

## PROJECT DESCRIPTION SUMMARY

For the  
PRAIRIE LIGHTS POWER PROJECT

Project Location  
35 km south of Grande Prairie, Alberta

Proponent

PRAIRIE LIGHTS POWER GP INC.



Submitted to  
IMPACT ASSESSMENT AGENCY OF CANADA

DOCUMENT COMPLETED BY



McCallum Environmental Ltd.

November 18, 2019

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## 1 GENERAL INFORMATION AND CONTACTS

This Project Description Summary has been prepared in accordance with the Canadian Environmental Assessment Agency (CEA Agency) Guide to Preparing a Description of a Designated Project under the *Canadian Environmental Assessment Act*, 2012 (Updated: March 2015). The numbers and titles used as main headings in the document align with the guide for ease of reference. During the draft review of this document by CEA Agency, the updated *Impact Assessment Act* came into force. The CEAA agency advised that the format of the *Guide to Preparing a Description of a Designated Project* could be used for this document. The content of this document meets the information requirements of the new *Information and Management of Time Limit Regulations*, Schedule 1.

### 1.1 NATURE OF PROJECT

Prairie Lights Power GP Inc. ('PLPGP') is proposing to permit, construct and operate a 360-Megawatt ('MW') Power Project. The Project is known as the Prairie Lights Power Project ('PLPP').

The location was selected based on proximity to natural gas supply; demand for electricity and available export grid capacity; adequate acreage; minimum number of neighbors to avoid noise inconvenience; access to site and road load capacity; and other environmental factors.

#### 1.1.1 PROJECT LOCATION

The PLPP is located about 35 km south of Grande Prairie, Alberta, within the Municipal District of Greenview #16. (Figure 1. PLPP Location)

The site is just northeast of the Canadian Forest Products Ltd. ('Canfor') 2000 Road turnoff from Alberta Highway 40.

The Project is located in Legal Sub Divisions (LSD) 5 and 12, Section 3, LSD 8 and 9, Section 4, Township 68, Range 5, West of the 6<sup>th</sup> Meridian.

Centre of Project lands located at:

- Latitude 54°51'25.64"N
- Longitude 118°41'12.00"W
- Easting 391720.77 m E (Zone 11U)
- Northing 6080217.41 m N (Zone 11U)

The PLPP lands encompass approximately 20.6 hectares and the lands were clearcut in the last 5 years.

### ***1.1.1.1 Ancillary Facilities***

#### ***1.1.1.1.1 Natural Gas Pipeline***

A 6 inch natural gas steel pipeline will run south from the PLPP, approximately 2200 metres to the Nova Gas Transmission Ltd. (NGTL) Pipeline branch and the pipeline will run through Section 3, Township 68, Range 5 and Section 34, Township 067, Range 05, W6M. The exact pipeline routing has not yet been surveyed.

#### ***1.1.1.1.2 Transmission Line***

Three potential Transmission Line ('TL') line routes were selected by desktop analysis and assessed in the field as potential route options, however only one approved by the Alberta Utilities Commission (AUC) will be constructed. The preferred route will run north from the PLPP, through the following lands:

- Sections 3, 10, 15, 22, 27, 33, Township 68, Range 5, W6M
- Sections 4, 9, 17, 20, 29, 32, Township 69, Range 5, W6M
- Sections 5, 8, 17, Township 70, Range 5, W6M

## **1.1.2 ALTERNATIVES TO THE PROJECT**

### ***1.1.2.1 Project Locations***

Alternative locations for the project site were identified from aerial photographs and site reconnaissance. Both the surveyed location and a number of alternate locations were evaluated to determine which siting would have the least impacts on operational design, environmental features, and existing infrastructure and existing land use

### ***1.1.2.2 Project Technology***

PLPGP undertook a detailed technology screening to identify numerous potential technologies that were initially considered feasible for project execution. The study considered 11 different gas turbine engine configurations, open cycle, combined cycle, etc.

Therefore, through detailed engineering and financial feasibility analysis it was determined the Project as proposed represents the best technically and economically feasible option.



### ***1.1.2.3 Alternatives to the Project***

PLPGP has not identified any potential alternatives to the Project that are technically or economically feasible. The Project is a standalone project to provide electricity to the Alberta Electrical Grid. Capacity access at the electrical grid and access to the source gas to provide energy inputs to the facility are the single largest constraints. In absence of the PLPP, no alternatives are currently being considered.

### ***1.1.2.4 Alternatives to the Natural Gas Supply***

An additional option to build a pipeline and take gas off the existing TransCanada Pipeline (TCPL) Gold Creek compressor station located 2.5 km southeast of the plant site in NW-26-067-05W6M was considered. This option was eliminated due to the technical challenges associated with the numerous road and pipeline crossings to meet the TCPL compressor location, which also results in increased financial risk.

### ***1.1.2.1 Transmission Line Options***

Three potential Transmission Line ('TL') line routes were selected by desktop analysis and field assessment as potential route options, however only the preferred route will be applied for to the various regulatory agencies.

Prepared For:  
Prairie Lights Power LP

**FIGURE 1**

**Prairie Lights Power Plant  
Location**

 Project Area



Coordinate System: NAD 1983 UTM Zone 11N  
Projection: Transverse Mercator  
Datum: North American 1983  
Units: Meter



0 1,000 2,000 4,000 m

1:80,000 Scale when printed @ 11" x 17"

Drawn By: John R. Gallop Date: 2019-04-04



McCallum Environmental Ltd.



## 1.2 PROPONENT AND CONTACT INFORMATION

<b>Name of the Designated Project</b>	Prairie Lights Power Plant
<b>Name of the Proponent</b>	Prairie Lights Power GP Inc.
<b>Address of the Proponent</b>	525 8 Ave SW Suite 2700, Calgary, AB T2P 1G1
<b>President and CEO</b>	Scott Rennie <a href="mailto:srennie@prairielights.ca">srennie@prairielights.ca</a> p. 1-855-930-0560
<b>Principal Contact Person</b>	Greg Belostotsky Staff Facilities and Pipelines Specialist <a href="mailto:gbelostotsky@prairielights.ca">gbelostotsky@prairielights.ca</a> Main: (855) 930-0560 24-Hour Emergency Response: (877) 431-5716

## 1.3 LIST OF PARTIES CONSULTED

### Federal

1. Impact Assessment Agency of Canada

### Provincial

1. Alberta Environment and Parks, Operations and Provincial Approvals
2. Alberta Environment and Parks, Industrial Approvals
3. Alberta Environment and Parks, Land Use Area, Lands Division
4. Alberta Culture, Multiculturalism and Status of Women
5. Alberta Utilities Commission
6. Alberta Economic Development, Trade and Tourism
7. Alberta Transportation – Highways and Roadside Planning Section
8. Alberta Transportation – Transportation and Civil Engineering

### Municipal

1. Municipal District of Greenview #16

### Indigenous Groups

#### Treaty 8 First Nations

- Duncan’s First Nation
- Driftpile First Nation
- Horse Lake First Nation

- Kapawe'no First Nation
- Sawridge First Nation
- Sturgeon Lake Cree Nation
- Sucker Creek First Nation
- Swan River First Nation

### **Metis**

- Gift Lake Metis Settlement
- East Prairie Metis Settlement
- Métis Nation of Alberta (in Region 6; near Region 4)
- Kelly Lake Metis Settlement Society / Metis Community Society of Kelly Lake
- Kelly Lake Leadership Group

### **Non-Treaty Indigenous Groups**

- Aseniwuche Winewak Nation
- Foothills Ojibway First Nation
- Kelly Lake Cree Nation
- Kelly Lake First Nation
- Foot Hills First Nation

### **Public Consultation**

Consultation occurred with landowners, occupants, residents, agencies, and industrial interest holders whom may potentially be impacted by the proposed Project within a minimum of 2000 m from proposed facilities.

### **Industry Consultation**

1. 1505440 Alberta Ltd.
2. ATCO Electric Ltd.
3. Alliance Pipeline Ltd.
4. Atco Gas and Pipelines Ltd. (South)
5. Canadian Natural Resources Limited
6. Devco Developments Corp.
7. Mainline Construction
8. Manitok Energy Inc.
9. Norbord Inc.
10. North Coast Ready Mix Ltd.

11. Nova Gas Transmission Ltd.
12. Petronas Energy Canada Ltd.
13. Recover Energy Services Inc.
14. Semcams ULC
15. Shell Canada Limited
16. Strong Pine Energy Services Inc.

#### **1.4 REGULATORY REQUIREMENTS OF MUNICIPAL & PROVINCIAL JURISDICTIONS**

- a. Alberta Environment and Parks (AEP): On April 4, 2019 AEP indicated that the Project is not a mandatory activity for the purposes of environmental assessment and that further assessment of the activity is not required.
- b. Under the *Environmental Protection and Enhancement Act* Approval is required to construct, operate and reclaim the Project, and is to be issued by AEP under the *Activities Designation Regulation (276/2003) (2) (vv)*.
  - a. AEP Operations Division crown land approval for Miscellaneous Lease (DML), which authorizes a commercial use under a miscellaneous lease.
  - b. Approval under the *Water Act* will be required for water withdrawal.
2. Alberta Culture, Multiculturalism and Status of Women (ACMSW): The Project lands are listed as Historical Resource Value 5, Categories Archaeological, Paleontological, which require regulatory review and clearance to proceed. Therefore, a Historic Resources (HR) Application was submitted to the Historical Resources Management Branch for review under the *Historical Resources Act*, to determine whether a Historical Resources Impact Assessment (HRIA) for archaeology or palaeontology is required.
3. Alberta Utilities Commission (AUC): Pursuant to sections 11 and 19 of the Hydro and Electric Energy Act, the AUC approved and granted Prairie Lights Power GP Inc. the approval set out in Appendix 1 – Power Plant Approval 24758-D02-2019 – October 30, 2019.
4. Municipal District of Greenview #16: Development permit required.

##### **1.4.1 PROVINCIAL ENVIRONMENTAL ASSESSMENT REQUIREMENTS**

The applications to AEP and AUC follow a prescribed table of contents that require environmental evaluations of the Project, including the description of mitigation measures. The information required by AEP in the environmental evaluation of the Project is listed in the *Environmental*

*Protection and Enhancement Act Guide to Content for Industrial Approval Applications* (GOA 2014).

The information required in the environmental effect evaluation of the Project by the AUC includes a prediction of the Project's effects on the environment and the measures to avoid or mitigate the Project's predicted adverse environmental effects and any monitoring proposed to evaluate the efficacy of those measures.

#### **1.4.2 ONGOING ENGAGEMENT**

PLPGP is committed to keeping consultation with landowners, municipalities, Indigenous groups and all affected stakeholders ongoing. PLPGP's objective is to provide notification and engage in consultation with affected stakeholders regarding the progress of the Project during all stages of development.

#### **1.5 PREVIOUS REGIONAL ENVIRONMENTAL STUDY**

According to the Impact Assessment Registry<sup>1</sup> the PLPP is not taking place in an area with a previously completed regional environmental assessment. There is no relevant strategic assessment that is being or has been carried out under section 95 of the Impact Assessment Act.

As of November 1, 2019, the AEP Land-use Framework, Regional Plans website<sup>2</sup> indicated that the Upper Peace Region Land Use Plan has not started the Land Use planning process.

<sup>1</sup> <https://www.ceaa.gc.ca/050/evaluations/exploration?culture=en-CA>

<sup>2</sup> <https://www.landuse.alberta.ca/RegionalPlans/UpperPeaceRegion/Pages/default.aspx>

## **2 PROJECT INFORMATION**

### **2.1 PROPOSED DEVELOPMENT**

The PLPP is a combined cycle plant that will be fueled using natural gas and will generate electricity from a “one-on-one” configuration consisting of one combustion turbine generator (CTG), one heat recovery steam generator (HRSG) and one steam turbine generator (STG). The steam turbine will be a condensing type using an air-cooled condenser rather than a water-cooled surface condenser. The air-cooled condenser mitigates the need for either large reliable water source with availability year-round or large storage pond.

The PLPP will generate electricity from natural gas to provide a reliable source of electricity to help meet the growing demand of electricity in Alberta, and support the transition from coal power plants, which are nearing retirement in Alberta. When compared to coal, combined cycle plants emit significantly fewer emissions of carbon dioxide (CO<sub>2</sub>), sulfur dioxide (SO<sub>2</sub>), nitrogen oxide (NO<sub>x</sub>) and other air emissions. CO<sub>2</sub> emissions from combined cycle facilities are less than half that of coal fired plants.

### **2.2 DESIGNATED PHYSICAL ACTIVITY**

The PLPP is a physical activity as defined in the *Physical Activities Regulations*: SOR/2019-285, Schedule, 30 “The construction, operation, decommissioning and abandonment of a new fossil fuel-fired electrical generating facility with a production capacity of 200 MW or more.”

As the Project is anticipated to have a maximum production capacity of 360 MW (360 MW net is both nominal rating and maximum due to limiting constraints on the transmission line and at the downstream substation) the threshold defined in item 2(a) would be exceeded.

### **2.3 COMPONENTS AND ACTIVITIES**

#### **2.3.1 PHYSICAL WORKS**

As the purpose of the plant is to generate electricity as required to meet power grid demands, the major process of the plant is electrical power generation.

##### ***2.3.1.1 Size of the Designated Project Lands***

The Project lands encompass 20.581 hectares. The Project will require construction of a pad, approximately 225 m x 300 m in size (6.75 hectares).

### 2.3.1.2 Fuel Supply

In order to fuel the PLPP, natural gas will be supplied from a new dedicated pipeline from the ATCO Grande Prairie Mainline located 2.2 km south of the PLPP.

### 2.3.1.3 Water Supply

The raw source water for PLPP operations will be trucked into the PLPP site from a pre-existing water storage pond used for well fracking / drilling currently owned and operated by Hammerhead Resources (HHR). The existing water storage pond is approximately 13 km east of the PLPP. Under an existing *Water Act* approval, HHR diverts water from the Smoky River at NE 31-067-04W6M. A water pipeline provides water to the HHR water storage pond at SW 35-067-04W6M.

PLPP will acquire an AEP *Water Act* license to receive source freshwater from the HHR point of water diversion on the Smoky River at NE 31-067-04W6M. However, the *Water Act* licence will stipulate that the point of use for the PLPP will be from the HHR water storage reservoir location SW 35-067-04W6M. Therefore, PLPP will be permitted for water withdrawal from the Smoky River but will not be required to install any infrastructure for that water withdrawal from the Smoky River and will rely upon the existing withdrawal infrastructure already in place. PLPP will only take the water directly from the water storage pond.

### 2.3.1.4 Electrical Interconnection

A single double circuit 144kV transmission line will provide electrical interconnection between the plant and the existing Big Mountain 845S substation. Design and construction of the new transmission line and expansion of the Big Mountain substation to accommodate the new transmission line will be done by ATCO and/or by a separate contractor. The Big Mountain substation is located just south of Grande Prairie and 24 km north of the plant. Three options for a new transmission line for the power plant have been assessed. No determination on the preferred and alternate routes has been decided at this time.

### 2.3.1.5 Buildings and Enclosures

The following lists the expected buildings or enclosures at the PLPP.

**Table 1. Buildings and Enclosures**

Name	Type
Administration/Warehouse/Control	Building
Turbine House	Building
Water Treatment	Inside Turbine House
Condensate Polishing	Inside Turbine House
Switchyard Electrical	Enclosure
ACC Electrical Power Distribution Centre	Enclosure
Diesel Engine/Generator	Enclosure



<b>Name</b>	<b>Type</b>
CEMS	Enclosure
HRSG	Doghouse
Firewater pump(s)	Enclosure
Potential other equipment enclosures	Enclosure

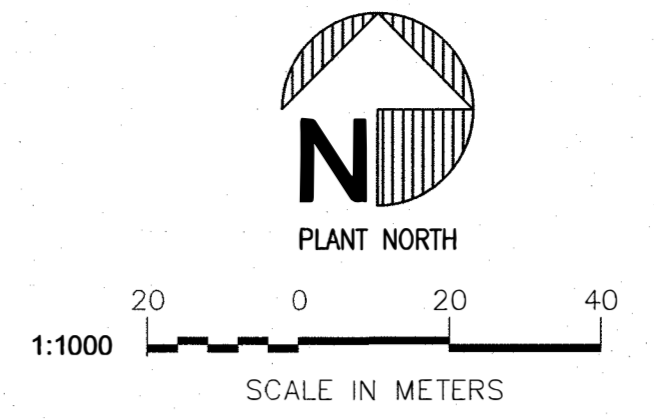
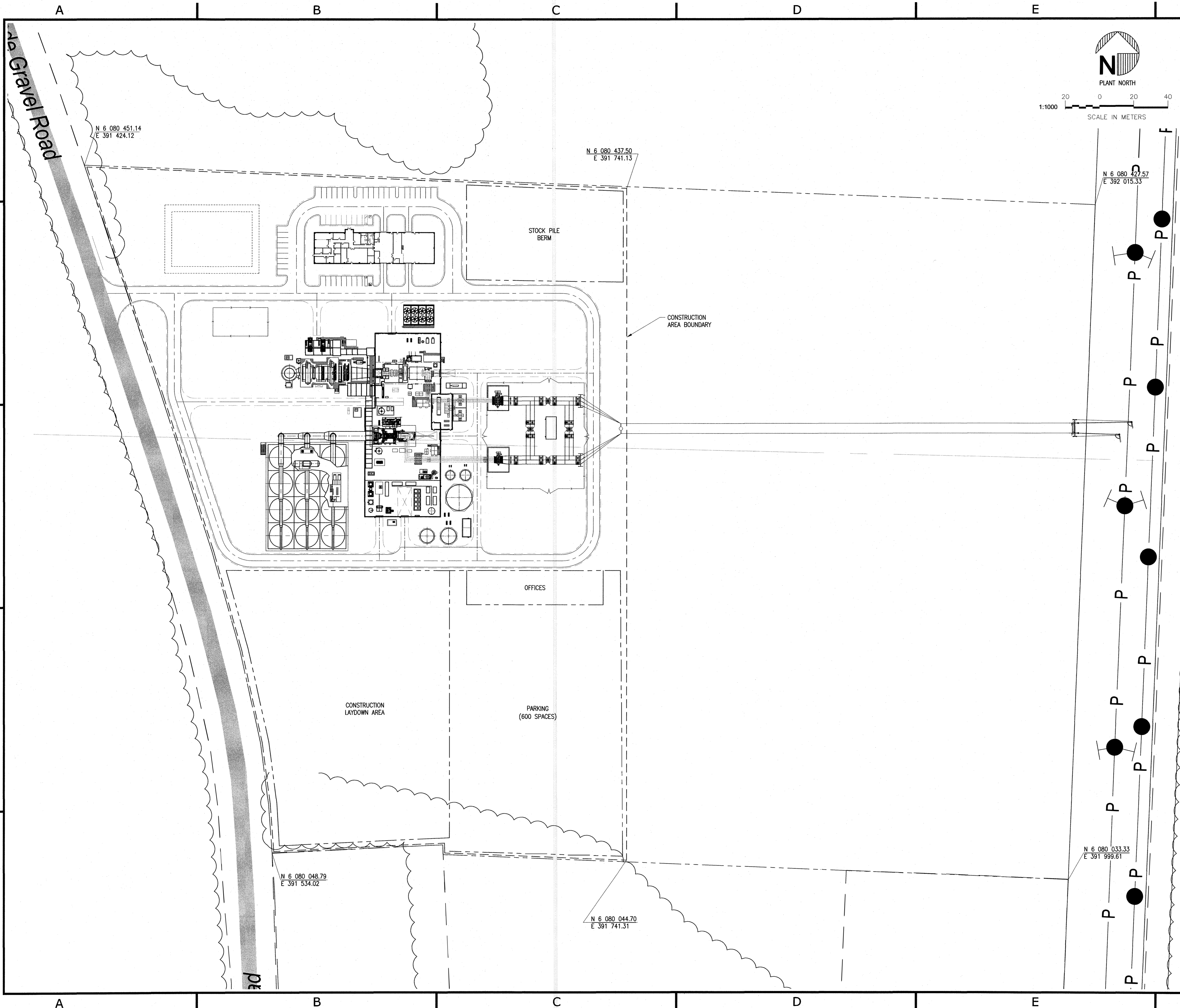
### 2.3.1.6 Equipment

The table below shows the total quantity of major equipment installed. In cases where one is operating and one in standby, equipment is identical.

**Table 2. Major equipment**

<b>Major Equipment</b>	<b>Installed</b>
Air Cooled Condenser	1
Auxiliary Boiler	1
Boiler Feedwater Pumps	2
Closed Cooling Water Heat Exchanger	1
Closed Cooling Water Pumps	2
Combustion Turbine Generator	1
Condensate Extraction Pumps	2
Condensate Polisher	2
Diesel Generator	1
Fuel Gas Filter/Separator	2
Fuel Gas Knockout Drum	1
Fuel Gas Performance Heater	1
Heat Recovery Steam Generator	1
Pumps, typically	2
Tanks, typically	1
Service/Instrument Air Compressor	2
Steam Jet Air Ejectors	3
Steam Turbine Generator	1

For a complete list of physical facilities on the PLPP please refer to Figure 2.



**GENERAL NOTES:**  
1. COORDINATES SHOWN ARE BASED ON UTM NAD83 (CSRS) ZONE 11.

Figure 2. General Equipment Arrangement

**LEGEND:**

**REFERENCE DWGS:**

**REFERENCE SPECS:**

**PRELIMINARY  
NOT FOR  
CONSTRUCTION**

ORIGINAL

ISSUED FOR REVIEW

7/12/19	BS	RS	DS	DEM	DS	SEO
---------	----	----	----	-----	----	-----

ISSUED FOR REVIEW

6/20/19	KDE	DS	DS	VJS	SEO
---------	-----	----	----	-----	-----

REVISION	DATE	BY	CHECKED	APPROVED	PROJ. TECH.	DIR. TECH.	PROJ. MGR.



SCALE: 1:1000  
THIS DRAWING IS THE PROPERTY OF SNC-LAVALIN INC. AND IS NOT TO BE USED IN ANY WAY INJURIOUS TO THEIR INTERESTS AND IS TO BE RETURNED UPON REQUEST.

PRAIRIE LIGHTS POWER PROJECT

GRANDE PRAIRIE, ALBERTA CANADA

OVERALL SITE PLAN  
CONSTRUCTION AREA

DWG. 662981 C005-S001

INSTR  
ELECT  
MECH  
STRUCT  
PIPING  
PROCESS  
SEMI  
SEW

### **2.3.1.7 Stormwater Pond**

All surface water runoff is being managed as a function of the PLPP. The collection of surface runoff from the PLPP is done for the purposes of keeping the operational area as dry as possible.

### **2.3.1.8 Access**

Road access to the plant is by Highway 40, 44.4 km south of Grande Prairie. Turn east onto the Canfor 2000 high grade gravel road. Access then turns north, 100 metres from highway 40. Turn north 970 metres to SW corner of power plant lands.

### **2.3.1.9 Existing Infrastructure**

There is no existing infrastructure within the Project lands. The only existing infrastructure that is present adjacent to the Project lands and includes:

- an existing all weather high grade gravel road that parallels the western boundary of the Project lands;
- an existing high voltage transmission line parallels the eastern boundary of the Project lands;
- an existing CNRL oil and gas surface lease on the SE boundary. However, this oil and gas surface lease has not been drilled to date and no surface disturbance has taken place.
- An existing Shell Canada storage site.

## **2.3.2 POWER PRODUCTION OF THE DESIGNATED PROJECT**

When fully operational, the Project will be capable of producing a maximum power output of 360 MW, which is above the threshold of 200 MW set out in the *Physical Activities Regulations*: SOR/2019-285, Schedule, 30.

## **2.3.3 PROJECT EXPANSION**

The Project is a new facility and neither a component of, nor expansion of, another project.

## **2.3.4 DESCRIPTION OF PHYSICAL ACTIVITIES INCIDENTAL TO THE PROJECT**

Activities that are incidental to the Project's construction and operation, and outside of PLPGP's control include:

1. Maintenance and upgrading of the existing access road along the west boundary.
2. General telecommunications in the Project area.
3. Construction and operation of a single double circuit 144kV transmission line that will provide electrical interconnection between the plant and the existing Big Mountain 845S substation.

## **2.4 EMISSIONS, DISCHARGE AND WASTE**

The PLPP construction and operations will result in air emissions (during construction; controlled operations and reclamation); noise emissions; surface runoff discharges; industrial wastewater disposal, and general operational waste generation.

### **2.4.1 AIR**

PLPGP has completed an Air Quality Assessment (AQA) for the PLPP. The contaminants of concern from the emission source are NO<sub>x</sub>, composed of nitric oxide (NO) and nitrogen dioxide (NO<sub>2</sub>), Carbon Monoxide (CO) and particulate matter less than 2.5 microns in diameter (PM<sub>2.5</sub>). Air quality modelling has been completed to assess how the PLPP affects the surrounding environment. The purpose of the air quality modelling was to evaluate the Project in terms of its compliance with the Alberta Ambient Air Quality Objectives (AAAQO). The results of the Air Quality Assessment (AQA) modeling predict that cumulative maximum CO, NO<sub>2</sub>, and PM<sub>2.5</sub> concentrations resulting from the addition of the PLPP to existing external industrial emission sources and ambient background, were less than their corresponding AAAQOs for all relevant averaging periods.

The plant will be equipped with a continuous emission monitoring system (CEMS) capable of monitoring carbon monoxide (CO), oxides of nitrogen (NO<sub>x</sub>), oxygen (O<sub>2</sub>), and opacity. Additional parameters may need to be monitored based on the PLPP approval conditions from AEP.

PLPGP will become a contributing member to the Peace Airshed Zone Association (PAZA). PAZA operates a network of six continuous monitoring stations and 49 passive monitoring stations that collectively monitor air quality across the Peace region.

#### **2.4.1.1 Operational Fugitive Emissions**

The key elements for effective long-term control of fugitive emissions are the application of best available technology and standards, implementation of management systems, and corporate

commitment<sup>3</sup>. The application of control technologies and design standards, alone, do not preclude the potential for fugitive emissions. Reliable fugitive emissions control requires the development of monitoring programs, operating procedures and performance objectives for controlling fugitive emissions, and management's commitment to the implementation and maintenance of an Inspection and Maintenance program.

As a component of successful and profitable operation of the PLPP, necessary components are subjected to regular screening for leaks as part of regular and scheduled maintenance. The objective is to minimize the potential for leaks in the most practicable manner possible. This is done by focusing efforts on the types of components and service applications and maintenance requirements most likely to offer significant cost-effective control opportunities.

Once a leak is detected and is determined to need fixing, this will be done within a reasonable period of time or at the next facility turnaround if a major shutdown is required

#### **2.4.1.2 Construction and Reclamation**

Construction and reclamation operations activities can affect air quality by producing dust and fugitive emissions (i.e., tailpipe exhaust emitting CO<sub>2</sub> and nitrous and sulphur oxides) mainly due to heavy machinery use and transportation. Fugitive emissions will be limited to tailpipe emissions from vehicle use, dust associated with equipment.

#### **2.4.1.3 Greenhouse Gas Emissions**

Greenhouse Gas (GHG) emissions will result from the PLPP. Using emission factors, the expected carbon dioxide (CO<sub>2</sub>) emissions have been estimated. In addition, emissions from other GHG contributors, namely methane (CH<sub>4</sub>) and nitrogen dioxide (N<sub>2</sub>O) were also estimated to determine expected total carbon dioxide equivalent (CO<sub>2</sub>e) emissions. A summary of the estimated annual emissions is provided in the following table.

**Table 3. GHG Emission Estimates**

<b>Parameter</b>	<b>Total Estimated CO<sub>2</sub>e Emissions (tonnes/year)</b>
Carbon Dioxide Emissions	1,090,000
GHG Emissions	1,104,000

<sup>3</sup> Canadian Association of Petroleum Producers. 2007. Best Management Practice. Management of Fugitive Emissions at Upstream Oil and Gas Facilities.

Although natural gas is a fossil fuel, the GHG emissions from gas combustion are much lower than those from coal. Natural gas emits approximately 50% less CO<sub>2</sub> when combusted in a new, efficient natural gas power plant compared with emissions from a typical new coal plant.<sup>45</sup>

GHG emissions in Alberta are currently regulated under the *Climate Change and Emissions Management Act* and the Carbon Competitiveness Incentive Regulation (CCIR). The CCIR applies to facilities that emit greater than 100,000 tonnes per year of GHGs and requires annual compliance and forecasting reporting. It is anticipated that these requirements will be replaced by the Technology Innovation and Emissions Reduction (TIER) early in 2020. Once operational, the PLPP will be subject to the requirements of either the CCIR or TIER programs which include requirements for payment of a carbon tax, completion of verification assessments and GHG emission forecasting.

Under both regulations, electricity generators are required to comply with a “good-as-best-gas” benchmark of 0.37 tonnes CO<sub>2e</sub> per megawatt-hour of power produced. Based on these regulations, allowable CO<sub>2e</sub> emissions for the facility are 972,360 tonnes per year, slightly under the estimated emissions of 1,090,000 tonnes per year (based on anticipated fuel use). Emissions estimates however were calculated based on conservative estimates of facility operation parameters (e.g. facility operates at peak load 24 hr/day, 365 days/year, no maintenance shutdown periods or other non-operating plant scenarios). As a result, the predicted GHG emissions are likely higher than actual.

In 2016, Alberta’s GHG Emissions were 262.9 megatonnes of CO<sub>2e</sub> (National Energy Board, 2019). Under full operation, 365 days / year, the GHG emissions from the PLPP would account for an increase in 1.1 megatonnes, or 0.42% of the Alberta 2016 total GHGs.

<sup>4</sup> National Energy Technology Laboratory (NETL). 2010. Cost and performance baseline for fossil energy plants, Volume 1: Bituminous coal and natural gas to electricity. Revision 2. November. DOE/NETL-2010/1397. United States Department of Energy.

<sup>5</sup> National Energy Board. 2017. Market Snapshot: Canada’s Power Generation: Switching from coal to natural gas. <https://www.neb-one.gc.ca/nrg/ntgrtd/mrkt/snpshst/2017/04-02cndpwrgrtn-eng.html>.

#### 2.4.1.3.1 *GHG Emissions and Federal Regulations*

The PLPP completed an assessment that compares the predicted NO<sub>2</sub> concentration results with the Canadian Ambient Air Quality Standards (CAAQS) and provides the information about the Carbon Dioxide Emission Intensity for the PLPP.

##### 2.4.1.3.1.1 **Comparing NO<sub>2</sub> results with CAAQS Objectives**

1-hour and annual NO<sub>2</sub> concentrations from the project only are below the CAAQS values for 2020 and 2025.

On the other hand, the cumulative 1-hour NO<sub>2</sub> concentration exceeds the 2020 and 2025 CAAQS targets. The cumulative annual concentration is less than CAAQS target value for year 2020. However, the predicted cumulative annual concentration exceeds the 2025 CAAQS target.

The Project does not contribute much to the cumulative concentration. Contribution of the project into the cumulative 1-hour results is less than 0.8%. Similarly, contribution of the project into the cumulative annual results is less than 0.7%.

##### 2.4.1.3.1.2 **Carbon Dioxide Emissions Intensity**

Carbon dioxide emissions intensity was calculated in accordance with the Regulations Limiting Carbon Dioxide Emissions from Natural Gas-fired Generation of Electricity (Canadian Environmental Protection Act, 1999).

Production of energy was calculated and consists of the gross quantity of electricity generated by the gas and steam turbines (360 MW = 0.360 GW).

The calculated emission intensity of 398 tonnes/GWh is below the established limit of 420 tonnes of CO<sub>2</sub> emissions/GWh of energy produced for the units of more than 150 MW.

Comparison of the estimated GHG emissions to the *Regulations Limiting Carbon Dioxide Emissions from Natural Gas-Fired Generation of Electricity* indicates that emission levels will meet the regulation requirements.

Comparison of the estimated GHG emissions to the *Regulations Limiting Carbon Dioxide Emissions from Natural Gas-Fired Generation of Electricity* indicates that emission levels will be the regulation requirements.

#### **2.4.2 NOISE**

PLPGP has completed a Noise Impact Assessment (“NIA”) for the Power Plant. The NIA has been prepared to support PLPGP's Industrial Approval Application and meets the requirements of the Alberta Utilities Commission (AUC) issued Rule 012 - Noise Control.

#### **2.4.3 SURFACE RUNOFF**

All surface water runoff is being managed as a function of the PLPP. The collection of surface runoff from the PLPP is done for the purposes of keeping the operational area as dry as possible.

##### ***2.4.3.1 Stormwater Management***

Surface runoff from the operational area will be collected by ditches, swales and grading directed to a storm water pond located at the northwest corner of the operational area. Dikes and berms will be installed along the plant perimeter as required to keep runoff within the operational area.

The purpose of the stormwater pond is hold runoff from major event and allow any solids to settle before releasing it. The PLPP is not allowed to use water collected in the storm water pond for operation purposes. Once water is in the pond, the water will be tested to meet AEP discharge criteria prior to being discharged back to the surrounding environment. Any water that is not suitable for release will trucked out to a 3<sup>rd</sup> party certified wastewater disposal/treatment facility. As the pond will only capture surface runoff, no hazardous materials will affect the quality of the water. PLPGP has a spill response plan and any spills or leaks will be immediately handled to ensure no effects to surface water or runoff.

#### **2.4.4 INDUSTRIAL WASTEWATER DISPOSAL**

No industrial wastewater will be released to the environment. All industrial wastewater and process liquids will be collected and temporarily stored in tanks, then pumped to a truck for disposal at an approved wastewater collection facility.

All tanks used for storage of Industrial/process water will meet requirements for design characteristics, including dyke sizing and will have secondary containment to prevent adverse effects to the surrounding environment in the case of leaks or failures.

#### **2.4.5 DOMESTIC SEWAGE**

Sewage will be generated during construction, operations and reclamation of the Project. Construction and reclamation sewage will be managed in portable toilets operated by a commercial



vendor. Sewage generated during operations will be contained within an onsite septic system including water and solids flowing to an underground tank within the boundaries of the PLPP.

#### 2.4.6 DOMESTIC WASTE

All domestic and industrial garbage is disposed using approved refuse containers for hauling and disposal at an approved landfill.

Bear proof containers will be used on location for holding of domestic and industrial garbage.

#### 2.4.7 OPERATIONAL WASTE

Operational wastes from the Project may include:

- Used oil / grease
- Process wastewater
- Oily Wastewater
- Relief valve discharges
- Domestic grey water, black water
- Solid wastes
- Exhausted Resin from Condensate Polisher

### 2.5 ANTICIPATED CONSTRUCTION, OPERATION, AND DECOMMISSIONING SCHEDULES

Physical activities will include:

1. Site preparation
2. Infrastructure Construction
3. Operations and maintenance
4. Decommissioning and reclamation

The following are the estimated project timelines and major milestones. The design life of the PLPP is approximately 30 years however the actual life span is dependent on the plant's continuing economic and technical viability.

**Table 4. Project Timelines**

TASK	DATE
Site Access for Construction Mobilization	2020-05-30
Initial Operation	2022-10-02
Decommissioning	2052 - 2053

TASK	DATE
Surface Reclamation	2053 - 2055

### 3 PROJECT LOCATION

#### 3.1 DESCRIPTION OF PROJECT LOCATION

The Project is located about 35 km south of Grande Prairie, Alberta, within the Municipal District of Greenview #16. The site is just northeast of the Canfor 2000 Road turnoff from Alberta Highway 40. (Figure 1. PLPP Location)

##### 3.1.1 SITE PLAN

Please refer to Figure 2 (above).

##### 3.1.2 PROJECT PROXIMITY

###### 3.1.2.1 Existing Residences

The closest permanent and/or seasonal residence is located 10.3 km northwest of the PLPP lands.

There is a temporary work camp located approximately 1.9 km southeast of the Project. The Work camp is operated by the CNRL gas plant and is found within the 1.5 km boundary of that facility.

###### 3.1.2.2 Indigenous Groups Traditional Territories

In accordance with Alberta's First Nations and Métis Settlements policies and guidelines (<http://indigenous.alberta.ca/1.cfm>), the Alberta Aboriginal Consultation Office indicated that the PLPGP is located within the traditional territories of the Gift Lake Métis Settlement; Horse Lake First Nation; and the Sucker Creek First Nation.

###### 3.1.2.3 Indigenous Reserves and Settlements

Please refer to **Figure 8. Indigenous Reserves and Settlements.** for reserves and settlements in proximity. The following provides distances to the Reserves and Settlements:

- Sturgeon Lake IR #154B, located 69 km east/northeast
- Horse Lake IR #152B, located 84 km northwest
- Alexander IR #134A is located approximately 157 km southeast

- Gift Lake Metis Settlement located approximately 200 km northeast
- Duncan IR #151A located approximately 147 km northeast
- William McKenzie IR #151K, located approximately 171 km northeast
- Sucker Creek IR #150A located approximately 170 km northeast
- Kapawe'no IR #230 located approximately 180 km northeast

#### 3.1.2.4 Federal Protected Areas

No federal protected areas are located within 130 km of the PLPP.

#### 3.1.2.5 National Parks

The closest national park is Jasper National Park, located approximately 130 km south of the Project. Please refer to Figure 7. Parks and Recreation Areas.

### 3.2 LAND AND WATER USE

The PLPP is within the Municipal District of Greenview #16 on provincial crown land, which is primarily public land managed for timber production, energy development, fish and wildlife, recreation, and other miscellaneous uses. The PLPP was clearcut approximately 5 years ago.

**Figure 3. 2018 Aerial Photo of PLPP lands**



Engagement with the Indigenous groups as having potential traditional lands in the area has not identified traditional use of the PLPP by their individuals. Therefore, the PLPP area does not appear to have resources currently used for traditional purposes by Indigenous peoples.

Furthermore, the PLPP will not require access to, use or occupation of, or the exploration, development and production of lands and resources currently used for traditional purposes by Indigenous peoples.

### 3.3 HEALTH, SOCIAL AND ECONOMICS OF MD OF GREENVIEW #16

The MD of Greenview encompasses approximately 32,000 km<sup>2</sup> and includes the town of Grande Cache. As of 2018 had a resident population of 9,223 persons<sup>6</sup>. Between 2013 – 2018, the MD had a population growth rate of -3.9%. In 2015, the median age within the MD was 37.9 years and the median individual income was \$45,552. In 2017, net municipal taxation within the MD amounted to \$76,843,959.<sup>7</sup>

#### 3.3.1 PROJECT ACTIVITIES AND SOCIO-ECONOMIC CONDITIONS INTERACTIONS AND EFFECTS

The Project has three distinct phases with specific project activities. The project activities will be assessed for interactions and effects.

**Table 5. Potential Interactions with Project Activities and Socioeconomic Conditions**

Project Phase	Duration	Relevant Project Activity
Site Preparation and Construction Phase	1 Year	<ul style="list-style-type: none"> <li>• Clearing, grubbing and grading</li> <li>• Drilling for foundations</li> <li>• Soils management</li> <li>• Surface infrastructure installation and construction, including lighting</li> <li>• Local traffic bypass road construction</li> <li>• General waste management</li> </ul>

<sup>6</sup> MD of Greenview. Review the Business Climate. Online. <https://expandyourvision.ecdev.org/business-climate>

<sup>7</sup> MD of Greenview No. 16 Financial Statements for the year ended December 31, 2018.

Project Phase	Duration	Relevant Project Activity
Operations Phase	25 years	<ul style="list-style-type: none"> <li>• Operations at the facility</li> </ul>
Closure Phase: Reclamation Stage	2-3 years	<ul style="list-style-type: none"> <li>• Infrastructure demolition</li> <li>• Site reclamation</li> <li>• Environmental monitoring</li> <li>• General waste management</li> </ul>

- Between 2018-2019, approximately \$1.5 million was spent on project design.
- The construction phase will generate \$400 million in value added for the local economy, support 300 jobs.
- Operating activities would generate \$30 million in value added annually, supporting 75 jobs annually and provide provincial and municipal government revenues. The expected taxation has not yet been determined.

The Project will have positive impacts on the local and regional employment market. Given the lower labour participation rates, the Project could increase participation in the labour force, and provide opportunities for in-migration and population growth of Grande Prairie.

The Project is not expected to have any significant impact on this wage distribution given the salary ranges for employees. The Proponent may develop an employment strategy to attract workers.

Employment will be of a fix term nature and upon closing of the Project, the jobs will cease. The Proponent does have other Project sites. However, as technical expertise is increased, there will be opportunity to transfer employees to other similar Projects, developed by other proponents.

With potential population growth and activity associated with the Project, local health care service providers may experience increased pressure for medical services. However, these is a lack of data on which to make final conclusions and there are many variables that could impact health care services, such as if another doctor is recruited to the area and if the labour force associated with the Project lives in the area. Health Care service providers and infrastructure may be vulnerable if increased population growth occurs.

With local employment opportunities, there may be increases in population, creating pressure on local housing markets, both ownership and rental, to accommodate new workers or immigration

to the area. Given the lack of a rental market, this provides opportunity for local builders and developers to meet a market need.

The Proponent may establish an office in Grande Prairie to provide a place for the public to ask questions and provide a point of contact for community members. In this location, the public will be able to submit resumes, ask questions about the Project, integrate into the local business community and create connections with the local community.

## **4 FEDERAL INVOLVEMENT**

### **4.1 FEDERAL FINANCIAL SUPPORT**

The PLPP does not include any proposed or anticipated federal financial support.

### **4.2 FEDERAL LANDS**

No federal lands will be used for the PLPP or associated activities for the purposes of carrying out the Project, nor will there be any granting of interest in federal land required.

### **4.3 FEDERAL LEGISLATIVE OR REGULATORY REQUIREMENTS**

The PLPP is captured in the *Physical Activities Regulations*: SOR/2019-285, Schedule, 30 and the operation of the PLPP will also be regulated under the Regulations Limiting Carbon Dioxide Emissions from Natural Gas-fired Generation of Electricity (SOR/2018-261).

There are no other confirmed federal legislative or regulatory requirements (including any federal permits, licences or other authorizations) applicable to the PLPP at this time.

## **5 ENVIRONMENTAL EFFECTS**

### **5.1 PHYSICAL AND BIOLOGICAL SETTING**

A background information review was conducted to determine historic and potential wildlife species of concern occurrences in the PLPP area. Two field assessments were conducted within and around the PLPP lands.

#### **5.1.1 ALBERTA CONSERVATION INFORMATION MANAGEMENT SYSTEM (ACIMS) RESULTS**

ACIMS is a data centre that provides biodiversity information on Alberta's species, natural ecological communities and sites. (Alberta Parks, 2019)

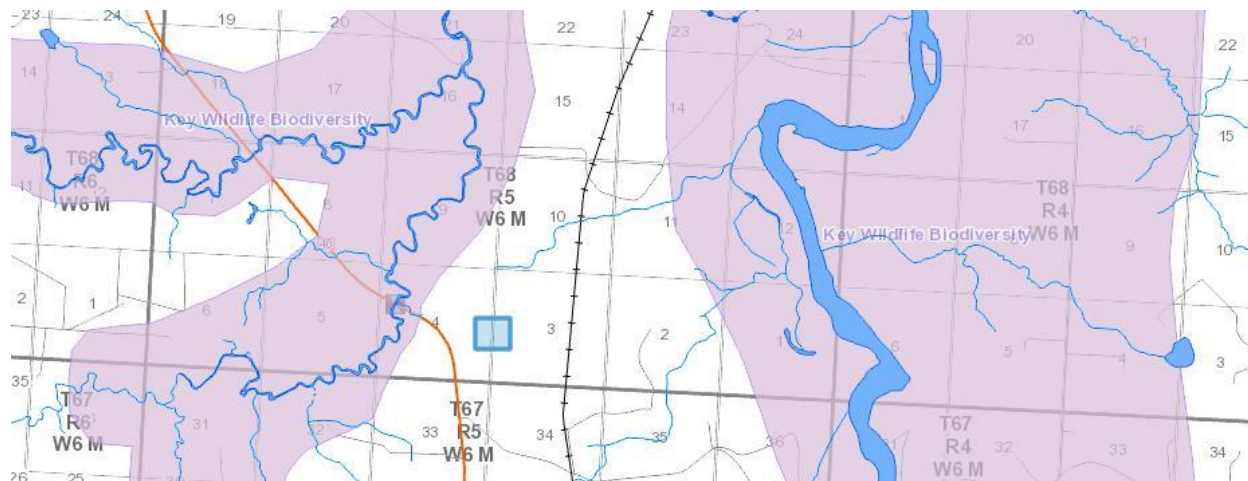
The results of the ACIMS search indicated:

1. No Non-sensitive Element Occurrences ('EO');
2. No sensitive EOs;
3. No Protected Areas found
4. No Crown Reservations/Notations found.

#### **5.1.2 ALBERTA FISH AND WILDLIFE INTERNET MAPPING TOOL SEARCH RESULTS**

The Alberta Fish and Wildlife Internet Mapping Tool (FWIMT) search identified a key wildlife biodiversity zone, located along the Smoky River (4 km east of the PLPP) and the along the Big Mountain Creek (900 metres west of the PLPP).

Both wildlife biodiversity zones are associated with winter ungulate ranges, which correspond to high ungulate use areas during winter seasons, allowing for easier passage of ungulates.



**Figure 4. FWIMT Database search results**

### **5.1.3 PROVINCIAL PROTECTED AREAS**

No provincially protected areas or provincially designated natural areas are located within or adjacent to the PLPP boundaries.

### **5.1.4 PROVINCIAL RECREATIONAL AREAS**

The closest provincial recreation area is the Big Mountain Creek Provincial Recreation Area, located 3.3 km north of the Project lands. The area is a group use recreation area used as an Off Highway Vehicle (OHV)/snowmobile off-loading and travel to trails location.<sup>9</sup>

The next closest recreation area is the Musreau Lake Recreation Area, located approximately 33 km south of the Project. (Figure 7. Parks and Recreation Areas)

### **5.1.5 ENVIRONMENTALLY SIGNIFICANT AREAS (ESA)**

The Project lands have an ESA scoring value rating of 0.045 (Scoring >0.189 equals Provincial ESA), which puts the Project lands in the second lowest ESA value rating category. This implies a low likelihood of:

1. Areas that contain focal species, species groups, or their habitat;

<sup>8</sup>FWIMT Database search:

[https://maps.alberta.ca/FWIMT\\_Pub/Viewer/?TermsOfUseRequired=true&Viewer=FWIMT\\_Pub](https://maps.alberta.ca/FWIMT_Pub/Viewer/?TermsOfUseRequired=true&Viewer=FWIMT_Pub). The blue rectangle represents the PLPP project location. The figure is provided directly from the database and mapping design and functionality is limited.

<sup>9</sup> <https://www.albertaparks.ca/parks/northwest/big-mountain-creek-pra/>



2. Areas that contain rare, unique, or focal habitat;
3. Areas with ecological integrity; and,
4. Areas that contribute to water quality and quantity.

According to the *Environmentally Significant Areas of Alberta* map and the *Environmentally Significant Areas of Alberta* (Sweetgrass Consultants Ltd., 2009) the Smoky River valley is listed as environmentally significant. The Smoky River valley is located 4.2 km east of the Project lands, with no connection by watercourses or topography to the PLPP.

## **5.1.6 VALUED ECOSYSTEM COMPONENTS**

### **5.1.6.1 Air Quality**

The results of the AQA determined cumulative maximum CO, NO<sub>2</sub>, and PM<sub>2.5</sub> concentrations resulting from the PLPP, including external industrial emission sources and ambient background, were predicted to be less than their corresponding AAAQOs for all relevant averaging periods.

### **5.1.6.2 Sensitive Species<sup>10</sup>**

The Project is not located in any Sensitive Species Ranges however the following are the closest known Sensitive Species ranges.

#### **5.1.6.2.1 *Grizzly Bears***

The closest Grizzly Bear range is the Grand Cache Grizzly Bear Zone (Grizzly Bear Management Area 2), which is located approximately 16 km south of the Project lands. (Figure 5. Grizzly Bear and Trumpeter Swan Habitat).

#### **5.1.6.2.2 *Trumpeter Swans***

Trumpeter Swans do not have specific “sensitive species range” within Alberta, however, as Trumpeter Swans breed on rivers, lakes and marshes, Alberta has development restrictions near known habitat. Specifically, that projects may not conduct any activities between April 1 and September 30 within 800 metres of the bed and shore of a known or identified Trumpeter Swan watercourse or waterbody, or 500 metres outside this timing window. (Environment and Parks, Government of Alberta, 2018)

<sup>10</sup> AEP Website. Wildlife Sensitivity Maps – October, 2016. <http://aep.alberta.ca/forms-maps-services/maps/wildlife-sensitivity-maps/default.aspx>

Database layers from Alberta for Trumpeter Swan locations indicate that the closest known Trumpeter Swan location is 4.1 km NE of the Project. (Figure 5. Grizzly Bear and Trumpeter Swan Habitat)

### ***5.1.6.3 Sensitive Species with Potential to Occur***

The following is a list of federal and provincial sensitive species with the potential to occur around the general project footprint. The determination of potential occurrence is based upon habitat preferences of the individual species compared to the habitat potential in and around the PLPP.

**Table 6. Potential Sensitive Species and likelihood of occurrence.**

Class	Scientific Name	Common Name	Alberta Status 2015	COSEWIC status	On Schedule 1 (Yes/No)?	SARA Status	Likelihood of Occurrence in Project
Birds	<i>Haliaeetus leucocephalus</i>	Bald Eagle	Sensitive	Not At Risk	No	Not Listed	Low. No nests found
Birds	<i>Strix varia</i>	Barred Owl	Sensitive	Not listed	No	Not Listed	Low due to lack of habitat
Birds	<i>Dendroica castanea</i>	Bay-breasted Warbler	Sensitive	Not listed	No	Not Listed	Low due to lack of habitat
Birds	<i>Picoides arcticus</i>	Black-backed Woodpecker	Sensitive	Not listed	No	Not Listed	Low due to lack of habitat

Class	Scientific Name	Common Name	Alberta Status 2015	COSEWIC status	On Schedule 1 (Yes/No)?	SARA Status	Likelihood of Occurrence in Project
Birds	<i>Dendroica virens</i>	Black-throated Green Warbler	Sensitive	Not listed	No	Not Listed	Low due to lack of habitat
Birds	<i>Dendroica fusca</i>	Blackburnian Warbler	Sensitive	Not listed	No	Not Listed	Low due to lack of habitat
Birds	<i>Spizella breweri</i>	Brewer's Sparrow	Sensitive	Not listed	No	Not Listed	Low due to lack of habitat
Birds	<i>Buteo platypterus</i>	Broad-winged Hawk	Sensitive	Not listed	No	Not Listed	Low due to lack of habitat
Birds	<i>Certhia americana</i>	Brown Creeper	Sensitive	Not listed	No	Not Listed	Low due to lack of habitat

Class	Scientific Name	Common Name	Alberta Status 2015	COSEWIC status	On Schedule 1 (Yes/No)?	SARA Status	Likelihood of Occurrence in Project
Birds	<i>Chordeiles minor</i>	Common Nighthawk		Special Concern	Yes	Threatened	Low due to lack of habitat
Birds	<i>Coccothraustes vespertinus</i>	Evening Grosbeak		Special Concern	Yes	Special Concern	Low due to lack of habitat
Birds	<i>Aquila chrysaetos</i>	Golden Eagle	Sensitive	Not listed	No	Not Listed	Low due to lack of habitat and no nests found
Birds	<i>Strix nebulosa</i>	Great Gray Owl	Sensitive	Not listed	No	Not Listed	Low due to lack of habitat

Class	Scientific Name	Common Name	Alberta Status 2015	COSEWIC status	On Schedule 1 (Yes/No)?	SARA Status	Likelihood of Occurrence in Project
Birds	<i>Contopus cooperi</i>	<u>Olive-sided Flycatcher</u>		Special Concern	Yes	Threatened	Low due to lack of habitat
Birds	<i>Pandion haliaetus</i>	Osprey	Sensitive	Not listed	No	Not Listed	Low due to lack of habitat. No nests found
Birds	<i>Dryocopus pileatus</i>	Pileated Woodpecker	Sensitive	Not listed	No	Not Listed	Low due to lack of habitat

Class	Scientific Name	Common Name	Alberta Status 2015	COSEWIC status	On Schedule 1 (Yes/No)?	SARA Status	Likelihood of Occurrence in Project
Birds	<i>Cygnus buccinator</i>	Trumpeter Swan	Sensitive	Not at Risk	No	Not Listed	Low due to lack of habitat. Identified habitat >800m away.
Birds	<i>Piranga ludoviciana</i>	Western Tanager	Sensitive	Not listed	No	Not Listed	Low due to lack of habitat
Mammals	<i>Lynx rufus</i>	Bobcat	Sensitive	Not listed	No	Not Listed	Low due to lack of habitat

Class	Scientific Name	Common Name	Alberta Status 2015	COSEWIC status	On Schedule 1 (Yes/No)?	SARA Status	Likelihood of Occurrence in Project
Mammals	<i>Lynx canadensis</i>	Canada Lynx	Sensitive	Not listed	No	Not Listed	Low due to lack of habitat and existing high level of industrial use in area.
Mammals	<i>Martes pennanti</i>	Fisher	Sensitive	Not listed	No	Not Listed	Low due to lack of habitat and existing high level of industrial use in area.



Class	Scientific Name	Common Name	Alberta Status 2015	COSEWIC status	On Schedule 1 (Yes/No)?	SARA Status	Likelihood of Occurrence in Project
Mammals	<i>Ursus arctos</i>	Grizzly Bear	At Risk	Special Concern	Yes	Special Concern	Low due to lack of habitat and existing high level of industrial use in area.
Mammals	<i>Myotis lucifugus</i>	Little Brown Myotis	May Be at Risk	Endangered	Yes	Endangered	Low due to lack of habitat
Mammals	<i>Myotis septentrionalis</i>	Northern Long-eared Bat	May Be at Risk	Not listed	No	Not Listed	Low due to lack of habitat
Mammals	<i>Myotis septentrionalis</i>	Northern Myotis		Endangered	Yes	Endangered	Low due to lack of habitat

Class	Scientific Name	Common Name	Alberta Status 2015	COSEWIC status	On Schedule 1 (Yes/No)?	SARA Status	Likelihood of Occurrence in Project
Mammals	<i>Rangifer tarandus caribou</i>	Woodland Caribou	At Risk	Not listed	No	Not Listed	Low due to lack of habitat. Closest population is the Little Smoky herd, with a range boundary approximately 66 km south of the project

#### **5.1.6.4 Vegetation**

The proposed plant site lies in a previously disturbed regenerated pine and mix-wood forest. The PLPP is dominated by regenerating non-merchantable aspen, pine, and to a lesser extent white spruce. No species at risk were identified on the PLPP lands.

##### **5.1.6.4.1 Mitigation**

PLPGP will re-seed all soil storage areas to limit the spread of weeds onto disturbed soils. PLPGP will conduct regular monitoring and management of weeds until it has demonstrated that noxious, prohibited, and invasive species on the project's disturbance footprint have been removed, eradicated or controlled.

#### **5.1.6.5 Soils**

In 2019 a geotechnical investigation was completed for the Project lands to provide baseline data to support engineering designs. The investigation<sup>11</sup> revealed the general soil profile at this site consisted of, in descending order; peat, clay and clay till. Bedrock was not encountered within the depths drilled.

##### **5.1.6.5.1 Mitigation**

Soil stripping and leveling will be completed. A Construction and Reclamation Plan that provides information on soil handling has been completed to provide further mitigation and soil handling.

#### **5.1.6.6 Groundwater<sup>12</sup>**

The observed groundwater conditions suggest a deep groundwater table with shallow seasonal perched conditions in the upper clay and clay till deposits. The local groundwater table is considered to be recharged by infiltration of precipitation. Groundwater elevations are expected to fluctuate on a seasonal basis and will be highest after periods of prolonged or heavy precipitation and snow melt. Seasonally high groundwater levels and perched conditions will dissipate as groundwater infiltrates down to the static groundwater table during drier periods. Groundwater seepage may be expected for shallow excavations on this site.

<sup>11</sup> Parkland Geotechnical Ltd. February 22, 2019. Geotechnical Investigation, Proposed Upstream Facility LSD5-3-68-5W6M, M.D. of Greenview South of Grande Prairie, Alberta.

<sup>12</sup> Parkland Geotechnical Ltd. February 22, 2019. Geotechnical Investigation, Proposed Upstream Facility LSD5-3-68-5W6M, M.D. of Greenview South of Grande Prairie, Alberta.

#### 5.1.6.6.1 *Mitigation*

During construction of the Project, there is potential for interactions with hydrogeology that can be mitigated through implementation of procedures and best management practices that minimize or eliminate disturbances to the local groundwater system. Standard and BMP mitigation measures for potential effects on hydrogeology during construction will be implemented. These may include waste management procedures, procedure to manage the risk of spills, reducing the amount of time that excavations remain open during construction to limit inputs of groundwater that require management, development and installation of a groundwater monitoring network if required by AEP and a spill response plan.

### 5.1.7 WILDLIFE

#### 5.1.7.1 *Habitat*

Observation of the vegetation, soils, and natural water bodies throughout within the PLPP lands indicates wildlife habitat of poor quality. Due to clearcutting there is no longer adequate cover for thermal and security requirements, and adequate under-story vegetation and food availability for small and large species are not present. In addition, the existence of the high grade road on the west boundary of the PLPP, and oil and gas infrastructure to the south resulted in fragmentation and wildlife corridor creation.

Impacts of the PLPP include a permanent displacement of wildlife species utilizing the area. Displacement of wildlife is expected during construction and operations. Complete loss of habitat within the PLPP will occur as the location will be fenced. However, the existence of cover to the east should be expected to meet basic habitat requirements for wildlife species. Given the amount of remaining available area surrounding the PLPP, there appears to be adequate habitat to continue to support wildlife in this area.

Species expected to inhabit the vicinity of the PLPP were established by examination of distribution maps and comparison of preferred habitat with that in the vicinity of the proposed location.

#### 5.1.7.1.1 *Ungulates*

- Moose (*Alces alces*)
- Mule Deer (*Odocoileus hemionus*)
- White-tail Deer (*Odocoileus virginianus*)

#### 5.1.7.1.2 *Carnivores*

- American Marten (*Martes Americana*): Habitat characteristics are not found on the PLPP lands and the high level of human activity in this area suggest a low likelihood.
- Striped skunk (*Mephitis mephitis*) - found throughout the region and would be likely to occur.
- Canada Lynx (*Lynx canadensis*): Habitat characteristics are not found on the PLPP lands and the high level of human activity in this area suggest a low likelihood
- Cougar (*Felis coloris*) – As the prey requirements for the cougar appear within region, cougar is expected within the region but it is unlikely they will be found on the PLPP lands.
- Short-tailed Weasel (*Mustela erminea*) – most abundant in coniferous or mixed forests and streamside woodlands and is expected in the forest systems, but lack of cover suggests limited use on the PLPP lands.
- Black bear (*Ursus americanus*) – Based upon the vegetation characteristics in adjacent areas and the high potential for forage capabilities, in addition to prey species, black bears are expected within the area but unlikely on the PLPP lands.
- Coyote (*Canis latrans*) – found throughout the region and would be likely to occur.
- Wolf (*Canis lupus*) – mostly restricted to forest areas and likely occur within the region.
- Grizzly Bear (*Ursus arctos*): Habitat characteristics are not found on the PLPP lands and the high level of human activity in this area suggest a low likelihood.

#### 5.1.7.1.3 *Birds*

No avian use assessments, migratory assessments or breeding bird surveys were completed for the Project. Incidental observations were limited to Common Ravens (*Corvus corax*) and Black-capped Chickadees (*Poecile atricapillus*)

Raptor species expected to inhabit the vicinity of the PLPP lands were established by examination of distribution maps and comparison of preferred habitat encountered by the location (McGillivray and Semenchuk 1998).

- Osprey (*Pandion haliaetus*)
- Bald Eagle (*Haliaeetus leucocephalus*)
- Sharp-Shinned Hawk (*Accipiter striatus*)
- Red-Tailed Hawk (*Buteo jamaicensis*)
- Golden Eagle (*Aquila chrysaetos*)
- American Kestrel (*Falco sparverius*)

- Great-Horned Owl (*Bubo virginianus*)
- Barred Owl (*Strix varia*)
- Snowy Owl (*Bubo scandiaca*)
- Great Gray Owl (*Strix nebulosa*)
- Common nighthawk (*Chordeiles minor*)

The majority of species mentioned above utilize edge habitats or open areas and are migratory. The expectation may be that the creation of new edge habitat may ultimately increase hunting capabilities of raptor species as prey is exposed.

The presence of similar habitat, nesting characteristics, and snags and deadfall concentrations remaining following construction are expected to provide the necessary forage, security, and nesting requirements for returning bird species. Therefore, the proposed development is not expected to significantly impact habitat requirements of bird species within the area.

#### 5.1.7.1.4 *Small Mammals*

- Deer mouse (*Peromyscus maniculatus*)
- Southern red-backed vole (*Myodes gapperi*)
- Meadow vole (*Microtis pennsylvanicus*)
- Least chipmunk (*Neotamia minimus*)
- Red squirrel (*Tamiasciurus hudsonicus*)
- Northern flying squirrel (*Glaucomys sabrinus*)
- Snowshoe hare (*Lepus americanus*)

##### 5.1.7.1.4.1 Mitigation

The timing and methods of construction and reclamation will be adjusted as needed to meet impact mitigation requirements specified by timing requirements for species in the vicinity.

The PLPP will be fenced prior to operations. This is expected to prevent wildlife intrusion into the PLPP area. The PLPP will follow the approval conditions provided issued by AEP.

## 5.1.8 SURFACE HYDROLOGY

### 5.1.8.1 *Watercourses*

No mapped watercourses are present within or adjacent to the PLPP. Field assessment confirmed there are no watercourses within or adjacent to the PLPP lands. The closest watercourse is located approximately 650 metres north of the Project lands, with no direct connection to PLPP lands. Big Mountain creek is located approximately 900 metres west of the PLPP. The Smoky

River is located greater than 4 km from the PLPP. Please refer to Figure 6. Wetlands and Watercourses.

#### **5.1.8.2 Wetlands**

No mapped wetlands are present. Field assessment confirmed there are no wetlands within or adjacent to the PLPP lands. The PLPP is not located within a 1 in 100 year floodplain and there was no evidence of natural springs on the lands. Please refer to Figure 6. Wetlands and Watercourses.

## **5.2 CHANGES THAT MAY BE CAUSED BY THE PROJECT TO FISH AND FISH HABITAT, LISTED AQUATIC SPECIES AND MIGRATORY BIRDS**

### **5.2.1 FISH AND FISH HABITAT**

Raw source water will be trucked into the site from a pre-existing water source sump used for well fracking / drilling currently owned and operated by HHR. The source location of the diversion on the Smoky River is already approved and in operation by HHR. Additional water withdrawal requirements will require approval by AEP, and possibly Fisheries and Oceans Canada. However, no new infrastructure will be required and there will be no direct effects to fish or fish habitat other than water withdrawal.

Daily water withdraw from the existing source location on the Smoky River for the PLPP is estimated at 32.8 m<sup>3</sup> / day. At 32.8 m<sup>3</sup>/day, the PLPP would only withdraw 0.00038 m<sup>3</sup>/s, or approximately 0.0026% of the volume. Finally, to put the proposed withdraw of 32.8 m<sup>3</sup>/day in perspective, the current water licence issued by AEP to HHR allows for 2700 m<sup>3</sup> of water withdraw daily from the Smoky River during the lowest flow events on the river, which typically occur in December. Therefore, the PLPP would only be 1.2% of this allowable daily amount. Therefore, given the flow volumes recorded, the effects of water withdraw from the PLPP would be insignificant and would no measurable effect on fish or fish habitat.

The Project will not have other indirect interaction with fish or fish habitat.

### **5.2.2 MARINE AND AQUATIC PLANTS**

The PLPP is over 1000 km from any marine environment and no potential effects to marine environments or aquatic species will occur as a result of the PLPP.

### **5.2.3 MIGRATORY BIRDS**

The PLPP lands has limited potential to support tree nesting migratory birds as the project was recently clearcut. There is potential to affect migratory birds including species at risk during construction and operation of the proposed Project.

Specifically, removal of vegetation from the Project footprint (20 ha) and ground disturbance have limited potential to result in the direct loss of migratory bird habitat as well as result in indirect habitat loss associated with sensory disturbance from operations. Potential sensory disturbance (e.g., noise, light) has the potential to continue during operations; however, mortality risk associated with potential equipment collisions during construction and operations is unlikely given displacement due to noise and loss of habitat within the constructed and operational areas.



The Project footprint will include a stormwater pond to hold any surface run-off prior to release. This area may be used by migratory birds in a similar fashion to use of wetlands in the region, but would be considered unlikely given the proximity to operational equipment.

Potential indirect interaction may occur through runoff from the site and material spills which could affect the quality of the stormwater pond. However, PLPGP has a spill response plan in place which will limit, if not wholly eliminate, the potential for contaminants into the pond.

Therefore, surface runoff collected in the stormwater pond not expected to contain measurable volumes of hydrocarbons (i.e. from spills from equipment) nor will it contain any hazardous waste, which will be collected and disposed of at licensed facilities. Furthermore, the stormwater pond would be expected to have qualities similar to background levels, thus allowing it to be pumped into surrounding vegetation when necessary. As such, the stormwater pond is not expected to adversely affect migratory birds.

With respect to the transmission line, line markers are to be installed on sections of the transmission line within 500 metres of Trumpeter Swan lakes as per Alberta Environment requirements. This will limit effects to Trumpeter Swans, and other species using similar habitat. Residual effects of bird mortality from transmission line would likely be limited as there is an existing transmission line adjacent to proposed route.

### **5.3 CHANGES THAT MAY BE CAUSED BY THE PROJECT TO FEDERAL LANDS OR LANDS OUTSIDE OF ALBERTA**

The closest federal land is Jasper National Park, located approximately 130 km south of the Project. Refer to Figure 7. Parks and Recreation Areas.

The closest first nation reserve lands are the Sturgeon Lake IR #154B, located 69 km east/northeast and the Horse Lake IR #152B, located 84 km northwest of the PLPP.

The PLPP is approximately 84 km from the Alberta – British Columbia border, which is the closest provincial border to the PLPP.

The PLPP will have localized effects, and negligible to no effects on aquatic resources. Additionally, the air emissions of the PLPP will be continuously monitored to be in compliance with Alberta and Federal regulatory requirements. Therefore, the Project is not anticipated to have any adverse environmental effects outside of Alberta.

## **5.4 CHANGES THAT MAY BE CAUSED BY THE PROJECT TO INDIGENOUS PEOPLES RESULTING FROM CHANGES TO THE ENVIRONMENT**

The environmental effects of the construction and operation of the PLPP are expected to be minimal, therefore impacts to Indigenous peoples are also expected to be minimal.

Changes to the environment are expected to be localized in or near the Project Area. The minimal effects on the environment are expected to have negligible effects on Indigenous peoples.

Regarding health and socio-economics, no ingestion or inhalation pathways that could trigger the need for a human health risk assessment are anticipated. The emissions from the PLPP during operations will be compliant with provincial and federal requirements. The existing oil and gas activity and forestry harvesting in the immediate area likely preclude indigenous use of the PLPP and immediately adjacent and surrounding areas. Given this, effects on human health are not anticipated.

### **5.4.1 TRADITIONAL USE OF LANDS**

#### **5.4.1.1 *Hunting***

To date no Indigenous groups have expressed concerns as a result of the PLPP. This would suggest there is limited to no use by Indigenous groups. Additionally, current land use in and immediately adjacent to the PLPP is heavy industrial (i.e. oil and gas, logging, transmission lines) which also suggests limited use and effects on current land use by first nations. For example, the proximity to Highway 40, west of the PLPP, the existing high grade road, existing oil and gas infrastructure south of the PLPP, and the active logging and CANFOR road likely create an exclusion zone for hunting due to potential safety concerns. Nevertheless, the PLPP is located within the Alberta Wildlife Management Unit 356, which allows hunting for bear, moose, elk, deer and game birds. This would suggest the broader area could be used for hunting by Indigenous persons.

The gas pipeline and electrical transmission line may encounter traditional use areas associated with hunting however during construction only the overstory vegetation is removed and work in and around watercourses and wetlands will be conducted to minimize environmental impacts using detailed mitigation strategies and Best Management Practices (BMP). Following construction of the gas and transmission lines, operational activities are minimal, thus there would be limited effects to use at that time. The presence of the existing transmission line adjacent to the proposed routes may have already impacted use, and further development would

not be expected to necessarily affect these areas further. Finally, during permitting of the gas pipeline and transmission line, further consultation with Indigenous groups will occur as per ACO requirements and areas of traditional use would hopefully be identified at that time, if they exist.

#### **5.4.1.2 Plant Gathering**

The collection of traditional use plants is likely limited due to the existing heavy industrial use around the PLPP, the lack of wetlands or watercourses within or adjacent to the PLPP boundaries, and the recent clearcut of the PLPP lands. The vegetation assessment at the PLPP did not identify any uncommon or species at risk, suggesting that the species identified at the PLPP are common to the area.

The gas pipeline and electrical transmission line may encounter traditional use areas associated with traditional use of plants, however during construction only the overstory vegetation is removed and work in and around watercourses and wetlands will be conducted to minimize environmental impacts using detailed mitigation strategies and Best Management Practices (BMP). Following construction of the gas and transmission lines, operational activities are minimal, thus there would be limited effects to use at that time. The presence of the existing transmission line adjacent to the proposed routes may have already impacted use, and further development would not be expected to necessarily affect these areas further. Finally, during permitting of the gas pipeline and transmission line, further consultation with Indigenous groups will occur as per ACO requirements and areas of traditional use would hopefully be identified at that time, if they exist.

#### **5.4.1.3 Fishing**

The PLPP and associated infrastructure will not have any effect on fish or fish habitat. Therefore, continued use of fisheries resources by Indigenous groups would not be affected.

#### **5.4.1.4 Trapping**

During consultation associated with the PLPP, registered trappers were notified. No concerns from active trappers were raised. No active traplines are present within or adjacent to the PLPP. During permitting for the transmission line and gas pipeline, further consultation with trappers will occur. Any concerns will be discussed with affected person(s) and mitigation employed following consultation.

## **5.4.2 HISTORICAL RESOURCES**

Currently, there are no identified sites or structures of historical, archaeological, paleontological, or architectural significance in the PLPP area. The identification of sites and potential risk to historical resources is first searched through the Alberta Listing of Historic Resources.

If undocumented historical resources are discovered during construction, salvage operations will be completed according to regulatory guidelines, which include the Historical Resources Act, the *Guidelines for Archaeological Permit Holders in Alberta* and the *Archaeological and Palaeontological Research Permit Regulation* (Alberta Regulation 254/2002).

The minimal effects on the environment are expected to have negligible effects on Indigenous peoples, including effects to health and socio-economic conditions, physical and cultural heritage, any structure, site or thing that is of historical, archaeological, paleontological, or architectural significance, and the current use of the land and resources for traditional purposes (current use).

Furthermore, the PLPP initiated consultation as required under regulatory guidance and no concerns were expressed by any of the IGs. Further consultation will continue during licensing and permitting of the transmission line and the pipeline. If further or potential effects are identified, or the first nations or Métis require or request further consultation and/or engagement, PLPGP will continue the consultation and/or engagement processes.

## **6 ENGAGEMENT WITH INDIGENOUS GROUPS**

### **6.1 ABORIGINAL CONSULTATION OFFICE REQUIREMENTS**

PLPGP submitted a pre-consultation request to the Aboriginal Consultation Office (ACO) for a miscellaneous lease (DML) on crown land. It was determined that Level 1-Streamlined consultation was required, which allows notified First Nations up to 15 Government of Alberta working days to respond to the project notification. If any First Nations respond to the notification, consultation should be complete within 15 working days of response to notification. If the 15-day notification period has expired and the First Nation has not responded to the project notification within that time, PLPGP, after providing First Nations with 5 working days to review the consultation record, may ask the ACO to review the consultation record for adequacy.

### **6.1.1 LIST OF POTENTIALLY AFFECTED AND INTERESTED INDIGENOUS GROUPS**

The closest first nation reserve lands are the Sturgeon Lake IR #154B, located 69 km east/northeast and the Horse Lake IR #152B, located 84 km northwest of the PLPP.

In accordance with Alberta's First Nations and Métis Settlements policies and guidelines the ACO indicated that the PLPGP is located within the traditional territories of the:

1. Gift Lake Métis Settlement;
2. Horse Lake First Nation; and,
3. Sucker Creek First Nation.

### **6.2 IMPACT ASSESSMENT AGENCY OF CANADA REQUIREMENTS**

On September 19, 2019 an initial list of Indigenous groups that the Agency would consult was provided. The list of groups included the following:

#### **Treaty 8 First Nations**

- Duncan's First Nation
- Driftpile First Nation
- Horse Lake First Nation
- Kapawe'no First Nation
- Sawridge First Nation
- Sturgeon Lake Cree Nation
- Sucker Creek First Nation
- Swan River First Nation

#### **Metis**

- East Prairie Metis Settlement
- Métis Nation of Alberta (in Region 6; near Region 4)
- Kelly Lake Metis Settlement Society / Metis Community Society of Kelly Lake
- Kelly Lake Leadership Group

#### **Non-Treaty Indigenous Groups**

- Aseniwuche Winewak Nation
- Foothills Ojibway First Nation
- Kelly Lake Cree Nation
- Kelly Lake First Nation

- Foot Hills First Nation

### **6.3 DESCRIPTION OF ENGAGEMENT ACTIVITIES CARRIED OUT TO DATE**

PLPGP sent information packages to the three Indigenous groups indicated by the ACO. PLPGP submitted their records of consultation to the ACO and received an Adequacy Assessment deeming consultation complete on April 18, 2019. Further consultation will be completed for both the transmission line and the gas pipeline following the same regulatory processes and requirements. Gift Lake Metis, Horse Lake, and Sucker Creek representatives reviewed and visited the Project location.

In October 2019, PLPGP sent information packages to the 15 Indigenous groups indicated by the IAAC. The consultation package included a cover letter, survey plan which shows the location of the PLPP, and this Project Description Summary document (less this section). The following summarizes actions and results to date:

- Driftpile First Nation - sent package twice – PLPGP will continue to engage
- Duncan First Nation - sent package twice – PLPGP will continue to engage
- Horse Lake First Nation: previously consulted on – letter of low concern given
- Kapawen’o/Sawridge – consultation / engagement ongoing
- Sturgeon Lake Cree Nation – consultation / engagement ongoing
- Sucker Creek First Nation - previously consulted on – letter of low concern given
- Swan River First Nation: sent package twice – PLPGP will continue to engage
- East Prairie Metis: consultation / engagement ongoing
- Metis Nation of Alberta: consultation / engagement ongoing
- Aseniwuche Winewak Nation: PLPGP will continue to engage
- Foothills Ojibway First Nation: consultation / engagement ongoing
- All of the Kelly Lake groups: consultation / engagement ongoing
- Foothills Ojibway First Nation: consultation / engagement ongoing

### **6.4 COMMENTS OR CONCERNS OF INDIGENOUS GROUPS**

No specific concerns from Indigenous groups related to the proposed Project have been received to date, including from the three groups that have visited the Project location (Gift Lake, Horse Lake, Sucker Creek).

## **6.5 FURTHER CONSULTATION AND INFORMATION GATHERING PLAN**

PLPGP plans to continue to engage the aforementioned Indigenous groups in 2019 / 2020 to provide them with information on the gas pipeline and the transmission line options for the PLPP and to solicit their questions and/or concerns.

PLPGP is committed to keeping consultation with Indigenous groups and all affected stakeholders ongoing. PLPGP's objective is to provide notification and engage in consultation with potentially affected Indigenous groups regarding the progress of the Project during all stages of development.

Should the Project be approved, PLPGP will continue to engage through construction and operation of the Project, as PLPGP believes this will result in a better Project and long-term involvement in the region.

## **7 CONSULTATION WITH THE PUBLIC OR OTHER PARTIES**

As per AUC Rule 007 requirements, a Participant Involvement Program (PIP) was undertaken by PLPGP. The goal of the PIP was to equip all potentially affected stakeholders with any necessary information and understanding regarding the project to enable them to provide their questions, concerns, and suggestions to PLPGP.

Consultation and notification included landowners, occupants, residents, agencies, first nations and industrial interest holders whom may potentially be impacted by the proposed Project.

### **7.1 OVERVIEW OF KEY COMMENTS AND CONCERNS EXPRESSED BY STAKEHOLDERS**

To date, no questions or concerns have been raised by any stakeholders notified.

### **7.2 OVERVIEW OF ONGOING CONSULTATION ACTIVITIES**

PLPGP will continue the PIP over the coming months with new stakeholders who buy, lease, rent, or occupy properties within a minimum of 2000 m from proposed facilities and with other stakeholders seeking additional information. Discussions with stakeholders will continue throughout application review, pre-construction, construction, and operation activities.

## **Appendix A - Additional Figures**

**Figure 5. Grizzly Bear and Trumpeter Swan Habitat**

**Figure 6. Wetlands and Watercourses**

**Figure 7. Parks and Recreation Areas**




**Figure 8. Indigenous Reserves and Settlements**



Prepared For:  
Prairie Lights Power GP

**FIGURE 5**

**Prairie Lights Power  
Project  
Trumpeter Swan  
Grizzly Bear**

-  Grande Cache Grizzly Bear Range
-  Trumpeter Swan 500m buffer
-  Project Area



Coordinate System: NAD 1983 UTM Zone 11N  
Projection: Transverse Mercator  
Datum: North American 1983  
Units: Meter



0 2 4 8 km

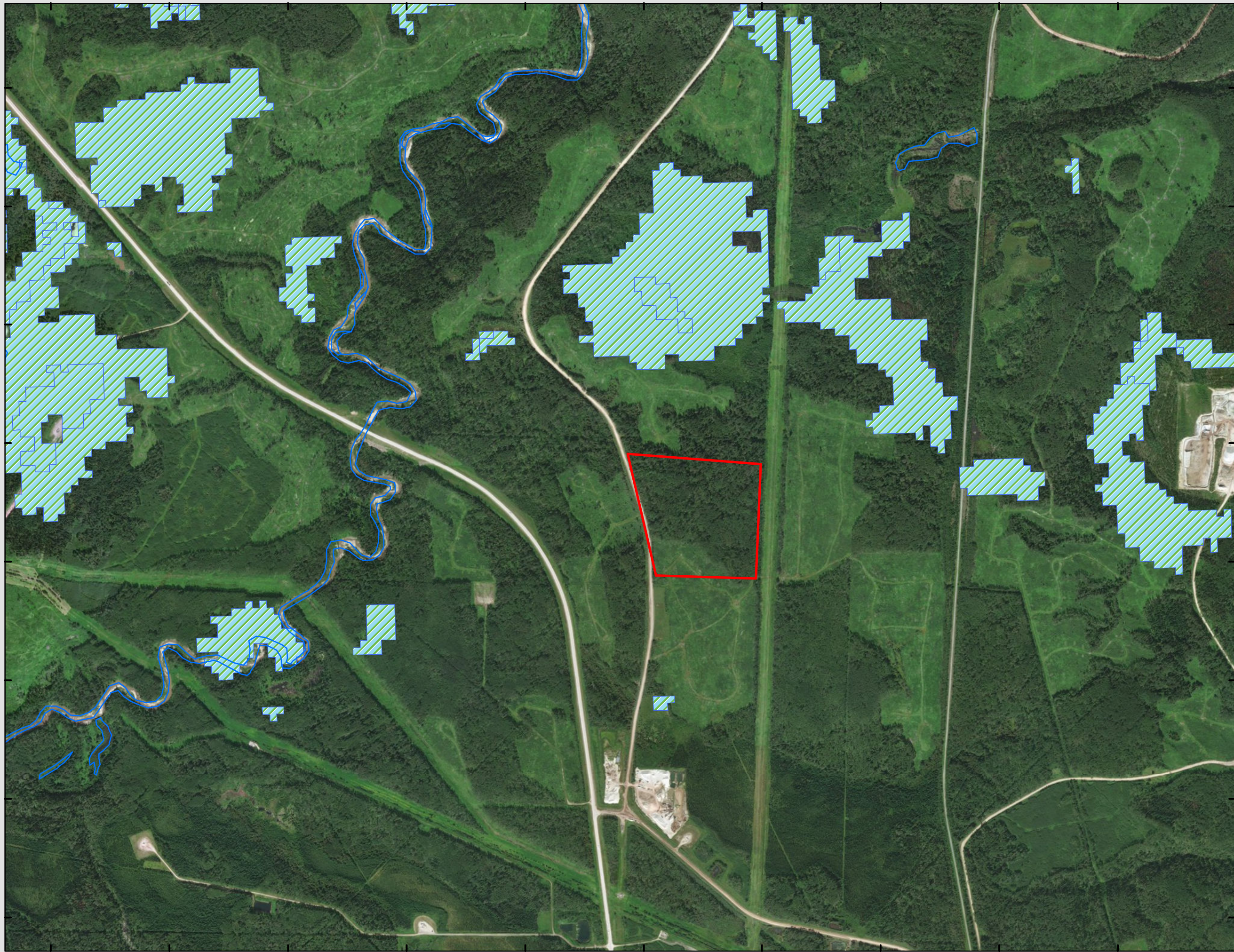
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Drawn By: LP

Date: 2019-07-17



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Prepared For:

Prairie Lights Power GP

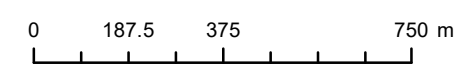
**FIGURE 6**

**Prairie Lights Power Project  
Mapped Wetland and  
Watercourse Features**

-  Watercourses (AB Inventory)
-  Wetlands (AB Inventory)
-  Project Area



Coordinate System: NAD 1983 UTM Zone 11N  
Projection: Transverse Mercator  
Datum: North American 1983  
Units: Meter



1:15,000 Scale when printed @ 11" x 17"

Drawn By: John R. Gallop Date: 2019-04-04



**McCallum Environmental Ltd.**

Prepared For:  
Prairie Lights Power GP Inc.

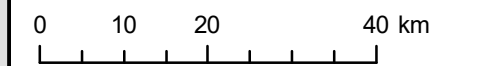
**FIGURE 7**

**Prairie Lights Power Project  
Parks and Provincial Areas**

-  Big Mountain Creek Provincial Recreation Area
-  Jasper National Park
-  Kakwa Wildland Area
-  Musreau Lake Provincial Recreation Area
-  Wilmore Wilderness Park
-  Project Area



Coordinate System: NAD 1983 UTM Zone 11N  
Projection: Transverse Mercator  
Datum: North American 1983  
Units: Meter



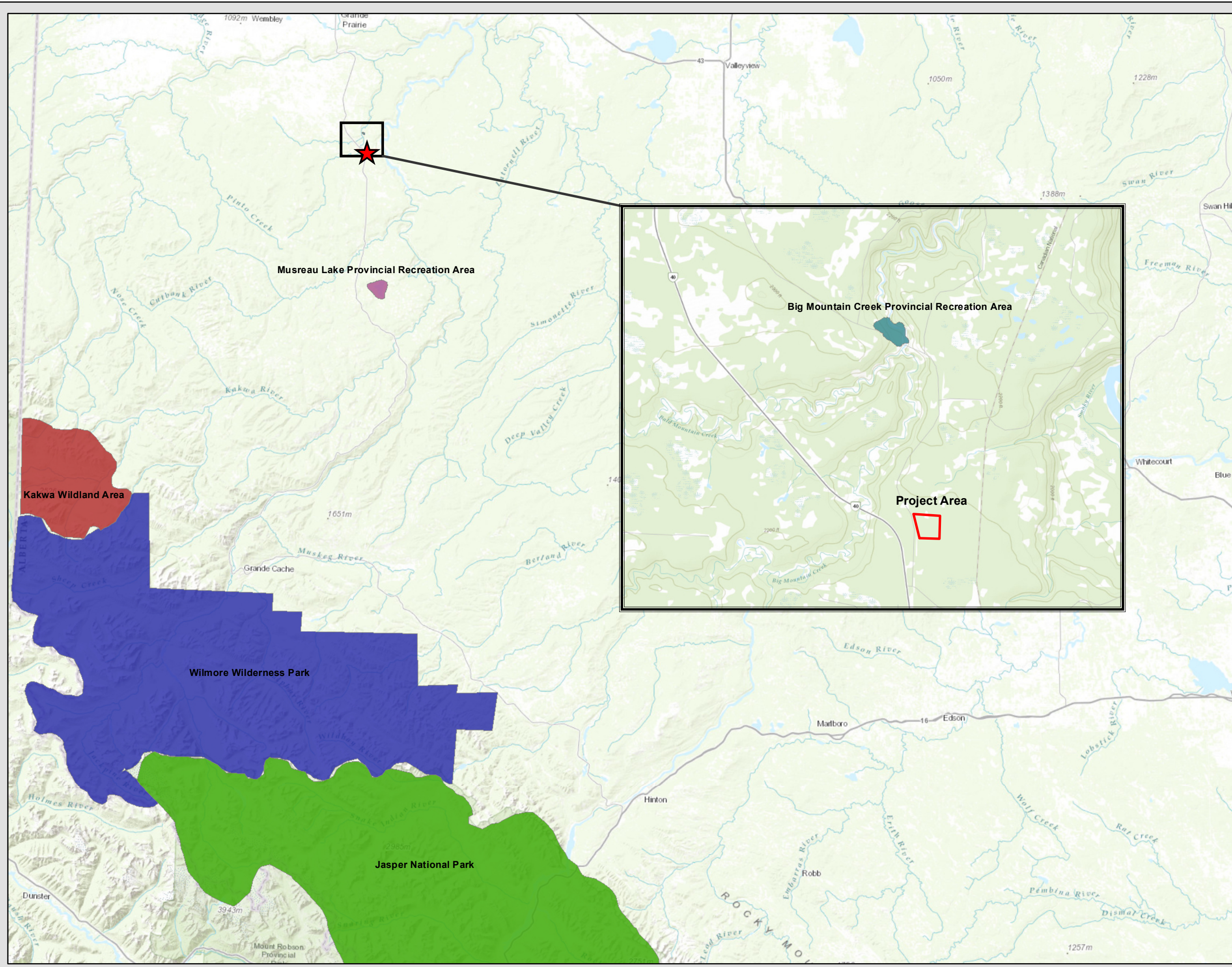
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Date: 2019-07-18





McCallum Environmental Ltd.



**FIGURE 8**

**Prairie Lights Power Project  
First Nations Reserves and  
Metis Settlements**

-  Metis Settlement
-  First Nations Reserve



Coordinate System: NAD 1983 UTM Zone 11N  
Projection: Transverse Mercator  
Datum: North American 1983  
Units: Meter



0 15 30 60 km

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Drawn By: LP

Date: 2019-09-11



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