



**Cascade Power Plant**  
Project Description

January 2019

Prepared for:

Cascade Power GP Ltd.

Prepared by:

Stantec Consulting Ltd.



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## Acronyms

%	percent
°C	degrees Celsius
ACC	air cooled condenser
ACIMS	Alberta Conservation Information Management System
ACO	Alberta Aboriginal Consultation Office
ACT	Alberta Culture and Tourism
AEP	Alberta Environment and Parks
AESCC	Alberta Endangered Species Conservation Committee
AIES	Alberta Interconnected Electric System
AUC	Alberta Utilities Commission
BC	British Columbia
BOP	balance of plant
Cascade	Cascade Power GP Ltd.
CEA Agency	Canadian Environmental Assessment Agency
CEAA 2012	the <i>Canadian Environmental Assessment Act, 2012</i>
CH <sub>4</sub>	methane
CO	Carbon monoxide
CO <sub>2</sub>	carbon dioxide
CO <sub>2e</sub>	carbon dioxide equivalent
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CRA	commercial, recreational or Aboriginal
DLE	Dry Low Emission
DML	miscellaneous lease



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ECCC	Environment and Climate Change Canada
FWMIS	Fisheries and Wildlife Management Information System
GJ	gigajoules
GSU	generator step-up transformer
GTG	Gas Turbine Generator
GWP	Global Warming Potentials
ha	hectare
HR	Historic Resources
HRIA	Historical Resources Impact Assessment
HRSG	Heat Recovery Steam Generator
igpm	imperial gallons per minute
kg	kilogram
km	kilometre
kV	kilovolt
m	metre
m <sup>2</sup>	metres square
m <sup>3</sup> /s	cubic metres per second
mbgs	metres below ground surface
MMcf	million cubic feet
MW	MegaWatts
MWh	MegaWatt hour
N <sub>2</sub> O	nitrous oxide
NE	northeast
NIA	Noise Impact Assessment
NO <sub>x</sub>	nitrogen oxide





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NRC	Natural Regions Committee
NW	northwest
O&M	Operation and Maintenance
PIP	Participant Involvement Program
PM	particulate matter
PM <sub>10</sub>	particulate matter 2.5 to 10 microns in diameter
PM <sub>2.5</sub>	particulate matter 2.5 microns or less in diameter
RAP	Restricted Activity Period
RD	Rural District
RTMP	Royal Tyrrell Museum of Palaeontology
SARA	<i>Species at Risk Act</i>
SCR	selective catalytic reduction
SO <sub>2</sub>	sulfur dioxide
SOMC	Species of Management Concern
STG	Steam Turbine Generator
SW	southwest
ULN	Ultra-low NOx
USA	United States
VOC	volatile organic compound



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## 1.0 GENERAL INFORMATION AND CONTACTS

This Project Description 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.

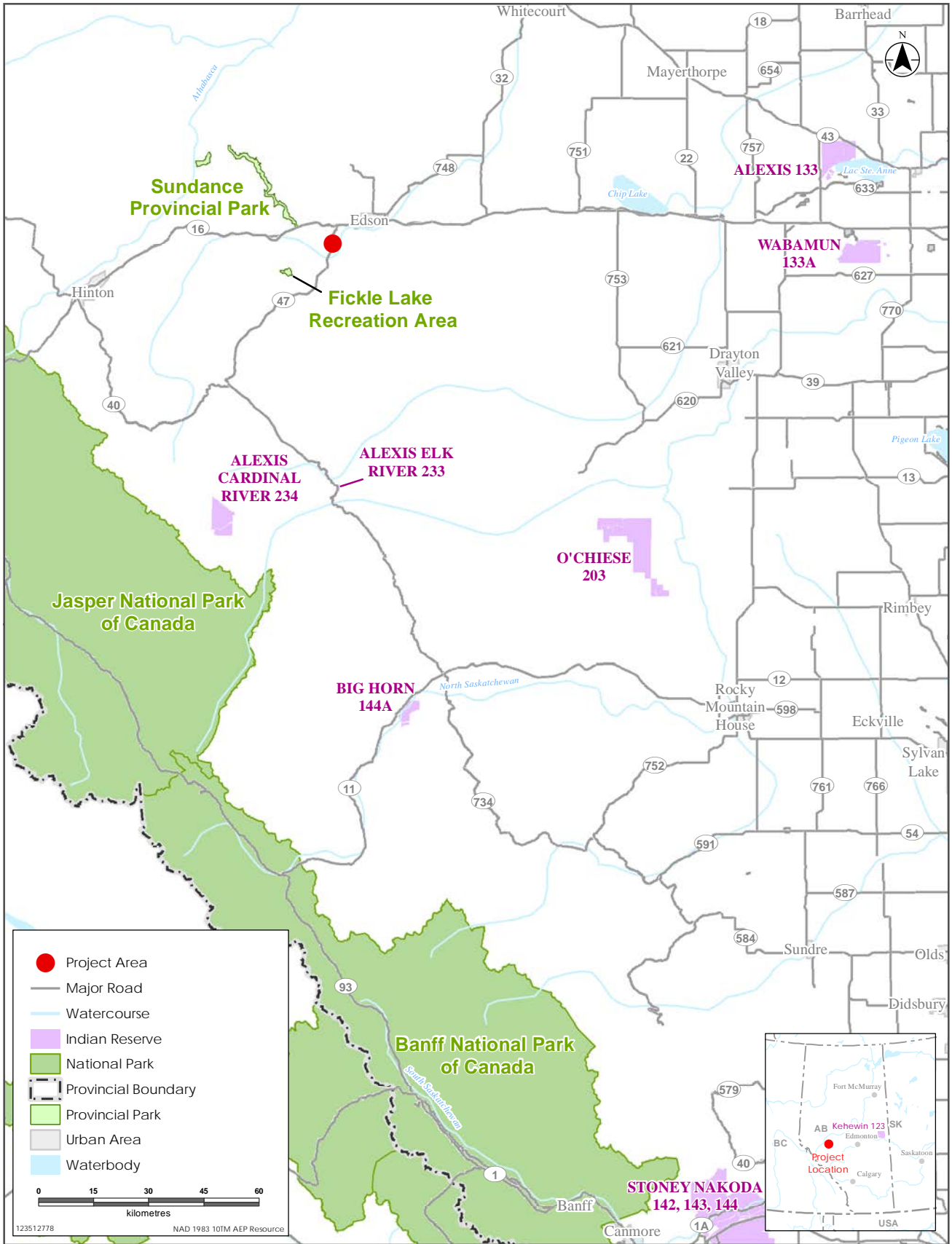
### 1.1 NATURE AND PROPOSED LOCATION OF THE PROJECT

Cascade Power GP Ltd. (Cascade) is proposing to develop the 900 MW Cascade Power Plant located on provincial crown land 12 km southwest of Edson, Alberta (the Project). Subject to final equipment configuration, it is anticipated that the Project will be developed in two phases, with the first 450 MW going in service by 2022 and the second 450 MW phase in the following year. The Project will utilize class H gas turbines and will be supplied with pipeline specific natural gas.

In line with the new Specific Gas Emitters Regulation, green-field combined cycle power generation facilities are a viable option to assist 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.

Figures 1-1 and 1-2 show the general area where the Project is located.



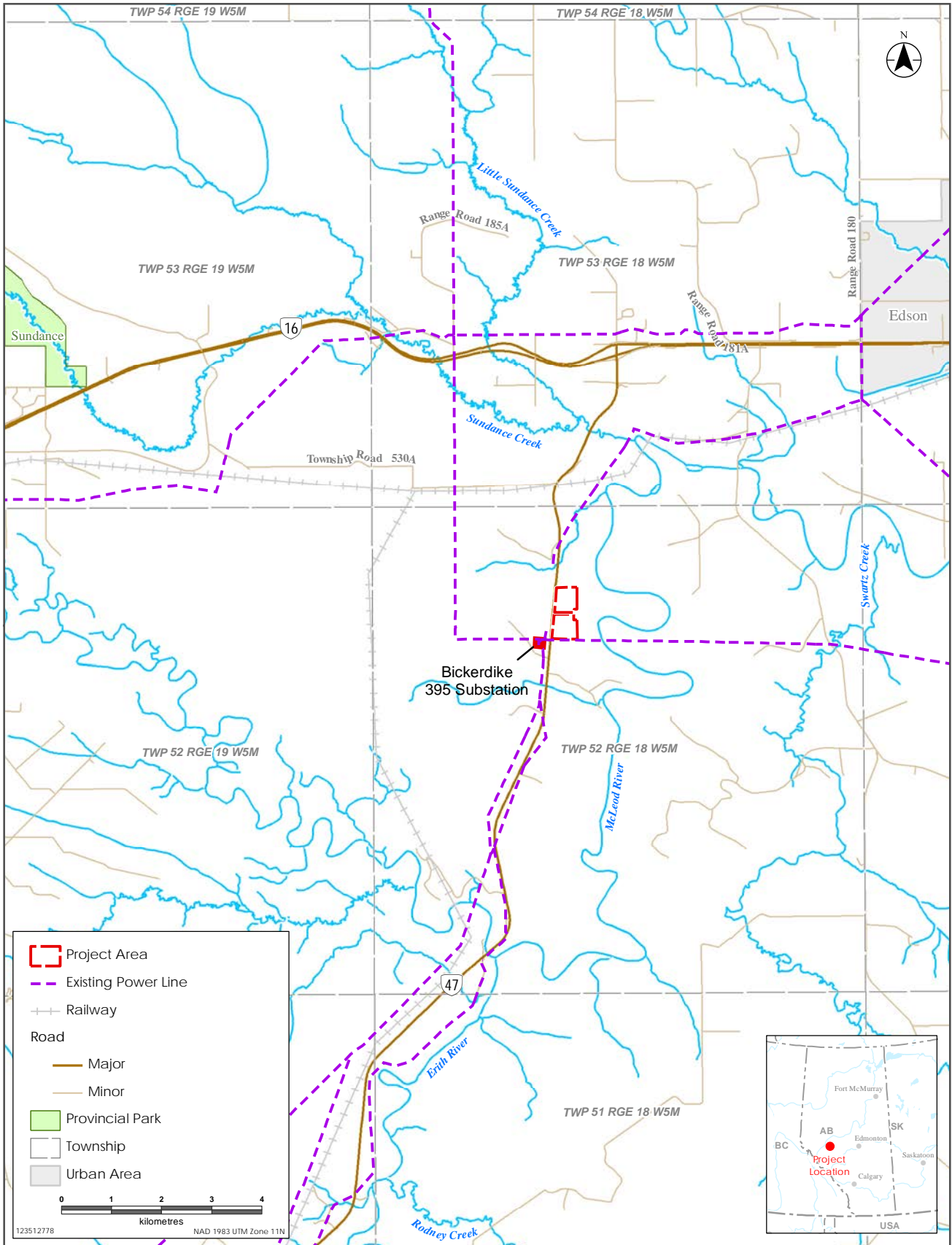


Sources: Project data provided by Cascade Power GP Ltd.  
Base data provided by the Governments of Canada, and Alberta.

Disclaimer: This map is for illustrative purposes to support this Stantec project; questions can be directed to the issuing agency.

Figure 1-1: Project Location in Relation to Indigenous Reserves and Parks





Sources: Project data provided by Cascade Power GP Ltd.  
Base data provided by the Governments of Canada, and Alberta.

Disclaimer: This map is for illustrative purposes to support this Stantec project; questions can be directed to the issuing agency.

Figure 1-2: Location of the Cascade Power Plant



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## 1.2 PROPONENT AND CONTACT INFORMATION

Cascade is an Alberta-based power producer. Cascade develops, owns and operates power generation facilities in Alberta.

Cascade deploys the latest technologies to produce power from clean resources such as natural gas and delivers power using the best economically available technology.

**Name of the Designated Project:** Cascade Power Plant

**Name of the Proponent:** Cascade Power GP Ltd.

**Address of the Proponent:** 1800, 715 5 Ave. SW  
Calgary, Alberta  
T2P 2X6

**CEO:** Andrew Plaunt  
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**Principal Contact Person:** Rob Thomas  
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Phone: 403-815-0203  
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## 1.3 LIST OF JURISDICTIONS AND OTHER PARTIES CONSULTED

Cascade plans to construct and operate a project that will include consideration of input gathered from stakeholder and Indigenous engagement efforts.

Cascade recognizes that public trust and confidence are earned through performance, open communication and ongoing community engagement. Cascade will strive to be a valued and trusted member of the local and regional community. Creating long-term economic and social benefits, as well as developing lasting relationships with the Indigenous communities and public stakeholders built on mutual trust and respect, are integral to the overall Cascade engagement and communications approach.

Engagement efforts for the Project are governed by the following guiding principles:

- Inclusion: Cascade will provide an opportunity for Indigenous communities and public stakeholders to be meaningfully involved in decisions that have the potential to affect them.



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- **Respect:** Cascade will work to develop and maintain constructive relationships through positive interactions based on mutual respect, trust and openness.
- **Timeliness:** Cascade will identify and involve stakeholders early in the process and provide timely opportunities for participation, in order to understand expectations, interests and concerns.
- **Responsiveness:** Cascade will encourage stakeholders to provide input to better understand how they wish to be consulted. Cascade will listen to stakeholder needs and interests and will strive to remain flexible and respond promptly.
- **Accountability:** The Cascade Project Team will use its stakeholder information management database to document all interactions with stakeholders and facilitate meeting commitments.

The Project engagement and communications activities have involved two principle phases: Pre-Project Sanctioning, which covers the period of March – early July 2018, and the Application Phase, which covers the period of early July through to submission of the various provincial and federal regulatory applications, which is notionally targeted to occur in Q1 2019.

## **Pre-Project Sanctioning**

Cascade and its external contractors, (including BV Lands and Communica) commenced site investigation and preliminary communications with public stakeholders and Indigenous communities and various provincial and federal regulators in March 2018 regarding a geotechnical program. BV Lands met in person with the Alberta Aboriginal Consultation Office (ACO) in Edmonton on March 28, 2018 to provide background on Cascade's engagement efforts with O'Chiese First Nation, Paul First Nation and Alexis Nakota Sioux Nation. The ACO recognized the attempts of Cascade to contact these First Nations and provided direction for Cascade to respond to the First Nations that Cascade is interested in conducting engagement and relationship building with. The ACO also indicated to Cascade that the contacted First Nations should provide a formal response with any site-specific geotechnical issues and concerns by April 6, 2018 (prior to the geotechnical program at the site). Cascade sent emails announcing the geotechnical program and followed up with phone calls but no responses were received.

Cascade met with the CEA Agency on April 12, 2018 to introduce the Project and determine the need for a Project Description. The need was confirmed in an email to Cascade dated April 12, 2018 (see Appendix A). The CEA Agency agreed to be available to review and comment on a draft of the Project Description prior to submission.

Cascade also met with Alberta Environment and Parks (AEP) on April 9, 2018. Cascade submitted a Project Summary to AEP, as per their guidelines on May 30, 2018. A letter from AEP dated June 6, 2018 was received indicating that an Environmental Impact Assessment (EIA) was not required. This letter is attached in Appendix A.

On June 19, 2018, Project representatives provided public presentations to the Town of Edson Mayor, Council and Administration with respect to the Project's anticipated schedule and future engagement approaches. On July 24, 2018, a similar meeting was held with the Yellowhead County Mayor and Council.



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On July 25, 2018, a public open house on the Project was held in the town of Edson, Alberta.

A list of the federal and provincial jurisdictions consulted for the Project is provided in Table 1-1. A list of the stakeholders and other interest groups engaged for the Project is provided in Table 1-2. A more detailed list of stakeholders is presented in Table 7-1 of Section 7.1, Stakeholders and Related Engagement Activities.

**Table 1-1 Jurisdictions Consulted by Cascade Regarding the Cascade Power Plant**

Federal Government	Canadian Environmental Assessment Agency Fisheries and Oceans Canada Transport Canada
Provincial Government	Alberta Environment and Parks Alberta Culture and Tourism Alberta Utilities Commission

**Table 1-2 Stakeholders and Other Interest Groups Engaged by Cascade Regarding the Cascade Power Plant**

Municipal Government	Town of Edson
Local Landowners, Occupants and Residents	Personal consultation within 800 m Notification within 3,000 m
Indigenous groups	O'Chiese First Nation, Paul First Nation, Alexis Nakota Sioux Nation and Kehewin Cree Nation
Regional Associations	Yellowhead County
Public	Recreational, business and other potentially interested parties

## **Application Phase**

Cascade commenced an Alberta Utilities Commission (AUC) Application process in July 2018. As part of this application process, Cascade began a comprehensive participant involvement program (PIP) for the Project in accordance with Section 3 and Appendix A of AUC *Rule 007: Applications for Power Plants, Substations, Transmission Lines and Industrial System Designations* (amended and approved on March 21, 2018 and effective as of April 2, 2018). The program includes engagement with the public (e.g., local landowners), Indigenous groups, government agencies, municipalities, industry, associations and special interest groups.





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The PIP activities include:

- mailing of a PIP package that included a cover letter, Project specific map, Project newsletter and invitation to community open houses in Edson
- personal engagement with all landowners, occupants, residents and interest holders within an 800 m radius of the proposed Project site
- project notification to all landowners, occupants, residents and interest holders within a 3,000 m radius of the proposed Project Area
- presentations to Indigenous communities and interested members of the public
- community meetings or open houses
- tours and site visits
- participation at community events

Cascade will utilize various communication materials to facilitate an understanding of the proposed Project among interested parties including:

- personal engagement with landowners and other interested parties
- project information packages sent to all stakeholders within 3,000 m of the Project site and other interested stakeholders
- dedicated Project website ([www.cascadepower.ca](http://www.cascadepower.ca))
- dedicated Project email account ([info@cascadepower.ca](mailto:info@cascadepower.ca))
- dedicated Project toll-free telephone inquiry line (1.855.955.3056)
- two community open houses with display boards, fact sheets, and presentations

## 1.4 OTHER RELEVANT INFORMATION

The Project will be subject to approvals issued by AEP and the *Environmental Protection and Enhancement Act*; Alberta Culture and Tourism (ACT) under the *Historical Resources Act* and AUC under the *Hydro and Electric Energy Act*. Approvals will also be required from AEP under the *Water Act* and possibly under the *Public Lands Act*.

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). It includes:

- a description of the current setting and condition of the environment
- the current ambient air quality of the Project Area
- current soil survey of the site and surrounding lands, including land capability, suitability for reclamation and local and regional vegetation, including rare plants
- nature and condition of wildlife in the area, including the species and their habitats, and identification of any sensitive species and special habitats



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- description and evaluation of any proposed receiving watercourses
- wastewater and runoff treatment and control;
- air treatment and control
- environmental risks and mitigation during construction
- environmental objectives during operation and environmental management systems
- reclamation objectives and a conceptual reclamation plan

The information required in the environmental evaluation of the Project by AUC is listed in *Rule 007 Applications for Power Plants, Substations, Transmission Lines, Industrial System Designations and Hydro Developments* (AUC 2018). It 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. Specifically, AUC says the environmental evaluation should include:

- a description of the existing environmental and land use conditions in the local study area
- the identification and description of the Project activities and infrastructure that may adversely affect the environment
- the identification of what specific ecosystem components (i.e., terrain and soils, surface water bodies and hydrology, groundwater, wetlands, vegetation species and communities, wildlife species and habitat, aquatic species and habitat, air quality and environmentally sensitive areas) within the local study area may be adversely affected by the Project
- the description of the potential adverse effects of the Project on the ecosystem components during the life of the Project
- the description of the mitigation measures the applicant proposes to implement during the life of the Project to reduce these potential adverse effects
- the description of the predicted residual adverse effects of the Project and their significance after implementation of the proposed mitigation
- the description of any monitoring activities proposed to implement during the life of the Project to verify the effectiveness of the proposed mitigation
- the description of the methodology used to identify, evaluate and rate the adverse environmental effects and determine their significance, along with an explanation of the scientific rationale for choosing this methodology

In addition to the environmental evaluation, the AUC requires a Noise Impact Assessment and mitigation measures implemented, as necessary, for the Project to comply with AUC Rule 012, *Noise Control*.

The applications to AEP and AUC were submitted on November 23, 2018.

The Project has been reviewed against the following regulatory agency approvals, licences or requirements to determine their applicability:



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## 1.4.1 Federal

- *Canadian Environmental Assessment Act, 2012* (CEAA 2012) Project Description Review
  - Under the CEAA 2012, a federal environmental assessment may be required for a project if it falls under the description of a designated activity as listed in the *Regulations Designating Physical Activities* (CEA Agency 2012). To determine if a federal environmental assessment is needed, a description of the designated project must be submitted to the CEA Agency for review and a screening must be conducted to determine whether a federal environmental assessment is required. Under the *Regulations Designating Physical Activities*, the Project meets the definition of a designated physical activity and is required to undergo a screening (i.e., review) by the CEA Agency (see Section 2.2). The results of the screening will inform the CEA Agency's decision as to whether an environmental assessment is required.
- *Navigation Protection Act* (not applicable)
  - The *Navigation Protection Act* seeks to protect the public right of navigation in navigable waters. Navigable waters include watercourses listed in a schedule to the Act, as well as any canal or other body of water created or altered as a result of the construction of any work and those waterways where the public has a right to use the waterway as a route of travel under Common Law. As the McLeod River is not a scheduled watercourse under the *Navigation Protection Act* and water extraction is not a component of the Project, the *Navigation Protection Act* is not applicable to the Project.
- *Fisheries Act* (not applicable)
  - Subsection 35(1) of the *Fisheries Act* prohibits the carrying out of a work, undertaking or activity that results in serious harm to fish that are part of, or support, a commercial, recreational or Aboriginal (CRA) fishery or to fish and fish habitat that support such a fishery. Under Subsection 35(2)(b) of the *Fisheries Act*, the Minister of Fisheries and Oceans (the Minister) may issue an authorization with terms and conditions in relation to a proposed work, undertaking or activity that may result in serious harm to fish and fish habitat. There are no Project works or activities that interact with fish or fish habitat. The Project is 380 m from the McLeod River. Accidental spills or releases will be captured on site or in the Stormwater Pond and will not discharge into the McLeod River. The Project will not require a federal *Fisheries Act* authorization for permanent alteration or destruction of fish habitat causing serious harm to a CRA fishery.
- *Species at Risk Act*
  - The *Species at Risk Act* (SARA 2014) contains prohibitions that make it an offence to kill, harm, harass, capture or take an individual of a species listed in Schedule 1 of SARA as Endangered, Threatened or Extirpated. These prohibitions may apply to the Project as 16 species that appear on Schedule 1 have the potential to occur in the Project Area.



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- *Migratory Birds Convention Act, 1994*
  - Migratory birds and their nests are protected under the *Migratory Birds Convention Act, 1994* (MBCA). The MBCA provides protection to the nests and eggs of migratory birds by prohibiting “incidental take” through disturbance, destruction, taking of a nest, egg, or nest shelter of a migratory bird. Environment and Climate Change Canada (ECCC) has established timing restrictions to help identify when the risk of contravening the MBCA is particularly high. ECCC advises against activities such as vegetation clearing, wetland draining, and construction in areas attractive to migratory birds between April 15 and August 15. If construction activities, such as vegetation clearing, are scheduled within the bird nesting window (April 15 to August 15), a nest search will be conducted to mitigate the risk of incidental take during these activities.

## 1.4.2 Provincial

- *Environmental Protection and Enhancement Act*
  - *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).
    - o (2) (vv) “power plant” means a plant that produces steam or thermal electrical power and has a rated production output of greater than one megawatt under peak load but does not include a production facility for space heating (Division 2 of Schedule 1).
- *Hydro and Electric Energy Act*
  - Pursuant to sections 11 and 14 of the *Hydro and Electric Energy Act*, any person intending to construct, connect, operate, or alter hydro developments, power plants, substations, transmission lines or industrial system designations, including ownership changes, must file an application with the AUC for approval to construct and operate the project. As the Project involves the construction of a power plant, an application must be filed with the AUC.
- *Water Act*
  - The Project will be planned and designed to minimize temporary and permanent disturbance to wetlands. Because complete avoidance of wetlands is not possible, an approval under the *Water Act*, is being applied for.
- *Public Lands Act*
  - Under the *Public Lands Act*, AEP regulates access, occupation or work in or near waterbodies in Alberta, including the bed and shores of all naturally occurring rivers, streams, watercourses and lakes. No Cascade activities will occur on the bed or shores of any watercourses.
- *Historical Resources Act*
  - There are no previously recorded historical resources within the Project Area or within a one kilometre buffer around it. The Listing of Historic Resources (ACT 2017), however, specifies that the eastern portion of the Project footprint, adjacent to the McLeod River, has elevated potential for containing previously unknown archaeological or palaeontological sites. As such, a Historic Resources (HR) Application was submitted to the Historical Resources Management Branch of ACT on October 29, 2018 for review under the *Historical Resources Act*, to determine whether a Historical Resources Impact Assessment (HRIA) for archaeology or palaeontology is required.



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### 1.4.3 Municipal

- *Municipal Government Act*
  - Development of the Project is regulated by zoning and development permit requirements administered by the Yellowhead County, under the *Municipal Government Act*.
  - Under the *Municipal Government Act*, a licence, permit, approval or other authorization granted by AUC prevails over any municipal development plan, area structure plan, land use bylaw or development decision by a development authority (*MGA Sec. 619(1)*).

## 1.5 PREVIOUS ENVIRONMENTAL STUDY

The Project will not be taking place in an area that has been or is the subject of a regional environmental study.



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## 2.0 PROJECT INFORMATION

### 2.1 PROPOSED DEVELOPMENT

The Project is a 900 MW combined cycle power facility that will generate electricity to provide a reliable source of electricity to help meet the growing demand for electricity in Alberta. The Project's proposed location is in Yellowhead County on crown land in the west half of 28-52-18-W5M, approximately 12 km southwest of Edson, Alberta. The Project Area is approximately 44 hectares (ha) in size and represents the area in which the development is sited. The Project footprint, as defined by the fenced area which demarcates plant equipment (10.4 ha), the access road (0.1 ha) and the temporary laydown area (8.1 ha) is approximately 18.6 ha and will be situated on the north portion of the Project Area.

Combined cycle power facilities are comprised of a combination of both gas and steam power production technologies. The combined cycle power facility uses natural gas as a fuel to produce power in a gas-turbine generator and then utilizes the waste energy from the exhaust in a Heat Recovery Steam Generator (HRSG) to produce steam, which drives the steam-turbine generator. The Project will feature two 1x1 gas/steam turbine line ups, each producing approximately 450 MW, for a total plant output of 900 MW. The electricity produced will be put into the Alberta Provincial Grid to meet the electric power requirements of the province. In order to fuel the combined cycle power facility, natural gas will be supplied to the facility from a pipeline tied to an existing natural gas distribution network. The Project will require up to 150,000 GJ/day of pipeline specific natural gas as fuel, with an estimated net plant efficiency of over 58%. In addition to the power generating components, other Project components will consist of fuel gas treatment components, generator step-up transformers, associated power distribution modules, and the demineralized water treatment facility with associated storage tanks.

The Project will require both electricity and water. The location of the Project is considered favourable because of its close proximity to the AltaLink 9S Substation and AltaLink 240 kilovolt (kV) transmission lines 973L and 974L. The proposed location will minimize the length of transmission interconnection to the Alberta Interconnected Electric System (AIES). Make-up water, required for the steam cycle, will be sourced locally from the town of Edson. The Project is not expected to withdraw water from an existing waterbody such as the McLeod River. Other components of each power train include an air-cooled condenser (ACC) and a generator step-up transformer (GSU).

This is a stand-alone Project and is not a component of a larger project that is not listed in the *Regulations Designating Physical Activities*.



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## 2.2 DESIGNATED PHYSICAL ACTIVITY

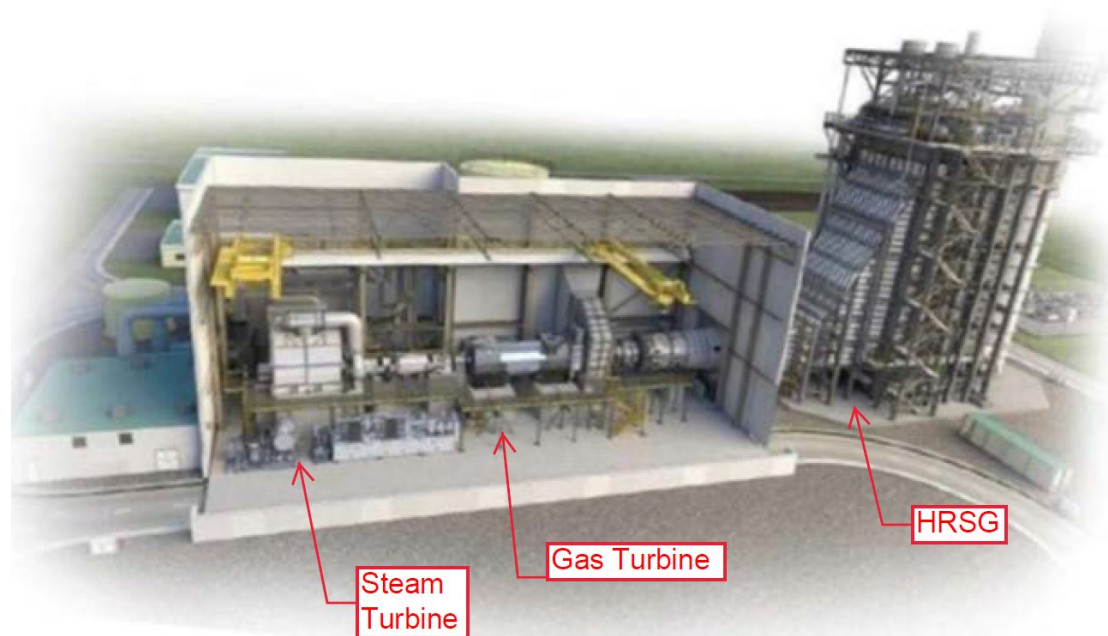
In an email dated April 12, 2018 (see Appendix A), the CEA Agency determined that the Project, as described, is a designated physical activity as defined in item 2(a) of the *Regulations Designating Physical Activities* (the Regulations) and may require a federal environmental assessment. Pursuant to the requirements outlined in CEEA 2012, Cascade is required to submit a project description to the CEA Agency to inform the decision as to whether an environmental assessment is required. Item 2(a) of the Regulations under the *Canadian Environmental Assessment Act, 2012* states:

*“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 production capacity of 900 MW, the threshold defined in item 2(a) would be exceeded. As such, the Project is considered a designated physical activity under the Regulations.

## 2.3 COMPONENTS AND ACTIVITIES

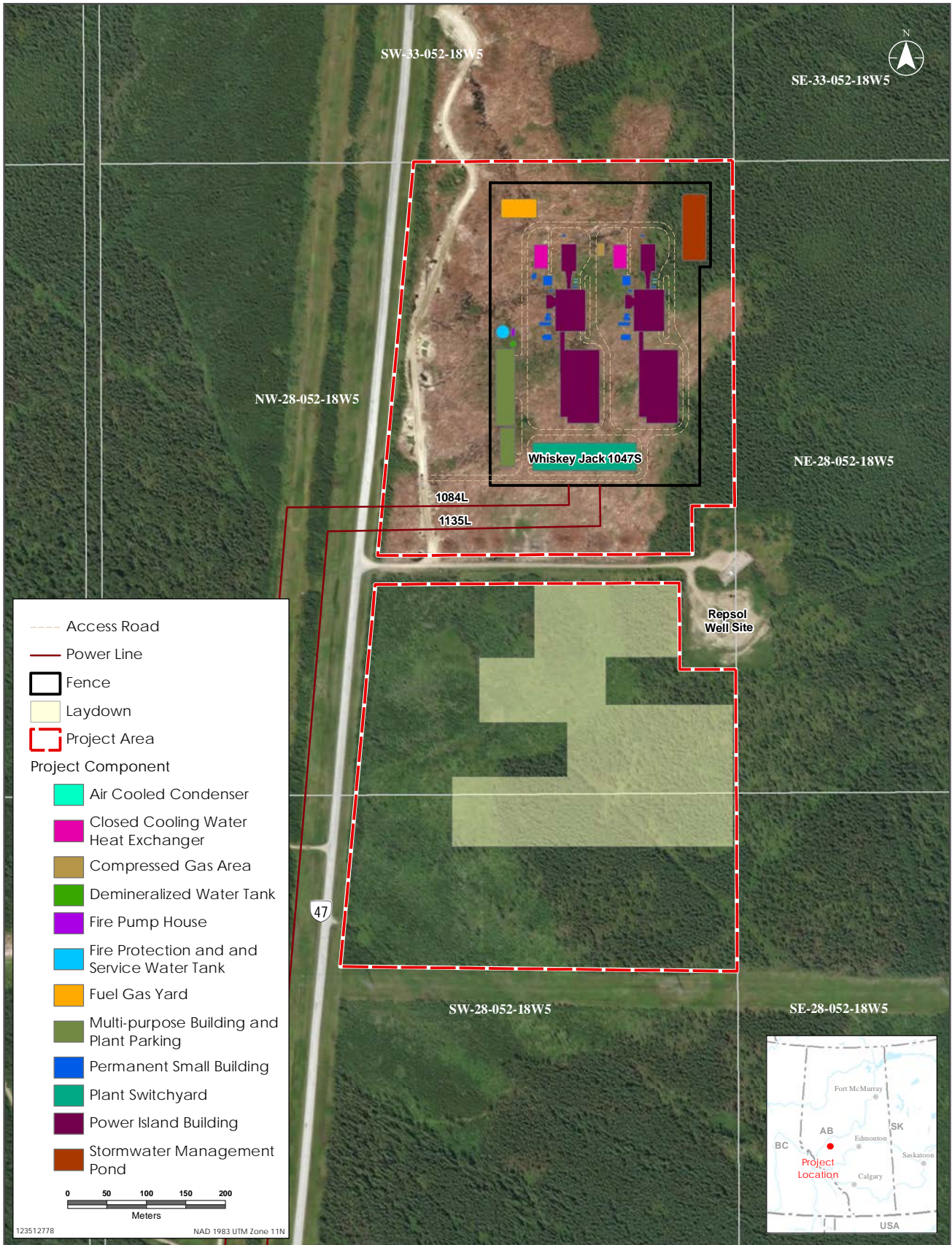
Figure 2-1 presents a conceptual design of the gas turbine and Figures 2-2 and 2-3 present a preliminary plant layout for the Cascade Power Plant.



**Figure 2-1 Conceptual Design of the Gas Turbine and HRSG Power Train Cascade Power Plant**



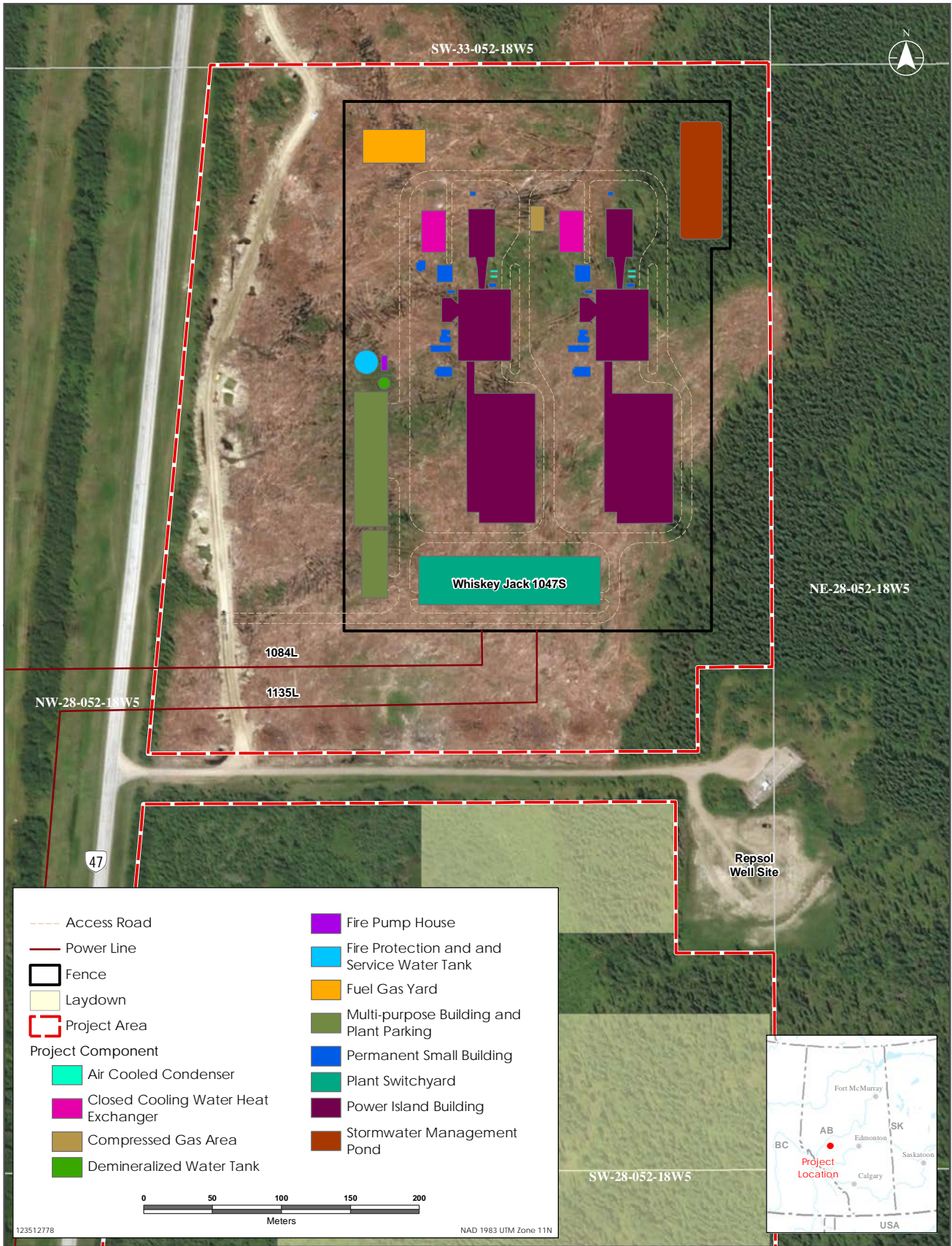




Sources: Project data provided by Cascade.  
Base data provided by the Governments of Canada, and Alberta.

Disclaimer: This map is for illustrative purposes to support this Stantec project; questions can be directed to the issuing agency.

Figure 2-2: Preliminary General Layout of the Cascade Power Plant



Sources: Project data provided by Cascade. Base data provided by the Governments of Canada, and Alberta.

Disclaimer: This map is for illustrative purposes to support this Stantec project; questions can be directed to the issuing agency.

Figure 2-3: Enlargement of the General Layout of the Cascade Power Plant

# CASCADE POWER PLANT PROJECT DESCRIPTION

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## 2.3.1 Physical Works Associated with the Designated Project

### 2.3.1.1 Project Components

The Project involves the construction and operation of a combined cycle natural gas fired power plant, constructed in two phases. The first phase will include facilities for the production of approximately 450 MW of power; the second phase will add an additional 450 MW of power. The Project will be located within a 44 ha green-field site 12 km southwest of Edson, Alberta.

Each phase of construction involves installation of four main components: a gas turbine, a HRSG, a steam turbine, and a generator in a “1-on-1” configuration. This configuration applies a common rotating shaft between the gas turbine and the steam turbine to generate power. Other components of each power train include an ACC and a GSU. To minimize the exposure to ambient conditions, two power island buildings will enclose the gas and steam turbine components of each 1-on-1 power train. The balance of plant (BOP) is the term used in describing all other components outside of power generating equipment such as warehouses, electrical distribution buildings, pumps and compressors that will be installed in the proximity of each power island building. In between each power island component line up, there will be interconnecting water, steam, compressed air, and natural gas supply lines to facilitate the operations of process equipment. There are no provisions for natural gas storage on site.

There will be a section of the site allocated to a 240 kV switchyard that will connect the Project to the nearby AltaLink’s Bickerdike 39S substation by transmission lines 1084L and 1135L. AltaLink will be responsible for maintaining any electrical and telecommunication infrastructure that connects the project to the AIES. Overall, the Project footprint, defined as the fenced area which demarcates the plant equipment, encompasses an area of 10.4 ha. This footprint will be located in the cleared area in the northern portion of the Project Area and will allow for the power plant and the construction lay down areas. If additional temporary laydown areas are required for construction, areas of the southern portion of the Project Area may be utilized (see Figure 2-2). These temporary laydown areas, which cover approximately 8 ha, avoid any wetlands and, if used, will be restored following the completion of construction. Each power island building will be approximately 33 m high. The height of each HRSG stack will be approximately 55 m. During construction, all facilities within the Project land lease will be under the care and control of Cascade. Upon commencement of commercial operations of the site, all facilities shown inside the plant boundary fence will be under the care and control of Cascade.



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Table 2-1 summarizes the Project structures and components.

**Table 2-1 Project Structures and Components**

Project Component	Description
<b>Permanent Facilities</b>	
Power Island Building	Building to enclose the Gas Turbine Generator (GTG), Steam Turbine Generator (STG), HRSG and other BOP electrical and mechanical equipment. The approximate dimension of the power island building will be 50 m L (long) x 50 m W (wide) x 29 m H (high). The exhaust transition duct will be constructed outside of the building leading towards the HRSG. The HRSG exhaust stack is anticipated to be 55 m tall.
Multi-purpose Building	A multi-purpose building will be constructed to house the operating and maintenance staff. The multi-purpose building will include an administration/control room, warehouse, maintenance shop, and water treatment area. A permanent parking lot will be located on the west side of the multi-purpose building. The approximate dimensions of the Multi-purpose building will be 98 m L x 23 m W x 7.6 m H.
Fuel Gas Building	A pre-engineered fuel gas building will condition the plant's fuel gas. Inside this building will be a closed loop glycol gas heater system where glycol is circulated to heat up fuel gas, a fuel gas filter/separator, and a knockout tank. This equipment will be used to prepare the natural gas for combustion in the gas turbine. The approximate dimension for the Fuel Gas Building will be 15 m L x 13 m W x 6 m H.
Glycol Closed Loop and Fin-Fan Heat Exchanger	A glycol loop will be used in a closed-cycle system to cool various STG, GTG, and BOP equipment. The glycol loop is cooled by a fin-fan heat exchanger.
Air Cooled Condenser	The ACC is a heat exchanger which condenses steam from the steam turbine to condensate. There will be one ACC per power train, for a total of two. The approximate dimensions for each ACC section will be 80 m L x 50 m W x 15 m H.
Underground Wash Water Drain Tank	An underground wash water drain tank will be located just outside of each power island building. The 5 m x 7 m tank will collect water from the compressor wash and will be hauled off site periodically for disposal at an approved facility. The compressor wash is demineralized water with added soap to remove soot buildup on the turbines. Washing is performed at pre-determined intervals to maintain the cleanliness of the gas turbine compressors.
Water	Make-up water is primarily required for the HRSG and equipment cooling needs. Utilization of air-cooled condensers in place of a water cooled apparatus minimizes the need for make-up water. The water requirement for the site is estimated at 125 gallons/min subject to final design. It is anticipated that water will be brought to site via tanker trucks from Edson on a daily basis. This water is then processed in the demineralized water facility on site to bring it up to acceptable specification. Demineralized water will be stored in demineralized water tanks.
Fire/Service Water and Demineralized Water Tanks	A fire/service water tank will supply water for plant fire protection measures. The approximate holding capacity of this tank will be 800,000 gallons. The demineralized water tank serves to improve operational reliability of the unit in the event of reduced access to demineralized water. It is anticipated that the tank will hold a nominal 2-day storage for demineralized water requirements. The approximate holding capacity of the demineralized water tank will be 750,000 gallons subject to final design. The water for both tanks will be trucked in to the site.
Oil/Water Separators	Oil/water separators will be used to separate oil from the water that will be collected from the facility drains.



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**Table 2-1 Project Structures and Components**

Project Component	Description
Permanent Small Buildings	The Project will include several other permanent small buildings or enclosures of varying sizes including the fire water pump building, emergency diesel generator, and power distribution modules. The fire water pump and emergency diesel generation buildings will each be approximately 12 m L x 4 m W x 3 m H. The power distribution modules building will be approximately 20 m L x 6 m W x 3 m H. All dimensions noted above are subject to the final design.
Stormwater Pond	The stormwater pond will be designed to collect surface water runoff only and will be designed for a 25-year storm event. The stormwater pond will be constructed with pond liners for the retention of liquids and prevention of leaching of water into local groundwater. Based on preliminary design, the approximate footprint of the pond will be 4,500 m <sup>2</sup> with an approximate depth of 2 m. In the unlikely event of the pond filling up, water would be stored in the ditch system leading to the pond allowing for excess water to be slowly released to the pond as the space becomes available. Surface catch basins and below-grade piping and perimeter swales will direct water and any surface runoff outside the perimeter to the stormwater pond. The ditching system will be at least 0.6 m deep with a 1.5 m wide flat bottom. If the pond and ditches were full, excess water would be released to the adjacent wetland. Prior to release, Cascade would first test the water to ensure it meets EPEA water quality standards (GOA 2018). Should the water not meet these standards, Cascade would pump the water into a truck for it to be disposed of at an approved disposal site. The release of stormwater will be designed to maintain existing drainage patterns so adjacent properties are not affected.
Site Access Road	The site access road will be built in the Project Area. The access road will be an all-weather crushed rock road and will be sited to avoid wetland areas within the Project Area. The main access road to the fenced area will be approximately 12 m wide and 125 m long and will run from the Highway 40 turn off to the east boundary of the Project footprint. There is an existing access road into the site belonging to Repsol Oil and Gas Canada. Cascade will be responsible for construction to upgrade the road to handle the heavy equipment. The road will be under Cascade's care and control within the Project footprint during construction and operation. Repsol will utilize the access road during Project construction but that access will be minimal and will be coordinated with Cascade
<b>Utilities and Infrastructure</b>	
Utilities and Infrastructure Electrical Power	The Project will be connected to the AltaLink's Bickerdike 39S substation by two 1.0 km 240kV transmission lines 1084L and 1135L (see Figures 1-2 and 2-2). On the plant side, the lines will be terminated at the Whiskey Jack 1074S substation within the Project fenced area. AltaLink and the Alberta Electric System Operator (AESO) will be responsible for routing of the powerlines, stakeholder engagement and regulatory approvals/permits, and construction, operation and maintenance for both components. These transmission lines are outside of the care and control of Cascade.
Telecommunications	Telecommunications will be required for operation of the Project. The primary method of communication with the Project controls will be through a wide area network whose central medium for communication is fibre optics. AltaLink will be responsible for the fibre optic routing, regulatory approvals/permits, construction, operation and maintenance of the telecommunications.



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**Table 2-1 Project Structures and Components**

Project Component	Description
Natural Gas Infrastructure	The Project requires a natural gas supply of high pressure service to supply the gas turbine and low pressure service to supply the building heaters. At a net output of 900 MW, the plant fuel requirements are 150,000 GJ or approximately 145 million cubic feet (MMcf) per day. Natural gas will be supplied by a new high pressure supply line connecting local gas producers to the plant. The supply lines will be sited, constructed, operated and maintained by the suppliers. In addition, a new 7 km tie-line to Nova Gas Transmission Ltd. will serve as back-up in case of any shortfall in gas supply. This line will be constructed, owned, and operated by Cascade. This pipeline will be 12" to 16" in diameter subject to further design. Pipeline routing is not finalized but will be from the TransCanada PipeLines Limited (TCPL) meter station adjacent to the Repsol Edson Gas Plant (see Figure 3-1). The pipelines will be regulated by the Alberta Energy Regulator. The plant natural gas system will begin at the downstream side of the fuel gas metering yard. An emergency stop valve, manually controlled from the control room, will be provided downstream of the metering yard to provide emergency shutoff capabilities in the event of an on-site gas system leak or major plant fire.

### 2.3.2 Size of the Designated Project

The Project Area is located on 44 ha of crown land. The Project footprint will be located in the northern portion of the Project Area which covers approximately 20 ha. The equipment general layout, referred to as the fenced area, covers approximately 10.4 ha within the Project footprint. When fully operational, the Project will be capable of producing a maximum of 900 MW of power, which is above the threshold of 200 MW set out in item 2(a) of the *Regulations Designating Physical Activities*. The Project's maximum power output is 900 MW. This output coincides with the maximum capacity of the AIES to receive power in the Hinton/Edson service area.

During normal operations, the Project will produce power through power generating equipment arranged in combined cycle configuration. The combined cycle line up consists of a gas turbine, a HRSG, and a steam turbine. The permanent structures constructed on site facilitate the operation of the main generating and other associated equipment. During the construction period, temporary structures such as construction trailers, scaffolding, temporary shelters and cranes will support the construction activities.

The Project is a new facility and not a component or expansion of another project.

### 2.3.3 Description of Project Activities

Project activities would consist of:

- Construction
- Operation and maintenance
- Decommissioning and abandonment



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## 2.3.3.1 Construction

A pre-construction geotechnical investigation was conducted in May 2018 to obtain surface and sub-surface information for foundation design. Construction activities will include clearing vegetation, access road construction, surface preparations, installation of major equipment, connection of process and ancillary equipment, site drainage and erosion control, and site clean-up and restoration. Soil will be stripped and stored on site for restoration upon decommissioning of the Project.

Initial activity involves survey and demarcation of site layout, followed by surface preparation. Site preparation is expected to take approximately four to five months to complete. The general sequence of the site preparation will be to commence with the main power plant area and the construction of the management trailer area/laydown area. The first step of site preparation involves levelling the site area to a predetermined site grade. This involves either cutting or filling the native soil depending on the pre-existing elevations of the landscape. The soil that is cleared will be stored on site. The balance of site preparation includes installing the site fence, preparing the switchyard area, installing the stormwater pond, and installing the access roads on the site. This will be followed by foundation excavation and construction which includes excavation, piling construction and foundation/substructures construction. Duct bank and grounding grid construction and underground piping installation work will be completed during the construction of the foundations in the same area. Building construction and equipment installation will begin following the completion of foundation construction. Building construction includes mechanical electrical and switchyard construction. The major equipment will be connected by piping and cables for eventual operation. The HRSG and its stacks will conclude the mechanical installation. The bulk of electrical installation will be done in parallel to the late stages of mechanical erection. The principal activities involved in commissioning of the Project include start-up planning and preparation, the start-up and commissioning process, start-up and commissioning management, operator training management, and performance testing.

Cleanup activities will be ongoing throughout construction. Following construction, waste materials will be removed, stored soil replaced and areas not covered by asphalt or structures will be revegetated.

## 2.3.3.2 Operation and Maintenance

The Project will be owned by Cascade Power GP Ltd. and operated by an Operation and Maintenance (O&M) contractor on behalf of Cascade. Day to day operation and maintenance will be provided by a staff of operators, engineers and support staff totaling approximately 20 persons. Additional support staff will be available from the operator's other natural gas plants in Alberta.

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

The basic principle of a combined cycle gas turbine plant is to combust natural gas to produce power in a gas turbine which can be converted to electrical power by a coupled generator. The hot exhaust gases from the gas turbine are used to produce steam in a HRSG. This steam is supplied to the steam turbine generator to produce additional power. As a result, combined cycle facilities are one of the most efficient and reliable generation technologies available.



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Pipeline quality natural gas will be used as the only fuel for the units. Prior to entering the gas turbine, the natural gas will be heated to a temperature specified by the original equipment manufacturer (OEM). Increasing the temperature of the natural gas increases the cycle efficiency. The heated natural gas is then combusted in the gas turbine to drive the turbine to generate electricity. Electricity generated by the gas turbines generator will be stepped up to 240 kV using the generator step-up transformers before interconnecting to the AltaLink transmission system. For this Project, an advanced H-class gas turbine has been selected for the facility. The advanced H-class turbine utilizes state-of-the-art technology to improve efficiency and boost output. The gas turbine is equipped with ultra-low NO<sub>x</sub> (ULN) burners which optimizes the ratio of combustion air to fuel as well as combustion temperature to control NO<sub>x</sub> emissions from the natural gas combustion process.

The temperature of the exhaust gas from the gas turbine ranges from 590°C to 630°C at the outlet of the turbine exhaust. The hot exhaust gas is ducted to the HRSG via the GTG exhaust transition piece to generate steam.

The HRSG is a waste heat boiler which produces high pressure, intermediate pressure and low-pressure steam. The HRSG also provides a cooling medium to the kettle boiler for the gas turbine compressor air. High temperature air from the compressor is extracted and piped to the kettle boiler. The cooled rotor air is returned to the gas turbine. The kettle boilers capture the waste heat from the rotor air to heat up low pressure and intermediate pressure feedwater thereby increasing the overall plant output. Amine, phosphate and ammonia are injected into the steam cycle along with continuous and intermittent boiler blowdown to maintain desired cycle chemistry to minimize corrosion and prevent scale formation.

Exhaust gas exits the HRSG via the stack. The stack is estimated to be approximately 55 m in height.

Steam from the low-pressure part of the turbine exhausts into the ACC. Ambient air drawn from the surroundings by fans of the ACC condenses the exhaust steam and the condensate collects in the condensate tank. Condensate is then pumped by condensate pumps and the boiler feedwater pumps to the HRSG and the steam cycle repeats.

The HRSG boiler blowdown system collects continuous and intermittent blowdown from the HRSG and steam drains local to the HRSG. Drains are routed from the collection points to the boiler blowdown tank where the steam expands and cools and is recycled back to the service water tank for reuse, reducing the overall water consumption of the facility. The boiler blowdown drain, HRSG stack drain, and feedwater pressure relief valves (PRVs) are routed to the plant drains system and pumped back to the Service/Fire Water Tank for reuse.

By adopting the process design above, the efficiency of the plant is approximately 58% on an annual average ambient condition on a low heating value (LHV) basis. As a result, the CO<sub>2</sub> emissions of the facility are expected to be well below the Government of Canada's emission limits (GOC 2018b) across all ambient conditions when the GTG is operating at full load. CO<sub>2</sub> emissions are estimated to range between 350 to 370 kg/MWh when the GTG operates at 100% load. As the plant ages, the unit will experience degradation which decreases the plant efficiency thereby increasing CO<sub>2</sub> emissions per MWh. The plant degradation curve follows a logarithmic function, reaching 1.5% in the first year and 3.6%





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overall at the end of the gas turbine major maintenance interval. The percent degradation corresponds to a reduction in MW output of the plant. The absolute cap for greenhouse gas emissions will not change during the life of the Project. Future degradation will be mitigated by implementing a long-term service agreement with the gas turbine supplier with contractual remedies on performance to ensure the facility will not exceed emission limits (GOC 2018b) over the life of the facility. The use of ACC saves water consumption by more than 90% when compared to a wet cooled unit. A continuous emissions monitoring system (CEMS) will be installed at the facility to measure and report emissions data per the requirements of the New Source Emission Guidelines for Thermal Generation (ECCC 2010) and for use in controlling the unit.

### 2.3.3.3 Decommissioning and Abandonment

The Project is expected to operate for approximately 30 years. Precise timing for the decommissioning of the facility cannot be predicted at this time as it depends solely on the mode of operation. 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 at that time.

### 2.3.4 Incidental Activities

All activities undertaken as part of the Project construction and operations will be for the purpose of power generation and will be under Cascade's care and control. Activities that are incidental to the Project construction and operation that would not be under Cascade's care and control include telecommunications, provision of power and fuel to the Project and highway access to the site.

## 2.4 EMISSIONS, DISCHARGES AND WASTES

### 2.4.1 Atmospheric Contaminant Emissions

#### 2.4.1.1 Air

Air emissions generated during construction of the facility will result from several sources and activities. Particulate matter (PM) is the term used to refer to solid particles and liquid droplets found in the air. Particulate matter is reported according to the diameter of the particle size; PM<sub>10</sub> refers to coarse dust particles 2.5 to 10 microns in diameter and typically includes crushing and grinding operations and dust from vehicles on roads. PM<sub>2.5</sub> refers to fine particles 2.5 microns or less in diameter and can only be seen with an electron microscope. Fine particles are produced from all types of combustion and some industrial processes.

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. In addition, off-road construction equipment (dozers, compressors, etc.) will release combustion by-products such as nitrous oxides (NO<sub>x</sub>), carbon monoxide (CO), and volatile organic compounds (VOCs) when they operate by combusting fuel. Fugitive dust emissions (particulate matter (PM/PM<sub>10</sub>/PM<sub>2.5</sub>)) will be higher during land



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clearing and site preparation and during active construction periods when there is increased vehicle traffic on the site from mobile equipment.

Construction equipment will also emit greenhouse gases. To estimate potential carbon dioxide equivalent (CO<sub>2</sub>e) emissions from the construction equipment, emission factors for CO<sub>2</sub>, methane (CH<sub>4</sub>), and nitrous oxide (N<sub>2</sub>O) were obtained from the United States Environmental Protection Agency (US EPA) Mandatory Greenhouse Gas Reporting Rule (40 CFR Part 98) and apportioned with their appropriate Global Warming Potentials (GWP). Greenhouse gas emissions during operation of the Project were conservatively modelled, assuming all turbines operating continuously at the maximum rated capacity and all exhaust exiting through the HRSG stacks. The potential emissions for both construction and operation are summarized in Table 2-2.

**Table 2-2 Estimated Maximum Potential Annual Greenhouse Gas Emission Rates of the Project during Construction and Operation**

Pollutant	Construction				Operation (kt/y)
	Year 1 (kt/y)	Year 2 (kt/y)	Year 3 (kt/y)	Total Over 3 Years (kt/y)	
CO <sub>2</sub>	44.130	59.062	10.735	113.927	2,832 <sup>a</sup>
CH <sub>4</sub>	0.0018	0.0024	0.0004	0.0046	0.055 <sup>b</sup>
N <sub>2</sub> O	0.00004	0.0005	0.0001	0.00064	0.049
CO <sub>2</sub> e	44.282	59.266	10.772	114.320	2,848

NOTES:  
 kt/y = kilotonnes per year  
<sup>a</sup> Based on the assumption the 100% carbon in fuel is converted to CO<sub>2</sub>  
<sup>b</sup> Based on Environment Canada emission factors (0.037 g/m<sup>3</sup> for CH<sub>4</sub> and 0.33 g/m<sup>3</sup> for N<sub>2</sub>O for industrial sources (ECCC 2016)

During operations, emission sources would include a 900 MW natural gas-fired power facility. The Project will require up to 150,000 GJ/day of pipeline specific natural gas as fuel. Two natural gas fired H-Class power trains with a net rating of 450 MW each will be installed. HRSGs will be used to recover gas turbine exhaust energy. Additional emission sources include an auxiliary boiler and a standby diesel generator. The primary Project emissions during operation will include CO<sub>2</sub>, NO<sub>x</sub>, PM<sub>2.5</sub>, and CO. Due to the low sulphur content of the fuel gas, the Project is not expected to emit measurable quantities of SO<sub>2</sub>.

The application of new H-Class dry low NO<sub>x</sub> combustion technologies will meet the emission limit of 85 g NO<sub>x</sub>/GJ (energy output) as required under the *Guidelines for the Reduction of Nitrogen Oxide Emissions from Natural Gas-fueled Stationary Combustion Turbines* established by Environment and Climate Change Canada (ECCC 2017). The H-Class GTG will have the most up-to-date Dry Low Emission (DLE) technology which keeps emissions low. When the combustion takes place at lower temperatures, the NO<sub>x</sub> emissions are reduced. Gas turbines with DLE achieve lower emissions without using water or steam to reduce combustion temperature. NO<sub>x</sub> emissions will be controlled by the use of ULN burners. Emissions of particulates will be low due to the combustion of clean-burning natural gas. In



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addition, CO and VOC emissions will be controlled through adjusting turbine firing temperatures that are implemented by combustion controls on the design of the gas turbine. Further, natural gas has the lowest SO<sub>2</sub> emissions of any fuels. The Project is being designed with the best available control technology to achieve ground level effects that will meet the Alberta and Canadian ambient air quality standards. However, provisions will be made during the HRSG stack construction to allow for installation of a selective catalytic reduction (SCR) system, should federal emission requirements become more stringent in the future. The essence of operation of an SCR involves injection of small amounts of ammonia to the exhaust gas stream to convert NO<sub>x</sub> to nitrogen and water.

Emission rates for NO<sub>x</sub>, PM<sub>2.5</sub>, and CO have been calculated, and dispersion modelling was undertaken to confirm that the Project meets the relevant air quality objectives. The modelling results and assessment of Project effects are discussed in Section 5.1.2.1.

## 2.4.1.2 Noise

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. Other ancillary equipment will also generate noise.

Industrial sized gas turbines are inherently noisy; however, the noise emissions produced during operations will be substantially curtailed first by the turbine noise enclosure and then subsequently by the power island building. The Project noise effects were assessed based on the Project engineering preliminary design information and acoustic modelling. The Project will comply with applicable regulatory noise limits, including the AUC Rule 012: *Noise Control*. The need for mitigation measures was determined based on the outcome of the noise impact assessment (NIA). Reasonably foreseeable mitigation measures include exhaust silencers, air inlet silencers, enclosing equipment in buildings, and procuring equipment with noise ratings that will allow the Project to meet Rule 012 requirements.

In the event of a noise complaint, Cascade will follow the complaint resolution process outlined in Rule 012. This process includes conducting a noise complaint investigation in a timely manner and may include conducting a comprehensive sound survey during representative conditions at the residential dwelling. The results of noise modelling are presented in Section 5.1.2.2.

## 2.4.2 Sources and Location of Liquid Discharges

Liquid discharges from the Project will be primarily stormwater, directed to the stormwater pond. The stormwater will be collected in a pond located in the Project Area. The pond will be constructed with a liner to prevent any leaching of water to local groundwater. On rare occasions, contaminants from a spill may be washed into the stormwater pond through site runoff. Such contaminants may include diesel, gasoline, or industrial oil.

There will be no recirculation water discharge.



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All other liquid discharge such as water from the demineralization and compressor wash systems will be collected through gravity drain lines and pumps into above ground tanks and disposed of in accordance with regulatory codes and standards. These tanks will be coated with anti-corrosion coating on the outer shell or will be equipped with cathodic protection. A leak detection system will be provided to indicate if a leak has occurred in the inner tank. The secondary containment structures will be concrete curbed areas that collect spills from equipment to prevent contamination. The demineralization waste water and compressor water tank will have an approximate capacity of 250,000 and 200,000 gallons, respectively. Should any spills occur, they will be dealt with according to the Project-specific spill response and reporting plan that will be developed prior to commencing construction and operation of the Project.

The sewage waste and waste water from the multi-purpose building or other washrooms will be collected in on-site tanks located adjacent to the building and will be serviced on a regular basis. The size of the tanks is not known at this time. The tanks will have secondary containment, in the event of a leak or spill.

### 2.4.3 Types of Wastes and Plans for Their Disposal

Table 2-3 lists the types of waste expected from the Project and their method of disposal.

**Table 2-3 Wastes and Waste Management Methods for the Project**

Waste Stream	Management Method
Domestic waste	Contracted waste disposal
Recyclables (wood, paper, metal)	Contracted recycling
Hazardous waste <sup>1</sup>	Licensed disposal facility
Waste oil <sup>2</sup>	Licensed recycler
<p>NOTES:</p> <p><sup>1</sup> Hazardous wastes include paint, solvents, batteries, fluorescent light bulbs, herbicides, etc. for use during construction and operation. Hazardous materials will be stored in secure cabinets. Wastes will be stored in a bin located adjacent to the multi-purpose building for disposal at a licensed facility.</p> <p><sup>2</sup> Waste oil from equipment is not captured and stored. Equipment containing oil will be located on a concrete pad with secondary containment and closed drain valves. In the event of a leak, the oil will be removed/cleaned up by a vacuum truck and hauled offsite to a licensed disposal facility.</p>	

A small stand-alone enclosure will be provided for hazardous waste storage, the enclosure will:

- provide protection from access by unauthorized persons
- be posted as a hazardous waste/recyclables storage area
- have dedicated people responsible for the site and be able to respond to emergency situations
- be located away from sewer drains, manholes, drainage ditches and standing water
- provide for protection from the weather
- have adequate ventilation
- store wastes in double walled containers in good condition
- have secondary containment for liquids



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- be of sufficient size to ensure non-compatible wastes are not stored together
- have the waste containers marked and labeled

## 2.5 CONSTRUCTION AND OPERATION PHASES AND SCHEDULING

The Project schedule is presented in Table 2-4.

**Table 2-4 Cascade Power Plant Proposed Schedule**

Date	Project Phase
2018	Permitting, engagement & preliminary front-end engineering & design
2019 Q1	CEA Agency Project Description submission
2019 Q1&2	Final engineering
2019 Q3&4	Permit approval; financing conclusion
2020 Q1	Site Preparation
2020-2021	Construction
2022 Q2	In service
2052-2054	Project decommissioning (after estimated 30-year life)



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## 3.0 PROJECT LOCATION

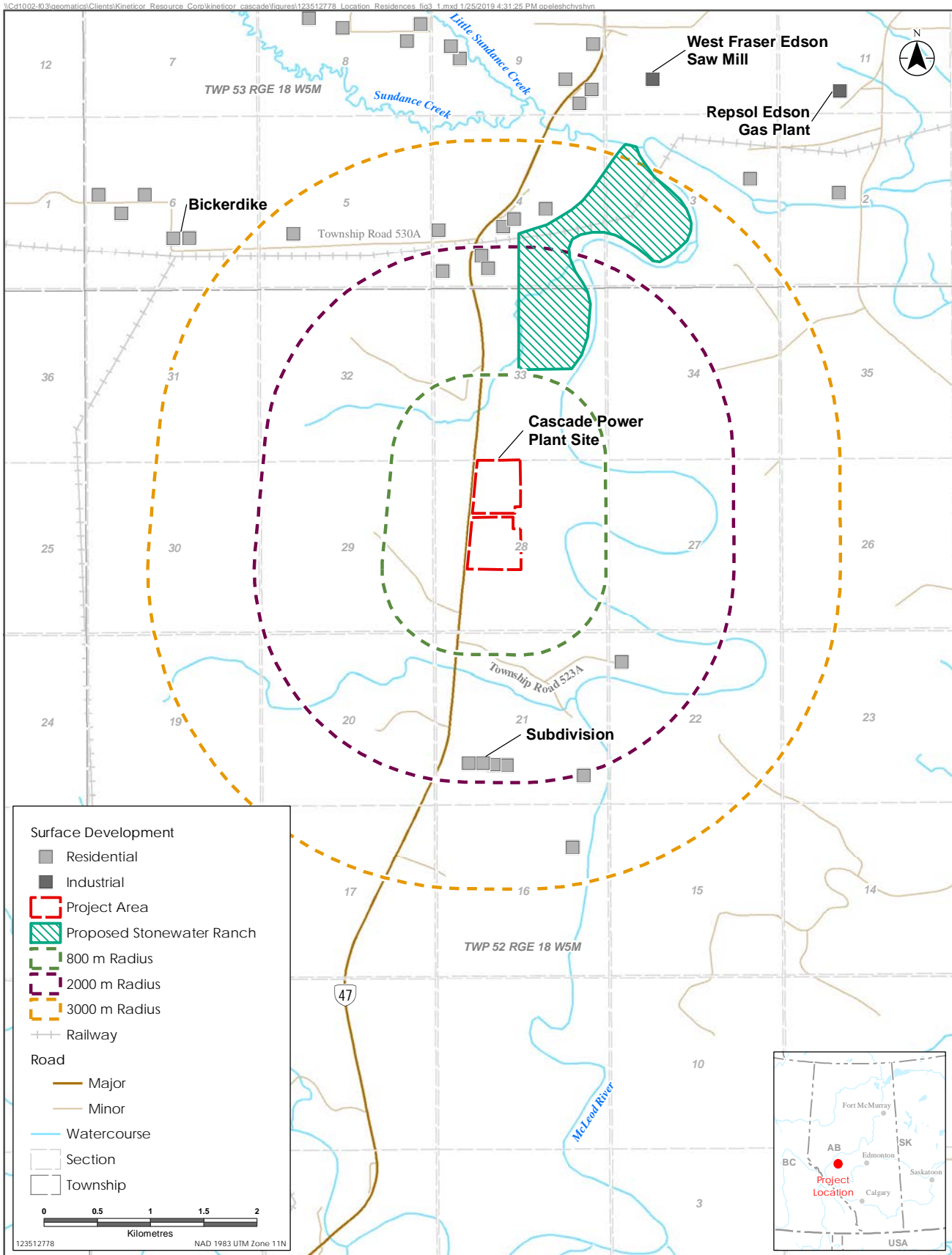
### 3.1 DESCRIPTION OF PROJECT LOCATION

The Project will be located 12 km southwest of Edson, Alberta in the west half of Sec 28 TWP 52, RGE 18, W5 M on crown lands within a 44 ha Project Area. The Project footprint will have dimensions of approximately 500 m by 400 m. The centre of the Project Area is located at 53° 31' 38" N 116° 35' 30" W. The Project Area is located approximately 70 m from Highway 47 and is approximately 380 m to the west of the McLeod River, at its closest point.

The nearest residence is located over 800 m to the southeast of the Project. Several other permanent residences and one seasonal accommodation facility are located within a 2 km radius of the Project. Stonewater Ranch, a proposed resort development is located in Sec 34 TWP 52, RGE 18, W5 M, 800 m north of the Project. Yellowhead County approved the land use plan for the development in 2009 but there has been no construction to date. Five Indigenous groups have identified to Cascade, traditional territories in the vicinity of the Project: O'Chiese First Nation, Paul First Nation, Alexis Nakota Sioux Nation, Kehewin Cree Nation and the Stony Nakoda Nation. The First Nation Reserves for these Indigenous groups area located over 65 km from the Project. The Fickle Lake Provincial Recreation Area and the Sundance Provincial Park are the closest provincial sites and are located over 10 km from the Project Area. The closest federal lands to the Project is Jasper National Park, located approximately 80 km west of the Project Area. The Project is located approximately 140 km from the Alberta-BC provincial border, 436 km from the Alberta-Saskatchewan provincial border and 502 km from the Canada – USA border.

Figures 1-1, 1-2 and 3-1 show the location of the Project. See Appendix C for photos of the Project Area.





Sources: Project data provided by Cascade Power GP Ltd.  
Base data provided by the Governments of Canada, and Alberta.

Disclaimer: This map is for illustrative purposes to support this Stantec project; questions can be directed to the issuing agency.

Figure 3-1: Location and Residences near the Cascade Power Plant





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## 3.2 LAND AND WATER USE

The Project Area is provincial crown land. The southern side of the Project Area is defined by a 240 KV power line and the Bickeredike 39S substation is across Highway 47 from the southwest corner of the Project Area. The Talisman Edison Gas Plant is approximately 2.5 km northeast of the Project Area. The Canadian National Rail Mainline runs east-west approximately 2 km north of the Project Area.

The Project is located in the provincial Green Area which is mostly public land managed for timber production, energy development, watershed, fish and wildlife, recreation and other uses. The Yellowhead County Land Use Bylaw (Yellowhead County 2013a) classifies the Project Area as Rural District (RD) where permitted uses include Public Utility and discretionary uses include General Industrial and Natural Resource Processing. The Yellowhead County Municipal Development Plan (Yellowhead County 2013b) classifies the area as being in the Foothills Policy Area where industrial and resource uses are supported provided that they are sited in a manner that ensures minimal conflicts with other land uses. The Project, then, is an acceptable land use in terms of the Land Use Bylaw and Municipal Development Plan. A mineral information land index search was conducted for the Project Area in October 2018 to ensure that no other entities had subsurface rights for the Project Area. The search did not show any other authorizations other than an existing Repsol well site located east of the Project Area between the north and south halves (see Figure 2-2).

Alberta Environment conducted a variety of aquatic studies in the McLeod and Upper Smoky rivers between 1998 and 2003 related to selenium and other metals near mine sites (Alberta Environment 2005). Sample locations on the McLeod River were located northeast and south of the Project Area. The McLeod River has also been included in studies related to mining and pipeline development and has been the focus of some conservation groups (e.g., Keepers of the Athabasca, Land Stewardship Centre). To date, no resource management or conservation plans have been developed based on these studies and no other water use, resource management or conservation plans are applicable to the Project Area.

Current Land Use dispositions in the vicinity of the Project Area are listed in Table 3-1.

**Table 3-1 Dispositions in the Cascade Power Plant Area**

Disposition	Description
TPA 1742	Trapline – David Winward
DLO 830363 DML 810061 EZE 770011 EZE 810180 EZE 870162 EZE 910204 VCE 900163	AltaLink Management: Department Licence of Occupation, Powerlines, Vegetation Control Easement, Miscellaneous
REA 1216 REA 1217	Fortis Alberta Inc.: Powerlines



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**Table 3-1 Dispositions in the Cascade Power Plant Area**

<b>Disposition</b>	<b>Description</b>
MSL 062413 PLA 062765	Peyto Exploration & Development Corp.: Miscellaneous, Pipeline Agreement
MSL 1530 MSL 9048 PLA 2230 PLA 2401 PLA 4861	Repsol Oil & Gas Canada Inc.: Miscellaneous, Pipeline Agreements
MSL 9048	Repsol Oil & Gas Canada Inc.: Access Road
DML 130128	Swan Hills Synfuels Ltd.: Miscellaneous
RRD2594PX	Alberta Transportation: Registered Roadway
PLA 091597	West Lake Energy Corp.: Pipeline Agreement
DPL 920518	Yellowhead Gas Co-op Ltd.: Department Pipeline Agreement
CNT090040	Alberta Forestry – Edson Office: Consultative Notation
CTL R13Z001	Precision Forest Industries Ltd.: Coniferous Timber Licence
FMA9700032	West Fraser Mills Ltd.: Forest Management Agreement

Based on the information received from Indigenous groups to date, the Project Area does not have resources currently used for traditional purposes by Indigenous peoples. Cascade's ongoing engagement with the four First Nations registered with the ACO as having traditional lands in the area has not identified traditional use of the Project perimeter or within the Project Area by their individuals. Letters have been sent to the Métis Settlements near the area informing them of the Project and, to date, no communication has been received back. Cascade will continue to reach out to those communities to ensure that they do not have any concerns. Engagement will continue through the development, operation, decommissioning, and reclamation phases of the Project.

Based on the information received from Indigenous groups to date, the Project 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.



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### 4.0 FEDERAL INVOLVEMENT

#### 4.1 FEDERAL FINANCIAL SUPPORT

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

#### 4.2 FEDERAL LANDS

No federal lands would be used for the purpose of carrying out the Project, nor would there be any granting of interest in federal land (i.e. easement, right-of-way, transfer of ownership).

#### 4.3 FEDERAL LEGISLATIVE OR REGULATORY REQUIREMENTS

Outside of the *Regulations Designating Physical Activities* under CEAA 2012, there are no confirmed federal legislative or regulatory requirements (including any federal permits, licences or other authorizations) applicable to the Project.



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## 5.0 ENVIRONMENTAL EFFECTS

### 5.1 PHYSICAL AND BIOLOGICAL COMPONENTS THAT MIGHT BE ADVERSELY AFFECTED BY THE PROJECT

#### 5.1.1 Environmental Overview Methods

In addition to a field reconnaissance of the Project Area conducted in April, June and July 2018, a desktop review of existing literature and publicly available geospatial datasets was conducted to identify potential environmental considerations relevant to the Project. The desktop review included:

- Soil Survey and Land Evaluation of the Hinton-Edson Area (Dumanski et al. 1972)
- documents and datasets used to identify wetlands, riparian zones, and historical rare plant locations
- AEP Water Well Information Database
- documents and datasets used to identify wildlife Species of Management Concern (SOMC) and habitat features that may require regulatory consideration during Project construction
- documents and datasets used to identify surface waters, and fish and fish habitat
- archaeological records and documents to provide archaeological and historic context and to interpret historical resource potential

#### 5.1.2 Atmospheric Environment

##### 5.1.2.1 Air

As discussed in Section 2.4.1, fugitive dust and fine particulate emissions during Project construction will be generated from land clearing, site preparation, earth moving and material handling, and vehicle movement. In addition, construction equipment (dozers, compressors, etc.) will release combustion by-products such as NO<sub>x</sub> and carbon monoxide (CO). Construction emissions are expected to be minor and of limited duration. Effects from construction emissions are expected to be limited to the immediate vicinity of the Project Area. Construction emissions will be addressed using standard mitigation measures as discussed in Section 5.3.1.

A dispersion modelling assessment compliant with the Alberta Air Quality Model Guideline (AQMG) was completed to assess the effects of Project operations on air quality. This assessment included the use of a receptor grid developed in compliance with the AQMG. The dispersion modelling assessment considered the primary Project emissions of NO<sub>x</sub>, PM<sub>2.5</sub>, and CO, the sources of which are discussed in Section 2.4.1. It also took into account other substantial emission sources within the study area. Output from the model was compared to relevant regulatory objectives.



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To assess the effects on air quality associated with emissions from the Project, dispersion modelling was conducted for the following scenarios:

- **Base Case:** includes emissions associated with existing regional facilities in the study area and ambient background
- **Project Case:** Includes emissions from the Cascade Power Plant (Project) alone
- **Application Case:** Includes cumulative emissions from all sources associated with the Project, existing regional facilities and ambient background

Figure 5-1 shows the 20 km by 20 km study area used for the air quality modelling and the regional emission sources.

For this assessment, the Edson and Steeper stations were selected for the ambient background concentration analysis. The Edson monitoring station is 13 km northeast of the Project Area and is the closest monitoring station measuring NO<sub>2</sub> and PM<sub>2.5</sub>. The Steeper monitoring station is 54 km southwest of the Project Area and is the closest monitoring station measuring CO. Ambient data for 2017 were analyzed using the AQMG (AEP 2013) methodology to calculate background concentrations.

## Base Case

Dispersion modelling for the Base Case includes emissions from the existing five regional emission facilities. The maximum predicted concentrations, including background, are summarized in Table 5-1.

**Table 5-1 Maximum Predicted Ground-level Concentrations (µg/m<sup>3</sup>) Associated with the Base Case**

Substance	Averaging Period	Maximum Predicted Ground-Level Concentrations (µg/m <sup>3</sup> )	Ambient Background Concentration (µg/m <sup>3</sup> )	Maximum Predicted Concentration Including Background (µg/m <sup>3</sup> )	AAAQO (µg/m <sup>3</sup> )	Comparison of Predictions to AAAQO (%)
NO <sub>x</sub>	1-hour <sup>b</sup>	621	NA	NA	NA	NA
	Annual	41.1	NA	NA	NA	NA
NO <sub>2</sub> <sup>a</sup>	1-hour <sup>b</sup>	127	23.1	150	300	50
	Annual	23.0	5.9	29.0	45	64
CO	1-hour <sup>b</sup>	124	343	467	15,000	3
	8-hour	111	343	454	6,000	8
PM <sub>2.5</sub>	1-hour <sup>b</sup>	9.0	11.0	20.0	80	25
	24-hour	6.0	10.4	16.4	30	55

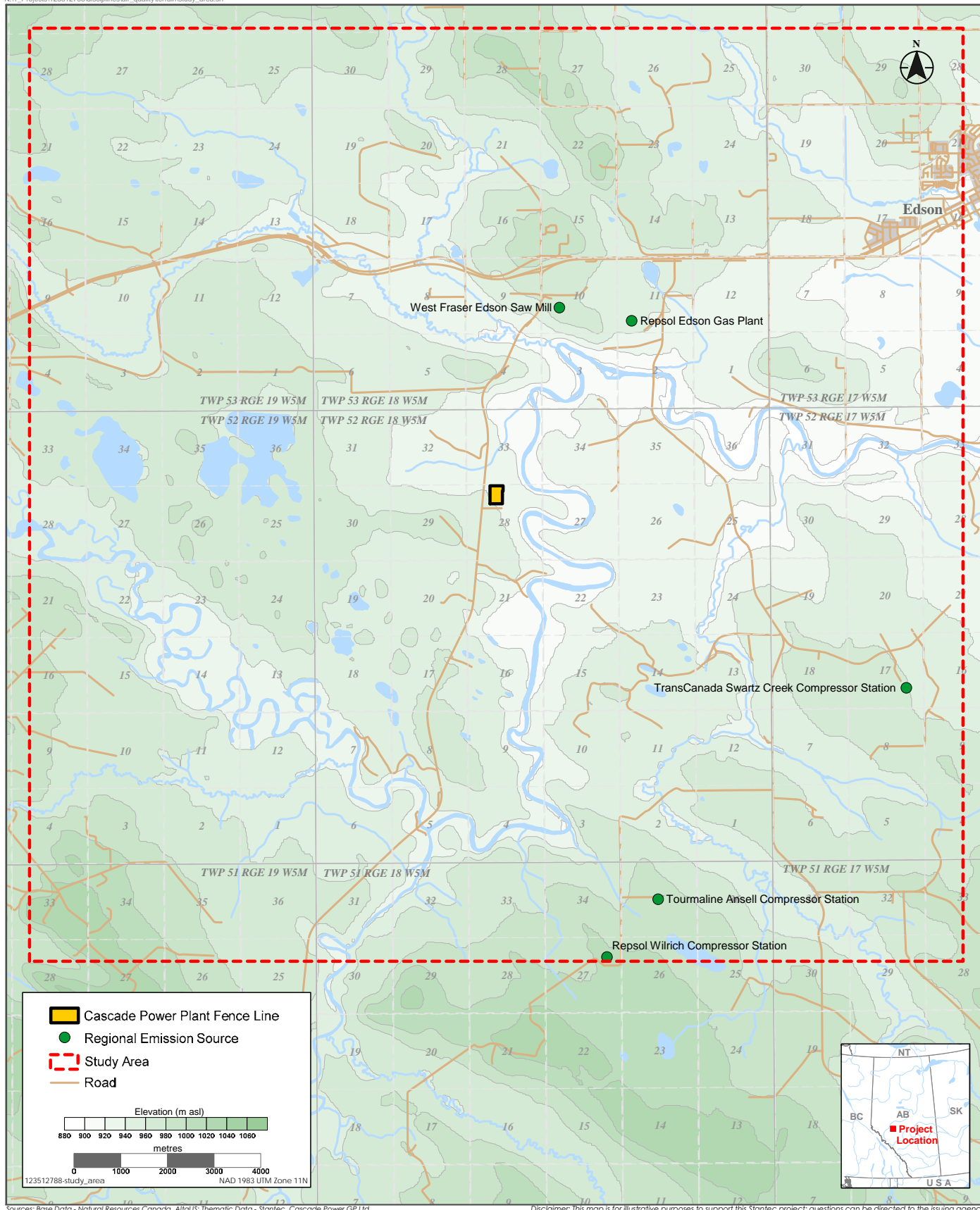
**NOTES:**

<sup>a</sup> NO<sub>x</sub> was converted to NO<sub>2</sub> using the Ozone Limiting Method.

<sup>b</sup> 9<sup>th</sup> highest predictions (AEP 2013).

NA – Not Applicable





Sources: Base Data - Natural Resources Canada, AITaUS; Thematic Data - Stantec, Cascade Power GP Ltd.

Disclaimer: This map is for illustrative purposes to support this Stantec project; questions can be directed to the issuing agency.

**Figure 5-1: Air Quality 20 km by 20 km Study Area Showing Regional Emission Sources**

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### Project Case

Dispersion modelling for the Project Case includes emissions from the two gas turbines plus the two duct burners in the HRSGs associated with the Project. All combustion equipment is assumed to operate continuously at maximum rated capacity with all exhaust exiting through the HRSG stacks. The maximum predicted concentrations, without background, are summarized in Table 5-2.

**Table 5-2 Maximum Predicted Ground-level Concentrations ( $\mu\text{g}/\text{m}^3$ ) Associated with the Project Case**

Substance	Averaging Period	Maximum Predicted Ground-Level Concentrations ( $\mu\text{g}/\text{m}^3$ )	AAAQO ( $\mu\text{g}/\text{m}^3$ )	Comparison of Predictions to AAAQO (%)
NO <sub>x</sub>	1-hour <sup>b</sup>	71.6	NA	NA
	Annual	2.4	NA	NA
NO <sub>2</sub> <sup>a</sup>	1-hour <sup>b</sup>	51.1	300	17
	Annual	2.1	45	5
CO	1-hour <sup>b</sup>	60.8	15,000	0.4
	8-hour	50.7	6,000	1
PM <sub>2.5</sub>	1-hour <sup>b</sup>	0.72	80	1
	24-hour	0.41	30	1

NOTES:  
<sup>a</sup> NO<sub>x</sub> was converted to NO<sub>2</sub> using the Ozone Limiting Method.  
<sup>b</sup> 9<sup>th</sup> highest predictions (AEP 2013).  
 NA – Not Applicable

### Application Case

Dispersion modelling for the Application Case includes emissions from the Project and the five regional emission facilities. The maximum predicted concentrations, including background, are summarized in Table 5-3.





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**Table 5-3 Maximum Predicted Ground-level Concentrations ( $\mu\text{g}/\text{m}^3$ ) Associated with the Application Case**

Substance	Averaging Period	Maximum Predicted Ground-Level Concentrations ( $\mu\text{g}/\text{m}^3$ )	Ambient Background Concentration ( $\mu\text{g}/\text{m}^3$ )	Maximum Predicted Concentration Including Background ( $\mu\text{g}/\text{m}^3$ )	AAAQO ( $\mu\text{g}/\text{m}^3$ )	Comparison of Predictions to AAAQO (%)	Percent Increase from Base Case (%)
NO <sub>x</sub>	1-hour <sup>b</sup>	621	NA	NA	NA	NA	NA
	Annual	41.4	NA	NA	NA	NA	NA
NO <sub>2</sub> <sup>a</sup>	1-hour <sup>b</sup>	127	23.1	150	300	50	0.0
	Annual	23.3	5.9	29.3	45	65	1.1
CO	1-hour <sup>b</sup>	124	343	467	15,000	3	0.0
	8-hour	111	343	454	6,000	8	0.0
PM <sub>2.5</sub>	1-hour <sup>b</sup>	9.0	11.0	20.0	80	25	0.0
	24-hour	6.0	10.4	16.4	30	55	0.0

NOTES:  
<sup>a</sup> NO<sub>x</sub> was converted to NO<sub>2</sub> using the Ozone Limiting Method.  
<sup>b</sup> 9<sup>th</sup> highest predictions (AEP 2013).  
 NA – Not Applicable

In all modelling cases, the NO<sub>2</sub>, CO and PM<sub>2.5</sub> concentrations are below the Alberta Ambient Air Quality Objectives. The Application Case shows increases that are 0% from the Base Case with the exception of annual NO<sub>2</sub> concentrations which show a 1.1 % increase.

Potential Effects

Air quality within the Project Area will be temporarily affected during the construction period by an increase in combustion by-products such as NO<sub>x</sub>, CO, and VOCs and particulate matter. Construction equipment will also emit greenhouse gases. Multiple control measures will be implemented during construction to minimize air emissions and potential effects. After grading, the untraveled or lightly traveled locations will be watered, mulched, overlain with a crushed stone layer, or vegetated to minimize fugitive PM emissions. Activities that potentially generate fugitive total suspended particle (dust) emissions will be monitored visually by construction personnel. If fugitive emissions become visible, water will be sprayed on the affected areas. Potential air quality effects from construction activities will vary depending on the level of activity, the specific operations, site conditions, control measures, and prevailing weather conditions. The maximum effects to air quality due to construction are expected to occur in areas within the immediate vicinity of the Project Area. Many of the site preparation and construction operations such as land clearing, filling, and grading, will be intermittent and of short duration. These aspects of the construction activities as well as control measures, will serve to reduce potential effects. Construction equipment and vehicles will be spread out over the Project Area and will



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only operate during the construction phase. Therefore, Project construction effects on air quality are expected to be limited.

During operations, the primary Project emissions will include CO<sub>2</sub>, NO<sub>x</sub>, PM<sub>2.5</sub>, and CO. Due to the low sulphur content of the fuel gas, the Project is not expected to emit measurable quantities of SO<sub>2</sub>. The Project is designed to control atmospheric emissions to meet the Alberta ambient air quality standards (AEP 2018c).

Mitigation measures to reduce potential adverse effects of the Project on ambient air quality will include the following:

- adherence to federal emission standards and guidelines for new turbine emissions (ECCC 2017)
- meeting ambient air quality objectives, and industry standard best practices for operational emissions
- emissions of NO<sub>x</sub> complying with the Alberta Air Emission Standards for Electricity Generation (December 2005)
- regular inspection and maintenance of the gas turbines to ensure optimum performance and minimize emissions
- reducing the idling of construction equipment and vehicles

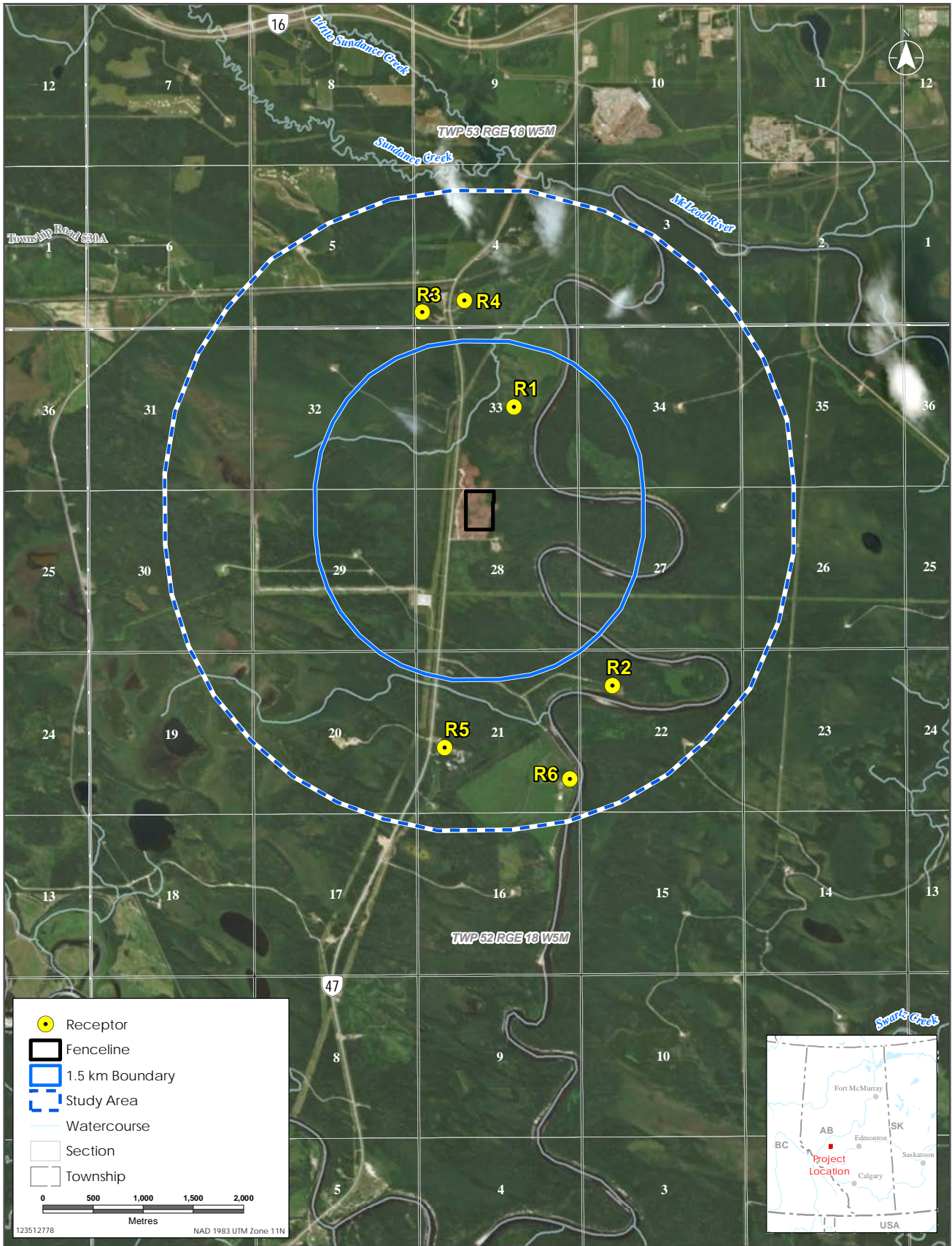
With the application of the mitigation measures and the fact that emissions are anticipated to be below the AAAQO guidelines, the effects of the Project on ambient air quality are assessed as being not significant.

### 5.1.2.2 Acoustic Environment

A noise impact assessment (NIA) has been completed for the Project. The purpose of the NIA was to quantify the Project's noise contribution within the acoustic study area. The acoustic study area was the area within 3 km of the Project fenceline (Figure 5-2). The results of the NIA were compared to the requirements under AUC Rule 012: Noise Control (AUC 2017) which sets Permissible Sound Levels (PSLs) for a project. Achieving PSLs at a 1.5 km boundary limit means that the Project noise effect beyond the 3 km study area will be below the assumed ambient sound level for remote areas and have a negligible impact.

A noise survey was conducted in June 2018 to quantify the noise emissions from third-party regulated facilities within 3 km of the Project. The only active regulated facility within the study area is the AltaLink 9S Substation. There are two system transformers rated at 240/138 kV, 180/240//269 MVA within the substation. There is also a Repsol gas plant approximately 4.5 km northeast of the Project (see Figure 5-1 for location). Although it is located outside the study area, it is included because it is a large facility with the potential to contribute to the cumulative sound level within the acoustic study area.





Sources: Project data provided by Cascade Power GP Ltd.  
Base data provided by the Governments of Canada, and Alberta.

Disclaimer: This map is for illustrative purposes to support this Stantec project; questions can be directed to the issuing agency.

Figure 5-2: Noise Study Area and Receptor Locations



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Project construction noise will occur during construction activities such as site preparation and the use of construction equipment for grading, pile driving, excavations, concrete pouring, and steel and component installation. Rule 012 does not set noise limits for construction activities; however, measures will be implemented to minimize noise effects from these activities. These mitigation measures include:

- Noisy construction activities will be scheduled within the daytime hours of 07:00 to 22:00.
- Noise mitigation devices installed on construction equipment (e.g., mufflers) will be kept in good working condition.
- Construction vehicles will follow posted speed limits.
- Construction equipment not in use will be turned off where practical.

Mitigation measures for noise during operation of the Project will include:

- noise reduction features on Project equipment
- incorporating noise attenuation measures on air cooled condensers during design by reducing fan speed, using low-noise fan blades, adding acoustic materials to the discharge plenum/fan housing, or by adding acoustic louvers to the inlet or discharge
- installation of a 4" thick envelope with 24 gauge exterior steel cladding, high density mineral wool insulation, and a perforated inside liner on turbine buildings

Noise levels during Project operation were modelled at six receptors within 3 km of the Project fenceline (see Figure 5-2). Table 5-4 shows the modelling results. The sound levels of the Project are combined with the baseline sound levels to give cumulative sound levels. The cumulative levels are below the regulated PSLs for all receptors. The effect of the Project on the acoustic environment is assessed as not significant.

**Table 5-4 Application Case Results of the Noise Study**

Receptor	Project Case Level (dBA)		Baseline Case Level (dBA)		Cumulative Sound Level (dBA)		Permissible Sound Level (dBA)		Below PSLs?
	Daytime	Nighttime	Daytime	Nighttime	Daytime	Nighttime	Daytime	Nighttime	
R1	40.2	40.2	48.1	39.1	48.8	42.7	53	43	Yes
R2	31.3	31.3	45.1	35.6	45.2	37.0	50	40	Yes
R3	36.5	36.5	50.0	40.4	50.2	41.9	55	45	Yes
R4	36.0	36.0	50.1	40.5	50.2	41.8	55	45	Yes
R5	31.0	31.0	50.0	40.2	50.1	40.7	55	45	Yes
R6	27.7	27.7	45.0	35.2	45.1	35.9	50	40	Yes



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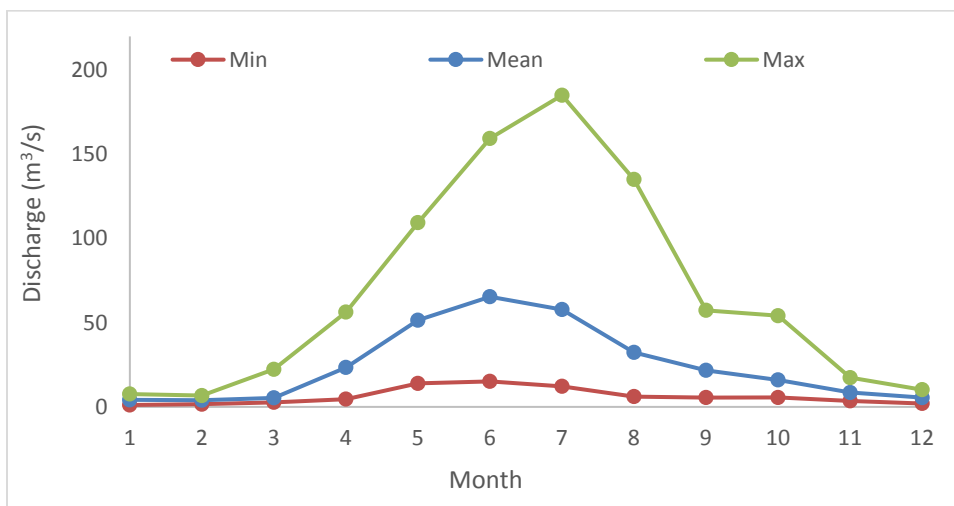
## 5.1.3 Aquatic Environment

### 5.1.3.1 Surface Water

The McLeod River drains the area east of the Project and lies approximately 380 m away at its closest point. Water Survey of Canada hydrometric stations are located upstream approximately 17 km and downstream approximately 64 km (McLeod River above Embarrass River and McLeod River near Rosevear, respectively). Historical monthly flow from 1984-2014 for the McLeod River near the Project Area is shown in Figure 5-3. Mean annual flow for this period is 24.6 m<sup>3</sup>/s. The minimum mean-monthly flow was 1.1 m<sup>3</sup>/s for January 2004, and the maximum mean-monthly flow was 185.1 m<sup>3</sup>/s for July 1986.

An unnamed, first-order tributary to the McLeod River drains the areas west and north of the Project Area and lies approximately 350 m to the northwest at its closest point (Fisheries and Wildlife Management Information System [FWMIS] Waterbody ID: 166153). A drainage south of the Project Area directs water toward the McLeod River. Fish, fish habitat, and surface water quality data are not available for the tributary or drainage (AEP 2018a).

Other surface water features include wetlands, as discussed in Section 5.1.4.2.



**Figure 5-3 Historical Monthly Flow (McLeod River near Project Area)**



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### 5.1.3.2 Groundwater

A search of the AEP Water Well Information Database was conducted in April 2018 (AEP 2018b). Two registered water wells were identified within 1 km of the Project Area. The use for the two water wells was reported as industrial. Completion depths of the water wells were 57.91 m below ground surface (mbgs) (Well ID 483608) and 79.25 mbgs (Well ID 483609). The depth to groundwater of Well ID 483609 was 36.27 mbgs. Depth to groundwater for Well ID 483608 was not recorded in the water well report. A preliminary geotechnical investigation was conducted at the Project Area in May 2018. Seven test holes were drilled during the program and the recorded depth to the water table ranged from 0.2 to 1.19 m in the test holes.

The average expected aquifer yield of the Project Area and the area within 1 km to the north, south, and west is 25 to 100 imperial gallons per minute (igpm), which would be considered high yield. The area within 1 km to the east of the Project Area has an average expected aquifer yield of 100 to 500 igpm (Vogwill 1983). The apparent yield for water wells completed through the sand and gravel is 0 to 1.5 igpm for the upper sand and gravel aquifer, and 15 to 45 igpm for the lower sand and gravel aquifer. Water wells completed through bedrock have an apparent yield of greater than 15 igpm for the upper bedrock and Dalehurst aquifers in the Project Area and the area within 1 km to the north, south, and east. The area within 1 km to the west of the Project Area has an apparent yield of 1.5 to 15 igpm (HCL 2004). Based on a review of the two water well drilling reports within 1 km of the Project Area, surficial lithology consists of clay from the surface to a depth ranging between 12.50 and 17.68 mbgs. Bedrock consisting of shale and sandstone underlies the clay (AEP 2018b). A buried bedrock valley is identified within the Project Area which may contain sand and gravel deposits (HCL 2004). The thickness of sand and gravel aquifers within 1 km of the Project Area ranges from approximately 2 m to 5 m (HCL 2004). No artesian conditions (Vogwill 1983) or springs (Vogwill 1983; HCL 2004) were identified within 1 km of the Project Area. There is no regional information pertaining to groundwater quality available for the Project Area and surrounding area.

### 5.1.3.3 Fish

For the McLeod River, the FWMIS database shows presence of arctic grayling, which are listed as a species of Special Concern by Alberta's Endangered Species Conservation Committee (GOA 2015), and bull trout, which are listed as Threatened. Other reported fish species from FWMIS in the McLeod River are listed in Table 5-5, none of which are listed under Schedule 1 of the *Species at Risk Act*. Athabasca rainbow trout, listed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as Endangered, are present in the McLeod River (COSEWIC 2018). No FWMIS records exist for the unnamed tributary to the McLeod River draining the areas west and north of the Project Area (AEP 2018a).



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**Table 5-5 Fish Species Presence in McLeod River**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Alberta Status<sup>1</sup></b>	<b>Federal Status<sup>2</sup></b>
arctic grayling	<i>Thymallus arcticus</i>	Special concern	-
Athabasca rainbow trout	<i>Oncorhynchus mykiss</i>	Threatened	Endangered
brook trout	<i>Salvelinus fontinalis</i>	-	-
Bull/brook trout hybrid	<i>Salvelinus confluentus X Salvelinus fontinalis</i>	-	-
bull trout	<i>Salvelinus confluentus</i>	Threatened	-
burbot	<i>Lota lota</i>	-	-
flathead chub	<i>Platygobio gracilis</i>	-	-
finescale dace	<i>Phoxinus neogaeus</i>	-	-
goldeye	<i>Hiodon alosoides</i>	-	-
lake chub	<i>Couesius plumbeus</i>	-	-
longnose dace	<i>Rhinichthys cataractae</i>	-	-
longnose sucker	<i>Catostomus catostomus</i>	-	-
mountain whitefish	<i>Prosopium williamsoni</i>	-	-
northern pike	<i>Esox lucius</i>	-	-
pearl dace	<i>Semotilus margarita</i>	-	-
rainbow trout	<i>Oncorhynchus mykiss</i>	-	-
spoonhead sculpin	<i>Cottus ricei</i>	-	-
spottail shiner	<i>Notropis hudsonius</i>	-	-
trout-perch	<i>Percopsis omiscomaycus</i>	-	-
walleye	<i>Sander vitreus</i>	-	-
white sucker	<i>Catostomus commersoni</i>	-	-
yellow perch	<i>Perca flavescens</i>	-	-

**NOTES:**

1. Status from Species at Risk – A Guide to Endangered and Threatened Species and Species of Special Concern in Alberta, Version 2, 2015
2. Status from COSEWIC



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## 5.1.3.4 Potential Effects on Surface Water and the Aquatic Environment

The following potential effects to surface water and the aquatic environment could be associated with the Project:

- change in surface water quality due to runoff and deleterious substance release such as leaks of hydrocarbons from equipment
- change in surface water quantity due to changes in flow patterns
- change in hydrological and sediment transport regime from construction of roads, drains, buildings and other related infrastructure

Mitigating the potential release of deleterious substances includes installing silt fences around construction activity and exposed earth to minimize erosion and sediment transport, as well as using drip pans for motorized equipment and having spill kits nearby. The Stormwater Management Plan will be developed, incorporating stormwater runoff calculations for the Project Area that have already been calculated, and will include measures to minimize effects on surface water and groundwater quantity and quality from the collection of stormwater. The Stormwater Management Plan will also include details on the design of the stormwater pond, the placement and composition of stormwater drainage ditches and the operation, monitoring and maintenance of the system.

As described in Table 2-1, the stormwater pond will be designed to collect surface water runoff from the Project Area. The stormwater pond will be constructed with pond liners for the retention of liquids and prevention of leaching of water into local groundwater. In the unlikely event of the pond filling up, water would be stored in the ditch system leading to the pond allowing for excess water to be slowly released to the pond as the space becomes available. If the pond and ditches were full, excess water would be released to the adjacent wetland. Prior to release, Cascade would first test the water to ensure it meets EPEA water quality standards (GOA 2018). Should the water not meet these standards, Cascade would pump the water into a truck for it to be disposed of at an approved disposal site. The release of stormwater will be designed to maintain existing drainage patterns so adjacent properties are not affected.

## 5.1.3.5 Potential Effects on Groundwater

The Project has the potential to change groundwater quantity and quality as a result of excavation and potential dewatering activities during construction. The preliminary geotechnical investigations in the Project Area encountered shallow groundwater at depths ranging from 0.2 to 1.19 m depths. Dewatering, during construction will be done in accordance with standard construction practices and mitigation measures to direct discharge water away from drainage courses, water bodies and wetlands. The amount of drawdown is expected to be low because of the limited depth of the excavation and the relatively short period of dewatering at a given location.





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The Project has the potential to change groundwater quality in the vicinity of the Project Area as a result of accidental spills during construction and/or operation in areas where groundwater is shallow (i.e., springs, water wells, wetlands). In the event of a spill, efforts to contain, remove and remediate any contaminant(s) causing environmental effects would be completed.

## 5.1.4 Terrestrial Environment

### 5.1.4.1 Soils and Terrain

A soil survey of the Project site was conducted in July 2018. This was supplemented by a desktop review of existing literature and publicly available geospatial datasets to identify potential environmental considerations relevant to soil and terrain.

The Project is located in the Edson Plain physiographic district (Pettapiece 1986). Landforms in this district commonly consist of undulating to hummocky moraine with smaller areas of undulating glaciolacustrine deposits (Pettapiece 1986). Surface elevations range between 600 to 850 m above sea level. Underlying bedrock geology consists of the Belly River Group characterized by fine to coarse-grained sandstone, sandstone interbedded with siltstone, and coal (Prior 2013).

The Project Area is on a plateau above the McLeod River, located approximately 380 m east of the Project at its nearest point. There is a steep bank leading to the river.

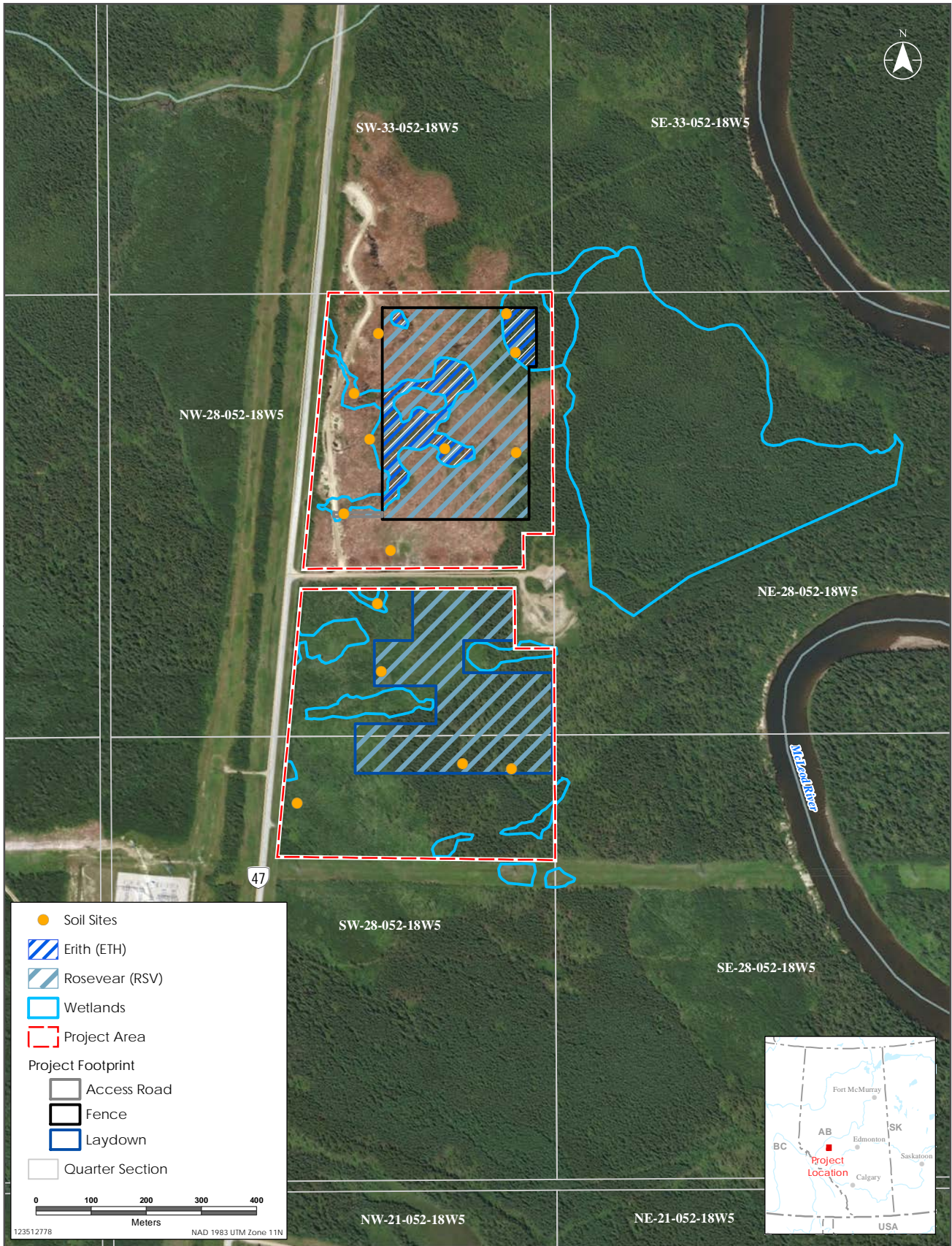
A desktop review of the Soil Survey and Land Evaluation of the Hinton-Edson Area (Dumanski et al. 1972) showed that the dominant soils in the vicinity of the Project are Orthic Gray Luvisols with fine to medium-textured lacustrine parent material (Rosevear Series, RSV), with areas of Orthic Gleysols on fine-textured lacustrine parent material (Erith Series, ETH). There are also smaller areas of Eutric Brunisols on very coarse textured aeolian deposits (Heart Series, HRT). Figure 5-4 shows the soil units underlying the Project fenced and laydown areas.

Potential Project effects on soils and terrain may include loss of soil from the surface during construction and from soil stockpiles, and the degradation of soil fertility due to admixing of topsoil and subsoil to be used for reclamation. Mitigation will include:

- implementing drainage and erosion control measures (e.g., silt fences) around stockpiles to prevent erosion
- stripping and stockpiling separate topsoil and subsoil horizons for use in reclamation
- revegetating exposed areas after construction

Operation of the Project is not anticipated to change soil quality or soil quantity because topsoil salvage and storage will be completed during the construction phase. The Project is not anticipated to change terrain as the Project is not located in an area of unstable terrain or steep slopes. Grading is required for construction of the Project; however, this activity is not anticipated to remove unique terrain features in the Project Area.





Sources: Project data provided by Cascade Power GP Ltd.  
 Base data provided by the Governments of Canada, and Alberta.

Disclaimer: This map is for illustrative purposes to support this Stantec project; questions can be directed to the issuing agency.

Figure 5-4: Cascade Power Plant Soil Units in the Project Footprint



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### 5.1.4.2 Vegetation and Wetlands

The Project is situated within the Lower Foothills Natural Subregion of the Foothills Natural Region of Alberta (Natural Regions Committee [NRC] 2006). The Lower Foothills Natural Subregion occupies a broad northwest-to-southeast belt between the Bow River Valley to the south and Grande Prairie to the north and is found at lower elevations of the Foothills Natural Region. The climate of this Subregion indicates that it is a transition zone between Cordilleran and Continental climate zones with Continental climate being the dominant influence (NRC 2006). This Subregion occurs at the western edge of the Interior Plains and is characterized by rolling and undulating till covered landscapes.

The Lower Foothills Natural Subregion has the most diverse forests in Alberta in terms of forest types and tree species. Forest cover in the region can include pure and mixed stands of aspen (*Populus tremuloides*), balsam poplar (*Populus balsamifera*), white birch (*Betula papyrifera*), lodgepole pine (*Pinus contorta*), black spruce (*Picea mariana*), white spruce (*Picea glauca*), balsam fir (*Abies balsamea*) and tamarack (*Larix laricina*). Shrubby grasslands may occur on dry sites and black spruce and tamarack dominate low, wet areas. Wetlands are not common on the steep valley sides, although seepage may occur in places on middle to lower slopes, often on northerly aspects. In the valley bottoms, and particularly on the undulating benchlands and plains, wetlands can cover 15 to 40 percent of the area. Wetlands in this Natural Subregion are characterized by peat accumulations up to 3 m thick. They are dominantly treed fens with some bogs and open fens. Wet mineral soils occasionally occur under the fens.

The Project Area has been largely logged and is composed of regenerating vegetation on portions of West 1/2-28-52-18-W5 (Figure 5-5). Other disturbances include a cleared oil and gas facility, wellsite, and associated permanent access road, and cleared seismic line and powerline rights-of-way. Mature forest remains on the Project Area on the eastern side of NW-28-52-18-W5 and the NE corner of SW-28-52-18-W5.



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**Figure 5-5 Cascade Power Plant, Site Photo Showing Vegetation Clearing**



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The undisturbed portion of the Project Area is predominantly coniferous with some deciduous trees and shrubs. Field reconnaissance conducted in June and July 2018 identified three upland communities within the Project footprint (Figure 5-6):

### **e2 – low-bush cranberry aspen (mesic/medium)**

The e2 ecosite phase is an aspen dominant forest with balsam poplar, white birch and sometimes white spruce. Shrubs include green alder, prickly rose and low-bush cranberry. Ground cover shrubs include twinflower, dewberry, Canada buffalo berry, wild red raspberry, Saskatoon, and willow species. Forbs and grasses include wild sarasaparilla, buchberry, common fireweed, cream-coloured vetchling, wild strawberry, common pink wintergreen, palmate-leaved coltsfoot, bluejoint, and hairy wild rye.

### **i2 - horsetail (hygric/rich)**

The i2 ecosite phase is a mixedwood forest with white spruce, aspen, white birch, balsam poplar, white birch, and white spruce. Shrubs include prickly rose, willow species, twinflower, bog cranberry, bracted honeysuckle, Canada buffaloberry, dewberry, and currant. The forbs and grasses layer includes common horsetail, meadow horsetail, tall lungwort, bunchberry, palmate-leaved coltsfoot, tall larkspur, common fireweed, common pink wintergreen, and bluejoint.

### **d2 – Labrador tea – mesic lodgepole pine**

The d2 ecosite phase is a coniferous forest site with lodgepole pine dominant with black spruce and white spruce also present. Shrubs include bog cranberry, Labrador tea, twinflower, red-osier dogwood, and prickly rose. The forb, grasses, and moss layer includes common fireweed, hairy wild rye, studded leather lichen, Schreber's moss, stair-step moss, and knight's plume.

Other upland communities adjacent to the Project Area, as shown in Figure 5-6 are:

- c1 – hairy wild rye PI
- e1 – low-bush cranberry PI
- e3 – low-bush cranberry Aw-Sw-PI
- e4 – low-bush cranberry Sw
- f1 – bracted honeysuckle/fern PI
- f2 – bracted honeysuckle/fern Aw-Pb
- f3 – bracted honeysuckle/fern Aw-Sw-PI
- i1 – horsetail Pb-Aw
- i-3 – horsetail Sw

There is potential for these vegetation communities to support migratory bird species and SOMC, including alder flycatcher, olive-sided flycatcher, Canada warbler, common nighthawk and grizzly bear. Refer to Appendix B for a full list of SOMC and their habitat associations.



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An Alberta Conservation Information Management System (ACIMS) (ACIMS 2018) search revealed that there is a non-sensitive S3 lichen that has been identified in the Project Area (*Cladonia squamosa* or dragon cladonia lichen). The provincial S3 designation indicates that the lichen may be somewhat vulnerable due to factors such as restricted range, relatively small population sizes or other factors. No *Species at Risk Act* listed plant species were observed during field surveys, nor were any identified from historical records.

The Project Area is on a plateau above the McLeod River. There are several drainages within the Project Area that may start with a coniferous treed swamp. The drainages provide runoff directly to the McLeod River.

Vegetation field reconnaissance found numerous wetlands present within or intersecting the Project Area (Figure 5-6). See Table 5-6 for the type and area of these wetlands. The Project footprint will be placed in the north portion of the Project Area where wetland W07 will be completely disturbed and portions of wetlands W01 and W02 will be disturbed. These disturbances will trigger the Alberta Wetland Policy and Alberta *Water Act*. The Alberta Wetland Policy requires replacement of lost wetlands through restoration, enhancement or construction of another wetland. Cascade will discuss options with AEP. The areas for temporary laydown situated in the southern portion of the Project Area will avoid wetlands to the degree possible so that the Wetland Policy and *Water Act* are not triggered.

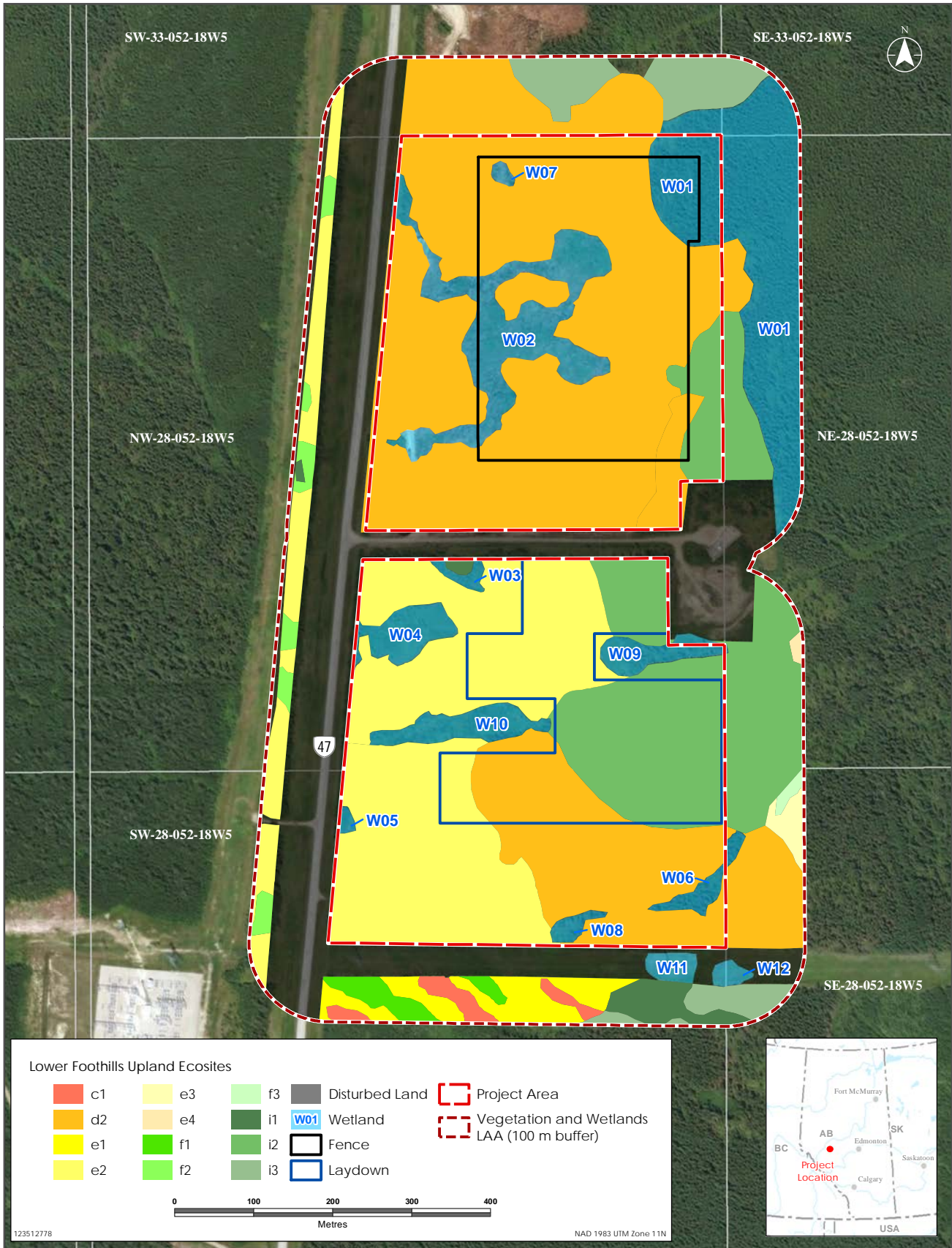
**Table 5-6 Wetlands Intersecting the Project Area**

Wetland ID	Wetland Area (ha)	Wetland Area within the Project Footprint (ha)	AWCS Class	Wetland Class Name
W01	2.23	0.58	Swc	Swamp Wooded, coniferous
W02	2.73	2.73 <sup>a</sup>	MG-III	Marsh Graminoid - Seasonal
W03	0.13	0.00	MG-III	Marsh Graminoid - Seasonal
W04	0.61	0.00	SS-III	seasonal shrubby swamp
W05	0.59	0.00	MG-II	Marsh Graminoid - Temporary
W06	0.29	0.00	Swc	Swamp Wooded, coniferous
W07	0.06	0.06	MG-II	Marsh Graminoid - Temporary
W08	0.15	0.00	SS-II	Swamp Shrubby - Temporary
W09	0.48	0.00	SS-II	Swamp Shrubby - Temporary
W10	0.68	0.00	SS-II	Swamp Shrubby - Temporary

**NOTE:**

<sup>a</sup> 1.97 ha directly affected, but full wetland loss assumed as Project infilling and grading will directly affect 72% of the wetland.





Sources: Project data provided by Cascade Power GP Ltd.  
Base data provided by the Governments of Canada, and Alberta.

Disclaimer: This map is for illustrative purposes to support this Stantec project; questions can be directed to the issuing agency.

Figure 5-6: Cascade Power Plant Vegetation Cover



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CASCADE POWER PLANT PROJECT

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Potential effects on vegetation include:

- change in species community diversity due to direct or indirect loss or alteration
- change in community diversity due to direct or indirect loss or alteration
- change in wetland function and area due to alteration or loss of area or class
- change in wetland function due to indirect alteration of water quality, surface water or groundwater flow patterns

The type and area of wetlands within or intersecting the Project Area are provided in Table 5-6. The extent of wetland disturbance is 3.37 ha. The effects of interaction between the Project and vegetation and wetlands will be managed through mitigation. Vegetation clearing will be restricted to the area needed for the Project footprint and laydown areas. Facilities have been sited to avoid wetlands wherever possible. The preferred approach to wetland disturbance is avoidance. In cases where avoidance is not possible, wetlands removed from the Project Area will be compensated for, as per the requirements of the Alberta Wetland Policy. Dust generated during construction will be controlled by water spraying when necessary. Exposed surfaces will be covered with mulch or a stone layer or revegetated after construction to control the proliferation of invasive species.

### 5.1.4.3 Wildlife

A field reconnaissance survey of the Project Area was conducted in June 2018 to determine existing conditions for wildlife species and habitat. This was supplemented by a wildlife desktop review to identify wildlife SOMC and habitat features (e.g., dens, hibernacula) that may require regulatory consideration during Project construction. SOMC include species that are:

- listed federally as “Endangered”, “Threatened” or “Special Concern” on Schedule 1 of the *Species at Risk Act* (GOC 2018c)
- designated federally as “Endangered”, “Threatened” or “Special Concern”, or identified as “under review” for listing by COSEWIC (2018)
- listed provincially as “Endangered” or “Threatened” under the *Alberta Wildlife Act*, or listed as special concern by the Alberta Endangered Species Conservation Committee (AESCC) (GOA 2015)
- designated provincially as “At Risk”, “May be at Risk” or “Sensitive” according to the General Status of Alberta’s Wild Species (AEP 2017)

A review of wildlife species ranges (Naughton 2012; Pattie and Fisher 1999; Sibley 2003; Stebbins 2003; Federation of Alberta Naturalists 2007; eBird 2018) and the presence of available wildlife habitat indicate that a total of 57 wildlife SOMC (44 bird, 9 mammal, 2 amphibian and 2 reptile species) may occur (breed, migrate, winter and/or reside) within 5 km of Project Area (see Appendix B Table B-1). Sixteen of these SOMC are listed under Schedule 1 of SARA as “Special Concern”, “Threatened” or “Endangered” (Appendix B, Table B-1).





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The Project and surrounding area does not intersect any sensitive wildlife ranges such as caribou, grizzly bear, or a Key Wildlife Biodiversity Zone (AEP 2016). Octopus Lake, which has been identified as a trumpeter swan waterbody, occurs approximately 5 km west of the Project Area. As such, the Project does not intersect the 800 m setback distance applied to this lake (AEP 2016).

The Project Area is not located within or near any nationally significant ecological areas. Jasper National Park is 80 km to the west of the Project Area.

The FWMIS search revealed no important bird areas, provincially protected areas, ecological reserves, wilderness areas, wildland provincial parks, wilderness parks, provincial parks, natural areas, heritage rangelands, or provincial recreation areas within 5 km of the Project Area. The closest ecologically important areas to the Project Area are the Sundance Provincial Park, located approximately 10 km northwest, and the Fickle Lake Provincial Recreation Area, located 13 km southwest of the Project Area.

Results from the FWMIS database indicated 11 previously recorded SOMC within 5 km of the Project Area including trumpeter swan, pied-billed grebe, common nighthawk, broad-winged hawk, northern pygmy owl, least flycatcher, grizzly bear, Canada lynx, fisher, badger and western toad. In addition, barn swallow has been previously recorded (eBird 2018). No previously recorded SOMC have been identified within 1 km of the Project Area.

All of the wildlife SOMC that may occur within the Project Area have restricted activity periods associated with them (GOA 2017, ECCC 2018). Although the restricted activity periods vary depending on wildlife species, the restricted activity period generally extends from March 1 to August 31, which provides protection for raptors as well as migratory birds and species at risk (see Section 5.2.4).

These timing restrictions apply to various land use/surface disturbance activities, including construction of permanent structures, and were developed to protect wildlife and maintain key wildlife areas or locations that play an essential role in a species' survival (GOA 2017).

The Project has the potential to result in direct and indirect (e.g., sensory disturbance) habitat loss as well as increased mortality risk associated with vegetation removal and ground disturbance during construction and vehicle collisions during construction and operations. Project construction will result in the loss or alteration of approximately 15.9 ha of upland vegetation communities (85.5% of the fenced area, access road and laydown area), which provides moderate suitability for wildlife habitat. Most of this upland vegetation occurs on areas that were previously disturbed and have regenerated, and currently support communities composed of both native and agronomic species, which provides habitat for migratory birds including grass, shrub and tree nesting species, bats, and other small mammals. The laydown area (approximately 8.1 ha), consist of upland vegetation communities, and will be temporarily disturbed and allowed to regenerate over time. Laydown areas will be returned to existing uses following completion of construction.



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Pre-construction surveys will be conducted if construction activities overlap with a SOMC restricted activity period. Site-specific mitigation would be developed for all wildlife features identified, which might include species-specific setback distances (e.g., active bird nests). Setback distances for birds range from 100 m to 1,000 m from their nesting sites, depending on the species; amphibians have a setback distance of 100 m from their breeding ponds. Setback locations for reptiles and mammals are generally based on their overwintering locations.

Potential effects on wildlife during operations include sensory disturbance (light and noise) from the facility, the potential for mortality risk from bird collisions with stacks, and vehicle collisions. Stacks will be designed with the minimum height allowable and no guy wires to mitigate against bird strikes. Sensory disturbance and vehicle collision effects are assessed as being minimal given that the Project will meet the AUC noise limits and the low number of workers at the site.

The Project has the potential to affect wildlife species protected under federal and provincial legislation. The *Species at Risk Act* makes it an offence to kill, harm, harass, capture or take an individual of a species listed in Schedule 1 of SARA. The Alberta *Wildlife Act* prohibits disturbance or destruction of a house or nest of prescribed wildlife (e.g., raptors, owls, game birds). Effects to wildlife will be reduced by carrying out construction activities outside of the restricted periods established by Alberta Environment and Parks (GOA 2017).

The decommissioning and reclamation plan for the facility will be developed prior to the plant closure and will meet the regulations in effect at that time. Reclamation will include habitat restoration in the Project Area.

With the implementation of the mitigation measures identified above, the relatively small area of habitat in the Project Area compared to the surrounding undisturbed area, and the absence of critical wildlife habitat in the Project Area, the effects of the Project on wildlife is assessed as not significant.

### 5.1.5 Historical Resources

#### 5.1.5.1 Archaeology

The Project was evaluated against the provincial database of known historical resource sites (the *Listing of Historic Resources* [ACT 2017]). There are no previously recorded historical resources within the Project Area or within a one kilometre buffer around it. The closest historical resource site is a traditional land use site, over 2 km away, on the other side of the McLeod River. The only previous study that partially overlaps with the Project footprint was an HRIA conducted for the northwest corner of the Project footprint, relative to the recently logged area within the Edson Forest Products 2012 Forestry Management Area (Roe 2013). This HRIA did not result in the identification of any sites within the Project Area; however, it did not evaluate the entire Project footprint and is considered as background information only.



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The *Listing of Historic Resources* (ACT 2017) specifies that the eastern portion of the Project footprint, adjacent to the McLeod River has elevated potential for containing previously unknown archaeological sites (a “5a” designation for historical resource value). This area contains some previously undisturbed terrain which could contain intact archaeological sites. The 5a designation on the Listing of Historical Resources indicates that an HR Application should be submitted to the Historical Resources Management Branch of ACT to determine whether an HRIA for archaeology is required. An HR Application for the Project Area, covering both archaeology and palaeontology, was submitted to ACT on October 29, 2018.

The effects assessment and mitigation measures for Historical Resources are discussed in Section 5.1.5.3.

### 5.1.5.2 Palaeontology

The Project Area is within the foothills, which are part of the disturbed belt for Cordilleran deformation. Strata in this area have been uplifted and tilted during the formation of the mountain ranges west of the Project Area. Bedrock is Paleocene in age (65-55 million years old) and is made up of mudstone, siltstone, sandstone and coal of the Paskapoo Formation (Hamilton et al. 1999). This is a fossiliferous unit and a significant early mammal locality has been recorded along the McLeod River downstream of the Project Area. The Project Area has a 5p designation for “high palaeontological resource sensitivity” in the *Listing of Historic Resources* (ACT 2017). No previously recorded sites are included in the *Listing of Historic Resources* for the Project Area.

### 5.1.5.3 Potential Changes to Historical Resources

#### Archaeology

ACT responded to the October HR Application on January 2, 2019 stating that there are no *Historic Resources Act* requirements associated with the Project. However, Cascade must comply with Standard Requirements under the Historical Resources Act, reporting the discovery of historic resources, as required under Section 31 of the Alberta *Historical Resources Act*, Cascade will meet these requirements. If any undocumented historical resources sites are discovered within the Project Area, mitigation measures such as avoidance, surface collection and documentation or excavation will be implemented. If a chance find occurs, construction will be suspended until ACT gives permission for work to continue. By following these mitigation measures, no significant effects on archaeology are predicted.



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## Palaeontology

Construction activities for the Project have the potential to disturb palaeontological resources. As the Project lies in an upland area covered by unfossiliferous till, the Project is only at risk of affecting palaeontological resources if construction requires deep excavation through the till and into the bedrock. If construction activities will be too shallow to disturb bedrock, then it is unlikely that the Project will affect palaeontological resources. Based on a geotechnical investigation in May 2018, bedrock is at least 13 m below surface. As the deepest open excavation will be up to 8 m deep, bedrock will not be exposed by construction.

ACT's January 2, 2019 response to the October HR Application requires that a palaeontological monitoring program be initiated if excavation is to occur where bedrock is close to the surface. If undocumented paleontological resources are discovered during the monitoring program, salvage operations will be completed according to the draft *Microsite Fossil Collecting by Palaeontological Consultants – Guidelines* in preparation by the Royal Tyrrell Museum of Palaeontology (RTMP). Any exceptional discoveries will be salvaged in consultation with the RTMP. With the implementation of these mitigation measures, the effects of the Project on palaeontology are expected to be not significant.

## 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, as Defined in the *Fisheries Act*

Project water requirements will be met by tanker trucks that will bring water to site on a daily basis from the town of Edson. All Project activities will be confined to the Project Area. No activities are planned in or near the McLeod River or any other watercourse. The Project will not have direct interaction with fish or fish habitat. Indirect interaction may occur through runoff from the site and hazardous material spills which could affect the aquatic environment. These indirect effects and their mitigation measures are discussed in Section 5.1.3.4. As stated in that section, all water from the Project Area will be collected in the stormwater pond. If the pond and ditches are full, excess water from the pond will be released to the adjoining wetland, only if the water meets Alberta EPEA standards. Water that does not meet these standards will be pumped into a truck for disposal at an approved disposal site. The Project is not expected to have any effects on fish, including the COSEWIC listed Athabasca rainbow trout (*Oncorhynchus mykiss*).

### 5.2.2 Marine Plants, as Defined in the *Fisheries Act*

The Project is located hundreds of kilometres away from any marine environment that supports marine plants. The Project will have no direct interaction with marine plants.



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### 5.2.3 Aquatic Species, as Defined in the *Species at Risk Act*

There are no aquatic species in the Project Area listed under Schedule 1 of SARA. The Athabasca rainbow trout has been assessed by COSEWIC as endangered. The Government of Canada is currently reviewing the status of the Athabasca rainbow trout to determine whether it should be listed as endangered under SARA (Schedule 1). All Project activities will be confined to the Project Area. No activities are planned in or near the McLeod River or any other watercourse. The Project will not directly interact with aquatic species. Indirect interaction may occur through runoff from the site and hazardous material spills which could affect the aquatic environment. These indirect effects and their mitigation measures are discussed in Section 5.1.3.4.

### 5.2.4 Migratory Birds, as Defined in the *Migratory Birds Convention Act, 1994*

Thirty-five of the 57 SOMC that may occur in the vicinity of the Project Area are migratory birds as defined in the *Migratory Birds Convention Act, 1994* (see Appendix B). Of these species, common nighthawk (*Chordeiles minor*), olive-sided flycatcher (*Contopus cooperi*), barn swallow (*Hirundo rustica*), bank swallow (*Riparia riparia*) and Canada warbler (*Cardellina canadensis*) are listed as threatened under Schedule 1 of SARA. Horned grebe (*Podiceps auratus*), western grebe (*Aechmophorus occidentalis*), yellow rail (*Coturnicops noveboracensis*), and rusty blackbird (*Euphagus carolinus*) are listed as special concern under Schedule 1 of SARA.

The entire Project Area has the potential to support migratory birds including grass, shrub and tree nesting species and those that favour wetland habitats. There is potential to affect migratory birds including species at risk during geotechnical activity and construction of the proposed Project. Specifically, removal of vegetation from the Project footprint (20 ha) and ground disturbance have potential to result in the direct loss of migratory bird habitat as well as result in indirect habitat loss associated with sensory disturbance. Potential sensory disturbance (e.g., noise, light) has the potential to continue during operations; however, mortality risk associated with potential vehicle collisions during construction is expected to decrease during operations as there will be fewer vehicles travelling to and from the Project Area once construction ceases. Potential changes to the atmospheric environment associated with fugitive dust as well as vehicle and equipment emissions may temporarily reduce habitat availability (e.g., food resources, nesting sites) for migratory birds during construction; however, these effects could be potentially confounded with indirect effects associated with sensory disturbance (i.e., overlap with avoidance). Nonetheless, proposed control measures during construction and operation (see Section 5.1.2.1) will reduce fugitive emissions, which will help reduce potential effects on migratory bird feeding and nesting habitat within the Project Area. Although there is potential to directly and indirectly affect breeding bird and raptor habitat, planning construction activities outside the restricted activity period will reduce potential effects associated with sensory disturbance (i.e., indirect effects) as well as mortality risk. The Project occurs in the B5 nesting zone (ECCC 2018), with an associated restricted activity period (RAP) which extends approximately from May 1 to August 10. However, in consideration of species at risk as well as recommended RAPs for raptors (GOA 2017, ECCC 2018), construction activities will avoid the breeding bird period (March 15-August 31), where possible. If Project construction is scheduled to occur



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during restricted activity periods for migratory birds or raptors, a bird nest search will be conducted using non-intrusive (i.e., passive) search techniques.

The construction and operation of the Project will result in the loss of 10.5 ha of habitat in the fenced area and access road for the duration of the Project and temporary loss of 8.1 ha of habitat in the laydown area. The laydown area will be reclaimed to equivalent habitat following construction. The fenced area and access road will be reclaimed to equivalent habitat following decommissioning of the Project. Loss or degradation of wetlands will be compensated for as per the Alberta *Water Act*.

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 surrounding wetlands. Potential indirect interaction may occur through runoff from the site and hazardous material spills which could affect the quality of the stormwater pond. The surface runoff collected in the stormwater pond not expected to contain measurable volumes of hydrocarbons nor will it contain any hazardous waste, which will be collected and disposed of at licensed facilities. With implementation of the Stormwater Management Plan (discussed in Section 5.1.3.4), the stormwater pond is not expected to adversely affect migratory birds as the water quality is expected to be similar to other wetlands in the area.

### 5.2.5 Species at Risk, as Defined in the Species at Risk Act (SARA)

There are 10 birds, one amphibian (western toad) as well as five mammals (American badger, little brown myotis, northern long-eared myotis, grizzly bear and wolverine) listed under Schedule 1 of SARA that have the potential to occur in the Project Area. The Project has the potential to affect these species if they are present in the Project Area through similar effects pathways as previously described in Sections 5.1.4.3 and 5.2.4 including direct and indirect habitat loss as well as increased mortality risk. Standard industry practices will be implemented to reduce potential bear-human conflicts on site (e.g., reducing or eliminating attractants, utilizing bear-resistant garbage containers). Wildlife mitigation measures, including conducting pre-construction surveys to identify wildlife features; avoiding removing vegetation during the RAP for migratory birds and raptors; and reclaiming exposed land following construction will be implemented to reduce effects on SARA species.

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

Federal lands in the vicinity of the Project Area include Indigenous reserve lands and Jasper National Park. These are shown in Figure 1-1 and their straight-line distances from the reserve boundary to the Project Area are as follows:

- O'Chiese Reserve No. 203 (O'Chiese First Nation) – 103 km
- Wabamun No. 133A (Paul First Nation) – 138 km
- Alexis Indian Reserve No.133 (Alexis Nakota Sioux Nation) – 134 km
- Alexis Elk River Reserve No. 233 (Alexis Nakota Sioux Nation) – 65 km
- Alexis Cardinal River Reserve No. 234 (Alexis Nakota Sioux Nation) – 76 km



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- Kehewin No. 123 (Kehewin Cree Nation) – 380 km
- Big Horn Reserve No. 144A (Bears paw, Chiniki, Stoney, Wesley First Nations) – 126 km
- Stoney Nakoda Reserve Nos. 142, 143, 144 (Bears paw, Chiniki, Stoney, Wesley First Nations) – 273 km
- Jasper National Park – 80 km

Given their distance, changes to federal lands by the Project are not anticipated. The Project is located approximately 140 km from the Alberta-BC provincial border, 436 km from the Alberta-Saskatchewan provincial border and 502 km from the Canada- USA border. Given the size of the Project and the localization of effects on air quality, noise, soil, vegetation, wildlife and heritage resources, and the expected lack of effects on aquatic resources, 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 Project on 44 ha of land southwest of Edson are expected to be minimal, therefore impacts to Indigenous peoples are also expected to be minimal. Changes to the environment, including air quality, noise, soil, vegetation, wildlife, and heritage resources are expected to be localized in the Project Area, and the Project is not expected to have effects on the aquatic environment. 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).

Regarding health and socio-economics, no ingestion or inhalation pathways that could trigger the need for a human health risk assessment are anticipated. Given this, effects on human health are not anticipated. In addition, Cascade is developing an Indigenous Engagement Plan, discussed in Section 6.0, that includes identifying and participating in long-term, meaningful processes to promote economic prosperity for the Indigenous groups. Socio-economic effects are anticipated to be positive for Indigenous groups due to opportunities for employment.

Currently, there are no identified sites or structures of historical, archaeological, paleontological, or architectural significance in the Project Area. If any undocumented sites are discovered, mitigation measures such as avoidance, surface collection and documentation or excavation may be recommended by the archaeological permit holder in the HRIA report. If undocumented paleontological resources are discovered during a construction monitoring program, salvage operations will be completed according to the draft *Microsite Fossil Collecting by Palaeontological Consultants – Guidelines* in preparation by the Royal Tyrrell Museum of Palaeontology.



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Cascade acknowledges the proposed Project Area lies within the Traditional Territories of Alexis Nakota Sioux Nation, Kehewin Cree Nation, O'Chiese First Nation and Paul First Nation. At the direction of the ACO, Cascade has engaged four Indigenous groups, listed in Table 6-1. Site visits were conducted with Alexis Nakota Sioux Nation, O'Chiese First Nation, and Paul First Nation, and no issues or concerns regarding effects on current use were identified during the site visits. This conclusion is further supported by:

- the small size of the Project in relation to the Crown land in Yellowhead County
- the distances from the Project to the Indigenous groups
- the fact that the proposed site has already been clear cut

Cascade will continue to consult with Indigenous communities as directed by the ACO and if potential effects are identified, Cascade will evaluate the need for mitigation at that time.





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### 6.0 PROPONENT ENGAGEMENT WITH INDIGENOUS GROUPS

Further to the direction provided by the Government of Alberta's ACO, Cascade has developed a comprehensive Indigenous engagement plan, which is guided by the principles of respect, understanding, trust and mutual benefit. The engagement plan is being implemented in alignment with the public engagement plan. Results from these engagement plans will be used in developing the regulatory applications.

Cascade's approach to engagement includes enhancing their understanding of Indigenous groups' issues, identifies options for their resolution and allows for appropriate choices for the future. Where possible, engagement processes will be refined to meet Indigenous groups' requirements.

The intent of the Indigenous engagement plan is to enable Cascade to build long-term relationships with Indigenous groups in close proximity to the Project Area, representing a positive investment in the Project's future.

Goals for the Indigenous Engagement Plan are to:

- enhance the understanding of Indigenous culture and rights
- provide Indigenous groups with clear and timely Project information
- identify Project specific issues and concerns
- provide opportunities to discuss any issues or concerns, gather feedback and incorporate feedback into the Project design where possible
- build long-term mutually beneficial relationships
- identify and participate in long-term, meaningful processes to promote economic prosperity

#### 6.1 LIST OF POTENTIALLY AFFECTED AND INTERESTED INDIGENOUS GROUPS

On March 16, 2018, Cascade submitted a pre-engagement assessment to the ACO for proposed temporary fieldwork for the purpose of geotechnical testing for the Project. As a result of the ACO review, it identified that a Level 1 streamlined engagement was required with the following three Indigenous groups in Treaty 6 who have the potential to be affected or may be interested in the Project: Alexis Nakota Sioux Nation, O'Chiese First Nation, and Paul First Nation.

On June 15, 2018, Cascade submitted a pre-engagement assessment to the ACO for a miscellaneous lease (DML) on crown land. As a result, the ACO determined Level 2 Standard Consultation was required with the following four Indigenous groups in Treaty 6 who have the potential to be affected or may be interested in the Project (Table 6-1). In addition to the three Indigenous groups mentioned above, Cascade received notification from the ACO on June 15, 2018 that consultation was also required with Kehewin Cree Nation.



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**Table 6-1 Indigenous Groups Potentially Affected by the Cascade Power Plant**

<b>Indigenous Group</b>	<b>Approximate Distance of Reserve from Project Area</b>	<b>Address</b>
Alexis Nakota Sioux	134 km <sup>1</sup>	PO Box 7 Glenevis, AB T0E 0X0
Kehewin Cree Nation	380 km	PO Box 220 Kehewin, AB, T0A 1C0
O'Chiese First Nation	103 km	PO Box 1570 Rocky Mountain House, AB, T4T 1B2
Paul First Nation	138 km	PO Box 89 Duffield, AB T0E 0N0
<sup>1</sup> Alexis Elk River Reserve No. 233 is 65 km from the Project and Alexis Cardinal River Reserve No. 234 is 76 km from the Project Area. The 134 km distance is to Reserve 133.		

Based on the direction from the ACO, Cascade was directed to undertake consultation with the Indigenous groups noted above. Cascade anticipates that other Indigenous groups may self-identify an interest in the Project.

**6.2 DESCRIPTION OF ENGAGEMENT ACTIVITIES CARRIED OUT TO DATE WITH INDIGENOUS GROUPS**

**Alexis Nakota Sioux Nation:**

Brian Vermeulen (BV Land), on behalf of Cascade, sent Project Notification packages on March 16, 2018 to Alexis Nakota Sioux Nation, O'Chiese First Nation and Paul First Nation to inform them of the proposed temporary fieldwork and geotechnical testing proposed to start April 9, 2018. The First Nations were requested to review the information and provide a written submission to Cascade of any identified potential adverse effects to their Treaty rights or traditional uses.

BV Land, on behalf of Cascade, sent a Project Notification package on July 27, 2018 to Alexis Nakota Sioux Nation to inform them of the proposed application for a crown lease and power plant construction.

Robert Thomas (Cascade) and Brian Vermeulen (BV Land) met with community members Gilbert Potts and Justin Adams for a site visit on August 28, 2018. Upon completion of their site visit, Gilbert Potts and Justin Adams indicated they had no issues or concerns with the proposed site. A subsequent phone call was made to Brian Vermeulen (BV Land) from Courtenay Letendre Alexis Consultation Manager) on September 5, 2018 indicating that there were no concerns based on the site visit and that Alexis Nakota Sioux Nation would be submitting their invoice for the assessment.

Record of Consultation Logs were sent to Alexis Nakota Sioux Nation for review on April 6, 2018 and September 6, 2018.



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### **Kehewin Cree Nation:**

Subsequent to the geotechnical work that occurred in April 2018, the ACO informed Cascade on June 2, 2018 that the Kehewin Cree Nation had expanded their traditional lands and that Kehewin Cree Nation would require Level 2 Standard Consultation (Appendix D).

On July 27, 2018, Brian Vermeulen (BV Land), on behalf of Cascade, sent a Project Notification package to Kehewin Cree Nation to inform them of the proposed application for a crown lease and Project construction.

On August 16, 2018, Rob Thomas (Cascade) and Brian Vermeulen (BV Land) met with Laurelle Downey (Kehewin Consultation Manager) of the Kehewin Cree Nation to provide an overview of the Project and Laurelle Downey provided history regarding the Kehewin Cree Nation and their activities in the area. Laurelle Downey requested access to the environmental reports that Cascade was developing for their project description submission to the CEA Agency and Cascade agreed to provide them. A date of August 28, 2018 was set for a site visit and it was agreed that Cascade would follow-up prior to the date to confirm. Subsequent follow-up with Kehewin Cree Nation revealed that August 28, 2018 would not work and Laurelle Downey suggested the week of September 10, 2018. Brian Vermeulen (BV Land) attempted to follow up with Laurelle Downey (via text messages, emails and voicemails) however Brian Vermeulen (BV Land) has received no responses to date regarding confirmation of a site visit date. On September 6, 2018, a copy of the environmental information contained in the Project Description was sent to Laurelle Downey. Brian Vermeulen (BV Land) will continue to follow up with the Kehewin Cree Nation to arrange a site visit.

Record of Consultation Logs were sent to Kehewin Cree Nation for review on September 6, 2018.

### **O'Chiese First Nation:**

Brian Vermeulen (BV Land), on behalf of Cascade, sent a Project Notification package on March 16, 2018 to O'Chiese First Nation to inform them of the proposed temporary fieldwork and geotechnical testing proposed to start April 9, 2018. Cascade requested that O'Chiese First Nation review the information and provide a written submission to Cascade of any identified potential adverse effects to their Treaty rights or traditional uses.

Brian Vermeulen (BV Land) had a telephone conversation with Ashlee Gladeau (Consultation Officer) of O'Chiese First Nation on July 31, 2018, who confirmed receipt of the Project Notification Package and responded with a request for a \$4,500 project initiation fee in order to begin review of documentation related to the Project. Following the direction of the ACO, Brian Vermeulen (BV Land) sent a response to Andrew Scott (Consultation Coordinator) of O'Chiese First Nation on March 30, 2018, stating that more certainty regarding site conditions would be required before formalizing consultation protocols (and proposed fees); however, a site visit is welcome and Cascade would be prepared to compensate for appropriate time and travel costs.



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On July 27, 2018, Brian Vermeulen (BV Land), on behalf of Cascade, sent a Project Notification package to O'Chiese First Nation to inform them of the proposed application for a crown lease and power plant construction.

On July 31, 2018, Brian Vermeulen (BV Land) received an email from Ashlee Gladeau regarding their consultation protocol agreement and associated fees. Brian Vermeulen (BV Land) replied that Cascade was prepared to compensate for a field visit but needed specific rates.

On August 14, 2018, Kevin De Carteret, a consultant for the O'Chiese First Nation, contacted Brian Vermeulen (BV Land) with some questions regarding the Project. Brian Vermeulen (BV Land) requested that Kevin De Carteret send his list of questions in an email and on August 16, 2018, Brian Vermeulen (BV Land) provided responses to his inquiries (see Appendix D).

After a number of emails and phone calls between Ashlee Gladeau and Brian Vermeulen (BV Land), a site visit was arranged. On August 29, 2018, O'Chiese Nation community members Ben Sauteaux and Jeff Daychief met with Robert Thomas (Cascade) and Brian Vermeulen (BV Land) to conduct their site visit. Upon completion of the site visit and discussion of the overall Project, Ben Sauteaux and Jeff Daychief indicated they had no issues or concerns.

Record of Consultation Logs were sent to O'Chiese First Nation for review on April 6, 2018 and September 6, 2018.

### **Paul First Nation:**

Brian Vermeulen (BV Land), on behalf of Cascade, sent a Project Notification package on March 16, 2018 to Paul First Nation to inform them of the proposed temporary fieldwork and geotechnical testing proposed to start April 9, 2018. Cascade requested that Paul First Nation review the information and provide a written submission to Cascade of any identified potential adverse effects to their Treaty rights or traditional uses.

Brian Vermeulen (BV Land) met with Donald Rain (Industry Relations Manager) on March 26, 2018 to discuss the proposed preliminary geotechnical work to assess the potential Project site. Paul First Nation provided a quote of \$4,500 for two days of fieldwork and requested that Cascade produce an Emergency Response Plan (ERP) with respect to any site visit.

On July 27, 2018, Brian Vermeulen (BV Land), on behalf of Cascade, sent Project Notification packages to Paul First Nation to inform them of the proposed application for a crown lease and power plant construction.

Brian Vermeulen (BV Land) arranged a site visit with Donny Rain and Raymond Cardinal (Industry Relations Manager) on August 20, 2018. Robert Thomas (Cascade) and Brian Vermeulen (BV Land) met with community members Paul House and Calvin Bird on August 28, 2018 to conduct their site visit. Upon completion of the site visit, Paul House and Calvin Bird indicated that they had no issues or concerns on behalf of Paul First Nation regarding the proposed Project.



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Record of Consultation Logs were sent to Paul First Nation for review on April 6, 2018 and September 6, 2018.

### **Other Indigenous Consultation:**

On April 25, 2018, Cascade asked the CEA Agency for a preliminary list of Indigenous groups that the Agency may contact regarding the Project. A list of seventeen Indigenous groups was provided by the CEA Agency to Cascade on April 27, 2018 (see Appendix D). On September 11, 2018, a registered letter and a Project information package (see Appendix D) were sent to all seventeen Indigenous groups. Cascade received responses from Stoney Nakoda Nation, Montana First Nation and Ermineskin Cree Nation. A meeting with the Stoney Nakoda Nation occurred on September 25, 2018. At that meeting Rob Thomas (Cascade) met with Dean Cherkas, Director of Consultation for Stoney Tribal Administration. Information was shared on the Project. Dean Cherkas stated that the Project was near traditional territories of the Stoney Nakoda Nation and requested more environmental information on the Project. Rob Thomas committed to providing the environmental information for Cascade's permit applications when submitted. Cascade reached out via email to arrange to meet with the Montana First Nation and still has not heard back. Cascade will continue to attempt to arrange a meeting. Cascade met with the Ermineskin Cree Nation on Oct 31, 2018 where information on the Project was presented. On November 26, 2018 a copy of the environmental evaluation from the AUC application was sent to the Stoney Nakoda Nation and Ermineskin Cree Nation.

No responses of objection to the Project were received from any First Nations both from an engagement level or the respective field visits. Record of Consultation Logs were sent to Alexis Nakota Sioux Nation, O'Chiese First Nation and Paul First Nation for review on April 6, 2018 and to Alexis Nakota Sioux Nation, Kehewin Cree Nation, O'Chiese First Nation and Paul First Nation on September 6, 2018.

## 6.3 KEY COMMENTS AND CONCERNS BY INDIGENOUS GROUPS

No site-specific comments or concerns from Indigenous groups related to the proposed Project have been received to date.

## 6.4 CURRENT INDIGENOUS TRADITIONAL LAND USE

Cascade acknowledges the proposed site lies within the Traditional Territories of Alexis Nakota Sioux Nation, Kehewin Cree Nation, O'Chiese First Nation, Paul First Nation and Stoney Nakoda. It is anticipated that additional information regarding actual Traditional Land Use related to the Project Area will be identified as part of the AUC application process. Cascade also recognizes that additional Indigenous groups, including Métis groups, may practice traditional land use around the Project Area and that the ACO may not have this information on file.

Cascade also acknowledges that the *Natural Resources Transfer Acts* provide Treaty First Nations with the right to hunt, fish and trap for food on all unoccupied Crown lands and lands to which they have the right of access.



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Cascade will continue to work with Indigenous communities to understand how individual Indigenous groups wish to be consulted and to gather preliminary information on Indigenous interests and concerns. A summary of the engagement activities that have occurred to date are outlined in Table 6-2.

**Table 6-2 Summary of Engagement Activities to Date**

Indigenous Group	Project Notification Packages Mail out	Project Introduction Meeting	Site Visit	ACO Record of Consultation Logs
Alexis Nakota Sioux Nation	March 16, 2018 & July 27, 2018	n/a	August 28, 2018	April 6, 2018 September 6, 2018
Kehewin Cree Nation (added on June 15, 2018)	July 27, 2018	August 16, 2018	TBD	September 6, 2018
O'Chiese First Nation	March 16, 2018 & July 27, 2018	n/a	August 29, 2018	April 6, 2018 September 6, 2018
Paul First Nation	March 16, 2018 & July 27, 2018	March 26, 2018	August 28, 2018	April 6, 2018 September 6, 2018

## 6.5 INDIGENOUS ENGAGEMENT AND INFORMATION GATHERING PLAN

Cascade is committed to engaging with all potentially affected Indigenous groups throughout the life of the Project. Cascade will work with Indigenous groups that have been identified by the ACO to support traditional knowledge and traditional land use studies for inclusion in any environmental assessments required for the Project. Proposed engagement and notification delivery methods will include:

- in-person meetings with First Nation's primary engagement contact
- in-person meetings with First Nation's Chief and Council
- in-person meetings with First Nation trappers
- community meetings and meals
- Project notifications and ongoing updates of Project information
- information packages and maps sent by mail
- email and telephone conversations
- Project website, toll-free line and project-specific email address
- participation in community events to promote informal dialogue regarding the Project

Should Indigenous communities not identified by the ACO express interest in the Project, Cascade is committed to engaging with those interested communities through the following methods:

- provide relevant, up to date Project information
- identify potential concerns related to Indigenous community rights and traditional uses within the Project Area and work with each community to develop effective mitigation for potential impacts
- ongoing Project notifications and Project updates



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- Project information packages and maps sent by registered mail
- ongoing communications (telephone, email correspondences)

Cascade will continue to engage with Alexis Nakota Sioux Nation, Kehewin Cree Nation, O'Chiese First Nation and Paul First Nation throughout the life of the Project. Cascade plans to engage the Indigenous groups in early 2019 to provide them with information on the gas pipeline to serve the Project and to solicit their questions and concerns regarding the pipeline and any other components of the Project. Cascade plans to send out quarterly updates on the Project, which will be sent to the public and Indigenous groups.

Additional background information on Indigenous groups' potential or established Aboriginal or treaty rights are included in the *Natural Resources Transfer Acts* of 1930 where the federal government turned over to the province the jurisdiction it had exercised over crown lands and natural resources. Additional information on Indigenous traditional territories and reserve lands can be found on the Aboriginal and Treaty Rights Information System.



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## 7.0 ENGAGEMENT WITH PUBLIC AND OTHER PARTIES

### 7.1 ENGAGEMENT STRATEGY

Effective and thorough stakeholder engagement is vital to the success of the Project and is being undertaken in support of the submission of regulatory applications. Engagement will continue to take place among local and regional government officials and representatives, industry and local business, immediately adjacent landowners, area recreational users and the public so that potential Project specific issues or concerns may be raised, properly addressed and, if possible, resolved. Recognizing that all communities and stakeholders have unique characteristics, Cascade will demonstrate knowledge of, and respect for, the community in which the Project is proposed.

Through engagement activities, open discussion and transparent Project planning, Cascade aims to engage in meaningful dialogue with stakeholders with the intent to mitigate any affected parties' Project specific concerns. The following concepts form the basis of our engagement process:

- proactively inform all those whose rights maybe directly and adversely affected by the Project
- maintain transparency about Project design and convey technical information in plain language
- identify full range of interests, opportunities and concerns relating to the Project
- provide opportunities to discuss and address identified questions and concerns
- facilitate the discussion of options, alternatives, and mitigation strategies, providing stakeholders an opportunity to influence the Project design where possible
- build positive long-term relationships

Implementation of the engagement plan is sensitive to the constraints of communities and stakeholders and provides various opportunities for stakeholders to voice their concerns or issues. Cascade will strive to work together with the communities to share information and build mutually beneficial relationships.

### 7.2 ENGAGEMENT GOALS AND OBJECTIVES

The engagement plan is being implemented with the intent of building trust, credibility and respectful relationships with identified stakeholders and Indigenous groups that have the potential to be affected by, or interested in, the Project.

Goals for the Public Engagement Plan are to:

- develop two-way dialogue with the community, identify issues and concerns and appropriately incorporate their feedback into the Project design where possible
- receive non-objection from stakeholders for the Project, enabling regulatory approval
- build mutually beneficial long-term relationships
- establish and increase Cascade's corporate reputation and social licence to operate



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## 7.3 IDENTIFIED STAKEHOLDERS AND INTERESTED PARTIES

Key communities and governments located in close proximity to the Project location are Yellowhead County and the Town of Edson. Land ownership within the vicinity of the Project is identified as both private and public land. The land upon which the Project will be located is public crown land. Table 7-1 lists the potentially affected and interested stakeholder groups for the Project.

**Table 7-1 Potentially Affected and Interested Stakeholder Groups**

<p><b>Directly Affected Stakeholders</b></p> <ul style="list-style-type: none"> <li>• Occupants, landowners and residents (within 800m)</li> </ul>
<p><b>Nearby / Adjacent Stakeholders</b></p> <ul style="list-style-type: none"> <li>• Occupants, landowners and residents (within 3,000m)</li> </ul>
<p><b>Federal Government</b></p> <ul style="list-style-type: none"> <li>• Local Member of Parliament in Yellowhead County, Canadian Environmental Assessment Agency</li> </ul>
<p><b>Provincial Government</b></p> <ul style="list-style-type: none"> <li>• Member of the Legislative Assembly of Yellowhead County, Alberta Environment and Parks, Alberta Aboriginal Consultation Office, Alberta Utilities Commission, Alberta Transportation, Alberta Energy Regulator, Alberta Electric System Operator</li> </ul>
<p><b>Local / Regional Government</b></p> <ul style="list-style-type: none"> <li>• Yellowhead County, Town of Edson, Town of Ansell</li> </ul>
<p><b>Others Interested Groups</b></p> <ul style="list-style-type: none"> <li>• Trappers, caveats, disposition holders</li> <li>• Special interest/advocacy groups</li> <li>• Area recreational users or interests</li> <li>• Regional associations</li> <li>• Community groups</li> <li>• Local businesses</li> </ul>
<p><b>Media</b></p> <ul style="list-style-type: none"> <li>• The Edson Leader</li> <li>• The Weekly Anchor</li> </ul>

## 7.4 ENGAGEMENT ACTIVITIES

Cascade and its external contractors (including BV Lands and Communica) commenced site investigation and preliminary communications with public stakeholders, Indigenous communities and various provincial and federal regulators in March of 2018. On June 19, 2018, Project representatives provided a public presentation to the Town of Edson Mayor, Council and Administration with respect to the Project's anticipated schedule and future engagement approaches. A similar presentation was made to the Yellowhead County Mayor, Council and Administration on July 24, 2018. An open house was held in Edson on July 25, 2018. The open house included representatives from Cascade, Stantec, Communica and BV Lands. Twenty individuals attended the open house. The majority of attendees were in favour of the Project with the exception of one individual who is developing some property to the north of the site and had some concerns around the noise potential. Cascade representatives remain in contact with that



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individual and continue to engage and address his concerns. On September 18, 2018, a presentation was made to the Edson Rotary Club. Approximately 30 people attended the presentation. On October 10, 2018, a presentation was given to the Edson Chamber of Commerce.

### **7.5 KEY COMMENTS AND CONCERNS EXPRESSED BY STAKEHOLDERS TO DATE**

The key concern expressed to date is about potential noise from the operation of the Project. Cascade conducted a comprehensive noise study as per the AUC Rule 007 process (see Section 5.1.2.2) and the modelling results showed that the Project's noise levels are likely to be below the regulated permissible sound levels for all receptors. Cascade has received numerous emails from business owners in the Edson area in support of the Project.

### **7.6 OVERVIEW OF ANY ONGOING OR PROPOSED STAKEHOLDER ENGAGEMENT ACTIVITIES**

Cascade is committed to engaging with all potentially affected or interested stakeholders throughout the life of the Project. Cascade will work with communities and stakeholders within and near the Project Area to identify issues and concerns and incorporate feedback into the design where possible. Proposed engagement activities include:

- Project-specific information packages and public announcements
- information sessions and open houses
- round table meetings / coffee meetings and one-on-one meetings
- Project-specific website, toll free line and Project-specific email
- phone calls and emails
- targeted briefings and field visits
- quarterly mail out of Project updates

### **7.7 ENGAGEMENTS WITH OTHER JURISDICTIONS**

See Section 1.3 for a description of the engagement carried out to date with jurisdictions and various other parties. There has been no engagement undertaken with jurisdictions other than those listed in Section 1.3. Following public disclosure, Cascade anticipates that it will meet regularly with key provincial, municipal and federal jurisdictions in the area to provide a Project overview and updates, as well as gather input and feedback on development in the area.



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# CASCADE POWER PLANT PROJECT DESCRIPTION

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# APPENDICES



CASCADE POWER PLANT  
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## CASCADE POWER PLANT PROJECT DESCRIPTION

Appendix A Regulatory Correspondence  
January 2019

### Appendix A REGULATORY CORRESPONDENCE

**From:** Tiege, Susan [CEAA] [<mailto:Susan.Tiege@ceaa-acee.gc.ca>]  
**Sent:** April-12-18 4:38 PM  
**To:** Rob Thomas <[Rob.Thomas@kineticor.ca](mailto:Rob.Thomas@kineticor.ca)>  
**Subject:** [LIKELY\_SPAM]CEAA 2012 - Cascade 900 MW Power facility

Hello Rob,

It was nice to meet you and Guido, today. Thank you for coming to the Agency office to discuss the proposed Cascade 900MW Power Project Facility.

Based on the information you provided it appears that the proposed Project is a designated project pursuant to the *Canadian Environmental Assessment Act, 2012* (CEAA 2012) as it meets the requirements set out in item 2(a) of the *Regulations Designating Physical Activities* (Regulations):

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

The proponent of a designated project must provide the Agency with a description of the project that includes the information set out in [Prescribed Information for the Description of a Designated Project Regulations](#). The project description is used to determine if a federal environmental assessment is required. Once an acceptable project description is submitted, the Agency has 45 days, including a 20 day public comment period, to determine if a federal environmental assessment is required. In making its determination, the Agency will assess the potential for the Project to affect areas of federal jurisdiction including fish and fish habitat, migratory birds, federal lands, and changes to the environment on Indigenous Peoples. Detailed information on the environmental assessment process is available [here](#) and [here](#).

Resources to develop a project description are located [here](#) (Guide to Preparing a Description of a Designated Project under CEAA 2012) and the Agency is available to read and comment on any draft project descriptions.

Please let me know if you have additional questions.

Regards,  
Susan





June 4, 2018

Rob Thomas, Regulatory Services Kinetikor  
1800, 715 5 Avenue SW  
Calgary, AB T2P 2X6 Dear

Mr.Thomas:

Further to your e-mail dated April 30<sup>th</sup>, 2018, I wish to advise you that pursuant to Section 44 of the *Environmental Protection and Enhancement Act* (EPEA), I have considered the application of the environmental assessment process to your proposed Cascade Power Project GP Ltd., Cascade Power Project. This activity is not a mandatory activity for the purposes of environmental assessment. Having regard to the consideration set out in Section 44(3) of EPEA, I have decided that further assessment of the activity is not required. Therefore, a screening report will not be prepared and an environmental impact assessment report is not required.

Please note that this decision is based on the current information about the project and that I reserve the ability to review this decision should different and/or new information come to light. Cascade Power Project GP Ltd. should also note that Section 47 of EPEA gives the Minister of Environment and Parks the authority to order the preparation of an environmental impact assessment report under appropriate circumstances, notwithstanding a director's decision to not require an environmental impact assessment report.

Cascade Power Project GP Ltd. should be advised that although an environmental impact assessment report is not required for this project, Alberta Environment and Parks may have other regulatory requirements under EPEA and/or the *Water Act*. For more information about regulatory requirements under EPEA and/or the *Water Act*, please contact Muhammad Aziz ([muhammad.aziz@gov.ab.ca](mailto:muhammad.aziz@gov.ab.ca)). I suggest that Cascade Power Project GP Ltd. contact Susan Foisy with Indigenous Relations at the Aboriginal Consultation Office at ([susan.foisy@gov.ab.ca](mailto:susan.foisy@gov.ab.ca)).

At this time, I recommend that you review the contents of the Alberta Utilities Commission's Rule 007 (<http://www.auc.ab.ca/acts-regulations-and-auc-rules/rules/Pages/default.aspx>) to inform yourselves about the application and environmental evaluation requirements of the AUC.

Cascade Power Project GP Ltd. should also contact Susan Tiege ([Susan.Tiege@ceaa-acee.gc.ca](mailto:Susan.Tiege@ceaa-acee.gc.ca)) with the Canadian Environmental Assessment Agency to discuss the potential submission of a federal project description and any federal environmental assessment requirements under the *Canadian Environmental Assessment Act, 2012*.

If you have any questions or need further information please contact me at 780-427-9335.

Sincerely,

**ORIGINAL SIGNED BY HEATHER DENT**

Heather Dent  
Senior Manager, Environmental Assessment, Assessment and Continuations Provincial Approvals  
(Designated Director, *Environmental Protection and Enhancement Act*)

cc: M. Daneluk (AEP)  
M. Aziz (AEP)  
S. Foisy (IR)  
S. Tiege (CEAA)  
A. Drolet (AUC)  
J. Murray (AEP)

CASCADE POWER PLANT  
PROJECT DESCRIPTION

Appendix B Wildlife Species of Management Concern with the Potential to Occur in the Project Area  
January 2019

**Appendix B WILDLIFE SPECIES OF MANAGEMENT CONCERN  
WITH THE POTENTIAL TO OCCUR IN THE  
PROJECT AREA**



**CASCADE POWER PLANT  
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Appendix B Wildlife Species of Management Concern with the Potential to Occur in the Project Area  
January 2019

**Table B-1 Wildlife Species of Management Concern with the Potential to Occur in the Project Area**

Common Name	Scientific Name	SARA Listing <sup>1</sup>	COSEWIC Listing <sup>2</sup>	Alberta <i>Wildlife Act</i> and AESCC <sup>3</sup>	Alberta General Status Listing <sup>4</sup>	Habitat Association	Observed within 5 km of the Project Area
<b>Birds</b>							
Trumpeter swan	<i>Cygnus buccinator</i>	-	Not at Risk	Special Concern	Sensitive	Shallow lakes, marshes and ponds, wooded swamps	√ <sup>a,b</sup>
White-winged scoter	<i>Melanitta fusca</i>	-	-	Special Concern	Sensitive	Lakes with islands, ponds and slow moving streams	
Pied-billed grebe	<i>Podilymbus podiceps</i>	-	-	-	Sensitive	Seasonal or permanent wetlands with emergent vegetation	√ <sup>ab</sup>
Horned grebe	<i>Podiceps auritis</i>	Special Concern	Special Concern	-	Sensitive	Small, shallow, graminoid ponds and marshes	
Western grebe	<i>Aechmophorus occidentalis</i>	Special Concern	Special Concern	Threatened	At Risk	Lakes and marshes with large open area	
Common nighthawk	<i>Chordeiles minor</i>	Threatened	Threatened	-	Sensitive	Grassland, clear-cut areas of forest, gravel	√ <sup>b</sup>
Yellow rail	<i>Coturnicops noveboracensis</i>	Special Concern	Special Concern	-	Undetermined	Sedge marsh	
Sora	<i>Porzana carolina</i>	-	-	-	Sensitive	Seasonal or semi-permanent graminoid marsh or wet meadows	
Sandhill crane	<i>Antigone canadensis</i>	-	-	-	Sensitive	Isolated bogs, marshes, swamps; cultivated fields	
Short-billed dowitcher	<i>Limnodromus griseus</i>	-	-	-	Sensitive	Shallow marshes, semi-permanent ponds	



**CASCADE POWER PLANT  
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January 2019

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Common Name	Scientific Name	SARA Listing <sup>1</sup>	COSEWIC Listing <sup>2</sup>	Alberta <i>Wildlife Act</i> and AESCC <sup>3</sup>	Alberta General Status Listing <sup>4</sup>	Habitat Association	Observed within 5 km of the Project Area
Black tern	<i>Chlidonias niger</i>	-	-	-	Sensitive	Shallow marshes, semi-permanent ponds	
American white pelican	<i>Pelecanus erythrorhynchos</i>	-	Not at Risk	-	Sensitive	Islands on lakes for breeding, forage in marshes, lakes, or rivers	
American bittern	<i>Botaurus lentiginosus</i>	-	-	-	Sensitive	Graminoid marsh	
Great blue heron	<i>Ardea herodias</i>	-	-	-	Sensitive	Swamps or islands on lakes	√ <sup>a</sup>
Osprey	<i>Pandion haliaetus</i>	-	-	-	Sensitive	Large trees, typically broadleaf, and man-made structures near waterbodies with fish	
Bald eagle	<i>Haliaeetus leucocephalus</i>	-	Not at Risk	-	Sensitive	Large trees, typically broadleaf, and man-made structures near waterbodies with fish	√ <sup>a</sup>
Northern goshawk	<i>Accipiter gentilis</i>	-	Not at Risk	-	Sensitive	Mature mixed and broadleaf forest	
Broad-winged hawk	<i>Buteo platypterus</i>	-	-	-	Sensitive	Broadleaf or coniferous forest	√ <sup>a</sup>
Golden eagle	<i>Aquila chrysaetos</i>	-	Not at Risk	-	Sensitive	Open habitats (e.g., native grassland), cliffs, riparian	
Northern pygmy-owl	<i>Glaucidium gnoma</i>	-	-	-	Sensitive	Grassland, shrubland, riparian and coniferous forest	√ <sup>a</sup>
Barred owl	<i>Strix varia</i>	-	-	Special Concern	Sensitive	Broadleaf or mixed forest	



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Appendix B Wildlife Species of Management Concern with the Potential to Occur in the Project Area  
January 2019

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Common Name	Scientific Name	SARA Listing <sup>1</sup>	COSEWIC Listing <sup>2</sup>	Alberta <i>Wildlife Act</i> and AESCC <sup>3</sup>	Alberta General Status Listing <sup>4</sup>	Habitat Association	Observed within 5 km of the Project Area
Great gray owl	<i>Strix nebulosa</i>	-	Not at Risk	-	Sensitive	Coniferous forest	
Short-eared owl	<i>Asio flammeus</i> )	Special Concern	Special Concern	-	Sensitive	Open graminoid fens, bogs and grasslands	
Black-backed woodpecker	<i>Picoides arcticus</i>	-	-	-	Sensitive	Coniferous forest, particularly those disturbed by fire	
Pileated woodpecker	<i>Dryocopus pileatus</i>	-	-	-	Sensitive	Mixed and broadleaf forest	
American kestrel	<i>Falco sparverius</i>	-	-	-	Sensitive	Grassland, meadows, agricultural fields with broadleaf or mixedwood tree stands	
Olive-sided flycatcher	<i>Contopus cooperi</i>	Threatened	Threatened	-	May Be At Risk	Coniferous and mixed forests, near open areas/edges; burns, with tall trees, dead standing trees	
Western wood-pewee	<i>Contopus sordidulus</i>	-	-	-	May Be At Risk	Broadleaf and mixed forest near riparian zones	
Yellow-bellied flycatcher	<i>Empidonax flaviventris</i>	-	-	-	Undetermined	Wet coniferous forest, bogs	
Alder flycatcher	<i>Empidonax alnorum</i>	-	-	-	Sensitive	Open broadleaf and mixed forest	
Least flycatcher	<i>Empidonax minimus</i>	-	-	-	Sensitive	Open broadleaf and mixed forest	√ <sup>a</sup>





**CASCADE POWER PLANT  
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Appendix B Wildlife Species of Management Concern with the Potential to Occur in the Project Area  
January 2019

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Common Name	Scientific Name	SARA Listing <sup>1</sup>	COSEWIC Listing <sup>2</sup>	Alberta <i>Wildlife Act</i> and AESCC <sup>3</sup>	Alberta General Status Listing <sup>4</sup>	Habitat Association	Observed within 5 km of the Project Area
Eastern phoebe	<i>Sayornis phoebe</i>	-	-	-	Sensitive	Open broadleaf or mixed forest near water	
Eastern kingbird	<i>Tyrannus tyrannus</i>	-	-	-	Sensitive	Open shrublands and woodlots, often near water	
Purple martin	<i>Progne subis</i>	-	-	-	Sensitive	Wet areas, burns and human settlements	
Bank swallow	<i>Riparia riparia</i>	Threatened	Threatened	-	Sensitive	Banks of river, streams, and wetlands	
Barn swallow	<i>Hirundo rustica</i>	Threatened	Threatened	-	Sensitive	Near water in grassland, shrubland, open forest	√ <sup>b</sup>
Brown creeper	<i>Certhia americana</i>	-	-	-	Sensitive	Mature/old-growth forest	
Black-throated green warbler	<i>Setophaga virens</i>	-	-	Special Concern	Sensitive	Coniferous and mixed forests	
Canada warbler	<i>Cardellina canadensis</i>	Threatened	Threatened	-	At Risk	Mature deciduous and mixed forest, shrubby swamps	
Cape may warbler	<i>Setophaga tigrina</i>	-	-	-	Sensitive	Coniferous forest	
Common yellowthroat	<i>Geothlypis trichas</i>	-	-	-	Sensitive	Graminoid marsh, shrubby and wooded swamp	
Baltimore oriole	<i>Icterus galbula</i>	-	-	-	Sensitive	Open woodlands, forest edges, river banks, small groves of trees, often deciduous trees	



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Appendix B Wildlife Species of Management Concern with the Potential to Occur in the Project Area  
January 2019

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Rusty blackbird	<i>Euphagus carolinus</i>	Special Concern	Special Concern	-	Sensitive	Wet coniferous and mixed forest, fens, bogs, swamps	
Western tanager	<i>Piranga ludoviciana</i>	-	-	-	Sensitive	Coniferous and mixed forest	
<b>Mammals</b>							
Grizzly bear	<i>Ursus arctos</i>	Special Concern	Special Concern	Threatened	At Risk	Grassland, shrubland, wet meadows, forest	√ <sup>a</sup>
Canada lynx	<i>Lynx canadensis</i>	-	-	-	Sensitive	Coniferous and mixed forest	√ <sup>a</sup>
Wolverine	<i>Gulo gulo</i>	Special Concern	Special Concern	Data deficient	May be At Risk	Wide range of habitat with suitable prey	
Fisher	<i>Pekania pennanti</i>	-	-	-	Sensitive	Mature coniferous and mixed forest	√ <sup>a</sup>
Long-tailed weasel	<i>Mustela frenata</i>	-	Not at Risk	-	May be At Risk	Grassland, shrubland, forest, agricultural land, marshes	
Badger	<i>Taxidea taxus taxus</i>	Special Concern	Special Concern	-			√ <sup>a</sup>
Little brown myotis	<i>Myotis lucifugus</i>	Endangered	Endangered	-	May be At Risk	Mature/old-growth forests with cavities, rock crevices, buildings	
Northern long-eared myotis	<i>Myotis septentrionalis</i>	Endangered	Endangered	Data Deficient	May be At Risk	Forests, especially old growth	
Silver-haired bat	<i>Lasiurus noctivagans</i>	-	-	-	Sensitive	Forests, especially old growth	



**CASCADE POWER PLANT  
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Appendix B Wildlife Species of Management Concern with the Potential to Occur in the Project Area  
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<b>Herpetiles</b>							
Western toad	<i>Anaxyrus boreas</i>	Special Concern	Special Concern	-	Sensitive	Graminoid marsh, swamps, shallow open water with emergent vegetation	√ <sup>a</sup>
Eastern long-toed salamander	<i>Ambystoma macrodactylum</i>	-	-	Special Concern	Sensitive	Graminoid marsh, swamps, shallow open water with emergent vegetation	
Wandering garter snake	<i>Thamnophis elegans</i>	-	-	-	Sensitive	Grassland, open forest, meadows and riparian areas	
Red-sided garter snake	<i>Thamnophis sirtalis</i>	-	-	-	Sensitive	Grassland, open forest, agricultural areas, marshes, lakes	
<p>NOTES:</p> <ul style="list-style-type: none"> <li>- no status</li> <li>√ Observed within 5 km from the Project Area</li> <li><sup>a</sup> FWMIS record (AEP 2018a)</li> <li><sup>b</sup> ebird 2018</li> <li><sup>1</sup> GOC 2018c</li> <li><sup>2</sup> COSEWIC 2018</li> <li><sup>3</sup> Endangered and Threatened species listed under Alberta's <i>Wildlife Act</i> and species of Special Concern assessed by the AESCC and its Scientific Subcommittee (GOA 2015)</li> <li><sup>4</sup> AEP 2017</li> </ul>							



**CASCADE POWER PLANT  
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Appendix B Wildlife Species of Management Concern with the Potential to Occur in the Project Area  
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CASCADE POWER PLANT  
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Appendix C Project Area Photographs  
January 2019

**Appendix C PROJECT AREA PHOTOGRAPHS**



**Figure C-1 Project Footprint, looking north**



**Figure C-2 Project Footprint, looking southeast**



**Figure C-3 Project Footprint, looking northwest**



**Figure C-4 Project Footprint, looking south**



**CASCADE POWER PLANT  
PROJECT DESCRIPTION**

Appendix C Project Area Photographs  
January 2019



**Figure C-4** Looking south into forested area



**Figure C-5** Forested area in south quarter



CASCADE POWER PLANT  
PROJECT DESCRIPTION

Appendix D Indigenous Engagement  
January 2019

## Appendix D INDIGENOUS ENGAGEMENT



**CASCADE POWER PLANT  
PROJECT DESCRIPTION**

Appendix D Indigenous Engagement  
January 2019





## Pre-consultation Assessment

File Number for Consultation:  Date of Submission:

Client Project Name:

Client Name:

Contact Name:  Contact Number:

Contact Email:

In accordance with Alberta's First Nations and Metis Settlements policies and guidelines (<http://indigenous.alberta.ca/1.cfm>), the Aboriginal Consultation Office has determined a level of consultation for each activity.

Reviewed by:  Date of Review:

Should you have any questions, please contact the reviewer at:

Phone Number:  Email Address:

Consultation contacts for each First Nation/Metis Settlements as identified below (name, mailing address, phone number) are available at <http://indigenous.alberta.ca/576.cfm>

Supporting Comments/Direction:

As stated there will be a submission for Authorizations of Decisions through the EPEA. To ensure you are consulting on the project as a whole please provide any further information regarding the potential EPEA approval to the First Nations you are required to consult with.

When providing notification and Record of Consultation (ROC) Log to First Nations/Metis Settlements, applicant must utilize the First Nations and Metis Settlements contacts lists and the prescribed consultation contact methods indicated. Use of any other list or method of contact will not be accepted and may result in a determination of Incomplete Consultation. The First Nations and Metis Settlements contacts lists are located on the Aboriginal Consultation Office website at <http://indigenous.alberta.ca/576.cfm>.

Personal information is collected in accordance with Section 33(c) of the Freedom of Information and Protection of Privacy Act. The personal information collected within this form will be used to administer the First Nations/Metis Settlements consultation process. If you have any questions about the collection or use of this information, you can contact the Director, FOIP Services, Indigenous Relations and International and Intergovernmental Relations (780)427-9658.

## Pre-consultation Assessment

Activity Number	Disp Type	Program Type	Source Line Spacing	Regulator	Purpose Type		Activity Area/ Distance	Land Use Area
FNC201804039-001	DML			AEP	Electrical - Power Station / Substation		43.87 HA	Upper Athabasca Region
	ATS Legal - From		ATS Legal - To		First Nation(s) / Metis Settlement(s)	Alexis Nakota Sioux Nation	KeheWIN Cree Nation	O'Chiese First Nation
	NW 28 52 18 5		SW 28 52 18 5			Paul First Nation		
Action Required	Level 2: Standard Consultation							
Activity Number	Disp Type	Program Type	Source Line Spacing	Regulator	Purpose Type		Activity Area/ Distance	Land Use Area
	ATS Legal - From		ATS Legal - To		First Nation(s) / Metis Settlement(s)			
Action Required								
Activity Number	Disp Type	Program Type	Source Line Spacing	Regulator	Purpose Type		Activity Area/ Distance	Land Use Area
	ATS Legal - From		ATS Legal - To		First Nation(s) / Metis Settlement(s)			
Action Required								

**From:** [Brian Vermeulen](#)  
**To:** [Rob Thomas](#)  
**Subject:** FW: Cascade Power Project 900 MW combined cycle power plant 12 km southwest of Edson  
**Date:** Wednesday, October 17, 2018 11:05:09 AM  
**Attachments:** [image002.jpg](#)

---

**Brian Vermeulen** | President



Office: 250-785-6340 | Fax: 250-785-6351  
FSJ Cell: 250-261-1802 | Calgary Cell: 403-860-9634  
[Error! Hyperlink reference not valid.](#) | [brianv@bvland.com](mailto:brianv@bvland.com)

---

**From:** Brian Vermeulen  
**Sent:** August-16-18 12:05 PM  
**To:** 'kevin.d@ocfn.ca'  
**Cc:** 'andrew.scott@ochiesebc.ca'; 'ashlee.gladeau@ochiesebc.ca'  
**Subject:** FW: Cascade Power Project 900 MW combined cycle power plant 12 km southwest of Edson

Hi Kevin,

Please see the answers to your questions below in blue. Also, as mentioned we are prepared to cover off costs associated for the site visit for some preliminary engagement to support the initial part as it pertains to the footprint of the DML. We are not prepared to pay in advance, but we do pay for work performed.

Give me a shout if you have any further questions or wish to discuss further.

**Brian Vermeulen** | President



Office: 250-785-6340 | Fax: 250-785-6351  
FSJ Cell: 250-261-1802 | Calgary Cell: 403-860-9634  
[Error! Hyperlink reference not valid.](#) | [brianv@bvland.com](mailto:brianv@bvland.com)

----- Forwarded message -----

**From:** Kevin De Carteret <[kevin.d@ocfn.ca](mailto:kevin.d@ocfn.ca)>  
**Date:** Aug 14, 2018 6:46 PM  
**Subject:** Cascade Power Project 900 MW combined cycle power plant 12 km southwest of Edson  
**To:** Brian Vermeulen <[brianv@bvland.com](mailto:brianv@bvland.com)>  
**Cc:** [ashlee.gladeau@ochiesebc.ca](mailto:ashlee.gladeau@ochiesebc.ca), [andrew.scott@ochiesebc.ca](mailto:andrew.scott@ochiesebc.ca)

Hi Brian,

Thank you for returning my call today. We discussed the following:

#### Initial Consultation Fee

On July 24, 2018, you sent an initial notification package for the Cascade Power Project, a 900MW power plant located 12km southwest of Edson proposed on 52ha of Crown land. On July 31, 2018 Cascade Power was assessed a \$4800 initial consultation fee by O'Chiese First Nation. On August 9, 2018 you wrote stating that Cascade Power would be willing to pay a day rate for a site visit, and that any rates above that would need to be negotiated. Today (August 14, 2018) we spoke on the phone. You asked me what the consultation fee covers. O'Chiese First Nation assesses proponents an initial consultation fee of \$4800 per request. The letter sent along with the invoice states:

"This fee covers travel costs, meeting costs, information review, legal costs, administrative costs, technical support, and other costs associated with review of FNCs and the process of consultation. When costs are incurred above this fee amount, additional invoices will be submitted to the industry proponent responsible for these additional costs. O'Chiese First Nation may also require negotiation of a consultation protocol agreement, depending on the amount, extent, and duration of the development activity proposed.

The consultation capacity funding provided by the Government of Alberta is insufficient to support the high volume of consultation requests received by O'Chiese First Nation each year. The

Government of Alberta recognizes this. The Aboriginal Relations Annual Report 2013-2014 recognizes that "...current funding levels are insufficient to enable First Nations to meaningfully

participate in the consultation process with industry and the province." O'Chiese First Nation's increased consultation fee reflects the Government of Alberta's delay in addressing this acknowledged lack of capacity."

You stated that earlier this year Cascade power was assessed a \$4800 invoice for geotechnical work that required consultation with O'Chiese First Nation, and that Cascade Power did not pay this fee.

On the phone I said that I would send you information about what the fee covers. If you have any additional questions please let me know.

#### Environmental Assessment Process

We discussed the timelines for the Cascade Power project. You pointed out that the Cascade Power project was assessed as a level 2 consultation in accordance with the Government of Alberta's Consultation Guidelines and that means that consultation can close within 3 weeks. We discussed that this means that consultation could close as early as August 14, 2018 (today). I asked you a few questions which you said you could answer at a later time: [You may want to note that you also stated that we would keep the consultation open](#)

1) Does the Cascade Power project trigger a federal environmental assessment? [Yes the](#)

project triggers the need for a project description which is submitted to the CEAA who will determine if a Federal EIA is required. We currently have a draft in front of the CEAA.

2) What is the process to be followed for a provincial environmental assessment? A project description is submitted to the AEP who determine if a EIA is necessary

3) Is the current level 2 consultation intended to fulfil the consultation requirements for a provincial environmental assessment? The level of consultation presently is just for the footprint to apply for the DML.

### Disposition sought

You mentioned on the phone and in your August 9 email that Cascade Power is seeking a DML disposition. What is a DML disposition and for how long will the disposition be issued? The DML is the crown land lease. The dispositions are for 10 years

### Contacts

Who should O'Chiese First Nation contact for further information about your project at the following agencies:

- 1) Alberta Aboriginal Consultation Office

**Kurt A Borzel RPFT**

Consultation Advisor – Central Subregion  
Aboriginal Consultation Office  
Alberta Indigenous Relations  
Suite 107, 1<sup>st</sup> Floor, Provincial Building.  
111 – 54<sup>th</sup> Street  
Edson, AB, Canada, T7E 1T2

- 2) Alberta Environment and Parks

**Fidelma Horgan, P.Eng.**

WA/EPEA Approvals Team Lead  
Upper Athabasca Region (UAR)  
Alberta Environment and Parks  
Suite 1, 250 Diamond Avenue  
Spruce Grove, AB T7X 3B4

The Canadian Environmental Assessment Agency (I know you said on the phone that no federal process was triggered, but I would like to follow up with anyone at CEAA that Cascade Power sought guidance from regarding this decision. It is my understanding that because the proposed project involves the construction, operation, decommissioning and abandonment of a new fossil fuel-fired electrical generating facility with a production capacity of 200 MW or more, a project description must be submitted to CEAA.) He is correct we met with the CEAA and also have a letter from them confirming that a project description must be submitted to them. Two contacts Susan Tiege Section Leader and Chelsea Fedrau Environmental Assessment Officer, Prairie and Northern Region  
Canadian Environmental Assessment Agency / Government of Canada

I think that this captures what we talked about. Please let me know if there was anything else. I can be reached at 403-402-9885, or by email.

Thank you,

Kevin de Carteret  
Consultation Analyst  
O'Chiese Consultation Office

Below is a **preliminary** list of Indigenous Groups that the Canadian Environmental Assessment Agency (the Agency) **may** contact regarding the proposed Cascade Power Project (the Project) upon the Agency's acceptance of a project description. The preliminary list is based on: the proximity of reserve lands to the Project area, asserted traditional territory that overlaps with the Project area, and groups whose traditional harvesting zones directly overlap and are in close proximity with the Project area.

On September 11, 2018 a introductory letter, Project newsletter and map were sent to the 17 CEA Agency identified Indigenous Groups by registered mail.

<b>Treaty 6</b>	<b>Distance from Project by Road (approx. kms)</b>
Alexis Nakota Sioux Nation	146
Paul First Nation	149
O'Chiese First Nation	194
Sunchild First Nation	202
Enoch Cree Nation	192
Samson Cree Nation	290
Montana First Nation	290
Louis Bull Tribe	290
Ermineskin Cree Nation	290
Saddle Lake Cree Nation	356
Alexander First Nation	221
Whitefish Lake First Nation	353
<b>Treaty 7</b>	
Stoney Nakoda Nation	440
Tsuut'ina Nation	445
<b>Treaty 8</b>	
Horse Lake Nation	435
<b>Other</b>	
Foothills Ojibway First Nation	85
Nakcowinewak Nation of Canada	231
<b>Metis Communities</b>	
Metis Nation of Alberta Region 4	200
Gunn Métis Local #55	167
Drayton Valley Local #888	141







Cascade Power GP Ltd.  
1800, 715 5 Ave SW  
T2P 2X6

September 11, 2018

Ken S. Arcand  
PO Box 3480 Morinville, AB  
T8R 1S3

**RE: Proposed Cascade Power Project**

Dear Ken,

My name is Rob Thomas and I am the Director of Regulatory Services for the proposed Cascade Combined Cycle Power Project (the Project), located in Yellowhead County.

***Project Overview***

Cascade Power is proposing to build, own and operate a combined cycle power generation facility, located on Crown Lands approximately 12 kilometres southwest of the town of Edson, Alberta, in Yellowhead County. This facility will have an estimated total output of 900 megawatts (MW). If approved, the proposed Project footprint will be approximately 500 metres by 400 metres and will require up to 150,000 GJ/day of pipeline specific natural gas as fuel.

The attached project information brochure provides an overview of the combined cycle power generation facility and how, if approved, the Cascade Power Project will add value to the provincial and local economy.

***Community Relationships***

As part of its corporate values and beliefs, Cascade Power strives to develop and maintain positive, meaningful, long-term relationships with communities adjacent to our facilities and operations, and we are committed to operating our business with integrity and open communication.

While it has been determined that consultation is not required with Alexander First Nation, we are providing our project information brochure as a means to introduce our company and proposed Project. Cascade Power is required to submit a Project Description as per the *Canadian Environmental Assessment Act* to the Canadian Environmental Assessment Agency (CEAA). The agency will then determine whether a federal environmental assessment is required. As a result, CEAA may contact you with regard to the determination.

***Contact***

If you require further information regarding the proposed Cascade Power Project, or would like to discuss the Project further, please contact me directly at 1.403.815.0203

Sincerely,

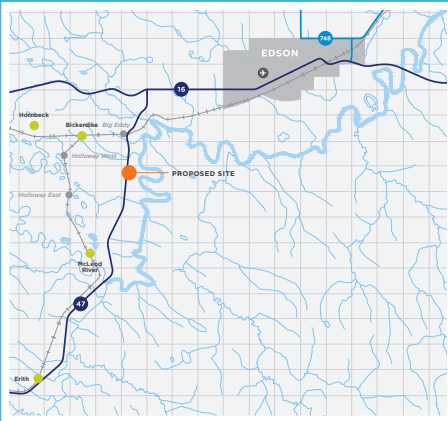
Rob Thomas  
Director, Regulatory Services  
Cascade Power Project

# CASCADE POWER PROJECT

JULY 2018 / Newsletter



## PROPOSED PROJECT LOCATION



## PROJECT DESCRIPTION

Cascade Power is proposing to develop a 900-megawatt (MW) combined cycle power facility, located in Yellowhead County approximately 12 kilometres southwest of Edson, Alberta. Cascade Power is an Alberta based power producer passionate about creating a clean energy future for Canada.

It is anticipated that the Project will be developed in two phases, with the first 450 MW of generation in service by 2022, and the second 450 MW phase being brought into service in the following year. The Project will be located on crown lands on a 52-hectare site and will have the capacity to serve the electrical needs of approximately 900,000 homes and businesses in Alberta. The facility will utilize modern, highly efficient industrial turbines, fueled by natural gas.

## You're Invited

Please join us at our community open house to learn more about the proposed Cascade Combined Cycle Power Project and to meet the Project team.

**Wednesday, July 25, 2018**  
**4:30p.m. – 8:00p.m.**  
**Best Western High Road Inn**  
**300 – 52nd St, Edson, Alberta T7E 1X8**

Cascade Power Project representatives will be available to share Project specific information, including studies being conducted to assess impacts to noise and air emissions and to gather feedback from the community. Light refreshments will be served; we look forward to seeing you.

## THE NEED

Alberta has set a renewable energy target in which 30% of future electricity requirements will come from renewable sources. Across Alberta, numerous wind and solar projects are currently being developed to help meet this target. However, the province will still need additional sources of reliable and cost effective sources of electricity that can support its future energy requirements.

Natural gas is one of the most affordable, reliable and abundant energy sources in Alberta. Combined cycle power facilities have been identified as a viable option to help reduce emissions and provide low carbon, reliable on-demand power.



For more information on Alberta's Climate Leadership Plan, please visit:  
<https://www.alberta.ca/climate-coal-electricity.aspx>

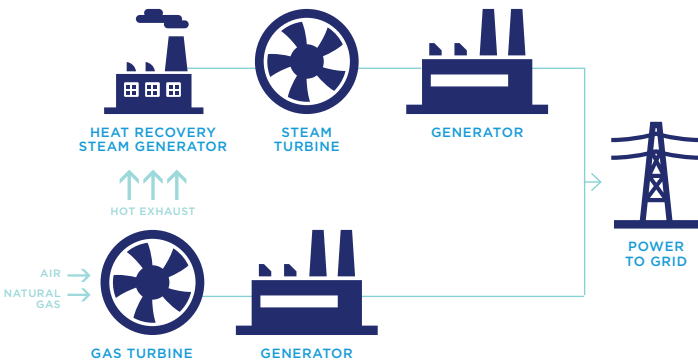
Alberta's abundant supply of natural gas is one of the cleanest, cheapest and most efficient sources of energy.

### COMBINED CYCLE POWER GENERATION FACILITIES

Natural gas combined cycle power generation facilities are a high efficiency, environmentally attractive form of power generation necessary to meet the growing demand for electricity in Alberta.

Combined cycle power facilities are comprised of a combination of both gas and steam power production technologies. A combined cycle power facility uses natural gas as a fuel to produce power in a gas-turbo generator and then utilizes the waste energy from the exhaust to produce steam, which then drives the steam-turbo generator. This process produces up to 50 per cent more electricity from the same amount of fuel than a traditional simple cycle power facility, which utilizes only a gas-turbo generator.

In order to fuel the combined cycle power facility, natural gas will be supplied to the plant via a small pipeline tied into the existing natural gas distribution network located near the Project.



#### Benefits:

- Optimal power outputs
- Higher efficiency
- Lower emissions

### Associated Components

The Project will require electricity, natural gas, and a water source. The site location is considered favourable because of its close proximity to existing substations and transmission lines



- Electricity will be supplied by interconnecting with the AltaLink 39S Substation adjacent to the Project site via a short power line.



- Gas will be supplied through a new supply pipeline tied into an existing natural gas transportation network, which is located in the vicinity of the site.



- Limited water is required for the Project as Air-cooled Condensers will be utilized, however the steam cycle requires make-up water which will be sourced locally.

Today, more than ever, the way we create and utilize energy matters.

### ENVIRONMENT

As a leading innovator in the development of efficient methods of generating power and heat, Cascade Power delivers smart generation solutions to energy consumers.

The Project is being designed and will be operated in a way that minimizes potential adverse environmental effects and supports the provincial government's effort to continue to diversify its overall power production mix. As part of the regulatory application, the following environmental studies and assessments have either been completed or in progress:

**Air** — A dispersion modelling assessment compliant with the Alberta Air Quality Model Guideline (AQMG) will be completed to assess Project effects on air quality. The Project will meet the National Base Level Industrial Emissions Requirements (BLIERS).

**Noise** — A detailed noise impact assessment is being undertaken to assess the noise that will be generated by the Cascade Power facility during both the construction and operation phases. The Project would comply with applicable regulatory noise limits, including the Alberta Utilities Commission (AUC) Rule 012: Noise Control.

**Field Surveys** — Various surveys and desktop reviews, specific to soils, vegetation and incidental wildlife have been conducted and are ongoing.



**ADDING VALUE IN ALBERTA**

**Creating power for a sustainable future.** The development of combined cycle power generation facilities will provide reliable on-demand power, which will help keep electricity costs competitive and will help Alberta transition to a diverse energy future.

**Efficiency and optimization of resources is critical.** Combined cycle power plants will help maintain a reliable supply of electricity as more renewable energy like solar and wind comes online.

**Creating opportunity for Edson and region.** The total capital investment associated with the Cascade Power Project is anticipated to be approximately \$1.5 Billion. Should the Project receive regulatory approval, Cascade Power anticipates that it will take three years of construction, employing at peak some 700 workers. Almost 2,000,000 man-hours will be required to undertake construction. During operations, Cascade anticipates a full-time workforce of approximately 20 people supported by local services and contractors, where required.

**ANTICIPATED PROJECT SCHEDULE**

In fall 2018, following completion of environmental studies and assessments and public and Indigenous engagement, Cascade Power will submit regulatory applications to the Alberta Utilities Commission (AUC) and Alberta Environment and Parks (AEP). Following regulatory approval, construction is anticipated to commence in spring 2019, with a planned in-service date of October 2022.

**COMMUNITY INVOLVEMENT + BENEFITS**

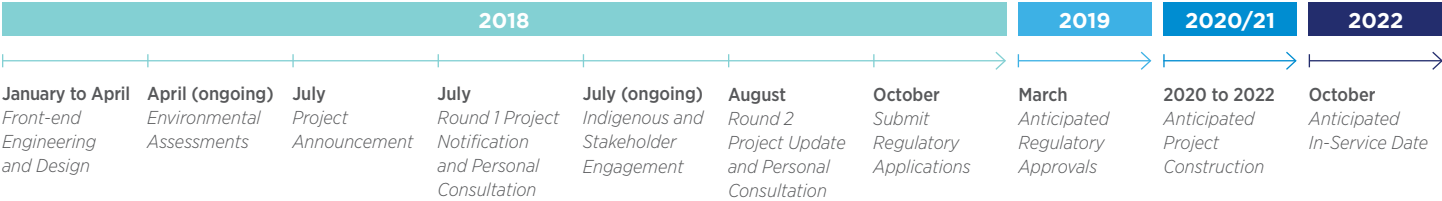
The development and operations of the Project will play an important role in the local economy by providing jobs during construction that will benefit the local and Indigenous communities, businesses and suppliers, as well as provide a base of additional tax revenue to Yellowhead County.

Cascade Power will work collaboratively and responsively with all interested parties, to answer questions and to better appreciate and understand potential issues or concerns regarding the Project.

Cascade Power believes strong Indigenous and stakeholder relationships strengthen the business decisions we make. We strive to build long-term relationships by collaborating with and listening to our neighbours in the area. We hope to maintain an open and respectful dialogue over the years to come.

**SAFETY**

Cascade Power supports policies that protect and enhance the safety of our workers and the communities within which we operate. If there are community concerns related to the Project, please contact us using the Project’s toll free number: **1-855-955-3056**



## FREQUENTLY ASKED QUESTIONS

### Why Yellowhead County?

Access to gas supply, proximity to power lines, and land access all played a role in the site selection process. The proximity to Edson will allow for staging during construction as well as access and investments into local goods and services.

### How long will construction take and what can I expect?

Should regulatory approvals be received, Cascade Power anticipates that it will require three — four years of construction to complete the new facility. We estimate that the workforce requirements will peak at some 700 people. Once operational, Cascade Power would employ more than 20 direct, long-term skilled jobs in the community.

### Will there be increased traffic due to construction?

The precise sequencing and traffic management plan for construction of the Project has yet to be determined. It is anticipated that construction of the facility may impact traffic at various times during large equipment delivery. Where possible, the Project will maintain safety and enforce an approved traffic management plan.

### What visual impacts can I expect to see?

The proposed Project site is located on a cleared site and would be visible from Highway 47. To reduce the visual impact of the facility, Cascade will continue to assess options to modify the overall site plan, through such measures as berms and other related options.

### Will this Project affect water in the area?

The Project anticipates that water could be trucked in to the Project site, to meet the needs of construction and operations.

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## NEXT STEPS

**As we move through the regulatory and permitting process, we will continue the dialogue with landowners and stakeholder in the area. We will consider your feedback for this Project. We encourage you to reach out to us as we provide Project updates.**

## CONTACT US

We welcome your feedback about the Project at any time. If you have any questions or concerns regarding the Cascade Power combined cycle power project, do not hesitate to contact us at:

Email: [info@cascadepower.ca](mailto:info@cascadepower.ca)

Toll-free: **1-855-955-3056**

For more information about the Project, please visit:

[www.cascadepower.ca](http://www.cascadepower.ca)

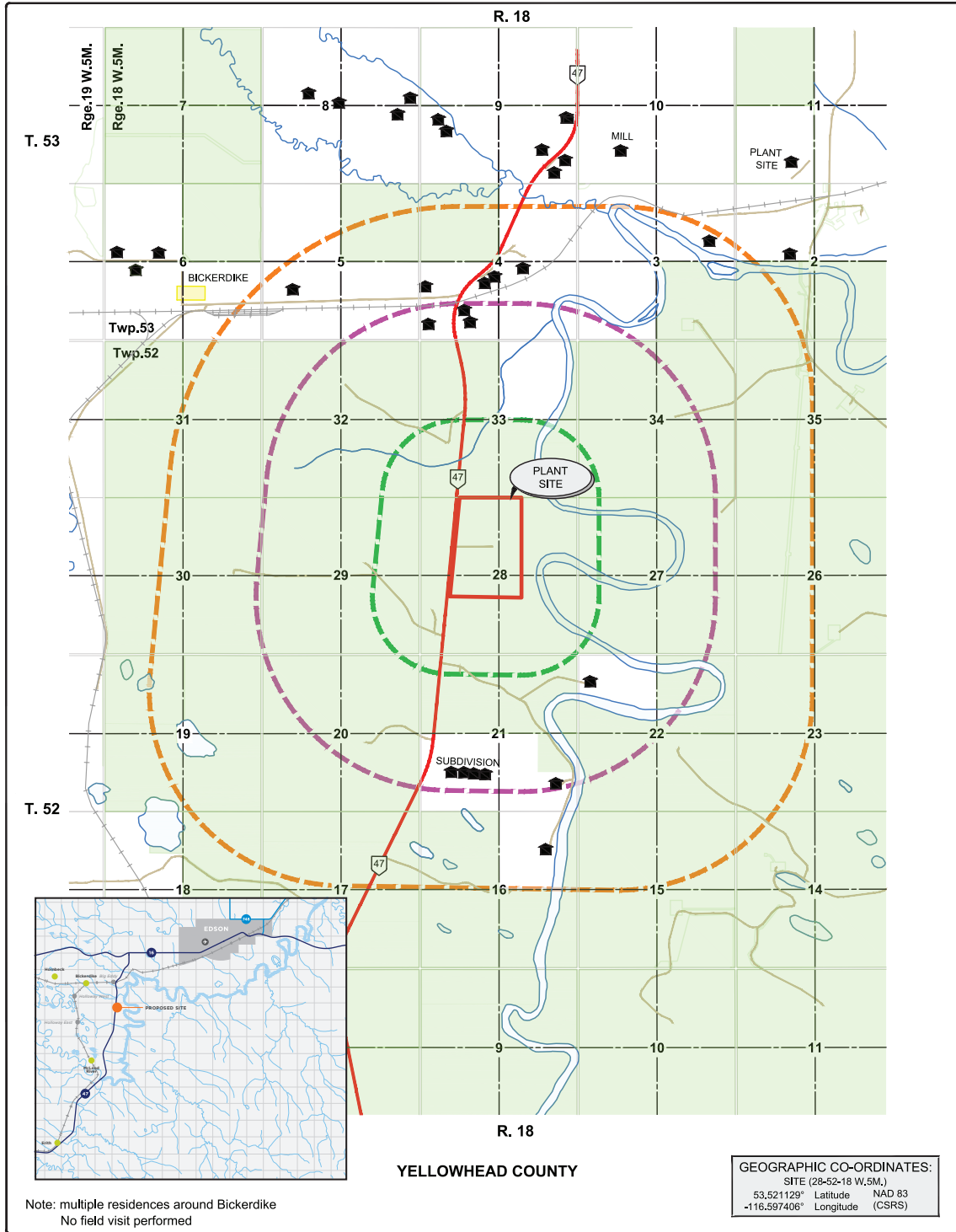


*Cascade Power is committed to protecting your privacy. Collected personal information will be protected under the Freedom of Information and Protection of Privacy Act. As part of the regulatory permitting process, Cascade Power may provide your personal information to provincial regulators and public responses may be reported in our regulatory application, which becomes part of the public record. Personal information we collect may be used to contact you in the future.*



# Cascade Power Project

## Project Location and Notification Map



LEGEND:	
800 m Radius Shown Thus:	
2.0 Km Radius Shown Thus:	
3.0 Km Radius Shown Thus:	
Proposed Plant Location:	
Surface Development:	
Crown Lands:	
Primary Highway:	
Secondary Highway:	
Road / Trail:	
Railroad:	
Water Courses:	
Lakes:	
Town/City:	

RADIUS MAP FOR:

**POWER PLANT**  
**Sec.28 Twp.52 Rge.18 W.5M.**

**Cascade Power Project**  
**Limited Partnership**