Electric Energy Act*, AUC Rule 007: Applications for Power Plants, Substations, Transmission Lines, Industrial System Designations, Hydro Developments and Gas Utility Pipelines (the AUC Rule 007)
- Province of Alberta - *Electric Utilities Act*, the AUC Rule 007
- Alberta Environment and Protected Areas (AEPA) - *Environmental Protection and Enhancement Act*
- AEPA - *Water Act*
- Alberta Arts, Culture and Status of Women (AACSW) - *Historical Resources Act*
- AEPA - *Public Lands Act*
- Province of Alberta - *Pipeline Act*
- Upper Athabasca Regional Plan - the land use plan or management framework for this region has not yet started

### 6.3 Municipal Regulatory Requirements

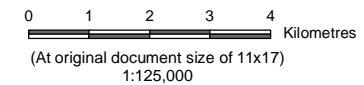
- Woodlands County Municipal Development Plan Bylaw #406/13
- Woodlands County Land Use Bylaw 490/17
- Intermunicipal Development Plan for Woodlands County and the Town of Whitecourt Bylaw 401/12
- Woodlands County – 2022-2025 Strategic Plan

## 7.0 Figures

All figures referenced in this summary hereby follow.



- Interconnection Site
- Existing Substation
- NGTL Windfall Meter Station
- Interconnection Option 1
- Interconnection Option 2
- Preferred CO<sub>2</sub> Pipeline Route
- Preferred Natural Gas Pipeline Route
- Proposed Power Generation Facility
- AESO 240 kV Transmission Line
- First Nation Reserve
- Township
- Urban Area
- Waterbody

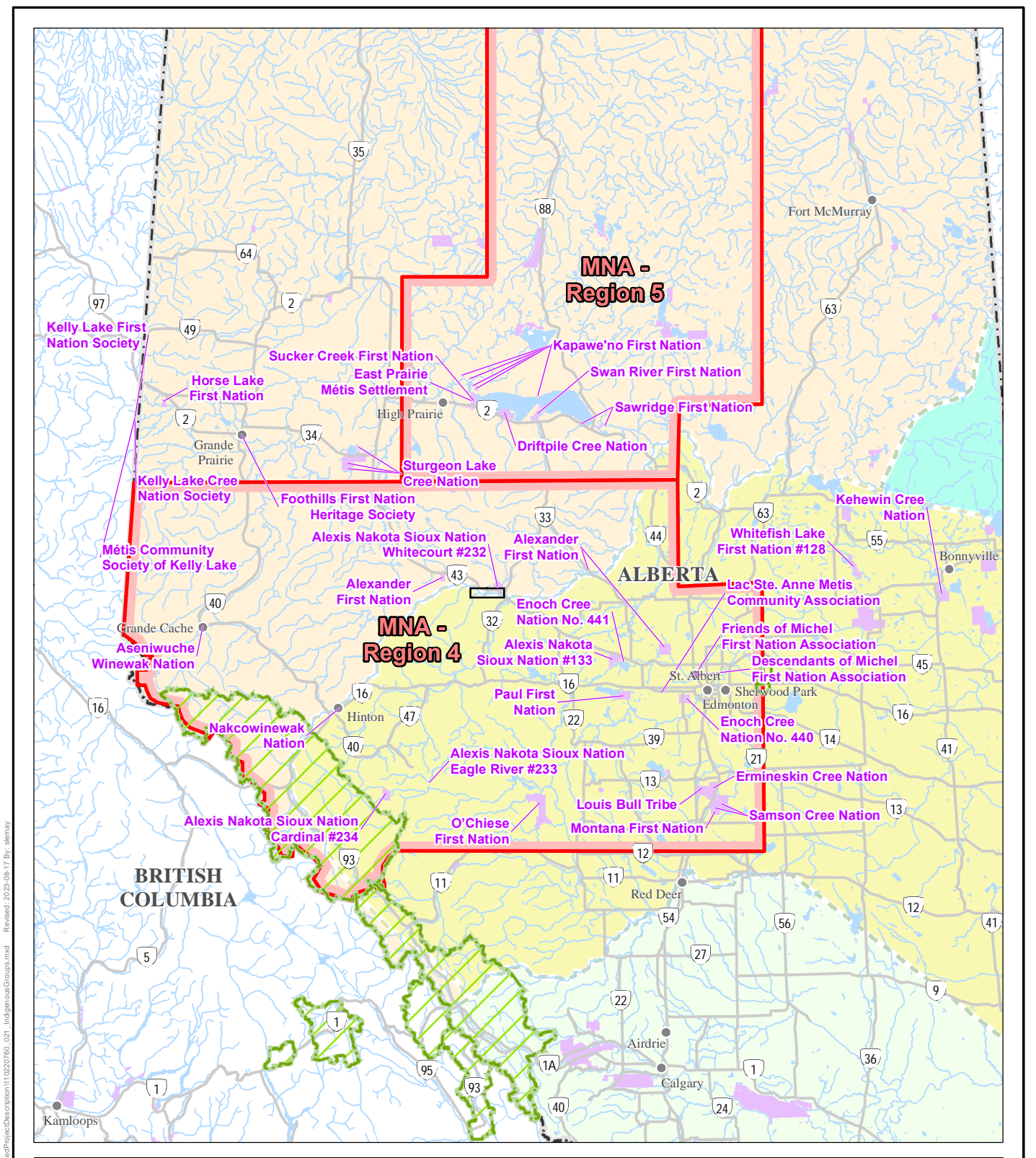


Project Location: Whitecourt, Alberta  
 Prepared by SL on 2023-08-17  
 TR by SM on 2023-08-17  
 IR Review by JR on 2023-08-17

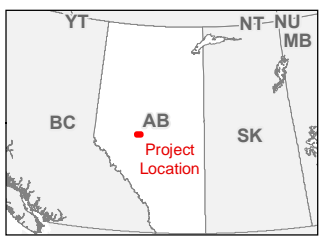
Client/Project: Client: Moraine Initiatives Ltd. Project: Moraine Power Generation Project  
 110220760-023

Figure No. 1  
 Title: Project Overview

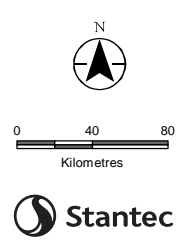
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 Revised: 2023-08-17 By: skema



- Project Area
- First Nation Reserve
- Métis Nation of Alberta (MNA) Regional Zone
- Treaty Boundary**
- Treaty 10 (1906)
- Treaty 8 (1899)
- Treaty 6 (1876)
- National Park
- Provincial Boundary
- Populated Place
- Major Road



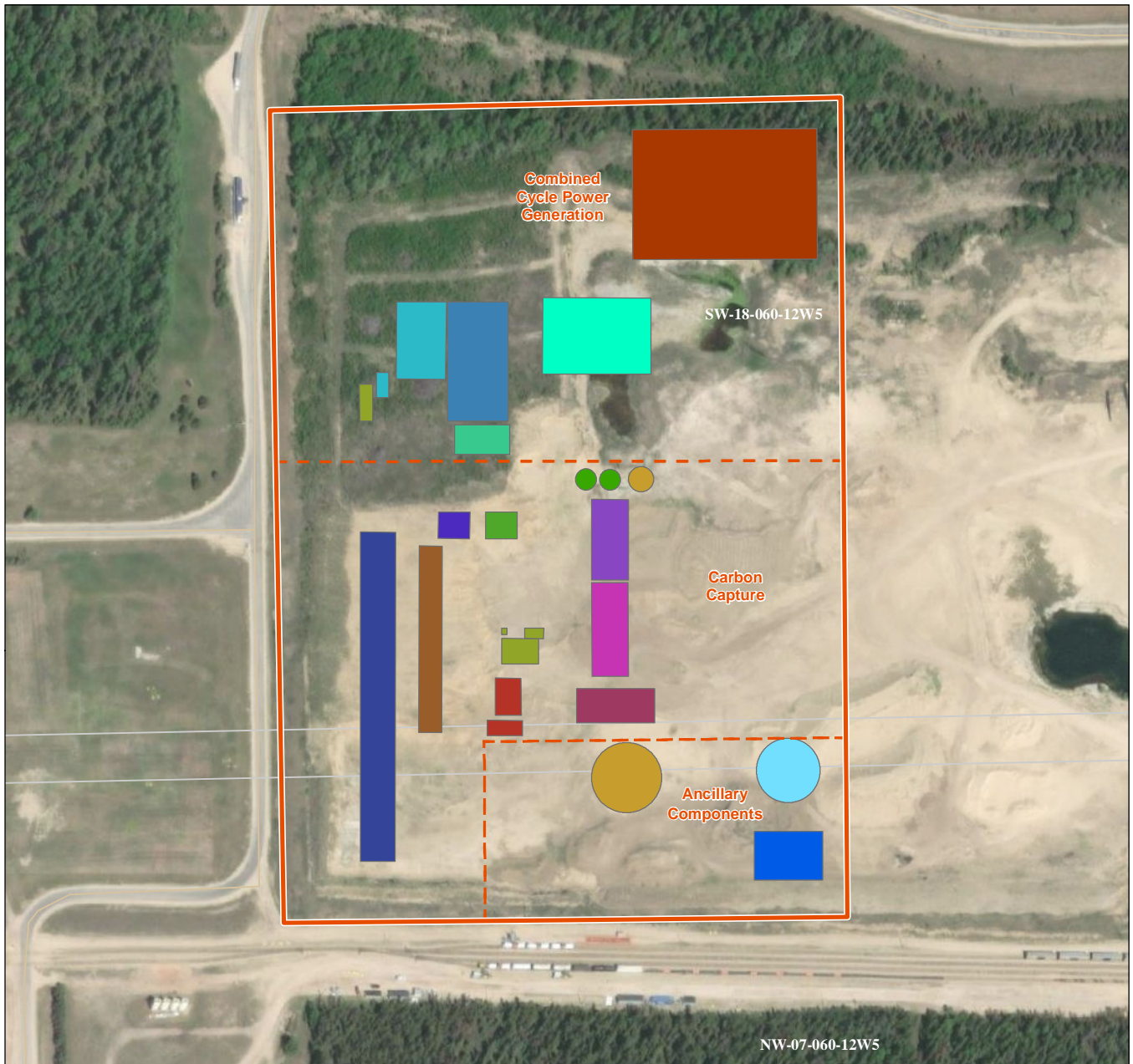
**Project Location**  
 Woodlands County, AB  
 Prepared by SL on 2023-08-17  
 TR by MP on 2023-08-17  
 IR Review by JR on 2023-08-17

**Client/Project**  
 Client: Moraine Initiatives Ltd.  
 Project: Moraine Power Generation Project  
 Detailed Project Description  
 Figure No. **2**  
 Title  
**Location of Indigenous Nation and Nearby Federal Lands**

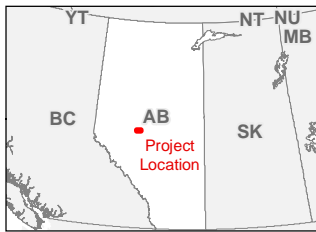
110220760-021

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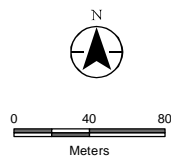
W:\Clients\General\Electric\Sagihwah\_Cogen\Figures\DetailedProjectDescription\110220760\_022\_PlotPlan\_inline.mxd  
 Revised: 2023-08-28 By: skemay



Project Component	
	Air Cooled Condenser
	Air Cooled Heat Exchanger
	Buffer (Raw Water Storage) Pond
	CO <sub>2</sub> Absorber
	CO <sub>2</sub> Compression and Dehydration Unit
	Combustion Turbine Building
	Control Building and Warehouse
	Demineralized Water Tank
	Fire Water / Raw Water / Service Water Tank
	Flue Gas Quencher
	Packaged Electrical Electronic Control Center
	Parking
	Pump
	Steam Turbine Building
	Storage Tank
	Surface Water Management Pond
	Wastewater Tank
	Water Treatment



- Proposed Power Generation Facility
- Minor Road
- Quarter Section



Project Location: Woodlands County, AB  
 Prepared by SL on 2023-08-17  
 TR by MP on 2023-08-17  
 IR Review by JR on 2023-08-17

Client/Project: Moraine Initiatives Ltd. 110110760-022

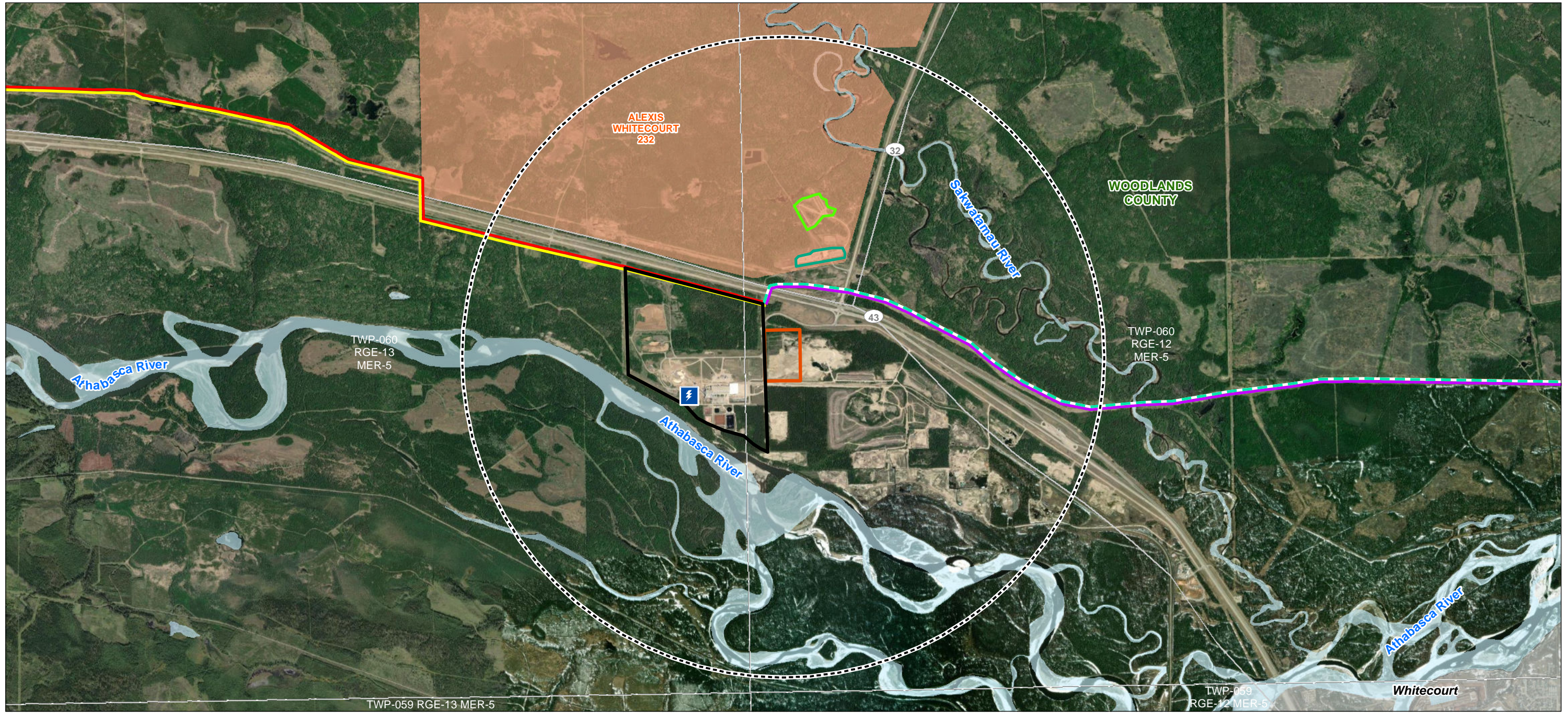
Project: Moraine Power Generation Project  
 Detailed Project Description
















Figure No. 3

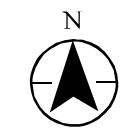
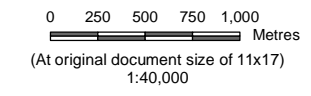
Title: Plot Plan



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-  Alberta Newsprint Company (ANC) Power Plant
-  Alberta Newsprint Company (ANC) Property Boundary
-  Eagle River Casino
-  Eagle River Tourism RV Park
-  Noise Baseline Assessment Study Area (1.5km Radius)
-  Interconnection Option 1
-  Interconnection Option 2
-  Preferred CO<sub>2</sub> Pipeline Route
-  Preferred Natural Gas Pipeline Route
-  Proposed Power Generation Facility
-  Major Road
-  First Nation Reserve
-  Township
-  Urban Area
-  Waterbody



*Project Location*  
Whitecourt,  
Alberta

*Client/Project*  
Client: Moraine Initiatives Ltd.  
Project: Moraine Power Generation Project  
Detailed Project Description

*Figure No.*  
**4**

*Title*  
**Noise Baseline Assessment Area and Receptor Locations**

Prepared by SL on 2023-07-31  
TR by JR on 2023-07-31  
IR Review by JR on 2023-07-31

110220760-018 REVA

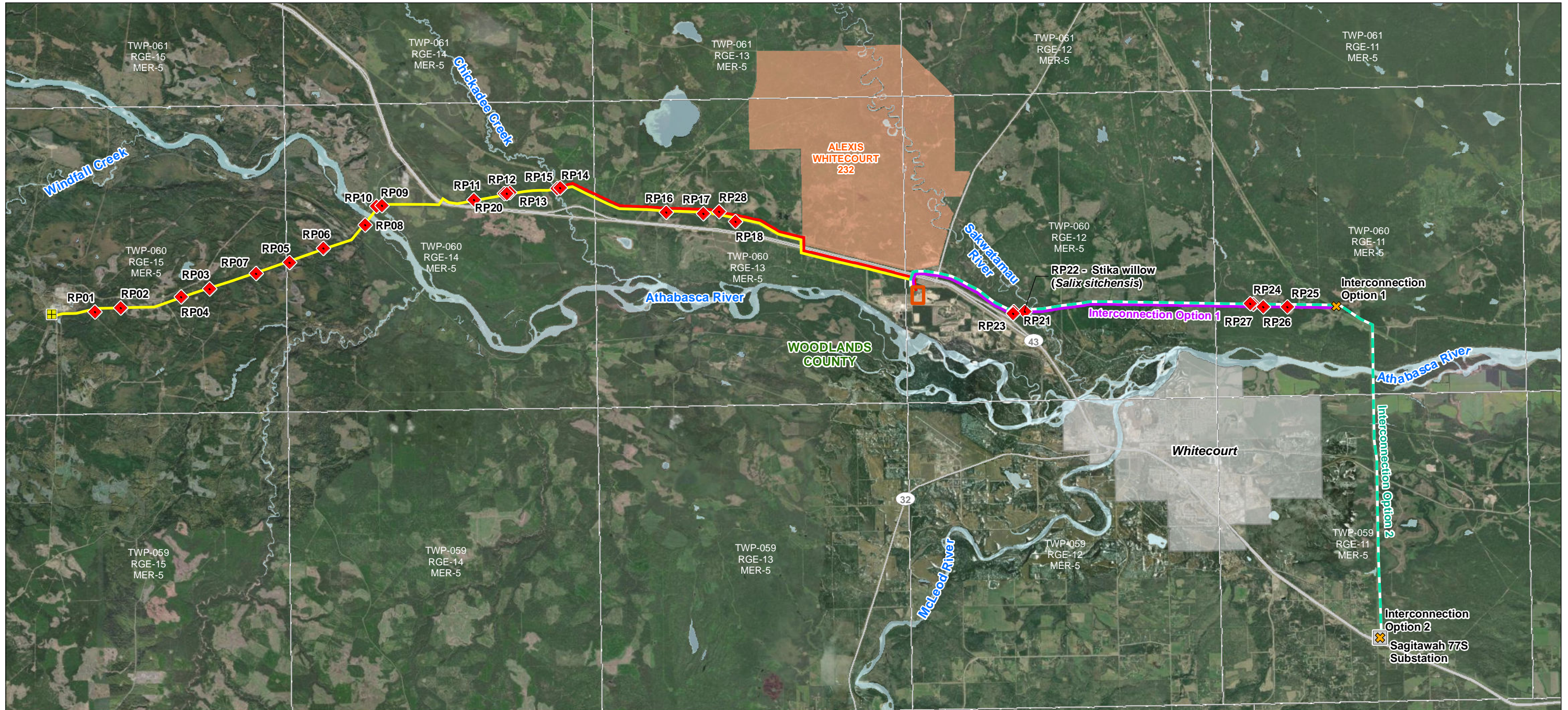
**Notes**  
1. Coordinate System: NAD 1983 UTM Zone 11N  
2. Data Sources: Government of Alberta and Canada, Stantec and General Electric  
3. Background: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

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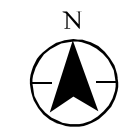
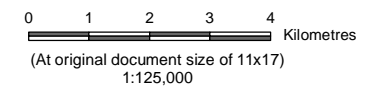
Disclaimer: This document has been prepared based on information provided by others as cited in the Notes section. Stantec has not verified the accuracy and/or completeness of this information and shall not be responsible for any errors or omissions which may be incorporated herein as a result. Stantec assumes no responsibility for data supplied in electronic format, and the recipient accepts full responsibility for verifying the accuracy and completeness of the data.



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- ◆ Rare Plant Survey Site
- ✕ Interconnection Site
- Existing Substation
- NGTL Windfall Meter Station
- Interconnection Option 1
- Interconnection Option 2
- Preferred CO<sub>2</sub> Pipeline Route
- Preferred Natural Gas Pipeline Route
- Proposed Power Generation Facility
- First Nation Reserve
- Township
- Urban Area
- Waterbody



**Project Location**  
Whitecourt,  
Alberta

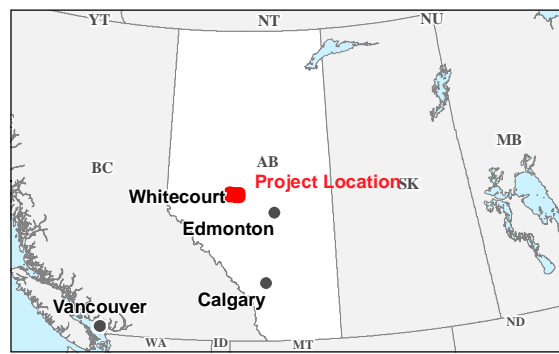
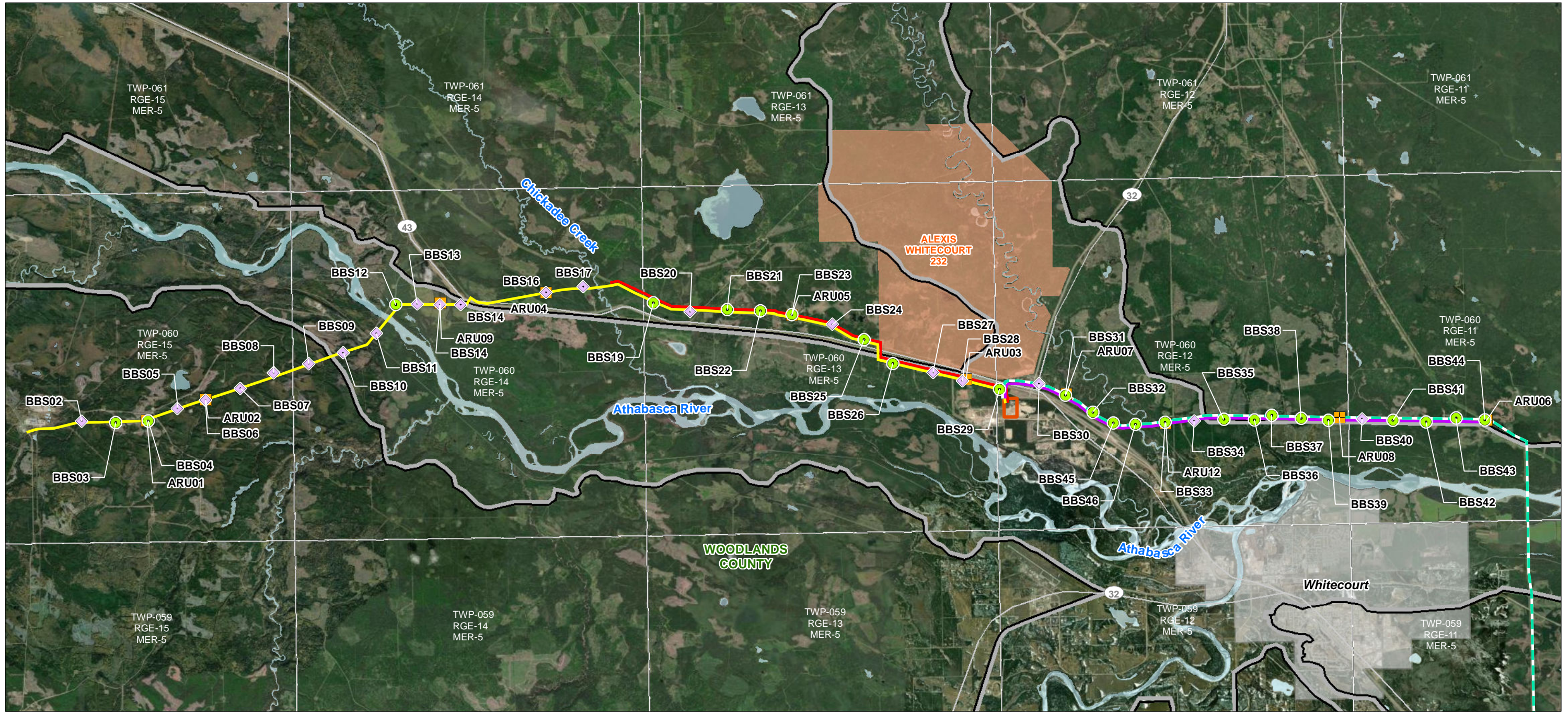
**Client/Project**  
Client: Moraine Initiatives Ltd.  
Project: Moraine Power Generation Project  
Detailed Project Description

Prepared by SL on 2023-08-22  
TR by SM on 2023-08-22  
IR Review by JR on 2023-08-22

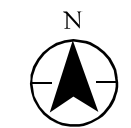
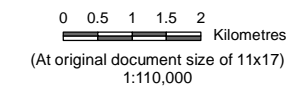
110220760-025

**Figure No.**  
**5**

**Title**  
**2023 Early and Late Rare Plant Surveys**



- ◆ Breeding Bird Survey Station
- Species of Management Concern Observation
- + Autonomous Recording Unit Location
- Interconnection Option 1
- Interconnection Option 2
- Preferred CO<sub>2</sub> Pipeline Route
- Preferred Natural Gas Pipeline Route
- Proposed Power Generation Facility
- Major Road
- First Nation Reserve
- Key Wildlife and Biodiversity Zone
- Township
- Urban Area
- Waterbody



**Project Location**  
Whitecourt,  
Alberta

**Client/Project**  
Client: Moraine Initiatives Ltd.  
Project: Moraine Power Generation Project  
Detailed Project Description

**Figure No.**  
**6**

**Title**  
**2023 Wildlife Survey Stations and Observations**

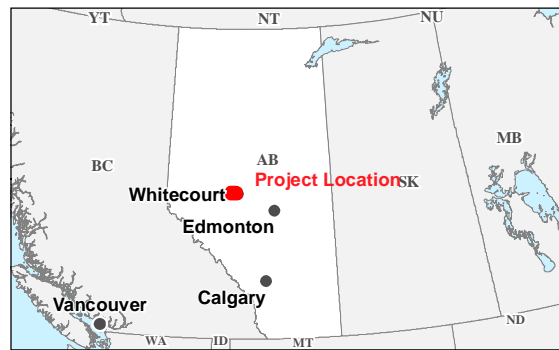
Prepared by SL on 2023-08-16  
TR by DA on 2023-08-16  
IR Review by JR on 2023-08-16

110220760-020 REVA

**Notes**  
1. Coordinate System: NAD 1983 UTM Zone 11N  
2. Data Sources: Government of Alberta and Canada, Stantec and General Electric  
3. Background: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

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- Study Area
- Major Road
- First Nation Reserve
- Township
- Urban Area
- Waterbody

0 0.5 1 1.5 2 Kilometres  
 (At original document size of 11x17)  
 1:75,000



**Project Location**  
 Whitecourt,  
 Alberta

**Client/Project**  
 Client: Moraine Initiatives Limited  
 Project: Moraine Power Generation Project  
 Detailed Project Description

**Figure No.**  
 7

**Title**  
 Potential Sites Overview

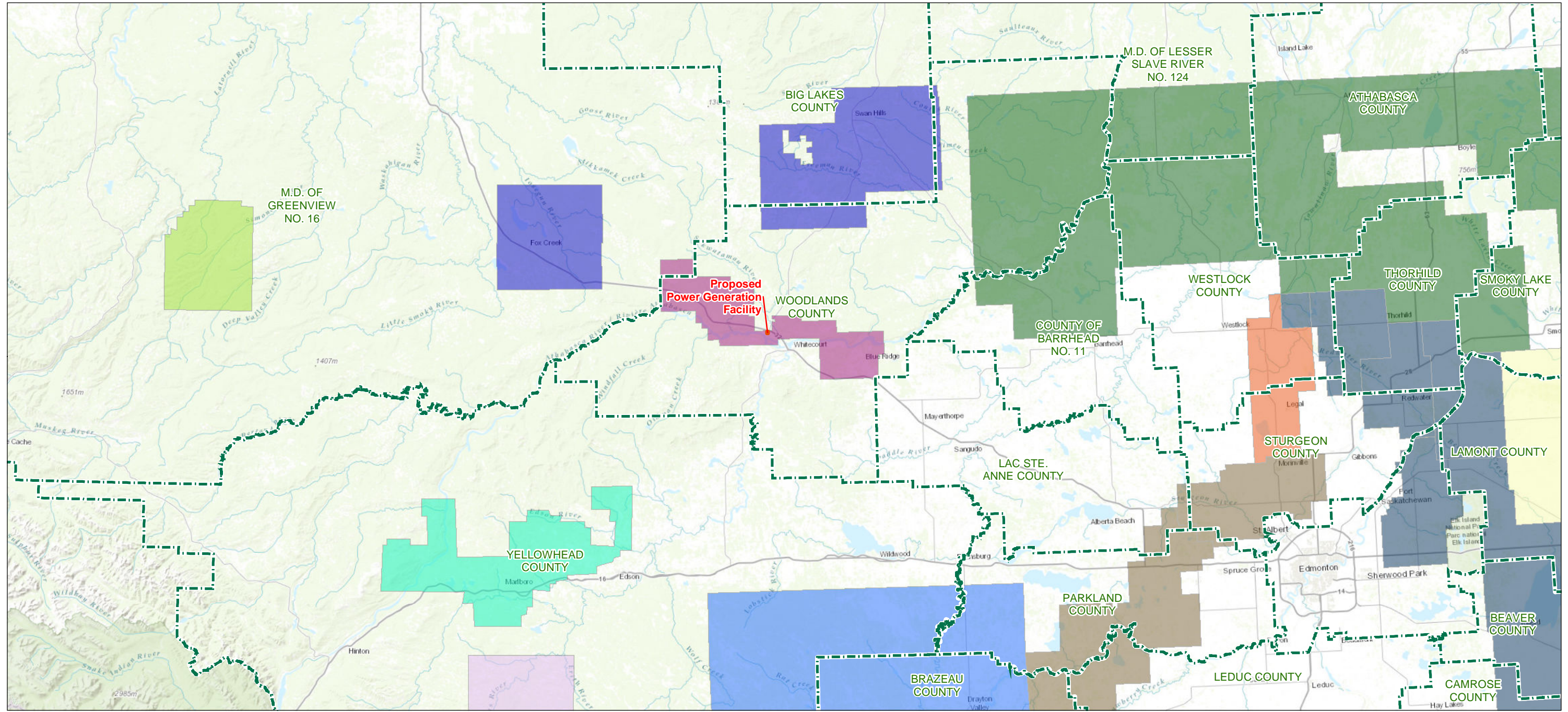
Prepared by DS on 2022-01-20  
 TR by SM on 2022-01-20  
 IR Review by JD on 2022-01-20

110220760-024 REVA

**Notes**  
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 2. Data Sources: Government of Alberta and Canada, Stantec and General Electric  
 3. Background: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

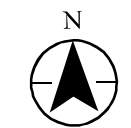
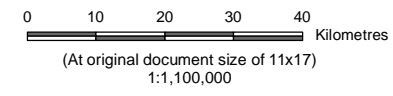
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W:\Clients\General\_Electric\Sagilwah\_Cogen\Figures\Detailed\ProjectDescription\110220760\_019\_CarbonHubAreas.mxd Revised: 2023-08-25 By: stlmay



- Proposed Power Generation Facility
- Potential Carbon Hub Area**
- ARC Resources Ltd.
- Athabasca Banks
- Bison Low Carbon Ventures Inc.
- Enbridge Wabamun Hub Ltd.
- Kiwetinohk Energy Corp.
- Pembina Pipeline Corporation
- Shell Canada Limited
- Tidewater Midstream and Infrastructure Ltd.
- Tourmaline Oil Corp.
- Vault 44.01 Ltd.
- Wolf Carbon Hub GP Inc

Municipal District



*Project Location*  
Whitecourt,  
Alberta

Prepared by SL on 2023-08-09  
TR by JR on 2023-08-09  
IR Review by JR on 2023-08-09

*Client/Project*  
Client: Moraine Initiatives Ltd.  
Project: Moraine Power Generation Project  
Detailed Project Description

110220760-019 REVA

*Figure No.*  
**8**

*Title*  
**Alternate Carbon Storage Hub Locations Near the Project**

**Notes**  
 1. Coordinate System: NAD 1983 UTM Zone 11N  
 2. Data Sources: Government of Alberta and Canada, Stantec and General Electric  
 3. Background: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

## 8.0 References

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[https://www.wcas.ca/wp-content/uploads/2022/09/WCAS-AR2021\\_FF.pdf](https://www.wcas.ca/wp-content/uploads/2022/09/WCAS-AR2021_FF.pdf)

## **8.2 Personal Communications**

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