INITIAL PROJECT DESCRIPTION

For the
BLACK BEAR POWER PLANT

Project Location
19 km south of Swan Hills, Alberta
LSDs 1, 2, 6, 7, 8, Section 15,
Township 64, Range 11, W5M

Proponent
Kiwetinohk Energy Corp.

Submitted to
IMPACT ASSESSMENT AGENCY OF CANADA

DOCUMENT COMPLETED BY

McCallum Environmental Ltd.

July 2024

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LIST OF DEFINED TERMS

Project	Black Bear Combined Cycle Power Plant
Indigenous Communities	First Nations or Métis Settlements

LIST OF ACRONYMS

AAAQOs	Alberta Ambient Air Quality Objectives
ACE	Air Contaminant Emissions
ACIMS	Alberta Conservation Information Management System
ACMSW	Alberta Culture, Multiculturalism and Status of Women
ACO	Aboriginal Consultation Office
ADR	Alberta Activities Designation Regulation
AEPA	Alberta Environment & Protected Areas (formerly AEP)
AER	Alberta Energy Regulator
AESO	Alberta Electrical System Operator
AGS	Alberta Geological Survey
AHS	Alberta Health Services
AMD	Air Monitoring Directive
APEGA	Association of Professional Engineers and Geoscientists of Alberta
AQA	Air Quality Assessment
AQMG	Air Quality Model Guideline
AUC	Alberta Utilities Commission
BEAHR	Building Environmental Aboriginal Human Resources
BBPP	Black Bear Combined Cycle Power Plant
BBS	Breeding Bird Survey
BMA	Bear Management Area
BMP	Best Management Practice
BTES	Bear Tracks Environmental Services
CAAQS	Canadian Ambient Air Quality Standards
CCIR	Carbon Competitiveness Incentive Regulation
CCP	Carbon Capture Plant
CCS	Carbon Capture System
CEMS	Continuous Emission Monitoring System
CER	Clean Electricity Regulations
CO_2	Carbon Dioxide

CO_2e	Carbon Dioxide Equivalent
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CRE	Central Rockies Ecosystem
CTG	Combustion Turbine Generator
DARS	Data Acquisition and Report generating system
dBA	A-weighted decibels
DBH	Diameter at breast height
DCC	Direct Contact Cooler
DCS	Distributed Control System
DFO	Department of Fisheries and Oceans
DLN	Dry Low NOx
DML	Department Miscellaneous Lease
ECCC	Environment and Climate Change Canada
EIA	Environmental Impact Assessment
EO	Element Occurrences
EPC	Engineering, Procurement, and Construction
EPEA	Environmental Protection and Enhancement Act
ESA	Environmentally Significant Area
ESRD	Alberta Environment and Sustainable Resource Development
FMA	Forest Management Agreement
FWIMT	Fish and Wildlife Internet Mapping Tool
FWMIS	Fisheries and Wildlife Management Information System
GBA+	Gender Based Analysis Plus
GBWU	Grizzly Bear Watershed Unit
GHG	Greenhouse Gas
GIS	Geographic Information System
gpm	Gallons Per Minute
GSC	Geological Survey of Canada
GWP	Global Warming Potential
ha	Hectare
HEEA	Hydro and Electric Energy Act
HP	High Pressure
HR	Historical Resources
HRA	Historical Resources Act
HRIA	Historical Resources Impact Assessment

HRV	Historical Resources Value
HRSG	Heat Recovery Steam Generator
HSE	Health, Safety and Environment
HV	High Voltage
IAA	Impact Assessment Act
IAAC	Impact Assessment Agency of Canada
IBA	Important Bird Area
IC	Indigenous Communities
IDF	Intensity-Duration-Frequency
IP	Intermediate Pressure
IWC	Indigenous Wellness Core
KEC	Kiwetinohk Energy Corp.
km	kilometres
kV	kiloVolt
LAT	Landscape Analysis Tool
LP	Low Pressure
LSD	Legal Subdivision
m	metre
m^3	Cubic metre
MEL	McCallum Environmental Ltd.
MGLC	Maximum Ground-Level Concentrations
MMV	Monitoring, Measurement, and Verification
MW	Megawatt
MWh	Megawatt hours
N	North
NE	Northeast
NIA	Noise Impact Assessment
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
O_2	Oxygen
OPaC	Online Permitting and Clearance system
OWS	Oily Water Separator
PDC	Power Distribution Center
PIP	Participant Involvement Program
$PM_{2.5}$	Particulate Matter (less than 2.5 microns in diameter)

POD	Point of Diversion
PSL	Permissible Sound Level
RH	Reheat
ROC	Record of Consultation
RSF	Resource Selection Function
SAR	Species at Risk
SARA	Species at Risk Act
SCR	Selective Catalytic Reduction
SE	Southeast
SO_2	Sulphur Dioxide
SOGIE	Sexual Orientation, Gender Identity & Gender Expression
STG/ST	Steam Turbine Generator
SW	Southwest
TBD	To Be Determined
TDL	Temporary Diversion License
TEG	Triethylene Glycol
TFA	Temporary Field Authorization
TIER	Technology Innovation and Emissions Reduction
TL	Transmission Line
TLRU	Traditional Land and Resource Use
TRU	Carbon Capture Thermal Reclaimer Unit
TSP	Total Suspended Particulate
UTM	Universal Transverse Mercator
VEC	Valued Ecosystem Components
W5M	West of the Fifth Meridian
WCAS	West Central Airshed Society
WWDR	Water Well Drilling Report

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PART A: GENERAL INFORMATION

Kiwetinohk Energy Corp. is proposing to permit, construct and operate the 460-Megawatt ('MW') Black Bear Power Plant. The Project is located on provincial Crown land approximately 19 km south of the Town of Swan Hills, Alberta.

This Project Description has been prepared in accordance with the Impact Assessment Agency of Canada (IAAC) *Guide to Preparing an Initial Project Description* under the *Impact Assessment Act, 2019.* The numbers and titles used as main headings in the document align with the guide for ease of reference. A concordance table can be found in Appendix A – Concordance Table. The content of this document meets the information requirements of the *Information and Management of Time Limit Regulations*, Schedule 1 (SOR/2019-283).

1 PROJECT INFORMATION

Kiwetinohk Energy Corp. (KEC) is proposing to permit, construct and operate the 460MW Black Bear Combined Cycle Power Plant (herein referred to as 'BBPP', or the 'Project'), with a carbon capture plant (CCP), and a 240kV substation on provincial Crown land approximately 19km south of the Town of Swan Hills, Alberta. The BBPP is a combined cycle power plant that is carbon capture ready consisting of one natural gas fired combustion turbine, one steam turbine, one carbon capture package, and one CO_2 compression and dehydration package.

Power at the BBPP will be fueled by using natural gas and will generate electricity from a "one-on-one" configuration consisting of one Combustion Turbine Generator (CTG), one Heat Recovery Steam Generator (HRSG), and one Steam Turbine Generator (STG) which will comprise the Power Island in a single shaft configuration with a common generator. The steam turbine will be a condensing type using an air-cooled condenser rather than a water-cooled surface condenser. The air-cooled condenser mitigates the need for either large reliable water source with availability year-round or a large storage pond.

Raw source water will either be obtained from on-site water wells or from the Freeman River via trucking with the point of diversion (POD) at 08-02-065-11W5. The water will be stored in a raw water tank, then pumped to an on-site water treatment system to produce fire/service water. To divert from the Freeman River, KEC will obtain a Temporary Diversion Licence (TDL) issued under the *Water Act* of the Province of Alberta. The proposed diversion will adhere to the requirements of the Province of Alberta *Water Act*, the Province of Alberta *Water Act Water (Ministerial) Regulations*, the AEP *Surface Water Allocation Directive*, Fisheries and Oceans Canada (DFO) *Interim code of practice: End-of-pipe fish protection screens for small water*

intakes in freshwater, DFO *Measures to protect fish and fish habitat* as well as conditions of the TDL as issued by Alberta Environment and Protected Areas.

Natural gas for the Project will be supplied from a new dedicated pipeline tied to an existing natural gas pipeline located 3.8 km northeast of the plant site at 03-25-064-11W5.

Electricity will be delivered to an existing 240kV HV transmission line located approximately 600 m west of the BBPP with the point of interconnection expected to be in 05-15-064-11W5.

The Project is a key pillar in KEC's energy transition business strategy which includes providing clean, reliable, dispatchable, and affordable energy to Albertans. The Project will provide the province a significant amount of baseload generation which is substantially lower in emissions and at higher thermal efficiency than any other existing thermal generation plant in Alberta. With the addition of the carbon capture system the Project will be up to 95% emission free and as the first of a kind provide a basis for other power generators to emulate.

1.1 PROJECT LOCATION

The BBPP is located approximately 19 km south of Swan Hills and 45 km north of Whitecourt, Alberta, Canada (See Figure 1. BBPP Location, Appendix B). The location for the Project was selected based on proximity to natural gas supply; demand for electricity and available export grid capacity; nearby CO_2 sequestration opportunities; established road network; adequate acreage; minimum number of neighbors to avoid noise inconvenience; access to site and road load capacity; and other environmental factors.

Access to the site is by Highway 32, 19 km south of Swan Hills, Alberta. From the highway, it is another 9 km to the northwest to the Project site from the Conifer Energy Inc. Road turnoff from Alberta Highway 32. Access to the site is along a medium grade road that runs along the southwest border of the site. No new access or access controls are required for the BBPP.

The Project will be constructed within 20.65 hectares (ha) of undeveloped forested land and is located in Legal Subdivisions (LSDs) 1, 2, 6, 7, 8, SE and SW ¼ Section 15, Township 64, Range 11, West of the 5th Meridian (W5M).

South end of Project area located at:

- Latitude: 54.532535°
- Longitude: –115.573190°
- NAD 83 UTM Easting Zone 11U: 592395.76 m E
- NAD 83 UTM Northing Zone 11U: 6043997.35 m N

1.1.1 Ancillary Facilities

1.1.1.1 Natural Gas Pipeline

Natural gas for the Project will be supplied from a new dedicated pipeline tied to an existing natural gas pipeline located 3.8 km northeast of the plant site. The point of interconnection will be at LSD 3, Section 25, Township 64, West of the 5th Meridian.

The exact pipeline routing has not yet been surveyed. The route, once surveyed, will be assessed, and permitted as per Alberta Energy Regulator (AER) requirements. This will include an assessment of environmental site conditions. KEC intends to follow existing disturbances where practical, official routing will be submitted through AER.

Two potential natural gas pipeline routes were selected by desktop analysis as potential route options, with the point of connection at 03-25-064-11 W5M, however only the preferred route will be applied for to the AER. Table 1 below provides a summary of the pipeline route options. Refer to Figure 2 in Appendix B to view potential pipeline options.

Table 1. Natural Gas Pipeline Options Description

Specification	West Option	East Option
Approximate Right-of-Way width (m)	15	15
Approximate Right-of-Way length (m)	4570	4385
Approximate Right-of-Way area (ha)	6.85	6.77

Specification	West Option	East Option
Approximate route length adjacent to existing disturbance (metres)	3570	4080
Type of adjacent existing disturbance	Existing pipelines, access roads, and forestry	Existing pipelines, access roads
Estimated Number of Watercourse Crossings	3	1
Estimated Number of Wetland Crossings	1	1
Number of road crossings	2	2
Number of Pipeline Crossings	11	11
Private Land Crossed	No	No
Risks	Route results in little increased linear disturbance and wildlife habitat fragmentation. The pipeline is parallel to existing infrastructure for the majority of the route (78%)	Route results in minimal increased linear disturbance and wildlife habitat fragmentation. The pipeline is parallel to existing infrastructure for the majority of the route (93%)

1.1.1.2 Transmission Line

Electricity will be delivered to an existing 240kV HV Transmission Line ('TL') located approximately 600 m west of the BBPP. The point of interconnection is expected to be in LSD 3, Section 5, Township 64, West of the 5th Meridian. Three potential TL routes were selected by desktop analysis as potential route options, however only the preferred route will be constructed. KEC intends to follow existing disturbances where practical and the official routing will be applied for through the Alberta Utilities Commission (AUC) and Alberta Environment and Protected Areas (AEPA) regulatory agencies. Table 2 below provides a summary of the Project route options. Refer to Figure 3 in Appendix B to view potential TL options.

Table 2. Transmission Line Options Description

Specification	Option 1	Option 2	Option 3
Approximate Right-of-Way width (m)	50	50	50
Approximate Right-of-Way length (m)	1052	582	1263
Approximate Right-of-Way area (ha)	5.26	2.91	6.32
Approximate route length adjacent to existing disturbance (metres)	843	190	830
Type of adjacent existing disturbance	Existing pipelines and reclaimed well sites	Reclaimed well site	Access roads and reclaimed well sites
Estimated Number of Watercourse Crossings	0	0	0
Estimated Number of Wetland Crossings	0	0	0
Number of road crossings	2	1	1
Number of Pipeline Crossings	3	1	2
Private Land Crossed	No	No	No
Risks	Route results in increased linear disturbance and wildlife habitat fragmentation. Approximately 80% of this route is parallel to existing linear infrastructure.	Shortest route option. Route results in increased linear disturbance and wildlife habitat fragmentation.	Route results in increased linear disturbance and wildlife habitat fragmentation. Approximately 66% of this route is parallel to existing linear infrastructure.

1.1.2 Alternative Project Locations

Alternative locations for the Project site were identified from aerial photographs and site reconnaissance. Seven (7) alternate locations were reviewed prior to further assessment of the BBPP final proposed location.

Both the surveyed location and these seven alternate locations were evaluated to determine which siting would have the least impacts on operational design, environmental features, and existing infrastructure and existing land use. The criteria considered during the evaluation were:

- Land with adequate acreage and convenient existing access to reduce new access construction;
- Avoidance of areas that were unique or potentially sensitive to disturbance, based upon desktop review of public databases;
- Avoidance of disturbance to areas with large concentrations of salvageable timber (i.e. the preference was for previously clearcut areas;
- Avoidance of fish and wildlife conflicts based upon potential habitat (I.e., clearcuts, lack of watercourses, wetlands, existing access);
- Utilization of existing clearings (i.e. clearcuts) to minimize new disturbance to flora and fauna;
- Minimization of disturbance to natural drainage patterns (I.e., no watercourses with defined bed or banks were identified);
- Finding lands with topography with limited slopes to avoid excessive amounts of cut / fill required to manage soils during construction and reclamation;
- Avoidance of areas with permanent residences;
- Allowance to meet potential noise setbacks as regulated by the AUC;
- Proximity to the Alberta Electrical System with grid capacity to receive the expected power output from the BBPP and to reduce the length of overhead transmission line required to interconnect to the electrical grid;
- Proximity to existing natural gas fuel supply to reduce the length of the gas pipeline to the greatest extent possible, and;
- Established industrial roads resulting in a lack of new road infrastructure required.

The BBPP lands meet all the above noted criteria to the greatest extent possible over the other locations considered. Considering the above noted preliminary characteristics, the proposed location was chosen as it minimizes the impacts listed above.

2 PROPONENT INFORMATION

KEC's mission is to build a profitable energy transition business which provides clean, reliable, dispatchable, low-cost energy. KEC develops and produces liquids rich natural gas and related products and is in the process of developing renewable and natural gas-fired power generation projects with a vision of also incorporating carbon capture technology and hydrogen production, all as part of a broader, integrated portfolio of clean energy assets that will support energy transition in the markets that it serves (See Table 3 below for contact information).

The name Kiwetinohk, which means "north" in the Cree language, was bestowed on the Company by Indigenous friends.

Table 3. Proponent and Primary Representative Contact Information

Name of the Designated Project	Black Bear Power Plant
Name of the Proponent	KIWETINOHK ENERGY CORP.
Address of the Proponent	1700, 250 – 2 Street SW Calgary, AB T2P 0C1
President and CEO	Pat Carlson
Primary Representative	Dobromir Filip Green Energy Division, Director of Development and Engineering dfilip@kiwetinohk.com Office: +1 587 392 4414 Cell: +1 403 835 4881

3 ENGAGEMENT WITH THE PUBLIC, REGULATORY AGENCIES, AND OTHER PARTIES

Public consultation for this Project is being completed as per the requirements of the AUC Rule 007 application process, and the IAA required processes of public notice on the IAA website. In addition, the *Alberta Environmental Protection and Enhancement Act* (EPEA) application requires a 30-day public notice once the draft terms and conditions are issued.

As per AUC Rule 007 requirements, a Participant Involvement Program (PIP) was undertaken by KEC (Appendix C – Consultation Program) and was initiated in September 2022. For reference, the PIP Guidelines are included in Appendix A1 of AUC Rule 007. The goal of the PIP was to equip all potentially affected stakeholders with any necessary information and understanding regarding the Project to enable them to provide their questions, concerns, and suggestions through personal consultations and other engagement methods.

Consultation and notification included landowners, occupants, residents, agencies, and industrial interest holders who may potentially be impacted by the BBPP.

The PIP report will be provided to the AUC to ensure that adequate and meaningful consultation has occurred.

KEC is confident that the PIP has succeeded in ensuring that stakeholders:

- have been properly and adequately notified about the Project; and,
- have been given the opportunity to ask questions and raise issues and concerns about the Project and have had those questions, issues and concerns addressed.

3.1 List of Public, Regulatory Agencies, and Other Parties Consulted

The following lists federal agencies, provincial regulatory agencies, municipal agencies, stakeholders, or other industries consulted or requiring regulatory applications.

Federal

1. Impact Assessment Agency of Canada (IAAC)

Provincial

1. Alberta Energy Regulator
2. Alberta Environment and Protected Areas, Operations and Provincial Approvals

3. Alberta Environment and Protected Areas, Industrial Approvals
4. Alberta Environment and Protected Areas, Land Use Area, Lands Division
5. Alberta Culture, Multiculturalism and Status of Women
6. Alberta Utilities Commission
7. Alberta Jobs, Economy and Trade
8. Aboriginal Consultation Office

Municipal

1. Big Lakes County, AB

Public Consultation

Consultation occurred with all applicable landowners, occupants, residents, agencies, and industrial interest holders who may potentially be impacted by the proposed Project within a minimum of 2000 m from proposed facilities. This was completed to satisfy the public consultation requirement of the AUC as outlined in Rule 007.

In addition, following review of the BBPP by AEPA for the Industrial Approval and once the application is deemed complete, AEPA will post public notices requesting public comments on the Project.

Industry Consultation

Industry Notifications were sent to the following:

1. NOVA Gas Transmission Ltd.
2. ATCO Electric Ltd.
3. Conifer Energy Inc.
4. Plains Midstream Canada ULC
5. Accel Energy Canada Limited
6. Trident Exploration (Alberta) Corp.
7. Shipwreck Oil & Gas Ltd.
8. Strathcona Resources Ltd.

A summary of correspondence can be found in Appendix C.

3.2 Regulatory Requirements of Provincial and Municipal Jurisdictions

The following provides an expanded summary of the provincial or municipal regulatory permitting requirements for the BBPP, listed by regulatory agency that is applicable to the IAA review. No federal permits or authorizations are required for the BBPP.

1. Alberta Environment and Protected Areas (AEPA), formerly Alberta Environment and Parks (AEP)

    a. A Project Summary Table and Project Report, including location figures has been provided by email to Alberta Environment and Parks, Operations, Provincial Approvals, requesting a review to determine if an Environmental Impact Assessment report is required for the proposed BBPP pursuant to Section 44 of the *Environmental Protection and Enhancement Act* (EPEA). As of June 21st, 2023, KEC received confirmation from AEPA that an environmental impact assessment report (EIA) is not required for the BBPP (Appendix D – AEPA Correspondence re. EIA Requirement).

    b. The construction, operation or reclamation of a power plant are designated activities under Schedule 1, Division 2, Part 9 of the Alberta *Activities Designation Regulation* (276/2003) (the "ADR"). A "power plant" is defined under section 2(vv) of the ADR to means a plant that produces steam or thermal electrical power and has a rated production output of greater than one megawatt under peak load. The BBPP falls within the scope of this definition and therefore requires an authorization in the form of an Approval under the *Environmental Protection and Enhancement Act.* As such, KEC will be making an application to Alberta Environment and Protected Areas for approval of the Power Project in accordance with the *Environmental Protection and Enhancement Act: Guide to Content for Industrial Approval Applications* (Government of Alberta, 2014). The approval of the Project has a 10-year approval limit, at which time, a renewal application would be required. Furthermore, any material changes to the Project, over the lifetime of the Project, require submission and approval of an amendment application.

    c. Due to the use of a fresh water source for the Project, the proposed diversion will adhere to the requirements of the Province of Alberta *Water Act,* the Province of Alberta *Water Act Water (Ministerial) Regulations,* the AEP *Surface Water*

Allocation Directive, Fisheries and Oceans Canada (DFO) *Interim code of practice: End-of-pipe fish protection screens for small water intakes in freshwater*, DFO *Measures to protect fish and fish habitat* as well as conditions of the TDL as issued by AEPA.

d. Due to the use of Alberta provincial Crown land, KEC submitted a land application for a Departmental Miscellaneous Lease (DML), which authorizes a commercial use under a miscellaneous lease. This application includes an assessment of environmental site conditions and Indigenous Community consultation. The BBPP received a DML approval (Disposition Number: DML230030) on October 5th, 2023 (Appendix E – DML Approval).

2. Alberta Culture, Multiculturalism and Status of Women (ACMSW): The BBPP submitted a Historic Resources (HR) Application to the Historical Resources Management Branch for review under the *Historical Resources Act*, to determine whether a Historical Resources Impact Assessment (HRIA) for archaeology or paleontology is required. The BBPP received a Historical Resource Act Clearance to proceed on February 16th, 2023 (HRA Number: 4940-23-0013-001).

3. Alberta Utilities Commission (AUC): The Project will be providing electrical energy to the provincial power grid. Therefore, BBPP has submitted an application to the AUC pursuant to Section 11 and 19 of the *Hydro and Electric Energy Act*, c H-16, R.S.A. 2000 (the HEEA), as amended. The BBPP has applied to the AUC for connection of the Project to an electric distribution system pursuant to Section 18 of the HEEA and is currently awaiting approval. The AUC application was completed in accordance with the requirements in AUC Rule 007 – *Applications for Power Plants, Substations, Transmission Lines, and Industrial System Designations*. The AUC requires engagement with the public (e.g., local landowners), Indigenous Communities, government agencies, municipalities, industry, association, and special interest groups. 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.

4. Municipal: A development permit will likely be required from the Big Lakes County ("County") for the BBPP. The same public information package that was sent to landowners, occupants and residents will be sent to the County. The County requires a land title, site plan and development permit application to be filled out with a Letter of

Authority for the DML. A development permit application has been underway since the DML was approved in October, 2023.

3.2.1 Provincial Environmental Assessment Requirements

As of June 21st, 2023, KEC received confirmation from AEPA that an environmental impact assessment report (EIA) is not required for the BBPP (Appendix D – AEPA Correspondence re. EIA Requirement). However, the applications to AEPA for the Industrial Approval, and AUC, follow a prescribed table of contents that require comprehensive 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* (Government of Alberta, 2014) It includes:

- a description of the current setting and condition of the environment;
- the current ambient air quality of the Project area (for the BBPP as 12 km x 12 km area was considered);
- 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 habitat description and evaluation of any proposed receiving watercourses;
- wastewater and runoff treatment and control;
- completion of an air quality assessment report;
- air treatment and control mechanisms;
- environmental risks and mitigation during construction;
- environmental objectives during operation and environmental management systems; and,
- reclamation objectives and a conceptual reclamation plan.

The information required in the environmental evaluation of the Project by AUC includes a prediction of the Project's effects on the environment and the measures to avoid or mitigate the Project's predicted adverse environmental effects and any monitoring proposed to evaluate the efficacy of those measures. Specifically, the environmental evaluation required to meet AUC requirements 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; and,
- 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.
- The BBPP had the noise impact assessment completed and the facility meets the provincial AUC 012.

3.3 Overview of Key Comments and Concerns Expressed by Stakeholders

KEC has conducted stakeholder engagement and consultation. See Appendix C for further detail on stakeholder consultation. Other than concerns of Indigenous Communities, which are addressed below in Sections 4.3 and 4.4, there were no other questions or concerns raised.

3.4 Ongoing Engagement Activities and Future Engagement Plans

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

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

KEC will continue to maintain the relationships it has built with its stakeholders as the Project moves forward, and should the BBPP be approved, will continue to engage with stakeholders through construction and operation of the Project, as they believe this will result in a better Project and long-term involvement in the region.

4 ENGAGEMENT WITH INDIGENOUS COMMUNITIES

4.1 PROVINCIAL CONSULTATION OFFICE REQUIREMENTS

KEC submitted a pre-consultation request to the Alberta Aboriginal Consultation Office (ACO) for a Departmental Miscellaneous Lease (DML) on Crown land for the BBPP, which authorizes a commercial use under a miscellaneous lease. It was determined that Level 2: Standard Consultation was required, which allows notified Indigenous Communities up to 20 Government of Alberta working days to respond to the project notification. If any Indigenous Communities respond to the notification, consultation should be complete within 20 working days of the notification response. If the 20-day notification period expires and the Indigenous Community did not respond to the project notification within that time, KEC, after providing Indigenous Communities with 5 working days to review the consultation record, may ask the ACO to review the consultation record for adequacy.

KEC adhered to ACO Level 2 – Standard Consultation requirements, and where requested, provided Indigenous Communities with additional time to review and respond to the project notification. KEC did have numerous requests and accommodated those requests for additional time from various Indigenous Communities.

4.1.1 LIST OF POTENTIALLY AFFECTED AND INTERESTED INDIGENOUS COMMUNITIES

In accordance with Alberta's First Nations and Métis Settlements policies and guidelines (Government of Alberta, 2024a), the ACO indicated that the BBPP is located within the traditional territories of the:

1. Driftpile Cree Nation
2. East Prairie Métis Settlement
3. Kapawe’no First Nation
4. Paul First Nation
5. Sawridge First Nation
6. Sturgeon Lake Cree Nation
7. Sucker Creek First Nation
8. Swan River First Nation

KEC commenced Provincial consultation with the aforementioned groups in September 2022. KEC further engaged with these communities and additional communities identified under the federal impact assessment process as described below.

4.2 Impact Assessment Agency of Canada Requirements

On February 1, 2023, the federal Impact Assessment Agency (IAA), identified fourteen (14) communities who may be impacted by the Project.

Out of the fourteen communities, eight of these communities had previously been consulted with under the provincial ACO process, as described in Section 4.1.1.

Treaty 8 First Nations

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

Treaty 6 First Nations

- Paul First Nation
- Alexis Nakota Sioux Nation
- Alexander First Nation
- Enoch Cree Nation no. 440

Métis

- East Prairie Métis Settlement
- Otipemisiwak Métis Government, District 21 (formerly known as the Métis Nation of Alberta, Region 4)

Non-Treaty Indigenous Communities

- Foothills Ojibway First Nation

4.3 Overview of Engagement Activities Carried out to Date

The initial Information Package (Package), containing the official Aboriginal Consultation Office (ACO) letter and a survey plan of the proposed location, was sent to the eight (8) communities identified by the ACO in their pre-consultation assessment on September 7, 2022.

The Package was sent under FNC202204642 via email and/or hard copies to the communities. Communities were asked to contact KEC if they had any concerns or wished to conduct a site visit. If KEC was contacted by a community regarding site specific concerns requesting a meeting and/or site visit, the concerns were responded to, and a site visit or meeting was set up to discuss the proposed project.

During the site visit either a representative or employee of KEC was present. If the communities did not respond to the initial email, two (2) follow up emails were sent, on September 14 and September 21, 2022. An updated information letter was sent to all eight (8) communities on September 26, 2022. The letter contained updates on the proposed construction date and the size, in megawatts, of the Project. On September 28, 2022, an additional letter was sent to the eight (8) communities to rectify a small typing mistake that was made on the September 26th letter.

Five site visits were conducted by the following First Nations:

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

KEC also met with four (4) communities; Driftpile Cree Nation, Paul First Nation, Foothills Ojibway First Nation, Kapawe'no First Nation and Sturgeon Lake Cree Nation, to present information about the BBPP. The presentations contained information about KEC, the BBPP and potential contracting and employment opportunities, among other topics. A brief overview of the potential for the Black Bear Carbon Storage Hub was provided, as the Hub's feasibility depends on many things such as; technical, economical and regulatory assessments. The CO_2 sequestration hub is not part of the BBPP project.

The Record of Consultation (ROC) was sent to the communities for their review and approval prior to being submitted to ACO for adequacy. A copy of each community's ROC can be found in Appendix C.

FNC202204642 was used for consultation and deemed adequate. To address concerns raised by Kapawe'no First Nation and Blue Ridge Timber (the Forest Management Agreement holder) over removal of vegetation not previously cleared under the existing cutblock of the BBPP ("Standing Timber") under FNC202204642, was subsequently reduced by 2.464 ha of Standing Timber. A notification letter and revised survey plan of the reduced area was circulated to all 8 communities under FNC202300400 on March 17, 2023. KEC received adequacy for FNC202300400 on March 20, 2023. Copies of the two (2) Adequacy Assessments are included in Appendix F – Adequacy Assessment. KEC applied for its Departmental Miscellaneous Lease (DML) application with AEPA on April 4, 2023 and was approved on October 5th, 2023 (Appendix E – DML Approval).

Engagement on Federal Impact Assessment Process

On April 21, 2023, KEC emailed a Project information letter and associated survey plans to the 14 communities identified by the Agency. The letter also advised that the Project was a designated project under the federal impact assessment requirements and provided an opportunity to engage in the federal impact assessment process. KEC followed up with all 14 communities via email on May 18, 2023. On July 4, 2023, KEC emailed the Project newsletter to all 14 communities. A copy of the newsletter can be found in Appendix C.

KEC is committed to ongoing Indigenous engagement for the life of the Project, as new or revised information about the Project is available and as the Project progresses throughout the different stages Indigenous Communities will be notified and encouraged to engage with KEC. Below is a summary of KEC Indigenous Community engagement.

Alexander First Nation

Under the Federal *Impact Assessment Act*, engagement with Alexander First Nation began on April 21, 2023, as they were not identified as one of the original eight (8) Indigenous Communities to be consulted with under the ACO consultation process. An email was sent to the community containing a Project information letter and associated survey plan of the BBPP's proposed location. A second email was sent on May 18, 2023, asking if there were initial

questions about the Project or if the Alexander First Nation were interested in scheduling a meeting to discuss the Project. No response was received.

On July 4, 2023, a third email was sent containing additional information about the Project, a newsletter and a visual representation of the proposed power plant were attached. On July 27, 2023, KEC called Alexander First Nation to follow up on the previous communications, there was no answer, and no voice message system was available.

Alexis Nakota Sioux Nation

Under the Federal *Impact Assessment Act*, engagement with Alexis Nakota Sioux Nation began on April 21, 2023, as they were not identified as one of the original eight (8) Indigenous communities to be consulted with under the ACO consultation process. An email was sent to the community containing a Project information letter and associated survey plan of BBPP's proposed location. A second email was sent on May 18, 2023, asking if they had any initial questions about the Project or if the Alexis Nakota Sioux Nation was interested in scheduling a meeting. Both communication attempts received no replies. On July 4, 2023, a third email was sent containing additional information about the Project, a newsletter and a visual representation of the proposed power plant were attached. On July 27, 2023, KEC called Alexis Nakota Sioux Nation to follow up on the previous communications, there was no answer, and no voice message system was available.

Driftpile Cree Nation

ACO

On September 7, 2022, a Project information letter was sent to Driftpile Cree Nation, the package included a letter and a survey plan for the BBPP's proposed location. On September 7, 2022, Driftpile Cree Nation responded to the initial email about the Project and requested a site visit. The site visit was scheduled and completed on September 26, 2022, with a KEC representative in attendance. KEC followed up with Driftpile Cree Nation on September 29, 2022, and October 17, 2022, requesting information on site-specific concerns. On October 21, 2022, a copy of Driftpile Environmental Consulting Services Phase I Environmental Site Assessment was received by KEC. No site-specific concerns were identified. The ROC log was circulated to Driftpile Cree Nation to be reviewed prior to submission to the ACO.

Federal

On April 21, 2023, KEC emailed a Project information letter and associated BBPP survey plans to Driftpile Cree Nation. The letter also advised that the Project was a designated project under federal impact assessment requirements and provided an opportunity to engage in the federal impact assessment process.

KEC sent a follow up email on May 18, 2023, asking if the Driftpile Cree Nation had any questions about the Project or if they were interested in scheduling a meeting. On July 4, 2023, via email, a newsletter and visual representation of the proposed power plant was sent to the Driftpile Cree Nation. As this engagement was conducted several months after the initial ACO consultation, additional information was available, and the letter contained the most current information about the plant and a more detailed explanation of the functions of the plant.

Driftpile Cree Nation emailed KEC on July 5th, 2023, and requested to meet with representatives to discuss the Project. On July 25th, 2023, KEC met with Driftpile Cree Nation where KEC presented information on the Project virtually. Driftpile Cree Nation referenced their own consultation policy and explained that process to KEC. The meeting ended with KEC agreeing to send Driftpile Cree Nation an email, and that Driftpile Cree Nation would then send their consultation policy for KEC to review. KEC sent an email on August 4th, 2023, in follow up and KEC has not received a response.

East Prairie Métis Settlement

ACO

On September 7, 2022, a Project information letter was sent to East Prairie Métis Settlement. The package included a letter and a survey plan for the BBPP's proposed location. Following the initial ACO project letter mail out, KEC followed up with East Prairie Métis Settlement on September 14, 2022, and September 21, 2022, by email. The official ROC log was sent via email to East Prairie Métis Settlement to review prior to submission to the ACO. East Prairie Métis Settlement has not responded to KEC's email that included the ROC log.

Federal

On April 21, 2023, KEC emailed a Project information letter and associated survey plans to East Prairie Métis Settlement. The letter also advised that the Project was a designated project under the federal impact assessment requirements and provided an opportunity to engage in the federal impact assessment process. KEC sent a follow up email on May 18, 2023, asking if the East Prairie Métis Settlement had questions about the Project or if they were interested in scheduling a meeting. On July 4, 2023, via email, a newsletter and visual representation diagram of the

proposed power plant was sent to East Prairie Métis Settlement. As this engagement was conducted several months after the initial ACO consultation, additional information was available, and the letter contained the most current information about the plant and a more detailed explanation of the functions of the plant. East Prairie Métis Settlement has not yet responded to the July 4, 2023, Project letter. KEC attempted to call East Prairie Métis Settlement on August 3, 2023, to follow up and ensure East Prairie Métis Settlement had no additional concerns or questions. A voicemail was left with a representative of East Prairie Métis Settlement.

Enoch Cree Nation No. #440

Under the Federal Impact Assessment Act, engagement with Enoch Cree Nation No #440 began on April 21, 2023, as they were not identified as one of the original eight (8) Indigenous communities to be consulted under the ACO consultation process. An email was sent to the Enoch Cree Nation No. #440 containing a Project information letter and associated survey plan of the BBPP's proposed location. A second email was sent on May 18, 2023, asking if they had questions about the Project or if they were interested in scheduling a meeting to discuss. KEC did not receive a response to either communication. On July 4, 2023, a third email was sent containing additional information about the proposed project, a newsletter and a visual representation of the proposed power plant were attached. KEC called Enoch Cree Nation No #440 on July 27, 2023, following up on the previous communications. There was no voicemail system available with Enoch Cree Nation No #440.

Foothills Ojibway First Nation

Under the Federal Impact Assessment Act, engagement with Foothills Ojibway First Nation began on April 21, 2023, as they were not identified as one of the original eight (8) Indigenous communities to be consulted with under the ACO consultation process. An email was sent to Foothills Ojibway First Nation containing a Project information letter and associated survey plan of the BBPP's proposed location. A second email was sent on May 18, 2023, asking if the Foothills Ojibway First Nation had questions about the Project or if they were interested in scheduling a meeting. No response was received. On July 4, 2023, a third email was sent containing additional information about the proposed Project, a newsletter and a visual representation of the proposed power plant were attached. Foothills Ojibway First Nation replied via email on July 21, 2023, requesting to arrange a meeting.

KEC representatives met with a representative from Foothills Ojibway First Nation in person on September 11, 2023. Foothills Ojibway First Nation expressed concern about land reclamation at site closure and requesting that the land be returned to the same condition that existed prior to ground disturbance, with the same plants planted in appropriate locations. KEC committed to working with any or all of the 14 Indigenous Communities designated by the Agency, desiring input into reclamation, including Foothills Ojibway, at the time of closure and restoration to ensure remediation and reclamation is completed in a manner that reflects Traditional Environmental Knowledge and meets regulatory requirements.

Horse Lake First Nation

Under the Federal Impact Assessment Act, engagement with Horse Lake First Nation began on April 21, 2023, as Horse Lake First Nation were not identified as one of the original eight (8) Indigenous communities to be consulted under the ACO consultation process. An email was sent to Horse Lake First Nation containing a Project information letter and associated survey plan of the BBPP's proposed location. A second email was sent on May 18, 2023, asking if Horse Lake First Nation had questions about the Project or if they were interested in scheduling a meeting. No response was received.

On July 4, 2023, a third email was sent containing additional information about the proposed Project, a newsletter and a visual representation of the proposed power plant were attached. KEC called Horse Lake First Nation on July 27, 2023, following up on the previous communications. KEC spoke with a Horse Lake First Nation Representative about the Project and re-sent the documents contained in the July 4, 2023, email. A Horse Lake First Nation representative mentioned the consultation representatives were on holidays and would review KEC's correspondence when they returned.

Kapawe'no First Nation

ACO

The initial Project email was sent on September 7, 2022, a Project information letter was sent to Kapawe'no First Nation, the package included a letter and a survey plan for the BBPP's proposed location. Follow up emails were sent to Kapawe'no First Nation on September 14 and 21, 2022. On September 21, 2022, Kapawe'no replied saying they had received the emails but had not received the hard copy of the information package sent by registered mail on September 7, 2022. Kapawe'no First Nation requested a copy of the shapefiles to complete a desktop review. The requested information was sent on September 21, 2022. A hard copy of the initial package,

originally sent on September 7, 2022, was re-sent via registered mail on September 20, 2022, and was picked up by a Kapawe'no representative on September 23, 2022. On September 23, 2022, KEC received acknowledgement of receipt.

On September 26, 2022, KEC representatives met with Kapawe'no representatives to discuss the Project. During the meeting, the following topics were discussed:

- Recent Treaty 1-11 gathering in Enoch
- 3-day cultural activity and exercise on the north shore of Lesser Slave Lake
- How Kapawe'no would like to be engaged and what type of mitigation is proposed for site specific concerns, economic opportunities, and a Project site visit.

On October 3, 2022, KEC reached out to Kapawe'no First Nation to book a site visit. On January 11, 2023, the site visit was completed and was followed by a Traditional Use Site Assessment (TUSA) letter on January 30, 2023. The TUSA outlined Kapawe'no First Nation's consultation process and summarized impacts to traditional use in the areas of hunting, trapping, and gathering, within the grizzly bear zone, increased wind and erosion, loss of vegetation, ecosystem, and moose habitat.

The TUSA also noted Kapawe'no First Nation recommendation of using a different location for the Project due to the reduced impact of that location. KEC responded on February 15, 2023, to the Kapawe'no First Nation concerns listed within the TUSA. On March 3, 2023, KEC communicated to Kapawe'no First Nation that it had considered their feedback and had achieved additional mitigation measures by reducing the footprint of the Project through removal of the southwestern corner of the site. Removing that portion of the site significantly reduces the loss of vegetation and wildlife habitat.

Kapawe'no First Nation responded on March 3, 2023, thanking KEC for the update and acknowledged that the reduced Project footprint would reduce the wildlife habitat impacts, reduce their preference for an alternative location, and overall, this change mitigated concerns stated in the TUSA.

Additional information on the selection process of finalizing the BBPP can be found within Section 1.1.2 (Alternative Project Locations). KEC provided a response letter to Kapawe'no October 12, 2023, referring to their letter dated January 26, 2023.

Federal

On April 21, 2023, KEC emailed a Project information letter and associated survey plans to Kapawe'no First Nation. The letter also advised that the Project was a designated project under the federal impact assessment requirements and provided an opportunity to engage in the federal impact assessment process.

KEC sent a follow up email on May 18, 2023, asking if they had any questions about the Project or if they were interested in scheduling a meeting. On July 4, 2023, via email, a newsletter and visual representation of the proposed power plant was sent to Kapawe'no First Nation. As this engagement was conducted several months after the initial ACO consultation, additional information was available, and the letter contained the most current information about the plant and a more detailed explanation of the functions of the plant. Kapawe'no First Nation has yet to respond to the Project letter delivered under the IAA.

Otipemisiwak Métis Government, District 21

Under the federal impact assessment, engagement with Otipemisiwak Métis Government, District 21 (formerly known as the Métis Nation of Alberta, Region 4) began on April 21, 2023, as they were not identified as one of the original eight (8) communities to be consulted under the ACO consultation process. An email was sent to the Otipemisiwak Métis Government, District 21 containing a Project information letter and associated survey plan of the BBPP proposed location. A second email was sent on May 18, 2023, asking if Otipemisiwak Métis Government, District 21 had questions about the Project or if they were interested in scheduling a meeting. No response was received.

On July 4, 2023, a third email was sent containing additional information about the proposed Project, a newsletter and a visual representation of the proposed power plant were attached. KEC called Otipemisiwak Métis Government, District 21 on July 25, 2023, following up on the previous communications, a voicemail was left with their main office number.

Paul First Nation

ACO

On September 7, 2022, a Project information letter was sent to Paul First Nation. The package included a letter and a survey plan for BBPP's proposed location.

On September 12, 2022, KEC received an email from Paul First Nation requesting a preliminary meeting with KEC. KEC met with a representative of Paul First Nation on September 28, 2022.

During the meeting, the following items were discussed:

- Establishing a relationship between Paul First Nation and KEC
- Objective and expectation of consultation
- Methodology of Paul First Nation monitors to assess proposed Project area
- Cost and number of monitors required to complete the site visit
- Cost of the site visit
- Potential economic opportunities

Following the initial meeting, times and dates for the site visit were discussed, and on December 9, 2022, the site visit was completed.

Paul First Nation requested to be updated on construction activities, proposed construction schedules and continued engagement throughout the lifecycle of the Project. Paul First Nation also requested to have an environmental monitor present during environmentally sensitive activities. KEC committed to all Paul First Nation requests. KEC followed up with Paul First Nation following the site visit and received a letter of non-objection on January 19, 2023.

KEC sent a letter to Paul First Nation following up on items discussed in a virtual a meeting held on September 28, 2022.

Federal

On April 21, 2023, KEC emailed a Project information letter and associated BBPP survey plans to Paul First Nation. The letter also advised that the Project was a designated project under the federal impact assessment requirements and provided an opportunity to engage in the federal impact assessment process.

KEC sent a follow up email on May 18, 2023, asking if Paul First Nation had any questions about the Project or if they were interested in scheduling a meeting. As this engagement was conducted several months after the initial ACO consultation, additional information was available and the May 18, 2023, letter included the most up-to-date information and a more detailed explanation of the functions of the plant. Paul First Nation has yet to respond to the Project letter delivered under the IAA.

Sawridge First Nation

ACO

On September 7, 2022, a Project information letter was sent to Sawridge First Nation. The package included a letter and a survey plan for the proposed BBPP location. KEC followed up via email with Sawridge First Nation on September 14, 2022, and September 21, 2022. No response was received.

The official ROC log was sent to Sawridge First Nation to review prior to submission to the ACO. Sawridge First Nation was unresponsive to all attempts made to contact them about the proposed Project.

Federal

On April 21, 2023, KEC emailed a Project information letter and associated BBPP survey plans to Sawridge First Nation. The letter also advised that the Project was a designated project under the federal impact assessment requirements and provided an opportunity to engage in the federal impact assessment process.

KEC sent a follow up email on May 18, 2023, asking if Sawridge First Nation had any questions about the Project or if they were interested in scheduling a meeting. On July 4, 2023, via email, a newsletter and visual representation of the was sent to Sawridge First Nation. As this engagement was conducted several months after the initial ACO consultation, additional information was available, and the letter contained the most current information about the plant and a more detailed explanation of the functions of the plant.

Sawridge First Nation has yet to respond to KEC's May 18, 2023, Project information letter, package or associated correspondence and inquiries.

Sturgeon Lake Cree Nation

ACO

On September 7, 2022, a Project information letter was sent to Sturgeon Lake Cree Nation. The package included a letter and a survey plan for the BBPP's proposed location. Between September 7, 2022, and September 21, 2022, several emails were exchanged with Sturgeon Lake Cree Nation regarding the September 7th Project information package, including spatial imagery files.

On September 21, 2022, Sturgeon Lake Cree Nation confirmed a desktop review would be completed with the additional information provided, and once completed, a site visit would be conducted.

On September 26, 2022, Sturgeon Lake Cree Nation called KEC regarding the Project and cost for site visits. Sturgeon Lake Cree Nation contacted KEC on September 28, 2022, requesting to book a site visit.

On October 6, 2022, Sturgeon Lake Cree Nation sent a list of possible impacts the Project may have, which included: cultural sites, historical sites, medicinal plants and Traditional Land Use in the proposed Project area.

Sturgeon Lake Cree Nation completed a site visit on October 24, 2022.

On November 29, 2022, Sturgeon Lake Cree Nation requested further explanation about carbon sequestration and storage practices. KEC responded to Sturgeon Lake Cree Nation's inquiry about carbon sequestration in writing on January 24, 2023.

On January 23, 2023, Sturgeon Lake Cree Nation sent a letter of low concern; the letter did not list any site-specific concerns. KEC met with Sturgeon Lake Cree Nation on February 1, 2023, to review the Project and potential employment and investment opportunities.

Federal

On April 21, 2023, KEC emailed a Project information letter and associated BBPP survey plans to Sturgeon Lake Cree Nation. KEC's letter also advised that the Project was a designated project under the federal impact assessment requirements and provided an opportunity to engage in the federal impact assessment process. KEC sent a follow up email on May 18, 2023, asking if Sturgeon Lake Cree Nation had questions about the Project or if they were interested in scheduling a meeting.

As this engagement was conducted several months after the initial ACO consultation, additional information was available, and the letter contained the most current information about the plant and a more detailed explanation of the functions of the plant.

On July 4, 2023, KEC emailed a newsletter, and a visual representation of the proposed power plant were attached. The newsletter contained more details on the proposed Project, including expected impacts and benefits.

Sturgeon Lake Cree Nation responded to KEC's email on July 14, 2023, requesting to be a part of impact assessment to highlight the impacts that may occur to traditional uses throughout the Project's lifecycle. The email also noted and encouraged KEC to continue further discussions with Sturgeon Lake Cree Nation's economic development officers. A virtual meeting was held on July 20, 2023, to discuss the proposed Project. Sturgeon Lake Cree Nation's main concerns were the socio-economic impacts and impact of temporary workers in the area. KEC committed to continued engagement with Sturgeon Lake Cree Nation relating to their concerns.

KEC representatives and Sturgeon Lake Cree Nation met September 21, 2023, to discuss the Project and other projects, along with the potential of equity ownership in the Project.

Sucker Creek First Nation

ACO

On September 7, 2022, a Project information letter was sent to Sucker Creek First Nation. The package included a letter and a survey plan for the BBPP's proposed location. On September 14 and 21, 2022 follow up emails were sent to Sucker Creek First Nation regarding the September 7, 2022, Project information package. On September 26, 2022, Sucker Creek First Nation replied to the email requesting a site visit. A KEC representative attended the site visit that was conducted on September 28, 2022.

On October 6, 2022, Sucker Creek First Nation sent their final response letter advising they had no site-specific concerns, however, did raise a concern regarding the long-term impact of the loss of accessible land on their Aboriginal rights and traditional uses.

Sucker Creek First Nation requested they be updated on:

- construction activities and schedule maintenance requirements
- decommissioning of the Project and any reclamation activities required after the termination of the Project.

KEC responded to Sucker Creek First Nation's correspondence, where KEC committed to updating Sucker Creek First Nation on construction activities, proposed construction schedules and continuous engagement throughout the lifecycle of the Project.

Federal

On April 21, 2023, KEC emailed a Project information letter and associated BBPP survey plans to Sucker Creek First Nation.

The letter also advised that the Project was a designated Project under the federal impact assessment requirements and provided an opportunity to engage in the federal impact assessment process.

KEC sent a follow up email on May 18, 2023, asking if Sucker Creek First Nation had any questions about the Project or if they were interested in scheduling a meeting. On July 4, 2023, via email, a newsletter and visual representation of the proposed power plant was sent to Sucker Creek First Nation.

As this engagement was conducted several months after the initial ACO consultation, additional information was available, and the letter contained the most current information about the plant and a more detailed explanation of the functions of the plant.

Sucker Creek First Nation has yet to respond to KEC's April 21, 2023, Project letter, information package or associated correspondence and inquiries.

Swan River First Nation

ACO

On September 7, 2022, a Project information letter was sent to Swan River First Nation. The package included a letter and a survey plan for the BBPP's proposed location. On September 14 and 21, 2022, follow up emails were sent to Swan River First Nation regarding the September 7, 2022, Project information letter and package.

On September 21, 2022, Swan River First Nation conducted a site visit, and the following day submitted a consultation policy, concerns letter and consultation process to KEC. The letter identified concerns relating to fish, wildlife, plants and medicines and cultural and historical features.

On October 21, 2022, Swan River First Nation submitted its Project site analysis which included an overview of the site visit. Swan River First Nation noted concerns surrounding the harvesting of berries and medicine in the area due to previous use of herbicides.

Swan River First Nation concluded its analysis by stating that Swan River First Nation had no critical concerns with the area proposed for the Project due to the previous disturbances and the potential presence of herbicide and other contaminants. For those reasons Swan River First Nation would not use the proposed Project location for harvesting.

Federal

On April 21, 2023, KEC emailed a project information letter and associated survey plans to Swan River First Nation. The letter also advised that the Project was a designated project under the federal impact assessment requirements and provided an opportunity to engage in the federal impact assessment process.

KEC sent a follow up email on May 18, 2023, asking if they had questions about the Project or if they were interested in scheduling a meeting. On July 4, 2023, via email, a newsletter and visual representation of the proposed power plant was sent to Swan River First Nation.

As this engagement was conducted several months after the initial ACO consultation, additional information was available, and the letter contained the most up-to-date information on the plant and a more detailed explanation of the functions of the plant. Swan River First Nation replied via email on July 4, 2023, inquiring if the BBPP had an FNC#. KEC replied on July 10, 2023, informing Swan River First Nation BBPP was related to ACO FNC20224642. No further inquiries or concerns were received.

Additional information about each specific community can be found below:

Table 4. Summary of Engagement of Indigenous Communities

Summary of Engagement Activities to Date					
Community	**ACO Information Package**	**ROC submitted to for review****	**IAA Information Package & Newsletter**	**Site Visit(s)**	**Project Meeting(s)**
Alexis Nakota Sioux Nation	N/A	N/A	Info Pckg: 04/21/2023 Follow up: 05/18/2023 Newsletter: 07/04/2023	IAA: no site visit requested	IAA: no meeting requested
Alexander First Nation	N/A	N/A	Info Pckg: 04/21/2023 Follow up: 05/18/2023 Newsletter: 07/04/2023	IAA: no site visit requested	IAA: no meeting requested

Summary of Engagement Activities to Date					
Driftpile Cree Nation	09/07/2022 09/26/2022	02/16/2023	Info Pckg: 04/21/2023 Follow up: 05/18/2023 Newsletter: 07/04/2023	ACO: 09/26/2022 site visit requested IAA: 07/25/2023 no site visit requested	ACO: no meeting requested IAA: 07/25/2023 (virtual meeting)
East Prairie Métis Settlement	09/07/2022 09/26/2022	02/16/2023	Info Pckg: 04/21/2023 Follow up: 05/18/2023 Newsletter: 07/04/2023 4/21/2023	ACO: no site visit IAA: no site visit	ACO: no meeting requested IAA: no meeting requested
Enoch Cree Nation No. 440	N/A	N/A	Info Pckg: 04/21/2023 Follow up: 05/18/2023 Newsletter: 07/04/2023	IAA: no site visit requested	IAA: no meeting requested
Foothills Ojibway First Nation	N/A	N/A	Info Pckg: 04/21/2023 Follow up: 05/18/2023 Newsletter: 07/04/2023	IAA: no site visit requested	IAA: 09/11/2023 (in-person meeting)
Horse Lake First Nation	N/A	N/A	Info Pckg: 04/21/2023 Follow up: 05/18/2023 Newsletter: 07/04/2023	IAA: no site visit requested	IAA: no meeting requested
Kapawe'no First Nation	09/07/2022 09/26/2022	03/16/2023	Info Pckg: 04/21/2023 Follow up: 05/18/2023 Newsletter: 07/04/2023	ACO: 10/24/2022 IAA: no site visit requested	ACO: 09/25/2022 (in-person meeting) IAA: no meeting requested
Otipemisiwak Métis Government, District 21	N/A	N/A	Info Pckg: 04/21/2023 Follow up: 05/18/2023 Newsletter: 07/04/2023	IAA: no site visit requested	IAA: no meeting requested
Paul First Nation	09/07/2022 09/26/2022	02/16/2023	Info Pckg: 04/21/2023 Follow up: 05/18/2023 Newsletter: 07/04/2023	ACO: 12/09/2023 IAA: no site visit requested	ACO: 09/28/2022 (virtual meeting) IAA: no meeting requested
Sawridge First Nation	09/07/2022 09/26/2022	02/16/2023	Info Pckg: 04/21/2023 Follow up: 05/18/2023 Newsletter: 07/04/2023	ACO: N/A IAA: site visit requested	ACO: no meeting requested IAA: no meeting requested
Sturgeon Lake Cree Nation	09/07/2022 09/26/2022	03/16/2023	Info Pckg: 04/21/2023 Follow up: 05/18/2023 Newsletter: 07/04/2023	ACO: 10/24/2022 IAA: no site visit requested.	ACO: 10/13/2022 (in-person meeting) IAA: 07/20/2023 (virtual meeting) 09/21/2023 (in-person meeting)

Summary of Engagement Activities to Date					
Sucker Cree First Nation	09/07/2022 09/26/2022	02/16/2023	Info Pckg: 04/21/2023 Follow up: 05/18/2023 Newsletter: 07/04/2023	ACO: 09/28/2022 IAA: no site visit requested	ACO: no meeting requested IAA: no meeting requested
Swan River First Nation	09/07/2022 09/26/2022	03/16/2023	Info Pckg: 04/21/2023 Follow up: 05/18/2023 Newsletter: 07/04/2023	ACO: 09/21/2022 IAA: no site visit requested	ACO: no meeting requested IAA: no meeting requested

*Rows highlighted in grey were only a part of the Federal IAA Indigenous consultation and engagement. Rows highlighted in white were a part of the Provincial and Federal IAA Indigenous consultation and engagement.
**ROC = Record of Consultation

4.4 Comments or Concerns of Indigenous Communities

The following is a list of comments or concerns that have been brought up by the Indigenous Communities, the table below indicates the responses KEC has provided to date. KEC remains committed to ongoing dialogue and engagement with Indigenous communities.

Table 5. Concerns Expressed by Indigenous Communities

Concern	Indigenous Communities	Responses
Located within Grizzly Bear Zone	Kapawe'no First Nation	KEC acknowledges that the Project is located within the Grizzly Bear Zone. One way of managing new associated human-caused grizzly bear mortality risk is by limiting the creation of new industrial roads and managing road densities. This proposed Project has been designed not to create new access roads. One of the several reasons why this site location was chosen was due to the established industrial roads in the area, resulting in a lack of new road infrastructure required.

Concern	Indigenous Communities	Responses
Ecosystem and moose habitat/displacement of wildlife	Kapawe'no First Nation	The Project is not located in an area of prime moose habitat. It is reasonable to conclude that the Black Bear project area, extending to approximately 400 metres out is primarily coniferous forest, which does not represent prime or core habitat for Moose. Wildlife sensory disturbance may occur as a result of ongoing human activity as well as visual and auditory disturbance related to the operation of the proposed Project. Sensitivity of wildlife to disturbance will vary by species, life stage, and noise type. These sensory disturbances may result in localized wildlife avoidance of the area surrounding the Project Area. Some species may avoid the area, while others may be attracted to the increased activity, including opportunistic species such as coyote, skunk, or black bear. The forested lands around the Project are expected to aid in muffling the noise being produced. Lighting at top of the project structures is regulated by Transport Canada, however during operations we can mitigate light sensory disturbance by installing motion-activated lighting on ground-based infrastructure.
Increased Wind and Erosion	Kapawe'no First Nation	The Project is located in an area where there is a lack of watercourses and significant slopes. Due to this location, it is anticipated that erosion potential for this

Concern	Indigenous Communities	Responses
		Project will be limited to the footprint of the Project. Additionally, KEC intends to use dust suppression measures.
Loss of Vegetation	Kapawe'no First Nation	KEC acknowledges that there will be loss of vegetation within the Project footprint and that this impact cannot be avoided. However, reclamation will occur at the end of the Project to restore the lands back to the original state. KEC will provide the Community with the opportunity to be involved and provide input in the eventual restoration and rehabilitation of this land at the end of the Project.
Streams and Waterbodies	Kapawe'no First Nation	One small seasonal marsh wetland was identified within the Project area (approximately 0.09 ha)*. No fish-bearing watercourses were identified during the survey. Accordingly, no effects on fish or fish habitat are anticipated from the Project.
Restoration of BBPP	Kapawe'no First Nation Foothills Ojibway First Nation Sturgeon Lake Cree Nation	KEC is committed to engaging with Indigenous Communities throughout the lifecycle of this Project and responding to issues or concerns raised. KEC will engage Kapawe'no First Nation, Foothills Ojibway First Nation, Sturgeon Lake Cree Nation, and other Indigenous Communities and request them to be involved and provide input into reclamation planning, including targeted

Concern	Indigenous Communities	Responses
		end land use and achieving equivalent land capability at the Project location.
Preference of different location for BBPP	Kapawe'no First Nation	KEC understands that the Community would have preferred the plant to be within a different location. However, after examining Project infrastructure requirements such as pipelines and transmission lines, the alternative location would not fit the technical requirements for the BBPP. KEC modified the project footprint by removing some of the lands of concern which significantly reduced the loss of vegetation and wildlife habitat.
Monitoring present during construction phase	Paul First Nation	KEC committed to having environmental monitors from Paul First Nation present during environmentally sensitive construction activities
Continuous engagement during life cycle of BBPP	Paul First Nation Sucker Creek First Nation Sturgeon Lake Cree Nation	KEC committed to continuous engagement throughout the lifecycle of the Project.

*The wetland was initially identified via desktop delineation as 0.2 hectares in size. Correspondence with Kapawe'no First Nation refers to this size, however, following field assessments the wetland size was reduced and confirmed to be 0.09 hectares.

Overall, Indigenous Communities have expressed some concern over the Project, mostly related to ground disturbance and construction of the BBPP.

4.5 Future Engagement Plan

KEC is committed to engaging with all potentially affected Indigenous Communities throughout the life of the Project. KEC will continue to work with Indigenous Communities identified by the ACO and the Federal government. Proposed engagement and notification delivery methods may include:

- in-person or virtual meetings with First Nation's primary engagement contact
- in-person or virtual meetings with First Nation's Chief and Council
- in-person on virtual meetings with Métis Settlements
- in-person, virtual meetings, or phone conversations with First Nation trappers
- community meetings
- Project notifications and ongoing updates of Project information
- email and telephone communication
- participation in community events to promote informal dialogue regarding the Project
- continue to engage with the Indigenous Communities who have identified concerns or have requests (see 4.4) to discuss concerns
- discuss opportunities with Indigenous Communities

Should Indigenous Communities not identified by the ACO or IAA express interest in the Project, KEC is committed to engaging with those interested communities. Proposed engagement and notification delivery methods would be like those listed above.

Further Indigenous consultation will be completed for the proposed provincially regulated transmission line, carbon hub, and the natural gas pipeline in relation to the BBPP and will follow the applicable regulatory processes and requirements.

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

5 RELEVANT STUDIES OR REGIONAL ASSESSMENTS CONDUCTED

As of July 5th, 2023, the BBPP is not taking place in an area with a previously completed regional environmental assessment, according to the Canadian Impact Assessment Registry (Government of Canada, 2024).

The BBPP is within Upper Athabasca Region but as of July 5th, 2023, the Alberta Environment and Protected Areas, Land-use Framework, Regional Plans website indicated that the Upper Athabasca Region Land Use Plan has not started the Land Use planning process (Government of Alberta, 2016a). Therefore, there are no land use frameworks in place.

No known Traditional Land and Resource Use (TLRU) studies have been conducted in the Project area.

6 RELEVANT STRATEGIC ASSESSMENTS CONDUCTED

According to the Canadian Impact Assessment Registry, the Strategic Assessment of Climate Change, conducted under Section 95(2) of the IAA is applicable to the Project (Government of Canada, 2020; Government of Canada, 2024). The Strategic Assessment of Climate Change was developed by Environment and Climate Change Canada (ECCC) and has been considered in this Initial Project Description, including potential alternative means of carrying out the Project (see Section 12 Alternatives to the Project) and preliminary estimates of greenhouse gas emissions associated with the Project (see Section 23 Greenhouse Gas Emissions Estimate, Section 14.6.1 Air Quality, and Section 24.1.4 Air Containment Emissions (ACE)).

PART B: PROJECT INFORMATION

7 PURPOSE AND NEED FOR THE PROJECT

The purpose of the BBPP is to generate electricity from natural gas to provide a reliable source of electricity to meet the growing demand of the Alberta Electrical Grid and support both provincial and federal net zero climate targets. The project will help fill the supply gap caused, as identified by the Alberta Electrical System Operator (AESO), and continuing as older coal and gas fired generation is being retired due to low efficiency and high emissions profiles.

The BBPP is needed to provide Alberta with a viable option to assist the transition from coal power generation and meet increasing demand. When compared to coal, combined cycle plants emit significantly fewer emissions of carbon dioxide (CO_2), sulfur dioxide (SO_2), nitrogen oxide (NO_x) and other air emissions. CO_2 emissions from combined cycle facilities are approximately half that of coal fired plants (de Gouw, Parrish, Frost, & Trainer, 2014). Additionally, the BBPP has the capability to include CCS, which could further reduce the emissions from the Project. Benefits of the BBPP will include:

- Significant employment during construction (over 700 employees during peak months, averaging at about 350 employees over the first 30 months of construction) and approximately 30 long-term employees during operations and maintenance.
- An estimated $13,000,000 per year in property tax revenue for Big Lakes County, Alberta will provide a significant increase in revenue for the county and support various local services and infrastructure.
- Reduced emissions associated with electricity generation in Alberta
- Clean, reliable, cost-effective source of new electricity supply for the Alberta Electrical Grid

8 PHYSICAL ACTIVITY

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

As the Project is anticipated to have a maximum production capacity of 460 MW (460 MW net output is both nominal rating and maximum due to limiting constraints on the transmission line and at the downstream substation), the threshold defined in item 2(a) would be exceeded.

KEC is therefore submitting an Initial Project Description (this document) to the Impact Assessment Agency to inform the decision as to whether an environmental assessment is required.

KEC notes that the Project will not take place on federal lands, will not require federal funding and not require any federal authorizations, licenses or permits.

The BBPP is a standalone project and is not a component of any larger project that is not listed in the *Physical Activities Regulations*, often referred to as the 'Project List'.

9 ACTIVITIES, COMPONENTS, AND INFRASTRUCTURE

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

The equipment layout of the BBPP is provided in Appendix G – Plant Site Drawings, PFDs, P&IDs. Visual impacts will be minor in nature, given the remote location and the lack of residents along the resource roads to public Highway #32.

9.1 Infrastructure and Components

9.1.1 Size of the Designated Project Footprint

The Project area is located on 20.65 ha of provincial Crown land, with 18.54 ha surveyed. The Project footprint has been reduced to the extent possible and will require roughly 12 ha for all the major process equipment, providing roughly 8 ha for laydown space for construction within the Project footprint. An additional 2.111 ha is proposed as additional area on the west side of the Project area to accommodate soil storage areas during construction (Refer to Appendix H – Survey Plans). The additional lands around the proposed infrastructure are not expected to be impacted following construction.

9.1.2 Natural Gas Supply

To fuel the BBPP, natural gas will be supplied from a new dedicated pipeline. The new pipeline will connect to an existing underground gas pipeline approximately 3.8 km northeast of the Project at LSD 3, Section 25, Township 64, Range 11, West of the 5th Meridian (03-25-064-11W5). The assessment and permitting for the route are not yet complete.

KEC will provide natural gas metering located off site and will install a new gas pipe routed underground to the northeast corner of the site. The gas line will be routed underground to the fuel gas yard in the BBPP. The fuel yard will include an emergency shutoff valve located upstream from all gas yard equipment. The gas yard will also include a check meter, preheater, pressure reduction skid, and fuel conditioning skid. Fuel conditioning will remove liquid and particulate from the gas.

A gas chromatograph will analyze the gas composition and that data will be collected by the Distributed Control System (DCS) in addition to data on flow, pressure, temperature.

The Combustion Turbine will burn only natural gas. Natural gas will also be used on site for the auxiliary boiler and building heating. An additional pressure reduction station(s) will be provided by the Engineering, Procurement, and Construction (EPC) Contractor for the auxiliary boiler and building heating.

9.1.3 WATER SUPPLY

The BBPP facility will require an initial water volume of 4545 m^3, which will be continuously recycled throughout power generation. The power generation process will operate with a net positive water balance up to an ambient temperature of 35°C.

KEC is planning to supply the initial water volume via onsite, non-saline, groundwater wells with diversion as authorized by a *Water Act* Licence (Term Licence) to be procured at a later date. The proposed diversion will adhere to the requirements of the *Water Act,* the *Water Act Water (Ministerial) Regulations,* and *Alberta Environment Guide to Groundwater Authorization* (Alberta Environment and Protected Areas, 2023). KEC will contract certified water well drillers to install the water wells. Utilization of certified water well drillers is required by the legislation and will ensure the water wells are installed as per the requirement of the regulations.

Based on available well water drilling reports (WWDR) of water wells drilled after 2020 and within 1.5km of the proposed site from the Alberta Water Well Information Database, there is a reasonable expectation multiple aquifers are present in the region at depths of 50 to 135 meters below surface grade with capable discharge rates of 40 to 240 m^3/day.

Once KEC has been issued a disposition for the site and certified water well drillers have installed the production and observation water wells, KEC will contract appropriate professionals to complete a detailed hydrogeological, quantitative assessment report of the aquifers as prepared by a member of the Association of Professional Engineers and Geoscientists of Alberta (APEGA) to determine the long-term sustainable yield of the aquifers. To determine the maximum potential daily yields of the aquifers, the 72 hours + 72 Hours aquifer assessment will be completed for each of the two production water wells. The aquifer assessments will be completed as detailed by the *Alberta Environment Guide to Groundwater Authorization.*

The water wells will be installed, their maximum daily yields determined, and appropriate diversion authorizations will be procured in advance of facility construction. The initial water volume will be diverted from the production water wells at a rate less than the determined maximum daily aquifer yield prior to facility activation. Based on aquifer assumed yields of 40

to 240 m^3/day, KEC will commence diversion once onsite system water storage is available and the initial water volume of 4545 m^3 will be diverted over 10 to 60 days. AEPA will issue any restrictive conditions to ensure diversion is only authorized if the aquifer has sufficient flow to support the proposed diversion rates, as well as minimize impacts to the aquifer. In addition, the subsurface artesian aquifers are expected to be confined aquifers, with no interconnection to groundwater. Therefore, effects to surface water (I.e., wetlands; watercourses) are not expected.

Although the system will operate with a net positive water balance up to an ambient temperature of 35°C, as KEC will be obtaining a long-term *Water Act* Licence, should any water losses occur, supplemental diversion from the production water wells will be possible on an as-needed basis.

The *Water Act* Licence application will be submitted to the AEPA once the certified water well drillers have drilled the water wells, provided the WWDR and detailed hydrogeological, quantitative assessments of the aquifers have been completed. The application will be at a minimum of 6 months in advance of diversion commencement; tentatively sometime within 2025. The *Water Act* Licence of the production water wells will be renewed throughout the life of the facility.

As a contingency for the event of the aquifers being determined to have poor yields or facility construction delays reducing the lead-time diversion period, KEC contracted Clear Environmental Solutions to assess potential surface waterbody sources within the vicinity of the proposed facility to determine a potential alternative source for the initial water volume and regulatory requirements. The effect of cumulative allocations over time from both rivers and lakes within a watershed may impact the health of the aquatic environment, which includes fish and wildlife resources. Alberta utilizes a hydrology-based tool and uses a cumulative watershed approach for water allocations. Alberta utilizes full aquatic ecosystem protection from water withdrawals in rivers and streams and addresses 'healthy aquatic ecosystems', which is only one of three goals in Alberta's Water for Life strategy (http://www.waterforlife.alberta.ca/). The intent of this is to minimize the incremental risk by addressing cumulative allocation impacts for both rivers and lakes.

With this noted principle in mind, Clear Environmental Solutions identified Freeman River from point of diversion (POD) at the surface land location of 08-02-065-11 W5M as a potential surface waterbody source.

To divert from the Freeman River, KEC will obtain a Temporary Diversion Licence (TDL) issued under the *Water Act* of the Province of Alberta. TDL application will be made to AEPA

approximately 3 months in advance of the proposed diversion starting, with the application tentatively planned to be submitted in February of 2026 with diversion to commence in May of 2026 during the river's spring freshet.

The proposed diversion will adhere to the requirements of the Province of Alberta *Water Act,* the Province of Alberta *Water Act Water (Ministerial) Regulations,* the AEP *Surface Water Allocation Directive,* Fisheries and Oceans Canada (DFO) *Interim code of practice: End-of-pipe fish protection screens for small water intakes in freshwater*, DFO *Measures to protect fish and fish habitat* as well as conditions of the TDL as issued by AEPA.

For land access to the POD, KEC will obtain a Temporary Field Authorization (TFA) as issued by the AEPA. Land access will adhere to the requirements of the *Public Lands Act, Public Lands Administration Regulation (PLAR)*, and the *Master Schedule of Standards and Conditions (MSSC).*

The source was considered suitable for the following reasons:

- Freeman River at POD: 08-02-065-11 W5M is a Strahler Stream Order 5 water course.
- Current allocations represent 2.85% of the mean annual flow; below the recommended, sustainable threshold of ≤12%.
- The proposed diversion rate required tentatively will be 0.02 m^3/s to 0.15 m^3/s. Mean flows of the Freeman River from mid-April through mid-August range from 3 m^3/s to 14 m^3/s. Considering limiting the diversion rate to 10% of the watercourse's flow to avoid impacting the water body and fish habitat, the river is capable of supporting the proposed diversion rates.
- There is existing access to the river at the proposed POD and no new disturbance to riparian vegetation or soils will occur.

An appropriately sized, DFO-compliant, pump-intake fish screen will be utilized as per the *Interim code of practice: End-of-pipe fish protection screens for small water intakes in freshwater* to maximize the protection of fish. *Measures to protect fish and fish habitat* will be able to be adhered to, which will prevent fish death and avoid alteration or disruption of fish habitat.

AEPA will issue the approval with restrictive conditions to ensure diversion is only authorized when the watercourse has sufficient flow to support the proposed diversion rates, as well as minimize impacts to the watercourse and fish habitat.

9.1.4 Electrical Interconnection

An existing 240kV HV transmission line is located approximately 600 m west of the BBPP and the point of interconnection for the BBPP is expected to be in 05-15-064-11W5. The 240kV HV transmission interconnection will be overhead and assessment and permitting for the route is not yet complete. Please refer to Figure 3 and Section 1.1.1.2 above for more details on the possible transmission line routes.

9.1.5 Carbon Capture System Hub

KEC continues to evaluate the technical and economic feasibilities of CO_2 capture and sequestration. The timing of any CO_2 capture installation will be aligned with the BBPP timeline however, KEC's carbon hub (the "Hub") is not part of the BBPP project.

KEC is evaluating various carbon sequestration options, including developing the Hub near the BBPP project or utilizing other carbon hubs in the area. In the case of the Hub, KEC intends on maintaining control of the Hub while also providing access to third-party emitters. The injection wells will be situated approximately 20 to 35 kilometers away. The Alberta Energy Regulator (AER) will manage and oversee the regulatory requirements for the Hub. The Hub has a planned sequestration capacity of 1.5 million tons of CO_2 per year, with a lifespan of approximately 25 years. KEC aims to sequester ±1.2 million tons of CO_2 per year from the BBPP and offer sequestration services to other emitters in the area, comprising an additional ±0.2 million tons per year to be sequestered. If the planned potential KEC carbon hub is determined to not be viable, or does not proceed for any reason, KEC will consider other potential hubs to sequester the CO_2. At present, there are several other hubs under development within 100km of the project for consideration and KEC is actively evaluating these sequestration options.

Typical hub infrastructure includes compression and dehydration facilities, pipelines and injector wells. While the pipeline routing is in development, it is anticipated to parallel existing disturbances to the extent possible. A monitoring, measurement, and verification (MMV) plan will be implemented to address any adverse effects. KEC will consult with external experts to conduct a risk assessment, and subsequently develop mitigation strategies.

9.1.6 Processes of the BBPP

The purposes of the BBPP are to generate electricity as required to meet power grid demands and to provide the option for carbon capture on the plant's post combustion exhaust system. The

major process of the plant is electrical power generation. The generation of electrical power requires the implementation of a number of supporting processes, illustrated on the attached piping and instrumentation diagrams P&IDs and PFDs (Appendix G – Plant Site Drawings, PFDs, P&IDs; Appendix I – Equipment List; and Appendix J – Water Mass Balance).

These processes include:

1. The Combustion Turbine Generator (CTG), Heat Recovery Steam Generator (HRSG), and Steam Turbine (ST) will comprise the Power Island in a single shaft configuration with a common generator. A Siemens STG6-9000HL natural gas fired combustion turbine generator is provided to generate electrical output to supplement a portion of the net 460 MW target for the facility. The CTG provides up to 423MW of power and the ST will provide the remaining MW needed to meet the net 460MW target for the BBPP.
2. Waste heat recovery: A HRSG, utilizing waste heat energy from the combustion turbine to generate steam for expansion in a steam turbine for increased output and efficiency of the Combined Cycle facility.
3. Condenser and air removal system: Steam, generated that has expanded from the steam turbine will be condensed utilizing an Air-Cooled Condenser.
4. Exhaust system: Combustion turbine exhaust will be managed by the use of an exhaust stack and silencer designed to meet exhaust dispersion requirements and to mitigate noise. Emissions will be continuously monitored and recorded.
5. Steam, feedwater, and condensate systems: The steam systems supply high-pressure (HP), Reheat (RH), intermediate pressure (IP), and low-pressure (LP) steam to drive the steam turbine. To meet the water demand and maintain the correct water levels in HRSG drums, the feedwater system supplies feedwater to the HP and IP systems. The condensate system likewise provides condensate to the LP system.
6. Closed-cooling system: The closed cooling water system will remove heat from the auxiliary equipment coolers. The heat picked up by the closed loop will be cooled by an auxiliary air-cooled heat exchanger. The system will circulate a propylene glycol water mixture with a freezing point below the design low temperature.
7. Inlet Air Heating System for cold startups, a rotor warming system is included in the Gas Turbine package. A compressor bleed anti-icing system is also provided during low ambient temperature operation. An evaporative cooler is not included due to the expected low site ambient temperatures.

8. Combustion air system: Outside air will enter the combustion turbine through an Inlet Air Filter. The temperature of the air entering the combustion turbine will be adjusted for optimal performance by compressor bleed air for inlet heating and rotor warming.

9. Carbon capture system: an amine-based post combustion carbon capture process consisting of modules designed to remove CO_2 from the HRSG flue gas. Before entering the absorber, the flue gas is quenched to a cooler temperature using a gas pre-cooler. This cooling improves the efficiency of the carbon capture process and generates a significant water condensate stream. The condensate will be recirculated in the pre-cooler and used in the absorber water wash system, with a portion being released with the cleaned flue gases through the stack. Excess condensate that is not needed in the pre-cooler and absorber wash system is sent back to a service water storage tank for further treatment and reuse in the combined cycle facility. Oily or contaminated water will be sent to an Oil Water Separator (OWS) and then separated water is sent to a wastewater collection tank to be disposed periodically by tanker truck. Clean water drains and sumps use a separate system from oily water drains to prevent any contamination of clean water. Wastewater collection sumps are necessary to collect water from various gravity fed plant drains. This can only be accomplished via a below grade sump. At the bottom of the sumps are small transfer pumps to pump the water to a tank. This is typical of other power plant designs in Alberta and elsewhere. Any sumps will be regularly inspected as part of the continuing maintenance program to ensure structural integrity is being maintained.

   After the flue gases are cooled in the pre-cooler, they are admitted to the absorber, where the flue gases come in contact with lean amine, which absorbs CO_2 from the flue gases. The CO_2-rich amine stream is then pumped from the bottom of the absorber to the stripper for regeneration. The water wash system at the top of the absorber cleans the flue gases to reduce the loss of amine prior to exiting the absorber stack. A heat exchanger is used to pre-heat the rich amine as it returns from the stripper for use in the absorber, as well as pre-cool the recycled lean amine that is being sent to the stripper.

   In the stripper, CO_2 gases are separated from the rich amine at elevated temperatures. Steam from the combined cycle facility heats the rich amine in a reboiler that is located adjacent to the stripping column. Stripping steam is developed in the reboiler and sent to the stripper, which aids in separating the CO_2 from the rich amine. The process steam is extracted from the cold reheat steam line of the steam turbine by a steam pressure control valve. The CO_2 gases that are separated from the rich amine exit out the top of the stripper and sent to the compression and dehydration unit. Before reaching the first stage compressor, the majority of excess water in the gas stream are removed by a condensing heat exchanger followed by a reflux knockout drum. The excess water is collected and

reused in a wash water system at the top of the stripper to remove excess amine from the CO_2 gases and also sent to the absorber to be used as makeup water in the absorber wash water system. The lean amine, free of CO_2 gases, is then pumped from the bottom of the stripper back to the absorber. This lean amine stream is cooled during its path to the absorber to aid in the absorption process.

10. Carbon Capture Thermal Reclaimer Unit (TRU): Over time, the amine solvent will degrade due to exposure to high temperatures. Thermal degradation products such as heat stable salts will build up in the amine solvent causing corrosion. To remove the thermal degradation products, a side stream of the circulating amine loop is sent through a thermal reclaimer. Medium pressure steam and caustic is used in the reclaiming process to remove the degradation products. The waste products are then sent to a degraded amine drum to be hauled off site by trucks. The cleaned amine is then sent back to the process for reuse in the circulating amine loop.
11. CO_2 Compression and Dehydration: After the majority of the water is removed in the reflux drum, the CO_2 gases from the stripper are then sent to an eight (8) stage compression unit to condense the gases and remove water vapor. Throughout the compression process, condensing knockout drums remove excess water from the CO_2 gas stream. After 5 stages of compressing the gas, any remaining water is removed by a Triethylene Glycol (TEG) dehydration unit which uses medium pressure steam to aid in water removal. The captured CO_2 is then sent through the final 3 stages of compression prior to pipeline transportation.
12. Auxiliary steam generation: A natural gas fired boiler is required to provide start-up steam for the Power Island processes, including steam jet air ejectors, HP evaporative heating, and STG gland sealing. Once the power island is online and running, the auxiliary boiler is no longer required.
13. Compressed air system: An electric drive air compressor and dryer system will provide instrumentation air and high-pressure utility air.
14. Natural gas fuel system: natural gas will be supplied at the plant boundary, connecting to a nearby pipeline from a natural gas pipeline company. Within the plant, the gas will be filtered, metered, heated to turbine fuel gas specifications, and regulated to the required turbine inlet pressure.
15. Backup generation: one emergency diesel fired generator will be provided as back up to critical systems for safe turn-down.
16. Fire Protection System: Water supplied from firewater storage tanks are delivered using an electric motor-driven fire pump or backup diesel pump at the flowrate and pressure

required by the power plant fire protection systems. A water mist fire protection system is included for the CTG and auxiliary enclosures. Hydrants, hose stations, fire extinguishers, panels and associated horns and alarms will be located throughout the plant as required by local, provincial, and federal codes.

17. Wastewater discharge system: This system collects, stores, and distributes waste streams produced by the BBPP.

    a. Relief fluid: There will be several pressure relief valves on liquid systems throughout the BBPP. These relief valves will be piped to an underground sump where any relieved liquids will be collected. Additionally, there will be several pressure relief valves on steam systems. These valves will be provided with silencers as required and vented to atmosphere. All relief vent drains will be routed to local bell ups to an underground drainage system. The water then drains to a sump, which will be intermittently pumped to the wastewater collection system.

    b. Combustion turbine wash water: Water used for combustion turbine water wash will be collected in a dedicated buried double walled water wash storage tank. This tank will be manually emptied periodically with the fluids transported via tanker truck for disposed at an approved location.

    c. Water used for cleaning floors and drains near plant equipment with potential of spilling oil will be collected by gravity fed plant drains and trench system to the Oil/Water Separator (OWS) tank. After separating the oil, the remaining wastewater will be directed to the plant wastewater collection sump to be pumped to the wastewater tank. The oily materials collected in the OWS will be manually removed by vacuum truck. Fluid inventories on both sides are monitored by level switches. All underground sumps are watertight and will be regularly inspected for cracks.

    d. TEG water: TEG water from the carbon capture dehydration equipment will collect in a tank to be hauled by truck for proper disposal.

    e. Thermal Reclaimer Unit (TRU) waste: Carbon capture TRU waste will be collected in a tank to be hauled by truck for proper disposal.

18. Lubricating oil: Lubricating systems shall provide uninterrupted supply of clean, filtered oil to all the bearings of the CTG and STG turbine generator set, the turning gear, and CCS users. The oil reservoirs are integrated with the lube oil skids, located adjacent to each turbine within the turbine call, and all equipment in system are mounted on the oil reservoir top for accessibility and maintainability. Oil level in the tanks will be

automatically maintained through a piping system and small electric driven transfer pump from the main lubricating oil tank. The piping system and transfer pump will also supply oil for scheduled oil changes.

19. Hydraulic oil: A Hydraulic Oil Power Unit, complete with pumps, filters, accumulators, and coolers provides high pressure hydraulic oil to operate valves and provides lift on the steam turbine bearings.
20. Used oil: Used oil from routine oil changes will be removed from pumps and oil-lubricated equipment. Used oil will be stored in aboveground storage tanks and will be trucked periodically to an approved recycling/disposal location.
21. Glycol storage: 60/40% glycol/water mixture will be used in a closed cooling loop for equipment cooling. Make up volumes will be stored on site in a small tank and moved to makeup injection points through a piping system utilizing a small electric driven transfer pump. Higher percentage of glycol is needed for the low ambient conditions of the site.
22. Diesel fuel: Diesel fuel for the backup generator will be stored in a day tank inside the backup generator enclosure or in a tank integral to the engine skid. Diesel fuel for the diesel engine driven firewater pump will be stored in a day tank adjacent to, or inside the pump enclosure.
23. Raw water will either be obtained from on-site water wells or from the Freeman River via trucking. The water will be stored in a raw water tank, then pumped to on-site water treatment system to produce fire/service water.
24. Service/Firewater Storage Tank: Service water and a large reserve of water for emergency firefighting will be stored in an on-site tank.
25. Demineralized water: Service water will be further treated on-site to produce demineralized water for makeup to the HRSG and auxiliary boiler.
26. Potable domestic water will be well water sourced from Judy Creek, Alberta. It will be used for washrooms, safety showers and eye wash water. The well will be located near the project site. Bottled drinking water will be delivered by truck.
27. Sanitary drains storage tank: Sanitary wastewater will be directed to an on-site storage tank, and then removed by tanker truck once filled.
28. Water Treatment Chemical storage: Chemicals for Water treatment shall be delivered by tote and stored on secondary containment pallets.
29. Boiler Water Treatment Chemical storage: Chemicals for Boiler water treatment shall be delivered by tote and stored on secondary containment pallets.

30. Caustic storage: Caustic storage for the carbon capture process shall be delivered by truck and stored in the caustic tank within a containment barrier.
31. Amine storage: Carbon capture process amine shall be delivered via iso tanker or tanker truck. Amine unloaded and stored in the makeup amine tank until use in the process. The makeup amine tank shall be located within a containment barrier.

Other than grey and black water from the sewage system which will be managed through an approved septic system tank that will be emptied with truck removal, all potentially harmful fluids will be stored behind secondary containment.

Products consumed at the BBPP include:

Table 6. Substances Consumed at BBPP

Product	Quantity
Natural gas	3,507 GJ/hr (HHV) Daily Gas Demand at average ambient conditions of Siemens STG-9000HL Gas Turbine, with CCS running. Natural gas consumption will depend on the loading of the turbine, and if the CCS is on. Additional consumption is primarily by the CCS, space heating and the auxiliary boiler.
Diesel fuel	Diesel fuel will be consumed only when the emergency diesel generator or backup diesel fire pump is in operation.
Lubricating oil	Trace amounts of lubricating oil will be consumed during normal operations, with 60.5 m^3 of oil required for filling the lube oil system for the power island equipment. The lube oil tank reservoir is located within the combustion turbine package.
60/40% glycol/water mixture with corrosion inhibitors	Small quantities will be used as make-up to the glycol systems.
Raw water	Approximately 18 tonne/hr during high ambient conditions will be used to produce service water, firewater, potable water, and demineralized water. Average daily use is around 1.9 tonne/hr (8.4 gpm).
Demineralized Water	Produced by the plant water treatment equipment primarily for makeup of the HRSG steam cycle.

Product	Quantity
Chemicals for Boiler chemistry	Chemicals, based on recommendations by the boiler water chemical treatment supplier, shall be used in the main feedwater, steam, and condensate cycle.
Amine & Caustic for CCS Equipment	Amine and caustic (NaOH) are used to curb potential impurities in the carbon capture system. BBPP's CCS provider, Shell Global Solutions International B.V., has daily consumption rates of 370 kg/day of NaOH and 1272 kg/day of Amine based solvent (Cansolv Solvent DC103). Initial fill of 1442 MT of Cansolv Solvent DC103 will also be required for CO_2 absorber.
Antifoam chemical for CCS Equipment	Total 2.74 kg/day antifoam chemical injection would be required on outlet of lean solvent cooler and suction line of stripper reflux pump.
Activated Carbon (Recommended type GC830) for CCS Equipment	56.6 m^3 of activated carbon is required in CCS filter elements.
Natural gas for CO_2 Dehydration System	Natural gas consumption shall be 779 Standard Cubic Meters (SCM)/day.
Tri-Ethylene Glycol for CO_2 Compression System	Initial fill of 11.18 m^3/TEG unit (i.e. total 22.36 m^3). Daily losses of 0.017m^3/day which shall be topped-up on regular basis.
Nitrogen for CO_2 Compression System	720 m^3/compressor (i.e. total 1440 m^3) required only for purging purpose during maintenance.
CO_2 Compressor Lube Oil	Only initial fill of 5,000 liters/compressor (i.e. total 10,000 liters) is required.

9.1.7 Buildings and Enclosures

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

Table 7. Buildings and Enclosures

Name	Type
Administration/Warehouse/Control	Building
Generation Building	Building
Water Treatment	Building
Auxiliary Boiler	Building
Boiler Feedwater	Building
Utility Rack	Enclosure
Fuel Conditioning Skid	Building
Fuel Compressor	Building
ACC Electrical PDC	Building
LV and MV PDC	Building
Diesel Engine/Generator	Enclosure
CEMS	Building
HRSG Drum Penthouse	Building
Stormwater pump(s)	Building
Carbon Capture Building	Building
CCS Thermal Reclaimer Building	Building
CCS Electrical PDC	Building
CO_2 Compression	Building

9.1.8 Equipment

Table 8 below shows the total quantity of major equipment installed at the BBPP based on the percent of total plant capacity for the specific service. In cases where one is operating and one in standby, equipment is identical. Please refer to Appendix I – Equipment List for a comprehensive list of equipment at the BBPP.

Table 8. Major Equipment at the BBPP

Major Equipment	Installed
Air Cooled Condenser	1
Auxiliary Boiler	1
Boiler Feedwater Pumps	2
Closed Cooling Water Heat Exchanger	1
Closed Cooling Water Pumps	2
Combustion Turbine Generator	1
Condensate Extraction Pumps	2
Condensate Collection Tank and Deaerator	1
Emergency Diesel Generator	1
Fuel Gas Filter/Separator	2
Fuel Gas Knockout Drum	1
Fuel Gas Performance Heater	1
Fuel Gas Compressor	1
Heat Recovery Steam Generator	1
HRSG Pumps, typically	2
HRSG Blowdown Tank	1
Service/Instrument Air Compressor	2
Steam Jet Air Ejector (Holding)	2
Steam Jet Air Ejector (Hogging)	1
Steam Turbine	1
CCS Reagent Storage	1
DCC (Direct Contact Cooler) and Absorber	1
CCS Process Pump	2
CO_2 Dehydration Package	2
CO_2 Suction Scrubber	12
CO_2 Cooler	12

For a complete list of facilities on the BBPP, please refer to Figure 4 in Appendix B – Figures.

9.1.9 Access

Road access to the plant is by Highway 32, 19 km south of Swan Hills, Alberta. Turn right onto Conifer Energy Inc's medium grade gravel road (LOC 840703). Continue west for 4.4 km, turn

right at the intersection, and continue for 1.9 km. Make a slight left and continue travelling northwest for 2.8 km to southwest border of BBPP lands. No new access or access controls are required for the BBPP.

The plant is laid out with good vehicle accessibility by a perimeter road looping the entire plant within the fence line. Numerous vehicle entrances to buildings branch off the main loop. Refer to Appendix H – Survey Plans.

9.1.10 EXISTING INFRASTRUCTURE

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

- an existing all weather medium grade gravel road, approximately 7 metres in width that parallels the southwestern edge of the Project boundary.
- drilled oil well pads adjacent to the northwestern, northeastern, and southwestern Project boundaries

Please refer to Appendix H – Survey Plans.

9.2 PHYSICAL ACTIVITIES INCIDENTAL TO THE PROJECT WITHIN KEC'S CONTROL

Physical activities at the BBPP will include:

1. Site Preparation
2. Infrastructure Construction
3. Operations and Maintenance
4. Decommissioning and Reclamation

9.2.1 SITE PREPARATION[1]

Site preparation, excavation, backfill, and grading will be performed as required to construct the BBPP and achieve finished site grades. The site will be cleared of trees, shrubs, and vegetation to the extent necessary to construct the BBPP. This includes the required pipeline and

[1] As recommended in Parkland Geotechnical Ltd. February 22, 2019. Geotechnical Investigation, Proposed Upstream Facility LSD 5-3-68-W6M, M.D. of Greenview South of Grande Prairie, Alberta

transmission line. The EPC Contractor will maintain primary control points and provide all detail measurements and layout for the BBPP with qualified personnel and certified equipment.

1. General Soil Stripping

- Every effort will be made to perform site work, and in particular the salvaging of topsoil in a season and under conditions most suitable for that activity.
- All topsoil, organic soil, soft or weak native subgrade will be removed from the development and access road areas. All soil stripping and leveling using a two-lift soil stripping method:

    1. The first lift will remove the duff layer consisting of organic matter to the color change (B-horizon);
    2. The second lift will remove the B-horizon. Both duff and B-horizons will be stockpiled with separation. Care will be taken to avoid admixing while handling and stockpiling soils. The soils will be preserved and used for production and final reclamation. The remaining C-horizon will be used as cut and fill to level each lease to accommodate the necessary equipment.

- Erosion control for wind and water erosion will be implemented as required
- The site is expected to be leveled with a balanced cut-fill operation.
- In areas of fill the subgrade may be inspected and any soft areas will be sub-cut to sufficient depth to remove the soft material and bridge to provide support for subsequent fills.
- For areas of fill more than 0.5 m thick with a stable exposed subgrade, no further site preparation is required prior to filling.
- If soft subgrade conditions persist in any areas during filling or site subgrade preparation the compaction recommendations and proposed construction procedures will be reviewed.
- KEC confirms that “as-built” details for soil materials storage and location will be permanently kept on record. The as built information will include amount and location of topsoil stockpiles, records of cut and fill including material types.

2. Fill

Fill required to bring the site up to grade will be well graded select granular material such as sand or gravel or low to medium plastic clay. The near surface clay and clay till is considered suitable

for use as engineered fill with moisture conditioning. New fills will be placed to a uniform density.

Compliance with compaction recommendation is important because poorly compacted backfill adjacent to foundation structures will settle, which may lead to ponding of surface water against foundations. It is recommended the maximum thickness of any lift after compaction should not exceed 200 mm for granular material and 150 mm for clays.

Fill placement and compaction during the winter months is not recommended due to the difficulty in moisture conditioning fill soils and obtaining high compaction levels. Materials and methodology will be reviewed prior to construction if cold weather compaction of clay fills is proposed. High compaction levels can only be achieved using fill soils that are unfrozen provided the compaction area is heated and hoarded to prevent freezing during placement and compaction.

3. Site Drainage

Surface water should be drained away from the site as quickly as possible, both during and after construction. A minimum grade of 2 percent is recommended to promote surface runoff and minimize the potential saturation and degradation of the roads and plant area subgrade.

Compliance with the recommendation for compaction of fill in exterior areas is important because poorly compacted backfill adjacent to foundation structures will settle, which may lead to ponding of surface water against foundation walls or grade beams. The slope of exterior backfill should be checked periodically to verify water is shed away from buildings. If backfill settles causing water to pond against foundation walls, the surface should be re-graded. Water should not be allowed to pond adjacent to buildings, equipment, or pavement areas.

Where excavation is carried below the groundwater surface, a dewatering system shall be installed with sufficient capacity to maintain groundwater elevation for construction activities. Contractor will be tasked with calculating the rate and volume per day that groundwater will be pumped to the surface. Discharge from the dewatering system shall be in accordance with AEPA *Water Act* requirements and permits.

9.2.2 Infrastructure Construction

Guidelines for how the various phases of the work will be executed, from planning to physical construction, erection, and infrastructure interconnection, are currently being developed so that

the various assets are constructed as required. Construction methods will be highly detailed, but a general summary is provided below.

Table 9. Typical Construction Phases

Phase	Details
Civil	• Construction of temporary workspace(s) • Construction of base pads and pilings • Delivery and set up of temporary facilities – construction offices, workers trailers, temporary washroom facilities, etc. • Construction equipment delivery • Installation of erosion and sediment control structures • Site grading • Compaction testing • Excavation of foundations • Installation of site drainage (aka - weeping tile) at foundations • Installation of re-bar at foundations • Installation of below-ground infrastructure • Installation of equipment bases • Pouring of concrete for foundations • Testing of concrete foundations • Backfilling of foundations with previously excavated soils
Buildings and Components	• Component delivery • Crane delivery • Delivery of building materials • Installation of foundation • Installation of building support systems • Installation of building structure • Installation of building equipment, component • Wiring, terminations, connections, etc. • Commissioning
Gas Pipeline	• Clearing of pipeline Right of Way • Salvage of merchantable timber • Land clearing, grubbing, stump removal • Soil stripping of Right of Way

Phase	Details
	• Grading of working surface • Excavation of a trench • Potential blasting of bedrock • Watercourse crossings for equipment and pipeline • Directional drilling of permanent watercourses if required • Welding of pipeline • Laydown of pipeline in trench • Backfilling of trench • Recontouring, restoration of Right of Way • Pressure testing and commissioning • Completion of tie-in locations
Transmission Line	• Clearing of Right of Way • Salvage of merchantable timber • Land clearing, grubbing, stump removal • Soil stripping of Right of Way • Grading of working surface • Road creation along Right of Way • Watercourse crossings for equipment • Pile installation • Anchoring of transmission tower foundations • Delivery of transmission towers • Assembly of transmission towers • Erection of transmission towers • Implosion joining of transmission lines • Stringing of transmission lines and towers • Counter-poise installation • Commissioning • Recontouring, restoration of Right of Way • Completion of tie-in locations

9.2.3 Operations and Maintenance

Day to day operation, maintenance, safety, and security will be provided by a staff of operators, engineers and support staff totaling approximately 30 persons (actual numbers TBD).

Operations management will include managing personnel, energy inputs to the facility from natural gas, operational requirements of the infrastructure, emissions and control monitoring during operations, and energy output to the electrical transmission grid. Within each of these tasks there are detailed design processes that will be developed.

Maintenance management will include regularly scheduled maintenance of infrastructure and the Project areas, including annual plant turnarounds as required, in addition to unscheduled maintenance.

9.2.4 Decommissioning and Reclamation

The design life of the BBPP is approximately 30 years, however the actual life span is dependent on the plant's continuing economic and technical viability. Decommissioning will adhere to the applicable Alberta regulations, permits and licences in place at that time.

A conceptual Reclamation Plan has been developed and submitted to AEPA as a required component of the Industrial Approval Application. Decommissioning and removal of equipment and surface reclamation of soils, vegetation and wildlife habitat will adhere to the applicable Alberta regulations, permits and licences in place at the time. KEC will provide Indigenous Communities with the opportunity to be involved and provide input and involvement in the eventual restoration and rehabilitation of this land at the end of the Project or as otherwise required by applicable Alberta regulations in place at that time.

The timeline for Decommissioning and Reclamation would be expected to occur over 3 years.

9.3 Physical Activities Incidental to the Project Outside KEC's Control

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

1. Maintenance and upgrading of the existing access road along the south boundary. The access road is owned and operated by Conifer Energy Inc. and KEC will pay a road usage fee for continued use of the road. Other than this expected payment, there are no contractual relationships between KEC and the road owner.

2. General telecommunications in the Project area.

3. Construction and operation of a 240kV HV transmission line that will provide electrical interconnection between the plant and the existing transmission line, located approximately 600 m west of the BBPP. The point of interconnection is expected to be in 05-15-064-11 W5M. The transmission line is subject to AUC requirements. As the Project will be providing electrical energy to the provincial power grid, KEC will be submitting an application to the Alberta Utilities Commission for connection of the Project to an electric distribution system pursuant to Sections 14 and 15 of the HEEA. Submission will be completed as per the requirements in *AUC Rule 007- Applications for Power Plants, Substations, Transmission Lines, Industrial System Designations, Hydro Developments and Gas Utility Pipelines* (Alberta Utilities Commission, 2024). The program includes engagement with the public (e.g., local landowners), Indigenous Communities, government agencies, municipalities, industry, association, and special interest groups. An environmental and feasibility assessment is being completed for four (4) possible route options.

4. Construction and operation of a new dedicated pipeline routed underground to the northeast corner of the site that will provide natural gas from an existing underground gas pipeline approximately 3.8 km northeast of the BBPP at 03-25-064-11W5. The pipeline is subject to AUC requirements. KEC will be submitting an application to the AUC for the Construction, Operation, and Modification of Gas Utility Pipelines or Pipeline Installations, pursuant to the *Pipeline Act* and the *Gas Utilities Act.* Submission will be completed as per the requirements in *AUC Rule 007- Applications for Power Plants, Substations, Transmission Lines, Industrial System Designations, Hydro Developments and Gas Utility Pipelines*. Similar to the process for transmission lines mentioned above, the program includes engagement with the public (e.g., local landowners), Indigenous Communities, government agencies, municipalities, industry, association, and special interest groups. The assessment and permitting for the route are not yet complete.

9.4 PROJECT EXPANSION

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

10 MAXIMUM PRODUCTION CAPACITY

When fully operational, the Project will be capable of producing a maximum power output of 460 MW, which is above the threshold of 200 MW set out in the *Physical Activities Regulations*: SOR/2019-285, Schedule, 30.

The BBPP production process involves producing electricity via combined cycle power plant with carbon capture consisting of one natural gas fired combustion turbine, one steam turbine, one carbon capture package and CO_2 compression and dehydration package. The generation of electrical power requires the implementation of a number of supporting processes, illustrated on the attached piping and instrumentation diagrams P&IDs and PFDs (Appendix G – Plant Site Drawings, PFDs, P&IDs).

11 ANTICIPATED CONSTRUCTION, OPERATION, AND DECOMMISSIONING SCHEDULES

The following are the estimated Project timelines and major milestones. Decommissioning is estimated at a 30-year timeline.

If the IAAC deems an Impact Assessment is required, Project timelines are anticipated to extend approximately 3 - 5 years beyond the dates provided below.

Table 10. Project Timelines

TASK	DATE
Power Plant Regulatory Applications	
IAA Project Description Draft Submission	May 2024
IAA Project Description Final Submission	July 2024
IAA Regulatory Project Review	July - August 2024
Alberta EPA Industrial Approval Application	May 2023
AUC Power Plant Application	February 2024
AUC Power Plant Approval	September 2024
Alberta EPA Industrial Approval	Q2 2024
Development Permit Application	Q1 2024
Development Permit Issued	Q2 2024
Engineering	
FEED	Q2 2025
Detailed Engineering	Q2 2026
Power Plant Construction	
Site Access for Construction Mobilization	Q2 2026
HRSG Start Delv. on Site	Q2 2027
Combustion Turbine Delivered on Site	Q3 2027
STG Complete Shipment to Site	Q3 2027
Back Feed Power Available	Q4 2026

TASK	DATE
Water Available	Q4 2026
First Fire	Q2 2028
Mechanical Completion	Q2/Q3 2028
Guaranteed Completion	Q4 2028
Construction	
Site Improvement	Q3 2026
Piling	Q4 2026
U/G Utilities	Q1 2027
Foundation Installation - CTG/STG Building	Q1 2027
Foundation Installation - STG	Q1 2027
Site Mobilization	Q3 2026
Foundation Installation - GSU Transformers	Q2 2027
Erect CTG/STG Building	Q3 2027
Foundation Installation - CTG & HRSG	Q1 2027
Foundation Installation - Air Cooled Condenser	Q2 2027
Foundation Installation - CCS Compressor	Q2 2027
Foundation Installation - Field Erected Tanks	Q3 2027
Foundation Installation - Water Treatment Tanks	Q3 2027
Install HRSG	Q2/Q3 2027
A/G Piping Installation	Q2 2027
Foundation Installation - CCS Absorber	Q2 2027
Foundation Installation - CCS Quencher	Q2 2027
Install Field Erected Tanks	Q4 2027
Install Air Cooled Condenser	Q3 2027
Install CCS Compressor	Q4 2027
Install BOP Piping / Equipment / Electrical	Q4 2027
Install CTG	Q1 2028

TASK	DATE
Install STG	Q1 2028
Install CCS Absorber	Q1/Q2 2028
Install CCS Quencher	Q1/Q2 2028
Install Distributed Control System	Q2 2028
Install GSU Transformers	Q2 2028
Electrical and Control Equipment Installation	Q2 2028
Start Up and Commissioning	
Energize GSU Transformer	Q2 2028
Checkout/Commission HRSG - Pre-Turbine Firing	Q2 2028
Initial Fire Combustion Turbine	Q2 2028
Steam Blows & Pipe Restoration - HRSG	Q2 2028
Commission STG	Q2 2028
Commission CTG	Q2 2028
Plant Fine Tuning	Q3 2028
Emissions Testing	Q3 2028
Noise Level Testing	Q3 2028
Plant Testing	Q3 2028
Commercial Operation Date	
Target Completion	Q4 2028
Decommissioning and Reclamation	
Site Access for Decommissioning	Q2 2058
Dismantling of Electrical Power Infrastructure	Q2 2058
Abandonment of Natural Gas Pipeline	Q2 2058
Power Plant Equipment Dismantling and Removal	Q1 2059
Foundation Dismantling and Removal	Q2 2059
Soil Redistribution and Site Surface Reclamation	Q2 2060
Dismantling and Removal of Project Fence	Q4 2063

TASK	DATE
Reclamation Certificate	Q3 2064

12 ALTERNATIVES TO THE PROJECT

The goal of the Project is to produce electrical power in an economic and environmentally responsible manner that is suitable for the selected geographic location and that has the capability to be integrated with CCS for the reduction of greenhouse gases ("GHGs"). By producing gas fired thermal power KEC hopes to align with the global and national decarbonization mandate. KEC believes electrification is one of the main paths in achieving that goal. In Alberta the electrical load grows approximately 180MW/year and will continue to grow year over year. Alberta is in need of low carbon, dispatchable and reliable power, specifically where the BBPP is located. The electrical load of the Project location exceeds generation and power must be transported from other distant areas with losses that impact the power cost and reduce energy efficiency. This Project can remedy this issue.

The main alternatives to gas fired thermal power generation are coal, solar power, wind power, hydro, nuclear power, hydrogen fired power and biomass power.

(1) Coal generated energy is being significantly reduced in Alberta as a source of electricity.

(2) Solar and Wind are intermittent resources and cannot provide dispatchable power. Current battery technology related to solar and wind energy generation are not yet to scale or cost to provide the electric load that would be required. Solar and wind powered generation can occupy up to 16 times the amount of land than a high efficiency gas-fired thermal generation plant.

(3) Hydro power is not feasible for this project due to project location and lack of hydro resources in this region.

(4) Small modular nuclear reactors still require a large amount of research and testing before they become technology mature. Currently there is no regulatory guidance on how a SMNR would be permitted or approved in Alberta.

(5) Hydrogen fired power is currently uneconomic and there are no technologies at scale that can offer fully hydrogen fired power. In addition, there are no hydrogen infrastructure to support hydrogen power. Currently there is a large economic barrier to deploy hydrogen as a fuel in substitute to natural gas in power generation.

(6) Biomass power is not scalable to this project size and is rather limited in Alberta due to technology requirements, challenging economics, feedstock at scale, and operational complexities.

Generation mix in Alberta is site specific and economics and market driven. Natural gas is the energy transition fuel that offers superior economics and dispatchable and reliable power at scale compared to other resources. The project has the capability to achieve the highest energy efficiency and lowest carbon footprint among existing combined cycle and simple cycle power plants.

12.1 Alternative Locations

Alternative locations for the BBPP, including options for the natural gas pipeline and transmission line, are discussed above in Section 1.1.1 (Ancillary Facilities) and 1.1.2 (Alternative Project Locations).

12.2 Alternative Means For Natural Gas Supply

Natural gas for the Project will be supplied from a new dedicated pipeline tied to an existing natural gas pipeline located 3.8 km northeast of the BBPP. No other location has been identified as a reliable source of natural gas for the Project. The exact pipeline routing has not yet been identified or surveyed.

No alternative fuel source was identified for the BBPP. Given that natural gas is reliable, cost-effective, and with optionality to add carbon capture and storage in the future, it is in alignment with KEC's energy transition strategy of providing clean, reliable, dispatchable, and affordable energy to Albertan's.

12.3 A) Project Technologies

Potential alternative means that the proponent is considering and that are technically and economically feasible, including through the use of best available technologies.

Preliminary design of the BBPP included high-level evaluation of the heat rejection system to determine whether the plant will utilize wet or dry heat rejection. The evaluation resulted in utilizing an air-cooled condenser for this project, which greatly reduces the BBPP water usage.

BBPP also evaluated single shaft versus multi-shaft configuration for the power island equipment. The single shaft was selected for various reasons, one of which is the slight improvement in efficiency due to reduced generator losses and auxiliary power.

Finally, duct firing and evaporative cooling provisions were evaluated and deemed not required. This configuration offers a more efficient plant and reduces the natural gas emissions as well as service water usage.

CO_2 removal can be done pre- and post-combustion. Pre-combustion options include changing the fuel or combustion practices to minimize the amount of CO_2 that is released (e.g., switching from natural gas to hydrogen). Pre-combustion options are not evaluated in this study as they are not considered applicable to BBPP operations. Post-combustion options capture CO_2 from flue gas streams through a variety of practices and use of solvents or sorbents. While multiple methods exist, amine-solvent absorption technology offers the most mature solution for commercial scales while many others are still in the research and development phase. An amine-based post combustion carbon capture process was selected for BBPP, consisting of chemical absorption and thermal reclamation using proprietary amines from one of six potential CCS technology licensors identified by KEC as a means for reducing CO_2 emissions. The carbon capture system will be capable of capturing a minimum of 90 percent of the CO_2 emissions with a delivered CO_2 gas purity of 95 percent or greater to CO_2 pipeline specification or similar.

This preliminary design study concluded that a 1x1x1 CTG/HRSG/STG configuration, with an "HL-class" gas turbine, such as the Siemens SGT6-9000HL, would be the best technological option to meet the objectives of the BBPP.

12.4 B) Technical Alternatives to the Project

Potential alternatives to the project that the proponent is considering and that are technically and economically feasible, and directly related to the project.

KEC has not identified any potential alternatives to the Project that are technically or economically feasible. The Project is a standalone project to provide electricity to the Alberta Electrical Grid. Capacity access at the electrical grid is the single largest limiting factor to the location and power output design of the Project. In addition, the Project requires both land access to the source gas, and an adequate supply of source gas, to provide energy inputs to the facility.

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

PART C: LOCATION INFORMATION AND CONTEXT

13 PROPOSED PROJECT LOCATION DESCRIPTION

The BBPP is located approximately 19 km south of Swan Hills and 45 km north of Whitecourt, Alberta, Canada (Figure 1. BBPP Location, Appendix B). The location for the Project was selected based on proximity to natural gas supply; demand for electricity and available export grid capacity; established road network; nearby CO_2 sequestration opportunities; adequate acreage; minimum number of neighbors to avoid noise inconvenience; access to site and road load capacity; and other environmental factors.

Access to the site is by Highway 32, 19 km south of Swan Hills, Alberta. From the highway, it is another 9 km to the northwest to the Project site. Access to the site is along a medium grade road that runs along the southwest border of the site. No new access or access controls are required for the BBPP.

13.1 A) GEOGRAPHIC COORDINATES AND DESCRIPTION

The south end of the Project area is located at:

- Latitude: 54.532535°
- Longitude: –115.573190°
- NAD 83 UTM Easting Zone 11U: 592395.76 m E
- NAD 83 UTM Northing Zone 11U: 6043997.35 m N

13.2 B) SITE MAPS

Please refer to the following maps in Appendix B – Figures:

- **Figure 1.** BBPP Location
- **Figure 2.** Natural Gas Pipeline Options
- **Figure 3.** Transmission Line Options
- **Figure 4.** General Equipment Arrangement
- **Figure 5.** Grizzly Bear Management Zones
- **Figure 6.** Wetlands and Watercourses
- **Figure 7.** Parks and Protected Areas
- **Figure 8.** Indigenous Reserves and Métis Settlements

13.3 C) Legal Land Description

The BBPP is located on provincial crown land in Big Lakes County, Alberta. The Project is located in Legal Subdivisions (LSDs) 1, 2, 6, 7, and 8, within the following quarter sections:

- SW 15-064-11 W5M
- SE 15-064-11 W5M

KEC submitted a land application for a Departmental Miscellaneous Lease (DML) to the AEPA, which authorizes a commercial use under a miscellaneous lease on provincial crown land. This application included an assessment of environmental site conditions and First Nation consultation. The DML has been issued to KEC. Please refer to Appendix E – DML Approval for a copy of the DML approval.

13.4 D) Proximity to Residences

The BBPP is located in a forested natural area with the closest seasonal and/or permanent residence located approximately 19 km north of BBPP lands, on the outskirts of the Town of Swan Hills, Alberta.

Please refer to Appendix C – Consultation Program for further information and Appendix H for the survey plan.

13.5 E) Proximity to Indigenous Lands

The BBPP is located on provincial Crown land rather than reserve or federal lands. A *reserve* is defined in subsection 2(1) of the *Indian Act*, *First Nation land* as defined in subsection 2(1) of the *First Nations Land Management Act*, land that is subject to a comprehensive land claim agreement or a self-government agreement and any other land set aside for the use and benefit of Indigenous peoples of Canada.

The BBPP is located within the traditional lands of the following Indigenous Communities:

Treaty 8 First Nations

- Driftpile Cree Nation
- Horse Lake First Nation

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

Treaty 6 First Nations

- Paul First Nation
- Alexis Nakota Sioux Nation
- Alexander First Nation
- Enoch Cree Nation no. 440

Métis

- East Prairie Métis Settlement
- Otipemisiwak Métis Government, District 21 (formerly known as the Métis Nation of Alberta, Region 4)

Non-Treaty Indigenous Communities

- Foothills Ojibway First Nation

Please refer to Figure 8 in Appendix B – Figures for a map of the First Nation Reserves and Métis Settlements in proximity to the BBPP. The following provides distances to the Reserves and Settlements:

- Alexis Whitecourt First Nation Reserve No. 232, located 35 km south-southwest
- Alexander First Nation Reserve No. 134B, located 53 km east-southeast
- Alexander First Nation Reserve No. 134A, located 60 km west-southwest
- East Prairie Métis Settlement, located 67 km north-northwest
- Swan River First Nation, located 88 km north
- Driftpile Cree Nation, located 90 km north
- Sawridge 150H First Nation, located 94 km north-northeast
- Sawridge 150G First Nation, located 99 km north-northeast
- Sucker Creek First Nation No. 150A, located 101 km north-northwest

- Kapawe'no First Nation No. 150c, located 123 km north-northwest
- Kapawe'no First Nation No. 150d, located 126 km north-northwest
- Paul First Nation, located 137 km south-southeast
- Sturgeon Lake Cree Nation, located 137 km west-northwest
- Peavine Métis Settlement, located 141 km north-northwest
- Gift Lake Métis Settlement, located 150 km north
- Enoch Cree Nation No. 440, located 162 km southeast
- Buffalo Lake Métis Settlement, located 201 km east
- Horse Lake First Nation, located 280 km west-northwest
- Otipemisiwak Métis Government, District 21 (BBPP located within District 21)

13.6 F) Proximity to Federal Lands

No federal protected areas are located adjacent to or within 10 km of the BBPP boundaries. Please refer to Figure 7 in Appendix B.

The closest federal wildlife area is the Meanook National Wildlife Area, located approximately 144 km east of the BBPP.

The closest national park is Elk Island National Park, located approximately 202 km southeast of the BBPP. The next closest national park is Jasper National Park, located approximately 210 km southwest of the Project lands.

14 PHYSICAL AND BIOLOGICAL ENVIRONMENT

14.1 ASSESSMENT OF SIGNIFICANCE OF EFFECTS

In order to identify if residual effects are significant or not, consideration of the magnitude, geographical extent, duration, frequency, and reversibility is required. Table 11, *Characterization Criteria for Residual Environmental Effects*, (below) provides a description of these effects characteristics and the varying degrees in which they can contribute to the significance of an effect. Where possible, criteria will be described quantitatively. When residual effects cannot be characterized quantitatively, they will be characterized qualitatively.

The following criteria were defined in relation to assessing the significance of the residual adverse effects for the following Valued Ecosystem Components (VEC):

Table 11. Characterization Criteria for Residual Environmental Effects

Characterization	Description	Definition of Categories
Magnitude	*Refers to the expected size and/or severity of an adverse effect relative to existing conditions on a valued component from Project activities after mitigation*	***Insignificant (I)*** *– Differing from the average value for the existing environment/baseline conditions to a small degree, but within the range of natural variation* ***Minor*** *– Differing from the average value for the existing environment/baseline conditions, outside the range of natural variation, and less than or equal to appropriate guideline* ***Moderate*** *– Differing from the existing environment/ baseline conditions and natural variation, and marginally exceeding a guideline* ***Major*** *– Differing from the existing environment/ baseline conditions and natural variation, and exceeding a guideline*
Likelihood	*The qualitative assessment of the probability of the impact occurring.*	***Almost Certain-*** *expected to occur with a high degree of certainty.* ***Likely*** *- expected to occur with a medium to high degree of certainty.* ***Possible*** *- expected to occur with a low to medium degree of certainty.* ***Unlikely*** *– expected to occur with a low degree of certainty*

14.2 Risk Assessment

Depending on the information available, there are several approaches used to characterize risk. In this report we have used a structured approach to Significance of Effects (Table 12), which considers magnitude and likelihood of effects.

Table 12. Risk Matrix of Consequences vs. Likelihood

Likelihood	Magnitude			
	Insignificant	**Minor**	**Moderate**	**Major**
Almost Certain	Medium	Medium	High	Very High
Likely	Medium	Medium	High	High
Possible	Low	Medium	Medium	High
Unlikely	Low	Low	Medium	Medium

14.3 Desktop Review

A desktop review was conducted to determine historic and potential wildlife species of concern occurrences in the BBPP area.

The following were reviewed prior to the wildlife assessment to determine potential sensitive species in the area and to develop proposed mitigation measures when warranted by the confirmed presence of species of management concern.

1. The Alberta Fish and Wildlife Internet Mapping Tool (FWIMT) was used to identify wildlife species at risk or of concern that have been previously observed within five-kilometer radius of BBPP centroid.
2. Alberta Environment and Sustainable Resource Development (Alberta Sustainable Resource Development [ASRD], 2013) Sensitive Species Inventory Guidelines.
3. Alberta Sustainable Resource Development (Alberta Environment and Protected Areas, 2020), The General Status of Alberta Wild Species 2020.
4. Government of Canada Species at Risk Public Registry (Government of Canada, 2019)
5. Provincial Wildlife Sensitive feature spatial data layers in GIS-usable format.

6. Alberta Conservation Information Management System (ACIMS) database search.
7. Landscape Analysis Tool (LAT) Report - The Landscape Analysis Tool (LAT) is a web-enabled geo-spatial mapping tool that identifies base and sensitive landscape features and how they interact with a proposed land location and activity being considered on Alberta Government Public Land. It provides users the ability to view and map their proposed project and generate a LAT report required for all Alberta public land disposition applications.
8. Review of aerial photos and online maps and government data sources for the general project region.

14.3.1 ECOREGION

The BBPP is located in the Green Zone, within the Upper Foothills Natural Region (Alberta Parks, 2015). The BBPP is located within the defined Wildlife Management Unit ID 347: the Marsh Head Wildlife Management Unit. It is in the Eastern Slopes Land Use Zone.

The Lower Foothills Natural Subregion has the most diverse forests in Alberta in terms of forest The Project is located within the Upper Foothills Natural Subregion, on the edge of the Lower Foothills Natural Subregion, within the Foothills Natural Region of Alberta. The subregions are characterized by dense mixed wood stands of aspen (*Populus tremuloides*), white spruce (*Picea glauca*), black spruce (*Picea mariana*), and pines (*Pinus* spp.) with an understory of native forbs and peatmosses (*Sphagnum* spp.). The Upper Foothills Natural Subregion contains large areas of productive timber stands and extensive oil and gas development is prevalent throughout (Alberta Parks, 2015).

14.3.2 ALBERTA CONSERVATION INFORMATION MANAGEMENT SYSTEM (ACIMS) RESULTS

Alberta Conservation Information Management System (ACIMS) is a data centre that provides biodiversity information on Alberta's species, natural ecological communities, and sites. Information about the location, condition, status and trends of selected elements is collected, updated, analyzed, and disseminated (Alberta Parks, 2019).

The results of the ACIMS search of the BBPP area indicated:

1. No Non-sensitive Element Occurrences (‘EO’);
2. No sensitive EOs;

3. No Protected Areas found
4. No Crown Reservations/Notations found.

The two closest Element Occurrences of non-sensitive species occur more than five kilometers away from the Study Area. A copy of the search results is provided in Appendix K – ACIMS Data Search Results.

14.3.3 Fish and Wildlife Internet Mapping Tool (FWIMT) Search Results

The desktop analysis indicated that three wildlife species of management concern have been documented within two kilometers of the Project development area. Of these, two are listed provincially as 'Sensitive' (Canada lynx [*Lynx canadensis*] and fisher [*Pekania pennanti*]) and one is listed provincially as 'At risk' (grizzly bear [*Ursus arctos ssp. horribilis*]). Grizzly Bear (Western Population) is listed under COSEWIC status as Special Concern.

14.3.4 LAT Report

The Landscape Analysis Tool (LAT) is a web-enabled geo-spatial mapping tool that identifies base and sensitive landscape features and how they interact with a proposed land location and activity being considered on Alberta Government Public Land. It provides users the ability to view and map their proposed project and generate a LAT report required for all Alberta public land disposition applications (Government of Alberta, 2024b).

LAT uses approximately sixty data layers, divided into two categories:

- Base Map Layers – This is a generalized view of key data layers that provide a background setting for the map. This presents the user with details at the provincial extent to help orient to the specific locations.
- Operational Layers – These layers provide specific context and detail of key data layers that can be turned on or off. Some of these layers pertain to the report processing logic of a user's proposed activities.

The specific and applicable approval standards and operating conditions associated with a disposition application are identified on a valid LAT report.

The results of the LAT Report and associated pre-construction requirements for assessment and approval conditions is found in Appendix M – LAT Report.

14.3.5 PROVINCIAL PROTECTED AREAS

The closest Provincial Park is the Carson-Pegasus Provincial Park is located 23 km south of the BBPP.

14.3.6 PROVINCIAL RECREATIONAL AREAS

The closest Provincial Recreational Area is the Freeman River Provincial Recreational Area located approximately 12 km west-northwest of the BBPP.

14.3.7 ENVIRONMENTALLY SIGNIFICANT AREAS (ESA)

ESAs are (Government of Alberta, 2016b):

- Important to the long-term maintenance of biological diversity, soil, water, or other natural processes, at multiple spatial scales.
- Areas that contain rare or unique elements or that include elements that may require special management consideration due to their conservation needs.

It is important to note that ESAs do not (Government of Alberta, 2016):

- Consider how these areas are being, or how they should be, managed or conserved.
- Represent natural resource policy, areas requiring specific management objectives, or comprehensive status reporting.
- Represent government policy, and do not necessarily require or confer legal protection.
- Replace other indicator-specific mapping and planning tools, such as wetland inventories, caribou range maps, and species at risk recovery plans.

ESAs are intended as an information tool – not as a regulatory tool (Government of Alberta, 2016b).

> ESA mapped areas "*are available for use by provincial and municipal land-use planners, industry, consultants, environmental organizations, academic institutions, and others, as an information tool to support municipal, regional, and provincial scale planning initiatives.*

> *The identification of significant areas does not consider how these areas are being, or how they should be, managed or conserved. As such, ESAs do not represent natural resource policy, areas requiring specific management objectives, or comprehensive status reporting. Further, ESAs do not represent government policy and do not necessarily require legal protection. They are intended to be an information tool that complements other information sources to inform land-use planning and policy at local, regional, and provincial scales*" (FIERA Biological Consulting, 2014).

A comprehensive list of criteria, sub-criteria, and indicators were selected to identify ESAs in Alberta. Given that a single criterion is unlikely to be representative of all desired components of an ESA, multiple criteria, sub-criteria, and indicators were incorporated into the ESA framework. (FIERA Biological Consulting, 2014).

Once final ESA values were calculated, and a continuous ESA value surface was produced, the distribution of ESA scores was examined, and a variety of methods were explored to objectively assign an ESA cut-off value, including Jenks and percentile ranks. Ultimately, professional judgement was used to determine a cutoff value of >0.189 for designating quarter sections as Environmentally Significant Areas in the province (FIERA Biological Consulting, 2014).

The Project lands have an ESA scoring value rating of 0.1215 (Scoring >0.189 equals Provincial ESA), which puts the Project lands in the third highest of the six ESA value rating categories.

This implies a mid-level likelihood of:

- Areas that contain focal species, species groups, or their habitat
- Areas that contain rare, unique, or focal habitat
- Areas with ecological integrity
- Areas that contribute to water quality and quantity.

According to the *Environmentally Significant Areas of Alberta* map and the *Environmentally Significant Areas of Alberta* (Sweetgrass Consultants Ltd., 2009) there are no environmentally significant areas (ESA scores >0.189) within 5 km of the BBPP lands.

14.3.8 IMPORTANT BIRD AREA (IBA)

There are no IBAs near the Project. The closest IBA is the Lesser Slave Lake IBA located 86 km north of the Project (Bird Studies Canada, 2024).

14.3.9 SENSITIVE SPECIES WITH POTENTIAL TO OCCUR

The following is a list of federal and provincial sensitive species with the potential to occur around the general project footprint (Table 13 below). The determination of potential occurrence is based upon habitat preferences of the individual species compared to the habitat potential in and around the BBPP area.

The list of species was first narrowed by broad geographic area. The list of species was then further narrowed by identifying specific habitat requirements for each species. The habitat requirements were then compared against the known, or expected habitat, at the Project. For example, if a listed species required open water lake habitat, and no open water lake habitat is present inside the Project area footprint, this species was not carried forward to the final list of priority species within the Project area.

Table 13. Potential Sensitive Species and Likelihood of Occurrence

Class	Scientific Name	Common Name	Alberta Status 2015	COSEWIC status	On Schedule 1 (Yes/No)?	SARA status	Comments	Likelihood of Occurrence in Project
Birds	Haliaeetus leucocephalus	Bald Eagle	Sensitive				A species once at risk throughout much of its North American range, but now recovering; low density in Alberta. Nests vulnerable to human disturbance, and as such, require protection.	Low. No nests found
Birds	Strix varia	Barred Owl	Sensitive				Likely fewer than 2000 breeding birds in the province. This interior forest species requires larger blocks of mature dense woodland. Forest fragmentation detrimental. Forest management plans need to ensure breeding habitat retained.	Low due to lack of habitat
Birds	Dendroica castanea	Bay-breasted Warbler	Sensitive				Dependent on old-growth forest. Forest management plans need to ensure retention of breeding habitat.	Low due to lack of habitat
Birds	Picoides arcticus	Black-backed Woodpecker	Sensitive				Maintenance of mature coniferous forests important. Standing dead trees (snags) required for nesting. Forestry and fire suppression practices may decrease the availability of these stand types.	Low due to lack of habitat
Birds	Dendroica virens	Black-throated Green Warbler	Sensitive				Over 10 000 individuals in the province. Designated a “Species of Special Concern” in Alberta. Habitat loss and fragmentation resulting from industrial development threaten this old-growth dependent species.	Low due to lack of habitat

Class	Scientific Name	Common Name	Alberta Status 2015	COSEWIC status	On Schedule 1 (Yes/No)?	SARA status	Comments	Likelihood of Occurrence in Project
Birds	Dendroica fusca	Blackburnian Warbler	Sensitive				Considered peripheral with a very restricted distribution in Alberta. Preference for mature mixedwood forests suggests it may be vulnerable to forestry operations.	Low due to lack of habitat
Birds	Spizella breweri	Brewer's Sparrow	Sensitive				Steep population decline in Alberta since 1994. Prairie population of the species relies on availability of natural sage brush. Thought to be declining because of its specific habitat requirements.	Low due to lack of habitat
Birds	Buteo platypterus	Broad-winged Hawk	Sensitive				May be experiencing major population declines as breeding habitat disappears. Requires large stands of mature to old-growth forest in the parkland and southern boreal forest. Careful woodlot management by essential to maintain breeding habitat.	Low due to lack of habitat
Birds	Certhia americana	Brown Creeper	Sensitive				A mature forest-dependent species that is vulnerable to forest fragmentation, and certain forest management practices.	Low due to lack of habitat
Birds	Chordeiles minor	Common Nighthawk		Special Concern	Yes	Threatened	Common Nighthawks nest in both rural and urban habitats including coastal sand dunes and beaches, logged forest, recently burned forest, woodland clearings, prairies, plains, sagebrush, grasslands, open forests, and rock outcrops.	Possible due to edge habitat

Class	Scientific Name	Common Name	Alberta Status 2015	COSEWIC status	On Schedule 1 (Yes/No)?	SARA status	Comments	Likelihood of Occurrence in Project
Birds	Coccothraustes vespertinus	Evening Grosbeak		Special Concern	Yes	Special Concern	Evening Grosbeaks breed in mature and second-growth coniferous forests of northern North America and the Rocky Mountains, including spruce-fir, pine-oak, pinyon-juniper, and aspen forests.	Low due to lack of habitat
Birds	Aquila chrysaetos	Golden Eagle	Sensitive				Most recent estimate suggests 100-250 breeding pairs in Alberta. Disturbance from human related activities is greatest threat. Because of its low population and dispersal over a large area, nest site inventory and protection are necessary.	Low due to lack of habitat and no nests found
Birds	Strix nebulosa	Great Gray Owl	Sensitive				A naturally scarce species, widely distributed in foothill and boreal habitats. Requires stands of mature forest for nesting, thus is vulnerable to clearing.	Low due to lack of habitat
Birds	Contopus cooperi	Olive-sided Flycatcher		Special Concern	Yes	Threatened	Olive-sided Flycatchers breed mostly in the boreal forest and in western coniferous forests.	Low due to lack of habitat

Class	Scientific Name	Common Name	Alberta Status 2015	COSEWIC status	On Schedule 1 (Yes/No)?	SARA status	Comments	Likelihood of Occurrence in Project
Birds	Pandion haliaetus	Osprey	Sensitive				This species is uncommon, but widespread, and faces limited threats to population and habitat, including threats to nesting sites. Continued monitoring and protection of specific nest sites desirable. In all nesting areas, they use openings or edges in the forest and are rarely found in deep, closed forest—look for them in meadows, rivers and streams, partially logged areas, recent burns, beaver ponds, bogs, and muskegs. These areas often have dead or dying trees, which provide exposed perches for singing, foraging, and watching for predators and rivals.	No nests found
Birds	Dryocopus pileatus	Pileated Woodpecker	Sensitive				Requires mature to old-growth trees for nesting. Essential to incorporate maintenance of breeding habitat into management plans on both public and private lands. Some threats to populations identified.	Low due to lack of habitat
Birds	Cygnus buccinator	Trumpeter Swan	Sensitive	Not at Risk	No		An estimated 166 breeding pairs occur in Alberta. Critical shortage of key winter habitat limits population growth. Breeding habitat relatively secure. Efforts underway to expand wintering areas. Designated as “Threatened” under the Wildlife Act.	Low due to lack of habitat. Identified habitat >6 km away.

Class	Scientific Name	Common Name	Alberta Status 2015	COSEWIC status	On Schedule 1 (Yes/No)?	SARA status	Comments	Likelihood of Occurrence in Project
Birds	Piranga ludoviciana	Western Tanager	Sensitive				Prefers old coniferous and mixedwood forest; obligate neotropical migrant. Species may be vulnerable to habitat loss or deterioration by various forecast land uses.	Low due to lack of habitat
Mammals	Lynx rufus	Bobcat	Sensitive				Perhaps fewer than 1 000 individuals. Population of bobcats is very low, but population is presumed to be stable.	Low due to lack of habitat
Mammals	Lynx canadensis	Canada Lynx	Sensitive				Cyclic species. Estimated less than 8 000 individuals at the bottom of the cycle. Population has decreased in recent years, and some concern exists over habitat loss and fragmentation.	Possible. Proximity to existing industrial use in area may limit use.
Mammals	Martes pennanti	Fisher	Sensitive				Species considered uncommon to rare. Population status is unknown, and trends in population and distribution uncertain. Current forestry practices may reduce availability of preferred habitat. Fisher has declined since 1985.	Low due to lack of habitat, proximity to human populations, and existing industrial use in area.

Class	Scientific Name	Common Name	Alberta Status 2015	COSEWIC status	On Schedule 1 (Yes/No)?	SARA status	Comments	Likelihood of Occurrence in Project
Mammals	Ursus arctos	Grizzly Bear	Threatened	Special Concern	Yes	Special Concern	Population estimates are currently underway. Currently sustaining its population under a very restrictive sport hunting regime. Greatest threat is loss and degradation of wilderness habitats through resource extraction and recreational development.	Low due to lack of habitat, proximity to human populations, and existing industrial use in area.
Mammals	Myotis lucifugus	Little Brown Myotis	May Be at Risk	Endangered	Yes	Endangered		Low due to lack of habitat
Mammals	Myotis septentrionalis	Northern Long-eared Bat	May Be at Risk				Population size unknown, but uncommon over known range. Current forestry practices threaten habitat, as it relies on large, early decay trees for roosting. Need to incorporate habitat requirements into forest management.	Low due to lack of habitat within project footprint.
Mammals	Myotis septentrionalis	Northern Myotis		Endangered	Yes	Endangered		Low due to lack of habitat

Class	Scientific Name	Common Name	Alberta Status 2015	COSEWIC status	On Schedule 1 (Yes/No)?	SARA status	Comments	Likelihood of Occurrence in Project
Mammals	Rangifer tarandus caribou	Woodland Caribou	At Risk				Most populations declining, with some at immediate risk of extirpation. Primary threat is increased predation by wolves in response to human activity. Maintenance of old-growth forest habitat is critical. Designated as "Threatened" under the Wildlife Act.	Low due to lack of habitat

14.3.9.1 Grizzly Bears

The area of proposed development is located within the Alberta provincial Bear Management Area (BMA) 7, also known as the Swan Hills Population unit. This BMA is an eastern outlier of the Foothills Natural Region and is composed primarily of Lower Foothills and Central Mixed-wood natural subregions. A narrow habitat linkage connects this BMA to the subpopulation of grizzly bears in BMA 2 (Grande Cache population unit;). This Project area is within the S3 grizzly bear watershed unit (3GBWU), which is a secondary conservation zone (Figure 5 in Appendix B – Figures). Please refer to Section 14.6.5.1.2.1 (Grizzly Bears) below for more information on Grizzly Bears at the BBPP.

14.4 FIELD SURVEYS

A field reconnaissance survey for wildlife, associated wildlife features, rare plants, and other sensitive habitat features (e.g., wetlands) was conducted on foot by Bear Tracks Environmental Services (2015) Ltd. (BTES) biologists on September 8th, 2022, under suitable weather conditions.

The assessment included recording vascular and non-vascular plant species encountered during a meander of the Project development area following the *Guidelines for Rare and Vascular Plant Surveys in Alberta* (ANPC, 2012). All wildlife species detected by sight or sound were documented. Potential high-value habitat features such as nesting cavities, and dens within the Project development area were also documented when encountered. When applicable, the locations of wetlands and watercourses identified within the proposed Project footprint were classified and recorded and the spatial extent of these features were estimated to aid with future characterization and delineation efforts of these features. Classification of wetlands followed the Alberta Wetland Classification System Guide (ESRD, 2015), while watercourses were classified in accordance with watercourse definitions as described in the Government of Alberta Pre-Application Requirements for Formal Dispositions (2019). The wetland encountered was visually inspected for evidence of amphibian presence (i.e., eggs, tadpoles, frogs/toads and froglets/toadlets). All GPS locations of sensitive wildlife features were recorded in NAD 83.

Additionally, a timber volume assessment was conducted to assess merchantable timber and species composition for salvageable timber within the Project development area. During the field assessment, the diameter at breast height (DBH) of merchantable trees within a 10 m radius sample plot were measured and drone flights were conducted to confirm the extent of salvageable timber. Tree volume was estimated using DBH and height within the sample plot area and extrapolated to the estimated extent of the merchantable stand (based on satellite

imagery review) to estimate total volume of merchantable timber within the Project development area.

In 2023, qualified biologists from BTES revisited the site to conduct sensitive raptor surveys in conjunction with two rounds of breeding bird surveys on June 16th and 28th. Please see Raptor and Breeding Bird Surveys in Section 14.4.2 below.

14.4.1 WETLAND SURVEYS

Under the Alberta Wetland Identification and Delineation directive, the wetlands have been delineated per Pathway 3 – simple desktop delineation and verification. "Pathway 3 is followed when the wetland boundary is obvious and simple to delineate, and imagery is available. In pathway 3, the desktop delineation is done by a desktop assessment, but the wetland boundary is subsequently verified in the field at a representative number of points using a GPS unit."

Wetlands and watercourses in the BBPP and the broader area were searched and characterized in the field by Clint Gellrich, P.Biol and Jason Headley, B.Sc.. Boundary determination was based on micro-topography and observed surface hydrology and vegetation. No watercourses were identified during the surveys and one small (approximately 0.09 ha) seasonal marsh wetland was identified on the BBPP. Please refer to Photo 1 below (Aerial photos of the BBPP).

14.4.2 RAPTOR AND BREEDING BIRD SURVEYS

Qualified biologists (Alysia Platz, B.Sc., P.Biol., and Michelle Fouriner, B.Sc., P.Biol.) from BTES completed a targeted search for nesting raptors on June 16th and June 28th, 2023, in conjunction with breeding bird surveys (Government of Canada, 2016). Surveys were conducted on foot within and adjacent to the project footprint, under suitable weather conditions. The timing of surveys coincided with requirements of the Sensitive Species Inventory Guidelines (ASRD, 2013). Six (6) BBS locations, spaced approximately 300 m apart, were placed throughout the proposed Project. A ten-minute point count was conducted at each location between sunrise and 10:00 a.m., during which all bird species occurrences (visual and auditory identification) within 200 m of the surveyor's location were recorded. Incidental observations (i.e., occurrences not observed during the dedicated point count survey, or outside of the 200 m point radius) were also recorded. This included the documentation of all wildlife species (i.e., birds, mammals, amphibians, etc.) and habitat features (i.e., nests, dens, etc.).

Within the study area, the surveyor would scan high value habitat areas (wetlands, mature tree stands) with binoculars, with particular focus on potential raptor nest habitat. The qualified professionals' movements throughout the assessment area were tracked using a GPS. All

wildlife species detected by sight, sound, and/or sign were recorded, as well as GPS locations for sensitive wildlife features and other environmental sensitivities observed during the assessments. The primary objective of the assessments was to identify potential sensitive wildlife habitat features associated with species of management concern that may be at risk of direct disturbance from Project activities in order to minimize impacts to nesting sites and prevent potential incidental take. Results of the surveys can be found in Section 14.6.5.1.3 (Birds).

14.5 AERIAL PHOTOS OF THE BBPP



Photo 1. Seasonal Marsh Wetland on BBPP Lands



Photo 2. SW corner of the BBPP facing east.



Photo 3. SW corner of the BBPP facing north.

14.6 VALUED ECOSYSTEM COMPONENTS (VECS)

Each VEC, including the baseline environmental work that has been completed to evaluate each VEC, is described in the following sections. Each VEC section provided below describes the results of the baseline conditions, potential effects as a result of the BBPP, mitigation measures to reduce potential effects, and the significance of potential effects.

Table 14. High Level Environmental Summary

Environmental Condition	Exists	If Yes, Explain
Historical Sites Identified	☐ Yes ☒ No	
Within Environmentally Significant Area	☐ Yes ☒ No	
Integrated Resource Plans in place	☐ Yes ☒ No	
Will the site be located on an alkaline flat or dry slough?	☐ Yes ☒ No	
Is the site in a flood-irrigated area?	☐ Yes ☒ No	
Is the site within a 1-in-100-year floodplain?	☐ Yes ☒ No	
Will the site be located within 30 m of a valley/coulee break?	☐ Yes ☒ No	
Is there intermittent drainage across the site?	☐ Yes ☒ No	
Does the site have a known spring?	☐ Yes ☒ No	
Are known rare plant species or plant communities on or near the site?	☐ Yes ☒ No	
Are there wildlife species at risk on the site?	☐ Yes ☒ No	
Within a Key/Critical Wildlife Zone?	☐ Yes ☒ No	
Within Caribou Protection Plan Area	☐ Yes ☒ No	
Any nests identified within 1000 metres?	☐ Yes ☒ No	
Any mineral licks identified within 1000 metres?	☐ Yes ☒ No	
Wetlands present on the project lands?	☒ Yes ☐ No	One seasonal marsh wetland, approximately 0.09 ha, will be lost to the BBPP
Watercourses present on the project lands?	☐ Yes ☒ No	
Do Timing Constraints apply? If "Yes," dates:	☐ Yes ☒ No	
Access Restrictions required?	☐ Yes ☒ No	

14.6.1 AIR QUALITY

The combustion of natural gas at the BBPP will result in atmospheric emissions of greenhouse gases (GHGs): CO_2, methane (CH_4), and nitrogen dioxide (N_2O); and other pollutants, namely NOx and particulate matter less than 2.5 microns in diameter ($PM_{2.5}$). Limited SO_x emissions are expected. Air emissions are expected to occur during the construction, operation, and decommissioning phases of the BBPP; however, for the purposes of this report, only direct emissions during the operations phase are discussed.

The BBPP will use the most efficient technology available today to produce electricity from natural gas combustion. To minimize NO_x emissions, the exhaust system will be equipped with selective catalytic reduction (SCR). Once the carbon capture system (CCS) is commissioned, it is expected that 95% of produced CO_2 will be recovered from the exhaust system's flue gases for geological sequestration.

14.6.1.1 Provincial Guidelines

The primary substance of concern from the BBPP is NO_x from the combustion of natural gas. Secondary substances of concern from natural gas combustion in the emission sources include carbon monoxide (CO), particulate matter less than 2.5 microns in diameter ($PM_{2.5}$) and total suspended particulate matter (TSP). Potential ammonia (NH_3) resulting from operation of the SCR system has also been evaluated. Air quality modelling has been completed to assess the potential air quality effects of BBPP on the surrounding environment to ensure the predicted maximum concentrations comply with the current *Alberta Ambient Air Quality Objectives* (*AAAQOs*; AEP, 2019).

Dispersion modelling was performed utilizing CALPUFF in accordance with the requirements outlined within the Alberta Environment and Protected Areas (AEPA) *Air Quality Model Guideline* (AQMG). In total, five modelling cases have been assessed.

The results of the dispersion modelling, indicate that the predicted maximum ground-level concentrations (MGLCs) of nitrogen dioxide (NO_2), CO, $PM_{2.5}$, TSP and NH_3 associated with various operating conditions comply with the applicable *AAAQO*s. Please refer to Appendix N – Air Quality Assessment.

14.6.1.2 GHG Emissions and Federal Regulations

The federal government is expected to establish new emission intensity benchmarks for electricity generation under the proposed *Clean Electricity Regulations*. As of April 2023, the federal *Regulations Limiting Carbon Dioxide Emissions from Natural Gas-fired Generation of Electricity* (SOR/2018-261) is the current regulation that sets an emission intensity limit for natural gas power generation facilities capable of producing 25 MW or more. For a combustion unit with a generation capacity greater than 150 MW, such as that of BBPP, the electricity generated cannot exceed 420 tCO_2e/GWh during a calendar year, on average.

Horizon Compliance Group Inc. (Horizon Compliance) was retained to prepare an Emissions Intensity Report in order to assess federal regulatory compliance at the BBPP (Appendix O – Emissions Intensity Report).

The results of the Emissions Intensity report indicate the BBPP will meet the federal *Regulations Limiting Carbon Dioxide Emissions from Natural Gas-fired Generation of Electricity* and comply with the applicable *Canadian Ambient Air Quality Standards* (*CAAQS*) during the facility's operations phase, with or without the commissioning of the CCS.

14.6.1.2.1 Summary of Results of Emissions Intensity Report

The BBPP is a combined cycle power plant with CCS. Emissions sources at the BBPP include one natural gas fired combustion turbine generator which vents to the heat recovery steam generator, one auxiliary boiler stack, one CCS absorber stack, and two triethylene glycol heaters.

It is possible that the carbon capture and storage (CCS) hub, or other party's hubs, may not be operational when the BBPP is commissioned. As such, the BBPP may operate for a period without CCS. Similarly, in the event that the CCS hub is down for maintenance or experiences unplanned outages, the BBPP will operate without CCS. The number of emission sources and release points change when operating with and without CCS. Dispersion modelling of the BBPP was conducted under continuous operations, with and without CCS, to ensure that all MGLC of ambient air quality are compliant regardless of the operational configuration.

Current GHG regulations applicable to the BBPP include the federal *Regulations Limiting Carbon Dioxide Emissions from Natural Gas-fired Generation of Electricity.* These regulations require that the carbon intensity be calculated using the gross electricity produced and CO_2 emissions only. The carbon intensity for the BBPP was calculated according to the requirements of the federal Regulations. Calculations integrated conservative values, where maximum power generation (100% load) is assumed to occur continuously over the course of a year. Table 15 summarizes the carbon intensity for the BBPP, with and without CCS, for comparison with federal limits.

Table 15. Carbon Intensity Results

Limits	Project without CCS	Project with CCS
FEDERAL CO_2 Emission Intensity Limit (tCO_2/GWh)	420	

BBPP CO_2 Emission Intensity (tCO_2/GWh)	383	19

Without CCS the BBPP is calculated to meet the 420 tCO_2/GWh intensity limit as required by the federal *Regulations Limiting Carbon Dioxide Emissions from Natural Gas-fired Generation of Electricity*. With the commissioning of CCS, the BBPP is calculated to reduce its CO_2 emission intensity to 19 tCO_2/GWh.

14.6.1.3 Monitoring

The plant will be equipped with a Continuous Emission Monitoring System (CEMS) capable of monitoring carbon monoxide (CO), nitrogen oxides (NO_x), oxygen (O_2), and opacity to ensure that emissions levels do not exceed acceptable levels. Typically, CEMS monitoring occurs on a minute-by-minute basis so that exceedances can be immediately identified. CEMS results are provided to AEPA as a component of the Industrial Approval requirements on a monthly basis.

14.6.1.4 Mitigation

BBPP will utilize large frame high efficiency class gas turbine technology designed to meet the requirements with the Alberta Air Emission Standards for Electricity Generation (AEP, 2005). The natural gas fired combustion turbine will primarily incorporate low emission combustors for emission control, such as the Dry Low NO_x (DLN) combustion systems, to limit the formation of pollutants in the burning zone by utilizing "lean-premixed" combustion technology.

Utilizing multi-staged lean pre-mixed combustors, the combustion process optimizes the firing rates, firing temperature and controls the heat released to optimum performance and emissions during turbine load transitions, reducing peak temperatures of local hot spots that contribute to NO_x production, thus reducing emissions throughout the operating range of the plant.

Other mitigating measures include selection of an adequate stack height and a low NO_x type natural gas fired burner management system and combustion control for the auxiliary boiler operated during plant startup.

GHG emissions in Alberta are currently regulated under the *Climate Change and Emissions Management Act* and the Technology Innovation and Emissions Reduction Regulation (TIER). The TIER applies to facilities that emit greater than 100,000 tonnes or more per year of carbon

dioxide equivalent (CO_2e) and requires annual compliance and forecasting reporting. Once operational, the BBPP will be subject to the requirements of the TIER program which include requirements for payment of a carbon tax, completion of verification assessments and GHG emission forecasting (Alberta Environment and Parks, 2022).

Under the regulations, electricity generators are required to subject to a "good-as-best-gas" electricity high performance benchmark, which is currently set at 0.37 tonnes CO_2e per megawatt-hour (MWh) of power produced reducing at a rate of 2% per year starting in 2023.

Based on TIER, allowable CO_2e emissions for the facility are 972,360 tonnes per year, slightly under the estimated emissions of 1,090,000 tonnes per year (based on anticipated fuel use). Emissions estimates were calculated based on conservative estimates of facility operation parameters (e.g. facility operates at peak load 24 hr/day, 365 days/year, no maintenance shutdown periods or other non-operating plant scenarios). As a result, the estimated GHG emissions are likely higher than actual.

14.6.2 VEGETATION

Land cover throughout the Project development area is dominated by stands of jack pine (*Pinus banksiana*), balsam fir (*Abies balsamea*), spruce, and aspen (*Populus* spp.) (approximately 2.5 ha.) over gently rolling terrain. The remaining landcover (approximately 17 ha.) consisted of dense regeneration in a former cutblock.

The trees are young, and the average diameter at breast height (DBH) was 19 cm. In some sections of the study area woody vegetation is dominated by young softwood trees spaced two or three metres apart, with a robust herbaceous understory of sedges, grasses, and mosses. Some aspen seedlings and shrubby species are scattered throughout. There is some downed wood, and few to no snags.

Dominant salvageable timber was Jack Pine and salvage is only present on approximately 2.48 ha of the total BBPP area (Table 16).

Table 16. Salvageable Timber Values

Tree sp.	Diameter (cm)	Estimated Height (m)
Jack pine	19.1	14.8
Jack pine	16.9	14.8
Jack pine	20.7	14.8

Tree sp.	Diameter (cm)	Estimated Height (m)
Jack pine	20.1	14.8
Jack pine	20.7	14.8
Jack pine	16.9	14.8
Jack pine	15.3	14.8
Jack pine	17.2	14.8
Jack pine	20.7	14.8
Jack pine	20.7	14.8
Jack pine	15.0	14.8
Jack pine	21.0	14.8
Jack pine	13.4	14.8
Jack pine	21.6	14.8
Jack pine	20.1	14.8
Jack pine	20.1	14.8
Jack pine	21.6	14.8
Jack pine	25.8	14.8
Jack pine	16.6	14.8
Jack pine	18.8	14.8
Jack pine	23.2	14.8
Jack pine	20.4	14.8
Jack pine	24.8	14.8
Jack pine	22.3	14.8
Jack pine	22.9	14.8
Jack pine	25.1	14.8
Jack pine	16.9	14.8
Jack pine	20.7	14.8
Jack pine	22.0	14.8
Jack pine	19.4	14.8
Jack pine	15.9	14.8

Seventy-one (71) vascular plant species and eight (8) non-vascular plant species were identified in the proposed Project development area (Table 17). The Project development area is primarily comprised of mixedwood forest (i.e., pine, spruce, poplar, aspen and fir) intermixed with forbs such as bunchberry (*Cornus canadensis*), cloudberry (*Rubus chamaemorus*), Canada mayflower (*Maianthemum canadense*), five-leave dwarf bramble (*Rubus pedatus*), and white twisted-stalk

(*Streptopus amplexifolius*). No vascular or non-vascular plant species of management concern were identified at the time of the assessment.

Table 17. Vegetation Identified on BBPP Lands

Scientific Name	Common Name	Ranking	Tracked	Origin	Lat.	Lon.
Viburnum edule	Squashberry	S5	Do not track	Native	54.53315	-115.572
Vaccinium vitis-idaea	Lingonberry	S5	Do not track	Native	54.53544	-115.576
Vaccinium myrtilloides	Velvetleaf Blueberry	S5	Do not track	Native	54.5354	-115.576
Trifolium repens	White Clover	SNA	Do not track	Exotic	54.53497	-115.577
Trifolium hybridum	Alsike Clover	SNA	Do not track	Exotic	54.53674	-115.575
Symphyotrichum ciliolatum	Lindley's Aster	S5	Do not track	Native	54.53669	-115.575
Streptopus amplexifolius	White Twisted-stalk	S5	Do not track	Native	54.53315	-115.572
Lycopodium annotinum	Interrupted Clubmoss	S5	Do not track	Native	54.53276	-115.57
Sphagnum sp.	Sphagnum mosses	N/A	N/A	N/A	54.53545	-115.576
Solidago sp.	Goldenrods	N/A	N/A	N/A	54.53474	-115.576
Scirpus microcarpus	Panicled Bulrush	S5	Do not track	Native	54.53424	-115.569
Scirpus atrocinctus	Black-girdle Bulrush	S4	Do not track	Native	54.53434	-115.569
Sceptridium multifidum	Leathery Grapefern	S4	Do not track	Native	54.53474	-115.576
Sceptridium multifidum	Leathery Grapefern	S4	Do not track	Native	54.53474	-115.576
Sceptridium multifidum	Leathery Grapefern	S4	Do not track	Native	54.5325	-115.571
Sambucus racemosa	Red-berried Elder	S4	Do not track	Native	54.53624	-115.573
Salix sp.	Willows	N/A	N/A	N/A	54.53545	-115.576
Rubus pubescens	Dwarf Raspberry	S5	Do not track	Native	54.53627	-115.573
Rubus pedatus	Five-leaf Dwarf Bramble	S5	Do not track	Native	54.53303	-115.572

Scientific Name	Common Name	Ranking	Tracked	Origin	Lat.	Lon.
Rubus idaeus	Red Raspberry	S5	Do not track	Native	54.53466	-115.574
Rubus chamaemorus	Cloudberry	S5	Do not track	Native	54.53574	-115.576
Rosa acicularis	Prickly Wild Rose	S5	Do not track	Native	54.53668	-115.575
Ribes lacustre	Swamp Currant	S5	Do not track	Native	54.53537	-115.577
Rhododendron groenlandicum	Bog Labrador Tea	S5	Do not track	Native	54.53539	-115.576
Rhinanthus minor	Yellow Rattle	S4	Do not track	Native	54.53525	-115.577
Ranunculus gmelinii	Small Yellow Water-crowfoot	S5	Do not track	Native	54.53428	-115.569
Ptilium crista-castrensis	Ostrich-plume Moss	S5	Do not track	Native	54.53543	-115.576
Ptilidium pulcherrimum	Tree Fringewort	S4	Do not track	Native	54.53678	-115.575
Populus tremuloides	Trembling Aspen	S5	Do not track	Native	54.53536	-115.576
Populus balsamifera	Poplars, Cottonwoods, and Aspens	S5	Do not track	Native	54.53252	-115.57
Polytrichum strictum	Bog Haircap Moss	S5	Do not track	Native	54.53624	-115.575
Polytrichum juniperinum	Juniper Haircap Moss	S4	Do not track	Native	54.53541	-115.576
Polytrichum commune	Common Haircap Moss	S4	Do not track	Native	54.53545	-115.576
Pleurozium schreberi	Red-stemmed Feather Moss	S5	Do not track	Native	54.53538	-115.577
Plagiomnium cuspidatum	Woodsy Thyme-Moss	S4	Do not track	Native	54.53628	-115.573
Pilosella sp.	Mouse Ear Hawkweeds	SNA	Do not track	Exotic	54.53623	-115.573
Picea mariana	Black Spruce	S5	Do not track	Native	54.53585	-115.575
Picea glauca	White Spruce	S5	Do not track	Native	54.53531	-115.576
Phleum pratense	Timothy Grass	SNA	Do not track	Exotic	54.53629	-115.573

Scientific Name	Common Name	Ranking	Tracked	Origin	Lat.	Lon.
Petasites frigidus	Arctic Butterbur	S5	Do not track	Native	54.53539	-115.577
Orthilia secunda	One-sided Wintergreen	S5	Do not track	Native	54.53475	-115.575
Mitella nuda	Mitreworts	S5	Do not track	Native	54.53277	-115.573
Mertensia paniculata	Tall Bluebells	S5	Do not track	Native	54.53527	-115.576
Melilotus officinalis	Yellow Sweetclover	SNA	Do not track	Exotic	54.53479	-115.576
Matricaria discoidea	Pineapple-weed	SNA	Do not track	Exotic	54.53497	-115.577
Maianthemum canadense	Canada Mayflower	S5	Do not track	Native	54.53284	-115.573
Lonicera involucrata	Twinberry Honeysuckle	S5	Do not track	Native	54.53676	-115.575
Linnaea borealis	Twinflower	S5	Do not track	Native	54.53545	-115.576
Hylocomium splendens	Stairstep Moss	S5	Do not track	Native	54.53542	-115.576
Hordeum jubatum	Foxtail Barley	S5	Do not track	Native	54.53507	-115.577
Hippuris vulgaris	Common Mare's Tail	S5	Do not track	Native	54.5343	-115.569
Hieracium umbellatum	Canada Hawkweed	S5	Do not track	Native	54.53623	-115.575
Gymnocarpium dryopteris	Northern Oak fern	S5	Do not track	Native	54.53526	-115.576
Gaultheria hispidula	Creeping Snowberry	S4	Do not track	Native	54.53434	-115.569
Galium triflorum	Fragrant Bedstraw	S5	Do not track	Native	54.53521	-115.576
Equisetum sylvaticum	Wood Horsetail	S5	Do not track	Native	54.53543	-115.576
Epilobium sp.	Willowherbs	N/A	N/A	N/A	54.53672	-115.575
Eleocharis sp.	Spikerushes	N/A	N/A	N/A	54.53427	-115.569
Dryopteris expansa	Spreading Wood Fern	S4	Do not track	Native	54.53446	-115.574
Dryopteris carthusiana	Spinulose Wood Fern	S5	Do not track	Native	54.53666	-115.575

Scientific Name	Common Name	Ranking	Tracked	Origin	Lat.	Lon.
Diphasiastrum complanatum	Northern Ground-cedar	S5	Do not track	Native	54.53626	-115.573
Cornus canadensis	Bunchberry	S5	Do not track	Native	54.53547	-115.576
Cirsium arvense	Canada Thistle	SNA	Do not track	Exotic	54.53249	-115.57
Circaea alpina	Alpine Enchanter's-Nightshade	S4	Do not track	Native	54.53627	-115.573
Chamaenerion angustifolium	Fireweed	S5	Do not track	Native	54.53638	-115.573
Carex utriculata	Northwest Territory Sedge	S5	Do not track	Native	54.53428	-115.569
Carex magellanica	Tall Bog-sedge	S5	Do not track	Native	54.53437	-115.569
Canadanthus modestus	Great Northern Aster	S5	Do not track	Native	54.53669	-115.575
Calamagrostis canadensis	Canadian Bluejoint	S5	Do not track	Native	54.53543	-115.576
Botrychium sp.	Moonworts	N/A	Track all extant and selected historical EOs	Native	54.53472	-115.577
Betula neoalaskana	Alaska Paper Birch	S5	Do not track	Native	54.53544	-115.577
Beckmannia syzigachne	American Slough Grass	S5	Do not track	Native	54.53431	-115.569
Athyrium filix-femina	Lady Fern	S4	Do not track	Native	54.53663	-115.575
Arnica cordifolia	Heartleaf Arnica	S5	Do not track	Native	54.53305	-115.572
Aralia nudicaulis	Wild Sarsaparilla	S5	Do not track	Native	54.53292	-115.57
Alopecurus aequalis	Short-awn Foxtail	S5	Do not track	Native	54.53427	-115.569
Alnus viridis	Green Alder	S5	Do not track	Native	54.53527	-115.576
Agrostis sp.	Bent Grass	N/A	N/A	N/A	54.53484	-115.573
Achillea millefolium	Common Yarrow	S5	Do not track	Native	54.53473	-115.577

Scientific Name	Common Name	Ranking	Tracked	Origin	Lat.	Lon.
Achillea alpina	Siberian Yarrow	S5	Do not track	Native	54.53524	-115.576
Abies balsamea	Balsam Fir	S5	Do not track	Native	54.53285	-115.573
Vulpicida pinastri	Powdered Sunshine Lichen	S3S5	Do not track	Native	54.53531	-115.576
Usnea sp.	Beard Lichens	N/A	N/A	Native	54.53538	-115.577
Tuckermanopsis sp.	Wrinkle Lichens	N/A	N/A	Native	54.5354	-115.577
Rhytisma salicinum	Willow Tar Spot	N/A	N/A	Native	54.53475	-115.574
Peltigera sp.	Pelt Lichens	N/A	N/A	Native	54.53678	-115.575
Parmelia sp.	Shield Lichens	N/A	N/A	Native	54.53547	-115.577
Lactarius sp.	Common Milkcaps	N/A	N/A	Native	54.5359	-115.575
Hypogymnia sp.	Tube Lichens	N/A	N/A	Native	54.53537	-115.577
Cladonia sp.	Pixie Cup Lichens	N/A	N/A	Native	54.53545	-115.576

14.6.2.1 Mitigation

Salvageable timber will be cut and decked for use by the forest management agreement (FMA) holder. Excess woody debris not required for rollback or reclamation will be disposed of by burning during winter conditions.

14.6.2.2 Effects of the Project

Regardless of mitigation implemented, vegetation removal is required, and all vegetation will be removed during construction on those areas required for construction and then operations.

14.6.2.3 Significance

14.6.2.3.1 Magnitude

The magnitude of effects to vegetation within the BBPP lands will be major due to clearing. But given the vegetation on surrounding lands and eventual reclamation of the Project, the magnitude will be insignificant. Interim reclamation, and revegetation techniques will reduce the magnitude of any localized effects.

14.6.2.3.2 Likelihood

The likelihood of effects on vegetation is almost certain, but only on vegetation affected by construction and operations. Surrounding vegetation are not anticipated to be affected.

14.6.2.3.3 Overall Risk

The overall risk to vegetation on the Project lands is medium due to clearing but the overall risk to surrounding vegetation is low.

14.6.3 SOILS[2]

In 2022, Tetra Tech Inc. (Tetra Tech) conducted a geotechnical desktop study for the proposed BBPP. The objective of the report is to assist KEC in assessing the geotechnical conditions for the proposed Project area and construction by identifying any potential geotechnical constraints that may affect the design and construction of the proposed development. Based on the geotechnical risks identified, preliminary recommendations to mitigate these risks were provided for consideration to address potential design and construction issues. Further intrusive and/or non-intrusive geotechnical evaluations (e.g., boreholes, test pits, probes geophysical exploration, etc.) are expected in future stages of the project to refine and confirm the findings, and to further investigate the areas identified as having potential geotechnical concerns. Refer to Appendix P – Geotechnical Report for the full report.

14.6.3.1 Subsurface Conditions

The subsurface conditions analyzed for the Project area include bedrock geology, bedrock topography, sediment thickness, surficial geology, and hydrogeology. A review of Tetra Tech's internal borehole database indicated several shallow boreholes less than 10 m in depth and offset greater than 1 km west of the Project area. These boreholes were drilled as part of a transmission line construction line Project to determine the surficial geology and have been excluded from analysis in this report. No publicly available geotechnical investigation reports near the Project area were found online using publicly available databases. Additional information for subsurface conditions was obtained using the Government of Alberta water well records online database.

[2] All information taken directly from the report: Geotechnical Desktop Study, Maskwa [BBPP] Project, Southwest of Swan Hills, Alberta. November 4, 2022 (Appendix P – Geotechnical Report).

14.6.3.2 Surficial Geology

The surficial geology of the Project area was determined through a review of the Alberta Geological Survey (AGS) and Geological Survey of Canada (GSC) maps.

The Sediment Thickness map shows an approximate thickness of 6 m to 20 m of sediment deposit above the bedrock. Lighter shaded regions exist near the Project area which indicate sediment thickness less than 5m are consistent with the findings of the bedrock topography map indicating potential presence of exposed bedrock formations.

The Surficial Geology of Alberta map shows the Project area is located near the division of the Moraine and Fluvial Deposit units. The Moraine unit is based in the Pleistocene period resulting from diamicton (till) deposition from glacial ice onto the subglacial landscape curing a period of glacial ice movement. The till is a heterogeneous material composed of clay, silt, sand, and minor coarse aggregate. The Fluvial Deposits are classified under the Holocene period and are sediments deposited via stream and river flows occurring in channels and overbank flows. These deposits can vary in the sorting and size of sand, gravel, silt, clay, and organic sediments. The physiographic region of the Project area is classified as Southern Alberta Plains.

The Surficial Geology of Whitecourt map was analyzed to confirm the findings and it also indicates that the Project area is located near the division of the Ground Moraine, Alluvium, and Colluvium. The topography of the area is classified as rolling to flat terrain which is confirmed by the findings of the site reconnaissance.

14.6.3.3 Bedrock Geology

The Bedrock Topography map indicates a top of bedrock elevation greater than 914.4 m for the Project area. Bedrock surface contour lines within the Project area are limited and it can be estimated the top of bedrock is between 914.4 m and 975.4 m (the largest mapped contour line) however the available contour lines indicate these are approximated elevations. Based on the ground surface contour lines, the surface elevation can be estimated to be approximately 1067 m. Google Earth topographical data indicates ground surface elevations greater than 1096 m which may be impacted by the significant tree growth in the area. Using a minimum ground surface elevation of 1067 m and a conservative top of bedrock elevation of 975.5 m, the bedrock topography map indicates greater than 90 m of cover. An additional drift thickness map indicates that 90 m of cover is likely conservative as the Project area is classified under less than 15.2 m of drift thickness with the potential for exposed bedrock in some areas. Using information from both maps and the water well records, shallow bedrock ranging from 21.3 m to the ground surface may be encountered.

14.6.3.4 Areas of Potential Geotechnical Risk

Based on the review of data and findings presented, several factors could exist within the Project area and along the gravel road that could impact the proposed construction, including:

- Uneven terrain and poor drainage;
- Existing development near the site;
- Potential presence of surficial fill soils;
- Presence of peat, moss, and organic soils;
- Presence of soft and wet near-surface soils;
- Potential for highly plastic near-surface soils and tile potential for soil swelling;
- Potential of rafted bedrock;
- Presence of a shallow groundwater table;
- Seeping and sloughing of subsurface soil;
- Potential for inadequate thickness of gravel along the road; and
- Presence of frost-susceptible soils.

14.6.3.5 Significance

14.6.3.5.1 Magnitude

The magnitude of effects to soils will be minor and only limited to the actual areas of disturbance. Implementation of the soils handling procedures, interim reclamation, and revegetation techniques will reduce the magnitude of any localized effects.

14.6.3.5.2 Likelihood

The likelihood of effects on soils is almost certain, but only on soils affected by construction and operations. Surrounding soils are not anticipated to be affected.

14.6.3.5.3 Overall Risk

The overall risk to soils is medium and is only isolated to the BBPP area of disturbance. Following interim and final reclamation, soil capability will be restored.

14.6.4 GROUNDWATER

Wet conditions were observed at the surface at some locations during the site reconnaissance, suggesting a relatively shallow groundwater table. Groundwater elevations are expected to fluctuate on a seasonal basis and will be highest after periods of prolonged heavy precipitation or snow melt. Perched groundwater may be encountered in sandy layers or bedrock rafts within the clay till deposits above the groundwater table. The perched groundwater will dissipate after wet periods as groundwater infiltrates down to the static groundwater table during drier periods.

14.6.4.1 Mitigation

KEC has developed an Environmental Protection Plan that will be used to guide construction, operations, and reclamation to further reduce BBPP effects on the environment.

This section describes standard mitigation measures designed to reduce or avoid interactions with hydrogeology during construction, operation, and reclamation activities, thereby mitigating potential effects.

If groundwater is encountered during construction, measures such as conventional pumping may be required and are expected to be effective. In sandier subgrades, more expensive measures may be required in some cases (i.e. well pointing).

During construction of the Project, there is potential for interactions with hydrogeology that can be mitigated through implementation of procedures and best management practices that minimize or eliminate disturbances to the local groundwater system. Standard mitigation measures for potential effects on hydrogeology during construction will include:

- Waste management procedures will be implemented for all construction wastes that are generated. Such measures would include the proper storage and segregation of wastes, such that impacts to groundwater quality are managed.
- Procedures and secondary containment will be implemented, where required, to manage the risk of spills of fuels, lubricants and other construction related fluids.
- Dewatering will be implemented, if required, during construction of subsurface infrastructure. The volumes of groundwater produced will be minimized through project pre-planning and careful construction scheduling such that the amount of time over which dewatering is required is minimized.
- The quality of groundwater produced would be assessed prior to discharge to the environment to confirm that the chemical composition of that water (relative to its

baseline quality) has not been altered through dewatering operations. Groundwater produced during dewatering would be released as close as practicable to the dewatering location (without causing hydraulic interference) within the local watershed such that watershed scale water balances are not altered. Water will be discharged in a manner to avoid erosion using turbidity barriers, containment berms and settling ponds. Construction dewatering, if required, will be in accordance with the terms and conditions of the EPEA approval conditions, and *Water Act* approval.

- Other potential accidental or acute interactions with the groundwater system will be mitigated through the following measures:

    - A groundwater monitoring network and a groundwater monitoring program may be implemented in accordance with the terms and conditions of the EPEA approval if required. The groundwater monitoring network would be designed to provide adequate characterization of background groundwater quality in upgradient areas, and ongoing characterization of groundwater quality in areas downgradient of potential sources of contamination.
    - Secondary containment procedures and leak detection monitoring will mitigate the potential for process liquids or wastes to be released into the subsurface, where they could migrate into groundwater. Routine maintenance inspections will be scheduled.
    - A spill prevention and response plan will be implemented for the Project, such that incidental spills are quickly identified, reported, and remediated.

14.6.4.2 Effects of the Project

Groundwater is an integral part of the hydrologic system and serves as a water resource that supports both the ecologic function within a watershed, and a variety of human land uses, such as commercial and industrial uses. Groundwater also interacts with surface water resources near rivers, lakes, or wetlands and can contribute baseflow to their water balance throughout the hydrologic year.

The value of groundwater resources can be broadly evaluated through two characteristics: groundwater quantity and groundwater quality. Groundwater quantity refers to the availability of groundwater at a given rate for production and use, and it varies widely depending upon the local geologic setting, hydrogeological conditions, and past/current groundwater use. Groundwater quality refers to the chemical composition of groundwater and its suitability for various uses and varies widely depending upon the local geologic setting, hydrogeological conditions, and past/current land use practices that may contribute to anthropogenic effects.

In evaluating potential effects on groundwater resources, both quantity and quality are considered.

Effects pathways describe the mechanism through which the Project can cause a potential effect on groundwater resources through physical infrastructure or associated activities. Effects pathways can change throughout the phases of the Project, depending upon the activities and physical infrastructure present.

Measurable parameters are a means through which change in groundwater quantity or quality can be characterized. The measurable parameter for a change in groundwater quantity is the hydraulic head (measured as an elevation above sea level). Hydraulic head distribution controls the movement of groundwater in the subsurface and is directly related to the availability of groundwater for use.

Changes in groundwater quality can be assessed through examination of a wide range of water quality parameter concentrations. Parameter concentrations can readily be determined from laboratory analysis of groundwater samples collected from water wells and the analysis results can be used to understand spatial and temporal variation in groundwater quality.

Interactions between the Project and groundwater quantity could include:

- Groundwater withdrawals for construction dewatering
- Groundwater withdrawals for Project water supply during operations
- Changes in local recharge due to construction of surface infrastructure and surface water management facilities

Interactions between the Project and groundwater quality can include:

- Changes to groundwater flow patterns during construction and/or operations that can in turn affect groundwater quality
- Accidental groundwater contamination related to construction activities
- Accidental groundwater contamination related to Project operations

With respect to potential interactions of the Project with groundwater as a result of construction and operation, the Project will require the installation of support structures into the ground to support the structures to an estimated depth of 10 feet (3 metres). In addition, electrical collector lines will be installed underground, likely at a depth of approximately 1.5 metres.

There has been interest in the effects of groundwater and aquitard deformations caused by the installation of piles to support large structures and buildings. Consequently, four studies

(Haymen et al. (1993); Boutwell et al. (2000); Achleitner et al. (2004); and Hird and Moseley (2000)) are summarized in the Environment Agency Science Report (2006). One of those test cells employed by Hayman et al. (1993), where a cylindrical steel pile was driven into two layers of soil: the upper sand layer saturated with contaminants (a mixture of two DNAPLs) and a lower layer saturated with clean water. It was concluded that no leakage of contaminants along the pile-clay interface took place. Another research study conducted by Boutwell et al. (2000) carried out a similar test on a wider range of pile types. In this case, Brine was used as a contaminant of preference. In this study, the results of Hayman et al. were confirmed. Further tests and similar conclusions were reported by Achleitner et al. (2004). It is contented that pile driving into consolidated clays can cause fracturing or cracking of the soil, causing a direct path for contaminants to travel. However, no evidence of hydraulic fracturing has been found in model testing conducted by those mentioned above or by Hird and Moseley (2000), some of which utilized consolidated clays in their studies.

14.6.4.3 Significance

14.6.4.3.1 Magnitude

The magnitude of effects to groundwater are expected to be minor during construction and operations.

14.6.4.3.2 Likelihood

The likelihood of effects on groundwater is likely during construction but unlikely to continue during operations as appropriate spill prevention measures will be in place during operations. Furthermore, the site is covered by low permeable soils which restrict groundwater infiltration and lateral movement following construction.

14.6.4.3.3 Overall Risk

The overall risk to groundwater is medium and is only isolated to the BBPP area of disturbance. Following interim and final reclamation, groundwater capability should be restored.

14.6.5 WILDLIFE

Surveyors completed a targeted search for nesting raptors on June 16th and June 28th 2023, in conjunction with BBS. No observations of any raptor species were recorded during this survey; however, a northern harrier (*Circus cyaneus*) was recorded incidentally within 1000 m of the Project site during the June 16th survey. No raptor nests were observed within 1000 m of the

Project footprint. Suitable nesting locations (i.e., aspen trees, cavities) for raptors were observed within the Project development area, primarily associated with mature, mixedwood forest stands present within and in the general area of the site.

Twenty (20) avian species were recorded during bird breeding season (BBS). All species that were observed are considered 'Secure' and are not provincially or federally listed as species of management concern.

14.6.5.1 Habitat

Habitat selection by wildlife is primarily a response to security, thermal comfort, and forage needs. Wildlife must balance these conflicting requirements. Habitat selection is species-specific, and choices will depend on physiological constraints and social needs of the species. Literature in conservation biology indicates that maintenance of movement corridors of suitable habitat between population centers is fundamental to wildlife health (Bentz, Saxena, & O'Leary, 1994).

Although security and thermal cover are important, habitat selection is strongly influenced by relative foraging opportunities (Renecker & Hudson, 1999). Diet, and consequently habitat selection in wildlife results from the differential scaling of metabolism and digestive capacity which forces smaller animals to feed more selectively (Demment & Van Soest, 1985). Forage quality is influenced by plant development processes, herbivore effects and environmental factors. Nutritional quality of available woody forage declines as food becomes more fibrous during winter. Certain foods may have high concentrations of secondary compounds (alkaloids, terpenes, tannins) making them unsuitable for consumption. Similarly, plant defenses may be stimulated by heavy browsing and result in unpalatable food items. Thus, quality of winter food resources offered to a browser can be considerably less than that of grazing ungulates which utilize extensive grassland and sedge meadows (Renecker & Hudson, 1999).

Seasonal changes in forage quality (Renecker & Hudson, 1999) are as dramatic as changes in biomass. However, staggered plant phenology offers an adaptive advantage to herbivores who track several different forage types. However, as browse matures there is a reduction in readily digestible cell solubles and leaf-to-stem ratios concomitant with an increase in cell wall constituents. During winter, wild ungulates are hard-pressed to meet their maintenance energy (Renecker & Hudson, 1999). As days become warmer in early spring there is increased movement of highly digestible cell solubles and sugars through the bark cambium of shrubs and trees to the expanding leaves. This flow of nutrients and growth of meristematic tissue within bark lowers the concentration of secondary compounds increases digestibility to about 65% for bark of trembling aspen, balsam poplar and willow; nevertheless, protein levels remain low.

Moose, wapiti, and presumably other species spend time in foraging habitats in direct proportion to foraging returns (measured as dry matter or protein intake rates) (Renecker & Hudson, 1999).

Because woody vegetation plays a fundamental role in ecosystem health, measurements of the level of use may assist in understanding effects of loss. Livestock will often browse woody vegetation in late summer and fall. Wildlife make use of woody vegetation year-round. Woody vegetation can sustain low levels of use; however, heavier browsing can deplete root reserves, inhibit establishment and regeneration, and cause loss of preferred woody species, leading to invasion by less desirable vegetation species (Renecker & Hudson, 1999).

Herbivores are faced with deciding the optimal trade-off between feeding rate and diet digestibility because the most nutritious forages also tend to be the rarest. Two main optimal foraging strategies have been identified (Renecker & Hudson, 1999). Time-minimization describes patterns of foraging that allow animals to meet their basic requirements in the least possible time. This is expected to operate when animals are exposed to increased risk of predation or cold stress while foraging. The second strategy, energy maximization, describes behaviors that maximize nutrient capture (Renecker & Hudson, 1991). In harsh environments, both strategies result in similar foraging patterns. As the disparity between forage availability and animal requirements widens, diet expansion is expected as the animal becomes less selective (Renecker & Hudson, 1999).

Estimation of seasonal change in the quality of forage is of paramount importance in assessment of range, and ultimately, ungulate condition in areas with suitable forage characteristics. Since forage choice and chemical composition of the diet can vary among ungulates and geographical regions, relationships must be both species and site specific (Renecker & Hudson, 1999).

Requirements for security vary seasonally and are greatest when animals feel threatened. Wildlife is vulnerable at parturition and when accompanied by neonates, a condition that is exacerbated when the mother is in poor condition. To off-set this disadvantage, wildlife selects habitats consistent with their physical attributes and cryptic coloration. For example, escape cover is open grassland for a pronghorn, forests for a white-tailed deer or moose, distance for a wapiti, and rocky terrains for bighorn sheep and mountain goats (Renecker & Hudson, 1999).

The thermal environment is defined by ambient temperature, short-wave and long-wave radiation, wind and humidity. The operational environment which integrates these meteorological parameters is modified by habitat structure in complex ways. Closed canopy forests reduce cold stress during winter, but shade provided by poplar and aspen forests during late spring is attractive during periods of high ambient temperatures. Moose exploit the thermal advantages of cool water in wetlands during hot summer days which enables them to feed

longer. Ungulates are often attracted to south facing slopes to take advantage of daytime radiation during cold winters (Renecker & Hudson, 1999).

The BBPP will inevitably lead to some additional habitat loss and fragmentation. The ecological impacts will depend on the nature and extent of the existing disturbance, and the degree to which natural and semi-natural habitats are already fragmented and isolated by intervening land use. The existing disturbance around the site is related to existing seismic lines, roads, cutblocks, pipelines, and wellsites.

Conclusions relating to affects to corridors and wildlife habitat through aerial photo interpretation, in addition to ground truthing, clearly demonstrate that some of the remaining habitat to the west, north and south of the boundaries of the BBPP will continue to provide excellent cover, browse, and travelling corridors for wildlife species.

The habitat that does presently exist appears to adequately provide the basic habitat requirements for species selection.

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

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

14.6.5.1.1 Ungulates

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

Moose (*Alces alces*)

Of the ungulates known to occur, moose is expected to be found. Optimal moose habitat occurs within the early successional mixedwood forest stands with willows, aspen and poplars to the north of the Project Moose is also expected within riparian and shoreline areas in the region to the east of the Project lands. Optimal moose habitat is not present however, incidental use would be expected.

Mule Deer (*Odocoileus hemionus*)

During spring and summer, grass and forbs make up a substantial part of the diet of the mule deer. In fall and throughout winter, mule deer primarily browse on shrubs (Buckmaster et al., 1999). Important shrubs during the winter include willow (*Salix* spp.), saskatoon (*Amalanchier alnifolia*), red-osier dogwood (*Cornus stolonifera*), rose (*Rosa* spp.), chokecherry (*Prunus pennsylvanica*), snowberry (*Symphoricarpos albus*), silverberry (*Eleagnus commutata*), and young aspen (*Populus tremuloides*) trees (Buckmaster et al., 1999).

In forested areas, mule deer are associated with hiding cover year-round and thermal cover (> 1.5 m tall, > 70% canopy closure) for protection and snow interception during winter (Buckmaster et al., 1999). In forested habitat, deer are usually found within 180 m of the cover/forage edge (Buckmaster et al., 1999). Based upon the results indicated by Buckmaster et al. (1999) adjacent forest habitat to the north and west is expected to meet the observed security and thermal requirements of the species.

Roads generally decrease the value of habitat for mule deer (Buckmaster et al., 1999) with the estimated zone of influence extending for 100 m from the road into adjacent habitat (Buckmaster et al., 1999).

The use of the existing roads for access, in addition to the small area of disturbance associated with the proposed BBPP and the mixed wood characteristics of the surrounding areas suggests that mule deer habitat will be continuous and maintained.

White-tail Deer (*Odocoileus virginianus*)

White-tailed deer forage on grasses, forbs and shrubby browse. They require large amounts of easily digested food (Buckmaster et al., 1999). During spring and summer, forbs, grasses, and sedges are common in their diet (Buckmaster et al., 1999). Forbs are eaten more than other forage during spring. White-tailed deer use forbs almost exclusively during summer; especially legumes (clover, pea-vine, vetch). In early fall, the deer begin to utilize more grasses and some browse, but forbs are still the main food. In late fall and throughout the winter, white-tailed deer

browse on numerous species of deciduous trees and shrubs and coniferous trees (Buckmaster et al., 1999).

White-tailed deer are an "edge" species. Suitable habitats have an intersection of untreed grassy or shrubby areas for feeding and treed areas for cover (Buckmaster et al., 1999). Areas of > 75% canopy closure that is > 1.5 m in height provide thermal and hiding cover, and reduce snow accumulation, which can limit movements of white-tailed deer (Buckmaster et al., 1999). Most white-tailed deer habitat use is within 180 metres of cover/open area edges (Buckmaster et al., 1999). Thermal cover is important in winter during periods of extreme wind chill. Mature coniferous stands may be used for protection since the branches provide wind protection and the ground tends to accumulate less snow. Cover is also required for protection from predators (Buckmaster et al., 1999). Areas with conifers and aspens may be among the best habitat for providing a mixture of food and cover. In mixed wood forests, white-tailed deer were more often in old (120+ yr.) stands versus mature (50-65 yr.) or young stands (20-30 yr.) during the winter (Buckmaster et al., 1999). Tall, large trees, gaps in the tree canopy, higher densities of conifer and abundant shrubs in old stands provided a good combination of winter food and thermal cover (Buckmaster et al., 1999). Winter deer abundance increased with distance from roads and cutblocks and decreased with distance from small conifer patches. During the summer, deer were found in all stand ages and showed no relationship between distance to roads or cutblocks (Buckmaster et al., 1999).

Based upon the results indicated by Buckmaster et al. (1999) there is no adequate cover, under-story vegetation and food availability for ungulates in addition to poor security and thermal cover. The key browse species used by deer are found throughout the lands. However, it is expected that surrounding forest systems will maintain adequate thermal and security requirements of the species.

14.6.5.1.2 Carnivores

Conclusions regarding carnivore species expected to inhabit the area resulted from examination of distribution maps and comparison of preferred habitat with those habitats encountered by the Project.

- American Marten (*Martes Americana*) – prefers mature, particularly coniferous forests that contain numerous dead trunks, branches and leaves and is not expected within the area.
- Striped skunk (*Mephitis mephitis*) – prefers groves of hardwood trees and semi-open areas. Characteristics of the area suggest that the area provides habitat characteristics suitable for foraging and are consistent in the BBPP.

- Canada Lynx (*Lynx canadensis*) – occupies coniferous and deciduous forests with numerous fallen trees and dense thickets and is not expected within the BBPP lands.
- Cougar (*Felis coloris*) – Cougar habitat is essentially the same as that of their primary prey. Within this habitat, cougars tend to prefer rocky cliffs, ledges, vegetated ridgetops, or other areas that provide cover for undetected surveillance of prey. Stream courses and ridgetops are frequently used as travel corridors and hunting routes. Riparian vegetation along streams provides cover for cougars traveling in open areas (Ackerman et al., 1984). Deer dominate the diet of cougars in most areas (USDA, 2002). Other prey species include white-tailed deer, elk, moose (*Alces alces*), bighorn sheep (*Ovis canadensis*), porcupines (*Erthizon dorsatum*), American beavers (*Castor canadensis*), snowshoe hares (*Lepus californicus*), ground squirrels (*Citellus* spp.), marmots (*Marmota* spp.), smaller rodents (*Rodentia*), other carnivores, and domestic livestock (Ackerman et al., 1984). As the prey requirements for the cougar appear within region, cougar is expected within the region, but it is unlikely they will be found on the BBPP lands.
- Short-tailed Weasel (*Mustela erminea*) – most abundant in coniferous or mixed forests and streamside woodlands and is expected in the forest systems, but lack of cover suggests limited use on the BBPP lands.
- Black bear (*Ursus americanus*) – primarily forest species, but often forage in natural or artificial clearings. A mosaic of forest cover and clearings or early successional habitat represents the most suitable habitat for black bears (Buckmaster et al., 1999). As distance from cover to open area edge increases to 180 to 200 meters, use by black bears apparently decreases (Buckmaster et al., 1999). Because black bears den during the winter, they do not have the thermal cover requirements of species active year-round. Nevertheless, escape cover is required during a bear's active months against potential predators (Buckmaster et al., 1999). Black bears will use dense cover and/or trees to escape from predators, and commonly bed in dense shrub communities (Buckmaster et al., 1999). Male black bears have very large home ranges, and females have smaller, more defined home ranges (Buckmaster et al., 1999). Based upon the vegetation characteristics in adjacent areas and the high potential for forage capabilities, in addition to prey species, black bears are expected within the area but unlikely on the BBPP lands.
- Coyote (*Canis latrans*) – very common in the study area. Adapts easily to human disturbance.
- Wolf (*Canis lupus*) – mostly restricted to forest areas and likely occur within the region.

- Grizzly Bears (*Ursus arctos*) – Habitat characteristics are not found on the BBPP lands and the high level of human activity in this area suggest a low likelihood of occurrence. Refer to the sections below for more information regarding grizzly bears at the BBPP.

14.6.5.1.2.1 Grizzly Bears

In 2018, the Foothills Research Institute (FRI) conducted field surveys within BMA 7 to learn about and quantify the grizzly population, and to create an inventory for management purposes (Stenhouse et al., 2021). Findings were published in a report which provided a base level of information for the BMA 7 population (Stenhouse et al., 2021, discussed further below).

Alberta Environment and Parks (AEP) wrote the Alberta Grizzly Bear Recovery Plan to assess the population trends and threats to this threatened species and to outline goals and objectives to help maintain and recover grizzly bear populations. The overall recovery goal as laid out by the Recovery Plan is as follows (AEP, 2020):

> "The Alberta grizzly bear population in the Recovery Zone is not limited by human-caused mortality, has access to secure habitat, is able to successfully disperse across major road corridors, and Albertans — in particular those living, working and recreating in grizzly bear management zones — are supportive of grizzly bear conservation and management."

The Alberta Grizzly recovery goal also includes the following four objectives:

1) Grizzly bear density throughout the Recovery Zone of each Bear Management Area is not limited by human-caused mortality, either stable or increasing, and within a population size range that is reflective of the habitat within the Recovery Zone.
2) The ability of grizzly bears to disperse across Habitat Linkage Zones is improved.
3) Habitat security for grizzly bears in the Recovery Zone is maintained or improved, and
4) Support for grizzly bear conservation and management is increasing among Albertans, especially those living, working, and recreating in Bear Management Areas.

The primary concern for grizzly bear population viability in BMA 7 is the current high open road density in some of the Grizzly Bear Watershed Units (GBWUs). GBWUs are geographical units whose boundaries are based on watersheds that were subdivided along heights of land, and occasionally along watercourses, to approximate the size of an adult female grizzly bear home

range (~500 km^2) (AEP, 2020). Areas with higher open road densities are associated with an increased risk of human-caused grizzly bear mortalities due to greater human-bear conflicts, which include vehicle collisions, and poaching events (Boulanger & Stenhouse, 2014; Graham, Boulanger, Duval, & Stenhouse, 2010; Nielsen, et al., 2004a; Schwartz, Haroldson, & White, 2010; Northrup, et al, 2012). Poaching is the primary cause of known human-caused grizzly bear mortality in this BMA (AEP, 2016).

Additionally, bears in BMA 7 are at risk of becoming further isolated from the neighboring subpopulation in BMA 2 due to the high open road densities in the narrow habitat linkage between BMA 2 and 7, which includes the increasing traffic volume on Highway 43 through Fox Creek (AEP, 2020). Highway 43, a major transportation corridor, is seen as a potential barrier for bears to move between the population units. Research in the adjacent BMA 2 found that none of the 37 radio collared bears being studied ever moved into BMA 7. While three bears did move within 40 km of the BMA 7 boundary, two of them were killed by poachers (Boulanger et al., 2009). Within BMA 7, there is some evidence of a reduction in the expected level of genetic heterozygosity potentially due to in-breeding depression (Proctor et al., 2012).

14.6.5.1.2.2 Resource Selection Function Models

Identifying grizzly bear habitat is essential for effective conservation and management planning. By examining the locations of GPS collared grizzly bears and relating this information to remote sensing data (landscape variables such as vegetation classification, water features, canopy cover, etc.) within geographic information systems (GIS), Dr. Scott Nielsen (University of Alberta) developed resource selection function (RSF) models that predict the relative probability of grizzly bear occurrence on the landscape (Nielsen, Boyce, Stenhouse, & Munro, 2002). Models have been developed for six population units (Livingstone, Castle, Clearwater, Yellowhead, Grande Cache, and Swan Hills), based on differences in resource use between regional population groups. Additionally, separate seasonal models (spring: May 1 to June 15, summer: June 16 to July 31, and fall: Aug 1 to Oct 15) were produced to account for temporal variation in food resources across the growing season, with an RSF max layer generated using the highest seasonal value for each pixel for ease of interpretation. The RSF models examine six basic landscape variables to quantify grizzly bear habitat quality: landcover type (eight broad vegetation classes), canopy cover, conifer/deciduous mix, streams, regenerating forest mask, and Compound Topographic Index (CTI, a measure of soil wetness). Maps developed from the RSF models became, and are used as, a surrogate to determine areas of high-quality grizzly bear habitat. The predictive power of these RSF models has been verified using independent data sources, including studies of grizzly bear occupancy and abundance relying on DNA collected from snagged hair samples (Stenhouse et al. 2015).

In the summer of 2018, FRI research teams conducted a large-scale study of grizzly bears across BMA 7. Researchers used barbed wire hair-snagging sites to determine population size and density, movement to and from BMA 7, and to see if bears were crossing Highway 43. The study included both core and secondary habitats with sampling locations in multiple habitats including both upland and lowland forests. Habitat was divided into 7x7 km grids, with a hair snag location placed in every core habitat grid section and a reduced number of hair snag sites within the secondary and outer habitat areas. The hair sampling and DNA analysis allowed for a more accurate understanding of number of individuals and distribution of bears within BMA 7. The results estimate that there are approximately 62 grizzly bears within the management area, though researchers caution that this estimate has low precision and the data had large confidence intervals (Stenhouse et al., 2021).

14.6.5.1.2.2.1 Habitat Quality

The BBPP project will not create new roads but will increase road activity in the area. The access road from highway 32 is 8km long. Grizzly bears, especially females with cubs, have been shown to travel closer than expected to roads and pipelines as anthropogenic openings attribute to the presence of important bear foods growing along edges of young or regenerating forests such as berries, rushes, and sedges (Laberee et al., 2014). Though in some situations such as in areas of high traffic volume studied by Gibeau et al. (2002), found that grizzly bears tended to avoid roads which had more than 100 vehicles traveling on it per day.

14.6.5.1.2.2.2 Mortality Risk

The likelihood of grizzly bear survival on the landscape is represented by the mortality risk model (Nielsen et al., 2004a) which predicts the relative probability of human-caused grizzly bear mortality as a function of landscape variables including terrain, proximity to roads and trails, and regional land-use. The model is based on multivariate logistic regression analysis of 297 anthropogenic grizzly bear mortalities that occurred within the Central Rockies Ecosystem (CRE) between 1971 and 2002. The model is derived from six base inputs: landcover, terrain ruggedness (TRI), and proximity to roads and trails, White Zone (agricultural areas), streams, and protected areas.

GIS applications developed by fRI Research were able to forecast changes in the landscape variables used within each of the above predictive models with the development of new anthropogenic features. Thus, their tools (GBTools) allow us to reconstruct and regenerate the

RSF surface measuring grizzly bear habitat and the mortality risk surface with changing landscape conditions.

14.6.5.1.2.2.3 Open Road Density

The development of the BBPP will not result in the addition of new roads but will increase the activity on the current roads. Currently, open road densities in the secondary GBWU S3 unit exceed the recommended threshold of 0.75 km/km^2 (AEP, 2016). Grizzly bear mortality rates documented by the Albertan government associated with accidental human related deaths (e.g. roadkill) have increased from 2008-2018. Accidental deaths caused by humans (67, reported deaths from 2008-2018) have surpassed illegal kills (62) (AEP, 2020).

One way of managing open road density values and the associated human-caused grizzly bear mortality risk is by limiting the creation of new industrial roads and by controlling access on established roads. This could be accomplished by using the established road infrastructure and by using effective and well-maintained locked gates, allowing access to industrial employees while excluding public traffic to limit human-bear conflicts.

KEC has indicated that one of the several reasons why the BBPP site location was chosen was due to the established industrial roads in the area, resulting in a lack of new road infrastructure required. Since KEC is not proposing development of any new industrial roads, the Project is not considered additive to current open road densities and aligns with the goal of maintaining the GBWU's road densities below threshold targets. KEC has also indicated a willingness to consider other alternatives, such as anti-poaching measures, to help mitigate grizzly bear mortality risk.

As demonstrated in the above analysis, habitat quality, as measured by resource selection values often increases with the addition of anthropogenic features including roads, pipelines, wellsites, or forestry cutblocks. This is largely due to the fact that these disturbances frequently open large tracts of mature stands, allowing forage resources such as herbaceous vegetation, grasses, sedges, and berry shrubs to establish (Nielsen et al., 2004a). While industrial development may optimize the amount of forage resources available to grizzly bears (Nielsen, Munro, et al., 2004b; Roever, Boyce, & Stenhouse, 2008a), a key priority is to minimize attractive sinks on the landscape (i.e. areas of attractive forage that also have a high human-caused mortality risk) associated with increased access (Roever, Boyce, & Stenhouse, 2008b; Stewart et al., 2013).

Managing road densities has been identified as a high priority for grizzly bear recovery, not just in this BMA, but across the species range in Alberta. The 2020 Alberta Grizzly Bear Recovery

Plan recommends thresholds for density of roads open to public motorized access of 0.6 km/km^2 in the core zone and 0.75 km/km^2 in the secondary zones.

14.6.5.1.3 Birds

No avian use assessments, migratory assessments or breeding bird surveys were completed during the first field visit on September 8th, 2022. The field visit produced incidental observations of eleven (11) species. All of which except one (Sandhill crane, 'Sensitive'), were observed to be provincially 'Secure' (Table 18).

Nesting raptor and breeding bird surveys were completed on June 16th and June 28th, 2023. No observations of any raptor species were recorded during this survey; however, a northern harrier (*Circus cyaneus*) was recorded incidentally within 1000 m of the Project site during the June 16th survey. No raptor nests were observed within 1000 m of the Project footprint.

Twenty-one (21) avian species were recorded during breeding bird surveys. All species that were observed are considered 'Secure' and are not provincially or federally listed as species of management concern. See Table 18 below for a list of incidental species and breeding bird survey observations.

Table 18. Avifauna Identified During Field Surveys

Scientific Name	Common Name	Ranking	Origin
Incidental Observations			
Regulus calendula	Ruby crowned kinglet	Secure	Native
Perisoreus canadensis	Canada jay	Secure	Native
Turdus migratorius	American robin	Secure	Native
Corvus corax	Common raven	Secure	Native
Loxia leucoptera	White-winged crossbill	Secure	Native
Antigone canadensis	Sandhill crane	Sensitive	Native
Sitta canadensis	Red-breasted nuthatch	Secure	Native
Poecile hudsonicus	Boreal chickadee	Secure	Native
Anser albifrons	Greater white-fronted goose	Secure	Native
Accipiter striatus	Sharp-shinned hawk	Secure	Native
Bonasa umbellus	Ruffed grouse	Secure	Native

Scientific Name	Common Name	Ranking	Origin
Breeding Bird Survey Observations			
Empidonax alnoram	Alder flycatcher	Secure	Native
Turdus migratorius	American robin	Secure	Native
Poecile atricapillus	Black-capped chickadee	Secure	Native
Spizella passerina	Chipping sparrow	Secure	Native
Spizella pallida	Clay-coloured sparrow	Secure	Native
Junco hyemalis	Dark-eyed junco	Secure	Native
Perisoreus canadensis	Canada jay	Secure	Native
Empidonax minimus	Least flycatcher	Secure	Native
Melospiza lincolnii	Lincoln's sparrow	Secure	Native
Dendroica magnolia	Magnolia warbler	Secure	Native
Vermivora celata	Orange-crowned warbler	Secure	Native
Seiurus aurocapilla	Ovenbird	Secure	Native
Sitta canadensis	Red-breasted nuthatch	Secure	Native
Vireo olivaceus	Red-eyed vireo	Secure	Native
Catharus ustulatus	Swainson's thrush	Secure	Native
Leiothlypis peregrina	Tennessee warbler	Secure	Native
Zonotrichia leucophrys	White-crowned sparrow	Secure	Native
Zonotrichia albicollis	White-throated sparrow	Secure	Native
Gallinago delicata	Wilson's snipe	Secure	Native
Dendroica petechia	Yellow warbler	Secure	Native
Dendroica coronate	Yellow-rumped warbler	Secure	Native

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

- Osprey (*Pandion haliaetus*) – found in the vicinity of permanent lakes and rivers with an adequate supply of fish and nesting sites.
- Bald Eagle (*Haliaeetus leucocephalus*) - found in the vicinity of permanent lakes and rivers with an adequate supply of fish and nesting sites.

- Sharp-Shinned Hawk (*Accipiter striatus*) – prefers thick deciduous and mixedwood forests.
- Red-Tailed Hawk (*Buteo jamaicensis*) – found in woodlands near open country.
- Golden Eagle (*Aquila chrysaetos*) – territories in forested areas contain large openings such as marshes, burns and meadows.
- American Kestrel (*Falco sparverius*) – semi-open to open country where trees provide cavities for nesting.
- Great-Horned Owl (*Bubo virginianus*) – uses many different habitats including deciduous and coniferous forest.
- Barred Owl (*Strix varia)* – mature coniferous and mixedwood forests near riparian habitat.
- Snowy Owl (*Nyctea scandiaca*) – winter only. Prefers open fields and marshes.
- Great Gray Owl (*Strix nebulosa*) – found in coniferous, deciduous and mixedwood forests, usually near water.
- Spruce Grouse (*Falcipennis canadensis*) – prefers conifer dominated forests but disperses into mixedwood forests.
- Common nighthawk (*Chordeiles minor*) – prefers open and partially open habitats, including forest openings and post-fire habitats, prairies, bogs, rocky natural habitats, and disturbed areas.

Tolerance of birds to human disturbance varies by species and by exposure to human activity. These disturbances do directly affect habitat quality, which affects populations. It has been assumed that these disturbances are anthropogenic in nature, when, in reality, natural factors contribute significantly to disturbance (Bentz et al., 1994). Ultimately, survival of bird species is dependent upon the availability of forage resources. Forage quality is contributed to by soil nutrients and environmental conditions.

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

The presence of similar habitat, nesting characteristics, and snags and deadfall concentrations remaining following construction are expected to provide the necessary forage, security, and

nesting requirements for returning bird species. Therefore, the proposed development is not expected to significantly impact habitat requirements of bird species within the area.

14.6.5.1.4 Small Mammals

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

No evidence of burrows was found during the assessment. The below species may be expected in the area in unknown abundance.

- Deer mouse (*Peromyscus maniculatus*) – found in a variety of habitats.
- Southern red-backed vole (*Clethrionomys gapperi*) – one of the most common and abundant rodents in the study area. Prefers a wide range of habitats from dry upland sites to moist forest edges with an abundance of deadfall.
- Meadow vole (*Microtis pennsylvanicus*) – found in a variety of habitats.
- Least chipmunk (*Tamia minimus*) – common in forest edges and in open coniferous and deciduous forests.
- Red squirrel (*Tamiasciurus hudsonicus*) – common in coniferous and mixedwood forests.
- Northern flying squirrel (*Glaucomys sabrinus)* - common in deciduous and coniferous forests where woodpecker cavities can provide nest sites. Nocturnal in nature.
- Snowshoe hare (*Lepus americanus)* – found wherever there is forest or dense shrub.

14.6.5.2 Effects of the BBPP

The BBPP lands have limited potential to support tree nesting migratory birds as the majority of the Project lands were clearcut in 2006, leaving young softwood trees with only the southern border of the Project area with merchantable timber. However, there is potential to affect migratory birds, as a result of species displacement, during construction and operation of the proposed Project. Clearing and grubbing for site preparation will remove vegetation, reducing the quantity of terrestrial habitat, and affecting the quality of already marginal habitat.

Specifically, removal of vegetation from the Project footprint (20.65 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 from operations. Potential sensory disturbance (e.g., noise, light) has the potential to continue during operations; however, mortality risk associated with potential equipment collisions during construction and operations is unlikely given displacement due to noise and loss of habitat within the constructed and operational areas.

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).

The construction of the BBPP will result in the loss of approximately 20 ha of habitat in the fenced area for the duration of the Project. The laydown area will be reclaimed to equivalent habitat following construction. The final operational area is expected to result in a loss of 13 ha. The fenced area and access road will be reclaimed to equivalent habitat following decommissioning of the Project.

The Project footprint will include a stormwater pond to hold any surface run-off prior to release. This area may be used by migratory birds in a similar fashion to use of wetlands in the region but would be considered unlikely given the proximity to operational equipment. Potential indirect interaction may occur through runoff from the site and spills which might affect the quality of the stormwater pond. However, KEC has a spill response plan in place which will limit, if not wholly eliminate, the potential for contaminants into the pond.

In addition, surface water testing of the collection pond is required, and the pond only collects surface runoff. Therefore, it is not expected to contain measurable volumes of hydrocarbons (i.e. from spills from equipment) nor will it contain any hazardous waste, which will be collected and disposed of at licensed facilities. As such, the stormwater pond is not expected to adversely affect migratory birds.

Bird species that currently use the habitat within the Study Area will be displaced during the initial stages of construction, changes in habitat availability, and associated sensory disturbances. This could potentially cause direct mortality if individuals are unable to relocate to alternate suitable habitat. However, there are areas of suitable nesting habitat in adjacent lands and the regional area in general.

The Project is likely to result in an increase in habitat fragmentation and an increased amount of forest edge. This could lead to decreased forest quality for species that rely on interior forest conditions (i.e., areas within a forest sheltered from edge effects). These effects have both

positive and negative outcomes depending on the bird species using the habitat. Habitat fragmentation and increased edge areas may lead to increased predation on birds. A study by Manolis, Andersen, and Cuthbert (2002) found that distance to nearest clear-cut was the best predictor of nest predation in multiple ground laying birds. However, some bird species benefit from forest edge habitat and have shown to return in subsequent years after an area is cleared due to the availability of foraging opportunities and other niche habitats. A study in Alberta showed that the abundance of alder flycatchers increased in a previously cut area (Tittler et al., 2001). Additionally, rusty blackbirds can also tolerate forestry activities as long as their habitat of coniferous dominant trees of varied heights near waterbodies is maintained. The Project will alter habitat within the Study Area; alterations will have both negative and positive effects depending on the bird species. Not all alterations will be permanent, and these alterations will not have a significantly negative impact on core habitat and similar habitat for avifauna is present in the surrounding landscape.

14.6.6 MITIGATION

The timing and methods of construction and reclamation could be adjusted as needed to meet impact mitigation requirements specified by timing requirements for species in the vicinity. In summary, the following mitigation was developed in order to reduce potential disturbance to wildlife and vegetation:

- Vegetation clearing works associated with construction should be completed between September 1st and April 14th (outside of breeding bird season) to accommodate sensitive periods and mitigate potential impacts to the majority of species of management concern known or presumed to be in the area.
- Should work be required outside of the period listed above, confirmatory wildlife sweeps should be conducted to avoid the disturbance or destruction of migratory bird nests that may be present during the breeding season.
- All open excavations should be checked daily for entrapped wildlife. If any entrapped wildlife are observed, a qualified professional experienced in safely handling wildlife and possessing appropriate permits will be required to relocate them. Any holes or trenches left unattended should have appropriately installed amphibian fencing to prevent amphibians from entering.
- If Project development cannot be completed during the winter season of 2023/2024, a confirmatory wildlife survey should be conducted in advance of project works to identify wildlife features (e.g., raptor nests) that may be established in the spring of 2024.
- Based on the results of the environmental assessment, no direct impacts to wildlife features associated with wildlife species of management concern would be anticipated

as a result of Project development. Project works will result in the loss of forested habitat; however, as the Project has been sited primarily on a previously disturbed site, the loss of mature forest will be minimized which will mitigate the potential for loss of habitat for wildlife species that rely on mature, overmature or dead trees for nesting or denning opportunities.

However, as no species requiring timing restrictions were observed or are expected, no other mitigation will be employed. Furthermore, the LAT report (Appendix M – LAT Report) provides requirements for standard mitigation for the BBPP.

Should incidental monitoring during operations identify significant mortality events to a particular species of bird, at a particular time of the year, or during specific weather conditions, the Proponent will implement an adaptive management protocol to monitor and mitigate future effects to the greatest extent possible.

Adaptive management is an iterative learning process producing better understanding and improved management over time (Kerlinger et al. 2010). An adaptive approach involves exploring alternative ways to meet management objectives, predicting the outcomes of alternatives based on the current state of knowledge, implementing one or more of these alternatives, monitoring to learn about the impacts of management actions, and then using the results to update knowledge and adjust management actions (U.S. Department of the Interior, 2009).

Adaptive Management options will be discussed with AEPA and the literature notes that being coupled with an agreed-upon set of criteria that is consistent with the regulatory context is important for success.

14.6.6.1 Significance

14.6.6.1.1 Magnitude

The potential effect of the loss of habitat from clearing for the BBPP would be of minor magnitude given the extent of disturbance in the area, in addition to the fact the lands have been clearcut.

The potential effect of sensory disturbance from construction and operational activities may result in habitat avoidance and that effect would occur over the life of the BBPP. Sensory disturbance during operations from the constant sound would be Major.

14.6.6.1.2 Likelihood

The likelihood of loss of habitat and behavioral effect is almost certain as no literature could be found that indicated that an operating facility does not result in wildlife displacement. However, the likelihood of effect on populations of is unlikely.

14.6.6.1.3 Overall Risk

The overall risk to wildlife would be Very High immediately within the BBPP due to loss of habitat and sensory disturbance and that is a function and result of any project being developed (i.e., oil and gas). The overall risk to wildlife habitat is medium and is only isolated to the BBPP area of disturbance. Following interim and final reclamation, habitat capability should be restored.

14.6.7 LAND USE

The BBPP area is on crown land, and historic aerial imagery reveals some of the land use in the region over time. Cut lines for oil and gas can be seen in historical imagery. Current land use at the BBPP area is forestry harvesting. The BBPP appeared to have been logged in 2006 and is in a stage of re-growth.

Surrounding land use consists of forestry, trapping, and upstream oil and gas development.

14.6.8 TOPOGRAPHY[3]

The topography of the area is classified as rolling to flat terrain which is confirmed by the findings of the site reconnaissance. There is a high point in the southeast quadrant and low point in the northwest quadrant.

The Bedrock Topography map indicates a top of bedrock elevation greater than 914.4 m for the Project area. Bedrock surface contour lines within the Project area are limited and it can be estimated the top of bedrock is between 914.4 m and 975.4 m (the largest mapped contour line) however the available contour lines indicate these are approximated elevations. Based on the ground surface contour lines, the surface elevation can be estimated to be approximately 1067 m. Google Earth topographical data indicates ground surface elevations greater than 1096 m which may be impacted by the significant tree growth in the area. Using a minimum ground

[3] All information taken directly from the report: Geotechnical Desktop Study, Maskwa [BBPP] Project, Southwest of Swan Hills, Alberta. November 4, 2022 (Appendix P – Geotechnical Report).

surface elevation of 1067 m and a conservative top of bedrock elevation of 975.5 m, the bedrock topography map indicates greater than 90 m of cover. An additional drift thickness map indicates that 90 m of cover is likely conservative as the Project area is classified under less than 15.2 m of drift thickness with the potential for exposed bedrock in some areas. Using information from both maps and the water well records, shallow bedrock ranging from 21.3 m to the ground surface may be encountered.

14.6.9 SURFACE HYDROLOGY

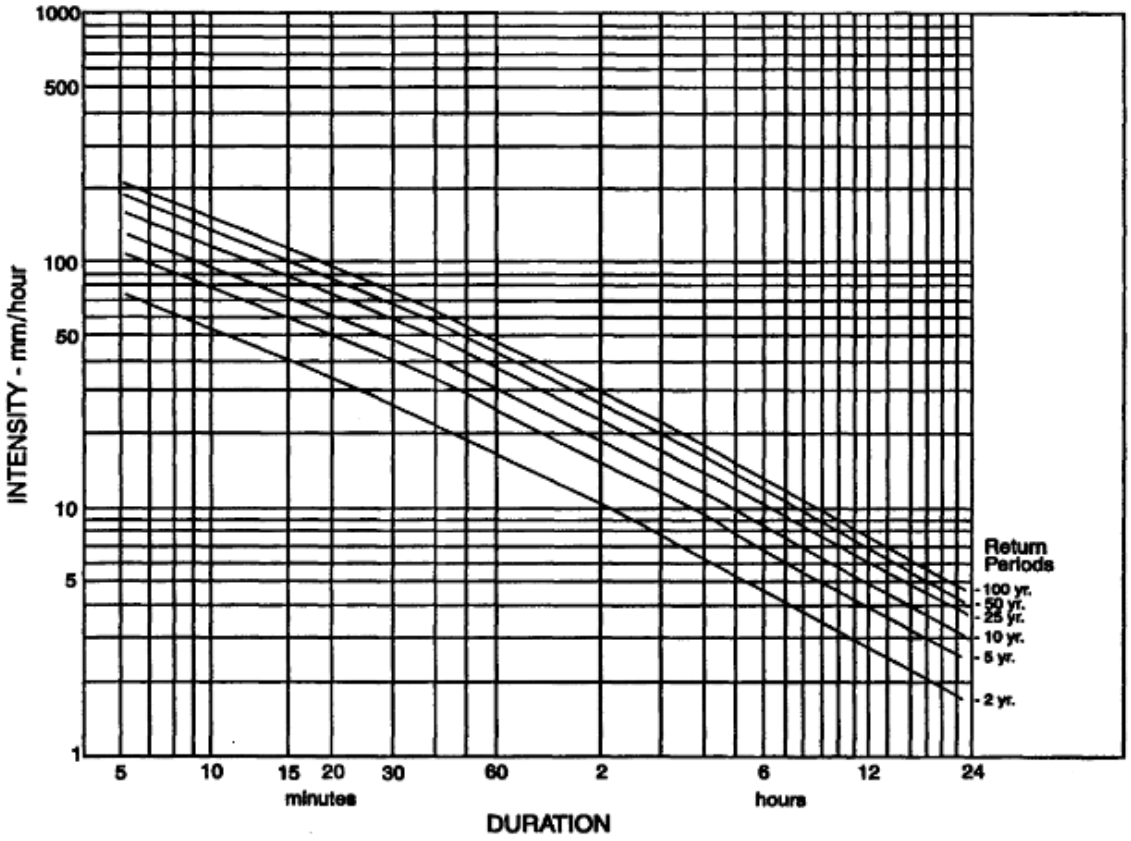
14.6.9.1 Precipitation and Surface Runoff

No wastewater, sludge, or surface runoff will be released into watercourses as a result of operations.

The topography of the area is classified as rolling to flat terrain which is confirmed by the findings of the site reconnaissance. There is a high point in the southeast quadrant and low point in the northwest quadrant.

Long-term Intensity-Duration-Frequency (IDF) rainfall data sets are published by Alberta Environmental Protection. The data is taken from the Storm Water Guidelines for the Providence of Alberta dated January 1999.

Table 19. Estimated Design Rainfall Intensities at Site (mm/h)



General site topography of project site is typically uniformly sloped with high point in the southeast quadrant and low point in the northwest quadrant. The power block is located in the east half of the property. The power block area would consist of a stormwater system that would move stormwater utilizing surface and drainage and stormwater diversion systems such as catch basins and drainage ditches to move stormwater to a stormwater detention pond. Perimeter drainage swales will be used to divert stormwater from other quadrants from infiltrating power block area.

14.6.9.2 Watercourses

No provincially mapped watercourses are present within or adjacent to the BBPP. Historical review of aerial photos between 2006 and 2017 did not reveal the presence of watercourses across the BBPP project lands.

Field assessment confirmed there are no watercourses within or adjacent to the BBPP lands.

14.6.9.3 Wetlands

No provincially mapped wetlands are present within the BBPP. Historical review of aerial photos between 2006 and 2017 did not reveal the presence of wetlands within the BBPP lands.

Field assessment confirmed there is one seasonal wetland (approximately 0.09 ha) within the BBPP lands that will be lost as a result of the BBPP. Disturbance of wetland areas is regulated by the Alberta Energy Regulator (AER) and Alberta Environment and Protected Areas (AEPA) and generally requires approval in accordance with the Alberta *Water Act*.

14.6.9.4 Effects of the Project

At the time of this application, one wetland disturbance that requires application under the *Water Act* will be occurring.

14.6.9.5 Mitigation

No mitigation is proposed as the wetland disturbance cannot be avoided.

14.6.9.6 Significance

14.6.9.6.1 Magnitude

The potential effects on wetland systems are insignificant.

14.6.9.6.2 Likelihood

The likelihood of effects on wetlands is certain as a single wetland will be lost due to construction.

14.6.9.6.3 Overall Risk

The overall risk to watercourses would be low due to lack of features. The overall risk to the single wetland is high, however, there are no risks to broader wetland systems as the wetland being impacted is isolated by topography with no connection to other wetlands or watercourses.

14.7 TABLE OF EFFECTS

The scope, methodology and baseline environmental conditions for the BBPP have been described in detail in this document. Each VEC, as identified and defined, has been described and baseline environmental work has been completed to evaluate each VEC based on the site-specific conditions relating to the BBPP.

Based on the environmental baseline work completed for each VEC over the course of one year, and the expertise of the various members of the Environmental Assessment Project Team, evaluation of each VEC has been completed to determine which VEC could have potential residual effects once planned mitigation has been completed. This evaluation is described in Table 20 (below).

Table 20. Valued Ecosystem Component Effects Table

Valued Ecosystem Components (VECs) Category	Valued Ecosystem Components (VECs)	Description of Impacts	Mitigation	Residual Effects after mitigation
Habitat	**Forested Habitat**	• Loss of vegetation • Soil disturbance • Loss of habitat	• Use of old cutblock for project location. • Completion of assessments for vegetation and wildlife use prior to construction	None expected following reclamation of the Project.
Soils	**All soil types**	Impacts associated with construction include potential reduction in soil characteristics (quality and quantity) due to handling, admixing and losses due to erosion.	Mitigation for soils has been outlined in the Industrial approval application.	Following interim reclamation, replacement and revegetation of soils following construction (outside operational areas), residual effects are short term and not expected to extend beyond construction.
Hydrology	**Groundwater**	Potential effects to quality and quantity	• Waste management procedures will be implemented for all construction wastes that are generated. • Procedures and secondary containment will be implemented, where required, to manage the risk of spills of fuels, lubricants and other construction related fluids. • Dewatering will be implemented, if required, during construction of subsurface	• Effects to quality not expected as secondary containment and spill response procedures will be implemented. Alberta Environment may request groundwater

Valued Ecosystem Components (VECs) Category	Valued Ecosystem Components (VECs)	Description of Impacts	Mitigation	Residual Effects after mitigation
			infrastructure. The volumes of groundwater produced will be minimized through project pre-planning and careful construction scheduling such that the amount of time over which dewatering is required is minimized. • A groundwater monitoring network and a groundwater monitoring program may be implemented in accordance with the terms and conditions of the EPEA approval if required. Secondary containment procedures and leak detection monitoring will mitigate the potential for process liquids or wastes to be released into the subsurface. • A spill prevention and response plan will be implemented for the Project, such that incidental spills are quickly identified, reported, and remediated.	monitoring during operations to ensure no effects. • Effects to quantity will be limited in duration and recharge of groundwater following dewatering not expected to result in residual effects.
	Surface Runoff	Movement of sediment and potential surface contaminants into surface water collection pond.	• An industrial runoff plan has been designed as a component of the operational requirements for the BBPP. Any pump off of industrial runoff will likely be directed towards the north side of the BBPP into	None

Valued Ecosystem Components (VECs) Category	Valued Ecosystem Components (VECs)	Description of Impacts	Mitigation	Residual Effects after mitigation
			surrounding natural vegetation and will drain north through natural topography. All water will be discharged without causing erosion (erosion control will be provided at the discharge point). The water will be discharged to a well vegetated area where the discharge will be distributed over the natural ground and will meet provincial discharge criteria prior to release. • Any runoff that does not meet criteria (as indicated in report) will be trucked to and disposed of at an approved facility.	
Wildlife	**Birds** **Ungulates** **Mammals**	Potential concerns associated with birds include: • Habitat alteration; • Sensory disturbance; • Potential for vehicle collisions with wildlife • Potential for bird mortality from transmission line.	• Pre-construction wildlife sweeps as per regulatory requirements. • Use of old cutblock for project location. • Project located in proximity to highway, high grade road, and oil and gas development expected to limit further effects. • Fencing of BBPP to prevent wildlife access • Vehicle collisions may be avoidable if all posted speed limits are followed	• Residual effects of vehicle collisions would be limited due to limited occurrences. • Residual effects of bird mortality from transmission line would likely be limited as existing transmission line adjacent to proposed route.

Valued Ecosystem Components (VECs) Category	Valued Ecosystem Components (VECs)	Description of Impacts	Mitigation	Residual Effects after mitigation
			however no specific mitigation available.	• None expected following reclamation of the Project.
Vegetation	**Rare Plants**	Impacts to rare plants not expected as none identified	• Use of old cutblock with no unique habitat. • Weed control will be implemented	None
Watercourses	**Watercourse**	None as no watercourses affected.	N/A	None
Wetlands	**All Classes, All Types**	Impacts are expected, removal of one seasonal marsh wetland	N/A	None as the wetland is isolated and is not connected to any other wetlands or watercourses.

15 HEALTH, SOCIAL, AND ECONOMIC CONTEXT

Big Lakes County, formerly the Municipal District of Big Lakes, encompasses approximately 14,000 km^2 and includes the Project as well as the towns of Swan Hills and High Prairie. The nearest towns to the Project include the town of Swan Hills in Big Lakes County and the town of Whitecourt in Woodlands County.

The population of Swan Hills in 2021 was 1,201 (-7.7% decrease between 2016 – 2021), with a proportion of 220 who identify as Indigenous (18.3% of the population) (Government of Alberta, 2023a; Statistics Canada, 2023a). The population of Whitecourt in 2021 was 9,927 (-2.8% decrease between 2016 – 2021), with 1,260 individuals identifying as Indigenous (12.7% of population in 2021) (Government of Alberta, 2023b; Statistics Canada, 2023b). According to Indigenous Services Canada, as of 2022 there were approximately 258,640 Indigenous peoples in the province of Alberta (Government of Canada, 2022), making up 6.5% of the population, lower than the proportions of Indigenous population of the towns of Swan Hills and Whitecourt. As of 2022, Big Lakes County had a resident population of 5,471 persons (Government of Alberta, 2023c).

Alberta Health Services (AHS) is the provincewide integrated health system, responsible for delivering health services to the residents of Alberta (Alberta Health Services, 2024a). AHS operates both the Swan Hills Healthcare Centre and the Whitecourt Healthcare Centre. Both facilities provide access to several health services, such as emergency services, addiction and mental health services, occupational therapy services, as well as sexual health and social work services.

The life expectancy at birth, often recognized as a strong determinant of health status and a good predictor of future health related costs, was measured to be approximately 77.7 years in the town of Swan Hills between 2011 – 2020 (Government of Alberta, 2022), slightly below the life expectancy at birth of the province of Alberta at approximately 81.7 years over the same period. The life expectancy at birth of the town of Whitecourt was measured to be approximately 79.7 years between 2008 – 2017 (Government of Alberta, 2019), also slightly below the life expectancy of Alberta at approximately 81.2 years over the same time period.

In the town of Swan Hills, the rate of people with three or more chronic diseases per 100 population during the same period was 7.5 (Government of Alberta, 2022). The rate of people with three or more chronic diseases per 100 population in the town of Whitecourt was 5.0, slightly higher when compared to the Alberta provincial rate of 4.2 (Government of Alberta, 2019).

The mortality rate (per 100,000 population) due to all causes was much higher in Swan Hills between 2019 – 2021, compared to the province (1169.0 vs. 700.3 Alberta). Between 2016 – 2018, the mortality rate due to all causes in Whitecourt was similar when compared to the province (729.8 vs 699.5 Alberta). The most frequent cause of death between 2011 – 2021 was diseases of the circulatory system in Swan Hills, and the leading cause of death in Whitecourt between 2009 – 2018 was neoplasms (cancer) (Government of Alberta, 2022; Government of Alberta, 2019).

Between 2018 – 2022, the County had a population growth rate of -4.7%. In 2021, the median age within the County was 45.6 years and the median individual income was $36,800 (Statistics Canada, 2023c). In 2021, net municipal taxation within the County amounted to $23,063,761 (Metrix Group LLP, 2022).

Specific information regarding the health of Indigenous peoples within the towns of Swan Hills and Whitecourt could not be identified. However, there are several resources that are available for Indigenous peoples to access in the region. AHS has created an Indigenous Health Program, now called Indigenous Wellness Core (IWC), which is a combination of the Provincial Indigenous Health Program and the Indigenous Health Strategic Clinical Network. The program partners with Indigenous peoples, communities, and key stakeholders to provide accessible, culturally appropriate health services for First Nations, Métis and Inuit people in Alberta (Alberta Health Services, 2024b). The vision of the IWC is to achieve health equity with and for Indigenous peoples in Alberta.

Although there is limited information regarding specific Indigenous physical health of the region, a report completed by Health Canada, titled '*Health Determinants for First Nations in Alberta, 2016*' (ISBN: 978-0-660-06374-4), outlines some of the disparities between the health, social, and economic aspects experienced by Indigenous peoples of the province (Health Canada, 2016). This report is designed to provide information which can be used as a resource by decision makers and program managers for program and service delivery planning aimed at addressing differences in determinants of health and improving the health and well-being of Indigenous individuals and communities in Alberta.

It is the hope of Health Canada that this report will contribute to the discussion and awareness of differences in Indigenous health outcomes and determinants in Alberta and lead to actions to decrease the differences. Highlights of the report include:

First Nations in Alberta

- Although the First Nations population is aging (median age of 25.9 years in 2014), they remain relatively young compared to Canadians (median age of 39.9 years in 2011) and Albertans (median age of 36.0 years in 2011).

Living Arrangements for Children Aged 14 Years and Younger

- First Nations children living on-reserve (1.6% in Treaty 8) were less likely to be in foster care than First Nations children living off-reserve (9.2%) in Alberta.
- Although registered First Nations people represented 6% of the children aged 14 years and under in Alberta in 2011, they represented 58% of the child population in foster care in Alberta.

Education

- First Nations people aged 20 years and over with at least a high school diploma increased from 51% in 2006 to 56% in 2011 for men and from 57% in 2006 to 60% for women in Alberta.
- By age 34 years, First Nations women were more than twice as likely to have completed a bachelor's degree or higher than First Nations men in both on- and off-reserve populations.
- First Nations people aged 25 to 34 years living off-reserve without children were more than 3 times more likely to have a bachelor's degree or higher than those with children (18% vs. 6% for women and 7% vs. 2% for men) in 2011.
- The high school completion rate within 5 years of entering Grade 10 for self-identified First Nations, Métis and Inuit students increased from 45% in 2009/2010 to 53% in 2013/2014.
- The dropout rate for self-identified First Nations, Métis and Inuit students aged 14 to 18 years decreased from 10% in 2009/2010 to 8% in 2013/2014.

Income

- The median after-tax personal income for First Nations people in Alberta increased for all age and sex groups from 2005 to 2010, with the highest increase (41%) occurring among men aged 55−64 years.

- At the same level of education, First Nations females on-reserve had a higher median after tax personal income than First Nations males on-reserve in 2010.
- In 2010, the median after-tax economic family income for both First Nations and non-Aboriginal individuals living on-reserve was lower than their counterparts living off-reserve in both Canada and Alberta.
- Among First Nations people in Alberta, the median after-tax family income increased for couple families and female lone-parent families from 2005 to 2010 and slightly decreased in male-lone-parent families.

Labour Force Activity

- First Nations people living on reserves in Alberta experienced lower participation and employment rates and higher unemployment rates than First Nations people living off-reserve in Alberta in both 2006 and 2011.
- Employment rates for First Nations individuals in all geographic areas increased with the education level attained, with employment rates ranging from 18% to 26% for people without a high school diploma to 74% to 80% for people with a bachelor's or higher degree in 2011.

Housing

- In 2011, 18.7% and 14.4% of First Nations people in Alberta and Canada, respectively, lived in crowded housing with an even higher proportion for First Nations people living on-reserve (35% in Alberta and 27% in Canada).
- In 2011, 30% and 25% of First Nations people in Alberta and Canada respectively lived in unsuitable housing, and the proportion was much higher for First Nations people living on-reserve (45% in Alberta and 37% in Canada).
- In 2011, 54% of First Nations people in Alberta and 43% of First Nations people in Canada lived on-reserve in houses requiring major repairs.
- In 2011, more than 50 in every 1,000 First Nations people (8.6% in Alberta and 5.7% in Canada) lived in both unsuitable and crowded housing requiring major repairs.

Community Well-Being (CWB) Index

- The average First Nations CWB index improved for all regions across Canada from 1981 to 2011, with the least improvement occurring in the Prairie provinces.

- The average CWB score gap between First Nations and non-Aboriginal communities in Alberta increased from 1981 to 1991, decreased in 1996 and increased afterwards, with the gap in 2011 being wider than the gap in 1981.
- Labour force activity is the component of CWB index with the highest scores over time in the First Nations communities in Alberta, with scores ranging from 62 to 68 on a possible scale of 100.
- Nearly 44% of First Nations communities in Alberta occupied the lower half of the CWB index range (scores 50 and under).

Selected Measures of Health Status

- In 2014, life expectancy at birth was approximately 74.3 years for Indigenous people who identify as women+, and 69.7 years for Indigenous people who identify as men+ (several years lower than the life expectancy of Swan Hills, Whitecourt, or the province of Alberta).
- In 2014, approximately 12 in every 100 live births were preterm births among First Nations women.
- Between 2005 and 2014, the average proportion of preterm live births among First Nations mothers increased with maternal age.
- The proportion of live births to First Nations mothers under the age of 20 years decreased from 21% in 2005 to 15% in 2014.
- The prevalence of diabetes among First Nations people in Alberta increased from 5% in 2004 to 7% in 2013.
- In 2014, the First Nations infant mortality rate was approximately 10 deaths per 1,000 live births.
- The age-adjusted potential years of life lost rate for First Nations people increased from 114 per 1,000 population in 2004 to 147 per 1,000 population in 2008 and decreased to 122 per 1,000 population in 2013.

There is likely limited potential population growth and activity associated with the Project. Day to day operation, maintenance, safety, and security will be provided by a staff of operators, engineers and support staff totaling approximately 30 persons (actual numbers TBD). This is only a net increase of the Big Hills regional population by 0.5%. Therefore, there would be almost no increased pressure for social and medical services, or other local health care service providers.

However, there is a lack of data from which to make final conclusions and there are many variables that could impact health care services, such as if another doctor is recruited to the area and if the labour force associated with the Project lives in the area. Health care service providers and infrastructure may be vulnerable if increased population growth occurs. However, the potential impact on the health and social services to the surrounding communities, including potential impacts to Indigenous peoples, Indigenous youth, women+, and members of the LGBTQIA2S+ community (as defined below), is not expected.

15.1 Gender Based Analysis Plus

Gender Based Analysis Plus (GBA+) is an analytical tool used to evaluate how a project may impact diverse or potentially vulnerable population groups, such as members of the members of the LGBTQIA2S+ community. GBA+ used as a process for understanding who is impacted by the issue being addressed and how, and the steps to reduce those impacts.

The LGBTQIA2S+ community is comprised of people who identify as lesbian, gay, bisexual, transgender and/or gender expansive, queer and/or questioning, intersex, asexual, and two-spirit. It is important to note that members of the LGBTQIA2S+ community are members of every community.

The BBPP is not located within any known pride network areas. The closest pride network to the Project, The Pride Centre of Edmonton, is located approximately 160 km southeast of Whitecourt and provides non-judgmental, welcoming space where people of all attractions, identities, and expressions can be themselves, find support, meet new people, and be part of a caring community. The Centre's mission is to provide supports that respond to the needs of people with diverse sexual orientations, gender identities, and gender expressions by offering resources, volunteer opportunities, counselling, and sensitive and expert information and referrals for those seeking help. The Centre also organizes programs to help improve the social, mental, and physical health of the LGBTQIA2S+ community (Pride Centre of Edmonton, 2024).

However, there are several resources provided by AHS, including the *Sexual Orientation, Gender Identity & Gender Expression (SOGIE) Safer Places Toolkit* (Alberta Health Services, 2024c). The Safer Places toolkit is an introductory and practical tool for AHS healthcare teams to increase awareness, promote education, encourage self-reflection and build skills to create more welcoming and safer care for LGBTQ2S+ people and their families. One of the biggest challenges trans, non-binary and gender diverse individuals face when it comes to health care is finding providers who are both welcoming and knowledgeable about their unique health needs.

AHS is working to fill this gap by delivering accessible services to members of the LGBTQIA2S+ community throughout every stage of their personal journey.

In addition to sex and gender, GBA+ attempts to consider all identity factors, including age, disability, race, ethnicity, economic status, education, religion, and mental and physical disabilities (Government of Canada, 2023). The proportion of the total population who identified as men+ and women+ in the town of Swan Hills was 52.1% and 47.9%, respectively (Statistics Canada, 2023a). This proportion is very similar to that of the town of Whitecourt, with 51.8% and 48.2% of the population identifying as men+ or women+, respectively (Statistics Canada, 2023b). 'Men+' includes men (and/or boys), as well as some non-binary persons. 'Women+' refers to women (and/or girls), as well as some non-binary persons (Statistics Canada, 2022). This proportion of men+ and women+ in Swan Hills and Whitecourt is slightly different than the rest of the province, where approximately 49.9% of the population identifying as men+ and 50.1% of the population identifying as women+ (Statistics Canada, 2023d).

When looking at the town of Swan Hills, individuals aged 0-14 had an even split of the population identified as men+ (120) and women+ (120). Of those aged 15-64, 52.8% of the population identified as men+ (420) and 47.2% of the population identified as women+ (375). Of those aged over 65, 51.5% of the population identified as men+ (85) and 48.5% identified as women+ (Statistics Canada, 2023a).

The town of Whitecourt had 52% of the population aged 0-14 identified as men+ (1130) and 48% identified as women+ (1045), a slightly different distribution than the same age group in Swan Hills. Of those in Whitecourt aged 15-64, 52.3% of the population identified as men+ (3,565) and 47.7% identified as women+ (3,245). Of those aged over 65, 47.9% of the population identified as men+ (450) and 52.1% of the population identified as women+ (490) (Statistics Canada, 2023b).

Indigenous Communities and the public did not identify any gender gap issues or other disparities during the consultation and engagement process. Indigenous and public engagement was open to all stakeholders, including individuals, Indigenous Communities, women+, unemployed, low income, seniors, disabled, and other marginalized groups.

KEC is committed to creating an environment that fosters diversity and inclusion and has several policies in place to achieve this goal. Policies include:

- Workplace Violence and Harassment Policy
- Health, Safety, and Environment Policy
- Diversity Policy

A summary of the purpose and scope of the relevant policies can be found below (Kiwetinohk Energy Corp., 2022).

Workplace Violence and Harassment Policy

KEC is committed to providing a physically and emotionally healthy workplace free of harassment and bullying and to providing a work environment in which all people are treated with respect and dignity. KEC expects all people working in its operations to contribute to a healthy and happy work environment and to protect each other from abusive behavior by any person engaged by KEC or any of its contractors.

KEC recognizes that workplace harassment, bullying and violence can arise from many sources. Our Respectful Workplace and Violence Prevention Policy makes clear that harassment, bullying and/or violence in the workplace, in any form, and from any person is unacceptable and will not be tolerated by KEC. Employees, contractors and other workers who violate this Respectful Workplace and Violence Prevention Policy will be subject to corrective action, including termination of employment or contract (and, possibly, disqualification from re-engagement) without notice or pay in lieu thereof.

Health, Safety, and Environment Policy

KEC's Health, Safety and Environment Policy (HSE Policy) outlines the specific responsibilities, requirements, behaviours, and expectations for all KEC employees and contractors. Compliance with this HSE Policy is mandatory for all employees and contractors.

Diversity Policy

The skills, experience, and competitiveness of the stakeholders KEC engages contributes to our success and forms a key part of KEC's competitive advantage.

Talent and skill, and opportunity, come in many different packages. In fact, KEC views diversity as an important factor in aggregate creativity and good will, qualities that are important to the success of our business. As such, we work everyday to ensure KEC is inclusive and respectful

as a place to work, as a supplier of energy to customers, as a community member, and as a business partner.

This policy outlines our diversity and inclusion goals, which are set by the CEO in consultation with the Board, why we place high value on diversity and inclusion, and how we set about making progress and continuous improvements.

KEC values a respectful and inclusive culture, and we benefit when all people fully contribute their way of thinking, experience, and skills to our business. We acknowledge that biases exist, and these can create barriers for some people to fully develop and contribute their skills, abilities, and talent. As such, we work to be inclusive in our hiring and human resources practices and to provide a workplace that encourages mutual respect and positive working relationships where everyone can succeed and feel a sense of belonging to the KEC team and a sense of ownership of our business.

In the future world we envision, people openly and fairly compete for career development and job opportunities regardless of physical or mental disability, race, 2 gender, colour, religion, gender expression, age, ancestry, place of origin, marital status, place of origin, family status, or sexual orientation.

We provide equal opportunity for consideration for employment and advancement based on business needs, job requirements, skills, abilities and potential, that are compliant with laws and regulations that apply to individuals who are qualified to perform certain job requirements.

To achieve the future vision KEC encourages open competition for contract and employment opportunities without regard to any of the irrelevant points of discrimination (physical or mental disability, race, gender, colour, religion, gender expression, age, ancestry, place of origin, marital status, place of origin, family status, sexual orientation) that have historically contributed to the barriers to participation.

KEC celebrates and supports Canada's diversity and the unique experiences and voices of our people by promoting a psychologically safe work environment and eliminating barriers that prevent the full participation of employees, contractors, and suppliers.

KEC eliminates discrimination and integrates inclusiveness across our policies, practices, and procedures, including hiring, contracting, talent management, training, community investments,

and procurement. We foster a culture of respect and positive interaction and are intolerant of negative, disrespectful, and bullying behaviour.

15.2 Project Activities and Socio-Economic Conditions Interactions and Effects

The Project has three distinct phases with specific project activities.

Table 21. Potential Interactions with Project Activities and Socio-economic Conditions

Project Phase	Duration	Relevant Project Activity
Site Preparation and Construction Phase	1 Year	• Clearing, grubbing, and grading • Drilling for foundations • Soils management • Surface infrastructure installation and construction, including lighting • General waste management
Operations Phase	30 years	• Operations at the facility
Closure Phase: Reclamation Stage	2-3 years	• Infrastructure demolition • Site reclamation • Environmental monitoring • General waste management

The BBPP will have positive impacts on the local and regional employment market. In 2021, Statistics Canada stated the economic region which houses nearby communities of Swan Hills and Whitecourt had a 10.4 percent unemployment rate (Government of Alberta, 2023d). The Project could increase participation in the labour force and provide opportunities for in-migration and population growth of Swan Hills and Whitecourt, but it may be that existing persons would more likely benefit from the Project.

The economic output of the Project is as follows:

- Between 2021-2022, approximately $1.5 million was spent on project design.
- The construction phase will generate $400 million in value added for the local economy, supporting on average 350 jobs during the 30-month construction phase (over 700 employees during peak months).
- Operating activities would generate $30 million in value added annually, supporting approximately 30 jobs (actual numbers TBD) annually and provide provincial and municipal government revenues. The expected taxation has not yet been determined.
- BBPP is an equal opportunity employer, and it is expected that employment will be of a fixed term nature and upon closing of the Project, the jobs will cease. However, as technical expertise is increased, there will be opportunity to use skilled employees to other similar Projects, developed by other proponents.

With local employment opportunities, there may be increases in population, creating pressure on local housing markets, both ownership and rental, to accommodate new workers or immigration to the area. Given the lack of a rental market, this provides opportunity for local builders and developers to meet a market need.

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

PART D: FEDERAL, PROVINCIAL, TERRITORIAL, INDIGENOUS AND MUNICIPAL INVOLVEMENT

16 FEDERAL FINANCIAL SUPPORT

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

17 FEDERAL LANDS USED FOR THE PROJECT

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

18 FEDERAL, PROVINCIAL, LEGISLATIVE OR OTHER REGULATORY REQUIREMENTS

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

Additional federal legislation that may apply to the Project include the *Fisheries Act*, the *Species At Risk Act*, and the *Migratory Birds Convention Act, 1994*. The Project will not require any authorizations under the *Fisheries Act* as the BBPP will not result in harmful impacts to fish or fish habitat. There will be no potential effects to marine environments or aquatic species, as defined in the *Species At Risk Act*, as the Project is located over 1000 km from any marine environment. There is potential to affect migratory birds, as defined in the *Migratory Birds Convention Act, 1994*, as a result of habitat disturbance and species displacement during construction and operation of the proposed Project. See Section 19A (Fish and Fish Habitat), 19B (Aquatic Species), and 19C (Migratory Birds) below for more information on how these Acts may apply to the BBPP and associated mitigation measures to reduce potential effects.

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

Provincial and municipal legislative or regulatory requirements can be reviewed above in Section 3.2 (Regulatory Requirements of Provincial and Municipal Jurisdictions).

PART E: POTENTIAL EFFECTS OF THE PROJECT

19 IMPACTS TO ENVIRONMENTAL COMPONENTS

19.1 A) Fish and Fish Habitat

The BBPP facility will require an initial water volume of 4545 m^3, which will be continuously recycled throughout power generation. KEC is planning to supply the initial water volume via onsite, non-saline, groundwater wells with diversion as authorized by a *Water Act* Licence (Term Licence) to be procured at a later date. The proposed diversion will adhere to the requirements of the *Water Act,* the *Water (Ministerial) Regulations,* and *Alberta Environment Guide to Groundwater Authorization.*

As a contingency for the event of the aquifers being determined to have poor yields or facility construction delays reducing the lead-time diversion period, KEC contracted Clear Environmental Solutions to assess potential surface waterbody sources within the vicinity of the proposed facility to determine a potential alternative source for the initial water volume and regulatory requirements.

Clear Environmental Solutions identified Freeman River from point of diversion (POD) at the surface land location of 08-02-065-11 W5M as a potential surface waterbody source.

To divert from the Freeman River, KEC will obtain a Temporary Diversion Licence (TDL) issued under the *Water Act* of the Province of Alberta. TDL application will be made to Alberta Environment and Protected Areas (AEPA) approximately 3 months in advance of the proposed diversion starting, with the application tentatively planned to be submitted in February of 2026 with diversion to commence in May of 2026 during the river's spring freshet.

For land access to the POD, KEC will obtain a Temporary Field Authorization (TFA) as issued by the AEPA. Land access will adhere to the requirements of the *Public Lands Act, Public Lands Administration Regulation (PLAR)*, and the *Master Schedule of Standards and Conditions (MSSC).*

The source was considered suitable for the following reasons:

- Freeman River at POD: 08-02-065-11 W5M is a Strahler Stream Order 5 watercourse
- Current allocations represent 2.85% of the mean annual flow; below the recommended, sustainable threshold of ≤12%.

- The proposed diversion rate required tentatively will be 0.02 m³/s to 0.15 m³/s. Mean flows of the Freeman River from mid-April through mid-August range from 3 m³/s to 14 m³/s. Considering limiting the diversion rate to 10% of the watercourse's flow to avoid impacting the water body and fish habitat, the river is capable of supporting the proposed diversion rates
- There is existing access to the river at the proposed POD and no new disturbance to riparian vegetation or soils will occur
- An appropriately sized, DFO-compliant, pump-intake fish screen will be utilized as per the *Interim code of practice: End-of-pipe fish protection screens for small water intakes in freshwater* to maximize the protection of fish
- *Measures to protect fish and fish habitat* will able to be adhered to, which will prevent fish death and avoid alteration or disruption of fish habitat
- AEPA will issue the approval with restrictive conditions to ensure diversion is only authorized when the watercourse has sufficient flow to support the proposed diversion rates, as well as minimize impacts to the watercourse and fish habitat

All Project activities will be confined to the Project area. No activities are planned in or near Louise Creek or the Freeman River, other than at the proposed POD. According to 2023 Alberta Guide to Sportfishing, Zone 3 Northern Boreal – NB2 (Sports Scene Publications Inc., 2023), Louise Creek and the Freeman River may contain mountain Whitefish (*Prosopium williamsoni*), listed as 'Secure', and several species of trout, including Rainbow Trout (*Oncorhynchus mykiss*), listed as 'At Risk' in Alberta and listed as 'Endangered' by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) (Canadian Wildlife Service, 2014).

No disturbance to riparian vegetation or soils will occur at the POD due to existing access, resulting in no effects to fish habitat due to a lack of sediment deposition into the river. The use of a pump-intake fish screen will minimize direct interactions with fish by preventing entrainment and impingement.

Therefore, given the flow volumes recorded, the existing access at the POD, and the use of a DFO-compliant pump-intake fish screen, the effects of water withdrawal from the Freeman River would be insignificant and would result in no measurable effect on fish or fish habitat as a result of the BBPP.

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

All surface water from the BBPP 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 upland areas in a controlled manner, only if the water quality meets release standards specified in the *Environmental Protection and Enhancement Act*. Water that does not meet these standards will be pumped into a truck for disposal at an approved disposal site. See Section 24.2.1 (Stormwater Management) for more information on the stormwater pond and associated water quality release criteria.

Water release will be to vegetated upland areas that do not drain directly into any watercourse. Therefore, no direct inputs to watercourses or waterbodies would occur.

The Project will not result in harmful impacts to fish or fish habitat and will not require any authorizations under the *Fisheries Act*.

19.2 B) Aquatic Species

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

19.3 C) Migratory Birds

The BBPP lands have limited potential to support tree nesting migratory birds as the majority of the Project lands were clearcut in 2006, leaving young softwood trees with only the southern border of the Project area with merchantable timber. However, there is potential to affect migratory birds, as a result of species displacement, during construction and operation of the proposed Project. Clearing and grubbing for site preparation will remove vegetation, reducing the quantity of terrestrial habitat, and affecting the quality of already marginal habitat. Specifically, removal of vegetation from the Project footprint (20.65 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 from operations. Potential sensory disturbance (e.g., noise, light) has the potential to continue during operations; however, mortality risk associated with potential equipment collisions during construction and operations is unlikely given displacement due to noise and loss of habitat within the constructed and operational areas.

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).

The construction of the BBPP will result in the loss of approximately 20 ha of habitat in the fenced area for the duration of the Project. The laydown area will be reclaimed to equivalent habitat following construction. The final operational area is expected to result in a loss of 13 ha. The fenced area and access road will be reclaimed to equivalent habitat following decommissioning of the Project.

The Project footprint will include a stormwater pond to hold any surface run-off prior to release. This area may be used by migratory birds in a similar fashion to use of wetlands in the region but would be considered unlikely given the proximity to operational equipment. Potential indirect interaction may occur through runoff from the site and spills which might affect the quality of the stormwater pond. However, KEC has a spill response plan in place which will limit, if not wholly eliminate, the potential for contaminants into the pond.

In addition, surface water testing of the collection pond is required, and the pond only collects surface runoff. Therefore, it is not expected to contain measurable volumes of hydrocarbons (i.e. from spills from equipment) nor will it contain any hazardous waste, which will be collected and disposed of at licensed facilities. As such, the stormwater pond is not expected to adversely affect migratory birds.

Bird species that currently use the habitat within the Study Area will be displaced during the initial stages of construction, changes in habitat availability, and associated sensory disturbances. This could potentially cause direct mortality if individuals are unable to relocate to alternate suitable habitats. However, there are areas of suitable nesting habitat in adjacent lands and the regional area in general.

The Project is likely to result in an increase in habitat fragmentation and an increased amount of forest edge. This could lead to decreased forest quality for species that rely on interior forest conditions (i.e., areas within a forest sheltered from edge effects). These effects have both positive and negative outcomes depending on the bird species using the habitat. Habitat fragmentation and increased edge areas may lead to increased predation on birds. A study by Manolis, Andersen, and Cuthbert (2002) found that distance to nearest clear-cut was the best predictor of nest predation in multiple ground laying birds. However, some bird species benefit from forest edge habitat and have shown to return in subsequent years after an area is cleared due to the availability of foraging opportunities and other niche habitats. A study in Alberta showed

that the abundance of alder flycatchers increased in a previously cut area (Tittler et al., 2001). Additionally, rusty blackbirds can also tolerate forestry activities as long as their habitat of coniferous dominant trees of varied heights near waterbodies is maintained. The Project will alter habitat within the Study Area; alterations will have both negative and positive effects depending on the bird species. Not all alterations will be permanent, and these alterations will not have a significantly negative impact on core habitat and similar habitat for avifauna is present in the surrounding landscape.

Several of the species documented on site are protected under the federal *Migratory Birds Convention Act (MBCA)* (Government of Canada, 1994), which prohibits the destruction of nests of specified bird species. Project works will result in the loss of forested habitat; however, as the Project has been sited primarily on a previously disturbed site, the loss of mature forest will be minimized which will mitigate the potential for loss of habitat for wildlife species that rely on mature, overmature or dead trees for nesting or denning opportunities.

Mitigation

To mitigate the potential impacts of habitat disturbance and removal, vegetation clearing works associated with construction should be completed between September 1st and April 14th to accommodate sensitive periods and reduce the potential for impacting nesting avifauna.

Should construction occur during the breeding season (April 15th to Aug 31st), a pre-disturbance wildlife survey and nest sweep will be included as part of an alternative mitigation strategy to address potential Project related effects to these species groups by identifying sensitive wildlife features and by avoiding the disturbance or destruction of migratory bird nests that may be present during the breeding season.

Should incidental monitoring during operations identify significant sensory disturbance or mortality events to a particular species of bird, at a particular time of the year, or during specific weather conditions, the Proponent will implement an adaptive management protocol to monitor and mitigate future effects to the greatest extent possible.

The following mitigations are relevant to general bird species and SAR species.

- All site workers shall comply with regulations outlined in the *Migratory Birds Convention Act*, which prohibit the damage, destruction, disturbance or removal of a migratory bird nests when they contain a live bird or viable egg. Year-round nest

protection is required for 18 species of migratory birds identified on Schedule 1, of the *Migratory Bird Regulation (MBR) 2022*, until they can be deemed abandoned.

- Maintain good housekeeping practices during construction to avoid indirectly feeding birds, and potentially attracting nuisance wildlife.

- During construction, if any nest is identified or behaviour observed which suggests a nest is present, work is to be immediately halted and the Project Manager must be notified, so steps can be taken to identify the species and determine appropriate mitigation or avoidance, if required.

- During morning start up, personnel will be made aware that birds can nest in equipment being stored on location for later use. This may include inside hollow equipment, and has been known to occur within construction equipment that has sat idle for small periods of time. Black Bear will consult with AEPA to determine appropriate courses of action.

- Some species (i.e., Common nighthawks) prefer to make their nests on the ground, in gravelly substrates such as those created at different locations during construction. Therefore, site personnel will monitor gravel stockpiles prior to disturbance.

- Nests (used by non-migratory birds) may be protected under the *Alberta Wildlife Act*. Therefore, if discovered during the construction phase of the Project, nests and birds may have to avoided and left undisturbed until breeding activities are determined to be over. All nests are protected under the *Alberta Wildlife Act* and as such no nests will be disturbed by site personnel, regardless of occupancy.

- Clearing and grubbing activities will be completed outside the accepted breeding bird window (April 15 to August 31), where practicable.

- If clearing is required within the breeding bird window, a qualified professional will be retained to conduct pre-clearing nest sweeps.

- During construction, the use of lights at night will be minimized to the extent practicable. Lights will be installed facing downward, and wherever practicable using motion-sensing lights.

- Construction will primarily occur during daylight hours, to prevent nighttime disturbance, however this cannot always occur given the type of project.

- Lighting of will be minimized and controlled by sensors as much as possible. If security lighting on buildings or inverters is installed, motion-activated lighting to minimize the duration that lighting will be used and down-shielding and directional lighting to restrict the area illuminated to the ground immediately within the building area.

Adaptive management is an iterative learning process producing better understanding and improved management over time (Kerlinger et al. 2010). An adaptive approach involves exploring alternative ways to meet management objectives, predicting the outcomes of alternatives based on the current state of knowledge, implementing one or more of these alternatives, monitoring to learn about the impacts of management actions, and then using the results to update knowledge and adjust management actions (U.S. Department of the Interior, 2009).

Adaptive Management options will be discussed with AEPA and the literature notes that being coupled with an agreed-upon set of criteria that is consistent with the regulatory context is important for success.

The expectation is that Adaptive Management would be applied to: assess the effectiveness of the site-specific mitigation strategies devised during pre-project planning; identify appropriate management responses or adjustments of operations to address unforeseen impacts; and inform and improve longer term mitigation strategies going forward. The Adaptive Management will also include other measures deemed necessary by the proponent based on project-specific details, emerging technology or as a result of improved understanding of potential impacts.

The predicted residual environmental effects of the Project on avifauna are assessed to be adverse, but not significant after the implementation of mitigation measures, monitoring, and further adaptive management, should it become necessary.

20 POTENTIAL ENVIRONMENTAL IMPACTS ON FEDERAL LANDS, IN OTHER PROVINCES, OR OUTSIDE OF CANADA

20.1 FEDERAL LANDS

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

No federal protected areas are located adjacent to or within 10 km of the BBPP boundaries.

The closest federal wildlife area is the Meanook National Wildlife Area, located approximately 144 km east of the BBPP.

The closest national park is Elk Island National Park, located approximately 202 km southeast of the BBPP. The next closest national park is Jasper National Park, located approximately 210 km southwest of the Project lands.

The closest First Nation reservation is the Alexis Whitecourt First Nation Reserve No. 232, located 35 km south-southwest of the BBPP lands. The next closest is Alexander First Nation Reserve No. 134B and 134A, located approximately 53 km east-southeast and 60 km west-southwest of the Project, respectively.

Therefore, due to the distance from the Project, no direct changes to the environment will occur on federal lands as a result of the BBPP.

Potential air emissions from the BBPP will be monitored continuously and were evaluated to be below both provincial and federal standards (See Section 14.6.1 Air Quality) and potential noise from the BBPP was evaluated to meet the standards of AUC Rule 012 – Noise Control (See Section 24.1.7 Noise). Therefore, indirect changes to the environment on federal lands, such as through increased noise or reduced air quality, will also not occur due to the distance of the Project from federal lands.

20.2 OTHER CANADIAN PROVINCES

The BBPP would not have any impacts to the environment to any other Canadian provinces as the Project area is approximately 260 km northeast of the Alberta – British Columbia border and 358 km west of the Saskatchewan border.

Given the size of the Project and the localization of effects environmental components, and the expected lack of effects on aquatic resources, the Project is not anticipated to have any adverse environmental effects outside of Alberta.

20.3 Outside of Canada

The BBPP will not have significant impacts to the environment anywhere outside of Canada as the Project area is located approximately 625 km north of the Canada (Alberta) – United States (Montana) border.

Given the size of the Project and the localization of effects environmental components, and the expected lack of effects on aquatic resources, the Project is not anticipated to have any adverse environmental effects outside of Canada.

21 POTENTIAL ENVIRONMENTAL IMPACTS ON INDIGENOUS PEOPLES

The BBPP is located within Treaty 8 and the territory of the Otipemisiwak Métis Government, District 21 (formerly known as the Métis Nation of Alberta, Region 4) (Refer to Figure 8. Indigenous Reserves and Métis Settlements in Appendix B). Potential environmental impacts of the Project are not expected to result in any significant impacts to Indigenous peoples, including the infringement of Aboriginal and Treaty Rights, impacts to physical and cultural heritage, impacts to the current use of lands and resources used for traditional purpose, and impacts to any site or structure of historical, archaeological, palaeontological, or architectural significance. Potential impacts and associated mitigation measures are discussed below.

21.1 PHYSICAL AND CULTURAL HERITAGE

The environmental effects of the construction and operation of the BBPP are expected to be minimal and localized, therefore potential impacts to Indigenous peoples will likely be localized to the Project area.

Changes to the environment, including air quality, noise, soil, vegetation, wildlife, and heritage resources are expected to be localized in or near the Project area.

Of the Indigenous Communities consulted during the engagement process, five (5) visited the Project site to evaluate for potential concerns, they were Driftpile Cree Nation, Kapawe'no First Nation, Paul First Nation, Sturgeon Lake Cree Nation and Sucker Creek First Nation. The Indigenous Communities and their concerns raised during the Project Site visit are reflected in Section 4.4 (Comments or Concerns of Indigenous Communities).

As the BBPP is located on Crown Land, there is no prohibition or restriction to continued access to adjacent crown land resulting from the BBPP. The BBPP does not control access to the Project location as the Project will be using the Conifer Energy Inc. Road from Highway 32, and all other incidental activities associated with the BBPP will use existing access. BBPP will only control access to the power plant lands. As such traditional use areas which may require access restrictions, should not be affected.

Nevertheless, further engagement to discuss potential mitigations of effects for land use, resources for traditional purpose use or practices will continue throughout the lifecycle of the Project, including licencing and permitting of the transmission line and the pipeline. However, if further consultation reveals there is a concern about traditional use or Aboriginal or Treaty rights

being affected, or a request that incorporation of traditional knowledge might be useful for the BBPP or the associated components (i.e. pipeline; transmission line), KEC will continue to engage with the Indigenous Communities identified and utilize that shareable knowledge to further guide mitigation or possible habitat compensation that may be appropriate or applicable, should they exist.

21.2 Lands and Resources used for Traditional Purposes

21.2.1 Hunting

Current land use in and immediately adjacent to the BBPP is heavy industrial (i.e. oil and gas, logging, transmission lines) which could suggest limited use and effects on current land use by Indigenous Communities. Nevertheless, the BBPP is located within the Alberta Wildlife Management Unit 356, which allows hunting for bear, moose, elk, deer, and game birds. This would suggest the broader area could be used for hunting by Indigenous people.

Indigenous engagement indicates the Project is located in traditional land use areas associated with hunting. During construction there will be heavy traffic and noise that may displace wildlife. See Section 9.2.2 (Infrastructure Construction) for a general summary of the construction phases of the Project. Dust control measures will be used to mitigate the potential impacts of increased vehicle traffic on Indigenous resources of the area. Vegetation will be removed from the site for construction and operations phases of the BBPP, however, vegetation will be replaced as part of site closure and reclamation, which will include the requested participation of Indigenous Communities.

Following construction of the Project additional vehicle traffic will be limited to plant operations and maintenance staff (approximately 30 people) plus commercial traffic associated with supplies and removal of waste. The Project site will be fenced for security and safety of people and wildlife. There will be continued displacement of wildlife from the power plant area during operations due to noise. The distance of displacement is unknown.

The existing roads and ATV trails have already enabled access within the regional area, and it is anticipated that there will not be an appreciable increase in hunting activity due to construction activities as existing roads will be used for access.

Alberta Hunting Regulations prohibit the discharge of a weapon within 183 m, or to cause a projectile from a weapon to pass within 183 m of any occupied building. Therefore, there will be an additional displacement of possible hunting practices of 183 metres outside the Project lands.

The potential effect of the loss of habitat from clearing for the BBPP would be of minor magnitude given the extent of disturbance in the area, in addition to the fact the lands have been clearcut.

The potential effect of sensory disturbance from construction and operational activities, including the increase in vehicle traffic, may result in habitat avoidance and that effect would occur over the life of the BBPP. Sensory disturbance during operations from the constant sound would be Major.

The likelihood of loss of habitat and behavioral effect is almost certain as no literature could be found that indicated that an operating facility does not result in wildlife displacement. However, the likelihood of effect on populations of wildlife is unlikely.

The overall risk to wildlife would be Very High immediately within the BBPP due to loss of habitat and sensory disturbance and that is a function and result of any project being developed (i.e., oil and gas). The overall risk to wildlife habitat is medium and is only isolated to the BBPP area of disturbance. Following interim and final reclamation, habitat capability should be restored.

As per Section 14.6.5 (Wildlife) above, the impacts to wildlife that could potentially be hunted, including bear, moose, elk, deer, and game birds, would be insignificant in magnitude given the small footprint of the area being disturbed and the local displacement of wildlife during construction and operations. See Section 24.1.5 (Dust) for more details on mitigation of potential impacts due to excess dust from increased vehicular traffic. Additional mitigation measures to address the potential impacts to wildlife can be found in Section 14.6.6 (Mitigation).

21.2.2 PLANT GATHERING

Indigenous Communities have requested to be notified so they can complete harvesting prior to the commencement of construction. The vegetation assessment at the BBPP did not identify any evidence of plant gathering or any uncommon plant species at risk, suggesting that the species identified at the BBPP are common to the area.

Regardless of mitigation implemented, vegetation and habitat removal is required within the BBPP site, and all vegetation will be removed during construction on those areas required for construction and then operations. The magnitude of effects to vegetation within the BBPP lands will be major due to clearing within the Project site. However, given the vegetation on surrounding lands and eventual reclamation of the Project, the magnitude will be insignificant. Interim reclamation, and revegetation techniques will reduce the magnitude of any localized effects and will be completed in consultation with Indigenous Communities.

Vegetation of adjacent lands of the Project may receive pump off water from the stormwater pond, if necessary.

The purpose of the stormwater pond is to hold runoff from major events and allow any solids to settle before being released. If the stormwater pond becomes full, water will be pumped and will likely be directed towards the north side of the BBPP into surrounding natural vegetation and will drain north through natural topography. All water will be discharged in a controlled manner without causing erosion (erosion controls will be provided at the discharge point). The water will be discharged to a well vegetated area where the discharge will be distributed over the natural ground and will meet provincial discharge criteria prior to release. Discharge events will be monitored to terminate the equipment if necessary and to mitigate the potential impact to vegetation by ensuring pump equipment remains operational, erosion and sediment controls remain effective, and released water is evenly distributed. See Section 24.2.1 (Stormwater Management) for stormwater quality release criteria and more information on stormwater management.

The magnitude of impact to vegetation quality and quantity of adjacent lands that receive stormwater discharge from the BBPP will be insignificant and will be mitigated by the monitoring of infrequent discharge events, the release of only water that meets provincial release criteria, and the use of erosion and sediment controls. Therefore, excess pump off water from the stormwater pond is not expected to result in any impact to Indigenous people's ability to harvest vegetation for traditional uses.

See Section 14.6.2 (Vegetation) for more details regarding the vegetation identified on the Project site during the field assessments.

21.2.3 FISHING

There are no watercourses within the Project area, the BBPP and associated infrastructure will not have any effect on fish or fish habitat. Therefore, continued use of fisheries resources by Indigenous Communities would not be affected. See Section 21.2.5 (Use of Navigable Waters) below for more information regarding mitigation of potential impacts to fish and fish habitat.

21.2.4 TRAPPING

During consultation associated with the BBPP, registered trappers were notified. No concerns from active registered trappers have been raised. No active traplines were present during our site assessment at the BBPP. During permitting for the transmission line and gas pipeline, further consultation with trapper(s) will occur. Any concerns will be discussed with affected person(s) and mitigation employed following consultation.

21.2.5 USE OF NAVIGABLE WATERS

There are no navigable waters within the BBPP Project area. Water may be withdrawn from the Freeman River as a contingency for the event of the on-site aquifers being determined to have poor yields or facility construction delays reducing the lead-time diversion period. The point of diversion (POD) will be at 08-02-065-11 W5M, where there is existing access to the Freeman River, mitigating the potential impacts of ground disturbance and soil compaction at the POD. If required, erosion and sediment control measures, such as silt fencing, may be installed at the POD to reduce the potential for impacting fish habitat due to sediment deposition.

The proposed diversion rate required tentatively will be 0.02 m^3/s to 0.15 m^3/s. Mean flows of the Freeman River from mid-April through mid-August range from 3 m^3/s to 14 m^3/s. Considering limiting the diversion rate to 10% of the watercourse's flow to avoid impacting the water body and fish habitat, the river is capable of supporting the proposed diversion rates with negligible impacts.

The pump-intake will utilize an appropriately sized, DFO-compliant, pump-intake fish screen as a mitigation measure as per the *Interim code of practice: End-of-pipe fish protection screens for small water intakes in freshwater* to maximize the protection of fish. *Measures to protect fish and fish habitat* will be able to be adhered to, which will prevent fish death and avoid alteration or disruption of fish habitat.

AEPA will issue the approval with restrictive conditions to ensure diversion is only authorized when the watercourse has sufficient flow to support the proposed diversion rates, as well as minimize impacts to the watercourse and fish habitat.

Therefore, the magnitude of impact on navigable waters as a result of the BBPP is insignificant and continued use of navigable waters by Indigenous Communities would not be affected.

See Section 9.1.3 (Water Supply) for more details on the proposed initial water sourcing for the BBPP.

21.2.6 RECREATIONAL USE

Except for the direct and adjacent footprint of the BBPP and associated infrastructure, the BBPP is not anticipated to have any effect on recreational use of the lands. This is further limited due to the proximity of existing oil and gas infrastructure, which surrounds the BBPP. Therefore, recreational use by Indigenous Communities should not be significantly affected.

21.2.7 COMMERCIAL USE OF THE LANDS BY INDIGENOUS COMMUNITIES

There is no known commercial use of the BBPP lands by Indigenous Communities. Commercial forestry has previously harvested commercial timber from the lands. No commercial outfitting is known to occur on the lands. Therefore, commercial use by Indigenous Communities should not be significantly affected.

21.3 SITES AND STRUCTURES OF HISTORICAL, ARCHAEOLOGICAL, PALEONTOLOGICAL OR ARCHITECTURAL SIGNIFICANCE

Currently, there are no identified sites or structures of historical, archaeological, paleontological, or architectural significance in the BBPP area. However, one site located approximately 700 m northeast of the Project boundary was identified as having a Historic Resource Value (HRV) of 5a (a = archaeological), meaning it has a "high potential to contain a historic resource'. Another site with an HRV value of 4a was identified approximately 1100 m northeast of the Project boundary and has been proven to "contain a historic resource that may require avoidance or assessment". The identification of sites and potential risk to historical resources is first searched through the Alberta Listing of Historic Resources interactive map (Government of Alberta, 2024c). "The listing is a tool that developers, industry representatives, and regulators may use to help determine if a proposed development might affect historic resources, including:

- archaeological sites
- palaeontological sites
- Indigenous traditional use sites of a historic resource nature (burials, ceremonial sites, etc.)
- historic structures

The Listing provides proponents with advance notification of possible historic resource concerns and may be used as a tool in planning projects. Used in conjunction with the Instructions for Use of the Listing and/or a relevant Land Use Procedures Bulletin, the Listing helps to determine if a proposed development needs approval under the *Historical Resources Act*. The Listing indicates the Historic Resource Value (HRV), if any, that has been assigned to lands in the Project area, and the Instructions for Use and the procedures bulletins explain the required action. In many cases, the required action is to submit a Historic Resources Application through the Online Permitting and Clearance (OPaC) system."

Although no listings are present on the BBPP lands, as per AUC requirements, an application through OPaC was submitted to the Historical Resources Branch for review. On February 16th, 2023, the BBPP received a Historical Resource Act Clearance to proceed (HRA Number: 4940-23-0013-001).

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

The magnitude of effects on the environment are expected to be insignificant and have negligible impacts 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.

Further consultation will continue during licencing and permitting of the transmission line and the pipeline. If further or potential effects are identified, or the First Nations or Métis require or request further consultation and/or engagement, KEC will continue the consultation and/or engagement processes.

22 POTENTIAL HEALTH, SOCIAL, OR ECONOMIC IMPACTS ON INDIGENOUS PEOPLES

22.1 HEALTH AND SOCIAL IMPACTS ON INDIGENOUS PEOPLES

The BBPP is not expected to impact the health, social conditions, or overall well-being of Indigenous Communities and peoples of Canada, including women+, Indigenous youth, and other marginalized groups. Indigenous Communities and the public did not identify any gender gap issues or other disparities during the consultation and engagement process.

The Air Quality Assessment conducted for the Project (Appendix N – Air Quality Assessment) evaluated the maximum predicted ground-level concentrations of pollutants for five different modelling scenarios under various operating conditions. All scenarios evaluated show the Project will operate below provincial and federal air quality regulations (AAAQO and CAAQS).

A Noise Impact Assessment ("NIA") was conducted for the BBPP (Appendix Q). The purpose of the NIA is to ensure that the noise from the BBPP, measured cumulatively with noise from other energy-related facilities, does not exceed the permissible sound level calculated. No dwellings were identified within 1.5 km from the Project, therefore boundary receptors along a cumulative 1.5 km criteria boundary were identified and assessed for compliance. The Project is located in an area that is heavily developed with oil and gas mainly including active pumping wells which have been included in the assessment. The potential for low frequency noise complaints is low because the Project is in a remote location with no dwellings nearby. Predicted noise levels were evaluated against permissible sound levels established within Rule 012 for the nearest receptors. The Project is found to comply with AUC Rule 012. KEC will continue to follow existing regulations for noise control to reduce the effects of noise on nearby residents and workers.

No ingestion or inhalation pathways that could trigger the need for a Human Health Risk Assessment are anticipated. The emissions (air and noise) from the site during operations will be compliant with provincial and federal requirements and will decrease with distance from the Project. The existing oil and gas activity and forestry harvesting in areas adjacent to the Project likely preclude Indigenous use of the site. Therefore, additional effects on the health or welfare of Indigenous peoples, including Indigenous youth and women+, are not anticipated.

During consultation and engagement, limited evidence of plant gathering was identified on Project lands. The Project site was clearcut in 2006, resulting in direct loss of vegetation, and no evidence of plant gathering was observed based on engagement with Indigenous Communities.

This suggests that the use of the area for a food supply is limited. The vegetation assessment did not recognize the presence of vegetation species that would be used in significant amounts to supply country foods as an adequate food source. Country foods can be defined as traditional Indigenous foods that are either harvested, grown, trapped, or hunted, most notably wild game, fish, and edible plants (Robin, Burnett, Parker, & Skinner, 2021).

As mentioned in Section 21.2.2 (Plant Gathering), Indigenous Communities have requested to be notified so they can complete harvesting prior to the commencement of construction to mitigate the possibility of removing culturally significant plants. The vegetation assessment at the BBPP did not identify any evidence of plant gathering or any uncommon plant species at risk, suggesting that the species identified at the BBPP are common to the area.

As per Section 14.6.5 (Wildlife) above, the impacts to wildlife that could potentially be hunted as a result of the BBPP, including bear, moose, elk, deer, and game birds, would be insignificant in magnitude given the small footprint of the area being disturbed and the local displacement of wildlife during construction and operations. Therefore, no significant impact to the ability of Indigenous Communities to provide country foods from hunting is expected. Refer to Section 21.2.1 (Hunting) for more information on the potential impacts to hunting as a result of the BBPP and associated mitigation measures to reduce such impacts.

As the BBPP is located on Crown Land, there is no prohibition or restriction to continued access to adjacent crown land resulting from the BBPP. The BBPP does not control access to the Project location as the Project will be using existing Conifer Energy Inc. roads, and all other incidental activities associated with the BBPP will use existing access. KEC will only control access to the power plant lands. As such, traditional land use areas which may require access restrictions, should not be affected.

There is likely limited potential population growth and activity associated with the Project. Therefore, there would be almost no increased pressure for social or medical services, or other local health care service providers. However, there is a lack of data from which to make final conclusions and there are many variables that could impact health care services, such as if another doctor is recruited to the area and if the labour force associated with the Project lives in the area. Health care service providers and infrastructure may be vulnerable if increased population growth occurs. A disproportionate impact on the health and social services to Indigenous Communities and peoples', including Indigenous youth and women+, compared to non-Indigenous people is not expected.

At this time, there are no worker camps proposed for the BBPP. Non-local workers will likely stay at hotels within the towns of Swan Hills and Whitecourt, where there is established infrastructure, access to health and social services, and an RCMP station. However, with local employment opportunities, as mentioned in Section 22.2 below, there may be slight increases in population due to non-local personnel coming to the towns of Swan Hills or Whitecourt. This may create pressure on local housing markets, both ownership and rental, to accommodate new workers or immigration to the area. Given the low vacancy in the rental market, this provides opportunity for local builders and developers to meet a market need. Given the prevalent oil and gas industry in the area, Swan Hills and Whitecourt have been proven to be able to accommodate non-local workers to the area with the current infrastructure and health and social services available.

The potential impact the BBPP will have to Indigenous peoples' traditional land use, including physical and cultural heritage, the land and resources used for traditional purposes (plant gathering, hunting, fishing, trapping, etc.), and the sites and structures of historical, archaeological, paleontological, or architectural significance are expected to be insignificant. Therefore, the BBPP is not expected to impact the health, social conditions, or overall well-being of Indigenous Communities and peoples of Canada, including women+, Indigenous youth, and other marginalized groups.

Decommissioning, reclamation, and abandonment of the Project will have a similar, insignificant effect on the health, social, and economic conditions of Indigenous peoples, including Indigenous youth and women+, as the construction and operation phases of the Project. BBPP will create a detailed Construction and Reclamation Plan to guide pre-construction and post-construction reclamation at the BBPP. The intent of the interim reclamation is to support vegetation growth and soil stabilization in and around the BBPP once construction is completed for stabilization during operations.

KEC will seek input from the Indigenous Communities during final reclamation and abandonment of the Project lands at the end of the BBPP lifecycle to ensure that consideration of traditional, or future land use by these groups is incorporated into any restoration plans. This may include the use of vegetation species that may not only support reclamation, but might also support plant gathering, such as berry picking, for example. Further reclamation design may also consider how the Project lands could be used in support of the practice of Indigenous rights. For example, this might include re-planting of coniferous vegetation to support larger ungulates, or perhaps a design that accommodates ceremonial use. These ideas wouldn't currently comply with Alberta Environment and Protected Areas requirements for reclamation and KEC would be

bound by regulations for reclamation, but as Indigenous knowledge is incorporated into restoration, this may be a culturally important consideration at that time.

Furthermore, given that the project could last 30 years or more, surrounding land use at the time of decommissioning and reclamation is currently unknown. The use of traditional knowledge may support the restoration of the greater area as a whole.

KEC will continue the engagement process with the Indigenous Communities identified in Section 4.3 (Overview of Engagement Activities Carried out to Date), and provide updates regarding the Project's permitting, construction, operation, and decommissioning schedules and related activities. If Project activities are found to produce negative impacts to the health and social well-being of Indigenous Communities and peoples, KEC will provide an opportunity for the identified Indigenous Communities to assist in the mitigation process. Future engagement with Indigenous Communities and the public will be inclusive to all stakeholders, including individuals, Indigenous Communities, women+, unemployed, low income, seniors, disabled, and other marginalized groups.

22.2 Economic Impacts on Indigenous Peoples

As stated in Section 15.2 (Project Activities and Socio-Economic Conditions Interactions and Effects), the BBPP will have positive impacts on the local and regional employment market. In 2021, Statistics Canada stated the economic region which houses nearby communities of Swan Hills and Whitecourt had a 10.9 % unemployment rate, which is significantly higher than the provincial average of 5.7% (Statistics Canada, 2023e). The Project could increase participation in the labour force among Indigenous people and women+ or provide opportunities for in-migration and population growth of Swan Hills and Whitecourt.

The potential economic benefits of the Project may include:

- $400 million in value added for the local economy during the construction phase, supporting on average 350 jobs during the 30-month construction phase (over 700 employees during peak months).
- Access to KEC's prequalification tool for interested service providers to register for contracting opportunities with the EPC contractor selected for the project.
- Access to KEC's internal, community-based contractor list sorted by service, which helps ensure local service providers are identified and included in the bid process.

- $30 million in estimated operations and maintenance spending annually, supporting approximately 30 well-paid jobs secure over the life of the Project.
- Access to KEC's Indigenous micro-loan program for Indigenous entrepreneurs building businesses in the areas where KEC operates.

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

The Project is not anticipated to have any negative economic impacts on Indigenous Communities and peoples, including Indigenous youth and women+, during the Project planning, permitting, construction, operation, or decommissioning, reclamation, and abandonment of the BBPP.

Across the Project lifecycle, KEC will engage with Indigenous Communities to discuss workforce needs, and where feasible, identify opportunities to develop local skills through training, contracting and workplace programs. KEC may utilize existing training institutions, and service providers, as well as mentorship opportunities by KEC staff to support trainee's skill development. For example, environmental monitor training may include access to EcoCanada's BEAHR (Building Environmental Aboriginal Human Resources) program and / or based on the learnings from the *Alberta Government Environmental Monitoring Technician Training for First Nations and Métis Communities in Oil Sands Regions, Alberta* (July 2017). Mandatory safety training will be provided for all work site personnel.

23 GREENHOUSE GAS EMISSIONS ESTIMATE

The BBPP is a combined cycle power plant with a Carbon Capture System (CCS). Emissions sources at the BBPP include one natural gas fired combustion turbine generator which vents to the heat recovery steam generator, one auxiliary boiler stack, one CCS absorber stack, and two triethylene glycol heaters.

It is possible that the carbon capture and storage (CCS) hub, or other party's hubs, may not be operational when the BBPP is commissioned. As such, the BBPP may operate for a period without CCS. Similarly, in the event that the CCS hub is down for maintenance or experiences unplanned outages, the BBPP will operate without CCS. The number of emission sources and release points change when operating with and without CCS. Dispersion modelling of the BBPP was conducted under continuous operations, with and without CCS, to ensure that all MGLC of ambient air quality are compliant regardless of the operational configuration.

Current GHG regulations applicable to the BBPP include the federal *Regulations Limiting Carbon Dioxide Emissions from Natural Gas-fired Generation of Electricity*. These regulations require that the carbon intensity be calculated using the gross electricity produced and CO_2 emissions only. The carbon intensity for the BBPP was calculated according to the requirements of the federal Regulations. Calculations integrated conservative values, where maximum power generation (100% load) is assumed to occur continuously over the course of a year. Table 22 summarizes the carbon intensity for the BBPP, with and without CCS, for comparison with federal limits.

Table 22. Carbon Intensity Results

Limits	Project without CCS	Project with CCS
FEDERAL CO_2 Emission Intensity Limit (tCO_2/GWh)	420	
BBPP CO_2 Emission Intensity (tCO_2/GWh)	383	19

Without CCS the BBPP is calculated to meet the 420 tCO2/GWh intensity limit as required by the federal Regulations Limiting Carbon Dioxide Emissions from Natural Gas-fired Generation of Electricity. With the commissioning of CCS, the BBPP is calculated to reduce its CO2 emission intensity to 19 tCO^2/GWh.

In Alberta, electricity generators are subject to a "good-as-best-gas" benchmark of 0.37 tonnes CO_2e per megawatt-hour of power produced, with a tightening rate of 2% per year starting in 2023 (Alberta Environment and Parks, 2022). Based on these regulations, allowable CO_2e emissions for the facility are 972,360 tonnes per year, slightly under the estimated emissions of 1,090,000 tonnes per year (based on anticipated fuel use). Emissions estimates, however, were calculated based on conservative estimates of facility operation parameters (e.g. facility operates at peak load 24 hr/day, 365 days/year, no maintenance shutdown periods or other non-operating plant scenarios). As a result, the predicted GHG emissions are likely higher than actual.

In 2020, Alberta's GHG Emissions were 256.4 megatonnes of CO_2e (Canada Energy Regulator, 2024). Under full operation, 365 days / year, the GHG emissions from the BBPP would account for an increase in 1.1 megatonnes, or 0.42% of the Alberta 2016 total GHGs. Please refer to Appendix O – Emissions Intensity Report for more details regarding GHG emissions associated with the BBPP.

KEC recognizes and acknowledges the Clean Electricity Regulations (CER) are not presently in effect. However, KEC strives to be industry leaders when it comes to regulations and is dedicated to complying with the upcoming provincial and federal regulations. The BBPP is scheduled to be commissioned by the second quarter of 2028, therefore, the BBPP would need to be "CCS-ready" by 2035. In order to be proactive, KEC is already designing the BBPP with CCS capabilities, seven years in advance of the deadline proposed by the CER. Although the CER guidelines are not available, KEC is confident that the BBPP design will meet the 2035 guidelines. KEC remains committed to continuous evaluations of technological advancements and alternative solutions to further reduce or achieve net-zero emissions by 2050.

24 EMISSIONS, DISCHARGE AND WASTE

24.1 AIR

24.1.1 CONSTRUCTION AND RECLAMATION

Construction and reclamation operations activities can affect air quality by producing dust and fugitive emissions (i.e., tailpipe exhaust emitting CO_2 and nitrous and sulphur oxides) mainly due to heavy machinery use and transportation. Fugitive emissions will be limited to tailpipe emissions from vehicle use during construction and operations, dust associated with construction and operational equipment, operations of the BBPP and the fugitive emissions from equipment leaks that are unintentional losses and may arise due to normal wear and tear, improper or incomplete assembly of components, inadequate material specification, manufacturing defects, damage during installation or use, corrosion, fouling and environmental effects. This may also result in odor release.

24.1.2 OPERATIONS

KEC has completed an Air Quality Assessment (AQA) for the BBPP. The AQA has been prepared to support KEC's Industrial Approval Application and is provided in Appendix N – Air Quality Assessment.

Air monitoring during operations will occur as per the methodologies outlined in the approval for the BBPP, which is expected to include the requirements of the document entitled Air Monitoring Directive (AMD), which specifies environmental monitoring and reporting requirements and guidelines for Alberta.

The AMD outlines the methods acceptable for air monitoring and reporting, as required by an Alberta EPEA approval, Code of Practice, Registration, or any other air monitoring and reporting activities for which data is submitted. In addition to the AMD, other regulatory tools exist to specify air monitoring requirements, including, but not limited to the Stack Sampling Code, and Substance Release Regulation.

The plant will be equipped with a continuous emission monitoring system (CEMS) capable of monitoring carbon monoxide (CO), oxides of nitrogen (NO_x), oxygen (O_2), and opacity. Additional parameters may need to be monitored based on the BBPP approval conditions. A Data Acquisition and Report Generating System (DARS) will also be provided.

KEC will become a contributing member to the West Central Airshed Society (WCAS). WCAS is a non-profit organization that operates a network of twelve (12) continuous monitoring stations and thirteen (13) micro sensors that collectively monitor air quality across the West Central region to provide scientifically credible air quality data on a regional scale (West Central Airshed Society, 2024).

Refer to Section 14.6.1 (Air Quality), Section 23 (GHG Emissions Estimate), or Appendix N – Air Quality Assessment for more information on air quality and emissions at the BBPP.

24.1.3 Operational Fugitive Emissions

The key elements for effective long-term control of fugitive emissions are the application of best available technology and standards, implementation of management systems, and corporate commitment[4]. The application of control technologies and design standards, alone, do not preclude the potential for fugitive emissions. Reliable fugitive emissions control requires the development of monitoring programs, operating procedures, and performance objectives for controlling fugitive emissions, and management's commitment to the implementation and maintenance of an Inspection and Maintenance program.

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

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

24.1.4 Air Containment Emissions (ACE)

The main contributors to criteria Air Contaminant Emissions (ACE) of the BBPP will be heavy machinery and truck transportation during the construction and operational phases.

[4] Canadian Association of Petroleum Producers. 2007. Best Management Practice. Management of Fugitive Emissions at Upstream Oil and Gas Facilities.

Machinery and vehicles will run for the most part on diesel fuel. Emissions generated during construction are considered to be similar to those produced for similar small-scale construction projects. During operations, fugitive emissions are only associated with maintenance activities which require the use of light trucks. These emissions are considered negligible and not considered further in this assessment.

Construction activities were grouped into four sequential phases:

1. Grubbing / Land Clearing;
2. Grading / Excavation;
3. Drainage / Utilities / Sub-Grade / Equipment Erection; and
4. Operations.

Using estimated equipment lists, numbers of workers, area of activity and duration of activities, and the built-in assumptions of the Road Construction Emissions Model, versions 7.1.15 assumptions, were inputted into the model for analysis. Table 23 below summarizes the expected construction-related emissions, with maximum daily estimates based on all equipment in use for the full workday.

Table 23. Fugitive Emissions Estimates

				Total	Exhaust	Fugitive Dust	Total	Exhaust	Fugitive Dust	
Project Phases (Metric Units)	**ROG (kg/day)**	**CO (kg/day)**	**NOx (kg/day)**	**PM_{10} (kg/day)**	**PM_{10} (kg/day)**	**PM_{10} (kg/day)**	**$PM_{2.5}$ (kg/day)**	**$PM_{2.5}$ (kg/day)**	**$PM_{2.5}$ (kg/day)**	**CO_2 (kg/day)**
Grubbing/Land Clearing	0.7	7.1	1.0	18.5	0.3	18.2	3.9	0.1	3.8	3,033.0
Grading/Excavation	0.8	8.5	2.0	91.3	0.4	90.9	19.1	0.2	18.9	3,322.5
Drainage/Utilities/Sub-Grade	0.7	6.9	2.0	91.2	0.3	90.9	19.1	0.2	18.9	2,603.4
Paving	-	-	-	-	-	-	-	-	-	-
Maximum (kilograms/day)	0.8	8.5	2.0	91.3	0.4	90.9	19.1	0.2	18.9	3,322.5
Total (megagrams/construction project)	0.5	4.7	1.2	44.4	0.2	44.2	9.3	0.1	9.2	1,818.6
Total (kg/construction project)									1,818,000	
Notes: Project Start Year ->	2024									
Project Length (months) ->	29									
Total Project area (hectares) ->	21									
Maximum Area Disturbed/Day (hectares) ->	0									
Total Soil Imported/Exported (meters^3/day)->	0									

[5] Sacramento Metropolitan Air Quality Management District, California DOT, California Air Resources Board, U.S. EPA, ICF Jones & Stokes, Tlax LLC. 2012. Road Construction Emissions Model, Version 7.1.1.

Project Phases (Metric Units)	ROG (kg/day)	CO (kg/day)	NOx (kg/day)	Total PM_{10} (kg/day)	Exhaust PM_{10} (kg/day)	Fugitive Dust PM_{10} (kg/day)	Total $PM_{2.5}$ (kg/day)	Exhaust $PM_{2.5}$ (kg/day)	Fugitive Dust $PM_{2.5}$ (kg/day)	CO_2 (kg/day)
	PM_{10} and $PM_{2.5}$ estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.									
	Total PM_{10} emissions shown in column Total are the sum of exhaust and fugitive dust emissions shown in columns Exhaust (PM_{10}) and Fugitive Dust (PM_{10}). Total $PM_{2.5}$ emissions shown in Column Total are the sum of exhaust and fugitive dust emissions shown in columns Exhaust ($PM_{2.5}$) and Fugitive Dust ($PM_{2.5}$).									
	Estimates do not include emissions associated with truck deliveries to the Project, which are expected to average 423 trips / month based on chronic truck traffic (FedEx, toilet service, town runner, etc.) of approximately 6-8 trucks per day. Permanent Plant deliveries during the 3rd to 4th month of the OEM build window will cause the truck count to spike peaking at about 25 trucks per day.									

Estimated particulate matter (PM_{10} and $PM_{2.5}$) presented include fugitive dust from earth disturbance. However, this represents an unmitigated scenario, and mitigation will be put in place to reduce fugitive dust, including spraying of several roads adjacent to the Project area with water or other controls as required.

24.1.5 DUST

During reclamation activities, appropriate dust suppression measures will be used as required. Water will be used for dust suppression on soil piles, exposed soil surfaces or other areas prone to wind and water erosion. Although there is no environmental impact in using water as a dust suppressant, research shows water will only control dust for up to 12 hours due to its evaporation rate. Therefore, in the event of prolonged use of an area, other surface amendments may be used for longer term dust control.

KEC realizes dust can be a significant source of particulate matter ($PM_{2.5}$) in the atmosphere and can have numerous environmental and socio-economic implications such as air pollution, impairment of driver vision, health impacts, and impacts to aesthetics. Road deterioration can increase because of loss of fines (i.e., <0.075 mm), since they act as road surface binders. This can lead to road safety issues, increased economic cost to vehicles and increased road maintenance needs. The use of dust suppressants has been shown to lower road maintenance requirements and associated costs as well as mitigate the environmental and health impacts associated with dust.

There are numerous products/techniques that can be used for dust suppression. Various road salts make up the main chemical-based dust suppressants currently used in Canada. However, in 1995

road salts were placed on the Federal Government's Priority Substances List 2 for assessment to determine its toxicity under the Canadian Environmental Protection Act (CEPA, 1999). The science assessment concluded that because of the high releases around storage and snow disposal sites and through run-off and splash from roadways into soils, streams and rivers, road salts pose a serious threat to the aquatic environment, plants, and animals.

There are several road salts that could be used as dust suppressants in Canada, for instance calcium chloride, magnesium chloride, potassium chloride and sodium chloride. The main use of dust suppression products is to minimize dust emissions from unpaved roads or other areas where soil handling is occurring as a result of reclamation operations. Loss of aggregate and subsequent surface deterioration (e.g. ruts, potholes, and corrugations) with the loss of surface fines results in dust generation. There are two major alternatives employed to achieve desired dust control results. The first general method to control dust generation is to apply good construction and maintenance practices. The second general method is the application of chemical methods of dust suppression. Other methods of dust suppression include changes to speed limits, encouraging the use of alternative routes, restricting heavy traffic, paving roads, or changing the timing of road construction and maintenance activities (i.e., to occur during wet weather).

BBPP will implement appropriate dust suppression measures on roads, work areas, or transportation and loading routes, as necessary. The decision to control dust will be made at the field level and will depend upon site conditions, level of activity, and worker health and safety.

24.1.6 ODOR

In the event that an adverse odor event occurs on site that has potential to impact surrounding areas the following steps will be undertaken to address the situation:

- The source of the odor will be investigated and identified.
- The contributing process/substance will be terminated, relocated, removed, or otherwise managed as deemed necessary.
- If the odor in indicative of a potentially hazardous event, the appropriate regulatory agency will be contacted immediately for assistance. Such assistance may include guidance on notification to nearby residents, business, or other land users.
- If the odor event is deemed to be unhazardous but substantially offensive and objectionable, nearby public will be contacted and provided with information regarding the odor.

24.1.7 NOISE

KEC will follow existing regulations for noise control to reduce effects of noise on nearby residents and workers. KEC will comply with the requirements of:

- Occupational Health and Safety Act, Occupational Health and Safety Code 2009.
- Approved (recommended CSA Class A or CSA Grade 4) hearing protection devices must be worn at all times where noise levels exceed 85 dBA. These areas will usually be marked with signage stating that hearing protection is required.
- KEC has completed a Noise Impact Assessment ("NIA") for the BBPP (Appendix Q). The NIA has been prepared to support KEC's Industrial Approval Application and meets the requirements of the AUC issued Rule 012 - Noise Control, which are applicable to noise emitted from the construction and operation of energy related facilities in Alberta. The purpose of the NIA is to ensure that the noise from the BBPP, measured cumulatively with noise from other energy-related facilities, does not exceed the permissible sound level calculated. No dwellings were identified within 1.5 km from the Project, therefore boundary receptors along a cumulative 1.5 km criteria boundary were identified and assessed for compliance. The Project is located in a heavily developed with oil and gas due mainly to active pumping wells which have been included in the assessment, therefore the potential for low frequency noise complaints is low because the Project is in a remote location with no dwellings nearby. Predicted noise levels were evaluated against permissible sound levels established within Rule 012 for the nearest receptors. The Project is found to comply with AUC Rule 012.

For the full NIA report, refer to Appendix Q – Noise Impact Assessment.

24.2 SURFACE RUNOFF

Site drainage, soil erosion and sediment control will be reviewed and implemented during construction and included into the final grading, drainage, and landscape design. A stormwater management plan drawing was developed and included in Appendix L – Surface Draining and Civil Grading. Water should not be allowed to pond adjacent to buildings, equipment, foundations, and roadways both during and after construction.

Drainage work will be limited to within the site boundary. Site grading contours and elevations will be designed to direct stormwater from the power plant area to a stormwater detention pond. Building roof drains shall discharge directly to stormwater system and not at grade.

Any water that is not suitable for release will be trucked out to a 3rd party certified wastewater disposal/treatment facility.

24.2.1 STORMWATER MANAGEMENT

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

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

As the pond will only capture surface runoff, no hazardous materials will affect the quality of the water. KEC has a spill response plan, and any spills or leaks will be immediately handled to ensure no effects to surface water or runoff. KEC is an existing member of Western Spill Response, a spill preparedness and equipment cooperative offering access to training and spill prevention equipment in the region.

Surface runoff will be managed as per the requirements of the Alberta Industrial Approval. No wastewater, sludge or surface runoff will be released directly to watercourses as a result of operations.

The purpose of the stormwater pond is to hold runoff from major events and allow any solids to settle before being released. The Project is not allowed to use water collected in the stormwater ponds for operation purposes or disposal in deep-well injection unless that removal is licensed under the Alberta Water Act. Stormwater will be tested and meet the following criteria prior to being released in a controlled fashion to adjacent lands:

- chloride content 500 mg/L maximum (e.g., test strips),
- pH 6.0 to 9.0 (e.g., test strips and/or meter readings),
- no visible hydrocarbon sheen (roughly equates to less than 10 mg/L),
- no other chemical contamination (e.g., clean operating conditions such that collected waters are not impacted by spills/releases),
- water not allowed to flow directly into any watercourse, and
- each release recorded, including the prerelease test data and the estimated volume of water released.

Any pump off water from the pond will likely be directed towards the north side of the BBPP into surrounding natural vegetation and will drain north through natural topography. All water will be discharged without causing erosion (erosion controls will be provided at the discharge point). The water will be discharged to a well vegetated area where the discharge will be distributed over the natural ground and will meet provincial discharge criteria prior to release. Discharge events will be monitored to ensure equipment remains operational and erosion and sediment controls remain effective, and to terminate equipment if necessary.

Stormwater pond overall size to accommodate a storage capacity for up to the 100-year 24-hour storm with an emergency spillway. The pond depth will be approximately 2.0 m including 0.6 m freeboard, with a capacity of approximately 16,600 cubic meters. The pond will empty via a mobile pumped system that outlets to the adjoining property. Details of the pump and its enclosure have not yet been determined.

At this time, the pond design characteristics, including liner types, leak detection, or other requirements, have not been finalized but will be during final plant design once an EPC contractor has been determined.

24.3 Industrial Wastewater Disposal

Industrial wastewater will not be released to the environment.

All wastewater sources are identified in the Water Mass Balance and P&ID (Appendix J – Water Mass Balance; and Appendix G – Plant Site Drawings, PFDs, P&IDs). These industrial wastewater and process liquids will be collected, stored and monitored in above ground tanks and wastewater will be trucked offsite to an approved wastewater collection facility.

All tanks used for storage of Industrial wastewater will meet requirements for design characteristics. Industrial wastewater disposal details will be recorded.

Reuse and minimization of wastewater was analyzed for the BBPP. Effluent streams that are re-usable in the facility (e.g. reboiler condensate, DCC condensate) will be stored separately for further use or treatment.

24.4 Domestic Sewage and Wastewater

Sewage generated during construction will be contained within portable toilets. As required, domestic bio-solids will be vacuumed from the septic tanks and hauled to the nearest sewage treatment facility or disposal.

Temporary storage and hauling to an approved disposal site will be completed for domestic wastewater.

Sanitary wastewater is collected in a system of drains within the Admin / Control building and routed to the Sanitary Drains Storage Tank, where it will be taken offsite by truck for disposal. Sanitary waste drainage is achieved by gravity flow. The Sanitary Drains System includes one sanitary manway and one sanitary drains storage tank. The septic system will be designed in accordance with Alberta Private Sewerage Standard of Practice Handbook 2021 and addenda to Version 12 and the Sanitary Sewage Management Guidelines for Industrial Operations.

The estimated daily flow for this type of facility is 3,315 litres/day.

The sanitary drain system will be designed for estimated peak demand domestic wastewater volume. The Sanitary Drains Storage Tank will be installed below insulation board to protect against freezing and will be installed with an atmospheric gooseneck vent terminating 1 m above grade.

Sanitary waste accumulated by the sanitary drains storage tank will be removed from site by truck. The collection tanks will be located in accordance with section 3.1.2 of 2021 Alberta Private Sewage Systems Standard of Practice, which states (minimum distances):

- 10 m from a water source;
- 10 m from a watercourse;
- 1 m from a property line; and
- 1 m from a building.

24.5 Domestic Waste

All domestic and industrial garbage will be disposed using approved refuse containers for hauling and disposal at an approved landfill. Bear proof containers will be used on location for holding of domestic and industrial garbage.

24.6 Operational Waste

Below is a list of operational wastes expected at the BBPP.

Table 24. Summary of Operational Wastes associated with the BBPP

Substance	Characterization	Source of introduction	Volume variation
HRSG and Auxiliary Boiler exhaust stack	See Table 6	Exhaust	According to load requirements.
Used oil / grease	See Table 6	Pump / motor maintenance	According to pump / motor maintenance schedule.
Fuel Gas Drains	Condensate from fuel gas, entrained solids, liquid particles, and fuel gas vapors	Knockout drum and scrubber drains	Infrequent
Process wastewater	Non-oily wastewater	from plant washdown (after oil separation) and water treatment wastewater	Infrequent
Oily Wastewater	Oil and Oily Wastewater	Oil water separator for plant area drains	Infrequent
Process wastewater	wastewater with detergents	combustion turbine wash	Infrequent
Relief valve discharges	discharged from relief valves (condensate; water/glycol mix).	Maintenance, system upsets	Intermittent
Domestic grey water, black water	Sink and shower drains, toilet.	Septic tank removal	Variable

Substance	Characterization	Source of introduction	Volume variation
Solid wastes	Housekeeping cleaning rags, parts packaging, paper	General maintenance and operations	Variable
TEG Waste	Liquid effluent containing rich TEG waste	By-product of the TEG process	Infrequent
TRU Waste	Liquid effluent, normally diluted for storage and transport. Will be disposed of offsite.	Degradation products separated from the amine in the TRU distillation column.	Infrequent

No third-party wastes will be accepted at the BBPP.

PART F: SUMMARY

25 INITIAL PROJECT DESCRIPTION SUMMARY

The Initial Project Description Summary, in both English and French, has been submitted along with this Initial Project Description.

26 CERTIFICATION

The undersigned has considered relevant factors and influences pertinent within the scope of the assessment. The undersigned has no past, present, or contemplated interest in the assessed underlying property or investments in the proponent. I have reviewed the information as submitted and completed this report in conformity with the Code of Ethics and the Duties of Professional Biologists.

Respectfully Submitted,

<original signed by>

Robert McCallum, P.Biol
President
McCallum Environmental Ltd.

<original signed by>

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Environmental Scientist
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Appendix A – Concordance Table

Required information as described in the *Information and Management of Time Limits Regulations,* Schedule 1	Initial Project Description Reference	Agency Comments based on the Submission of the Draft Initial Project Description on February 9th, 2024	Revisions Made Based on Agency Comments
PART A – GENERAL INFORMATION			
1. The project's name, type or sector and proposed location.	Section 1 Section 1.1 Figure 1	• Complete	N/A
2. The proponent's name and contact information and the name and contact information of their primary representative for the purpose of the description of the project.	Section 2 Table 3	• Complete	N/A
3. A summary of any engagement undertaken with any jurisdiction or other party, including a summary of the key issues raised and the results of the engagement, and a brief description of any plan for future engagement.	Section 3 Appendix C Appendix D	• Complete	N/A
4. A list of the Indigenous groups that may be affected by the carrying out of the project, a summary of any engagement undertaken with the	Section 4 Table 4 Table 5 Appendix C Appendix E	• Complete	Yes

Required information as described in the *Information and Management of Time Limits Regulations,* Schedule 1	Initial Project Description Reference	Agency Comments based on the Submission of the Draft Initial Project Description on February 9th, 2024	Revisions Made Based on Agency Comments
Indigenous peoples of Canada, including a summary of key issues raised and the results of the engagement, and a brief description of any plan for future engagement.	Appendix F	• Editorial: the first line under Sawridge First Nation: ACO (pg. 34) includes a stranded 'T'.	
5. Any study or plan, relevant to the project, that is being or has been conducted in respect of the region where the project is to be carried out, including a regional assessment that is being or has been carried out under section 92 or 93 of the Act or by any jurisdiction, including by or on behalf of an Indigenous governing body, if the study or plan is available to the public.	Section 5	• Recommend providing additional details about any potential Traditional Land Use studies that have been conducted for the project site. • Editorial: 'Impact Assessment Act Registry' should be 'Canadian Impact Assessment Registry'	Yes
6. Any strategic assessment, relevant to the project, that is being or has been carried out under section 95 of the Act.	Section 6	• Complete • Editorial: 'Impact Assessment Act Registry' should be cited in text as 'Canadian Impact Assessment Registry'	Yes

Required information as described in the *Information and Management of Time Limits Regulations,* Schedule 1	Initial Project Description Reference	Agency Comments based on the Submission of the Draft Initial Project Description on February 9th, 2024	Revisions Made Based on Agency Comments
PART B: PROJECT INFORMATION			
7. A statement of the purpose of and need for the project, including any potential benefits.	Section 7	• Complete	N/A
8. The provisions in the schedule to the *Physical Activities Regulations* describing the project, in whole or in part.	Section 8	• Complete • Editorial: under the Physical Activity heading (pg.44), the last line of the page includes a stranded 'c'	Yes
9. A list of all activities, infrastructure, permanent or temporary structures and physical works to be included in and associated with the construction, operation and decommissioning of the project.	Section 9, 9.1, 9.2, 9.3 Table 6 Table 7 Table 8 Table 9 Figure 2 Figure 3 Appendix G Appendix H Appendix I Appendix J	• On page 14, it is noted that Kiwetinohk Energy Corp. (KEC) may develop a carbon dioxide storage facility, called the Black Bear CCS Hub, which would be co-located with the Project. If KEC will or may develop the Black Bear CCS Hub, the Agency recommends describing whether the Hub is incidental to the Project. To support this analysis, provide the following information:	Yes

Required information as described in the *Information and Management of Time Limits Regulations,* Schedule 1	Initial Project Description Reference	Agency Comments based on the Submission of the Draft Initial Project Description on February 9th, 2024	Revisions Made Based on Agency Comments
		○ describe when the Black Bear CCS Hub would be operational. ○ whether the Black Bear CCS Hub is subordinate or complimentary to the Project. ○ the proximity of the Black Bear CCS Hub to the Project. ○ Whether the Black Bear CCS Hub would be within the care and control of KEC. If not, describe the relationship of KEC with the third party undertaking the activity, and clarify whether KEC would have the ability to direct or influence the carrying out of the activity. ○ whether the Black Bear CCS Hub would be solely for the benefit of KEC, or will be available for use by other parties as well; and	

Required information as described in the *Information and Management of Time Limits Regulations,* Schedule 1	Initial Project Description Reference	Agency Comments based on the Submission of the Draft Initial Project Description on February 9th, 2024	Revisions Made Based on Agency Comments
		○ the federal and/or provincial regulatory requirements for the Black Bear CCS Hub. • If the Black Bear CCS Hub is incidental to the Project, describe the components of the facility, its location, its storage capacity, potential effects of the facility to valued components, and mitigation measures to address any adverse effects. • If the Black Bear CCS Hub would not be operational prior to the commencement of project operations, indicate how captured CO2 emissions from the Project will be managed/stored until it is operational.	
10. An estimate of the maximum production capacity of the project and a description of the production processes to be used.	Section 10 Section 9.1.5 Appendix G	• Complete	N/A
	Section 11 Table 10	• Recommend including an estimated timeline of the decommissioning,	Yes

Required information as described in the *Information and Management of Time Limits Regulations,* Schedule 1	Initial Project Description Reference	Agency Comments based on the Submission of the Draft Initial Project Description on February 9th, 2024	Revisions Made Based on Agency Comments
11. The anticipated schedule for the project's construction, operation, decommissioning and abandonment, including any expansions of the project.		reclamation, and abandonment phases in Table 10.	
12. A list of a) potential alternative means of carrying out the project that the proponent is considering and that are technically and economically feasible, including through the use of best available technologies; and	Section 1.1.1 Section 1.1.2 Section 12.2 Section 12.3	• Complete	N/A
b) potential alternatives to the project that the proponent is considering and that are technically and economically feasible and directly related to the project.	Section 12.4	• Complete	N/A
PART C: LOCATION INFORMATION			
13. Provide a description of the designated project's proposed location including:			

Required information as described in the *Information and Management of Time Limits Regulations,* Schedule 1	Initial Project Description Reference	Agency Comments based on the Submission of the Draft Initial Project Description on February 9th, 2024	Revisions Made Based on Agency Comments
a) its proposed geographic coordinates, including, for linear development projects, the proposed locations of major ancillary facilities that are integral to the project and a description of the spatial boundaries of the proposed study corridor;	Section 13 – A Section 1.1 Appendix B	• Complete	N/A
b) site maps produced at an appropriate scale in order to determine the project's proposed general location and the spatial relationship of the project components;	Section 13 – B Appendix B	• Recommend including a figure showing the proposed route/location of the natural gas pipeline and/or possible options being considered at this time if the final route/location has not yet been identified.	Yes
c) the legal description of land to be used for the project, including, if the land has already been acquired, the title, deed or document and any authorization relating to a water lot;	Section 13 – C Appendix F Appendix L	• In this section, it is noted that a Departmental Miscellaneous Lease (DML) has been issued for the Project. Recommend including a copy of the DML, if available.	Yes

Required information as described in the *Information and Management of Time Limits Regulations,* Schedule 1	Initial Project Description Reference	Agency Comments based on the Submission of the Draft Initial Project Description on February 9th, 2024	Revisions Made Based on Agency Comments
d) the project's proximity to any permanent, seasonal or temporary residences and to the nearest affected communities;	Section 13 – D Appendix C Appendix H	• Complete	N/A
e) the project's proximity to land used for traditional purposes by Indigenous peoples of Canada, land in a reserve as defined in subsection 2(1) of the *Indian Act*, First Nation land as defined in subsection 2(1) of the *First Nations Land Management Act*, land that is subject to a comprehensive land claim agreement or a self-government agreement and any other land set aside for the use and benefit of Indigenous peoples of Canada; and,	Section 13 – E Figure 8	• Complete	N/A
f) the project's proximity to any federal lands	Section 13 – F Figure 7	• Complete	N/A
14. A brief description of the physical and biological environment of the	Section 14 Section 14.1 – 14.7	• Complete	N/A

Required information as described in the *Information and Management of Time Limits Regulations,* Schedule 1	Initial Project Description Reference	Agency Comments based on the Submission of the Draft Initial Project Description on February 9th, 2024	Revisions Made Based on Agency Comments
project's location, based on information that is available to the public.	Table 11 – 20 Appendix B Appendix K Appendix M Appendix N Appendix O Appendix P		
15. A brief description of the health, social and economic context in the region where the project is located, based on information that is available to the public or derived from any engagement undertaken.	Section 15 Section 15.1 Section 15.2 Table 21	• Recommend including more details for the human health component, such as the average life expectancy, leading causes of death in the region, access to health care services, etc. • Recommend presenting information through a Gender-Based Analysis Plus lens. • Recommend presenting information regarding the current health, social, and economic conditions of Indigenous peoples in the region of the Project.	Yes
PART D: FEDERAL, PROVINCIAL, TERRITORIAL, INDIGENOUS, AND MUNCIPAL INVOLVEMENT			

Required information as described in the *Information and Management of Time Limits Regulations,* Schedule 1	Initial Project Description Reference	Agency Comments based on the Submission of the Draft Initial Project Description on February 9th, 2024	Revisions Made Based on Agency Comments
16. A description of any financial support that federal authorities are, or may be, providing to the project.	Section 16	• Complete	N/A
17. A list of any federal lands that may be used for the purpose of carrying out the project.	Section 17	• Complete	N/A
18. A list of any jurisdictions that have powers, duties or functions in relation to an assessment of the project's environmental effects	Section 18 Section 3.2	• Recommend identifying any federal legislation that will or may apply to the Project, such as the Migratory Birds Convention Act, 1994, the Species at Risk Act, and the Fisheries Act, and including a statement regarding how they will or may apply to the Project.	Yes
PART E: POTENTIAL EFFECTS OF THE PROJECT			
19. A list of any jurisdictions that have powers, duties, or functions in relation to an assessment of the project's environmental effects.	Section 19		

Required information as described in the *Information and Management of Time Limits Regulations,* Schedule 1	Initial Project Description Reference	Agency Comments based on the Submission of the Draft Initial Project Description on February 9th, 2024	Revisions Made Based on Agency Comments
a) fish and fish habitat, as defined in subsection 2(1) of the *Fisheries Act*;	Section 19 – A	• Recommend clarifying which release standards will be adhered to determine whether water from the stormwater pond can be released to upland areas. • Recommend clarifying whether any fish species at risk are or may be present in any waterways that may be affected by the Project, including the Freeman River. • Editorial: Typo in 6th paragraph of Section A – Fish and Fish Habitat, beneath list of reasons for suitable water source: "and would no measurable effect on fish…". • Editorial: Typo in 8th paragraph of Section A – Fish and Fish Habitat: "Water release will be to upland areas that do no drain directly'.	Yes
b) aquatic species, as defined in subsection 2(1) of the *Species at Risk Act*; and	Section 19 – B	• Complete	N/A

Required information as described in the *Information and Management of Time Limits Regulations,* Schedule 1	Initial Project Description Reference	Agency Comments based on the Submission of the Draft Initial Project Description on February 9th, 2024	Revisions Made Based on Agency Comments
c) migratory birds, as defined in subsection 2(1)of the *Migratory Birds Convention Act*, 1994.	Section 19 – C	• Recommend providing further information regarding any mitigation measures that will be implemented to address effects to migratory birds, such as from habitat disturbance/removal, sensory disturbance, increased mortality risk, etc.	Yes
20. A list of any changes to the environment that, as a result of the carrying out of the project, may occur on federal lands, in a province other than the province in which the project is proposed to be carried out or outside Canada.	Section 20.1 Section 20.2 Section 20.3	• Recommend including a description of any direct or indirect project-related changes to the environment that may occur on federal land, even though federal lands will not be used.	Yes
21. With respect to the Indigenous peoples of Canada, a brief description of the impact — that, as a result of the carrying out of the project, may occur in Canada and result from any change to the environment — on physical and cultural heritage, the current use of lands and resources for traditional purposes	Section 21 Section 4.4	• Section 21.1 notes that project effects will largely be localized to the project area. Recommend describing how these effects may impact the physical and cultural heritage of Indigenous peoples, particularly given that the project area overlaps with the traditional lands of several Indigenous	Yes

Required information as described in the *Information and Management of Time Limits Regulations,* Schedule 1	Initial Project Description Reference	Agency Comments based on the Submission of the Draft Initial Project Description on February 9th, 2024	Revisions Made Based on Agency Comments
and any structure, site or thing that is of historical, archaeological, paleontological or architectural significance, based on information that is available to the public or derived from any engagement undertaken with Indigenous peoples of Canada.		groups, and mitigation measures that will be implemented to address these effects. • Section 21.2: This section discusses potential pathways through which the Project may affect the current use of lands and resources for traditional purposes (current use). Recommend describing the magnitude of potential project effects to current use, including those resulting from vehicle traffic increases, effects to wildlife, and vegetation and habitat removal, and mitigation measures that will be implemented to address these effects. • Section 21.2: Recommend describing how discharge from the stormwater pond to surrounding upland areas may affect current use, such as through alteration of vegetation quality or quantity, and mitigation measures that will be implemented to address effects.	

Required information as described in the *Information and Management of Time Limits Regulations,* Schedule 1	Initial Project Description Reference	Agency Comments based on the Submission of the Draft Initial Project Description on February 9th, 2024	Revisions Made Based on Agency Comments
		• Section 21.2.5: Recommend describing whether water withdrawals that may be required during project construction and/or operation may affect navigation by Indigenous peoples, the magnitude of any effects, and mitigation measures that will be implemented to address effects. • Editorial: In the 3rd paragraph of section 21.2.1, recommend updating the following text "(approximately xx people)".	
22. A brief description of any change that, as a result of the carrying out of the project, may occur in Canada to the health, social or economic conditions of Indigenous peoples of Canada, based on information that is available to the public or derived from any engagement undertaken with Indigenous peoples of Canada.	Section 22 Appendix N Appendix Q	• Recommend describing how the Project may affect the availability, quality, or access to country foods by Indigenous peoples, and mitigation measures that will be implemented to address any effects identified. • Recommend describing potential project effects to the social conditions of Indigenous peoples, and mitigation measures that will be implemented to address any effects identified.	Yes

Required information as described in the *Information and Management of Time Limits Regulations,* Schedule 1	Initial Project Description Reference	Agency Comments based on the Submission of the Draft Initial Project Description on February 9th, 2024	Revisions Made Based on Agency Comments
		• Recommend describing how decommissioning and abandonment of the Project may affect the health, social, and economic conditions of Indigenous peoples, and any mitigation measures that will be implemented to address effects. • Recommend describing whether the Project may result in an influx of non-local personnel due to employment opportunities and, if so, how this may affect the health, social, and economic conditions of Indigenous peoples (e.g. safety, access to infrastructure and health/social services, etc.), and mitigation measures that will be implemented to address effects. • Recommend consideration of GBA Plus principles in the assessment of effects to Indigenous peoples' health, social, and economic conditions, including how effects may be disproportionately felt by Indigenous	

Required information as described in the *Information and Management of Time Limits Regulations,* Schedule 1	Initial Project Description Reference	Agency Comments based on the Submission of the Draft Initial Project Description on February 9th, 2024	Revisions Made Based on Agency Comments
		peoples in general, Indigenous women, Indigenous youth, etc.	
23. An estimate of any greenhouse gas emissions associated with the project.	Section 23 Table 15 Table 22 Appendix O	• Recommend providing estimated GHG emissions for all phases of the Project, including construction, operation, and decommissioning. • Recommend discussing project related GHG emissions in comparison to the requirements of the Clean Electricity Regulations, including how compliance with these Regulations will be maintained during periods where carbon capture and storage will or may not be available.	Yes
24. A list of the types of waste and emissions that are likely to be generated — in the air, in or on water and in or on land — during any phase of the project.	Section 24 Section 14.6.1 Table 23 Table 24 Appendix G Appendix J Appendix L Appendix N Appendix Q	• Complete	N/A

Appendix B – Figures

Figure 1. BBPP Location

Figure 2. Natural Gas Pipeline Options

Figure 3. Transmission Line Options

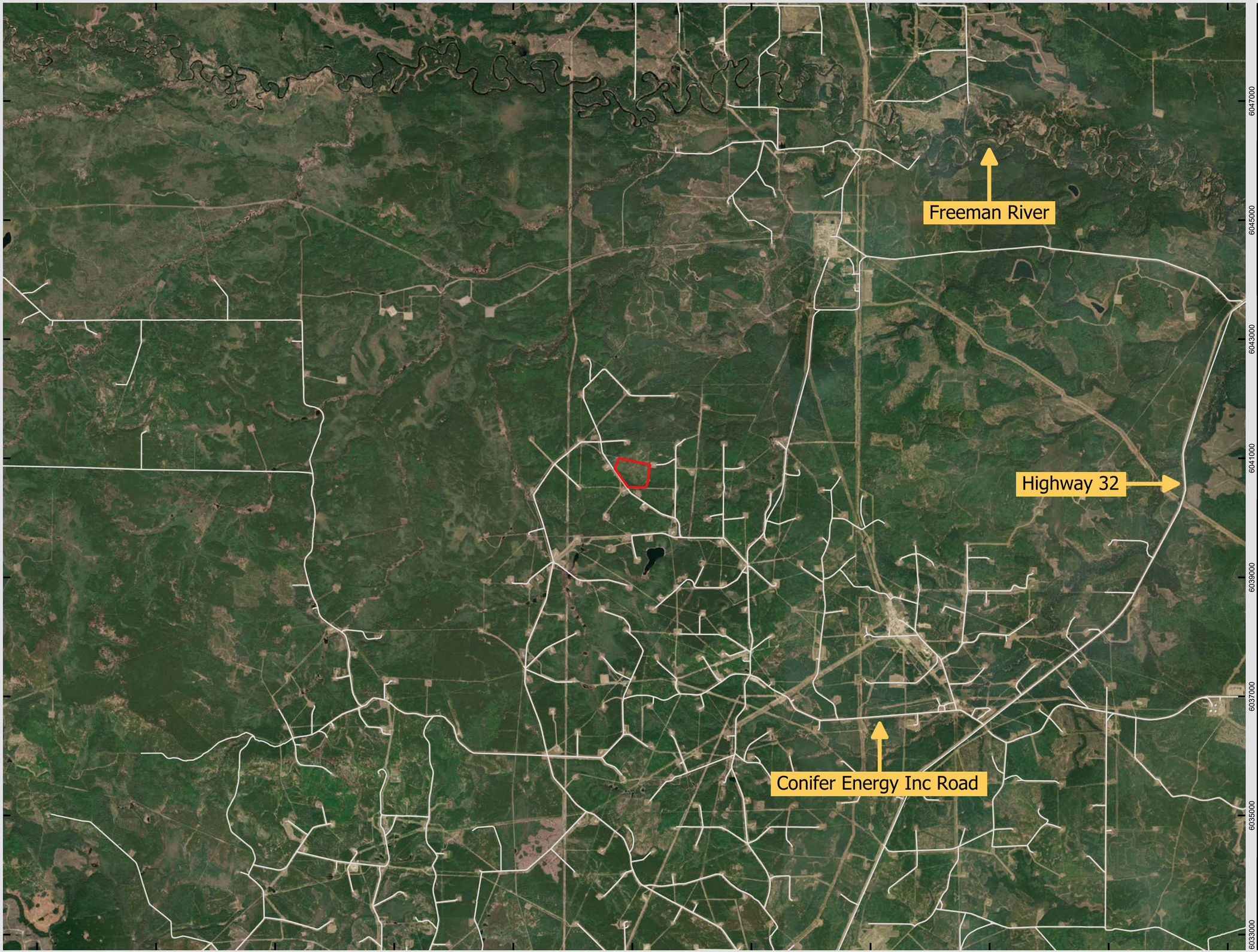
Figure 4. General Equipment Arrangement

Figure 5. Grizzly Bear Management Zones

Figure 6. Wetlands and Watercourses

Figure 7. Parks and Protected Areas

Figure 8. Indigenous Reserves and Métis Settlements



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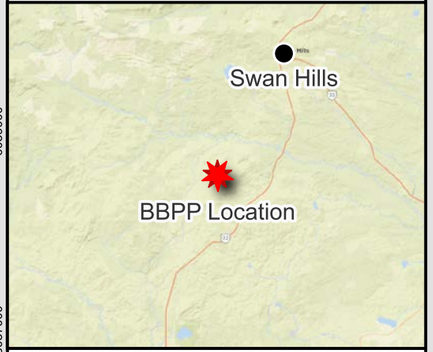
FIGURE 1

Black Bear Power Plant (BBPP)

LSDs 1, 2, 6, 7, 8, SE ¼ SEC. 15, TWP. 64, RGE. 11, W5M

Legend

- Alberta Roads
- Project Area



Coordinate System: NAD83 / Alberta 10-TM (Forest)
Projection: Transverse Mercator
Datum: North American 1983
Units: Meter

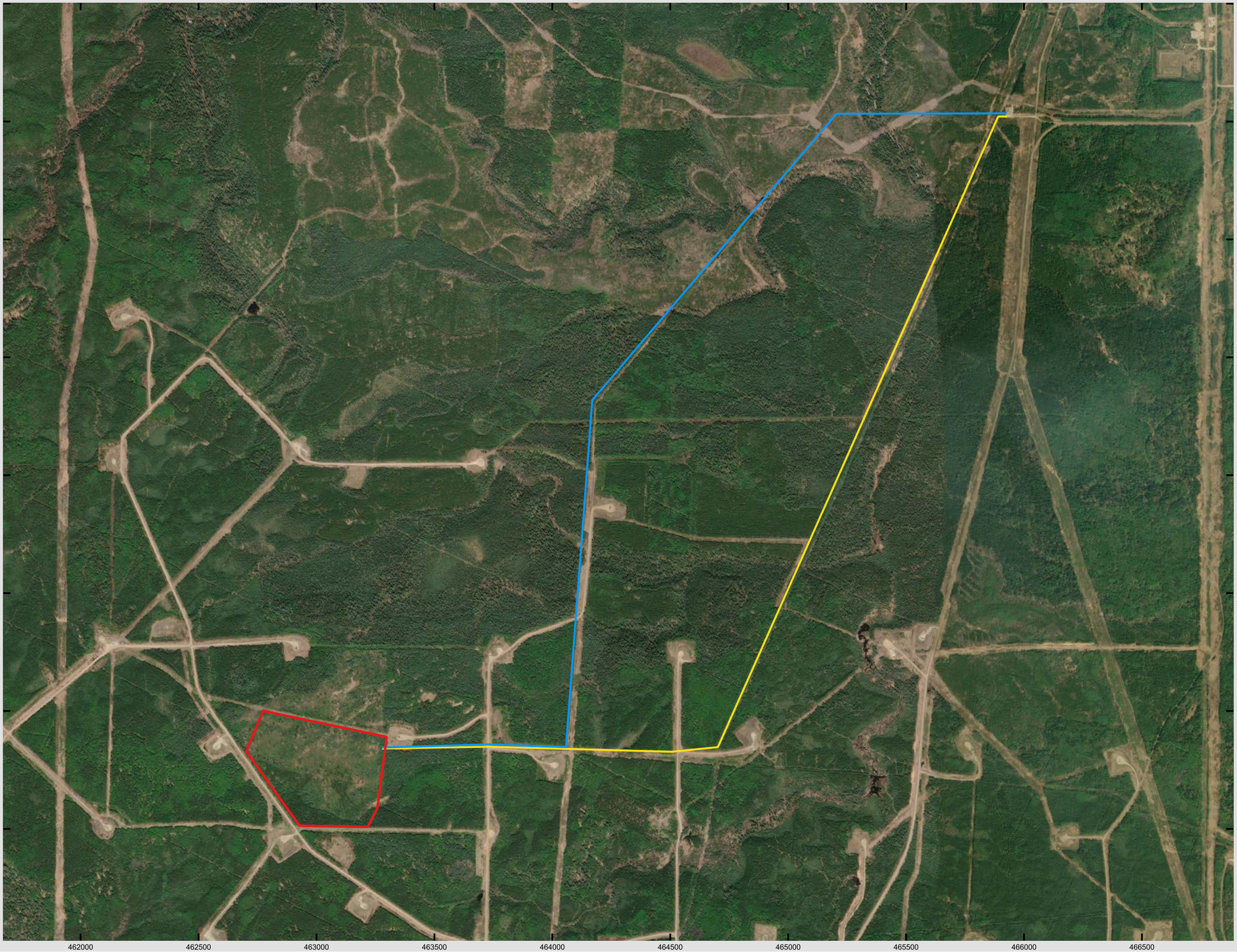
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Drawn By: DG
Reviewed By: RM

2024-05-05

McCallum Environmental Ltd.



Prepared for:

kiwetinohk energy

FIGURE 2

Black Bear Power Plant (BBPP)

Natural Gas Pipeline Options

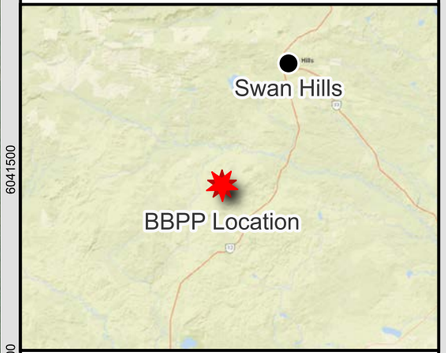
Point of Interconnection at LSD 3, SW ¼ SEC. 25, TWP. 64, RGE. 11, W5M

Legend

- Project Area

Gas Pipeline Options

- East Route
- West Route



Coordinate System: NAD83 / Alberta 10-TM (Forest)
Projection: Transverse Mercator
Datum: North American 1983
Units: Meter

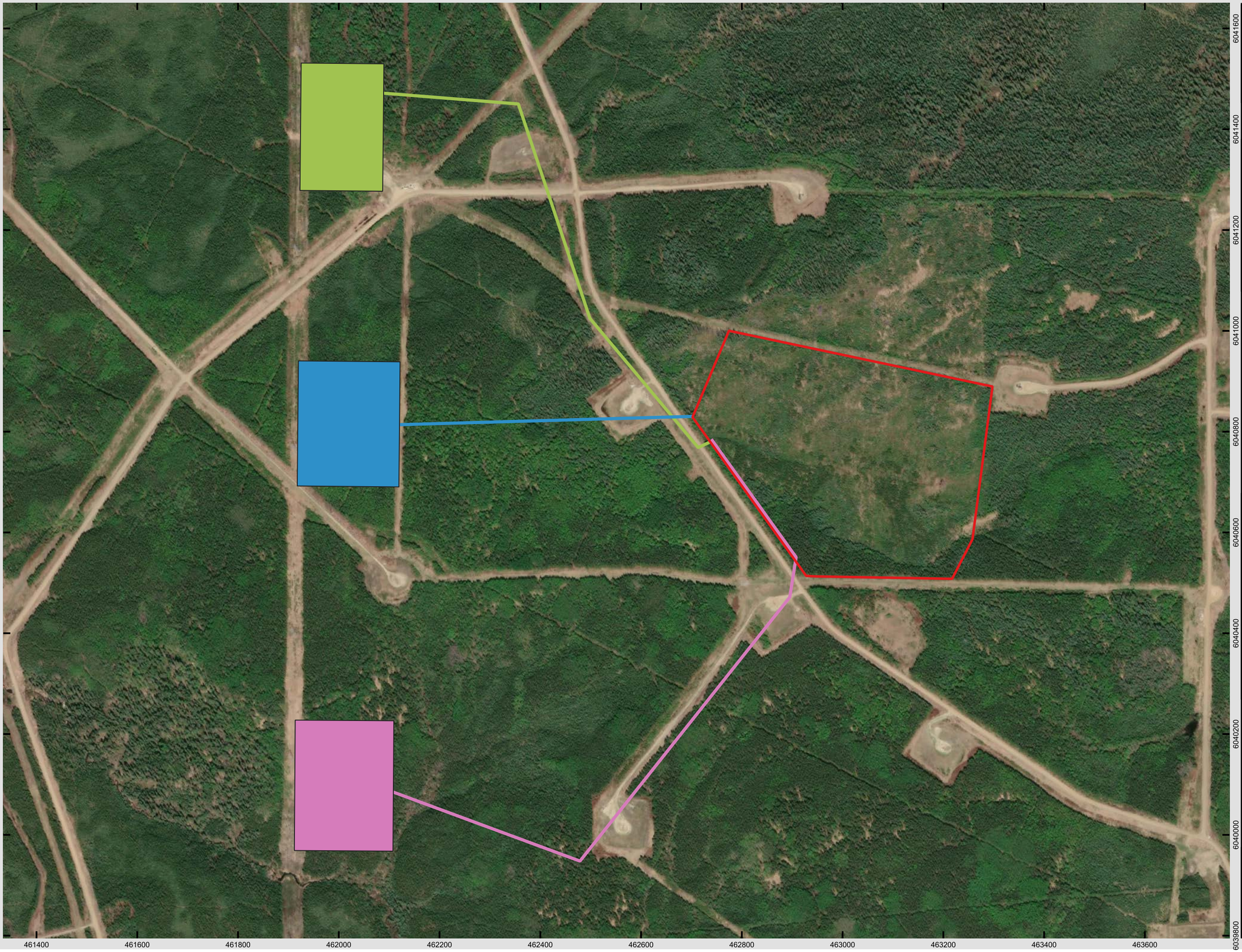
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Drawn By: DG
Reviewed By: RM

2024-05-05

McCallum Environmental Ltd.



Prepared for:

kiwetinohk energy

FIGURE 3

Black Bear Power Plant (BBPP)

Transmission Line and Switching Station Options

Legend

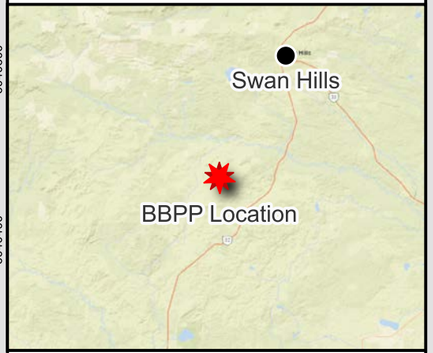
- Project Area

Transmission Line Route Options

- Option 1
- Option 2
- Option 3

Switching Station Options

- Option 1
- Option 2
- Option 3



Coordinate System: NAD83 / Alberta 10-TM (Forest)
Projection: Transverse Mercator
Datum: North American 1983
Units: Meter

0 200 400 m

Scale: 1:7,000 Scale when printed @ 11" x 17"

Drawn By: DG
Reviewed By: RM

2024-05-05

McCallum Environmental Ltd.

ITEM NO.	EQUIPMENT NAME
128	MAKEUP AMINE TANK
129	AMINE DRAIN TANK
130	STRIPPER OVERHEAD ACCUMULATOR
131	LEAN FLASH TANK
132	CONDENSATE FLASH TANK
133	HYDROGEN STORAGE TRAILER
134	HRSG DRUM PENTHOUSE
135	FUEL GAS COMPRESSOR BUILDING

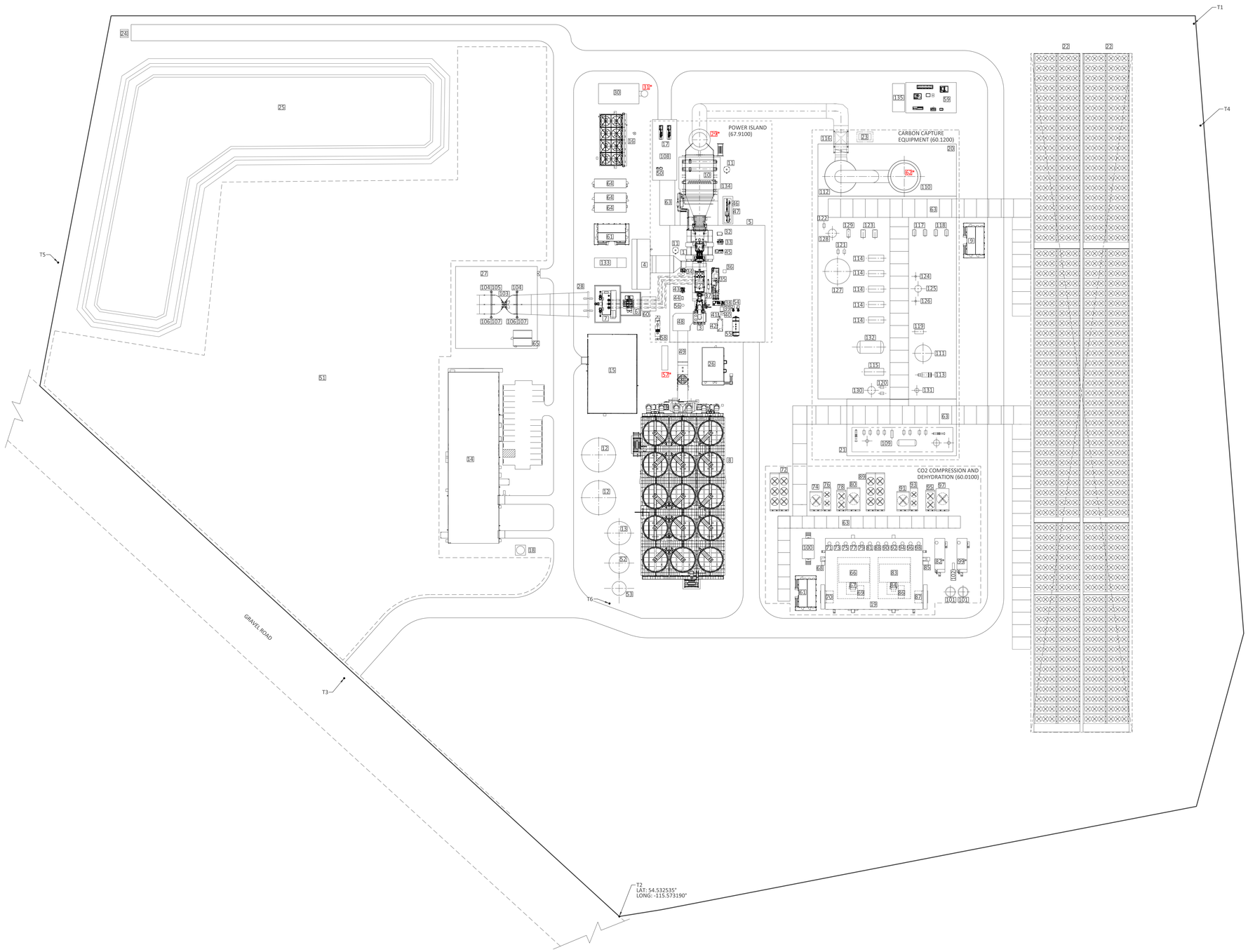
ITEM NO.	EQUIPMENT NAME
111	CO2 STRIPPER
112	PRESCRUBBER
113	STRIPPER REBOILER
114	LEAN / RICH EXCHANGER
115	LEAN FLASH COMPRESSOR
116	BOOSTER FAN
117	WASH WATER PUMPS
118	RICH AMINE PUMPS
119	LEAN AMINE PUMP
120	STRIPPER REFLUX PUMPS
121	AMINE FEED PUMPS
122	MAKEUP AMINE PUMP
123	WATER WASH PUMPS
124	LEAN AMINE PRE-FILTER
125	ACTIVATED CARBON FILTER
126	LEAN AMINE POST-FILTER
127	LEAN AMINE TANK

ITEM NO.	EQUIPMENT NAME
94	FOURTH STAGE SUCTION SCRUBBER (TRAIN-2)
95	FIFTH STAGE COOLER (TRAIN-2)
96	FIFTH STAGE DISCHARGE SCRUBBER (TRAIN-2)
97	EIGHTH STAGE COOLER (TRAIN-2)
98	SIXTH STAGE SUCTION SCRUBBER (TRAIN-2)
99*	CO2 DEHYDRATION PACKAGE (TRAIN-2)
100	LOW VOLTAGE MCC BUILDING
101	STILL VENT CONDENSING TANK
102	GLYCOL MAKE-UP TANK
103	240 KV CIRCUIT BREAKER
104	240 KV LINE DISCONNECT
105	240 KV CCVT
106	240 KV SURGE ARRESTOR
107	240 KV H-FRAME
108	BOILER FEEDWATER PUMP BUILDING
109	THERMAL RECLAIMER
110	CO2 ABSORBER

ITEM NO.	EQUIPMENT NAME
77	FOURTH STAGE SUCTION SCRUBBER (TRAIN-1)
78	FIFTH STAGE COOLER (TRAIN-1)
79	FIFTH STAGE DISCHARGE SCRUBBER (TRAIN-1)
80	EIGHTH STAGE COOLER (TRAIN-1)
81	SIXTH STAGE SUCTION SCRUBBER (TRAIN-1)
82*	CO2 DEHYDRATION PACKAGE (TRAIN-1)
83	8 STAGE INTEGRALLY GEARED CENTRIFUGAL COMPRESSOR (TRAIN-2)
84	9.7 MW SYNCHRONOUS ELECTRIC MOTOR (TRAIN-2)
85	SYNCHRONOUS ELECTRIC MOTOR COOLING AIR HANDLER (TRAIN-2)
86	COMPRESSOR LUBE OIL SKID (TRAIN-2)
87	COMPRESSOR LUBE OIL COOLER (TRAIN-2)
88	FIRST STAGE SUCTION SCRUBBER (TRAIN-2)
89	FIRST STAGE COOLER (TRAIN-2)
90	SECOND STAGE SUCTION SCRUBBER (TRAIN-2)
91	SECOND STAGE COOLER (TRAIN-2)
92	THIRD STAGE SUCTION SCRUBBER (TRAIN-2)
93	THIRD STAGE COOLER (TRAIN-2)

ITEM NO.	EQUIPMENT NAME
39	STEAM TURBINE HYDRAULIC SKID
40	H2 GAS DRYER
41	H2 GAS SKID
42	STATOR WATER COOLING SKID
43	GLAND STEAM CONDENSER
44	GENERATOR NEUTRAL GROUNDING CUBICLE
45	FUEL GAS PURGE AIR COMPRESSOR AND TANK
46	FUEL GAS FINAL FILTER & PREHEATER SKID
47	FUEL GAS FINAL FILTER & PREHEATER ENCLOSURE
48	HOT BOX
49	ACC MAIN STEAM DUCT
50	CONDENSATE RECIRC. PUMP
51	LAYDOWN AREA (APPROX 20 ACRES)
52	RAW WATER STORAGE TANK
53	WASTEWATER STORAGE TANK
54	CONDENSATE EXTRACTION PUMPS
55	CONDENSATE COLLECTION TANK
56	STEAM TURBINE DRAINS TANK
57*	EMERGENCY DIESEL GENERATOR
58	OIL WATER SEPARATOR (BELOW GRADE)
59	FUEL GAS YARD
60	GENERATOR BREAKER
61	MV PDC
62*	ABSORBER STACK
63	UTILITY RACK
64	GT/ST/AUXILIARY POWER CONTROL CENTER
65	240KV CONTROL BUILDING
66	8 STAGE INTEGRALLY GEARED CENTRIFUGAL COMPRESSOR (TRAIN-1)
67	9.7 MW SYNCHRONOUS ELECTRIC MOTOR (TRAIN-1)
68	SYNCHRONOUS ELECTRIC MOTOR COOLING AIR HANDLER (TRAIN-1)
69	COMPRESSOR LUBE OIL SKID (TRAIN-1)
70	COMPRESSOR LUBE OIL COOLER (TRAIN-1)
71	FIRST STAGE SUCTION SCRUBBER (TRAIN-1)
72	FIRST STAGE COOLER (TRAIN-1)
73	SECOND STAGE SUCTION SCRUBBER (TRAIN-1)
74	SECOND STAGE COOLER (TRAIN-1)
75	THIRD STAGE SUCTION SCRUBBER (TRAIN-1)
76	THIRD STAGE COOLER (TRAIN-1)

ITEM NO.	EQUIPMENT NAME
1	COMBUSTION TURBINE GENERATOR
2	TURBINE GENERATOR
3	STEAM TURBINE
4	INLET AIR FILTER
5	GENERATION BUILDING
6	AUXILIARY TRANSFORMER
7	GENERATOR STEP-UP TRANSFORMER
8	AIR COOLED CONDENSER
9	LV CCS PDC
10	HEAT RECOVERY STEAM GENERATOR
11	BLOW DOWN TANK
12	FIREWATER / SERVICE WATER STORAGE TANKS
13	DEMINERALIZED WATER TANK
14	ADMIN BUILDING
15	WATER TREATMENT BUILDING
16	AUXILIARY COOLING HEAT EXCHANGER
17	BOILER FEEDWATER PUMPS
18	SANITARY DRAINS STORAGE TANK
19	MAIN CO2 COMPRESSION BUILDING
20	CARBON CAPTURE BUILDING
21	THERMAL RECLAIMER BUILDING
22	CARBON CAPTURE AIR COOLERS
23	CEMS
24	STORMWATER PUMP BUILDING
25	STORM RETENTION POND
26	LV ACC PDC
27	SWITCH YARD
28	240 KV OVERHEAD LINES
29*	HRSG STACK
30	AUXILIARY BOILER
31*	AUXILIARY BOILER STACK
32	MOBILE COMPRESSED CLEANING SKID
33	THERMAL MANAGEMENT BLOWER SKID
34	INST. AIR COMPRESSOR & AIR RECEIVER TANKS
35	LUBE OIL & HYDRAULIC SKID
36	MOBILE LUBE OIL PURIFIER
37	BEARING EXHAUSTER SKID & SEAL OIL STORAGE TANK
38	SEAL OIL SKID



TERMINAL POINTS	
T1	FUEL GAS
T2	RAW WATER FROM CARSON LAKE
T3	PLANT ACCESS ROAD
T4	WELL WATER FROM JUDY CREEK
T5	240kV TRANSMISSION LINES
T6	WASTEWATER (HAUL BY TRUCK)

NOTES

1. SITE PLAN IS CONCEPTUAL IN NATURE. NOT ALL EQUIPMENT IS REPRESENTED OR OF ACTUAL SIZE.
2. ALL EMISSION SOURCES ON THE SITE ARE DENOTED WITH AN ASTERISK (*) AND IN RED FONT.

SYMBOLS

- PROJECT BOUNDARY
- CO2 COMPRESSION AND DEHYDRATION (61.0100)
- CARBON CAPTURE EQUIPMENT (60.1200)
- POWER ISLAND (67.9100)

NOT TO BE USED FOR CONSTRUCTION

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NO	DATE	REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	PDE	APP
				GMT	JEB		
1	08/FEB/23	REVISED PROJECT NAME AND SHIFTED SITE	PDN	JSH		GMT	JEB
0	15/DEC/22	ISSUED FOR PERMITTING	PDN	JSH		GMT	JEB

1:750 — 0 20 40 60 — SCALE IN METERS

BLACK & VEATCH

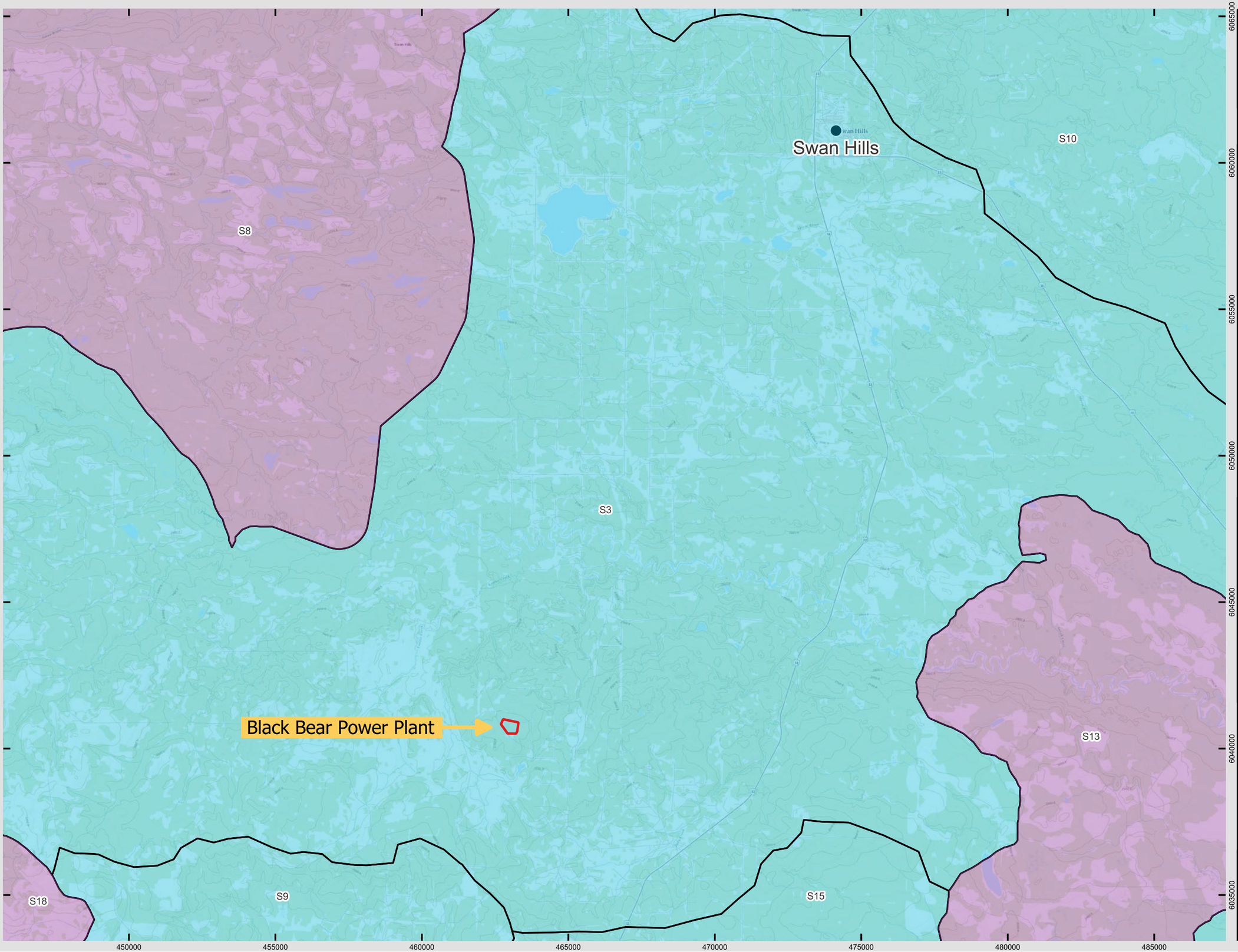
DESIGNER	DRAWN
JSH	PDN
CHECKED	DATE

KIWETINOHK ENERGY CORP
BLACK BEAR COMBINED CYCLE WITH CCS

GENERAL
SITE ARRANGEMENT

PROJECT	DRAWING NUMBER	REV
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AREA		

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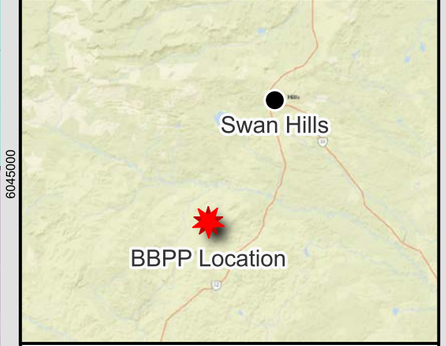
FIGURE 5

Black Bear Power Plant (BBPP)

Grizzly Bear Management Zones

Legend

- Grizzly Bear Watershed Units
- Grizzly Bear Secondary Habitat
- Grizzly Bear Core Habitat
- Project Area



Coordinate System: NAD83 / Alberta 10-TM (Forest)
Projection: Transverse Mercator
Datum: North American 1983
Units: Meter

0 2,500 5,000 m

Scale: 1:120,000 Scale when printed @ 11" x 17"

Drawn By: DG
Reviewed By: RM

2024-05-05

McCallum Environmental Ltd.



Prepared for:

kiwetinohk energy

FIGURE 6

Black Bear Power Plant (BBPP)

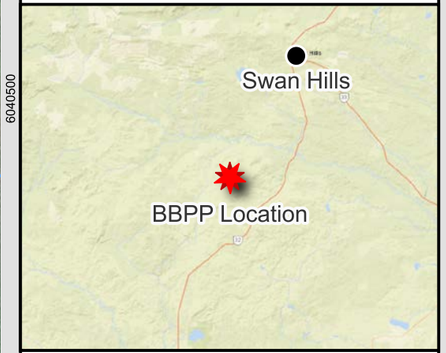
Wetlands and Watercourses

Legend

- Alberta Mapped Watercourses
- Field Delineated Wetland
- Project Area

Alberta Merged Wetland Inventory

- Bog
- Fen
- Marsh
- Open Water
- Swamp



Coordinate System: NAD83 / Alberta 10-TM (Forest)
Projection: Transverse Mercator
Datum: North American 1983
Units: Meter

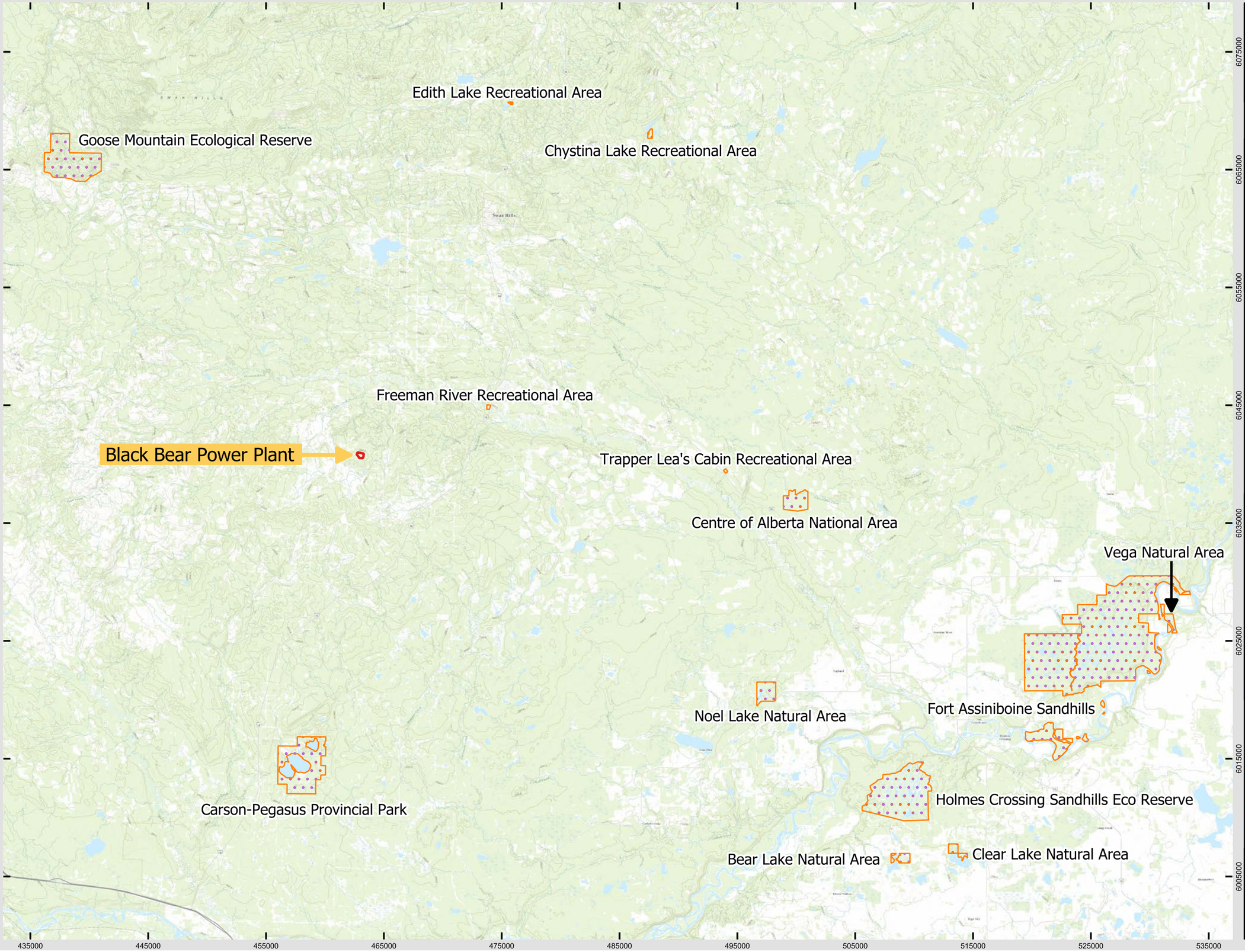
0 250 500 m

Scale: 1:10,000 Scale when printed @ 11" x 17"

Drawn By: DG
Reviewed By: RM

2024-05-05

McCallum Environmental Ltd.



Prepared for:

kiwetinohk energy

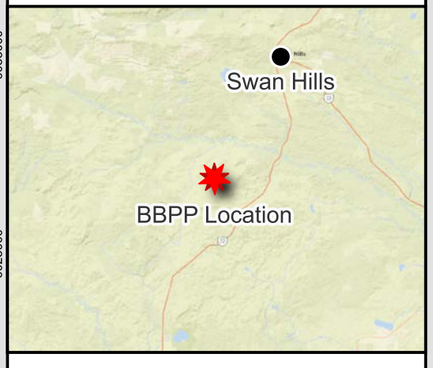
FIGURE 7

Black Bear Power Plant (BBPP)

Parks and Protected Areas

Legend

- Parks and Protected Areas
- Project Area



Coordinate System: NAD83 / Alberta 10-TM (Forest)
Projection: Transverse Mercator
Datum: North American 1983
Units: Meter

0 5,000 10,000 15,000 m

Scale: 1:300,000 Scale when printed @ 11" x 17"

Drawn By: DG
Reviewed By: RM

2024-05-05

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Kapawe'no First Nation No. 150D (Pakashan 150D)
Kapawe'no First Nation No. 150C (Halco 150C)
Kapawe'no First Nation No. 229 (Grouard 229)
Kapawe'no First Nation No. 150B (Freeman 150B)
Kapawe'no First Nation No. 230 (Grouard 230)
Kapawe'no First Nation No. 231 (Grouard 231)
Sucker Creek No. 150A (Sucker Creek First Nation)
Horse Lakes No. 152 B (Horse Lake First Nation)
Drift Pile River No. 150 (Driftpile Cree Nation)
Assineau River No. 150F (Swan River First Nation)
Swan River No. 150E (Swan River First Nation)
Sawridge No. 150G (Sawridge First Nation)
East Priarie Métis Settlement
Sawridge No. 150H (Sawridge First Nation)
Sturgeon Lake No. 154A (Sturgeon Lake Cree Nation)
Sturgeon Lake No. 154 (Sturgeon Lake Cree Nation)
Sturgeon Lake No. 154B (Sturgeon Lake Cree Nation)
Alexander No. 134B (Alexander First Nation)
Alexander No. 134A (Alexander First Nation)
Alexis Whitecourt No. 232 (Alexis Nakota Sioux Nation)
Alexander No. 134 (Alexander First Nation)
Alexis No. 133 (Alexis Nakota Sioux Nation)
Stony Plain 135A (Enoch Cree Nation No. 440)
Wabamun No. 133B (Paul First Nation)
Wabamun No. 133A (Paul First Nation)
Stony Plain 135 (Enoch Cree Nation No. 440)
Alexis Elk River No. 233 (Alexis Nakota Sioux Nation)
Alexis Cardinal No. 234 (Alexis Nakota Sioux Nation)
Buck Lake No. 133C (Paul First Nation)

6155000
6105000
6055000
6005000
5955000
5905000
5855000

205000 255000 305000 355000 405000 455000 505000 555000 605000 655000

Prepared for:

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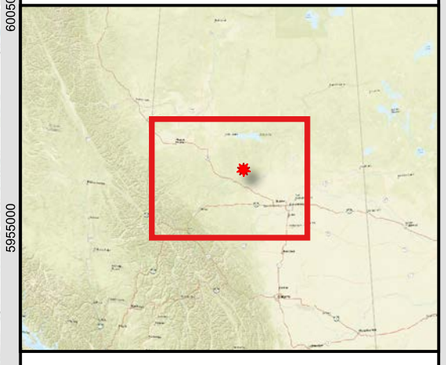
FIGURE 8

Black Bear Power Plant (BBPP)

Indigenous Reserves and Métis Settlements

Legend

- Black Bear Power Plant
- First Nation Reserve
- Métis Settlement



Coordinate System: NAD83 / Alberta 10-TM (Forest)
Projection: Transverse Mercator
Datum: North American 1983
Units: Meter

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Drawn By: DG
Reviewed By: RM
2024-05-05

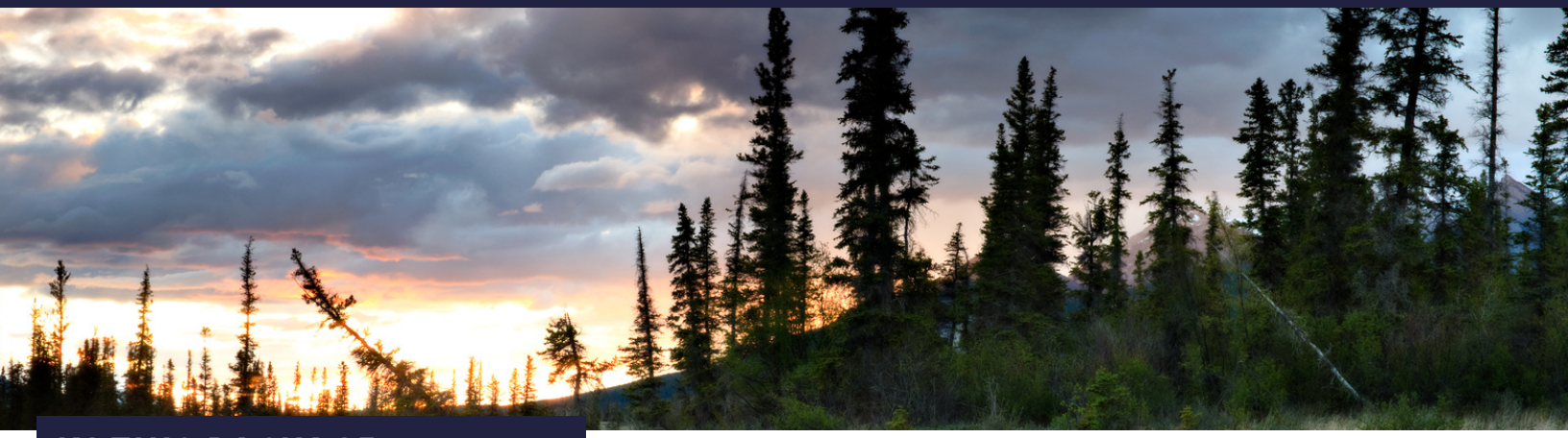
McCallum Environmental Ltd.

Appendix C – Consultation Program

July 2023 | Newsletter #1

BLACK BEAR COMBINED CYCLE POWER PLANT PROJECT

KIWETINOHK ENERGY CORP.



IN THIS PACKAGE:

- Project Introduction
- Who is Kiwetinohk?
- Who is the AUC?
- Project Location
- Privacy Policy
- Project Details
- Project Assessments
- Engagement Process
- Regulatory Process
- Project Benefits
- Preliminary Schedule
- Need for the Project

INSERTS:

- Preliminary Site Layout
- AUC Public Involvement Brochure

PROJECT INTRODUCTION

You are receiving this letter and attached information as a courtesy because you may be interested in the proposed Black Bear Combined Cycle Power Plant Project. Kiwetinohk Energy Corp. (Kiwetinohk) is proposing to construct and operate a 460 megawatt (MW) combined cycle power plant with carbon capture capability and a 240 kV substation known as the Gemini 1008S Substation (the Project) on crown land approximately 24 km south of the Town of Swan Hills, Alberta. The Project will be connected to the Alberta Interconnected Electric System (AIES) via a new transmission line, for which the routing is to be determined. The Project will occupy approximately 52 acres of land and acquisition of a surface lease from Alberta Environment and Protected Areas (AEPA) is underway. The Project will create water while generating electricity.

Major components of the Project include one natural gas fired combustion turbine, one steam turbine, one carbon capture package, one heat recovery steam generator (HRSG), one new 240 kV substation (consisting of one 500 MVA main power transformer) and a control building. The Project may also include one standby diesel generator.

WHO IS KIWETINOHK ENERGY CORP?

Kiwetinohk is an energy transition company targeting the conversion of renewable energy resources, natural gas into zero and low-emissions power and hydrogen creation. Kiwetinohk, pronounced "Key-Wheat-In-Oh", means north in Cree, a widely-spoken indigenous language in Canada. The name, bestowed upon the company by Indigenous friends, reflects the Canadian values of love for and protection of the natural environment and the need for Indigenous and stakeholder engagement in business. For further information see the Kiwetinohk website at: kiwetinohk.com.

kiwetinohk energy

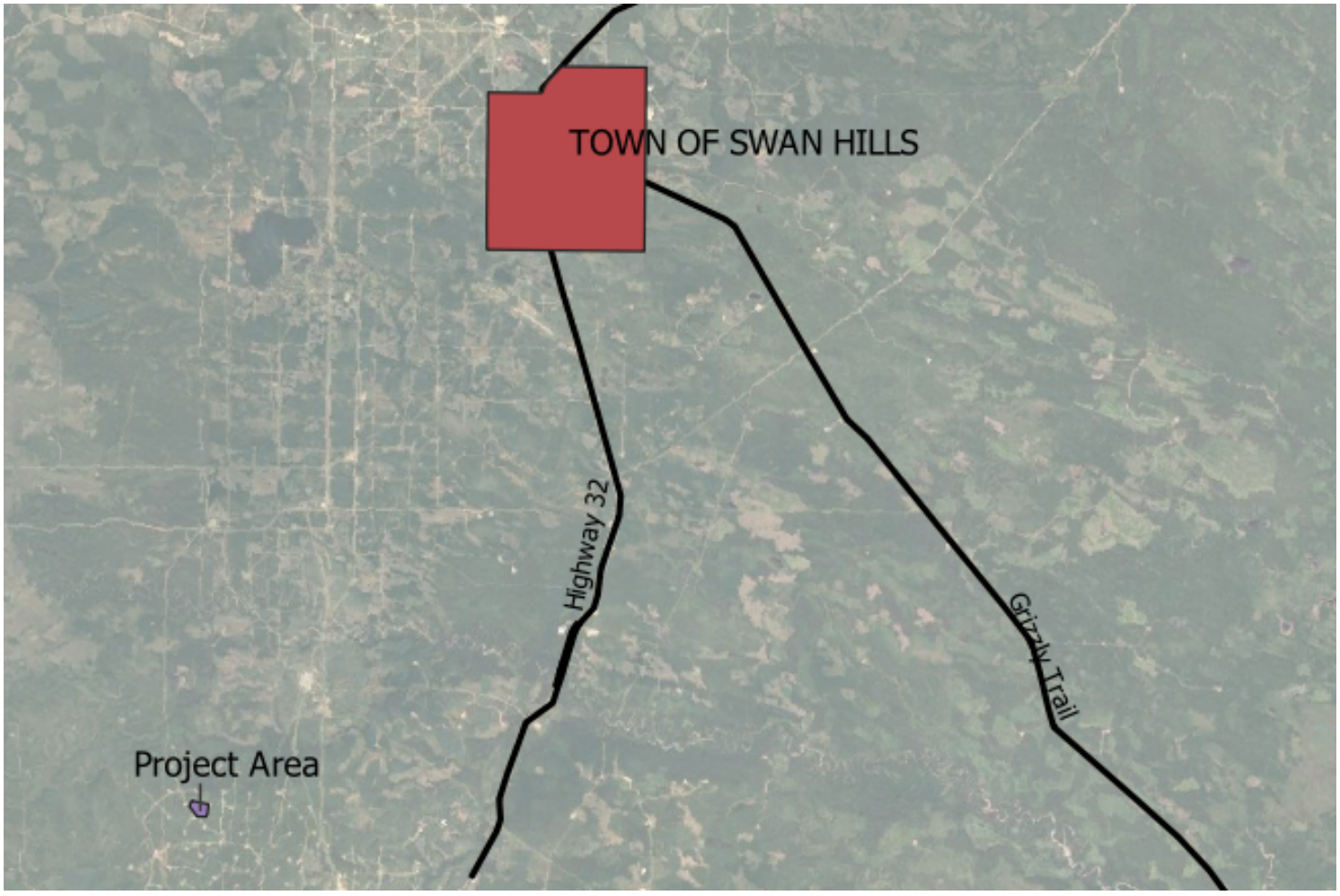
WHO IS THE ALBERTA UTILITIES COMMISSION?

The Alberta Utilities Commission (AUC) is a quasi-judicial independent agency established by the Government of Alberta, responsible to ensure that the delivery of Alberta's utility service takes place in a manner that is fair, responsible and in the public interest. They regulate investor - owned natural gas, electric and water utilities, and certain municipally-owned electric utilities to protect social, economic and environmental interests of Alberta where competitive market forces do not.

To learn more about the AUC application and review process, please contact:
Alberta Utilities Commission (AUC)
Phone: (780) 427-4903
Toll-Free by dialing 310-000 before the number
Email: consumer-relations@auc.ab.ca

PROJECT LOCATION

The Project is located on S 15-64-11 W5M, approximately 24 km south west of the Town of Swan Hills, as shown on the map below.



PRIVACY POLICY

Kiwetinohk is committed to protecting your privacy. Collected personal information will be protected under the provincial Personal Information Protection Act. As part of the regulatory process for new generation projects, Kiwetinohk may be required to provide your personal information to the AUC. For more information about how Kiwetinohk protects your personal information, contact us at lwong@kiwetinohk.com or via mail at 1700, 250 - 2 Street SW, Calgary, AB T2P 0C1, Attention: Privacy Officer.

PROJECT DETAILS

The Project will consist of one natural gas fired combustion turbine, one steam turbine, one carbon capture package, one CO2 compression and dehydration package, one new 240 kV substation (consisting of one 500 MVA main power transformer) and a control building. The Project may also include standby diesel generator (approximately 3 MW). The Project is capable of exporting 460 MW to the Alberta electricity grid.

Additional components (as shown on the enclosed site plan) of the Project include:

- Power island: gas turbine (STG6-9000HL), steam turbine (SST-5000) and heat recovery steam generator (HRSG)
- CO2 capture plant
- Fuel conditioning skid
- Compressor/dehydration package
- Waste water system
- Fire protection/service water systems
- Water treatment facility
- Two auxiliary boilers
- 240kV switchyard and substation
- Switchgear MV and LV
- Air cooled condenser
- Cooling fans system
- Buildings: generation, compressor, administration

PROJECT ASSESSMENTS

Air Emissions

Air emissions modelling has been completed for the Project and a copy of the modelling report will be included in the application to the Alberta Utilities Commission. The Project will meet the Alberta Air Emission Standard for Electricity Generation and Alberta Emission Guidelines for Electricity Generation and the Alberta Ambient Air Quality Objectives and Guidelines, as required.

Noise Impact Assessment

A detailed Noise Impact Assessment (NIA) has been completed to ensure the Project adheres to AUC Rule 012: Noise Control during both the construction and operation phases. A copy of the NIA will be included in the application to the Alberta Utilities Commission.

Environmental Assessments

A variety of wildlife assessments, wetland/watercourse assessments, vegetation and rare plants surveys and soils assessment have been completed as required by Alberta Environment and Protected Areas (AEPA). Environmental assessment information and proposed mitigation measures was submitted to AEPA in May 2023 as part of the Industrial Designation application process. An application will be completed pursuant to the Historical Resources Act and clearance will be obtained prior to construction.

In addition, the Project will include a CO2 capture plant approximately 3 acres (60m x 200m) which is intended to capture 95% of the CO2 from from the HRSG. The estimated captured CO2 amount will be approximately 1.3 Mega tonnes per year and is expected to be compressed, dehydrated, and safely sequestered in a nearby site.

ENGAGEMENT PROCESS

Kiwetinohk is undertaking a Participant Involvement Program (PIP), as part of the Alberta Utilities Commission (AUC) Rule 007 application process. The process is intended to inform and engage landowners, occupants, residents, Indigenous communities, and other potentially impacted stakeholders near the proposed power plant. The PIP includes this mailed notice to Indigenous communities and stakeholders within 2 kilometres of the project and personal communications with interested stakeholders.

Stakeholders with questions or concerns are encouraged to contact us. Please see the enclosed document prepared by the AUC, called “Public Involvement in a Proposed Utility Development”, for further information on the PIP.

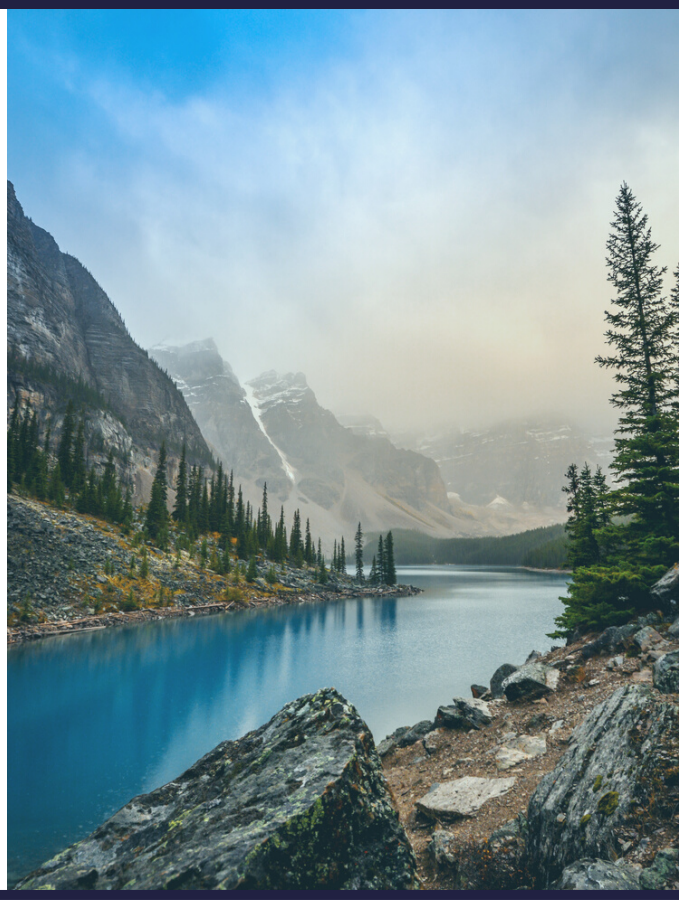
Should you have any questions, please contact us:

Samantha Brown
SABR Energy Consulting Inc.
(587) 434-7547
sbrown@sabrenergyconsulting.com

SABR Energy Consulting Inc.

REGULATORY PROCESS

Kiwetinohk must obtain several approvals for the Project including an industrial designation from AEPA, a power plant and substation approval from the AUC and a development permit or exemption from Big Lakes County. Kiwetinohk submitted the industrial application to AEPA in May 2023, and expects to submit applications to the AUC in Q3 2023 and Big Lakes County in Q1 2024.



PROJECT BENEFITS

The Project will offer a number of benefits including:

- A clean, reliable, cost-effective source of new electricity supply
- The Project will be a net creator of water
- Enhancing local and regional reliability of power supply
- Provide employment opportunities during construction and operating and maintenance jobs during operations
- Generate tax revenue for the municipality
- Highest efficiency and lowest emission gas fired thermal plant in Alberta



PRELIMINARY SCHEDULE

Public Notification	March 2023
Indigenous and Stakeholder Consultation	Ongoing
AEPA Industrial Application	May 2023
AEPA Disposition Application	April 2023
AUC Applications	Q3 2023
Anticipated AUC Approval	Q4 2023
Development Permit Application	Q1 2024
Construction Start	Q4 2025
In-service Date	Q4 2027

NEED FOR THE PROJECT

The Province of Alberta has established a target of at least 30% of the electric energy produced in Alberta, (measured on an annual basis), will be produced from renewable energy resources by the end of 2030. While several renewable energy projects are underway to meet this target, other sources of reliable and clean baseload electricity are needed to support the Province's future energy requirements. Natural gas is one of the most affordable, reliable energy resources and Alberta has an abundance of it. Subject to regulatory approvals, this power plant will be the highest efficiency and lowest emission natural gas-fired power plant in Alberta once built.

VISUAL REPRESENTATION

The image below is of a similar project by Siemens Energy and is similar in size and type as the proposed Black Bear Combined Cycle Power Plant Project.



Source: https://www.siemens-energy.com/global/en/news/magazine/2020/hl-clcassic-duke-energy.html

ITEM NO.	EQUIPMENT NAME
128	MAKEUP AMINE TANK
129	AMINE DRAIN TANK
130	STRIPPER OVERHEAD ACCUMULATOR
131	LEAN FLASH TANK
132	CONDENSATE FLASH TANK
133	HYDROGEN STORAGE TRAILER
134	HRSG DRUM PENTHOUSE
135	FUEL GAS COMPRESSOR BUILDING

ITEM NO.	EQUIPMENT NAME
111	CO2 STRIPPER
112	PRESCRUBBER
113	STRIPPER REBOILER
114	LEAN / RICH EXCHANGER
115	LEAN FLASH COMPRESSOR
116	BOOSTER FAN
117	WASH WATER PUMPS
118	RICH AMINE PUMPS
119	LEAN AMINE PUMP
120	STRIPPER REFLUX PUMPS
121	AMINE FEED PUMPS
122	MAKEUP AMINE PUMP
123	WATER WASH PUMPS
124	LEAN AMINE PRE-FILTER
125	ACTIVATED CARBON FILTER
126	LEAN AMINE POST-FILTER
127	LEAN AMINE TANK

ITEM NO.	EQUIPMENT NAME
94	FOURTH STAGE SUCTION SCRUBBER (TRAIN-2)
95	FIFTH STAGE COOLER (TRAIN-2)
96	FIFTH STAGE DISCHARGE SCRUBBER (TRAIN-2)
97	EIGHTH STAGE COOLER (TRAIN-2)
98	SIXTH STAGE SUCTION SCRUBBER (TRAIN-2)
99*	CO2 DEHYDRATION PACKAGE (TRAIN-2)
100	LOW VOLTAGE MCC BUILDING
101	STILL VENT CONDENSING TANK
102	GLYCOL MAKE-UP TANK
103	240 KV CIRCUIT BREAKER
104	240 KV LINE DISCONNECT
105	240 KV CCVT
106	240 KV SURGE ARRESTOR
107	240 KV H-FRAME
108	BOILER FEEDWATER PUMP BUILDING
109	THERMAL RECLAIMER
110	CO2 ABSORBER

ITEM NO.	EQUIPMENT NAME
77	FOURTH STAGE SUCTION SCRUBBER (TRAIN-1)
78	FIFTH STAGE COOLER (TRAIN-1)
79	FIFTH STAGE DISCHARGE SCRUBBER (TRAIN-1)
80	EIGHTH STAGE COOLER (TRAIN-1)
81	SIXTH STAGE SUCTION SCRUBBER (TRAIN-1)
82*	CO2 DEHYDRATION PACKAGE (TRAIN-1)
83	8 STAGE INTEGRALLY GEARED CENTRIFUGAL COMPRESSOR (TRAIN-2)
84	9.7 MW SYNCHRONOUS ELECTRIC MOTOR (TRAIN-2)
85	SYNCHRONOUS ELECTRIC MOTOR COOLING AIR HANDLER (TRAIN-2)
86	COMPRESSOR LUBE OIL SKID (TRAIN-2)
87	COMPRESSOR LUBE OIL COOLER (TRAIN-2)
88	FIRST STAGE SUCTION SCRUBBER (TRAIN-2)
89	FIRST STAGE COOLER (TRAIN-2)
90	SECOND STAGE SUCTION SCRUBBER (TRAIN-2)
91	SECOND STAGE COOLER (TRAIN-2)
92	THIRD STAGE SUCTION SCRUBBER (TRAIN-2)
93	THIRD STAGE COOLER (TRAIN-2)

ITEM NO.	EQUIPMENT NAME
39	STEAM TURBINE HYDRAULIC SKID
40	H2 GAS DRYER
41	H2 GAS SKID
42	STATOR WATER COOLING SKID
43	GLAND STEAM CONDENSER
44	GENERATOR NEUTRAL GROUNDING CUBICLE
45	FUEL GAS PURGE AIR COMPRESSOR AND TANK
46	FUEL GAS FINAL FILTER & PREHEATER SKID
47	FUEL GAS FINAL FILTER & PREHEATER ENCLOSURE
48	HOT BOX
49	ACC MAIN STEAM DUCT
50	CONDENSATE RECIRC. PUMP
51	LAYDOWN AREA (APPROX 20 ACRES)
52	RAW WATER STORAGE TANK
53	WASTEWATER STORAGE TANK
54	CONDENSATE EXTRACTION PUMPS
55	CONDENSATE COLLECTION TANK
56	STEAM TURBINE DRAINS TANK
57*	EMERGENCY DIESEL GENERATOR
58	OIL WATER SEPARATOR (BELOW GRADE)
59	FUEL GAS YARD
60	GENERATOR BREAKER
61	MV PDC
62*	ABSORBER STACK
63	UTILITY RACK
64	GT/ST/AUXILIARY POWER CONTROL CENTER
65	240KV CONTROL BUILDING
66	8 STAGE INTEGRALLY GEARED CENTRIFUGAL COMPRESSOR (TRAIN-1)
67	9.7 MW SYNCHRONOUS ELECTRIC MOTOR (TRAIN-1)
68	SYNCHRONOUS ELECTRIC MOTOR COOLING AIR HANDLER (TRAIN-1)
69	COMPRESSOR LUBE OIL SKID (TRAIN-1)
70	COMPRESSOR LUBE OIL COOLER (TRAIN-1)
71	FIRST STAGE SUCTION SCRUBBER (TRAIN-1)
72	FIRST STAGE COOLER (TRAIN-1)
73	SECOND STAGE SUCTION SCRUBBER (TRAIN-1)
74	SECOND STAGE COOLER (TRAIN-1)
75	THIRD STAGE SUCTION SCRUBBER (TRAIN-1)
76	THIRD STAGE COOLER (TRAIN-1)

ITEM NO.	EQUIPMENT NAME
1	COMBUSTION TURBINE GENERATOR
2	TURBINE GENERATOR
3	STEAM TURBINE
4	INLET AIR FILTER
5	GENERATION BUILDING
6	AUXILIARY TRANSFORMER
7	GENERATOR STEP-UP TRANSFORMER
8	AIR COOLED CONDENSER
9	LV CCS PDC
10	HEAT RECOVERY STEAM GENERATOR
11	BLOW DOWN TANK
12	FIREWATER / SERVICE WATER STORAGE TANKS
13	DEMINERALIZED WATER TANK
14	ADMIN BUILDING
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19	MAIN CO2 COMPRESSION BUILDING
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21	THERMAL RECLAIMER BUILDING
22	CARBON CAPTURE AIR COOLERS
23	CEMS
24	STORMWATER PUMP BUILDING
25	STORM RETENTION POND
26	LV ACC PDC
27	SWITCH YARD
28	240 KV OVERHEAD LINES
29*	HRSG STACK
30	AUXILIARY BOILER
31*	AUXILIARY BOILER STACK
32	MOBILE COMPRESSED CLEANING SKID
33	THERMAL MANAGEMENT BLOWER SKID
34	INST. AIR COMPRESSOR & AIR RECEIVER TANKS
35	LUBE OIL & HYDRAULIC SKID
36	MOBILE LUBE OIL PURIFIER
37	BEARING EXHAUSTER SKID & SEAL OIL STORAGE TANK
38	SEAL OIL SKID

POWER ISLAND (67.9100)

CARBON CAPTURE EQUIPMENT (60.1200)

CO2 COMPRESSION AND DEHYDRATION (60.0100)

T1

T2
LAT: 54.532535°
LONG: -115.573190°

T3

T4

T5

T6

GRAVEL ROAD

TERMINAL POINTS

T1	FUEL GAS
T2	RAW WATER FROM CARSON LAKE
T3	PLANT ACCESS ROAD
T4	WELL WATER FROM JUDY CREEK
T5	240kV TRANSMISSION LINES
T6	WASTEWATER (HAUL BY TRUCK)

NOTES

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SYMBOLS

PROJECT BOUNDARY

CO2 COMPRESSION AND DEHYDRATION (61.0100)

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NO	DATE	REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	PDE	APP
2	23/FEB/23	UPDATED LEGEND	PDN	JSH		GMT	JEB
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0 20 40 60

SCALE IN METERS

BLACK & VEATCH

DESIGNER JSH | DRAWN PDN | CHECKED | DATE

KIWETINOHK ENERGY CORP
BLACK BEAR COMBINED CYCLE WITH CCS

GENERAL
SITE ARRANGEMENT

PROJECT 412155-00AAA-G1000 | DRAWING NUMBER | REV 2

CODE | AREA

MicroStation v10.11.0.36
Full Size 1:1
01/27/2023 02:54 PM
sant55714
Air

Stakeholder Type	Short Legal	Radius	Consult/Notify	Responsibility	Landowner	Address	City	Province	Postal Code	Contact	Notification Date	Comments
FMA	NW 2-64-11 W5M N 3-64-11 W5M SEC 9-64-11 W5M SEC 10-64-11 W5M SEC 11-64-11 W5M NW 12-64-11 W5M W 13-64-11 W5M SEC 14-64-11 W5M SEC 15-64-11 W5M SEC 16-64-11 W5M SEC 21-64-11 W5M SEC 22-64-11 W5M SEC 23-64-11 W5M	800m	Consult	N/A	BLUE RIDGE LUMBER INC.	PO BOX 87	BLUE RIDGE	Alberta	T0E 0B0		4-Jul-23	Handled in FMA consent process.
TPA	NW 2-64-11 W5M N 3-64-11 W5M SEC 9-64-11 W5M SEC 10-64-11 W5M SEC 11-64-11 W5M NW 12-64-11 W5M W 13-64-11 W5M SEC 14-64-11 W5M SEC 15-64-11 W5M SEC 16-64-11 W5M SEC 21-64-11 W5M SEC 22-64-11 W5M SEC 23-64-11 W5M	800m	Consult	SABR (Kurt)	JAMES D ROBISON	PO BOX 1345	WHITECOUR	Alberta	T7S 1P2		4-Jul-23	Aug 31/23: Called new located number (1-780-778-4948). Let ring over 10 times, no answer. Sept 2/23: Called new located number (1-780-778-4948). Let ring over 10 times, no answer.
Industry	NW 2-64-11 W5M NE 3-64-11 W5M NE 11-64-11 W5M SE 11-64-11 W5M SW 11-64-11 W5M NW 13-64-11 W5M NE 14-64-11 W5M SE 14-64-11 W5M	2000m	Notify	N/A	NOVA GAS TRANSMISSION LTD.	450 1 STREET SW	CALGARY	Alberta	T2P 5H1		4-Jul-23	
Industry	NW 2-64-11 W5M N 3-64-11 W5M NE 9-64-11 W5M NW 9-64-11 W5M SE 9-64-11 W5M SEC 10-64-11 W5M NE 3-64-11 W5M SEC 11-64-11 W5M NW 12-64-11 W5M W 13-64-11 W5M SEC 14-64-11 W5M SEC 15-64-11 W5M NE 16-64-11 W5M SE 16-64-11 W5M NW 22-64-11 W5M SE 22-64-11 W5M SW 22-64-11 W5M SW 23-64-11 W5M	800m	Notify	N/A	ATCO ELECTRIC LTD	LANDS AND PROPERTIES 10035 105 ST NW FLOOR 12 PO BOX 2426 STN MAIN	EDMONTON	Alberta	T5J 2V6		4-Jul-23	TFO connecting the project. No action taken.
Industry	NW 2-64-11 W5M N 3-64-11 W5M NE 9-64-11 W5M NW 9-64-11 W5M SE 9-64-11 W5M SEC 10-64-11 W5M SEC 11-64-11 W5M NE 3-64-11 W5M SEC 11-64-11 W5M NW 12-64-11 W5M W 13-64-11 W5M SEC 14-64-11 W5M SEC 15-64-11 W5M NE 16-64-11 W5M SE 16-64-11 W5M NW 22-64-11 W5M SE 22-64-11 W5M SW 22-64-11 W5M SE 23-64-11 W5M SW 23-64-11 W5M	800m	Consult	SABR (Kurt)	CONIFER ENERGY INC.	700 9 AVENUE SW SUITE 2500	CALGARY	Alberta	T2P 3V4		4-Jul-23	July 19/23: Email from agent to land general email introducing the project. July 28/23: Called main reception to inquire about a contact. Office is closed today, will re-open Moday July 31. Left brief message expalining why I called, but will call back on Monday. Aug 10/23: Email respnse received: Conifer is aware of this project and I have been forwarding on your information as it's provided. I don't know of any questions or concerns from Conifer currently, but I will make a point to check in with the team to see if they have items for discussion and will reach out to you if something comes up.

Stakeholder Type	Short Legal	Radius	Consult/Notify	Responsibility	Landowner	Address	City	Province	Postal Code	Contact	Notification Date	Comments
Industry	NW 2-64-11 W5M NE 3-64-11 W5M NE 3-64-11 W5M NE 11-64-11 W5M SE 11-64-11 W5M SW 11-64-11 W5M NE 14-64-11 W5M SE 14-64-11 W5M	2000m	Notify	N/A	PLAINS MIDSTREAM CANADA ULC	607 8 AVE SW SUITE 1400	CALGARY	Alberta	T2P 0A7		4-Jul-23	
Industry	NE 3-64-11 W5M NE 9-64-11 W5M SE 9-64-11 W5M SE 11-64-11 W5M	2000m	Notify	N/A	ACCEL ENERGY CANADA LIMITED	700 9 AVE SW SUITE 2500	CALGARY	Alberta	T2P 3V4		4-Jul-23	
Industry	SE 11-64-11 W5M	2000m	Notify	N/A	TRIDENT EXPLORATION (ALBERTA) CORP.	111 5 AVE SW SUITE 3100	CALGARY	Alberta	T2P 5L3		4-Jul-23	
Industry	W 13-64-11 W5M	2000m	Notify	N/A	SHIPWRECK OIL & GAS LTD.	PO BOX 417 203 304 MAIN STREET SE SUITE 417	AIRDRIE	Alberta	T4B 3C3		4-Jul-23	
Industry	SW 14-64-11 W5M	800m	Consult	SABR (Kurt)	STRATHCONA RESOURCES LTD.	421 7 AVE SW SUITE 1900	CALGARY	Alberta	T2P 4K9		4-Jul-23	July 19/23: Email from agent to main email address: My name is Kurt Kaminsky, and I am a SR. Land Agent and Community Consultation Agent for SABR Energy. We have a client Kiwtinohk Energy that is proposing to construct and operate a 460-megawatt combined cycle power plant with carbon capture capability and a 240kv substation known as the Gemini 10085 Substation. This project is on Crown Land approximately 24km south of Swan Hills, Alberta. The quarter listed below is one that Strathcona has an interest in. SE 14-64-11 W5M This consultation is part of the AUC process, not the crown land acquisition process and I am just checking to see if you have any questions or concerns. As a stakeholder within 800m of the proposed project you must be included in the consultation process. And be given the opportunity to voice any concerns or have any questions you may have answered. I can be reached anytime, by email, or by the cell phone number below. I look forward to hearing from you soon. July 28/23: Called main reception, wrang 9 times, answering machine comes on saying that that extension cannot be reached at this time. Pressed 0 for assistance and the same thing happened. Will try again Monday. July 28/23: Email to Ambika Sharma: My name is Kurt Kaminsky, and I am contacting you as we have a client that is proposing a Combined Cycle Power Plant Project. I have included the Project Specific Information Package. This project is approximately 24kms from Swan Hills and Strathcona has an interest in Lands within an 800m consultation radius of the proposed project. SW 14-64-11 W5M. My responsibility is to contact any stakeholders and ensure that they have all questions and any possible concerns regarding the project discussed. I was given your contact in the hopes that you could direct me to the proper individual that I would need to discuss with. July 28/23: Response received: Thanks Kurt, our landman Len Moriarity forwarded it onto to the ESG team as they would be interested in this. AUg 10/23: Agent followed up via email.
Agency			Consult	SABR (SB)	Big Lakes County	Box 239, 5305-56 Street	High Prairie	Alberta	T0G 1E0	Pat Olansky Director of Planning & Development, Director of Emergency Management polansky@biglakescounty.ca	4-Jul-23	July 17/23: Email received from Pat: Thank you for the information package on the Black Bear Combined Cycle Power Plant Project. The Planning & Development Department of Big Lakes County will require a development permit application for all components of the project that are not subject to AUC authorization as per Section 619 of the Municipal Government Act. I have attached a development permit application for your convenience. July 17/23: Responded asking Pat for emergency services info. Pat responded: I do not have any questions about the project currently. We are bringing the information forward to our Council at their July 26th meeting so some questions might come out of that meeting. You can send the emergency response plan to myself and Jason Cottingham. I am the Director of Emergency Management for the County and Jason is the Deputy Director of Emergency Management / Fire Chief. July 18/23: Send ERP for review and comment. Sept 4/23: Followed up on ERP and newsletter review.
Agency			Consult	SABR (SB)	Big Lakes County	Box 239, 5305-56 Street	High Prairie	Alberta	T0G 1E0	Amanda Backs Development Officer 780-523-5955 abacks@biglakescounty.ca	4-Jul-23	
Agency			Consult	SABR (SB)	Big Lakes County	Box 239, 5305-56 Street	High Prairie	Alberta	T0G 1E0	Jason Cottingham Deputy Director of Emergency Management / Fire Chief firechief@biglakescounty.ca	4-Jul-23	July 18/23: Sent ERP for review and comment. Sept 4/23: Followed up on ERP review.
Agency			Consult	SABR (SB)	NAV Canada	N/A - Email Only				landuse@navcanada.ca	N/A	Aug 8/23: Submitted Land Use Approval request.
Agency			Consult	SABR (SB)	Transport Canada	N/A - Email Only				aviation.pnraaf-rpnfea@tc.gc.ca	N/A	Aug 8/23: Submitted Aeronautical Assessment Aug 10/23: Email received advising they will not assess more than 18 months prior to construction. Follow up in 2024.

Kiwetinohk Energy Corp.
Suite 1700, 250 – 2 Street S.W.
Calgary, AB T2P 0C1

April 21, 2023

Via Email: ken@afnirc.ca

ALEXANDER FIRST NATION
PO BOX 3480
MORINVILLE, AB T8R 1S3

Dear: KEN S. ARCAND

Re: Kiwetinohk Energy Corp.
Black Bear Power Plant
Land - S 15-064-11 W5M
KEC File: S00229

Kiwetinohk Energy Corp. (**Kiwetinohk**) is writing to provide you with information on our proposed Black Bear Power Plant Project (**Project**). We would like to offer an opportunity for you to ask us any questions you may have or provide any comments in relation to our Project.

The Project is a 460 MW thermal combined cycle power generation facility with the capacity to capture carbon dioxide ($C0_2$). As the Project is over 200 MW, it is a designated project under the federal *Impact Assessment Act* and as such, Kiwetinohk is under a requirement to submit an initial project description to the Impact Assessment Agency of Canada (**Agency**).

The Agency has also recommended that we reach out to your community to see if there is interest in participating in the federal impact assessment process in relation to the Project. As part of our commitment to the principles of reconciliation, we believe that engaging in meaningful dialogue with Indigenous communities is a vital step towards building a positive and collaborative relationship with communities potentially impacted by the Project.

The purpose of this letter is to provide an opportunity for you to learn more about the Project, ask questions, and provide feedback that will be taken into consideration in the project planning process. We believe that your input will be valuable in helping us to ensure that the Project is developed in a way that is respectful of Indigenous rights and interests, cultural values and environmental concerns.

The Project will be located on Alberta Crown lands (Departmental Miscellaneous Leases consisting of 20.651 HA / 51.03 Acres) and includes the power plant as well as a small storage site, located in the northwest corner of the Project. The storage site will be used to store conserved topsoil and other materials during the life span of the project. We have attached copies of the survey plans for your reference.

The power produced by the Project will produce into the Alberta Interconnected Electric System (**AIES**), more commonly referred to as the "power grid". Construction of the Project is planned to begin in the spring of 2025 and will take approximately 3 years to complete, with an anticipated life cycle of 30 years.

The Project is being designed to include carbon capture capability with the intent of capturing 95% of its emissions and sequestering them underground. Kiwetinohk is evaluating carbon dioxide sequestration options, including a hub in the area.

We are working on a Project newsletter further detailing the scope of the Project and proposed activity and will send it to you when available.

Kiwetinohk would like to meet with you to discuss this Project, your questions and concerns, and potential opportunities for your community. If you would like to meet, please contact Barb Freeborn at bfreeborn@kiwetinohk.com to arrange a time to meet.

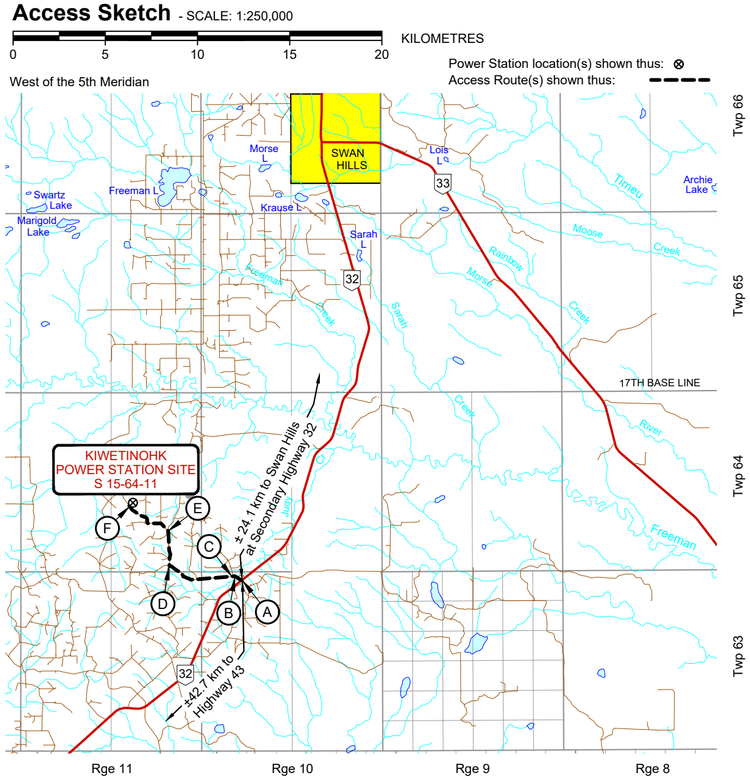
Sincerely,
KIWETINOHK ENERGY CORP.

<original signed by>

Sue Kuethe
Executive Vice President – Land and Community Inclusion



Access Sketch - SCALE: 1:250,000



Access Route Information			
Length (km)		Road/Disposition	Owner
A - B	0.5	LOC 840703	CONIFER ENERGY INC.
B - C	0.2	ROE 6190	CONIFER ENERGY INC.
C - D	3.7	ROE 6400	CONIFER ENERGY INC.
D - E	1.9	ROE 6721	CONIFER ENERGY INC.
E - F	2.8	ROE 6812	CONIFER ENERGY INC.

PREPARED FOR:

kiwetinohk energy

CONSULTATION MAP

FOR

PROPOSED POWER STATION SITE (ELECTRICAL)

WITHIN THE

SW 1/4 SEC. 15, TWP. 64, RGE. 11, W5M.

AND WITHIN THEORETICAL

SE 1/4 SEC. 15, TWP. 64, RGE. 11, W5M.

BIG LAKES COUNTY

LEGEND & NOTES

Proposed Power Station Site:

30 m Buffer:

Index contours (50.0m):

Intermediate contours (10.0m):

Map Datum: UTM, NAD83, Zone 11
Distances are ground and in metres and decimals thereof.
Public Land Standing search date: March 7, 2023

Total Area of Proposed Power Station Site = 18.540 ha.

AREAS REQUIRED

ACTIVITY	HECTARES	ACRES
POWER STATION SITE	18.540	45.81
TOTAL	**18.540**	**45.81**

N

SCALE: 1:5000

0 50 100 150 200 250

METRES

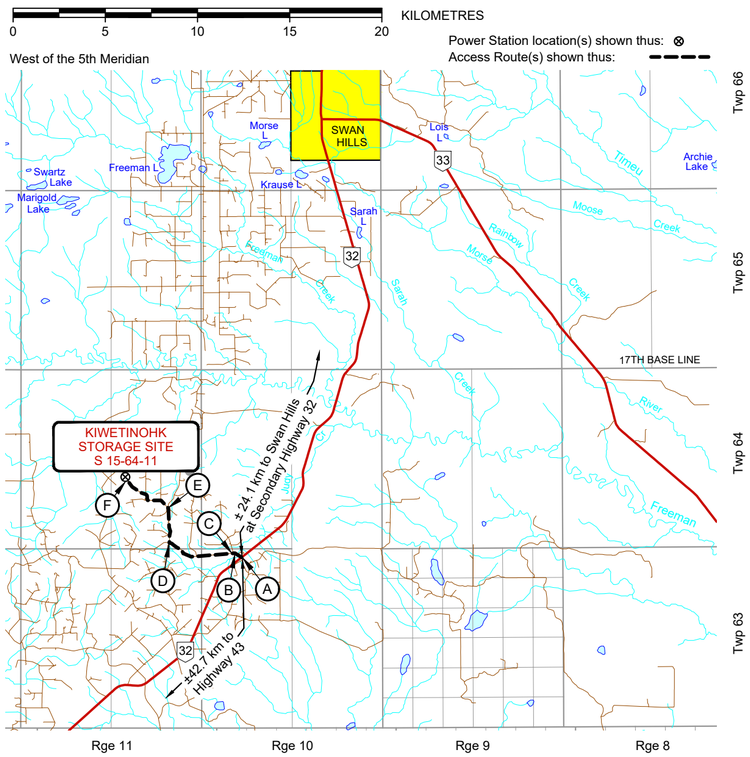
Rev	Date	Description	pc	dwn	chk
00	Aug. 4/22	Original Issue	-	jw	ma
01	Mar 9/23	Revise Site Boundary	-	lfl	ma
02	-	-	-	-	-

Bearisto & Associates
ENGINEERING & SURVEY
10940 - 92 Avenue, Grande Prairie, AB T8V 6B5
P: 1 855 879 5973 **W:** www.baseng.ca

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E - F	3.0	ROE 6812	CONIFER ENERGY INC.

PREPARED FOR:

kiwetinohk energy

CONSULTATION MAP

FOR

PROPOSED STORAGE SITE (STOCKPILE)

WITHIN THE

SW 1/4 SEC. 15, TWP. 64, RGE. 11, W5M.

AND WITHIN THEORETICAL

SE 1/4 SEC. 15, TWP. 64, RGE. 11, W5M.

BIG LAKES COUNTY

LEGEND & NOTES

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Intermediate contours (10.0m):

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Distances are ground and in metres and decimals thereof.
Public Land Standing search date: March 7, 2023

Total Area of Proposed Power Station Site = 2.111 ha.

AREAS REQUIRED

ACTIVITY	HECTARES	ACRES
STORAGE SITE	2.111	5.22
TOTAL	**2.111**	**5.22**

N

SCALE: 1:5000

0 50 100 150 200 250

METRES

Rev	Date	Description	pc	dwn	chk
00	Mar 9/23	Original Issue	-	lfl	ma
01	-	-	-	-	-
02	-	-	-	-	-

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Kiwetinohk Energy Corp.
Suite 1700, 250 – 2 Street S.W.
Calgary, AB T2P 0C1

April 21, 2023

Via Email: consultation@ansn.ca

ALEXIS NAKOTA SIOUX NATION
BOX 337
GLENEVIS AB T0E 0X0

Dear: DUANE KOOTENAY

Re: Kiwetinohk Energy Corp.
Black Bear Power Plant
Land - S 15-064-11 W5M
KEC File: S00229

Kiwetinohk Energy Corp. (**Kiwetinohk**) is writing to provide you with information on our proposed Black Bear Power Plant Project (**Project**). We would like to offer an opportunity for you to ask us any questions you may have or provide any comments in relation to our Project.

The Project is a 460 MW thermal combined cycle power generation facility with the capacity to capture carbon dioxide ($C0_2$). As the Project is over 200 MW, it is a designated project under the federal *Impact Assessment Act* and as such, Kiwetinohk is under a requirement to submit an initial project description to the Impact Assessment Agency of Canada (**Agency**).

The Agency has also recommended that we reach out to your community to see if there is interest in participating in the federal impact assessment process in relation to the Project. As part of our commitment to the principles of reconciliation, we believe that engaging in meaningful dialogue with Indigenous communities is a vital step towards building a positive and collaborative relationship with communities potentially impacted by the Project.

The purpose of this letter is to provide an opportunity for you to learn more about the Project, ask questions, and provide feedback that will be taken into consideration in the project planning process. We believe that your input will be valuable in helping us to ensure that the Project is developed in a way that is respectful of Indigenous rights and interests, cultural values and environmental concerns.

The Project will be located on Alberta Crown lands (Departmental Miscellaneous Leases consisting of 20.651 HA / 51.03 Acres) and includes the power plant as well as a small storage site, located in the northwest corner of the Project. The storage site will be used to store conserved topsoil and other materials during the life span of the project. We have attached copies of the survey plans for your reference.

The power produced by the Project will produce into the Alberta Interconnected Electric System (**AIES**), more commonly referred to as the “power grid”. Construction of the Project is planned to begin in the spring of 2025 and will take approximately 3 years to complete, with an anticipated life cycle of 30 years.

The Project is being designed to include carbon capture capability with the intent of capturing 95% of its emissions and sequestering them underground. Kiwetinohk is evaluating carbon dioxide sequestration options, including a hub in the area.

We are working on a Project newsletter further detailing the scope of the Project and proposed activity and will send it to you when available.

Kiwetinohk would like to meet with you to discuss this Project, your questions and concerns, and potential opportunities for your community. If you would like to meet, please contact Barb Freeborn at bfreeborn@kiwetinohk.com to arrange a time to meet.

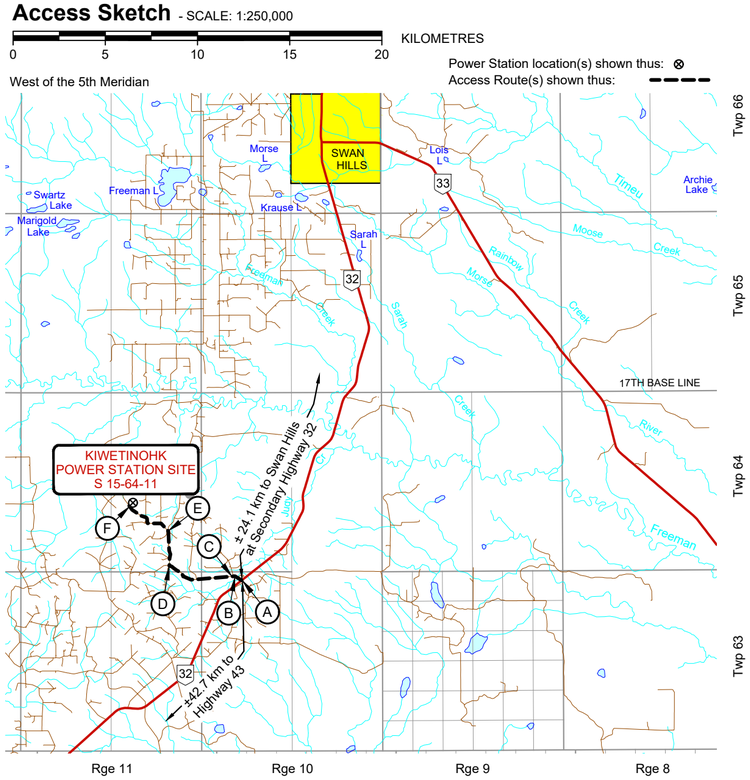
Sincerely,
KIWETINOHK ENERGY CORP.

<original signed by>

Sue Kuethe
Executive Vice President – Land and Community Inclusion



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PREPARED FOR:

kiwetinohk energy

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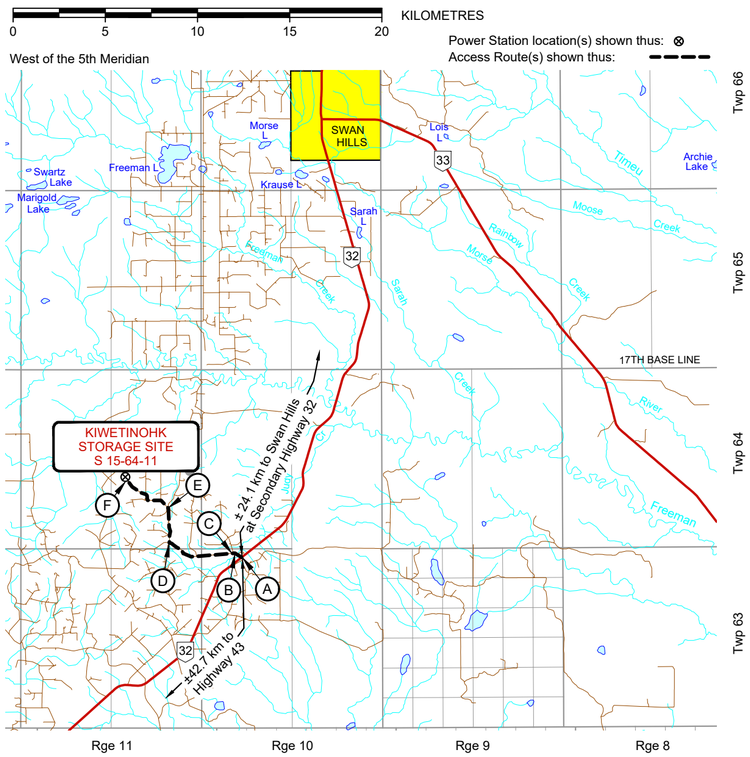
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PREPARED FOR:

kiwetinohk energy

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BIG LAKES COUNTY

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Kiwetinohk Energy Corp.
Suite 1700, 250 – 2 Street S.W.
Calgary, AB T2P 0C1

April 21, 2023

Via Email: consultation@dpcn.ca
Cc Email: cons.monitor@dpcn.ca

DRIFTPILE CREE NATION
PO BOX 30
DRITFPILE, AB T0G 0V0

Dear: KARL ROBIN GIROUX

Re: Kiwetinohk Energy Corp.
Black Bear Power Plant
Land - S 15-064-11 W5M
KEC File: S00229

Kiwetinohk Energy Corp. (**Kiwetinohk**) is writing to provide you with further information on our proposed Black Bear Power Plant Project (**Project**). We would like to offer an opportunity for you to ask us any questions you may have or provide any comments in relation to our Project. As you may be aware, we previously reached out to your First Nation under the direction of the Alberta Aboriginal Consultation Office (FNC#202204642 and FNC#202300387) to consult on the Project.

The Project is a 460 MW thermal combined cycle power generation facility with the capacity to capture carbon dioxide (CO_2). As the Project is over 200 MW, it is a designated project under the federal *Impact Assessment Act* and as such, Kiwetinohk is under a requirement to submit an initial project description to the Impact Assessment Agency of Canada (**Agency**).

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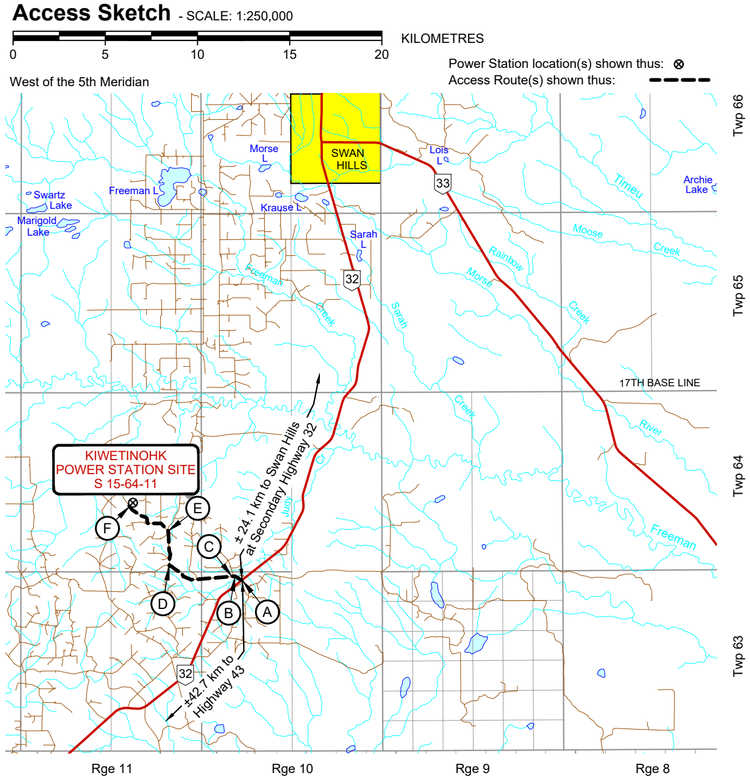
Sincerely,
KIWETINOHK ENERGY CORP.

<original signed by>

Sue Kuethe
Executive Vice President – Land and Community Inclusion



Access Sketch - SCALE: 1:250,000



Access Route Information			
Length (km)		Road/Disposition	Owner
A - B	0.5	LOC 840703	CONIFER ENERGY INC.
B - C	0.2	ROE 6190	CONIFER ENERGY INC.
C - D	3.7	ROE 6400	CONIFER ENERGY INC.
D - E	1.9	ROE 6721	CONIFER ENERGY INC.
E - F	2.8	ROE 6812	CONIFER ENERGY INC.

PREPARED FOR:

kiwetinohk energy

CONSULTATION MAP

FOR

PROPOSED POWER STATION SITE (ELECTRICAL)

WITHIN THE

SW 1/4 SEC. 15, TWP. 64, RGE. 11, W5M.

AND WITHIN THEORETICAL

SE 1/4 SEC. 15, TWP. 64, RGE. 11, W5M.

BIG LAKES COUNTY

LEGEND & NOTES

Proposed Power Station Site:

30 m Buffer:

Index contours (50.0m):

Intermediate contours (10.0m):

Map Datum: UTM, NAD83, Zone 11
Distances are ground and in metres and decimals thereof.
Public Land Standing search date: March 7, 2023

Total Area of Proposed Power Station Site = 18.540 ha.

AREAS REQUIRED

ACTIVITY	HECTARES	ACRES
POWER STATION SITE	18.540	45.81
TOTAL	**18.540**	**45.81**

N

SCALE: 1:5000

0 50 100 150 200 250

METRES

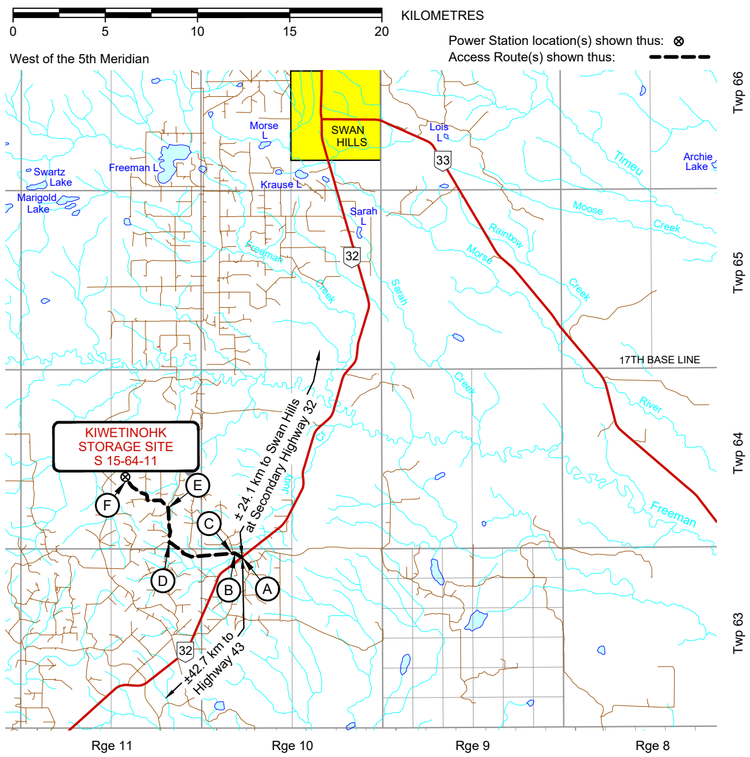
Rev	Date	Description	pc	dwn	chk
00	Aug. 4/22	Original Issue	-	jw	ma
01	Mar 9/23	Revise Site Boundary	-	lfl	ma
02	-	-	-	-	-

Bearisto & Associates
ENGINEERING & SURVEY
10940 - 92 Avenue, Grande Prairie, AB T8V 6B5
P: 1 855 879 5973 **W:** www.baseng.ca

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PREPARED FOR:

kiwetinohk energy

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BIG LAKES COUNTY

LEGEND & NOTES

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Public Land Standing search date: March 7, 2023

Total Area of Proposed Power Station Site = 2.111 ha.

AREAS REQUIRED

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TOTAL	**2.111**	**5.22**

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SCALE: 1:5000

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FNC

FNC202204642

First Nation or Metis Settlement* Consulted

Driftpile Cree Nation

Level of Consultation

Level 2: Standard

Company Proponent Name

Kiwetinohk Energy Corp.

Project/Activity Name/ID

Kiwetinohk - DML

Comments (Max. 250 characters)

For Files Requiring Bi-monthly Reviews

Date range for new entries:

From To

Final ROC Log: ☐ Yes ☐ No

Add/ Delete Row	No.	Date	First Nation or Metis Settlement* representative(s), and proponent representative(s)	Method of Contact	Documentation Provided	Purpose and details of contact	Issue(s) or concern(s) expressed	Proponent's mitigation measures
+ -	1	Sep 7, 2022	Karl Robin Giroux, Victor Prinz	Email	Yes	Jamie Lacey emailed DPCN to provide Information Package to initiate consultation.	N/A	N/A
+ -	2	Sep 7, 2022	Victor Prinz	Email	Yes	Jamie Lacey received email from DPCN requesting field assessment. Inquiring if representative required to accommodate.	N/A	N/A
+ -	3	Sep 7, 2022	Victor Prinz	Email	Yes	Jamie Lacey emailed DPCN requesting costs associated to complete field assessment, client approval required.	N/A	N/A
+ -	4	Sep 7, 2022	Victor Prinz	Email	Yes	Jamie Lacey received email from DPCN, costs provided.	N/A	N/A
+ -	5	Sep 7, 2022	Victor Prinz	Email	Yes	Jamie Lacey emailed DPCN, will confirm with client.	N/A	N/A

+ -	6	Sep 7, 2022	Victor Prinz	Email	Yes	Jamie Lacey received email from DPCN, thank you.	N/A	N/A
+ -	7	Sep 12, 202	Victor Prinz	Email	Yes	Jamie Lacey emailed DPCN, okay with costs, representative to be present, will be in contact to discuss time/place.	N/A	N/A
+ -	8	Sep 12, 202	Victor Prinz	Email	Yes	Jamie Lacey received email from DPCN, scheduled in for September 26th.	N/A	N/A
+ -	9	Sep 12, 202	Victor Prinz	Email	Yes	Jamie Lacey emailed DPCN, representative will be in touch this week.	N/A	N/A
+ -	10	Sep 14, 202	Karl Robin Giroux, Victor Prinz	Email	Yes	Jamie Lacey emailed DPCN, first follow up, also advised pending who is attending field assessment, will advise.	N/A	N/A
+ -	11	Sep 15, 202	Victor Prinz	Email	Yes	Jamie Lacey emailed DPCN to advise agent will be in touch shortly to discuss field assessment.	N/A	N/A
+ -	12	Sep 15, 202	Victor Prinz	Email	Yes	Jamie Lacey received email from DPCN, thank you.	N/A	N/A
+ -	13	Sep 20, 202	Victor Prinz	Phone Ca	No	Mason Muller phoned DPCN, left voice mail message to call back.	N/A	N/A
+ -	14	Sep 21, 202	Karl Robin Giroux, Victor Prinz	Email	Yes	Jamie Lacey emailed DPCN, second follow up, also advised to contact land agent to schedule place/time for field assessment.	N/A	N/A
+ -	15	Sep 22, 202	Victor Prinz	Phone Ca	No	Mason Muller phoned DPCN, left voice mail message to call back.	N/A	N/A
+ -	16	Sep 22, 202	Victor Prinz	Phone Ca	No	Mason Muller received phone call from DPCN, field assessment set for 10am on Monday.	N/A	N/A
+ -	17	Sep 26, 202	Victor Prinz	Site visit	No	Mason Muller completed field assessment with DPCN, no concerns noted.	N/A	N/A
+ -	18	Sep 26, 202	Karl Robin Giroux, Victor Prinz	Email	Yes	Jamie Lacey emailed DPCN with project update letter.	N/A	N/A

+ -	19	Sep 28, 202	Karl Robin Giroux, Victor Prinz	Email	Yes	Jamie Lacey emailed DPCN to advise correction within project update letter.	N/A	N/A
+ -	20	Sep 29, 202	Victor Prinz	Email	Yes	Jamie Lacey emailed DPCN for any concerns brought forward from field assessment.	N/A	N/A
+ -	21	Oct 17, 2022	Victor Prinz	Email	Yes	Jamie Lacey emailed DPCN for any concerns.	N/A	N/A
+ -	22	Oct 21, 2022	Rose Aokimaw	Email	Yes	Mike Christensen received email from DPCN, notes from site assessment.	N/A	N/A
+ -	23	Oct 21, 2022	Rose Aokimaw	Email	Yes	Mike Christensen emailed DPCN, invoice forwarded for processing.	N/A	N/A
+ -	24	Feb 16, 202	Karl Robin Giroux, Victor Prinz	Email	Yes	Jamie Lacey emailed DPCN to provide Record of Consultation Log for review.	N/A	N/A

Please include any additional comments related to consultation as well as any commitments made during the communication, such as a future site visit or a promise to respond to a question.
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Kiwetinohk Energy Corp.
Suite 1700, 250 – 2 Street S.W.
Calgary, AB T2P 0C1

April 21, 2023

Vi Via Email: Kristal@epms.ca
Cc: Jessica@epms.ca

EAST PRAIRIE METIS SETTLEMENT
PO BOX 1289
HIGH PRAIRIE, AB T0G 1E0

Dear: KRISTAL HOWSE

Re: Kiwetinohk Energy Corp.
Black Bear Power Plant
Land - S 15-064-11 W5M
KEC File: S00229

Kiwetinohk Energy Corp. (**Kiwetinohk**) is writing to provide you with further information on our proposed Black Bear Power Plant Project (**Project**). We would like to offer an opportunity for you to ask us any questions you may have or provide any comments in relation to our Project. As you may be aware, we previously reached out to your communities under the direction of the Alberta Aboriginal Consultation Office (FNC#202204642 and FNC#202300387) to consult on the Project.

The Project is a 460 MW thermal combined cycle power generation facility with the capacity to capture carbon dioxide (CO_2). As the Project is over 200 MW, it is a designated project under the federal *Impact Assessment Act* and as such, Kiwetinohk is under a requirement to submit an initial project description to the Impact Assessment Agency of Canada (**Agency**).

The Agency has also recommended that we reach out to your community to see if there is interest in participating in the federal impact assessment process in relation to the Project. As part of our commitment to the principles of reconciliation, we believe that engaging in meaningful dialogue with Indigenous communities is a vital step towards building a positive and collaborative relationship with communities potentially impacted by the Project.

The purpose of this letter is to provide an opportunity for you to learn more about the Project, ask questions, and provide feedback that will be taken into consideration in the project planning process. We believe that your input will be valuable in helping us to ensure that the Project is developed in a way that is respectful of Indigenous rights and interests, cultural values and environmental concerns.

The Project will be located on Alberta Crown lands (Departmental Miscellaneous Leases consisting of 20.651 HA / 51.03 Acres) and includes the power plant as well as a small storage site, located in the northwest corner of the Project. The storage site will be used to store conserved topsoil and other materials during the life span of the project. We have attached copies of the survey plans for your reference.

The power produced by the Project will produce into the Alberta Interconnected Electric System (**AIES**), more commonly referred to as the “power grid”. Construction of the Project is planned to begin in the spring of 2025 and will take approximately 3 years to complete, with an anticipated life cycle of 30 years.

The Project is being designed to include carbon capture capability with the intent of capturing 95% of its emissions and sequestering them underground. Kiwetinohk is evaluating carbon dioxide sequestration options, including a hub in the area.

We are working on a Project newsletter further detailing the scope of the Project and proposed activity and will send it to you when available.

Kiwetinohk would like to meet with you to discuss this Project, your questions and concerns, and potential opportunities for your community. If you would like to meet, please contact Barb Freeborn at bfreeborn@kiwetinohk.com to arrange a time to meet.

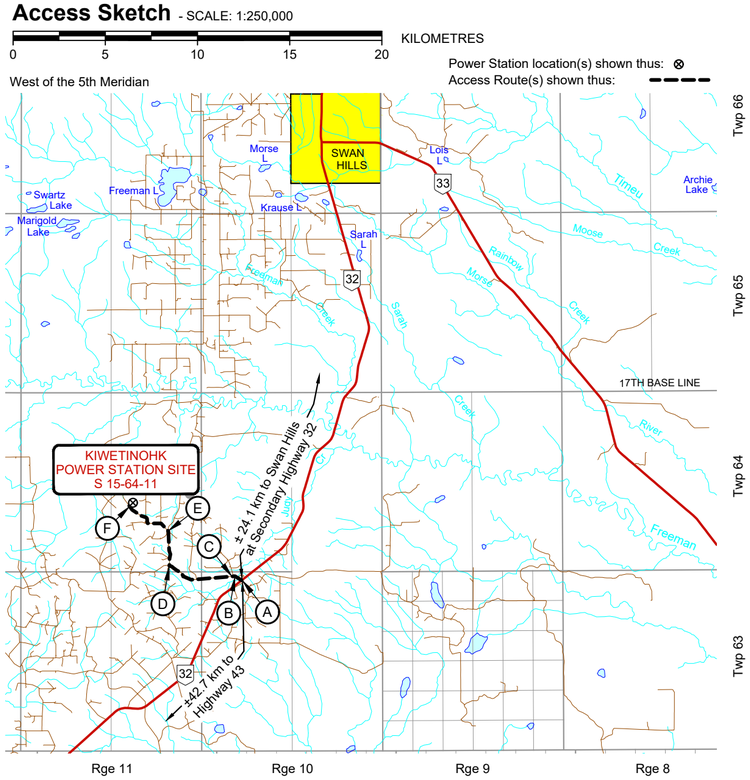
Sincerely,
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Sue Kuethe
Executive Vice President – Land and Community Inclusion



Access Sketch - SCALE: 1:250,000



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PREPARED FOR:

kiwetinohk energy

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FOR

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WITHIN THE

SW 1/4 SEC. 15, TWP. 64, RGE. 11, W5M.

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BIG LAKES COUNTY

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Total Area of Proposed Power Station Site = 18.540 ha.

AREAS REQUIRED

ACTIVITY	HECTARES	ACRES
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TOTAL	**18.540**	**45.81**

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SCALE: 1:5000

0 50 100 150 200 250

METRES

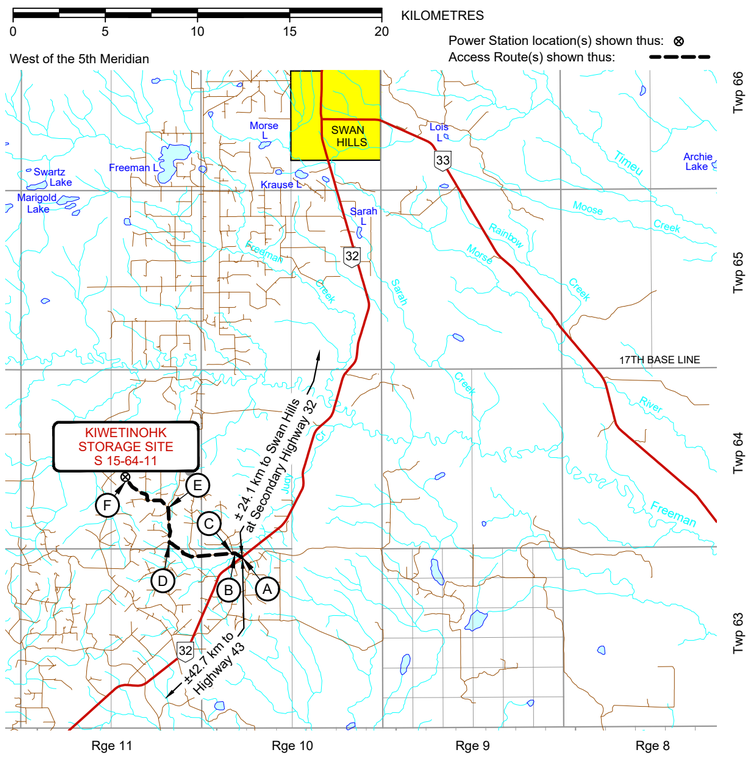
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Bearisto & Associates
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10940 - 92 Avenue, Grande Prairie, AB T8V 6B5
P: 1 855 879 5973 **W:** www.baseng.ca

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PREPARED FOR:

kiwetinohk energy

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FNC

FNC202204642

First Nation or Metis Settlement* Consulted

East Prairie Metis Settlement

Level of Consultation

Level 2: Standard

Company Proponent Name

Kiwetinohk Energy Corp.

Project/Activity Name/ID

Kiwetinohk - DML

Comments (Max. 250 characters)

For Files Requiring Bi-monthly Reviews

Date range for new entries:

From To

Final ROC Log: ☐ Yes ☐ No

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Kiwetinohk Energy Corp.
Suite 1700, 250 – 2 Street S.W.
Calgary, AB T2P 0C1

April 21, 2023

Via Email: stephana.morin@enochnation.ca
Cc: shailley.peacock@enochnation.ca

ENOCH CREE NATION #440
PO BOX 29
ENOCH, AB T7X 3Y3

Dear: STEPHANA MORIN

Re: Kiwetinohk Energy Corp.
Black Bear Power Plant
Land - S 15-064-11 W5M
KEC File: S00229

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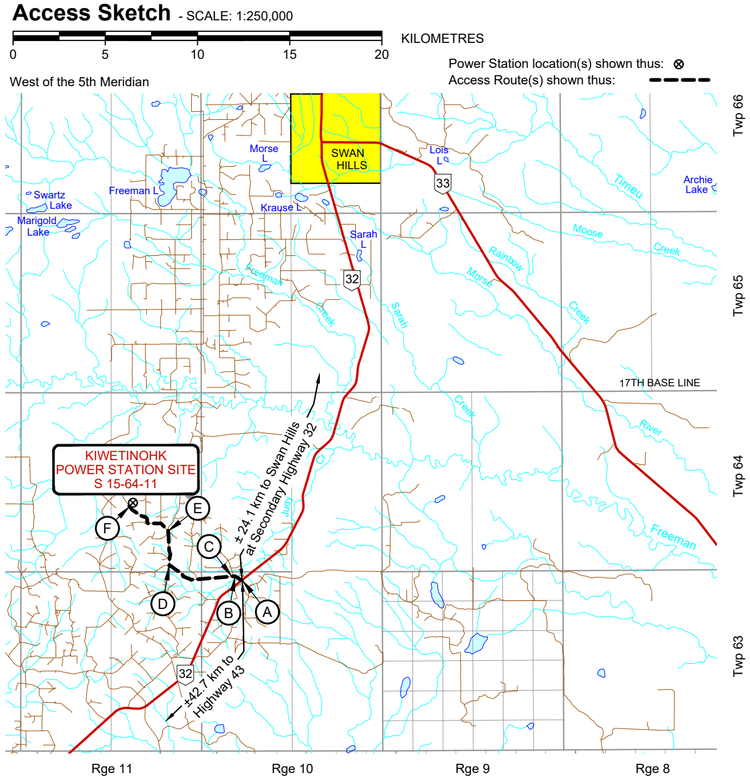
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PREPARED FOR:

kiwetinohk energy

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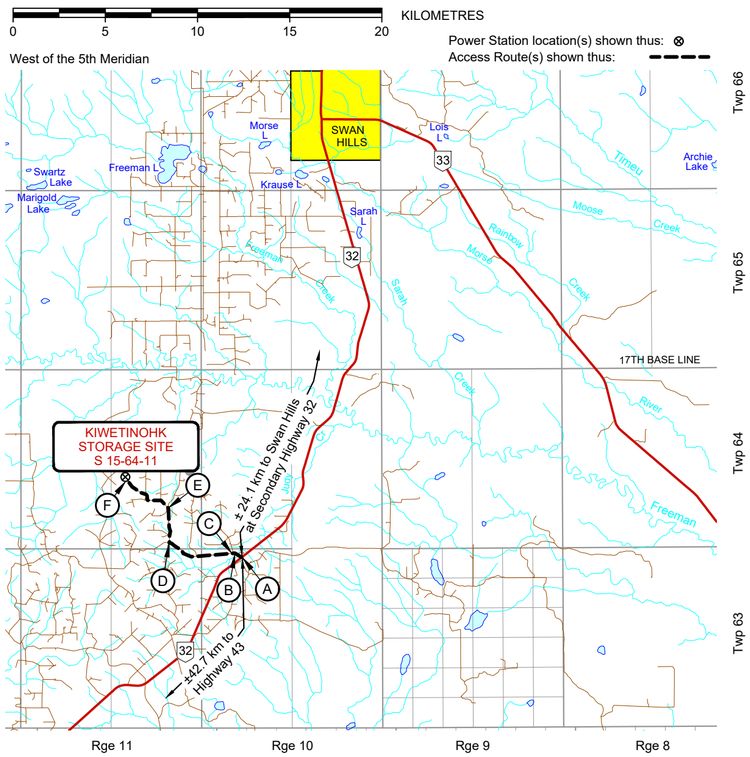
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PREPARED FOR:

kiwetinohk energy

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BIG LAKES COUNTY

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10940 - 92 Avenue, Grande Prairie, AB T8V 6B5
P: 1 855 879 5973 **W:** www.baseng.ca

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Kiwetinohk Energy Corp.
Suite 1700, 250 – 2 Street S.W.
Calgary, AB T2P 0C1

April 21, 2023

Via Email: fos1865@gmail.com
Cc: k_i_kiss@icloud.com

FOOTHILLS OJIBWAY FIRST NATION
51111, HIGHWAY 40
LOTS A, B, C
HINTON, AB T7Y 1X5

Dear: JIM O'CHIESE

Re: Kiwetinohk Energy Corp.
Black Bear Power Plant
Land - S 15-064-11 W5M
KEC File: S00229

Kiwetinohk Energy Corp. (**Kiwetinohk**) is writing to provide you with information on our proposed Black Bear Power Plant Project (**Project**). We would like to offer an opportunity for you to ask us any questions you may have or provide any comments in relation to our Project.

The Project is a 460 MW thermal combined cycle power generation facility with the capacity to capture carbon dioxide ($C0_2$). As the Project is over 200 MW, it is a designated project under the federal *Impact Assessment Act* and as such, Kiwetinohk is under a requirement to submit an initial project description to the Impact Assessment Agency of Canada (**Agency**).

The Agency has also recommended that we reach out to your community to see if there is interest in participating in the federal impact assessment process in relation to the Project. As part of our commitment to the principles of reconciliation, we believe that engaging in meaningful dialogue with Indigenous communities is a vital step towards building a positive and collaborative relationship with communities potentially impacted by the Project.

The purpose of this letter is to provide an opportunity for you to learn more about the Project, ask questions, and provide feedback that will be taken into consideration in the project planning process. We believe that your input will be valuable in helping us to ensure that the Project is developed in a way that is respectful of Indigenous rights and interests, cultural values and environmental concerns.

The Project will be located on Alberta Crown lands (Departmental Miscellaneous Leases consisting of 20.651 HA / 51.03 Acres) and includes the power plant as well as a small storage site, located in the northwest corner of the Project. The storage site will be used to store conserved topsoil and other materials during the life span of the project. We have attached copies of the survey plans for your reference.

The power produced by the Project will produce into the Alberta Interconnected Electric System (**AIES**), more commonly referred to as the "power grid". Construction of the Project is planned to begin in the spring of 2025 and will take approximately 3 years to complete, with an anticipated life cycle of 30 years.

The Project is being designed to include carbon capture capability with the intent of capturing 95% of its emissions and sequestering them underground. Kiwetinohk is evaluating carbon dioxide sequestration options, including a hub in the area.

We are working on a Project newsletter further detailing the scope of the Project and proposed activity and will send it to you when available.

Kiwetinohk would like to meet with you to discuss this Project, your questions and concerns, and potential opportunities for your community. If you would like to meet, please contact Barb Freeborn at bfreeborn@kiwetinohk.com to arrange a time to meet.

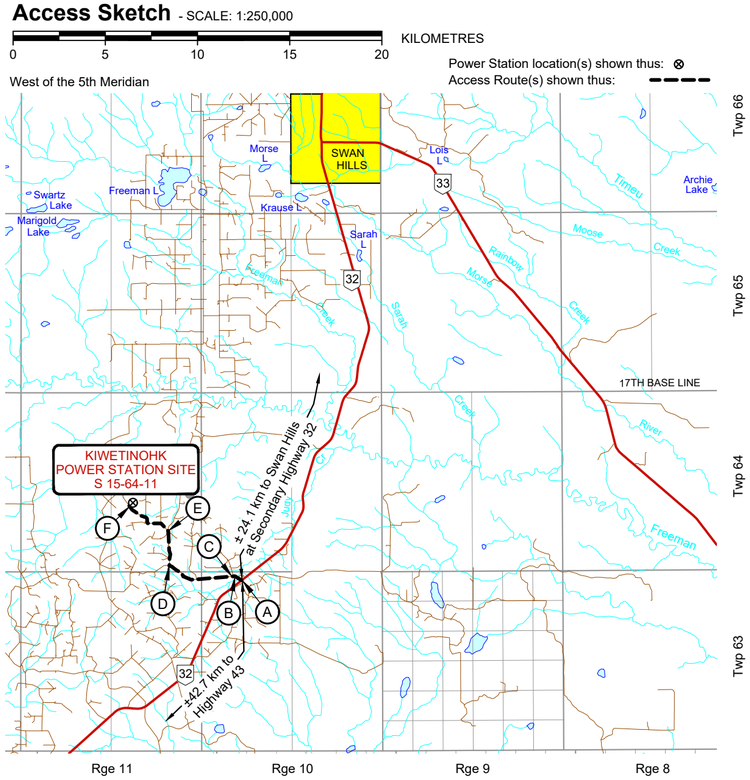
Sincerely,
KIWETINOHK ENERGY CORP.

<original signed by>

Sue Kuethe
Executive Vice President – Land and Community Inclusion



Access Sketch - SCALE: 1:250,000



Access Route Information			
Length (km)		Road/Disposition	Owner
A - B	0.5	LOC 840703	CONIFER ENERGY INC.
B - C	0.2	ROE 6190	CONIFER ENERGY INC.
C - D	3.7	ROE 6400	CONIFER ENERGY INC.
D - E	1.9	ROE 6721	CONIFER ENERGY INC.
E - F	2.8	ROE 6812	CONIFER ENERGY INC.

PREPARED FOR:

kiwetinohk energy

CONSULTATION MAP

FOR

PROPOSED POWER STATION SITE (ELECTRICAL)

WITHIN THE

SW 1/4 SEC. 15, TWP. 64, RGE. 11, W5M.

AND WITHIN THEORETICAL

SE 1/4 SEC. 15, TWP. 64, RGE. 11, W5M.

BIG LAKES COUNTY

LEGEND & NOTES

Proposed Power Station Site:

30 m Buffer:

Index contours (50.0m):

Intermediate contours (10.0m):

Map Datum: UTM, NAD83, Zone 11
Distances are ground and in metres and decimals thereof.
Public Land Standing search date: March 7, 2023

Total Area of Proposed Power Station Site = 18.540 ha.

AREAS REQUIRED

ACTIVITY	HECTARES	ACRES
POWER STATION SITE	18.540	45.81
TOTAL	**18.540**	**45.81**

N

SCALE: 1:5000

0 50 100 150 200 250

METRES

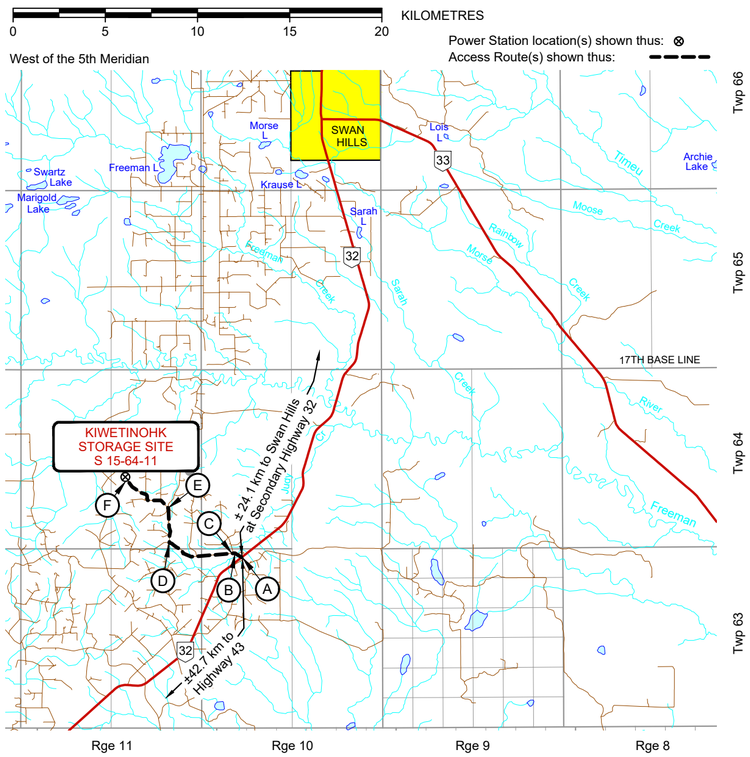
Rev	Date	Description	pc	dwn	chk
00	Aug. 4/22	Original Issue	-	jw	ma
01	Mar 9/23	Revise Site Boundary	-	lfl	ma
02	-	-	-	-	-

Bearisto & Associates
ENGINEERING & SURVEY
10940 - 92 Avenue, Grande Prairie, AB T8V 6B5
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E - F	3.0	ROE 6812	CONIFER ENERGY INC.

PREPARED FOR:

kiwetinohk energy

CONSULTATION MAP

FOR

PROPOSED STORAGE SITE (STOCKPILE)

WITHIN THE

SW 1/4 SEC. 15, TWP. 64, RGE. 11, W5M.

AND WITHIN THEORETICAL

SE 1/4 SEC. 15, TWP. 64, RGE. 11, W5M.

BIG LAKES COUNTY

LEGEND & NOTES

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Intermediate contours (10.0m):

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Distances are ground and in metres and decimals thereof.
Public Land Standing search date: March 7, 2023

Total Area of Proposed Power Station Site = 2.111 ha.

AREAS REQUIRED

ACTIVITY	HECTARES	ACRES
STORAGE SITE	2.111	5.22
TOTAL	**2.111**	**5.22**

N

SCALE: 1:5000

0 50 100 150 200 250

METRES

Rev	Date	Description	pc	dwn	chk
00	Mar 9/23	Original Issue	-	lfl	ma
01	-	-	-	-	-
02	-	-	-	-	-

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Kiwetinohk Energy Corp.
Suite 1700, 250 – 2 Street S.W.
Calgary, AB T2P 0C1

April 21, 2023

Via Email: consultation@hlfnirc.ca
Cc Email: Farrah_Grey@hotmail.com, Casey.Horseman@hotmail.com

HORSE LAKE FIRST NATION
PO BOX 18
HYTHE, AB T0H 2C0

Dear: ERIN PETERS

Re: Kiwetinohk Energy Corp.
Black Bear Power Plant
Land - S 15-064-11 W5M
KEC File: S00229

Kiwetinohk Energy Corp. (**Kiwetinohk**) is writing to provide you with information on our proposed Black Bear Power Plant Project (**Project**). We would like to offer an opportunity for you to ask us any questions you may have or provide any comments in relation to our Project.

The Project is a 460 MW thermal combined cycle power generation facility with the capacity to capture carbon dioxide (CO_2). As the Project is over 200 MW, it is a designated project under the federal *Impact Assessment Act* and as such, Kiwetinohk is under a requirement to submit an initial project description to the Impact Assessment Agency of Canada (**Agency**).

The Agency has also recommended that we reach out to your community to see if there is interest in participating in the federal impact assessment process in relation to the Project. As part of our commitment to the principles of reconciliation, we believe that engaging in meaningful dialogue with Indigenous communities is a vital step towards building a positive and collaborative relationship with communities potentially impacted by the Project.

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We are working on a Project newsletter further detailing the scope of the Project and proposed activity and will send it to you when available.

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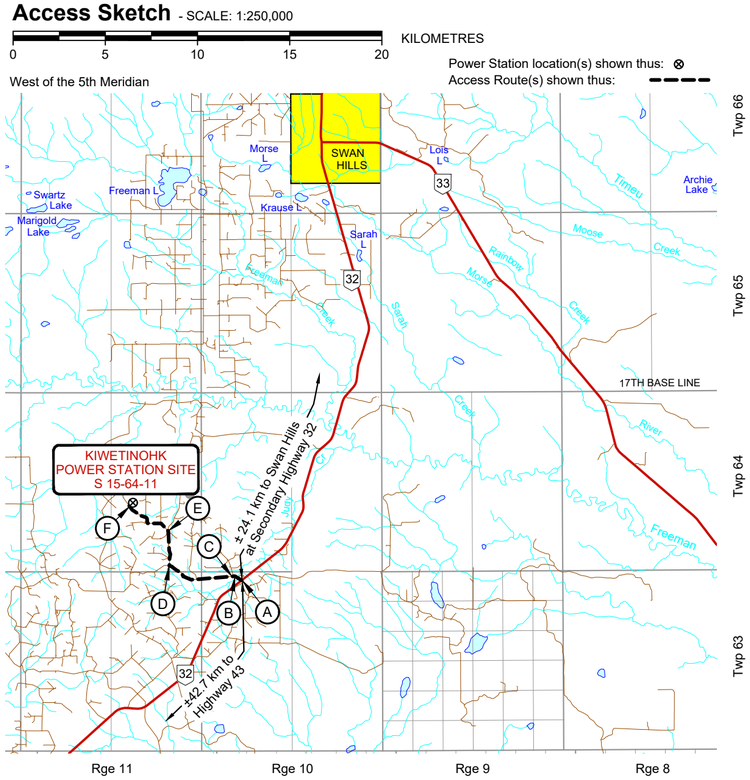
Sincerely,
KIWETINOHK ENERGY CORP.

<original signed by>

Sue Kuethe
Executive Vice President – Land and Community Inclusion



Access Sketch - SCALE: 1:250,000



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Length (km)		Road/Disposition	Owner
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PREPARED FOR:

kiwetinohk energy

CONSULTATION MAP

FOR

PROPOSED POWER STATION SITE (ELECTRICAL)

WITHIN THE

SW 1/4 SEC. 15, TWP. 64, RGE. 11, W5M.

AND WITHIN THEORETICAL

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BIG LAKES COUNTY

LEGEND & NOTES

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TOTAL	**18.540**	**45.81**

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SCALE: 1:5000

0 50 100 150 200 250

METRES

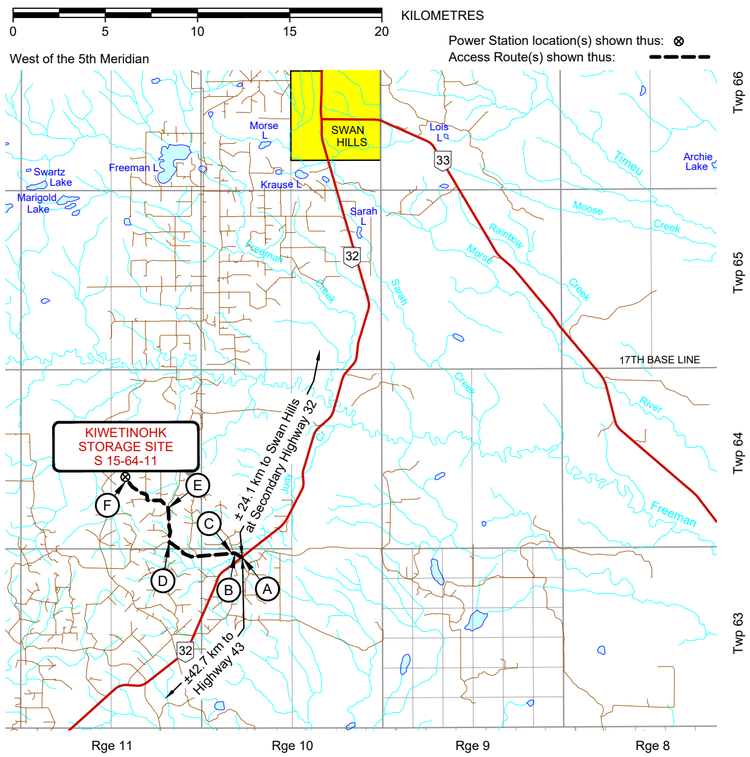
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PREPARED FOR:

kiwetinohk energy

CONSULTATION MAP

FOR

PROPOSED STORAGE SITE (STOCKPILE)

WITHIN THE

SW 1/4 SEC. 15, TWP. 64, RGE. 11, W5M.

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BIG LAKES COUNTY

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0 50 100 150 200 250

METRES

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Kiwetinohk Energy Corp.
Suite 1700, 250 – 2 Street S.W.
Calgary, AB T2P 0C1

April 21, 2023

Via Email: consultation@kapaweno.ca
Cc Email: michelle.knibb@kapaweno.ca

KAPAWE'NO FIRST NATION
PO BOX 10
GROUARD, AB T0G 1C0

Dear: MICHELLE KNIBB

Re: Kiwetinohk Energy Corp.
Black Bear Power Plant
Land - S 15-064-11 W5M
KEC File: S00229

Kiwetinohk Energy Corp. (**Kiwetinohk**) is writing to provide you with further information on our proposed Black Bear Power Plant Project (**Project**). We would like to offer an opportunity for you to ask us any questions you may have or provide any comments in relation to our Project. As you may be aware, we previously reached out to your First Nation under the direction of the Alberta Aboriginal Consultation Office (FNC#202204642 and FNC#202300387) to consult on the Project.

The Project is a 460 MW thermal combined cycle power generation facility with the capacity to capture carbon dioxide ($C0_2$). As the Project is over 200 MW, it is a designated project under the federal *Impact Assessment Act* and as such, Kiwetinohk is under a requirement to submit an initial project description to the Impact Assessment Agency of Canada (**Agency**).

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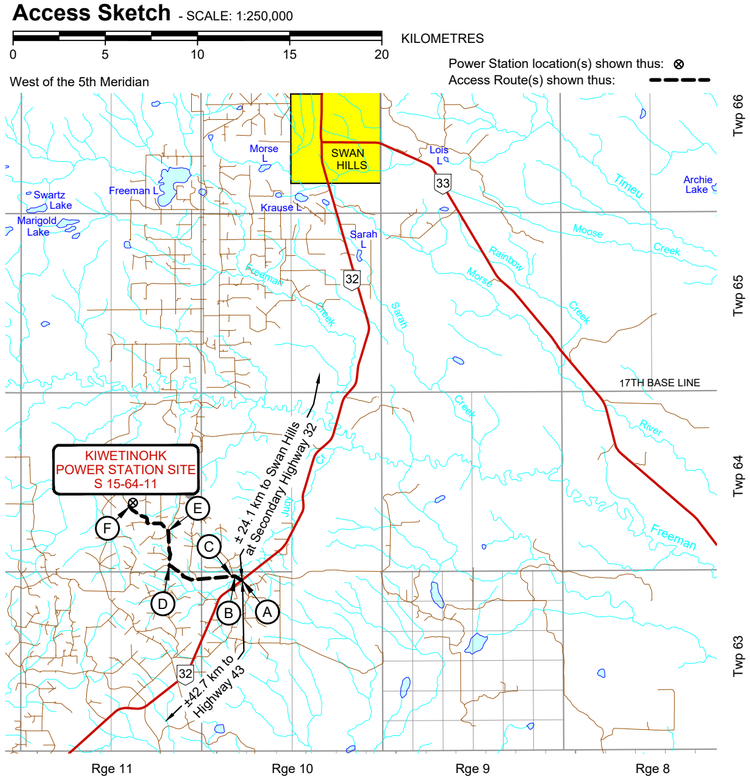
Sincerely,
KIWETINOHK ENERGY CORP.

<original signed by>

Sue Kuethe
Executive Vice President – Land and Community Inclusion



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PREPARED FOR:

kiwetinohk energy

CONSULTATION MAP

FOR

PROPOSED POWER STATION SITE (ELECTRICAL)

WITHIN THE

SW 1/4 SEC. 15, TWP. 64, RGE. 11, W5M.

AND WITHIN THEORETICAL

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BIG LAKES COUNTY

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0 50 100 150 200 250

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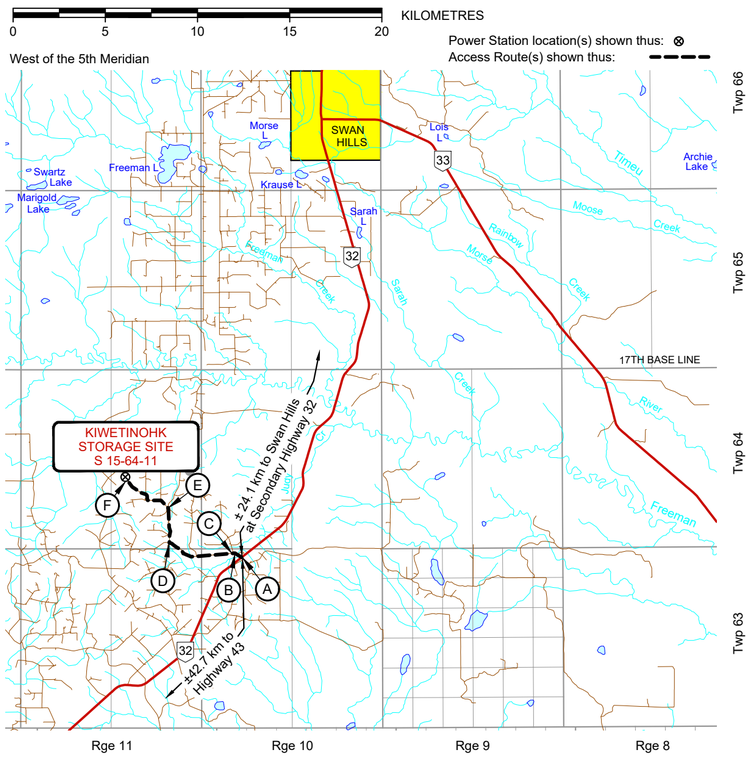
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PREPARED FOR:

kiwetinohk energy

CONSULTATION MAP

FOR

PROPOSED STORAGE SITE (STOCKPILE)

WITHIN THE

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AND WITHIN THEORETICAL

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BIG LAKES COUNTY

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N

SCALE: 1:5000

0 50 100 150 200 250

METRES

Rev	Date	Description	pc	dwn	chk
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02	-	-	-	-	-

Bearisto & Associates
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FNC

FNC202204642

First Nation or Metis Settlement* Consulted

Kapawe'no First Nation

Level of Consultation

Level 2: Standard

Company Proponent Name

Kiwetinohk Energy Corp.

Project/Activity Name/ID

Kiwetinohk - DML

Comments (Max. 250 characters)

For Files Requiring Bi-monthly Reviews

Date range for new entries:

From To

Final ROC Log: ☐ Yes ☐ No

Add/ Delete Row	No.	Date	First Nation or Metis Settlement* representative(s), and proponent representative(s)	Method of Contact	Documentation Provided	Purpose and details of contact	Issue(s) or concern(s) expressed	Proponent's mitigation measures
+ -	1	Sep 7, 2022	Michelle Knibb	Email	Yes	Jamie Lacey emailed KFN to provide Information Package to initiate consultation.	N/A	N/A
+ -	2	Sep 7, 2022	Michelle Knibb	Other	Yes	Jamie Lacey sent Information Package to KFN via express post.	N/A	N/A
+ -	3	Sep 12, 202	Kapawe'no First Nation	Other	Yes	Jamie Lacey received confirmation, Information Package delivered to KFN via express post.	N/A	N/A
+ -	4	Sep 14, 202	Michelle Knibb	Email	Yes	Jamie Lacey emailed KFN, first follow up.	N/A	N/A
+ -	5	Sep 14, 202	Bobbi-Jo Halcrow	Email	Yes	Jamie Lacey received email from KFN advising hard copy package not received.	N/A	N/A

+ -	6	Sep 15, 202	Bobbi-Jo Halcrow	Email	Yes	Jamie Lacey emailed KFN to advise hard copy package was picked up and/or delivered September 12th, will re-send.	N/A	N/A
+ -	7	Sep 15, 202	Michelle Knibb	Other	Yes	Jamie Lacey resent Information Package to KFN via express post.	N/A	N/A
+ -	8	Sep 8, 2022	Bobbi-Jo Halcrow	Email	Yes	Jamie Lacey received email from KFN, thank you for resending the project.	N/A	N/A
+ -	9	Sep 20, 202	Bobbi-Jo Halcrow	Email	Yes	Jamie Lacey emailed KFN to advise Information Package in the mail today.	N/A	N/A
+ -	10	Sep 20, 202	Bobbi-Jo Halcrow	Email	Yes	Jamie Lacey received email from KFN, thank you for the update.	N/A	N/A
+ -	11	Sep 21, 202	Michelle Knibb	Email	Yes	Jamie Lacey emailed KFN, second follow up, also advised meeting taking place Monday September 26th to discuss project.	N/A	N/A
+ -	12	Sep 21, 202	Bobbi-Jo Halcrow	Email	Yes	Jamie Lacey received email from KFN asking status of hard copy package.	N/A	N/A
+ -	13	Sep 21, 202	Bobbi-Jo Halcrow	Email	Yes	Jamie Lacey emailed KFN to advise hard copy package sent yesterday, once delivery notice received, will follow up to ensure delivered.	N/A	N/A
+ -	14	Sep 21, 202	Kapawe'no First Nation	Email	Yes	Nikki Sitch emailed KFN to provide shape files.	N/A	N/A
+ -	15	Sep 22, 202	Kapawe'no First Nation	Other	Yes	Jamie Lacey received confirmation, Information Package delivered to KFN via express post.	N/A	N/A
+ -	16	Sep 23, 202	Bobbi-Jo Halcrow	Email	Yes	Jamie Lacey emailed KFN to confirm hard copy package was delivered.	N/A	N/A
+ -	17	Sep 23, 202	Bobbi-Jo Halcrow	Email	Yes	Jamie Lacey received email from KFN to confirm hard copy package received.	N/A	N/A
+ -	18	Sep 23, 202	Bobbi-Jo Halcrow	Email	Yes	Jamie Lacey emailed KFN, thank you.	N/A	N/A

+ -	19	Sep 23, 202	Bobbi-Jo Halcrow	Email	Yes	Jamie Lacey received email from KFN, you're welcome.	N/A	N/A
+ -	20	Sep 23, 202	Shayla Anderson	Email	Yes	Jamie Lacey received email from KFN with acknowledgment letter & invoice.	N/A	N/A
+ -	21	Sep 23, 202	Shayla Anderson	Email	Yes	Jamie Lacey emailed KFN to advise meeting taking place Monday to discuss project.	N/A	N/A
+ -	22	Sep 26, 202	Michelle Knibb, Shayla Anderson	Meeting	No	Mike Christensen met with KFN to discuss project.	N/A	N/A
+ -	23	Sep 26, 202	Bobbi-Jo Halcrow	Email	Yes	Jamie Lacey received email from KFN advising meeting today is a meet n greet.	N/A	N/A
+ -	24	Sep 26, 202	Bobbi-Jo Halcrow	Email	Yes	Jamie Lacey emailed KFN thanking for the update, if a further meeting is required to advise.	N/A	N/A
+ -	25	Sep 26, 202	Michelle Knibb	Email	Yes	Jamie Lacey emailed KFN with project update letter.	N/A	N/A
+ -	26	Sep 26, 202	Michelle Knibb	Other	Yes	Jamie Lacey sent project update letter to KFN via express post.	N/A	N/A
+ -	27	Sep 26, 202	Bobbi-Jo Halcrow	Email	Yes	Jamie Lacey received email from KFN, thank you for your email.	N/A	N/A
+ -	28	Sep 28, 202	Michelle Knibb	Email	Yes	Jamie Lacey emailed KFN to advise correction within project update letter.	N/A	N/A
+ -	29	Sep 29, 202	Shayla Anderson	Email	Yes	Jamie Lacey received email from KFN with revised invoice.	N/A	N/A
+ -	30	Oct 3, 2022	Internal Correspondence	Email	Yes	Mike Christensen provided notes from meeting including presentation. Including in adequacy correspondence as it outlines notes from September 26th meeting.	N/A	N/A
+ -	31	Oct 3, 2022	Shayla Anderson	Email	Yes	Mike Christensen emailed KFN to advise invoice in process of payment, would like to schedule site visit.	N/A	N/A

+ -	32	Oct 5, 2022	Kapawe'no First Nation	Other	Yes	Jamie Lacey received confirmation, project update letter delivered to KFN via express post.	N/A	N/A
+ -	33	Oct 14, 2022	Bobbi-Jo Halcrow	Email	Yes	Jamie Lacey received email from KFN requesting status on invoice payment.	N/A	N/A
+ -	34	Oct 14, 2022	Bobbi-Jo Halcrow	Email	Yes	Mike Christensen emailed KFN,will look into it and get back to KFN.	N/A	N/A
+ -	35	Oct 14, 2022	Bobbi-Jo Halcrow	Email	Yes	Mike Christensen received email from KFN, great.	N/A	N/A
+ -	36	Jan 11, 2023	Kapawe'no First Nation Representatives	Site visit	No	Site visit completed.	N/A	N/A
+ -	37	Jan 25, 2023	Shayla Anderson	Email	Yes	Mike Christensen emailed KFN to request letters.	N/A	N/A
+ -	38	Jan 30, 2023	Shayla Anderson	Email	Yes	Mike Christensen received email from KFN with letter attached.	Traditional uses noted in the area are hunting, trapping and gathering. Grizzly Bear Zone, increased wind and erosion, loss of vegetation, ecosystem and moose habitat.	N/A
+ -	39	Feb 15, 2023	Shayla Anderson	Email	Yes	Mike Christensen emailed KFN to respond to letter.	N/A	N/A
+ -	40	Feb 16, 2023	Michelle Knibb	Email	Yes	Jamie Lacey emailed KFN to provide Record of Consultation Log for review.	N/A	N/A
+ -	41	Mar 3, 2023	Shayla Anderson, Michelle Knibb	Email	Yes	Jamie Lacey emailed KFN to provide sketch of area being omitted on updated plans, KFN to advise if this is the area of concern, KFN will be notified prior to construction to allow for harvesting.	N/A	Notification prior to construction to allow for harvesting.
+ -	42	Mar 7, 2023	Shayla Anderson	Email	Yes	Jamie Lacey received email from KFN to advise area of concern was area circled in red.	N/A	N/A
+ -	43	Mar 7, 2023	Shayla Anderson	Email	Yes	Jamie Lacey emailed KFN, will update & provide updated log.	N/A	N/A
+ -	44	Mar 16, 2023	Michelle Knibb	Email	Yes	Jamie Lacey emailed KFN to provide Record of Consultation Log for review.	N/A	N/A

Please include any additional comments related to consultation as well as any commitments made during the communication, such as a future site visit or a promise to respond to a question.
If the method of contact is "other", please also include a description of the method of contact in this column.
*is defined as Metis Settlements as established under the *Metis Settlements Act*. Also includes any organization that the ACO has an established practice of consulting under *The Government of Alberta's Guidelines on Consultation with Metis Settlements on Land and Natural Resource Management, 2016*.

Kiwetinohk Energy Corp.
Suite 1700, 250 – 2 Street S.W.
Calgary, AB T2P 0C1

April 21, 2023

Via Email: ArLHirondelle@metis.org
Cc: MNAR4notifications@metis.org

METIS NATION OF ALBERTA, REGION 4
11724 – 95TH STREET
EDMONTON, AB T5G 1L9

Dear: ALFRED L'HIRONDELLE

Re: Kiwetinohk Energy Corp.
Black Bear Power Plant
Land - S 15-064-11 W5M
KEC File: S00229

Kiwetinohk Energy Corp. (**Kiwetinohk**) is writing to provide you with information on our proposed Black Bear Power Plant Project (**Project**). We would like to offer an opportunity for you to ask us any questions you may have or provide any comments in relation to our Project.

The Project is a 460 MW thermal combined cycle power generation facility with the capacity to capture carbon dioxide (CO_2). As the Project is over 200 MW, it is a designated project under the federal *Impact Assessment Act* and as such, Kiwetinohk is under a requirement to submit an initial project description to the Impact Assessment Agency of Canada (**Agency**).

The Agency has also recommended that we reach out to your community to see if there is interest in participating in the federal impact assessment process in relation to the Project. As part of our commitment to the principles of reconciliation, we believe that engaging in meaningful dialogue with Indigenous communities is a vital step towards building a positive and collaborative relationship with communities potentially impacted by the Project.

The purpose of this letter is to provide an opportunity for you to learn more about the Project, ask questions, and provide feedback that will be taken into consideration in the project planning process. We believe that your input will be valuable in helping us to ensure that the Project is developed in a way that is respectful of Indigenous rights and interests, cultural values and environmental concerns.

The Project will be located on Alberta Crown lands (Departmental Miscellaneous Leases consisting of 20.651 HA / 51.03 Acres) and includes the power plant as well as a small storage site, located in the northwest corner of the Project. The storage site will be used to store conserved topsoil and other materials during the life span of the project. We have attached copies of the survey plans for your reference.

The power produced by the Project will produce into the Alberta Interconnected Electric System (**AIES**), more commonly referred to as the "power grid". Construction of the Project is planned to begin in the spring of 2025 and will take approximately 3 years to complete, with an anticipated life cycle of 30 years.

The Project is being designed to include carbon capture capability with the intent of capturing 95% of its emissions and sequestering them underground. Kiwetinohk is evaluating carbon dioxide sequestration options, including a hub in the area.

We are working on a Project newsletter further detailing the scope of the Project and proposed activity and will send it to you when available.

Kiwetinohk would like to meet with you to discuss this Project, your questions and concerns, and potential opportunities for your community. If you would like to meet, please contact Barb Freeborn at bfreeborn@kiwetinohk.com to arrange a time to meet.

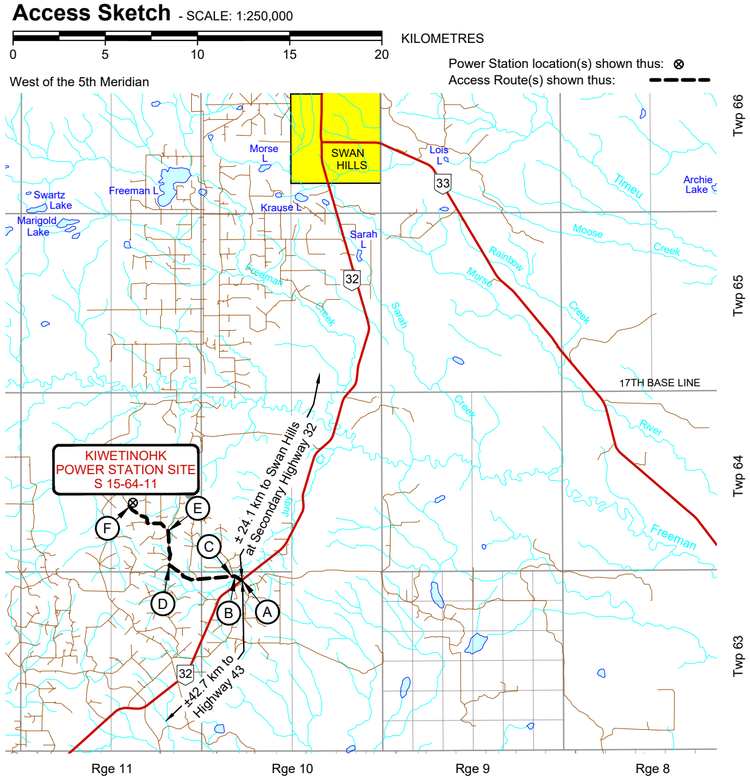
Sincerely,
KIWETINOHK ENERGY CORP.

<original signed by>

Sue Kuethe
Executive Vice President – Land and Community Inclusion



Access Sketch - SCALE: 1:250,000



Access Route Information			
Length (km)		Road/Disposition	Owner
A - B	0.5	LOC 840703	CONIFER ENERGY INC.
B - C	0.2	ROE 6190	CONIFER ENERGY INC.
C - D	3.7	ROE 6400	CONIFER ENERGY INC.
D - E	1.9	ROE 6721	CONIFER ENERGY INC.
E - F	2.8	ROE 6812	CONIFER ENERGY INC.

PREPARED FOR:

kiwetinohk energy

CONSULTATION MAP

FOR

PROPOSED POWER STATION SITE (ELECTRICAL)

WITHIN THE

SW 1/4 SEC. 15, TWP. 64, RGE. 11, W5M.

AND WITHIN THEORETICAL

SE 1/4 SEC. 15, TWP. 64, RGE. 11, W5M.

BIG LAKES COUNTY

LEGEND & NOTES

Proposed Power Station Site:

30 m Buffer:

Index contours (50.0m):

Intermediate contours (10.0m):

Map Datum: UTM, NAD83, Zone 11
Distances are ground and in metres and decimals thereof.
Public Land Standing search date: March 7, 2023

Total Area of Proposed Power Station Site = 18.540 ha.

AREAS REQUIRED

ACTIVITY	HECTARES	ACRES
POWER STATION SITE	18.540	45.81
TOTAL	**18.540**	**45.81**

N

SCALE: 1:5000

0 50 100 150 200 250

METRES

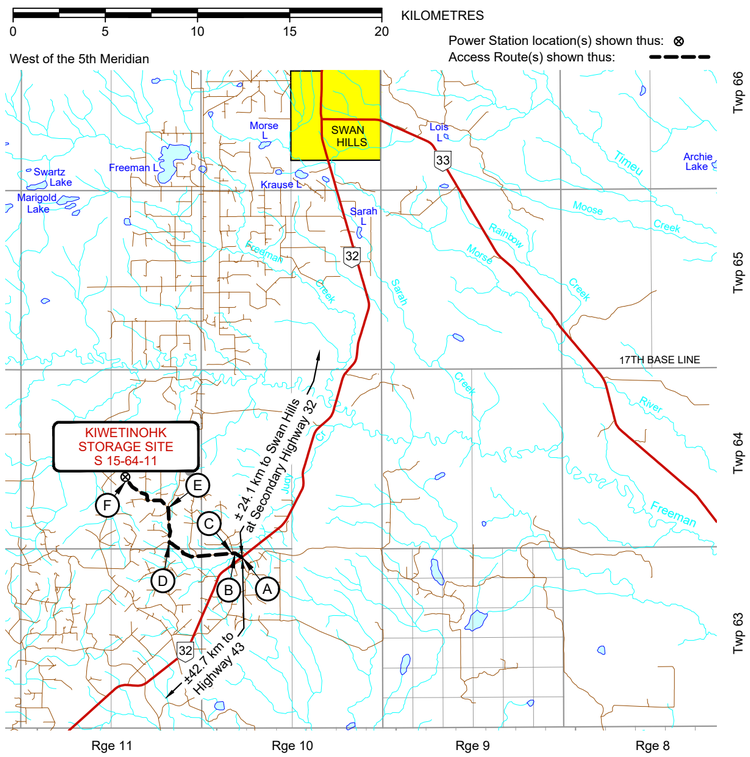
Rev	Date	Description	pc	dwn	chk
00	Aug. 4/22	Original Issue	-	jw	ma
01	Mar 9/23	Revise Site Boundary	-	lfl	ma
02	-	-	-	-	-

Bearisto & Associates
ENGINEERING & SURVEY
10940 - 92 Avenue, Grande Prairie, AB T8V 6B5
P: 1 855 879 5973 **W:** www.baseng.ca

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Access Sketch - SCALE: 1:250,000



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PREPARED FOR:

kiwetinohk energy

CONSULTATION MAP

FOR

PROPOSED STORAGE SITE (STOCKPILE)

WITHIN THE

SW 1/4 SEC. 15, TWP. 64, RGE. 11, W5M.

AND WITHIN THEORETICAL

SE 1/4 SEC. 15, TWP. 64, RGE. 11, W5M.

BIG LAKES COUNTY

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Total Area of Proposed Power Station Site = 2.111 ha.

AREAS REQUIRED

ACTIVITY	HECTARES	ACRES
STORAGE SITE	2.111	5.22
TOTAL	**2.111**	**5.22**

N

SCALE: 1:5000

0 50 100 150 200 250

METRES

Rev	Date	Description	pc	dwn	chk
00	Mar 9/23	Original Issue	-	lfl	ma
01	-	-	-	-	-
02	-	-	-	-	-

Bearisto & Associates
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Kiwetinohk Energy Corp.
Suite 1700, 250 – 2 Street S.W.
Calgary, AB T2P 0C1

April 21, 2023

Via Email: df_rain@hotmail.com
Cc Email: irc.executivesecretary@gmail.com

PAUL FIRST NATION
PO BOX 66
DUFFIELD AB T0E 0N0

Dear: DONALD RAIN

Re: Kiwetinohk Energy Corp.
Black Bear Power Plant
Land - S 15-064-11 W5M
KEC File: S00229

Kiwetinohk Energy Corp. (**Kiwetinohk**) is writing to provide you with further information on our proposed Black Bear Power Plant Project (**Project**). We would like to offer an opportunity for you to ask us any questions you may have or provide any comments in relation to our Project. As you may be aware, we previously reached out to your First Nation under the direction of the Alberta Aboriginal Consultation Office (FNC#202204642 and FNC#202300387) to consult on the Project.

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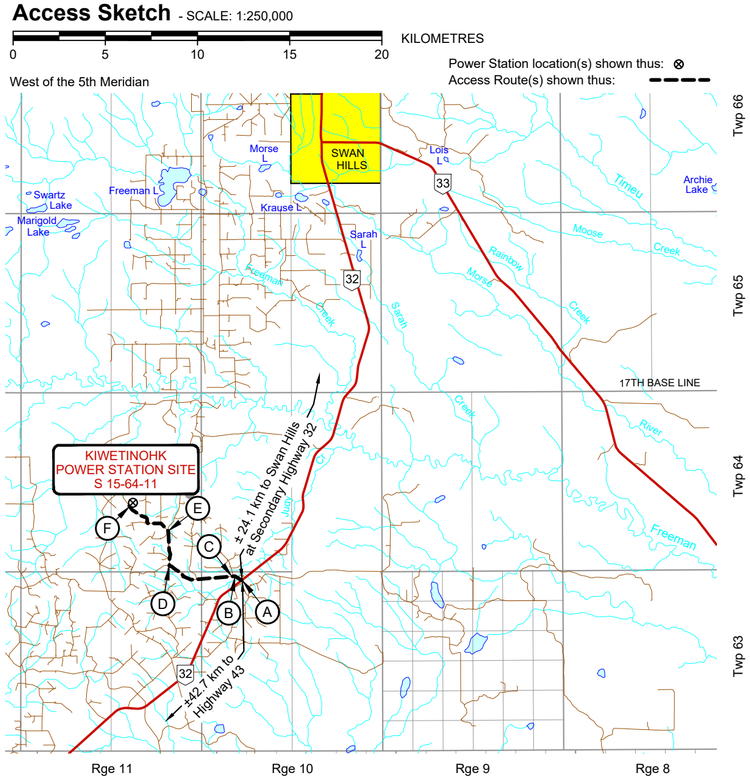
Sincerely,
KIWETINOHK ENERGY CORP.

<original signed by>

Sue Kuethe
Executive Vice President – Land and Community Inclusion



Access Sketch - SCALE: 1:250,000



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PREPARED FOR:

kiwetinohk energy

CONSULTATION MAP

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AND WITHIN THEORETICAL

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BIG LAKES COUNTY

LEGEND & NOTES

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TOTAL	**18.540**	**45.81**

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SCALE: 1:5000

0 50 100 150 200 250

METRES

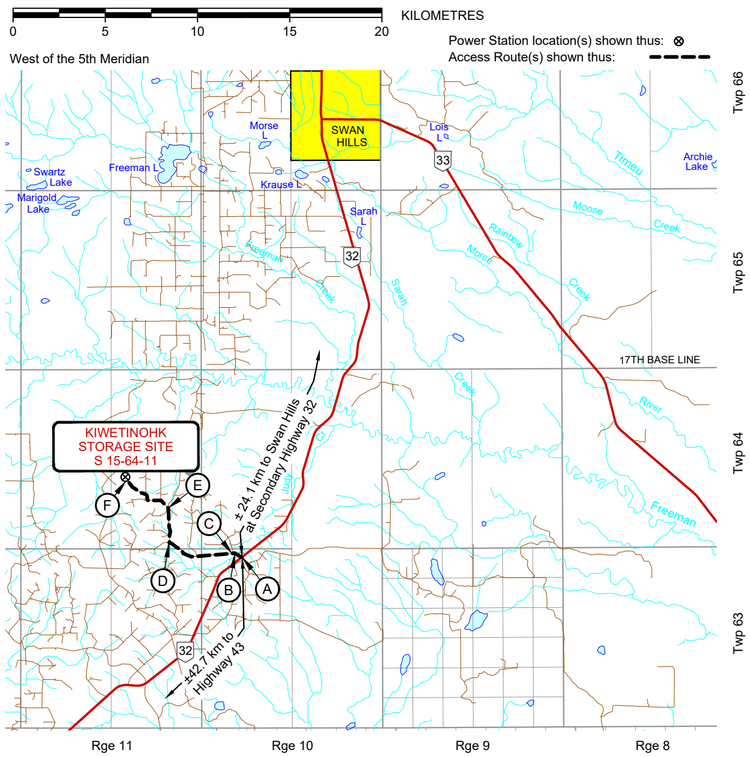
Rev	Date	Description	pc	dwn	chk
00	Aug. 4/22	Original Issue	-	jw	ma
01	Mar 9/23	Revise Site Boundary	-	lfl	ma
02	-	-	-	-	-

Bearisto & Associates
ENGINEERING & SURVEY
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P: 1 855 879 5973 **W:** www.baseng.ca

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PREPARED FOR:

kiwetinohk energy

CONSULTATION MAP

FOR

PROPOSED STORAGE SITE (STOCKPILE)

WITHIN THE

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AND WITHIN THEORETICAL

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BIG LAKES COUNTY

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METRES

Rev	Date	Description	pc	dwn	chk
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02	-	-	-	-	-

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FNC

FNC202204642

First Nation or Metis Settlement* Consulted

Paul First Nation

Level of Consultation

Level 2: Standard

Company Proponent Name

Kiwetinohk Energy Corp.

Project/Activity Name/ID

Kiwetinohk - DML

Comments (Max. 250 characters)

For Files Requiring Bi-monthly Reviews

Date range for new entries:

From To

Final ROC Log: ☐ Yes ☐ No

Add/ Delete Row	No.	Date	First Nation or Metis Settlement* representative(s), and proponent representative(s)	Method of Contact	Documentation Provided	Purpose and details of contact	Issue(s) or concern(s) expressed	Proponent's mitigation measures
+ -	1	Sep 7, 2022	Donald Rain, Jeanne Kenoras	Email	Yes	Jamie Lacey emailed PFN to provide Information Package to initiate consultation.	N/A	N/A
+ -	2	Sep 12, 202	Morissa Rain	Email	Yes	Jamie Lacey received email from PFN, still waiting for telephone meet n greet prior to scheduling.	N/A	N/A
+ -	3	Sep 12, 202	Morissa Rain	Email	Yes	Jamie Lacey emailed PFN, will forward email onto client.	N/A	N/A
+ -	4	Sep 12, 202	Morissa Rain	Email	Yes	Jamie Lacey received email from PFN to arrange telephone meet n greet.	N/A	N/A
+ -	5	Sep 12, 202	Morissa Rain	Email	Yes	Jamie Lacey emailed PFN, pending update from client then will schedule.	N/A	N/A

+ -	6	Sep 14, 202	Donald Rain, Morissa Rain	Email	Yes	Jamie Lacey emailed PFN, first follow up, also advised pending telephone meet n greet, will advise.	N/A	N/A
+ -	7	Sep 15, 202	Morissa Rain	Email	Yes	Jamie Lacey emailed PFN to advise client will be in touch to schedule meet n greet.	N/A	N/A
+ -	8	Sep 21, 202	Donald Rain, Morissa Rain	Email	Yes	Jamie Lacey emailed PFN, second follow up, also advised client will be in touch to schedule meet n greet.	N/A	N/A
+ -	9	Sep 21, 202	Donald Rain, Morissa Rain	Email	Yes	Jamie Lacey emailed PFN to advise client reached out Monday, just waiting on a returned call.	N/A	N/A
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+ -	15	Nov 24, 202	Morissa Rain	Email	Yes	Mike Christensen emailed PFN to schedule site visit, Kiwetinokh unable to attend.	N/A	N/A
+ -	16	Nov 25, 202	Morissa Rain	Email	Yes	Mike Christensen received email from PFN to discuss site visit dates.	N/A	N/A
+ -	17	Nov 28, 202	Morissa Rain	Email	Yes	Mike Christensen received email from PFN to discuss site visit dates.	N/A	N/A
+ -	18	Nov 29, 202	Morissa Rain	Email	Yes	Mike Christensen received email from PFN to discuss site visit dates.	N/A	N/A

+ -	19	Dec 9, 2022	Paul House	Site visit	No	Site visit completed.	N/A	N/A
+ -	20	Jan 13, 2023	Morissa Rain	Email	Yes	Mike Christensen emailed PFN following up on site visits.	N/A	N/A
+ -	21	Jan 17, 2023	Morissa Rain	Email	Yes	Jamie Lacey received email from PFN requesting contact information for invoice purpose.	N/A	N/A
+ -	22	Jan 17, 2023	Morissa Rain	Email	Yes	Jamie Lacey emailed PFN to provide contact information as requested.	N/A	N/A
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Kiwetinohk Energy Corp.
Suite 1700, 250 – 2 Street S.W.
Calgary, AB T2P 0C1

April 21, 2023

Via Email: consultation@sawridgefirstnation.com

SAWRIDGE FIRST NATION
PO BOX 326
SLAVE LAKE, AB T0G 2A0

Dear: WINONA TWIN

Re: Kiwetinohk Energy Corp.
Black Bear Power Plant
Land - S 15-064-11 W5M
KEC File: S00229

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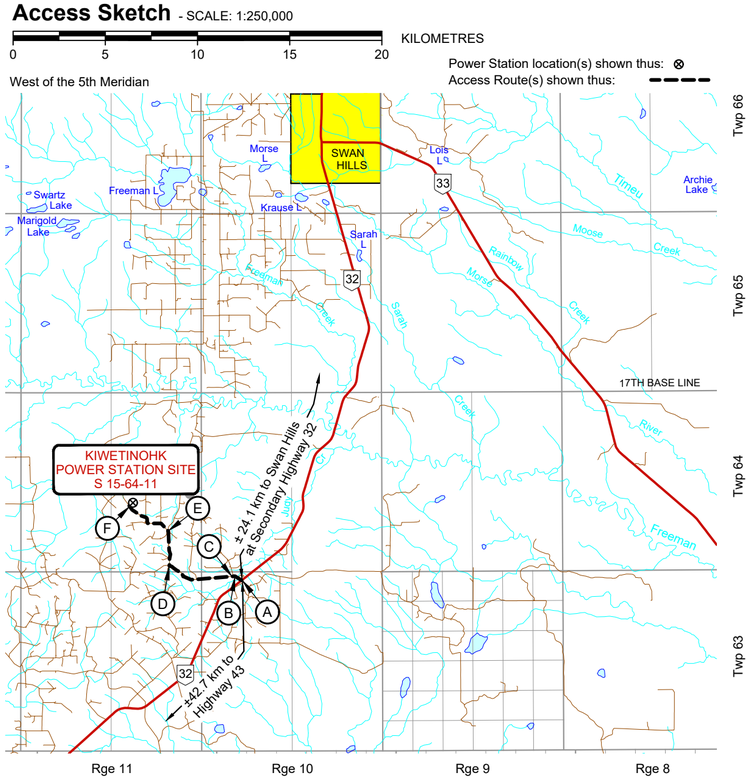
Sincerely,
KIWETINOHK ENERGY CORP.

<original signed by>

Sue Kuethe
Executive Vice President – Land and Community Inclusion



Access Sketch - SCALE: 1:250,000



Access Route Information			
Length (km)		Road/Disposition	Owner
A - B	0.5	LOC 840703	CONIFER ENERGY INC.
B - C	0.2	ROE 6190	CONIFER ENERGY INC.
C - D	3.7	ROE 6400	CONIFER ENERGY INC.
D - E	1.9	ROE 6721	CONIFER ENERGY INC.
E - F	2.8	ROE 6812	CONIFER ENERGY INC.

PREPARED FOR:

kiwetinohk energy

CONSULTATION MAP

FOR

PROPOSED POWER STATION SITE (ELECTRICAL)

WITHIN THE

SW 1/4 SEC. 15, TWP. 64, RGE. 11, W5M.

AND WITHIN THEORETICAL

SE 1/4 SEC. 15, TWP. 64, RGE. 11, W5M.

BIG LAKES COUNTY

LEGEND & NOTES

Proposed Power Station Site:

30 m Buffer:

Index contours (50.0m):

Intermediate contours (10.0m):

Map Datum: UTM, NAD83, Zone 11
Distances are ground and in metres and decimals thereof.
Public Land Standing search date: March 7, 2023

Total Area of Proposed Power Station Site = 18.540 ha.

AREAS REQUIRED

ACTIVITY	HECTARES	ACRES
POWER STATION SITE	18.540	45.81
TOTAL	**18.540**	**45.81**

N

SCALE: 1:5000

0 50 100 150 200 250

METRES

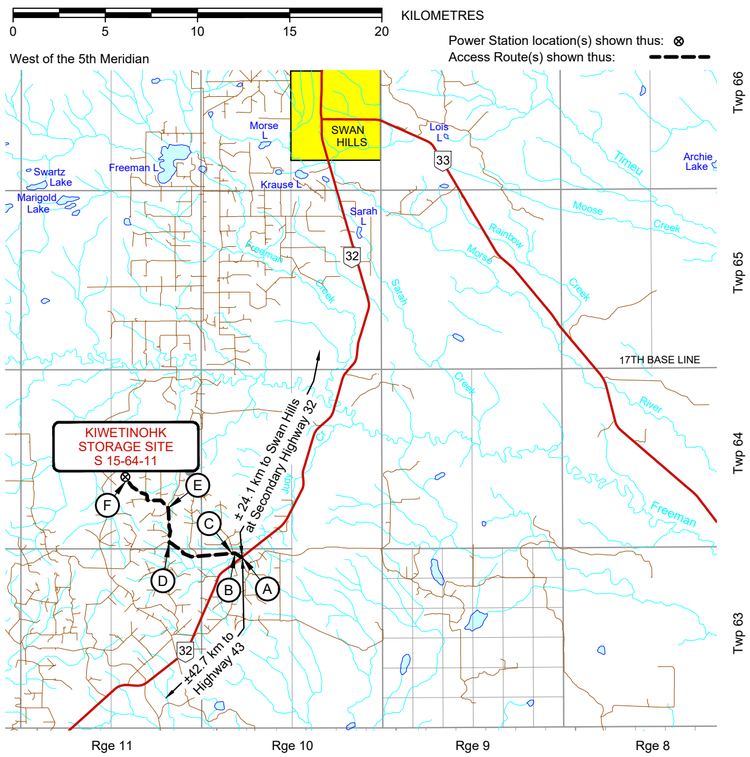
Rev	Date	Description	pc	dwn	chk
00	Aug. 4/22	Original Issue	-	jw	ma
01	Mar 9/23	Revise Site Boundary	-	lfl	ma
02	-	-	-	-	-

Bearisto & Associates
ENGINEERING & SURVEY
10940 - 92 Avenue, Grande Prairie, AB T8V 6B5
P: 1 855 879 5973 **W:** www.baseng.ca

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Access Sketch - SCALE: 1:250,000



Access Route Information

	Length (km)	Road/Disposition	Owner
A - B	0.5	LOC 840703	CONIFER ENERGY INC.
B - C	0.2	ROE 6190	CONIFER ENERGY INC.
C - D	3.7	ROE 6400	CONIFER ENERGY INC.
D - E	1.9	ROE 6721	CONIFER ENERGY INC.
E - F	3.0	ROE 6812	CONIFER ENERGY INC.

PREPARED FOR:

kiwetinohk energy

CONSULTATION MAP

FOR

PROPOSED STORAGE SITE (STOCKPILE)

WITHIN THE

SW 1/4 SEC. 15, TWP. 64, RGE. 11, W5M.

AND WITHIN THEORETICAL

SE 1/4 SEC. 15, TWP. 64, RGE. 11, W5M.

BIG LAKES COUNTY

LEGEND & NOTES

Proposed Power Station Site:

30 m Buffer:

Index contours (50.0m):

Intermediate contours (10.0m):

Map Datum: UTM, NAD83, Zone 11
Distances are ground and in metres and decimals thereof.
Public Land Standing search date: March 7, 2023

Total Area of Proposed Power Station Site = 2.111 ha.

AREAS REQUIRED

ACTIVITY	HECTARES	ACRES
STORAGE SITE	2.111	5.22
TOTAL	**2.111**	**5.22**

N

SCALE: 1:5000

0 50 100 150 200 250

METRES

Rev	Date	Description	pc	dwn	chk
00	Mar 9/23	Original Issue	-	lfl	ma
01	-	-	-	-	-
02	-	-	-	-	-

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FNC

FNC202204642

First Nation or Metis Settlement* Consulted

Sawridge First Nation

Level of Consultation

Level 2: Standard

Company Proponent Name

Kiwetinohk Energy Corp.

Project/Activity Name/ID

Kiwetinohk - DML

Comments (Max. 250 characters)

For Files Requiring Bi-monthly Reviews

Date range for new entries:

From To

Final ROC Log: ☐ Yes ☐ No

Add/ Delete Row	No.	Date	First Nation or Metis Settlement* representative(s), and proponent representative(s)	Method of Contact	Documentation Provided	Purpose and details of contact	Issue(s) or concern(s) expressed	Proponent's mitigation measures
+ -	1	Sep 7, 2022	Winona Twin	Email	Yes	Jamie Lacey emailed SFN to provide Information Package to initiate consultation.	N/A	N/A
+ -	2	Sep 7, 2022	Winona Twin	Other	Yes	Jamie Lacey sent Information Package to SFN via express post.	N/A	N/A
+ -	3	Sep 12, 202	Sawridge First Nation	Other	Yes	Jamie Lacey received confirmation, Information Package delivered to SFN via express post.	N/A	N/A
+ -	4	Sep 14, 202	Winona Twin	Email	Yes	Jamie Lacey emailed SFN, first follow up.	N/A	N/A
+ -	5	Sep 21, 202	Winona Twin	Email	Yes	Jamie Lacey emailed SFN, second follow up.	N/A	N/A
+ -	6	Sep 26, 202	Winona Twin	Email	Yes	Jamie Lacey emailed SFN with project update letter.	N/A	N/A

+ -	7	Sep 26, 202	Winona Twin	Other	Yes	Jamie Lacey sent project update letter to SFN via express post.	N/A	N/A
+ -	8	Sep 28, 202	Winona Twin	Email	Yes	Jamie Lacey emailed SFN to advise correction within project update letter.	N/A	N/A
+ -	9	Oct 3, 2022	Sawridge First Nation	Other	Yes	Jamie Lacey received confirmation, project update delivered to SFN via express post.	N/A	N/A
+ -	10	Feb 16, 202	Winona Twin	Email	Yes	Jamie Lacey emailed SFN to provide Record of Consultation Log for review.	N/A	N/A

Please include any additional comments related to consultation as well as any commitments made during the communication, such as a future site visit or a promise to respond to a question.
If the method of contact is "other", please also include a description of the method of contact in this column.
*is defined as Metis Settlements as established under the *Metis Settlements Act*. Also includes any organization that the ACO has an established practice of consulting under *The Government of Alberta's Guidelines on Consultation with Metis Settlements on Land and Natural Resource Management, 2016*.

Kiwetinohk Energy Corp.
Suite 1700, 250 – 2 Street S.W.
Calgary, AB T2P 0C1

April 21, 2023

Via Email: alexia.goodswimmer@sturgeonlake.ca
Cc Email: teresam@sturgeonlake.ca

STURGEON LAKE CREE NATION
BOX 757
VALLEYVIEW, AB T0H 3N0

Dear: ALEXIA GOODSWIMMER

Re: Kiwetinohk Energy Corp.
Black Bear Power Plant
Land - S 15-064-11 W5M
KEC File: S00229

Kiwetinohk Energy Corp. (**Kiwetinohk**) is writing to provide you with further information on our proposed Black Bear Power Plant Project (**Project**). We would like to offer an opportunity for you to ask us any questions you may have or provide any comments in relation to our Project. As you may be aware, we previously reached out to your First Nation under the direction of the Alberta Aboriginal Consultation Office (FNC#202204642 and FNC#202300387) to consult on the Project.

The Project is a 460 MW thermal combined cycle power generation facility with the capacity to capture carbon dioxide ($C0_2$). As the Project is over 200 MW, it is a designated project under the federal *Impact Assessment Act* and as such, Kiwetinohk is under a requirement to submit an initial project description to the Impact Assessment Agency of Canada (**Agency**).

The Agency has also recommended that we reach out to your community to see if there is interest in participating in the federal impact assessment process in relation to the Project. As part of our commitment to the principles of reconciliation, we believe that engaging in meaningful dialogue with Indigenous communities is a vital step towards building a positive and collaborative relationship with communities potentially impacted by the Project.

The purpose of this letter is to provide an opportunity for you to learn more about the Project, ask questions, and provide feedback that will be taken into consideration in the project planning process. We believe that your input will be valuable in helping us to ensure that the Project is developed in a way that is respectful of Indigenous rights and interests, cultural values and environmental concerns.

The Project will be located on Alberta Crown lands (Departmental Miscellaneous Leases consisting of 20.651 HA / 51.03 Acres) and includes the power plant as well as a small storage site, located in the northwest corner of the Project. The storage site will be used to store conserved topsoil and other materials during the life span of the project. We have attached copies of the survey plans for your reference.

The power produced by the Project will produce into the Alberta Interconnected Electric System (**AIES**), more commonly referred to as the “power grid”. Construction of the Project is planned to begin in the spring of 2025 and will take approximately 3 years to complete, with an anticipated life cycle of 30 years.

The Project is being designed to include carbon capture capability with the intent of capturing 95% of its emissions and sequestering them underground. Kiwetinohk is evaluating carbon dioxide sequestration options, including a hub in the area.

We are working on a Project newsletter further detailing the scope of the Project and proposed activity and will send it to you when available.

Kiwetinohk would like to meet with you to discuss this Project, your questions and concerns, and potential opportunities for your community. If you would like to meet, please contact Barb Freeborn at bfreeborn@kiwetinohk.com to arrange a time to meet.

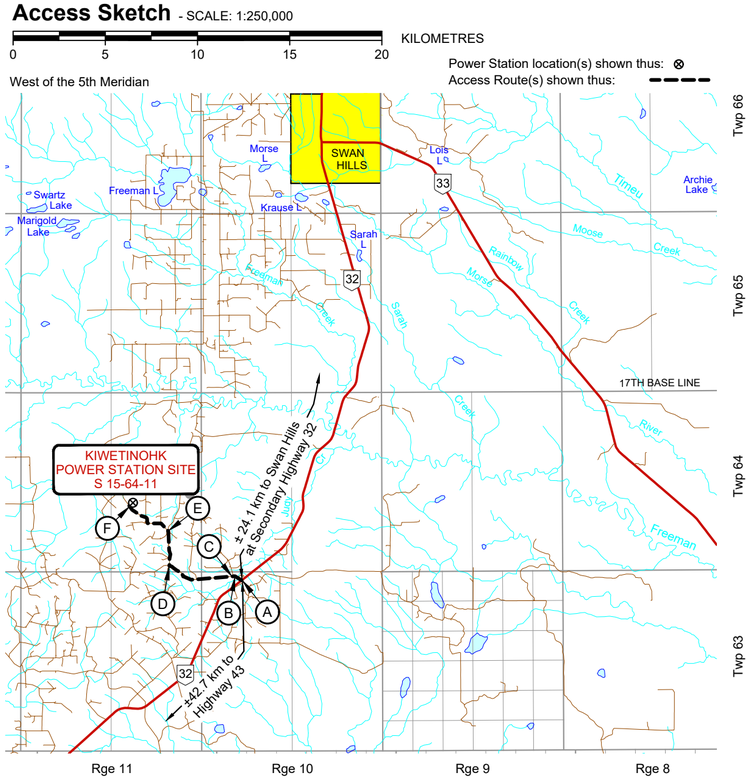
Sincerely,
KIWETINOHK ENERGY CORP.

<original signed by>

Sue Kuethe
Executive Vice President – Land and Community Inclusion



Access Sketch - SCALE: 1:250,000



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PREPARED FOR:

kiwetinohk energy

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FOR

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AND WITHIN THEORETICAL

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BIG LAKES COUNTY

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TOTAL	**18.540**	**45.81**

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SCALE: 1:5000

0 50 100 150 200 250

METRES

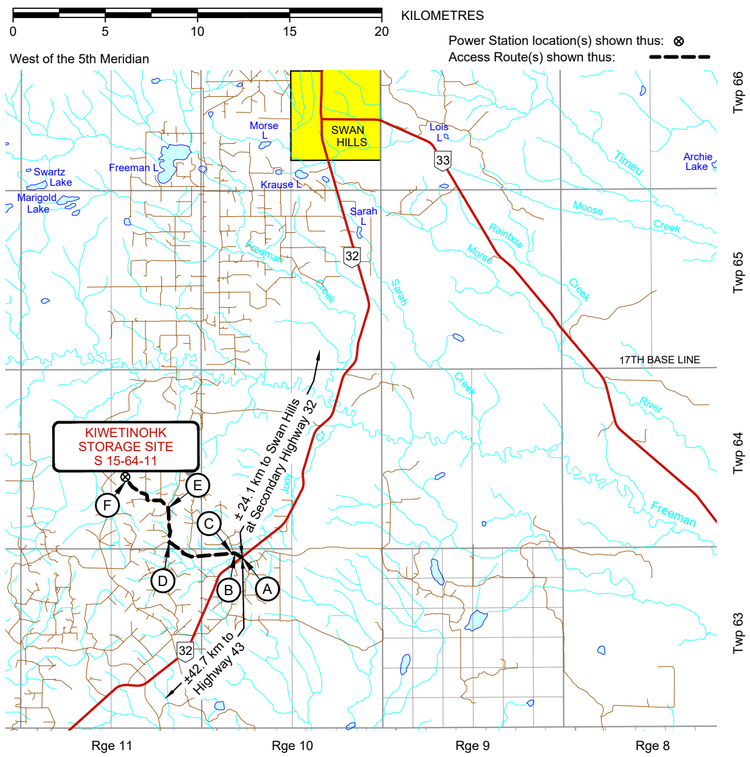
Rev	Date	Description	pc	dwn	chk
00	Aug. 4/22	Original Issue	-	jw	ma
01	Mar 9/23	Revise Site Boundary	-	lfl	ma
02	-	-	-	-	-

Bearisto & Associates
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PREPARED FOR:

kiwetinohk energy

CONSULTATION MAP

FOR

PROPOSED STORAGE SITE (STOCKPILE)

WITHIN THE

SW 1/4 SEC. 15, TWP. 64, RGE. 11, W5M.

AND WITHIN THEORETICAL

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BIG LAKES COUNTY

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SCALE: 1:5000

0 50 100 150 200 250

METRES

Rev	Date	Description	pc	dwn	chk
00	Mar 9/23	Original Issue	-	lfl	ma
01	-	-	-	-	-
02	-	-	-	-	-

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FNC

FNC202204642

First Nation or Metis Settlement* Consulted

Sturgeon Lake Cree Nation

Level of Consultation

Level 2: Standard

Company Proponent Name

Kiwetinohk Energy Corp.

Project/Activity Name/ID

Kiwetinohk - DML

Comments (Max. 250 characters)

For Files Requiring Bi-monthly Reviews

Date range for new entries:

From To

Final ROC Log: ☐ Yes ☐ No

Add/ Delete Row	No.	Date	First Nation or Metis Settlement* representative(s), and proponent representative(s)	Method of Contact	Documentation Provided	Purpose and details of contact	Issue(s) or concern(s) expressed	Proponent's mitigation measures
+ -	1	Jun 13, 2022	Chief and Council	Meeting	No	Kiwetinohk representatives met with SGLCN to discuss potential opportunities for SGLCN members relating to power and oil & gas projects.	N/A	N/A
+ -	2	Sep 7, 2022	Alexia Goodswimmer, Teresa Mitchell	Email	Yes	Jamie Lacey emailed SGLCN to provide Information Package to initiate consultation.	N/A	N/A
+ -	3	Sep 7, 2022	Alexia Goodswimmer	Other	Yes	Jamie Lacey sent Information Package to SGLCN via express post.	N/A	N/A
+ -	4	Sep 12, 202	Sturgeon Lake Cree Nation	Other	Yes	Jamie Lacey received confirmation, Information Package delivered to SGLCN via express post.	N/A	N/A
+ -	5	Sep 14, 202	Alexia Goodswimmer, Teresa Mitchell	Email	Yes	Jamie Lacey emailed SGLCN, first follow up.	N/A	N/A

+ -	6	Sep 14, 202	Alexia Goodswimmer	Email	Yes	Jamie Lacey received email from SGLCN requesting project be uploaded onto portal including the Spatial data.	N/A	N/A
+ -	7	Sep 15, 202	Sturgeon Lake Cree Nation	Portal	Yes	Jamie Lacey sent Information Package to SGLCN via online portal.	N/A	N/A
+ -	8	Sep 15, 202	Alexia Goodswimmer	Email	Yes	Jamie Lacey emailed SGLCN to advise Information Package uploaded to portal, pending Spatial data, will advise once uploaded.	N/A	N/A
+ -	9	Sep 15, 202	Alexia Goodswimmer	Email	Yes	Jamie Lacey emailed SGLCN to request format type for Spatial data.	N/A	N/A
+ -	10	Sep 19, 202	Alexia Goodswimmer	Email	Yes	Jamie Lacey emailed SGLCN to follow up on format type for Spatial data.	N/A	N/A
+ -	11	Sep 20, 202	Teresa Mitchell	Email	Yes	Jamie Lacey received email from SGLCN, KMZ file.	N/A	N/A
+ -	12	Sep 20, 202	Teresa Mitchell	Email	Yes	Jamie Lacey emailed SGLCN, will request & advise once uploaded.	N/A	N/A
+ -	13	Sep 21, 202	Alexia Goodswimmer, Teresa Mitchell	Email	Yes	Jamie Lacey emailed SGLCN, second follow up, also advised KMZ files to be uploaded once received.	N/A	N/A
+ -	14	Sep 21, 202	Alexia Goodswimmer	Email	Yes	Jamie Lacey received email from SGLCN to provide KMZ file.	N/A	N/A
+ -	15	Sep 21, 202	Alexia Goodswimmer	Email	Yes	Jamie Lacey emailed SGLCN to advise will upload once received.	N/A	N/A
+ -	16	Sep 21, 202	Alexia Goodswimmer	Email	Yes	Jamie Lacey received email from SGLCN to mention Beth is filling in for Teresa.	N/A	N/A
+ -	17	Sep 21, 202	Alexia Goodswimmer	Email	Yes	Jamie Lacey received email from SGLCN, proceeding with desk top review, once completed will schedule site visit.	N/A	N/A
+ -	18	Sep 21, 202	Alexia Goodswimmer	Email	Yes	Jamie Lacey emailed SGLCN thanking for the update.	N/A	N/A

+ -	19	Sep 21, 202	Alexia Goodswimmer	Email	Yes	Jamie Lacey emailed SGLCN, once reviewed, let me know, can schedule site visit.	N/A	N/A
+ -	20	Sep 21, 202	Alexia Goodswimmer	Email	Yes	Jamie Lacey received email from SGLCN, will continue for the consultation process.	N/A	N/A
+ -	21	Sep 21, 202	Alexia Goodswimmer	Email	Yes	Jamie Lacey received email from SGLCN to advise notification provided also has copy of SRFN's notification.	N/A	N/A
+ -	22	Sep 21, 202	Alexia Goodswimmer	Email	Yes	Jamie Lacey emailed SGLCN thanking for the update.	N/A	N/A
+ -	23	Sep 21, 202	Alexia Goodswimmer	Email	Yes	Jamie Lacey emailed SGLCN asking if hard copy package or portal.	N/A	N/A
+ -	24	Sep 21, 202	Alexia Goodswimmer	Email	Yes	Jamie Lacey received email from SGLCN advising portal.	N/A	N/A
+ -	25	Sep 21, 202	Alexia Goodswimmer	Email	Yes	Jamie Lacey emailed SGLCN to advise guidance needed.	N/A	N/A
+ -	26	Sep 21, 202	Alexia Goodswimmer	Email	Yes	Jamie Lacey received email from SGLCN to loop Trevor Wiens to conversation.	N/A	N/A
+ -	27	Sep 21, 202	Alexia Goodswimmer	Email	Yes	Jamie Lacey emailed SGLCN thanking for the help.	N/A	N/A
+ -	28	Sep 22, 202	Alexia Goodswimmer	Email	Yes	Jamie Lacey emailed SGLCN to discuss notes from session with Trevor Wiens.	N/A	N/A
+ -	29	Sep 22, 202	Sturgeon Lake Cree Nation	Portal	Yes	Jamie Lacey received Initial Reponse Letter from SGLCN requesting site visit.	N/A	N/A
+ -	30	Sep 22, 202	Sturgeon Lake Cree Nation	Portal	Yes	Jamie Lacey sent KMZ file to SGLCN via online portal.	N/A	N/A
+ -	31	Sep 22, 202	Alexia Goodswimmer	Email	Yes	Jamie Lacey emailed SGLCN to advise KMZ file uploaded to online portal.	N/A	N/A
+ -	32	Sep 22, 202	Alexia Goodswimmer	Email	Yes	Jamie Lacey emailed SGLCN for costs associated for requested site visit.	N/A	N/A
+ -	33	Sep 26, 202	Alexia Goodswimmer	Email	Yes	Jamie Lacey received email from SGLCN, will adjust settings and set task.	N/A	N/A

+ -	34	Sep 26, 202	Alexia Goodswimmer	Email	Yes	Jamie Lacey emailed SGLCN, thanks.	N/A	N/A
+ -	35	Sep 26, 202	Alexia Goodswimmer	Email	Yes	Jamie Lacey received email from SGLCN, all learning together.	N/A	N/A
+ -	36	Sep 26, 202	Alexia Goodswimmer	Phone Ca	No	Jamie Lacey received phone call from SGLCN to discuss project, requested costs for site visit to get scheduled.	N/A	N/A
+ -	37	Sep 26, 202	Elizabeth Calahaison	Email	Yes	Jamie Lacey received email from SGLCN with consultation rate sheet.	N/A	N/A
+ -	38	Sep 26, 202	Alexia Goodswimmer	Email	Yes	Jamie Lacey emailed SGLCN, you as well.	N/A	N/A
+ -	39	Sep 26, 202	Elizabeth Calahaison	Email	Yes	Jamie Lacey emailed SGLCN, will forward to client for approval and will contact to schedule.	N/A	N/A
+ -	40	Sep 26, 202	Alexia Goodswimmer	Email	Yes	Jamie Lacey emailed SGLCN, fees okay, will schedule shortly.	N/A	N/A
+ -	41	Sep 26, 202	Alexia Goodswimmer, Teresa Mitchell	Email	Yes	Jamie Lacey emailed SGLCN with project update letter.	N/A	N/A
+ -	42	Sep 26, 202	Alexia Goodswimmer	Other	Yes	Jamie Lacey sent project update letter to SGLCN via express post.	N/A	N/A
+ -	43	Sep 26, 202	Sturgeon Lake Cree Nation	Portal	Yes	Jamie Lacey sent project update letter to SGLCN via online portal.	N/A	N/A
+ -	44	Sep 28, 202	Alexia Goodswimmer, Teresa Mitchell	Email	Yes	Jamie Lacey emailed SGLCN to advise correction within project update letter.	N/A	N/A
+ -	45	Sep 28, 202	Sturgeon Lake Cree Nation	Portal	Yes	Jamie Lacey communicated w/ SGLCN via online portal to advise of correction within project update letter.	N/A	N/A
+ -	46	Sep 28, 202	Teresa Mitchell	Email	Yes	Mike Christensen received email from SGLCN to proceed in booking site visit.	N/A	N/A
+ -	47	Sep 28, 202	Teresa Mitchell	Email	Yes	Mike Christensen emailed SGLCN to schedule teams meeting to discuss.	N/A	N/A

+ -	48	Oct 3, 2022	Sturgeon Lake Cree Nation	Other	Yes	Jamie Lacey received confirmation, project update letter delivered to SGLCN via express post.	N/A	N/A
+ -	49	Oct 6, 2022	Teresa Mitchell	Portal	Yes	Jamie Lacey received communication from SGLCN via online portal to contact to schedule site visit.	N/A	N/A
+ -	50	Oct 6, 2022	Teresa Mitchell	Portal	Yes	Jamie Lacey received letter from SGLCN requesting site visit.	- Possible impact on cultural sites - Possible impact on historical sites - Possible impact on medicinal plants - Possible Traditional Land Use in the Proposed Project Area	N/A
+ -	51	Oct 6, 2022	Teresa Michelle	Portal	Yes	Jamie Lacey communicated w/ SGLCN via online portal to advise client will contact to schedule site visit.	N/A	N/A
+ -	52	Oct 11, 2022	Alexia Goodswimmer	Email	Yes	Mike Christensen received email from SGLCN to schedule teams meeting.	N/A	N/A
+ -	53	Oct 12, 2022	Alexia Goodswimmer	Email	Yes	Mike Christensen emailed SGLCN to advise determining date for site visit.	N/A	N/A
+ -	54	Oct 13, 2022	Alexis Goodswimmer	Meeting	No	Mike Christensen met w/SGLCN via teams to discuss.	N/A	N/A
+ -	55	Oct 14, 2022	Teresa Mitchell	Email	Yes	Mike Christensen received email from SGLCN to schedule a site visit.	N/A	N/A
+ -	56	Oct 17, 2022	Alexia Goodswimmer	Phone Ca	No	Mike Christensen phoned SGLCN, left message.	N/A	N/A
+ -	57	Oct 17, 2022	Teresa Mitchell	Email	Yes	Mike Christensen received email from SGLCN following up on site visit.	N/A	N/A
+ -	58	Oct 17, 2022	Teresa Mitchell	Email	Yes	Mike Christensen emailed SGLCN to advise will schedule shortly.	N/A	N/A
+ -	59	Oct 17, 2022	Alexia Goodswimmer	Phone Ca	No	Mason Muller phoned SGLCN to schedule site visit, scheduled for Monday October 24th.	N/A	N/A
+ -	60	Oct 24, 2022	Sturgeon Lake Cree Nation Site Inspection Crew	Site visit	No	Mason Muller met with SGLCN to complete site visit.	N/A	N/A

+ -	61	Oct 27, 2022	Alexia Goodswimmer, Teresa Mitchell	Email	Yes	Jamie Lacey emailed SGLCN requesting notes from site visit, if any concerns.	N/A	N/A
+ -	62	Nov 9, 2022	Alexia Goodswimmer	Email	Yes	Jamie Lacey received email from SGLCN, will update portal with locations of concern.	N/A	N/A
+ -	63	Nov 9, 2022	Sturgeon Lake Cree Nation	Portal	Yes	Jamie Lacey received updated impact list & herbicide from SGLCN.	- Possible impact on cultural site - Possible impact on historical site - Possible impact on medicinal plants - Possible Traditional Land Use in the Proposed Project Area Location, #170 and #171 were containing a variety of medicinal vegetation. Due to the time line of the project, we propose harvest for this location in the summer/fall months of 2023. Location #172 was fur bearing habitat, smaller mammal, perhaps ermine. So they have identified this as a fur bearing, harvestable location for trappers within the area. However we have no RFMA holder identified within this project scope from Sturgeon Lake Cree Nation. Location #173 the elder and knowledge holder have photographed a moose and within the project they have noticed a fair amount of "feed" spots that our elders have acknowledge to be the moose eating. This location is very active and has detrimental impacts to our inherit rights if this project is completed. As this is a Power Plant project, this projects lifespan is large. Therefore the loss is great for the community land users within the project area when it comes to the completion of this project.	N/A

+ -	64	Nov 9, 2022	Alexia Goodswimmer	Email	Yes	Jamie Lacey emailed SGLCN, attachments received, will pass along to client to address.	N/A	N/A
+ -	65	Nov 9, 2022	Teresa Mitchell	Email	Yes	Jamie Lacey received automatic reply from SGLCN.	N/A	N/A
+ -	66	Nov 9, 2022	Alexia Goodswimmer	Email	Yes	Jamie Lacey emailed SGLCN for GPS points.	N/A	N/A
+ -	67	Nov 9, 2022	Alexia Goodswimmer	Email	Yes	Jamie Lacey received email from SGLCN with direction on locating GPS points.	N/A	N/A
+ -	68	Nov 9, 2022	Alexia Goodswimmer	Email	Yes	Jamie Lacey emailed SGLCN, appreciate the help.	N/A	N/A
+ -	69	Nov 9, 2022	Alexia Goodswimmer	Email	Yes	Jamie Lacey emailed SGLCN, client okay with costs for 3 days of harvest, client will provide adequate time prior to construction for SGLCN to harvest.	N/A	N/A
+ -	70	Nov 29, 202	Alexia Goodswimmer	Email	Yes	Jamie Lacey received email from SGLCN requesting further explanation and expanding on the sequestering carbon and storage practices.	N/A	N/A
+ -	71	Nov 29, 202	Alexia Goodswimmer	Email	Yes	Jamie Lacey emailed SGLCN, will pass along to client for further discussions.	N/A	N/A
+ -	72	Nov 29, 202	Alexia Goodswimmer	Email	Yes	Jamie Lacey received automatic reply from SGLCN.	N/A	N/A
+ -	73	Jan 23, 2023	Alexia Goodswimmer	Portal	Yes	Jamie Lacey received letter of low concern from SGLCN.	N/A	N/A
+ -	74	Jan 24, 2023	Alexia Goodswimmer	Email	Yes	Mike Christiansen emailed SGLCN to provide explanation for carbon sequestering and storage.	N/A	N/A
+ -	75	Jan 25, 2023	Alexia Goodswimmer	Email	Yes	Mike Christensen received email from SGLCN thanking for the sequestering storage information.	N/A	N/A

+ -	76	Feb 1, 2023	Chief Sheldon Sunshine, Councillors Hugh and Grant	Meeting	Yes	Sue Kuethe met with SGLCN to review project and potential employment & investment opportunities, presentation given.	N/A	N/A
+ -	77	Feb 16, 2023	Alexia Goodswimmer, Teresa Mitchell	Email	Yes	Jamie Lacey emailed SGLCN to provide Record of Consultation Log for review.	N/A	N/A
+ -	78	Mar 16, 2023	Alexia Goodswimmer, Teresa Mitchell	Email	Yes	Jamie Lacey emailed SGLCN to provide updated Record of Consultation Log for review.	N/A	N/A

Please include any additional comments related to consultation as well as any commitments made during the communication, such as a future site visit or a promise to respond to a question.
If the method of contact is "other", please also include a description of the method of contact in this column.
*is defined as Metis Settlements as established under the *Metis Settlements Act*. Also includes any organization that the ACO has an established practice of consulting under *The Government of Alberta's Guidelines on Consultation with Metis Settlements on Land and Natural Resource Management, 2016*.

Kiwetinohk Energy Corp.
Suite 1700, 250 – 2 Street S.W.
Calgary, AB T2P 0C1

April 21, 2023

Via Email: caz@scfn.ca
Cc Email: Steve@scfn.ca

SUCKER CREEK FIRST NATION
BOX 65
ENILDA, AB T0G 0W0

Dear: CAZ BADGAR

Re: Kiwetinohk Energy Corp.
Black Bear Power Plant
Land - S 15-064-11 W5M
KEC File: S00229

Kiwetinohk Energy Corp. (**Kiwetinohk**) is writing to provide you with further information on our proposed Black Bear Power Plant Project (**Project**). We would like to offer an opportunity for you to ask us any questions you may have or provide any comments in relation to our Project. As you may be aware, we previously reached out to your First Nation under the direction of the Alberta Aboriginal Consultation Office (FNC#202204642 and FNC#202300387) to consult on the Project.

The Project is a 460 MW thermal combined cycle power generation facility with the capacity to capture carbon dioxide (CO_2). As the Project is over 200 MW, it is a designated project under the federal *Impact Assessment Act* and as such, Kiwetinohk is under a requirement to submit an initial project description to the Impact Assessment Agency of Canada (**Agency**).

The Agency has also recommended that we reach out to your community to see if there is interest in participating in the federal impact assessment process in relation to the Project. As part of our commitment to the principles of reconciliation, we believe that engaging in meaningful dialogue with Indigenous communities is a vital step towards building a positive and collaborative relationship with communities potentially impacted by the Project.

The purpose of this letter is to provide an opportunity for you to learn more about the Project, ask questions, and provide feedback that will be taken into consideration in the project planning process. We believe that your input will be valuable in helping us to ensure that the Project is developed in a way that is respectful of Indigenous rights and interests, cultural values and environmental concerns.

The Project will be located on Alberta Crown lands (Departmental Miscellaneous Leases consisting of 20.651 HA / 51.03 Acres) and includes the power plant as well as a small storage site, located in the northwest corner of the Project. The storage site will be used to store conserved topsoil and other materials during the life span of the project. We have attached copies of the survey plans for your reference.

The power produced by the Project will produce into the Alberta Interconnected Electric System (**AIES**), more commonly referred to as the “power grid”. Construction of the Project is planned to begin in the spring of 2025 and will take approximately 3 years to complete, with an anticipated life cycle of 30 years.

The Project is being designed to include carbon capture capability with the intent of capturing 95% of its emissions and sequestering them underground. Kiwetinohk is evaluating carbon dioxide sequestration options, including a hub in the area.

We are working on a Project newsletter further detailing the scope of the Project and proposed activity and will send it to you when available.

Kiwetinohk would like to meet with you to discuss this Project, your questions and concerns, and potential opportunities for your community. If you would like to meet, please contact Barb Freeborn at bfreeborn@kiwetinohk.com to arrange a time to meet.

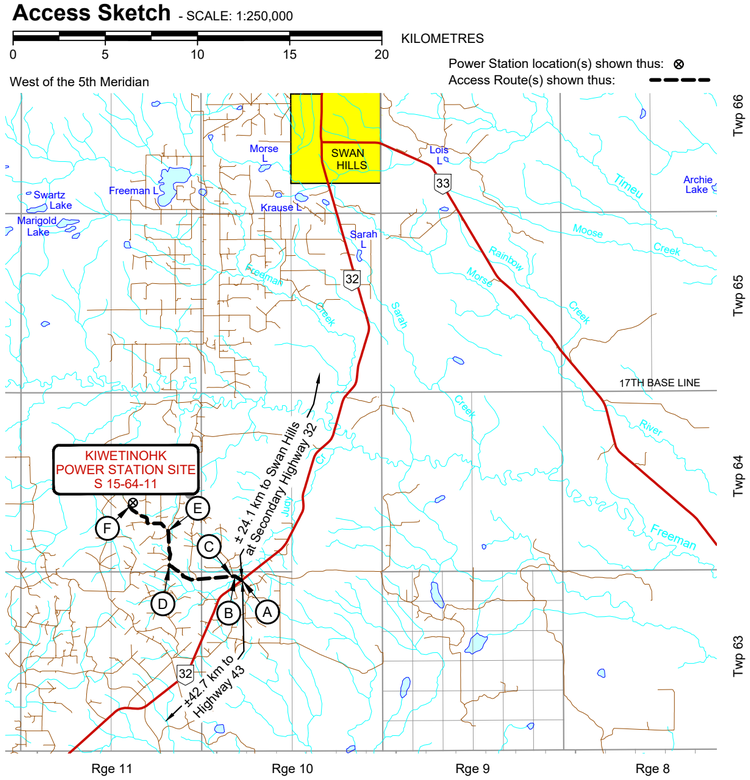
Sincerely,
KIWETINOHK ENERGY CORP.

<original signed by>

Sue Kuethe
Executive Vice President – Land and Community Inclusion



Access Sketch - SCALE: 1:250,000



Access Route Information			
Length (km)		Road/Disposition	Owner
A - B	0.5	LOC 840703	CONIFER ENERGY INC.
B - C	0.2	ROE 6190	CONIFER ENERGY INC.
C - D	3.7	ROE 6400	CONIFER ENERGY INC.
D - E	1.9	ROE 6721	CONIFER ENERGY INC.
E - F	2.8	ROE 6812	CONIFER ENERGY INC.

PREPARED FOR:

kiwetinohk energy

CONSULTATION MAP

FOR

PROPOSED POWER STATION SITE (ELECTRICAL)

WITHIN THE

SW 1/4 SEC. 15, TWP. 64, RGE. 11, W5M.

AND WITHIN THEORETICAL

SE 1/4 SEC. 15, TWP. 64, RGE. 11, W5M.

BIG LAKES COUNTY

LEGEND & NOTES

Proposed Power Station Site:

30 m Buffer:

Index contours (50.0m):

Intermediate contours (10.0m):

Map Datum: UTM, NAD83, Zone 11
Distances are ground and in metres and decimals thereof.
Public Land Standing search date: March 7, 2023

Total Area of Proposed Power Station Site = 18.540 ha.

AREAS REQUIRED

ACTIVITY	HECTARES	ACRES
POWER STATION SITE	18.540	45.81
TOTAL	**18.540**	**45.81**

N

SCALE: 1:5000

0 50 100 150 200 250

METRES

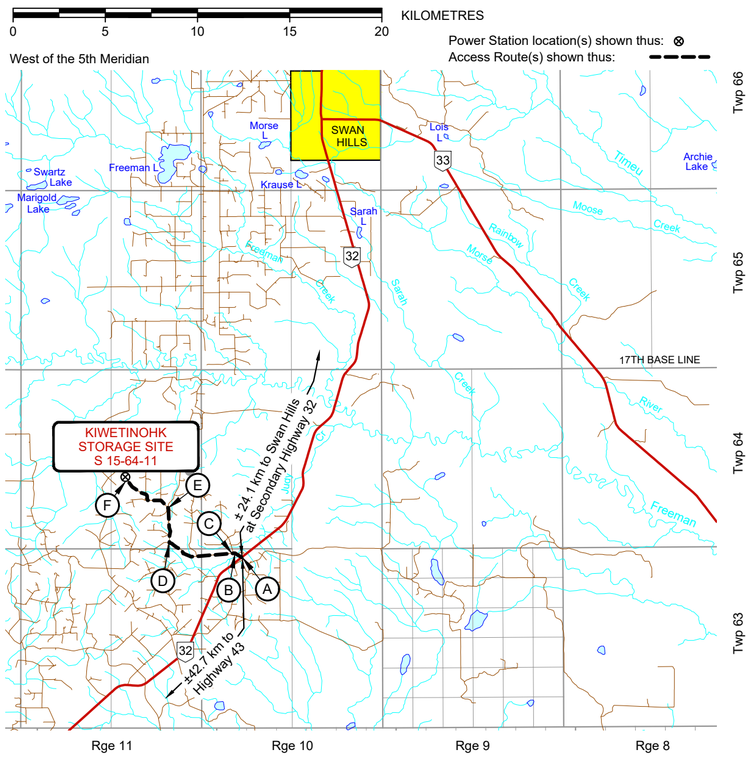
Rev	Date	Description	pc	dwn	chk
00	Aug. 4/22	Original Issue	-	jw	ma
01	Mar 9/23	Revise Site Boundary	-	lfl	ma
02	-	-	-	-	-

Bearisto & Associates
ENGINEERING & SURVEY
10940 - 92 Avenue, Grande Prairie, AB T8V 6B5
P: 1 855 879 5973 **W:** www.baseng.ca

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Access Sketch - SCALE: 1:250,000



Access Route Information

	Length (km)	Road/Disposition	Owner
A - B	0.5	LOC 840703	CONIFER ENERGY INC.
B - C	0.2	ROE 6190	CONIFER ENERGY INC.
C - D	3.7	ROE 6400	CONIFER ENERGY INC.
D - E	1.9	ROE 6721	CONIFER ENERGY INC.
E - F	3.0	ROE 6812	CONIFER ENERGY INC.

PREPARED FOR:

kiwetinohk energy

CONSULTATION MAP

FOR

PROPOSED STORAGE SITE (STOCKPILE)

WITHIN THE

SW 1/4 SEC. 15, TWP. 64, RGE. 11, W5M.

AND WITHIN THEORETICAL

SE 1/4 SEC. 15, TWP. 64, RGE. 11, W5M.

BIG LAKES COUNTY

LEGEND & NOTES

Proposed Power Station Site:

30 m Buffer:

Index contours (50.0m):

Intermediate contours (10.0m):

Map Datum: UTM, NAD83, Zone 11
Distances are ground and in metres and decimals thereof.
Public Land Standing search date: March 7, 2023

Total Area of Proposed Power Station Site = 2.111 ha.

AREAS REQUIRED

ACTIVITY	HECTARES	ACRES
STORAGE SITE	2.111	5.22
TOTAL	**2.111**	**5.22**

N

SCALE: 1:5000

0 50 100 150 200 250

METRES

Rev	Date	Description	pc	dwn	chk
00	Mar 9/23	Original Issue	-	lfl	ma
01	-	-	-	-	-
02	-	-	-	-	-

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10940 - 92 Avenue, Grande Prairie, AB T8V 6B5
P: 1 855 879 5973 **W:** www.baseng.ca

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FNC

FNC202204642

First Nation or Metis Settlement* Consulted

Sucker Creek First Nation

Level of Consultation

Level 2: Standard

Company Proponent Name

Kiwetinohk Energy Corp.

Project/Activity Name/ID

Kiwetinohk - DML

Comments (Max. 250 characters)

For Files Requiring Bi-monthly Reviews

Date range for new entries:

From To

Final ROC Log: ☐ Yes ☐ No

Add/ Delete Row	No.	Date	First Nation or Metis Settlement* representative(s), and proponent representative(s)	Method of Contact	Documentation Provided	Purpose and details of contact	Issue(s) or concern(s) expressed	Proponent's mitigation measures
+ -	1	Sep 7, 2022	Emily Calliou, Steve Noskey	Email	Yes	Jamie Lacey emailed SCFN to provide Information Package to initiate consultation.	N/A	N/A
+ -	2	Sep 7, 2022	Emily Calliou	Other	Yes	Jamie Lacey sent Information Package to SCFN via express post.	N/A	N/A
+ -	3	Sep 12, 202	Sucker Creek First Nation	Other	Yes	Jamie Lacey received confirmation, Information Package delivered to SCFN via express post.	N/A	N/A
+ -	4	Sep 14, 202	Emily Calliou, Steve Noskey	Email	Yes	Jamie Lacey emailed SCFN, first follow up.	N/A	N/A
+ -	5	Sep 21, 202	Emily Calliou, Steve Noskey	Email	Yes	Jamie Lacey emailed SCFN, second follow up.	N/A	N/A
+ -	6	Sep 26, 202	Emily Calliou	Email	Yes	Jamie Lacey received email with letter requesting site visit.	N/A	N/A

+ -	7	Sep 26, 202	Emily Calliou	Email	Yes	Jamie Lacey emailed SCFN, will obtain client approval and be in touch to schedule.	N/A	N/A
+ -	8	Sep 26, 202	Emily Calliou	Email	Yes	Jamie Lacey received email from SCFN, thank you.	N/A	N/A
+ -	9	Sep 26, 202	Emily Calliou	Email	Yes	Jamie Lacey emailed SCFN, fees okay, will schedule shortly.	N/A	N/A
+ -	10	Sep 26, 202	Emily Calliou	Email	Yes	Jamie Lacey received email from SCFN, thank you.	N/A	N/A
+ -	11	Sep 26, 202	Emily Calliou, Steve Noskey	Email	Yes	Jamie Lacey emailed SCFN with project update letter.	N/A	N/A
+ -	12	Sep 26, 202	Emily Calliou	Other	Yes	Jamie Lacey sent project update letter to SCFN via express post.	N/A	N/A
+ -	13	Sep 26, 202	Sucker Creek First Nation	Phone Ca	No	Mason Muller phoned SCFN to schedule site visit, was advised will call back once FNC was reviewed.	N/A	N/A
+ -	14	Sep 26, 202	Emily Calliou	Phone Ca	No	Mason Muller received phone call from SCFN, site visit scheduled for Wednesday September 28th at 10am.	N/A	N/A
+ -	15	Sep 26, 202	Emily Calliou	Email	Yes	Jamie Lacey received email from SCFN requesting a shapefile of project.	N/A	N/A
+ -	16	Sep 27, 202	Emily Calliou	Email	Yes	Jamie Lacey emailed SCFN, will request and forward once received.	N/A	N/A
+ -	17	Sep 27, 202	Emily Calliou	Email	Yes	Jamie Lacey emailed SCFN with shapefile.	N/A	N/A
+ -	18	Sep 28, 202	Sucker Creek First Nation Representatives (Site Inspector and Elder)	Site visit	No	Mason Muller completed site visit with SCFN, no concerns noted.	N/A	N/A
+ -	19	Sep 28, 202	Emily Calliou, Steve Noskey	Email	Yes	Jamie Lacey emailed SCFN to advise correction within project update letter.	N/A	N/A
+ -	20	Sep 28, 202	Emily Calliou	Email	Yes	Jamie Lacey received email from SCFN, thank you for the information.	N/A	N/A

+ -	21	Oct 3, 2022	Sucker Creek First Nation	Other	Yes	Jamie Lacey received confirmation, project update letter delivered to SCFN via express post.	N/A	N/A
+ -	22	Oct 4, 2022	Emily Calliou, Steve Noskey	Email	Yes	Jamie Lacey emailed SCFN to follow up on site visit site specific concerns.	N/A	N/A
+ -	23	Oct 6, 2022	Emily Calliou	Email	Yes	Jamie Lacey received email from SCFN with final response letter. SCFN advises no site specific concerns.	N/A	N/A
+ -	24	Oct 6, 2022	Emily Calliou	Email	Yes	Jamie Lacey emailed SCFN, thank you.	N/A	N/A
+ -	25	Feb 16, 2023	Caz Badger, Steve Noskey	Email	Yes	Jamie Lacey emailed SCFN to provide Record of Consultation Log for review.	N/A	N/A

Please include any additional comments related to consultation as well as any commitments made during the communication, such as a future site visit or a promise to respond to a question.
If the method of contact is "other", please also include a description of the method of contact in this column.
*is defined as Metis Settlements as established under the *Metis Settlements Act*. Also includes any organization that the ACO has an established practice of consulting under *The Government of Alberta's Guidelines on Consultation with Metis Settlements on Land and Natural Resource Management, 2016*.

Kiwetinohk Energy Corp.
Suite 1700, 250 – 2 Street S.W.
Calgary, AB T2P 0C1

April 21, 2023

Via Email: srfnjohn@gmail.com
Cc Email: todd.srfn@gmail.com

SWAN RIVER FIRST NATION
PO BOX 270
KINUSO, AB T0G 1K0

Dear: JOHN WILLIER

Re: Kiwetinohk Energy Corp.
Black Bear Power Plant
Land - S 15-064-11 W5M
KEC File: S00229

Kiwetinohk Energy Corp. (**Kiwetinohk**) is writing to provide you with further information on our proposed Black Bear Power Plant Project (**Project**). We would like to offer an opportunity for you to ask us any questions you may have or provide any comments in relation to our Project. As you may be aware, we previously reached out to your First Nation under the direction of the Alberta Aboriginal Consultation Office (FNC#202204642 and FNC#202300387) to consult on the Project.

The Project is a 460 MW thermal combined cycle power generation facility with the capacity to capture carbon dioxide ($C0_2$). As the Project is over 200 MW, it is a designated project under the federal *Impact Assessment Act* and as such, Kiwetinohk is under a requirement to submit an initial project description to the Impact Assessment Agency of Canada (**Agency**).

The Agency has also recommended that we reach out to your community to see if there is interest in participating in the federal impact assessment process in relation to the Project. As part of our commitment to the principles of reconciliation, we believe that engaging in meaningful dialogue with Indigenous communities is a vital step towards building a positive and collaborative relationship with communities potentially impacted by the Project.

The purpose of this letter is to provide an opportunity for you to learn more about the Project, ask questions, and provide feedback that will be taken into consideration in the project planning process. We believe that your input will be valuable in helping us to ensure that the Project is developed in a way that is respectful of Indigenous rights and interests, cultural values and environmental concerns.

The Project will be located on Alberta Crown lands (Departmental Miscellaneous Leases consisting of 20.651 HA / 51.03 Acres) and includes the power plant as well as a small storage site, located in the northwest corner of the Project. The storage site will be used to store conserved topsoil and other materials during the life span of the project. We have attached copies of the survey plans for your reference.

The power produced by the Project will produce into the Alberta Interconnected Electric System (**AIES**), more commonly referred to as the “power grid”. Construction of the Project is planned to begin in the spring of 2025 and will take approximately 3 years to complete, with an anticipated life cycle of 30 years.

The Project is being designed to include carbon capture capability with the intent of capturing 95% of its emissions and sequestering them underground. Kiwetinohk is evaluating carbon dioxide sequestration options, including a hub in the area.

We are working on a Project newsletter further detailing the scope of the Project and proposed activity and will send it to you when available.

Kiwetinohk would like to meet with you to discuss this Project, your questions and concerns, and potential opportunities for your community. If you would like to meet, please contact Barb Freeborn at bfreeborn@kiwetinohk.com to arrange a time to meet.

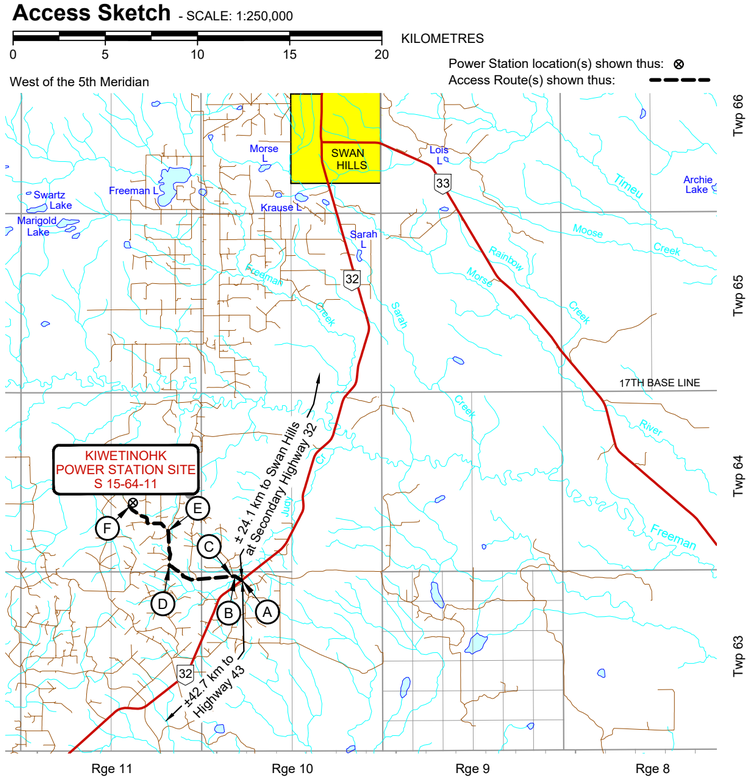
Sincerely,
KIWETINOHK ENERGY CORP.

<original signed by>

Sue Kuethe
Executive Vice President – Land and Community Inclusion



Access Sketch - SCALE: 1:250,000



Access Route Information			
Length (km)		Road/Disposition	Owner
A - B	0.5	LOC 840703	CONIFER ENERGY INC.
B - C	0.2	ROE 6190	CONIFER ENERGY INC.
C - D	3.7	ROE 6400	CONIFER ENERGY INC.
D - E	1.9	ROE 6721	CONIFER ENERGY INC.
E - F	2.8	ROE 6812	CONIFER ENERGY INC.

PREPARED FOR:

kiwetinohk energy

CONSULTATION MAP

FOR

PROPOSED POWER STATION SITE (ELECTRICAL)

WITHIN THE

SW 1/4 SEC. 15, TWP. 64, RGE. 11, W5M.

AND WITHIN THEORETICAL

SE 1/4 SEC. 15, TWP. 64, RGE. 11, W5M.

BIG LAKES COUNTY

LEGEND & NOTES

Proposed Power Station Site:

30 m Buffer:

Index contours (50.0m):

Intermediate contours (10.0m):

Map Datum: UTM, NAD83, Zone 11
Distances are ground and in metres and decimals thereof.
Public Land Standing search date: March 7, 2023

Total Area of Proposed Power Station Site = 18.540 ha.

AREAS REQUIRED

ACTIVITY	HECTARES	ACRES
POWER STATION SITE	18.540	45.81
TOTAL	**18.540**	**45.81**

N

SCALE: 1:5000

0 50 100 150 200 250

METRES

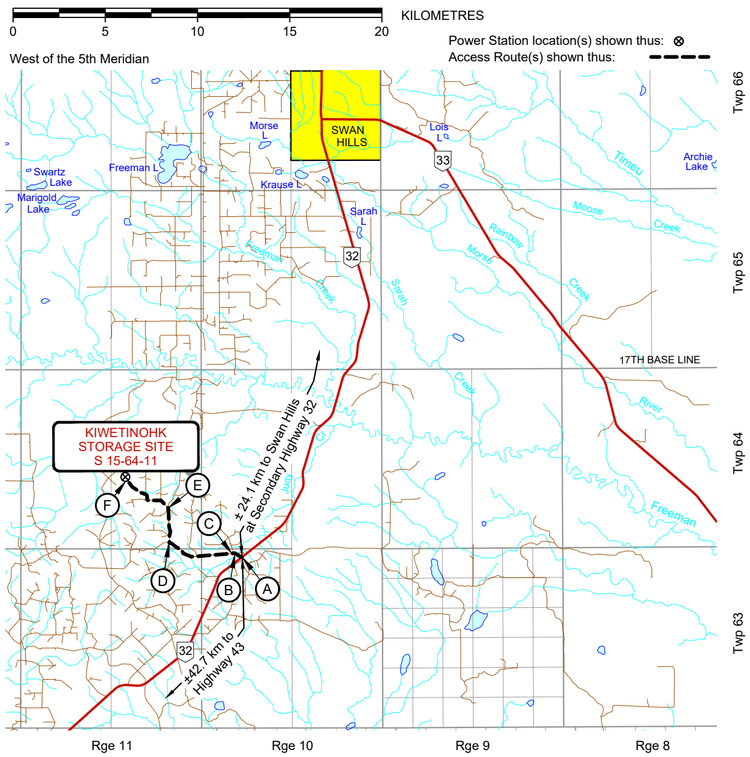
Rev	Date	Description	pc	dwn	chk
00	Aug. 4/22	Original Issue	-	jw	ma
01	Mar 9/23	Revise Site Boundary	-	lfl	ma
02	-	-	-	-	-

Bearisto & Associates
ENGINEERING & SURVEY
10940 - 92 Avenue, Grande Prairie, AB T8V 6B5
P: 1 855 879 5973 **W:** www.baseng.ca

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Access Sketch - SCALE: 1:250,000



Access Route Information

	Length (km)	Road/Disposition	Owner
A - B	0.5	LOC 840703	CONIFER ENERGY INC.
B - C	0.2	ROE 6190	CONIFER ENERGY INC.
C - D	3.7	ROE 6400	CONIFER ENERGY INC.
D - E	1.9	ROE 6721	CONIFER ENERGY INC.
E - F	3.0	ROE 6812	CONIFER ENERGY INC.

PREPARED FOR:

kiwetinohk energy

CONSULTATION MAP

FOR

PROPOSED STORAGE SITE (STOCKPILE)

WITHIN THE

SW 1/4 SEC. 15, TWP. 64, RGE. 11, W5M.

AND WITHIN THEORETICAL

SE 1/4 SEC. 15, TWP. 64, RGE. 11, W5M.

BIG LAKES COUNTY

LEGEND & NOTES

Proposed Power Station Site:

30 m Buffer:

Index contours (50.0m):

Intermediate contours (10.0m):

Map Datum: UTM, NAD83, Zone 11
Distances are ground and in metres and decimals thereof.
Public Land Standing search date: March 7, 2023

Total Area of Proposed Power Station Site = 2.111 ha.

AREAS REQUIRED

ACTIVITY	HECTARES	ACRES
STORAGE SITE	2.111	5.22
TOTAL	**2.111**	**5.22**

N

SCALE: 1:5000

0 50 100 150 200 250

METRES

Rev	Date	Description	pc	dwn	chk
00	Mar 9/23	Original Issue	-	lfl	ma
01	-	-	-	-	-
02	-	-	-	-	-

Bearisto & Associates
ENGINEERING & SURVEY
10940 - 92 Avenue, Grande Prairie, AB T8V 6B5
P: 1 855 879 5973 **W:** www.baseng.ca

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FNC

FNC202204642

First Nation or Metis Settlement* Consulted

Swan River First Nation

Level of Consultation

Level 2: Standard

Company Proponent Name

Kiwetinohk Energy Corp.

Project/Activity Name/ID

Kiwetinohk - DML

Comments (Max. 250 characters)

For Files Requiring Bi-monthly Reviews

Date range for new entries:

From To

Final ROC Log: ☐ Yes ☐ No

Add/ Delete Row	No.	Date	First Nation or Metis Settlement* representative(s), and proponent representative(s)	Method of Contact	Documentation Provided	Purpose and details of contact	Issue(s) or concern(s) expressed	Proponent's mitigation measures
+ -	1	Sep 7, 2022	John Willier, Todd Bailey	Email	Yes	Jamie Lacey emailed SRFN to provide Information Package to initiate consultation.	N/A	N/A
+ -	2	Sep 7, 2022	Swan River First Nation	Portal	Yes	Jamie Lacey sent Information Package to SRFN via online portal.	N/A	N/A
+ -	3	Sep 13, 202	Swan River First Nation	Portal	Yes	Jamie Lacey received Consultation Policy, Concerns Letter & Consultation Process Introduction Letter from SRFN requesting site visit.	Concerns related to fish, wildlife, plants and medicines. In addition, the proposed project may impact cultural and historical features of concern.	N/A
+ -	4	Sep 14, 202	John Willier, Todd Bailey	Email	Yes	Jamie Lacey emailed SRFN, first follow up.	N/A	N/A
+ -	5	Sep 21, 202	John Willier, Todd Bailey	Email	Yes	Jamie Lacey emailed SRFN, second follow up.	N/A	N/A

+ -	6	Sep 21, 202	Swan River First Nation	Site visit	No	Swan River First Nation conducted site visit (as noted on invoice dated September 22, 2022).	N/A	N/A
+ -	7	Sep 22, 202	John Willier, Todd Bailey	Email	Yes	Jamie Lacey emailed SRFN for costs associated for requested site visit.	N/A	N/A
+ -	8	Sep 22, 202	Swan River First Nation	Portal	Yes	Jamie Lacey received invoice from SRFN, costs provided.	N/A	N/A
+ -	9	Sep 23, 202	Swan River First Nation	Portal	Yes	Jamie Lacey communicated w/ SRFN via online portal to advise agent will contact to schedule site visit.	N/A	N/A
+ -	10	Sep 23, 202	Kage Bellerose	Portal	Yes	Jamie Lacey received communication from SRFN via online portal to advise site visit has already been conducted.	N/A	N/A
+ -	11	Sep 23, 202	Kage Bellerose	Portal	Yes	Jamie Lacey communicated w/ SRFN via online portal to advise invoice will be sent to client for payment.	N/A	N/A
+ -	12	Sep 26, 202	Kage Bellerose	Portal	Yes	Jamie Lacey communicated w/ SRFN via online portal to request report from site visit and if any site specific concerns to discuss.	N/A	N/A
+ -	13	Sep 26, 202	John Willer, Todd Bailey	Email	Yes	Jamie Lacey emailed SRFN with project update letter.	N/A	N/A
+ -	14	Sep 26, 202	Swan River First Nation	Portal	Yes	Jamie Lacey sent project update letter to SRFN via online portal.	N/A	N/A
+ -	15	Sep 28, 202	John Willer, Todd Bailey	Email	Yes	Jamie Lacey emailed SRFN to advise correction within project update letter.	N/A	N/A
+ -	16	Sep 28, 202	Kage Bellerose	Portal	Yes	Jamie Lacey communicated w/ SRFN via online portal to advise correction within project update letter.	N/A	N/A
+ -	17	Oct 3, 2022	John Willer, Todd Bailey	Email	Yes	Jamie Lacey emailed SRFN to request report from site visit and if any site specific concerns to discus.	N/A	N/A

+ -	18	Oct 3, 2022	Kage Bellerose	Portal	Yes	Jamie Lacey communicated w/ SRFN via online portal to request report from site visit and if any site specific concerns to discuss.	N/A	N/A
+ -	19	Oct 21, 2022	Swan River First Nation	Portal	Yes	Jamie Lacey received Site Assessment Analysis from SRFN. SRFN does not have any critical concerns.	SRFN has concerns when it comes to the history of the area specifically if there was herbicide sprayed in this location in the past.	N/A
+ -	20	Oct 21, 2022	Swan River First Nation	Portal	Yes	Jamie Lacey communicated w/ SRFN via online portal thanking for the analysis.	N/A	N/A
+ -	21	Nov 8, 2022	Swan River First Nation	Portal	Yes	Jamie Lacey received Site Assessment Analysis from SRFN. SRFN does not have any critial concerns.	SRFN has concerns when it comes to the history of the area specifically if there was herbicide sprayed in this location in the past.	N/A
+ -	22	Jan 13, 2023	Swan River First Nation	Portal	Yes	Jamie Lacey received invoice from SRFN.	N/A	N/A
+ -	23	Jan 16, 2023	Swan River First Nation	Portal	Yes	Jamie Lacey communicated w/ SRFN via online portal to advise invoice will be sent to client for payment.	N/A	N/A
+ -	24	Jan 16, 2023	Swan River First Nation	Portal	Yes	Jamie Lacey communicated w/ SRFN via online portal to advise payment was made as noted on invoice.	N/A	N/A
+ -	25	Feb 16, 2023	John Willier, Todd Bailey	Email	Yes	Jamie Lacey emailed SRFN to provide Record of Consultation Log for review.	N/A	N/A
+ -	26	Mar 16, 2023	John Willier, Todd Bailey	Email	Yes	Jamie Lacey emailed SRFN to provide updated Record of Consultation Log for information.	N/A	N/A

Please include any additional comments related to consultation as well as any commitments made during the communication, such as a future site visit or a promise to respond to a question.
If the method of contact is "other", please also include a description of the method of contact in this column.
*is defined as Metis Settlements as established under the *Metis Settlements Act*. Also includes any organization that the ACO has an established practice of consulting under *The Government of Alberta's Guidelines on Consultation with Metis Settlements on Land and Natural Resource Management, 2016*.

Appendix D – AEPA Correspondence re. EIA Requirement

Environment and Protected Areas

Regulatory Assurance Division
Regulatory Programs Branch
2nd Floor, Petroleum Plaza, South Tower
9915 – 108 Street
Edmonton, Alberta T5K 2G8
Canada
Telephone: 780-427-5828
http://www.ea.alberta.ca

June 21, 2023

Dobromir Filip
Director of Engineering, Green Energy Division
Kiwetinohk Energy Corp. (KEC)
Via Email: dfilip@kiwetinohk.com

Dear Dobromir Filip:

Further to your Email of May 24th, 2023, 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 Black Bear Power Plant (BBPP). 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. Kiwetinohk Energy Corp. (KEC) should also note that Section 47 of EPEA gives the Minister of Environment and Protected Areas 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.

Kiwetinohk Energy Corp. (KEC) should be advised that although an environmental impact assessment report is not required for this project, Alberta Environment and Protected Areas (EPA) may have other regulatory requirements under EPEA and/or the *Water Act* and/or the *Public Lands Act*. For more information about regulatory requirements under EPEA and/or the *Water Act*, please contact Okey Obiajulu (okey.obiajulu@gov.ab.ca). For information regarding the regulatory requirements under the *Public Lands Act* please see the website: https://www.alberta.ca/public-lands-dispositions.aspx.

Kiwetinohk Energy Corp. (KEC) should also note that the Government of Alberta's Indigenous consultation policies and guidelines may apply to this project. For more information, please contact the Aboriginal Consultation Office. https://www.alberta.ca/indigenous-consultations-in-alberta.aspx

There is the potential requirement for a review under the *Historical Resources Act.* Contact the Historic Resources Management Branch, Alberta Culture at Historical.LUP@gov.ab.ca.

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

Kiwetinohk Energy Corp. (KEC) should also contact the Impact Assessment Agency of Canada (IAAC) (pnr-rpn@iaac-aeic.gc.ca) to discuss the potential submission of a federal project description and any federal environmental assessment requirements under the *Impact Assessment Act*.

If you have any questions or need further information please contact me at 780-644-4983.

Sincerely,

Lori Havanka
Approvals Program Manager
Regulatory Assurance Section
Environment and Protected Areas
(Designated Director, *Environmental Protection and Enhancement Act*)

cc: B. Shand (AUC)
pnr-rpn@iaac-aeic.gc.ca (IAAC)
O. Obiajulu (EPA)
B. Downey (EPA)
Historical.LUP@gov.ab.ca (CMSW)
T. Holden (IR)
environmental.assessment@gov.ab.ca (EPA)

Classification: Protected A

Appendix E – DML Approval

Alberta Government

DISPOSITION

PROVINCE OF ALBERTA

PUBLIC LANDS ACT

R.S.A. 2000, c.P-40, as amended

DISPOSITION TYPE

Miscellaneous Lease

DISPOSITION NUMBER

DML230030

PURPOSE

Electrical

ACTIVITY

Power Station / Substation

DISPOSITION HOLDER

KIWETINOHK ENERGY CORP.

EFFECTIVE DATE	EXPIRY DATE
2023-10-05	**2048-10-04**
PLAN NUMBER	PLAN VERSION DATE
148184 MS	**2023-05-04**

ADMINISTRATIVE CONDITIONS

Definitions

001 All definitions in the *Public Lands Act*, RSA 2000, c P-40 and regulations apply except where expressly defined in this Disposition.

Where a definition is not provided for in the *Public Lands Act*, RSA 2000, c P-40 and regulations or this Disposition, the definition contained in the ***Alberta Public Lands Glossary of Terms*** shall apply.

In this Disposition,

“Act” means the *Public Lands Act*, RSA 2000, c P-40, as amended;

“Activity” means the construction, operation, use and reclamation associated with the purpose for which this disposition has been granted.

"Director" means the “director” duly designated under the Act;

“Disposition” means this disposition, granted pursuant to the Act, which includes this document in its entirety, including all recitals, indices and Schedules;

“Disposition Holder” means the holder of a disposition according to the records of the Regulatory Body;

“Effective Date” means the date referred to as such on the first page of this Disposition;

“Expiry Date” means the date referred to as such on the first page of this Disposition;

"Lands" means those lands as identified in the approved Plan which forms part of this Disposition;

“Personal Information” has the meaning as set out in the Freedom of Information and Protection of Privacy Act, RSA 2000, c F-25, as amended;

“Regulatory Body” means the Department of Environment and Protected Areas or the Alberta Energy Regulator;

“Regulation” means all regulations, as amended, under the Act.

“Term” has the meaning set forth in section 5 of this Disposition.

Grant of Disposition

002 The Regulatory body issues this Disposition to the Disposition Holder, in accordance with the Act/ Regulation subject to the terms and conditions contained in this Disposition.

003 The Disposition Holder must only enter, occupy and use the Lands for the purpose* and activity as referred to as such on the first page of this Disposition.

004 Notwithstanding any references in this Disposition, the Act, or the Regulation, this Disposition is not intended to be, nor shall it be interpreted as or deemed to be a lease of real property at

common law.

Term

005 The term of this Disposition means the period of time commencing on the Effective Date and ending on the Expiry Date, unless otherwise changed in accordance with this Disposition (the "**Term**").

Disposition Fees and Other Financial Obligations

006 The Disposition Holder must pay all fees, rents, charges, security and other amounts payable in accordance with the Act and Regulations.

007 The Disposition Holder must be responsible for the payment of, and must pay promptly and regularly as they become due and payable, any tax, rent, rate or assessment that is duly assessed and charged against the Disposition Holder, including but not limited to property taxes and local improvement charges with respect to the municipality in which the Lands are located.

Notwithstanding that this Disposition has expired, the Disposition Holder remains liable for the amount of rent, property taxes and local improvement charges.

Notwithstanding that this Disposition has been cancelled, the Disposition Holder remains liable for the amount of the property taxes and local improvement charges, as calculated on a pro-rated basis from January 1st of the last year of the Term to the date of cancellation of the Disposition.

008 The Disposition Holder must be responsible for the payment of all costs to the appropriate service provider or to the Regulatory Body charges with respect to the supply and consumption of any utility services and the disposal of garbage.

Compliance

009 The Disposition Holder must obtain federal, provincial, municipal, and other permits and approvals, as applicable, with respect to activities that may take place on the Lands.

Condition of the Lands

010 The Disposition Holder accepts the Lands on an "as is" basis.

Improvements to the Lands

011 The Lands and buildings, structures and equipment erected thereon must be used by the Disposition Holder solely for the purposes permitted by this Disposition, the Act, and the Regulations.

Impact on Other Disposition Holders

012 The Disposition Holder shall be responsible for damage to improvements or to the Lands in which

prior rights have been issued, including damage to traps, snares or other improvements.

013 The disposition holder is required to contact the registered trapper(s) identified on an Activity Standing Search Report by registered mail at least ten days prior to commencing any activity.

Province's Use of the Lands

014 The Province may reconstruct, expand or alter its facilities on the Lands in any manner. The Disposition Holder must, if directed by the Regulatory Body, relocate the Disposition Holder's improvements at the Disposition Holder's expense in order to facilitate reconstruction, expansion or alteration of the Province's facilities.

015 The Disposition Holder acknowledges that:

a) the Regulatory Body may issue additional dispositions to any person authorizing that person to enter onto, use and occupy the Lands for various purposes including, but not limited to, the extraction and removal of merchantable resources, or to conduct development, including, but not limited to mineral resource development;

b) the Regulatory Body may retain revenues from such additional dispositions; and

c) the Disposition Holder is not entitled to any reduction in its fees, rents, charges or other amounts payable on the basis that additional dispositions relating to the Lands have been issued.

Assignment, Subletting and Encumbrances

016 The Disposition Holder must not:

a) Permit any builder's liens or other liens for labour or material relating to work to remain filed against the Lands; or

b) Register, cause or allow to be registered, or permit to remain registered any caveat or encumbrance against the title to the Lands, without first obtaining the prior written consent of the Regulatory Body, which may be arbitrarily withheld.

Default and Termination

017 The Regulatory Body may cancel this Disposition immediately if:

a) a creditor lawfully seizes any of the Disposition Holder's property on the Land;

b) the Disposition Holder is adjudged bankrupt or makes a general assignment for the benefit of creditors;

c) a receiver of any type is appointed for the Disposition Holder's affairs;

d) in the Regulatory Body's opinion, the Disposition Holder is insolvent;

018 When a Disposition has been terminated, the Regulatory Body may cancel any associated dispositions.

019 The Regulatory Body may, upon written notice to the Disposition Holder of not less than 60 days,

cancel this Disposition or withdraw any part of the Lands from this Disposition as the Regulatory Body considers necessary to construct banks, drains, dams, ditches, canals, turnouts, weirs, spillways, roads or other structures necessary or incidental to those works.

Indemnification and Limitation of Liability

020 The Disposition Holder must indemnify and hold harmless the Province and/or the Regulatory Body, its employees, and agents against and from all actions, claims, demands, or costs (including legal costs on a solicitor-client basis) to the extent arising from:

a) the Disposition Holder's breach of this Disposition, or

b) any actions or omissions, negligence, other tortious act, or willful misconduct of the Disposition Holder, or of those for whom the Disposition Holder is legally responsible, in relation to the exercise of the rights, powers, privileges or duties under this Disposition.

021 The Disposition Holder will not be entitled to any damages, costs, losses, disbursements, or compensation whatsoever from the Province or the Regulatory body, regardless of the cause or reason therefore, on account of:

a) partial or total failure of, damage caused by, lessening of the supply of, or stoppage of utility services or any other service;

b) the relocation of facilities or any loss or damage resulting from flooding or water management activities;

c) the relocation of facilities or any loss or damage resulting from wildfire or wildfire management activities;

d) any damage or annoyance arising from any acts, omissions, or negligence of owners, occupants, or tenants of adjacent or contiguous property; or

e) the making of alterations, repairs, improvements or structural changes to the utility services, if any, anywhere on or about the Lands provided the same, must be made with reasonable expedition.

Insurance

022 The Disposition Holder must at all times during the Term, at its own expense and without limiting the Disposition Holder's liabilities therein, maintain the following insurance coverage in compliance with the *Insurance Act*, RSA 2000, c I-3, with carriers, on forms, and with coverage and endorsements satisfactory to the Regulatory Body in its sole discretion:

i. General or commercial liability insurance in an amount not less than $2,000,000 inclusive per occurrence, insuring against bodily injury, personal injury, and property damage including loss of use thereof. That includes employees and members as additional insureds, products and completed operations liability if applicable; sudden and accidental pollution coverage if applicable; and watercraft liability if applicable;

ii. Automobile liability insurance on all vehicles owned, operated or licensed in the name of the Disposition Holder and used on or taken onto the Lands or used in carrying out the obligations under this Disposition in an amount not less than $2,000,000;

iii. "All risk" property insurance insuring the Disposition Holder's personal property on the Lands against accidental loss or damage; and

iv. Such additional insurance policies and coverage as the Regulatory Body reasonably

requires from time to time, including, but not limited to, wildfire expense coverage in an amount not less than $250,000

023 The Disposition Holder must on request of the Regulatory Body, provide the Regulatory Body with acceptable evidence of insurance, in the form of a detailed certificate of insurance, prior to using or occupying the Lands and at any other time upon request of the Regulatory Body. On request, the Disposition Holder must promptly provide the Regulatory Body with a certified true copy of each policy.

024 Any insurance called for under this Disposition must be endorsed to provide the Regulatory Body with at least 30 days advance written notice of cancellation or material change.

Notices

025 The Disposition Holder must maintain current contact information with the Regulatory Body.

Interpretation

026 The headings used throughout this Disposition are inserted for convenience of reference only and do not form part of the Disposition.

027 A reference to any federal or provincial law or regulation or to any municipal bylaw shall be deemed to be a reference to the law, regulation or bylaw as may be amended, revised, repealed and replaced, or substituted from time to time.

General

028 For greater certainty, the Disposition Holder must comply with the terms of the attached indices, supplements, addendums and schedules, including:

a) Landscape Analysis Tool Report
b) Supplements
c) Condition Addendum (if applicable)
d) Or otherwise identified by the regulatory body

029 Should any term of the disposition be invalid or not enforceable, it must be severed from the Disposition and the remaining terms of the disposition must remain in full force and effect.

030 The Disposition Holder must:

a) generate and receive an Entry Confirmation Number through the Electronic Disposition System (EDS) within 72 hours of commencing the activity; and

b) provide other notifications in relation to the status of the activity as directed in writing by the Regulatory Body.

031 The Disposition Holder must comply with the direction as provided within the *Pre-Application Requirements for Formal Dispositions* document as amended and in effect on the date of issuance of this Disposition.

Landscape Analysis Tool (LAT) Report

LAT Number:	000005F4B1	**LAT Date:**	2023-03-09	10:30:54
Project Name:	22GLOG9042			
Project Description:	POWER STATION SITE (ELECTRICAL)			
Disposition Type:	DML	Miscellaneous Lease		
Purpose Type:	EDRA	Electrical		
Activity Type:	EDRA02DMLP	Power Station / Substation		

Responsibility of Applicants:

It is the applicant's responsibility to conduct a full review of the generated LAT Report, ensuring that you are aware and have a full understanding of the identified standards and conditions, and any additional limitations that may also be imposed by an approved higher level plan, reservation or notation or any other law or Order of the Province or the Government of Canada that may impact the placement, construction or operation of the proposed disposition, purpose and activity.

The applicant must assess if the proposed disposition, purpose and activity can meet the applicable standards, conditions and any limitations which will subsequently determine if the application can be submitted to the regulatory body. Applicants should complete a thorough review of regulatory and application processes including supporting procedural documents and the generated LAT Reports prior to making this determination.

Where the applicant chooses not to meet, or is not able to meet, one or more Approval Standards or higher level plans within the generated LAT Report as submitted as part of the application, or any affected reservations as identified within the land status report, the applicant is required to complete the appropriate mitigation as part of their supplement submission that addresses individually each of the items not being met.

The information provided within the LAT Tool is a spatial representation of features provided to the applicant for activity and land use planning. The accuracy of these layers varies depending on the resource value being represented. The regulatory body insists that site visits, wildlife surveys and groundtruthing efforts are completed to ensure that you, the applicant can meet the procedures detailed within the *Pre-Application Requirements for Formal Dispositions*, the identified approval standards, operating conditions and *Best Management Practices* as represented within the *Master Schedule of Standards and Conditions*.

Proximity to Watercourse/Waterbodies:

Applicants will ensure that standards or conditions for Watercourse/Waterbody features as identified within the generated LAT Report are followed. It is the responsibility of the applicant to ensure the identified setbacks and buffers are properly established through a pre-site assessment and maintained.

NOTE: Be aware that the submission of a LAT Report as part of an application submission does not imply approval of the activity. The standards and conditions identified within the LAT Report may be subject to change based on regulatory review.

Base Features

Green/White Area	Green Area
Municipality	Big Lakes County
FMA	Blue Ridge Lumber Inc.
FMU	W14
Provincial Grazing Reserve	
Rocky Mountain Forest Reserve	
PLUZ Areas	
Protected Areas	

Provincial Sanctuaries

Wildlife Corridors	
Restricted Area	
Game Bird	Zone 2
Seasonal	

Higher Level Plans

Integrated Resource Plan (Local)	
Integrated Resource Plan (Subregional)	
Access Management Plan	
Landscape Management Plan	

Additional Application Requirements

Wildlife Survey		DND Area	

Historical Resources

HRV Rating	Category

Historic Resources Application Required: No

While no specific historic resource concerns have been identified within the proposed activity area, Section 31 of the *Historical Resources Act* states that "a person who discovers a historic resource in the course of making an excavation for a purpose other than for the purpose of seeking historic resources shall forthwith notify the Minister of the discovery." Should a historic resource be encountered with the construction or operation of this disposition, information on who to contact can be found on the Ministry of Culture and Tourism's website in; Standard Requirements under the Historical Resources Act: Reporting the Discovery of Historic Resources.

Sensitive Features

Wildlife and Other Sensitive Species

	Intersected
Burrowing Owl Range	
Caribou Range	
Caribou Range - Zone A	
Caribou Range - Zone B	
Colonial Nesting Birds	
Critical Habitat of Aquatic Species at Risk	
Endangered and Threatened Plants Ranges	
Greater Short-horned Lizard Habitat	
Greater Short-horned Lizard Range	
Greater Sage Grouse Core Area	
Greater Sage Grouse Recovery Area	
Greater Sage Grouse Leks and Buffer	
Grizzly Bear Core Access Management Area	
Grizzly Bear Habitat Linkage	
Grizzly Bear Secondary Access Management Area	Yes
Grizzly Bear Support Zone	
High Risk Watersheds	Yes

	Intersected
Key Wildlife and Biodiversity Areas	
Mountain Goat and Sheep Areas Disease Buffer	
Mountain Goat and Sheep Zone	
Ord's Kangaroo Rat Range	
Ord's Kangaroo Rat Key Habitat Area	
Piping Plover Waterbodies	
Provincial Hibernacula Buffer	
Sensitive Amphibian Ranges	
Sensitive Raptor Range	
Sensitive Snake Habitat	
Sensitive Snake Hibernacula Range	
Sharp-tailed Grouse Leks and Buffer	
Sharp-tailed Grouse Survey	
Special Access Area	
Swift Fox Range	
Trumpeter Swan Waterbodies/Watercourse	
Trumpeter Swan Watercourse Buffer	

Federal Orders:

	Intersected
Greater Sage Grouse	

Grassland and Natural Regions:

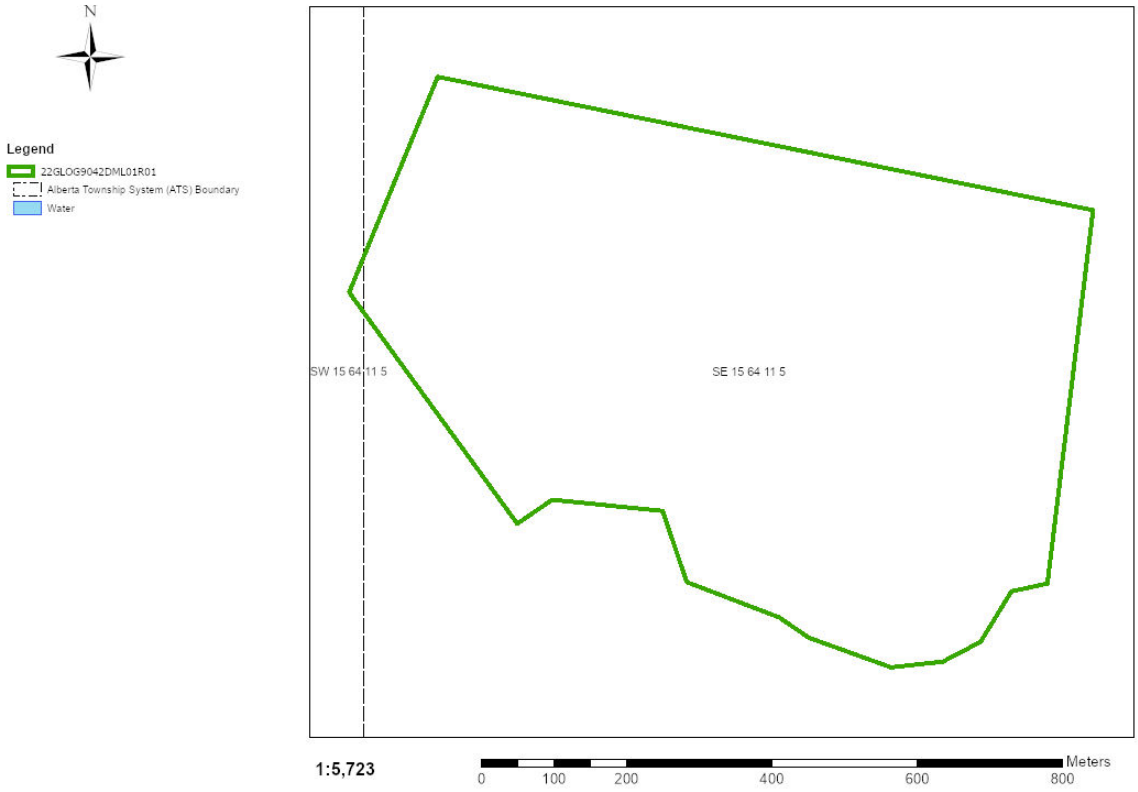
	Intersected
Central Parkland	
Central Parkland and Northern Fescue	
Chinook Grasslands	
Dry Mixed Grass	
Foothills Fescue	
Foothills Parkland Grasslands	
Grassland and Parkland Natural Region	

	Intersected
Mixed Grass Sub-region layer	
Montane	
Northern Fescue	
Peace River Parkland	
Permafrost	
Rough Fescue PNT	
Subalpine or Alpine	

Alberta Township System (ATS) Land List

Quarter	Section	Township	Range	Meridian	Road Allow.	Sensitive Features Identified
SE	15	64	11	5		Green / White Area,High Risk Watersheds,Grizzly Bear Secondary Access Management Area
SW	15	64	11	5		Green / White Area,High Risk Watersheds,Grizzly Bear Secondary Access Management Area

Landscape Analysis Tool (LAT) Report



Land Management

Report ID	Approval	Condition
1	1030-AS	Where an Integrated Resource Plan or a Reservation/Protective Notation identifies a greater set back, the greater set back will prevail.
2	1031-AS	Where a Higher Level Plan* exists, the Disposition Holder must follow any direction provided within that plan.
3	1033-AS	With the exception of pipelines, for activities that fall within any Protective Notation (PNT) lands with a purpose code 400 Series encompassing a section of land (259 hectares) or less, located in the Provincial White Area, the Disposition Holder must construct all activities within lands previously disturbed or cleared. Where no previous disturbance exists, activities must occur within 100 metres of the PNT.
4	1041	The Disposition Holder must maintain proper drainage of surface water.
5	1044-AS	The Disposition Holder must not locate activities within 45 metres from the top of any coulees* with the exception of activities such as; access, pipelines and linear easements crossing those features.
6	1049	The Disposition Holder must remove all garbage and waste material from this site.
7	1053	The Disposition Holder must not enter the boundaries of any research or sample plot unless consent is received from the reservation holder.
8	1061	Where FireSmart activities are considered, the Disposition Holder must follow Information Letter- “Authorization of FireSmart Activities on Public Land” as amended from time to time.

Vegetation

Report ID	Approval	Condition
9	1300	The disposition holder must manage all regulated weeds to the satisfaction of the regulatory body.
10	1302	"The Disposition Holder must remove all deciduous or coniferous merchantable timber from the Activity as per the following utilization standards; - Deciduous Timber: 15 cm Base/10 cm Top - Coniferous Timber: 15 cm Base/11cm Top and haul said timber to the location of end use."
11	1304	For fire control purposes on forested lands, the Disposition Holder must dispose of excess coarse woody debris* not utilized for rollback* or stockpiled for reclamation*.
12	1305	Within FireSmart Community Zones*, the Disposition Holder must dispose of coarse woody debris* by burning unless a Debris Management Plan has been approved under the Forest and Prairie Protection Act.

Soil

Report ID	Approval	Condition
13	1356	The Disposition Holder must not conduct the Activity during adverse ground conditions*.
14	1357	The Disposition Holder must prevent erosion* and sedimentation on to adjacent* Lands or Water bodies * that results from the activity.
15	1359-AS	The Disposition Holder must not remove from the Lands topsoil* or subsoil* unless approved in writing by the Regulatory Body.
16	1360	"Where activities have occurred on the Lands that do not involve minimal disturbance* construction, the Disposition Holder must salvage topsoil* for land reclamation as follows: a. Salvage all topsoil* from: i. Mineral soils ii. Shallow organic soils* iii. Reclaimed soils b. Where the depth of the topsoil* is less than 15 cm, the topsoil* and part of the subsoil* to a total depth of 15 centimetres must be salvaged, unless the upper subsoil* is considered chemically unsuitable*."
17	1363	All reclamation material* must be considered suitable as defined in the May 2001 Salt Contamination Assessment Guidelines and meet the February 2016 Alberta Tier 1 Soil and Groundwater Remediation Guidelines, as amended or replaced from time to time.
18	1365	"The Disposition Holder must store reclamation material* in accordance with all of the following: a. reclamation material* must not be placed beneath the ground surface or buried in any way; b. coarse woody debris* stored for reclamation purposes for greater than 12 months must be mixed with topsoil*; and c. topsoil* and subsoil* must be stored separately."
19	1367	The Disposition Holder must not mix wood chips with any reclamation material*.
20	1368	The Disposition Holder must not apply wood chips to the lands at a depth greater than five (5) centimeters.
21	1369	The Disposition Holder must manage wood chips in accordance with the directive ID 2009-01 Management of Wood Chips on Public Land as amended from time to time.
22	1370	The Disposition Holder must not store piles or windrows of reclamation material* within standing timber.
23	1371	The Disposition Holder must not use soil sterilant on the Lands.

Watercourse / Waterbody

Report ID	Approval	Condition
24	1402-AS	The Disposition Holder must not conduct the Activity within the following watercourse* setbacks from the top of the breaks: a. Intermittent watercourses* including springs must have a setback of at least 45 metres. b. Small Permanent watercourses* must have a setback of at least 45 metres. c. Large Permanent watercourses* must have a setback of at least 100 metres.
25	1412	The Disposition Holder must acquire an authorization for access (off-disposition) for water withdrawal activities.
26	1419	For use of equipment within the bed of a water body*, the Disposition Holder must prior to operations follow the “Decontamination Protocol for Work in or Near Water”, as amended from time to time.
27	1420	The Disposition Holder must provide a completed Record of Decontamination form as proof of decontamination to the Regulatory Body upon request.

Reclamation

Report ID	Approval	Condition
28	1451	For progressive reclamation* on forested lands*, the Disposition Holder must replace all reclamation materials* that have been salvaged in accordance with all of the following: a. all salvaged subsoil* must be replaced, then all salvaged topsoil*; and b. reclamation materials* must be replaced over the entire progressive reclamation area*; unless otherwise approved in writing by the Regulatory Body.
29	1453	The Disposition Holder must complete temporary reclamation* on the Lands within 1 growing season of construction phase* for all topsoil* and subsoil* stockpiles required for final reclamation*.
30	1454	The Disposition Holder must prior to seeding herbaceous seed in forested* or peatlands* submit a Request for Seeding in writing to the Regulatory Body that contains all of the following: a. rationale for conducting seeding of herbaceous species*; b. a description of the proposed site for seeding including information with respect to the following: i. whether the Lands are subject to high erosion* and; ii. whether the Lands are prone to invasion from agronomic or weed species. c. a proposed seed mix composition for re-vegetation of the Lands in accordance with the Native Plant Revegetation Guidelines for Alberta, 2001 as amended or replaced from time to time or a rationale for alternate species; d. provide a seed certificate in accordance with the Seed Act for the seed mixed mix to be used for re-vegetation* and; any other information requested by the Regulatory Body.

31	1455	The Disposition Holder must only conduct seeding in accordance with the written authorization of the Regulatory Body.
32	1456	The Disposition Holder must when seeding cultivated lands*; a. use agronomic or forage seed that meets or exceeds Certified #1 as outlined in the Seeds Act and Seeds Regulations; b. use seed mixes that are free of species listed in the Weed Control Act and; c. provide a seed certificate to the Regulatory Body within 30 days of request.
33	1457	Within the Green Area* of the Province, the Disposition Holder must re-vegetate the Lands with trees or shrubs that meet the requirements of the December 2016 Alberta Forest Genetic Resource Management and Conservation Standards document, as amended or replaced from time to time.
34	1459	The Disposition Holder must not have slash and rollback* accumulations within five (5) metres of the perimeter of the disposition boundary, greater than the percent ground cover on the surrounding undisturbed forest floor.
35	1461	The Disposition Holder must complete progressive reclamation* on forested lands* for all associated and incidental disturbances to the Disposition.
36	1462	The following activities are excluded from progressive reclamation* requirement on forested lands*: a) Lands that have received authorization for clay pad construction; and b) Lands with a 4:1 or steeper slopes where a cut and fill has been constructed to level the ground surface.
37	1463	For final reclamation*, the Disposition Holder must complete all of the following: a. contour the disturbed land to the pre-disturbance landform or to the landform approved by the Regulatory body; b. replace all stockpiled subsoil*, then replace all stockpiled topsoil*; c. spread all coarse woody debris* on forested lands* and; d. reclamation materials* must be replaced over the entire area from which they were removed unless otherwise approved in writing by the Regulatory Body.
38	1464	The Disposition Holder must reclaim the Lands to the pre-disturbance land use type* unless otherwise authorized in writing by the Regulatory Body.

Wildlife

Report ID	Approval	Condition
39	1600	The Disposition Holder must conduct a complete and immediate Wildlife Sweep* of the Lands subject to the disposition prior to any activity, as per the “Wildlife Sweep Protocol”.
40	1601	The Disposition Holder must submit observations from a Wildlife Sweep* to the Fisheries and Wildlife Management Information System (FWMIS) and notify the issuing Regulatory Body in writing upon request that the Wildlife Sweep* was completed.

41	1602-AS	The Disposition Holder must incorporate a buffer* zone of a minimum width of 100m undisturbed vegetation, where an established buffer* does not already exist for any and all key habitat features including, but not limited to leks*, nests, dens and houses identified in the Wildlife Sweep*.
42	1603	When Wildlife Surveys* are required, the Disposition Holder must submit results as defined by the sensitive species inventory guidelines from Wildlife Survey* to the Fisheries and Wildlife Management Information System (FWMIS).
43	1608	The Disposition Holder must incorporate buffers*, setbacks and activity timing restrictions for any and all key habitat features including, but not limited to leks*, nests, dens and houses identified in the wildlife survey*.

Grizzly Bear

Report ID	Approval	Condition
44	1934-AS	The Disposition Holder must construct within 100 metres of an existing arterial all-weather permanent access.
45	1935	The Disposition Holder must not seed legumes.
46	1936	The Disposition Holder must re-vegetate activities, associated facilities and clearings to vegetative species compatible and consistent with the adjacent vegetation type.

LAND DESCRIPTION

PURPOSE: Electrical

ACTIVITY: Power Station / Substation

PLAN NUMBER: 148184 MS

PLAN VERSION DATE: 2023-05-04

AFFECTED LANDS:

Qtr/LS	Sec	Twp	Rge	Mer	Qtr/LS	Sec	Twp	Rge	Mer
SE	15	64	11	5	SW	15	64	11	5

Application Supplement - Miscellaneous

Submitted Date:	2023-03-20 08:45:00	Application Supplement Number:	AS2022000702
Disposition Type:	DML	Purpose Assigned Code:	EDRA02DMLP
Purpose/Activity Type:	Electrical - Power Station / Substation		
Project Name:	Maskwa Power Station		

A. Project/Construction Description

1. Does the proposed activity generate any waste as defined in the Alberta User Guide for Waste Managers? No

   If Yes, describe the waste disposal method

2. Does the proposed activity generate any sewage? No

   If Yes, indicate the amount of waste in M3:

   If Yes, describe the disposal Method

3. Identify all aspects of vegetation removal/management:

   a) Is merchantable timber present? Yes

   b) Describe your method of site clearing:

   Salvageable timber will be cut and decked for use by FMA holder. Excess woody debris not required for rollback or reclamation will be disposed of by burning during winter conditions.

   c) Brush disposal: (select all that apply)

   ☐ Rollback ☐ Mulch ☐ Spread ☒ Pile & Burn ☐ N/A ☐ Other:

4. Topsoil Handling:

   a) Method: Stripping - Single Lift

   Describe soil storage and potential debris storage for site clearing:

   Soil storage areas will be to the west of the DML lands, and applied for under a separate DML application. Soils will be stripped as single lift but second lift of parent material for contouring and levelling will be required. All soil storage areas will be clearly identified for use in interim and final reclamation.

5. Site Profile (Upland/Wetland area): Define in hectares the amount of Upland and Wetland area that is present within the proposed disposition area prior to construction:

   Upland area: 18.54 (ha) **Wetland** area: 0.897 (ha)

B. Land Standing Review

1. Based on the Detailed Lands Standing search of the affected lands, were any reservations/notations identified?

   No

2. Based on the LAT Report and the Detailed Land Standing search of the affected lands, were any government approved higher level plans identified?

   No

   If **Yes**, identify the government approved higher level plan within the table below, identify the direction as identified within Table 5 of the Pre-Application Requirements for Formal Dispositions and when contact was made, if required.

Higher Level Plan Name	
Table 5 Direction	Date of Contact (if required)

Higher Level Plan Name	
Table 5 Direction	Date of Contact (if required)

   Note: Approving staff may request the notification or referral response documents at any time to support land use decisions or compliance and assurance purposes.

3. Based on the LAT Report, is an approval under the Historical Resources Act Required? No

   Historical Resources Application Number:

   Date Application was Submitted:

C. Site Sensitivity

1. Was a Wildlife Survey required for this activity based on the LAT Report?

   No If Yes, complete the next question.

2. Did the Wildlife Survey identify any of the sensitive species listed below?

   If Yes, select all that apply:

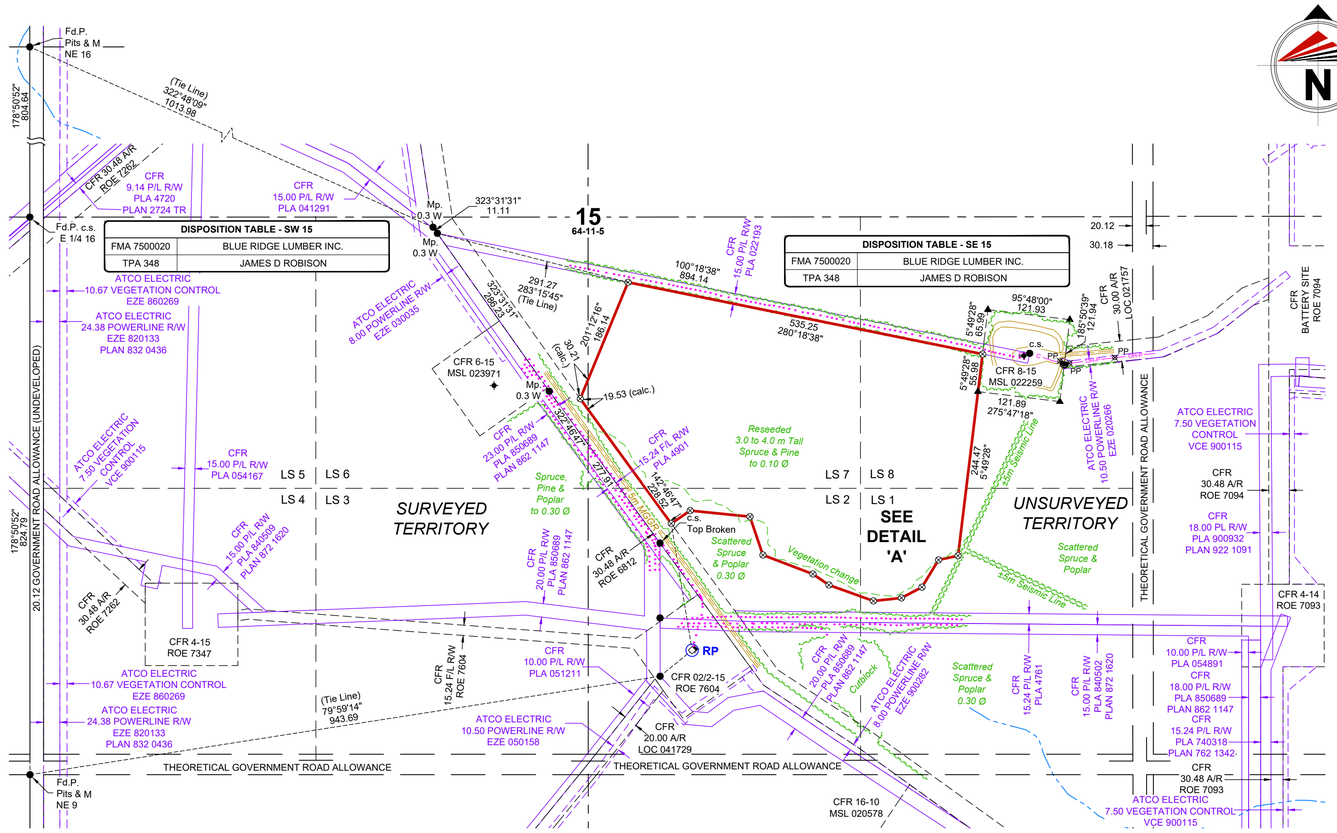
   - ☐ Sensitive Raptor Nest
   - ☐ Burrowing Owl Den/Nest
   - ☐ Sensitive Snake Rookery
   - ☐ Sensitive Snake Hibernacula
   - ☐ Endangered/threatened plant species:
   - ☐ Sharp Tailed Grouse Lek
   - ☐ Active Swift Fox Den
   - ☐ Ord's Kangaroo Rat Den
   - ☐ Eastern Short-Horned Lizard Coulee or Valley Edge

D. Incidental Activities

The details of all incidental activities identified on your application plan must be provided in the following table. All fields must be filled out properly in order to be processed by the regulating body.

NOTE: Incidental activities shown on the authorized plan that comply with the PLAR Approval and Authorizations Procedures shall be permitted during the term of a Short Term Disposition. This approval is limited to: borrow pits, log decks, temporary work spaces, push outs and bank stabilization, within identified sizing limits.

The disposition holder must obtain a separate TFA before commencing any incidental activities or temporary uses which are not shown on the authorized plan or those that do not comply with the *PLAR Approval and Authorizations Procedures.*



Access Route Information

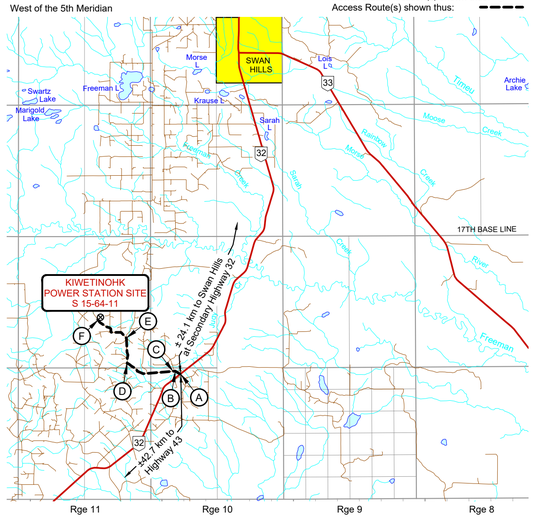
Length (km)		Road/Disposition	Owner
A - B	0.5	LOC 840703	CONIFER ENERGY INC.
B - C	0.2	ROE 6190	CONIFER ENERGY INC.
C - D	3.7	ROE 6400	CONIFER ENERGY INC.
D - E	1.9	ROE 6721	CONIFER ENERGY INC.
E - F	2.8	ROE 6812	CONIFER ENERGY INC.

Access Sketch - SCALE: 1:250,000

0 5 10 15 20 KILOMETRES

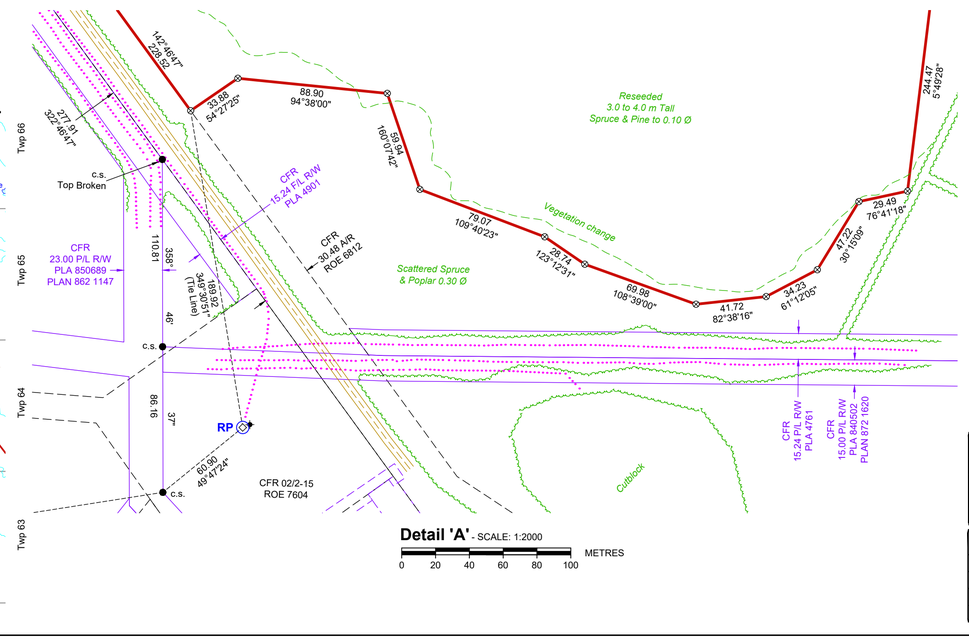
West of the 5th Meridian

Power Station location(s) shown thus: ⊗
Access Route(s) shown thus: - - -



Detail 'A' - SCALE: 1:2000

0 20 40 60 80 100 METRES



HISTORICAL RESOURCES TABLE

** Alberta Culture & Tourism - Fall 2022 listing **

Location	LSD(s)	HRV	Category
SE 15-64-11 W5	N/A	N/A	N/A
SW 15-64-11 W5	N/A	N/A	N/A

WILDLIFE SENSITIVITY TABLE

Location	Sensitive Feature(s)
15-64-11 W5	GRIZZLY BEAR ZONE

WETLAND AREAS

Wetland areas were not confirmed by a Qualified Wetlands Specialist

Activity	Wetland	Upland
Power Station Site	0.000 ha.	18.540 ha.

DISPOSITION AREAS - FMA 7500020

Type	Hectares	Acres
Power Station Site (within existing dispositions)	0.000	0.00
Power Station Site (outside existing dispositions)	18.540	45.81
Power Station Site Total	18.540	**45.81**

VEGETATION AREAS

Type	Hectares	Acres
Power Station Site (new cut)	18.540	45.81
Power Station Site (existing cut)	0.000	0.00
Storage Site Total	**18.540**	**45.81**

ABBREVIATIONS

A/R	access road	km	kilometre	Rge.	range
calc.	calculated	LS	legal subdivision	RP	Geo-reference Point
c.s.	countersunk	M.	mound or meridian	R/W	right-of-way
CSRS	Canadian Spatial Reference System	m	metre	S	south
E	east	MGGR	medium grade gravel road	Sec.	section
Fd.	found	Mp.	marker post	Twp.	township
F/L	flowline	N	north	UTM	Universal Transverse Mercator
GNSS	Global Navigation Satellite System	NRCAN	Natural Resources Canada	W	west
ha.	hectare	NAD83	North American Datum of 1983	Ø	diameter
I.	statutory iron post	PPP	Precise Point Positioning		
		P/L	pipeline		
		P.	standard brass cap		
		Pit	4 pits		

LEGEND & NOTES

	Placed	Found
Statutory Iron Post:		●
Iron Bar:	◇	
Iron Spike:		▲
Non-monumented position:	⊗	
Existing well head:	✦	
Power pole:	✕PP	
Anchor:		⚓

Areas dealt with by this plan:
Buried pipe:
Power line: ONLP
Buried cable: C
Tree line:
Vegetation change:

Surface Land Status: Crown
Public Land Standing Search Date: Mar 7, 2023

DISCLAIMER:

1. This plan represents the best information available at the time of survey. Not all underground facilities may be shown on this plan. **Beairsto & Associates Engineering Ltd.** and its employees will assume no responsibility for the location of any underground facilities. Locations of such are approximate and should be verified by the respective authorities, prior to construction.

ALBERTA ONE CALL 1-800-242-3447
www.albertaonecall.com

2. Unless otherwise noted, Wetlands shown on this plan were not identified by a qualified Wetlands Specialist and this plan is not intended to be used for Water Act approvals.

GEO-REFERENCING

Geo-reference point is shown thus: ..... ◯ RP
Northing: 6043657.29
Easting: 592267.95
} Derived from NRCAN PPP
Projection / Datum: UTM, NAD83 (CSRS) EPOCH 2002
Reference Meridian: 117° W (Zone 11)
Combined scale factor: 0.999534
Bearings are grid, derived from GNSS observations.
Distances are ground and in metres and decimals thereof.

KIWETINOHK ENERGY

SKETCH PLAN SHOWING
LOCATION OF

POWER STATION SITE (ELECTRICAL)

WITHIN

SW 1/4 SEC. 15, TWP. 64, RGE. 11, W5M.

AND WITHIN THEORETICAL

SE 1/4 SEC. 15, TWP. 64, RGE. 11, W5M.

BIG LAKES COUNTY

SCALE: 1:5000

0 250 500 METRES

AREAS REQUIRED

Type	Hectares	Acres
Power Station Site	18.540	45.81
Total	**18.540**	**45.81**

Rev	Date	Description	pc	dwn	chk
00	Aug. 9/22	Original Issue	kd	jw	ma/db
01	Mar 8/23	Revise Site Boundary	-	jl	ma
02	-	-	-	-	-
03	-	-	-	-	-
04	-	-	-	-	-

Beairsto & Associates
ENGINEERING & SURVEY
10940 - 92 Avenue, Grande Prairie, AB T8V 6B5
P: 1 855 879 5973 W: www.baseng.ca

22GLOG9042

J:\Jobs\2022\22GLOG9042\CAD\Drafting\DML01\R01\22GLOG9042-DML01R01.dwg

DML230030 EPA Plan: 148184 MS, 2023-05-04, CR

DML230030 EPA Plan: 148184 MS, 2023-05-04, CR

Signature Page

Pursuant to the *Public Lands Act*, RSA 2000, c P-40, this disposition is issued on the date noted above subject to the attached terms and conditions.

UserName: darrell.kentner
Title: NE Lands Manager
Date: Thursday, 05 October 2023, 03:13 PM Mountain Daylight Time
Meaning:
==========

Appendix F – Adequacy Assessment

Adequacy Assessment

File Number for Consultation: FNC202300400 Date of Submission: 2023/03/20

Client Project Name: Power Station Site S 15-64-11-W5M

The Aboriginal Consultation Office has reviewed the consultation records regarding the proposed projects provided by

KIWETINOHK ENERGY CORP.

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 adequacy for each activity number. The proponent may proceed with their regulatory applications for those activities deemed Adequate.

Be advised that this notice does not grant the client any authority to make application for any use of land not identified within this notification.

Reviewed by: Alton, Caitlin Date of Review: 2023/03/20

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

Phone Number: (780)644-7154 Email Address: caitlin.alton@gov.ab.ca

Supporting Comments/Direction:

Already deemed adequate under FNC202204642.

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.

Adequacy Assessment

Activity Number	Disp Type	Program Type	Source Line Spacing	Regulator	Purpose Type	Activity Area/Distance	Land Use Area
FNC202300400-001	DML			AEP	Electrical - Power Station / Substation	18.54 HA	Upper Athabasca Region

ATS Legal - From	ATS Legal - To
SW 15 64 11 5	SE 15 64 11 5

Action Required	Already Deemed Adequate
Adequacy	Already Deemed Adequate

First Nation(s) / Metis Settlement(s)			
	Driftpile Cree Nation	Paul First Nation	Sucker Creek First Nation
	East Prairie Metis Settlement	Sawridge First Nation	Swan River First Nation
	Kapawe'no First Nation	Sturgeon Lake Cree Nation	

Activity Number	Disp Type	Program Type	Source Line Spacing	Regulator	Purpose Type	Activity Area/Distance	Land Use Area

ATS Legal - From	ATS Legal - To

Action Required	
Adequacy	

First Nation(s) / Metis Settlement(s)			

Activity Number	Disp Type	Program Type	Source Line Spacing	Regulator	Purpose Type	Activity Area/Distance	Land Use Area

ATS Legal - From	ATS Legal - To

Action Required	
Adequacy	

First Nation(s) / Metis Settlement(s)			

Adequacy Assessment

File Number for Consultation: FNC202204642 Date of Submission: 2022/08/15

Client Project Name: KIWETINOHK - DML

The Aboriginal Consultation Office has reviewed the consultation records regarding the proposed projects provided by

KIWETINOHK ENERGY CORP.

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 adequacy for each activity number. The proponent may proceed with their regulatory applications for those activities deemed Adequate.

Be advised that this notice does not grant the client any authority to make application for any use of land not identified within this notification.

Reviewed by: Garritty, Kalina Date of Review: 2023/03/31

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

Phone Number: (780)644-4883 Email Address: kalina.garritty@gov.ab.ca

Supporting Comments/Direction:

Consultation deemed adequate and approved with buffer.

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.

Adequacy Assessment

Activity Number	Disp Type	Program Type	Source Line Spacing	Regulator	Purpose Type	Activity Area/Distance	Land Use Area
FNC202204642-001	DML			AEP	Electrical - Power Station / Substation	21.004 HA	Upper Athabasca Region

ATS Legal - From	ATS Legal - To	First Nation(s) / Metis Settlement(s)			
SW 15 64 11 5	SE 15 64 11 5	Driftpile Cree Nation	East Prairie Metis Settlement	Kapawe'no First Nation	
		Paul First Nation	Sawridge First Nation	Sturgeon Lake Cree Nation	
Action Required	Adequate	Sucker Creek First Nation	Swan River First Nation		
Adequacy	Adequate				

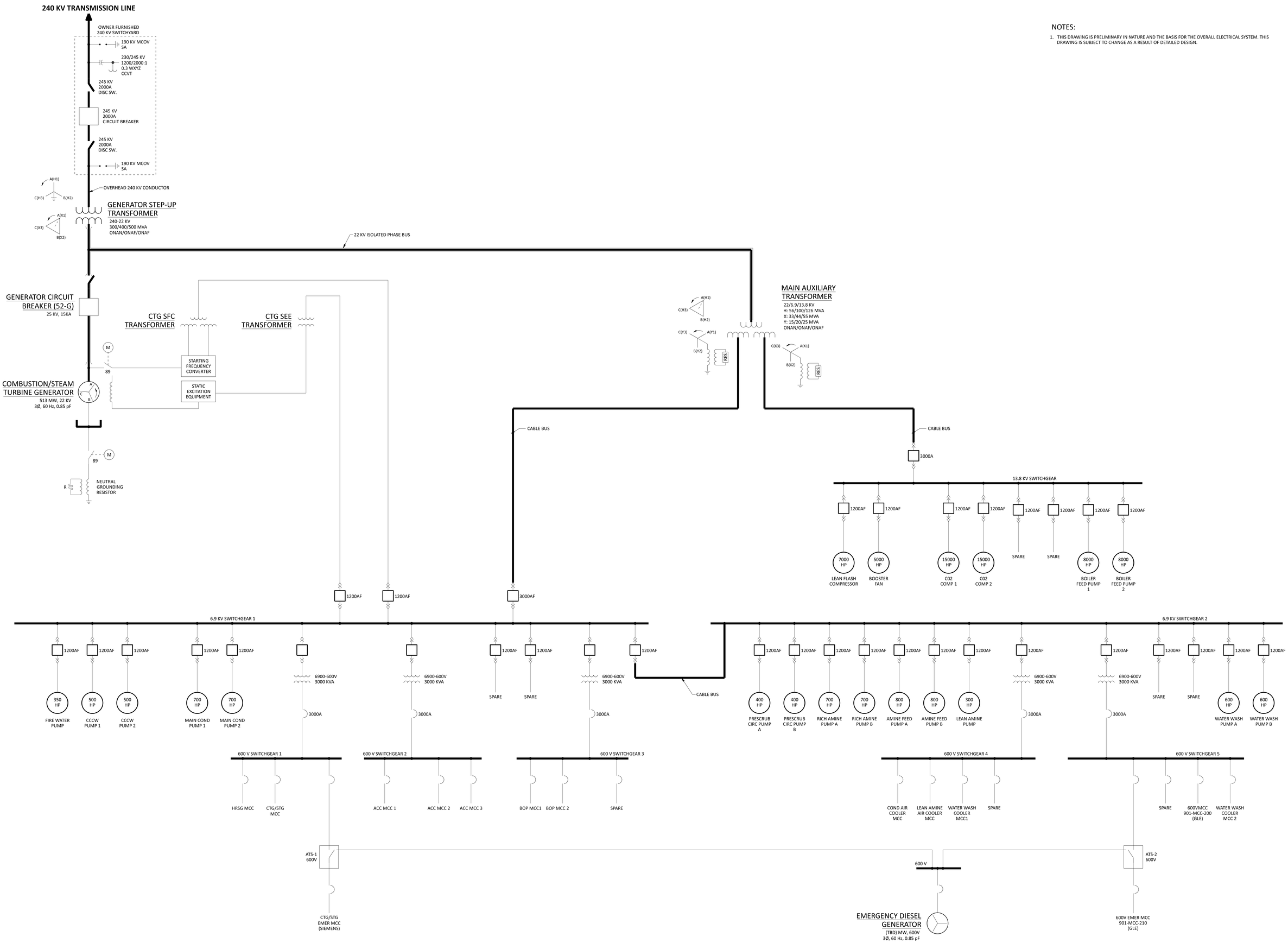
Activity Number	Disp Type	Program Type	Source Line Spacing	Regulator	Purpose Type	Activity Area/Distance	Land Use Area

ATS Legal - From	ATS Legal - To	First Nation(s) / Metis Settlement(s)			
Action Required					
Adequacy					

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					
Adequacy					

Appendix G – Plant Site Drawings, PFDs, P&IDs



NOTES:

1. THIS DRAWING IS PRELIMINARY IN NATURE AND THE BASIS FOR THE OVERALL ELECTRICAL SYSTEM. THIS DRAWING IS SUBJECT TO CHANGE AS A RESULT OF DETAILED DESIGN.

NOT TO BE USED FOR CONSTRUCTION

THE DISTRIBUTION AND USE OF THE NATIVE FORMAT CAD FILE OF THIS DRAWING IS UNCONTROLLED. THE USER SHALL VERIFY TRACEABILITY OF THIS DRAWING TO THE LATEST CONTROLLED VERSION.

NO	DATE	REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	PDE	APP
0	15/DEC/2022	ISSUED FOR PERMITTING	AKQ	RBS		RBS	JEB

BLACK & VEATCH Building a world of difference®

DESIGNER	DRAWN
RBS	AKQ
CHECKED	DATE

KIWETINOHK ENERGY CORPORATION
MASKWA COMBINED CYCLE WITH CARBON CAPTURE
OVERALL ELECTRICAL SYSTEM
ONE LINE DIAGRAM

PROJECT	DRAWING NUMBER	REV
412155-CAPU-E1001		0
CODE		
AREA		

MicroStation v10.15.0.74
qa#73802
12/13/2022 11:15:01 PM

ITEM NO.	EQUIPMENT NAME
128	MAKEUP AMINE TANK
129	AMINE DRAIN TANK
130	STRIPPER OVERHEAD ACCUMULATOR
131	LEAN FLASH TANK
132	CONDENSATE FLASH TANK
133	HYDROGEN STORAGE TRAILER
134	HRSG DRUM PENTHOUSE
135	FUEL GAS COMPRESSOR BUILDING

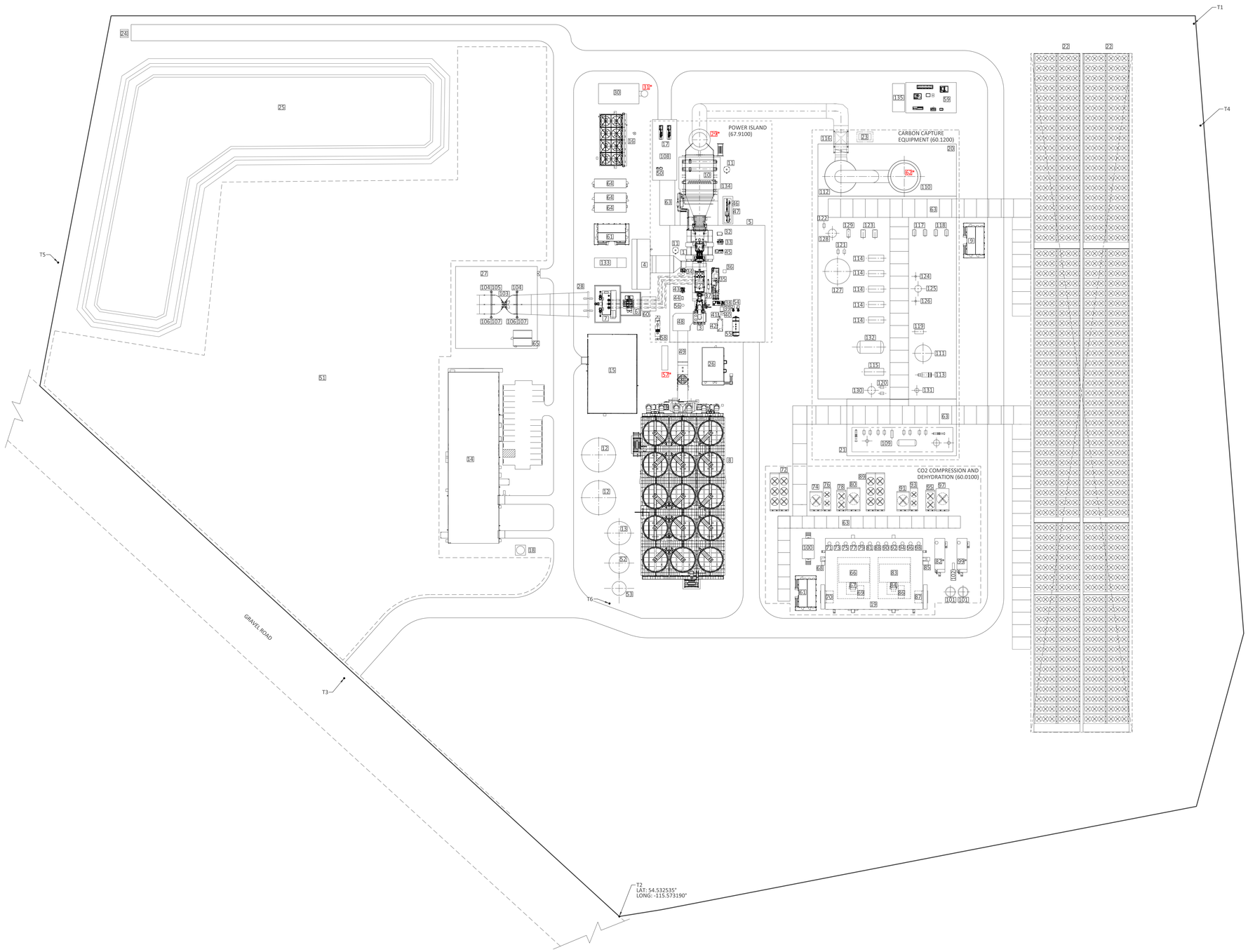
ITEM NO.	EQUIPMENT NAME
111	CO2 STRIPPER
112	PRESCRUBBER
113	STRIPPER REBOILER
114	LEAN / RICH EXCHANGER
115	LEAN FLASH COMPRESSOR
116	BOOSTER FAN
117	WASH WATER PUMPS
118	RICH AMINE PUMPS
119	LEAN AMINE PUMP
120	STRIPPER REFLUX PUMPS
121	AMINE FEED PUMPS
122	MAKEUP AMINE PUMP
123	WATER WASH PUMPS
124	LEAN AMINE PRE-FILTER
125	ACTIVATED CARBON FILTER
126	LEAN AMINE POST-FILTER
127	LEAN AMINE TANK

ITEM NO.	EQUIPMENT NAME
94	FOURTH STAGE SUCTION SCRUBBER (TRAIN-2)
95	FIFTH STAGE COOLER (TRAIN-2)
96	FIFTH STAGE DISCHARGE SCRUBBER (TRAIN-2)
97	EIGHTH STAGE COOLER (TRAIN-2)
98	SIXTH STAGE SUCTION SCRUBBER (TRAIN-2)
99*	CO2 DEHYDRATION PACKAGE (TRAIN-2)
100	LOW VOLTAGE MCC BUILDING
101	STILL VENT CONDENSING TANK
102	GLYCOL MAKE-UP TANK
103	240 KV CIRCUIT BREAKER
104	240 KV LINE DISCONNECT
105	240 KV CCVT
106	240 KV SURGE ARRESTOR
107	240 KV H-FRAME
108	BOILER FEEDWATER PUMP BUILDING
109	THERMAL RECLAIMER
110	CO2 ABSORBER

ITEM NO.	EQUIPMENT NAME
77	FOURTH STAGE SUCTION SCRUBBER (TRAIN-1)
78	FIFTH STAGE COOLER (TRAIN-1)
79	FIFTH STAGE DISCHARGE SCRUBBER (TRAIN-1)
80	EIGHTH STAGE COOLER (TRAIN-1)
81	SIXTH STAGE SUCTION SCRUBBER (TRAIN-1)
82*	CO2 DEHYDRATION PACKAGE (TRAIN-1)
83	8 STAGE INTEGRALLY GEARED CENTRIFUGAL COMPRESSOR (TRAIN-2)
84	9.7 MW SYNCHRONOUS ELECTRIC MOTOR (TRAIN-2)
85	SYNCHRONOUS ELECTRIC MOTOR COOLING AIR HANDLER (TRAIN-2)
86	COMPRESSOR LUBE OIL SKID (TRAIN-2)
87	COMPRESSOR LUBE OIL COOLER (TRAIN-2)
88	FIRST STAGE SUCTION SCRUBBER (TRAIN-2)
89	FIRST STAGE COOLER (TRAIN-2)
90	SECOND STAGE SUCTION SCRUBBER (TRAIN-2)
91	SECOND STAGE COOLER (TRAIN-2)
92	THIRD STAGE SUCTION SCRUBBER (TRAIN-2)
93	THIRD STAGE COOLER (TRAIN-2)

ITEM NO.	EQUIPMENT NAME
39	STEAM TURBINE HYDRAULIC SKID
40	H2 GAS DRYER
41	H2 GAS SKID
42	STATOR WATER COOLING SKID
43	GLAND STEAM CONDENSER
44	GENERATOR NEUTRAL GROUNDING CUBICLE
45	FUEL GAS PURGE AIR COMPRESSOR AND TANK
46	FUEL GAS FINAL FILTER & PREHEATER SKID
47	FUEL GAS FINAL FILTER & PREHEATER ENCLOSURE
48	HOT BOX
49	ACC MAIN STEAM DUCT
50	CONDENSATE RECIRC. PUMP
51	LAYDOWN AREA (APPROX 20 ACRES)
52	RAW WATER STORAGE TANK
53	WASTEWATER STORAGE TANK
54	CONDENSATE EXTRACTION PUMPS
55	CONDENSATE COLLECTION TANK
56	STEAM TURBINE DRAINS TANK
57*	EMERGENCY DIESEL GENERATOR
58	OIL WATER SEPARATOR (BELOW GRADE)
59	FUEL GAS YARD
60	GENERATOR BREAKER
61	MV PDC
62*	ABSORBER STACK
63	UTILITY RACK
64	GT/ST/AUXILIARY POWER CONTROL CENTER
65	240KV CONTROL BUILDING
66	8 STAGE INTEGRALLY GEARED CENTRIFUGAL COMPRESSOR (TRAIN-1)
67	9.7 MW SYNCHRONOUS ELECTRIC MOTOR (TRAIN-1)
68	SYNCHRONOUS ELECTRIC MOTOR COOLING AIR HANDLER (TRAIN-1)
69	COMPRESSOR LUBE OIL SKID (TRAIN-1)
70	COMPRESSOR LUBE OIL COOLER (TRAIN-1)
71	FIRST STAGE SUCTION SCRUBBER (TRAIN-1)
72	FIRST STAGE COOLER (TRAIN-1)
73	SECOND STAGE SUCTION SCRUBBER (TRAIN-1)
74	SECOND STAGE COOLER (TRAIN-1)
75	THIRD STAGE SUCTION SCRUBBER (TRAIN-1)
76	THIRD STAGE COOLER (TRAIN-1)

ITEM NO.	EQUIPMENT NAME
1	COMBUSTION TURBINE GENERATOR
2	TURBINE GENERATOR
3	STEAM TURBINE
4	INLET AIR FILTER
5	GENERATION BUILDING
6	AUXILIARY TRANSFORMER
7	GENERATOR STEP-UP TRANSFORMER
8	AIR COOLED CONDENSER
9	LV CCS PDC
10	HEAT RECOVERY STEAM GENERATOR
11	BLOW DOWN TANK
12	FIREWATER / SERVICE WATER STORAGE TANKS
13	DEMINERALIZED WATER TANK
14	ADMIN BUILDING
15	WATER TREATMENT BUILDING
16	AUXILIARY COOLING HEAT EXCHANGER
17	BOILER FEEDWATER PUMPS
18	SANITARY DRAINS STORAGE TANK
19	MAIN CO2 COMPRESSION BUILDING
20	CARBON CAPTURE BUILDING
21	THERMAL RECLAIMER BUILDING
22	CARBON CAPTURE AIR COOLERS
23	CEMS
24	STORMWATER PUMP BUILDING
25	STORM RETENTION POND
26	LV ACC PDC
27	SWITCH YARD
28	240 KV OVERHEAD LINES
29*	HRSG STACK
30	AUXILIARY BOILER
31*	AUXILIARY BOILER STACK
32	MOBILE COMPRESSED CLEANING SKID
33	THERMAL MANAGEMENT BLOWER SKID
34	INST. AIR COMPRESSOR & AIR RECEIVER TANKS
35	LUBE OIL & HYDRAULIC SKID
36	MOBILE LUBE OIL PURIFIER
37	BEARING EXHAUSTER SKID & SEAL OIL STORAGE TANK
38	SEAL OIL SKID



TERMINAL POINTS	
T1	FUEL GAS
T2	RAW WATER FROM CARSON LAKE
T3	PLANT ACCESS ROAD
T4	WELL WATER FROM JUDY CREEK
T5	240kV TRANSMISSION LINES
T6	WASTEWATER (HAUL BY TRUCK)

NOTES

1. SITE PLAN IS CONCEPTUAL IN NATURE. NOT ALL EQUIPMENT IS REPRESENTED OR OF ACTUAL SIZE.
2. ALL EMISSION SOURCES ON THE SITE ARE DENOTED WITH AN ASTERISK (*) AND IN RED FONT.

SYMBOLS

- PROJECT BOUNDARY
- CO2 COMPRESSION AND DEHYDRATION (61.0100)
- CARBON CAPTURE EQUIPMENT (60.1200)
- POWER ISLAND (67.9100)

NOT TO BE USED FOR CONSTRUCTION

THE DISTRIBUTION AND USE OF THE NATIVE FORMAT CAD FILE OF THIS DRAWING IS UNCONTROLLED. THE USER SHALL VERIFY TRACEABILITY OF THIS DRAWING TO THE LATEST CONTROLLED VERSION.

NO	DATE	REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	PDE	APP
				GMT	JEB		
1	08/FEB/23	REVISED PROJECT NAME AND SHIFTED SITE	PDN	JSH		GMT	JEB
0	15/DEC/22	ISSUED FOR PERMITTING	PDN	JSH		GMT	JEB

1:750 — 0 20 40 60 — SCALE IN METERS

BLACK & VEATCH

DESIGNER	DRAWN
JSH	PDN
CHECKED	DATE

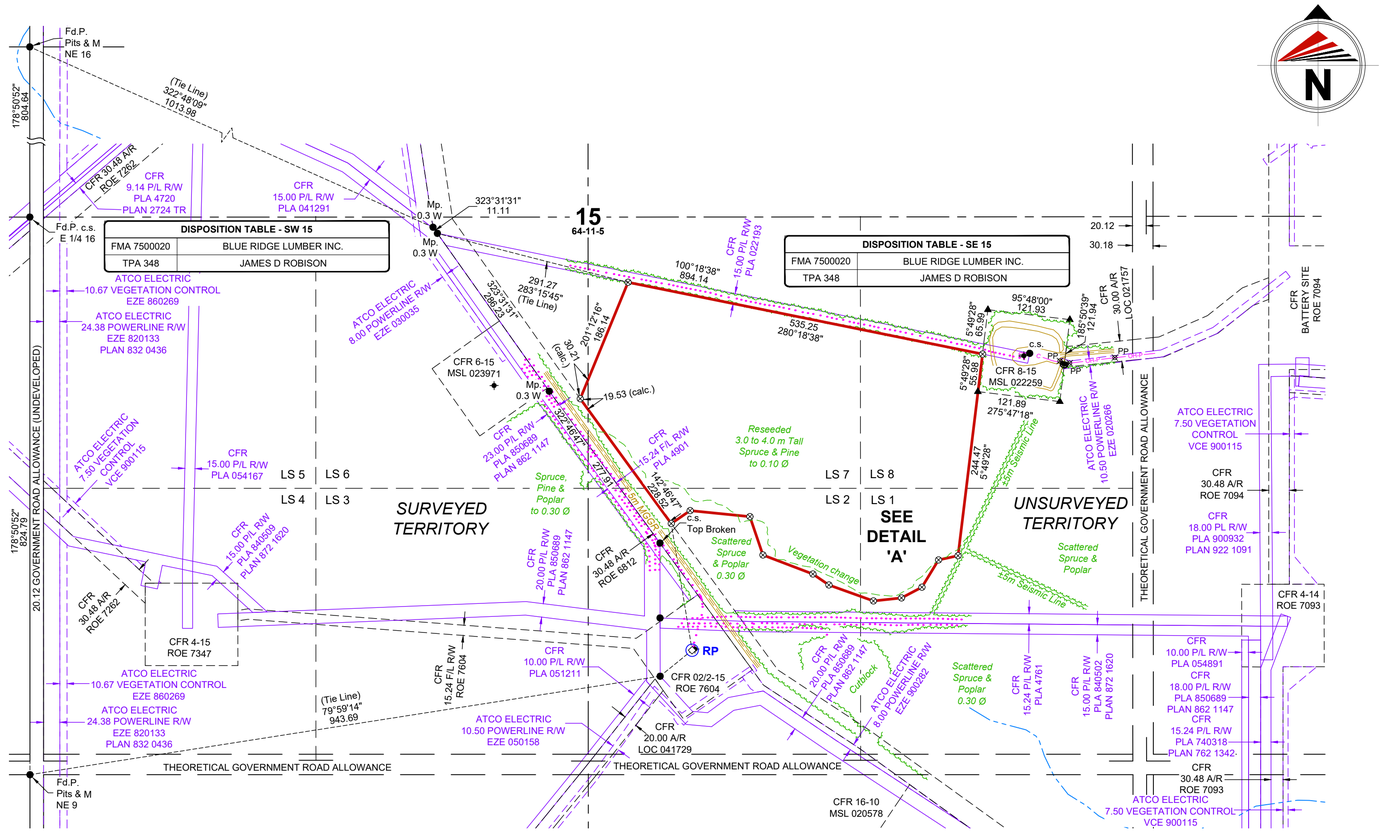
KIWETINOHK ENERGY CORP
BLACK BEAR COMBINED CYCLE WITH CCS

GENERAL
SITE ARRANGEMENT

PROJECT	DRAWING NUMBER	REV
412155-00AAA-G1000		1
CODE		
AREA		

user:55714
Acad MicroStation v10.11.0.36
02/08/2023 12:18 PM Full Size 1:1

Appendix H – Survey Plans



Access Route Information

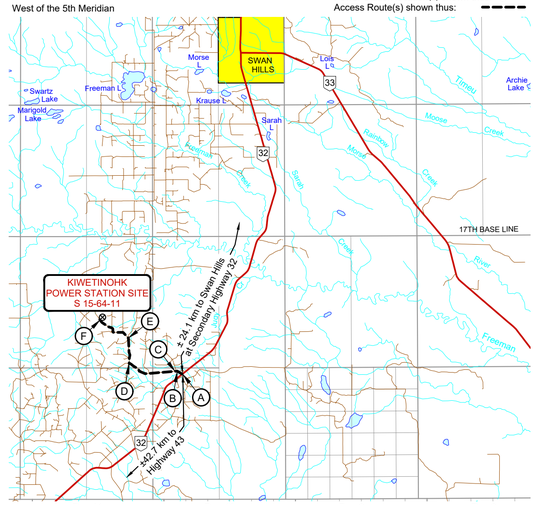
Length (km)		Road/Disposition	Owner
A - B	0.5	LOC 840703	CONIFER ENERGY INC.
B - C	0.2	ROE 6190	CONIFER ENERGY INC.
C - D	3.7	ROE 6400	CONIFER ENERGY INC.
D - E	1.9	ROE 6721	CONIFER ENERGY INC.
E - F	2.8	ROE 6812	CONIFER ENERGY INC.

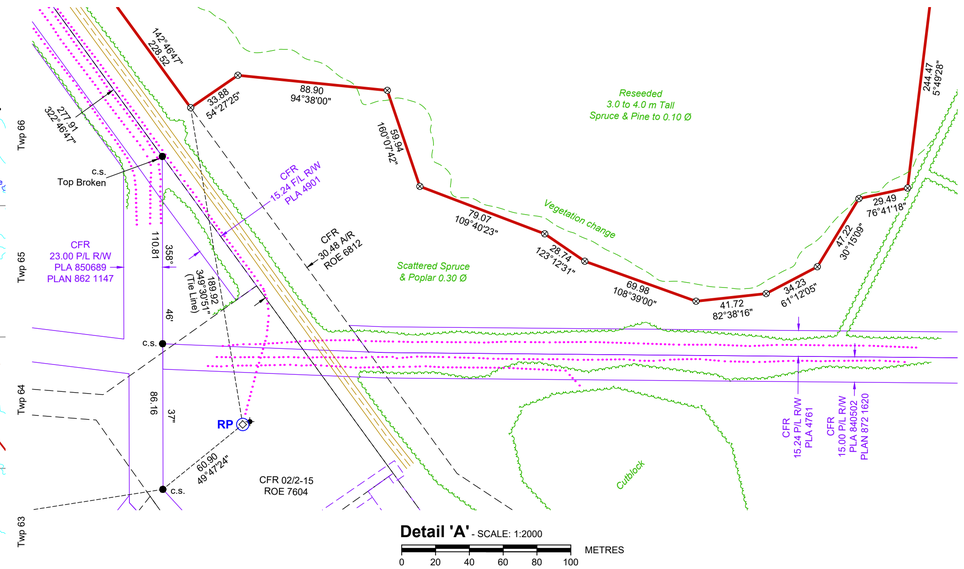
Access Sketch - SCALE: 1:250,000

0 5 10 15 20 KILOMETRES

West of the 5th Meridian

Power Station location(s) shown thus: ⊗
Access Route(s) shown thus: - - -





Detail 'A' - SCALE: 1:2000

0 20 40 60 80 100 METRES

ABBREVIATIONS

A/R	access road	km	kilometre	Rge.	range
calc.	calculated	LS	legal subdivision	RP	Geo-reference Point
c.s.	countersunk	M.	mound or meridian	R/W	right-of-way
CSRS	Canadian Spatial Reference System	m	metre	S	south
E	east	MGGR	medium grade gravel road	Sec.	section
Fd.	found	Mp.	marker post	Twp.	township
F/L	flowline	N	north	UTM	Universal Transverse Mercator
GNSS	Global Navigation Satellite System	NRCAN	Natural Resources Canada	W	west
ha.	hectare	NAD83	North American Datum of 1983	Ø	diameter
I.	statutory iron post	PPP	Precise Point Positioning		
		P/L	pipeline		
		P.	standard brass cap		
		Pit	4 pits		

LEGEND & NOTES

	Placed	Found
Statutory Iron Post:		●
Iron Bar:	◇	
Iron Spike:		▲
Non-monumented position:	⊗	
Existing well head:	✦	
Power pole:	✖PP	
Anchor:	⚓	

Areas dealt with by this plan:
Buried pipe:
Power line: OHLP
Buried cable: C
Tree line:
Vegetation change:

Surface Land Status: Crown
Public Land Standing Search Date: Mar 7, 2023

DISCLAIMER:

1. This plan represents the best information available at the time of survey. Not all underground facilities may be shown on this plan. **Beairsto & Associates Engineering Ltd.** and its employees will assume no responsibility for the location of any underground facilities. Locations of such are approximate and should be verified by the respective authorities, prior to construction.

ALBERTA ONE CALL 1-800-242-3447
www.albertaonecall.com

2. Unless otherwise noted, Wetlands shown on this plan were not identified by a qualified Wetlands Specialist and this plan is not intended to be used for Water Act approvals.

GEO-REFERENCING

Geo-reference point is shown thus: ..... ◯ RP
Northing: 6043657.29
Easting: 592267.95
} Derived from NRCAN PPP
Projection / Datum: UTM, NAD83 (CSRS) EPOCH 2002
Reference Meridian: 117° W (Zone 11)
Combined scale factor: 0.999534
Bearings are grid, derived from GNSS observations.
Distances are ground and in metres and decimals thereof.

KIWETINOHK ENERGY

SKETCH PLAN SHOWING
LOCATION OF

POWER STATION SITE (ELECTRICAL)

WITHIN

SW 1/4 SEC. 15, TWP. 64, RGE. 11, W5M.

AND WITHIN THEORETICAL

SE 1/4 SEC. 15, TWP. 64, RGE. 11, W5M.

BIG LAKES COUNTY

SCALE: 1:5000

0 250 500 METRES

HISTORICAL RESOURCES TABLE

** Alberta Culture & Tourism - Fall 2022 listing **

Location	LSD(s)	HRV	Category
SE 15-64-11 W5	N/A	N/A	N/A
SW 15-64-11 W5	N/A	N/A	N/A

WILDLIFE SENSITIVITY TABLE

Location	Sensitive Feature(s)
15-64-11 W5	GRIZZLY BEAR ZONE

WETLAND AREAS

Wetland areas were not confirmed by a Qualified Wetlands Specialist

Activity	Wetland	Upland
Power Station Site	0.000 ha.	18.540 ha.

DISPOSITION AREAS - FMA 7500020

Type	Hectares	Acres
Power Station Site (within existing dispositions)	0.000	0.00
Power Station Site (outside existing dispositions)	18.540	45.81
Power Station Site Total	18.540	**45.81**

VEGETATION AREAS

Type	Hectares	Acres
Power Station Site (new cut)	18.540	45.81
Power Station Site (existing cut)	0.000	0.00
Storage Site Total	**18.540**	**45.81**

AREAS REQUIRED

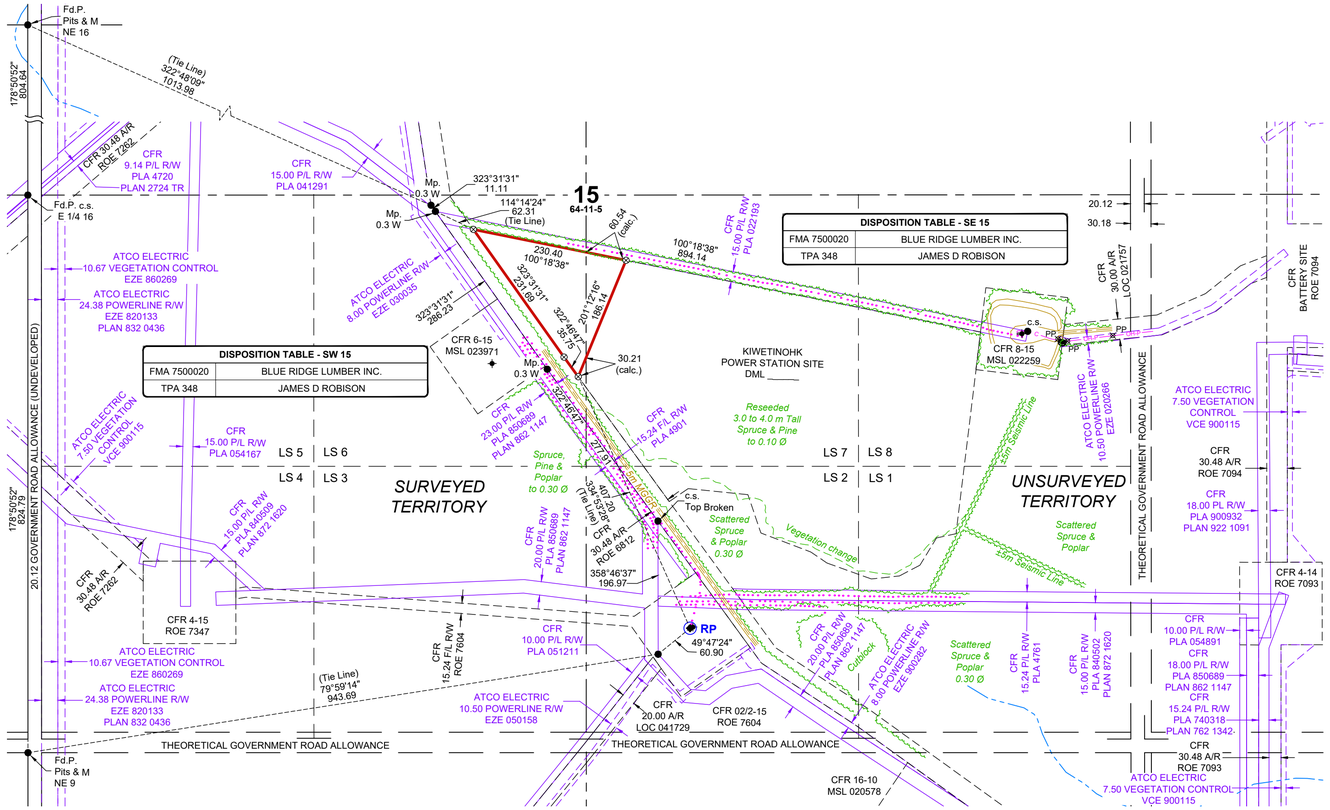
Type	Hectares	Acres
Power Station Site	18.540	45.81
Total	**18.540**	**45.81**

Rev	Date	Description	pc	dwn	chk
00	Aug. 9/22	Original Issue	kd	jw	ma/db
01	Mar 8/23	Revise Site Boundary	-	jl	ma
02	-	-	-	-	-
03	-	-	-	-	-
04	-	-	-	-	-

Beairsto & Associates
ENGINEERING & SURVEY
10940 - 92 Avenue, Grande Prairie, AB T8V 6B5
P: 1 855 879 5973 W: www.baseng.ca

22GLOG9042

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22GLOG9042-DML01R01.dwg

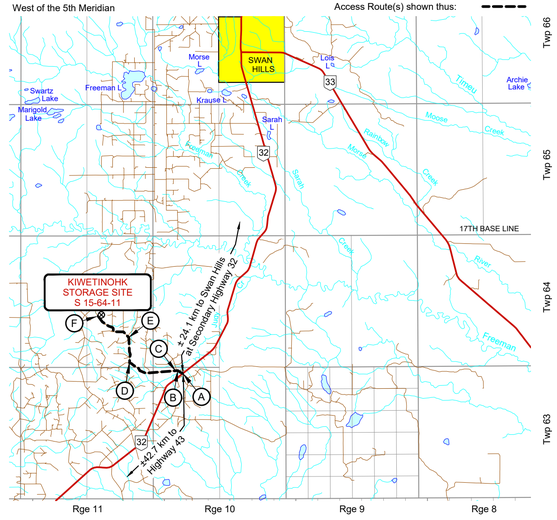


Access Sketch - SCALE: 1:250,000

KILOMETRES
0 5 10 15 20

Storage Site location(s) shown thus: ⊗
Access Route(s) shown thus: ▬ ▬ ▬

West of the 5th Meridian



Access Route Information

Length (km)		Road/Disposition	Owner
A - B	0.5	LOC 840703	CONIFER ENERGY INC.
B - C	0.2	ROE 6190	CONIFER ENERGY INC.
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15-64-11 W5	GRIZZLY BEAR ZONE

WETLAND AREAS

**Wetland areas were not confirmed by a Qualified Wetlands Specialist*

Activity	Wetland	Upland
Storage Site	0.000 ha.	2.111 ha.

DISPOSITION AREAS - FMA 7500020

Type	Hectares	Acres
Storage Site (within existing dispositions)	0.000	0.00
Storage Site (outside existing dispositions)	2.111	5.22
Storage Site Total	2.111	**5.22**

VEGETATION AREAS

Type	Hectares	Acres
Storage Site (new cut)	2.111	5.22
Storage Site (existing cut)	0.000	0.00
Storage Site Total	**2.111**	**5.22**

ABBREVIATIONS

A/R	access road	km	kilometre	Rge.	range
calc.	calculated	LS	legal subdivision	RP	Geo-reference Point
c.s.	countersunk	M.	mound or meridian	R/W	right-of-way
CSRS	Canadian Spatial Reference System	m	metre	S	south
E	east	MGGR	medium grade gravel road	Sec.	section
Fd.	found	Mp.	marker post	Twp.	township
F/L	flowline	N	north	UTM	Universal Transverse Mercator
GNSS	Global Navigation Satellite System	NRCAN	Natural Resources Canada	W	west
ha.	hectare	NAD83	North American Datum of 1983	Ø	diameter
I.	statutory iron post	PPP	Precise Point Positioning		
		P/L	pipeline		
		P.	standard brass cap		
		Pit	4 pits		

LEGEND & NOTES

	Placed	Found
Statutory Iron Post:		●
Iron Bar:	◇	
Iron Spike:		▲
Non-monumented position:	⊗	
Existing well head:	✦	
Power pole:	✕PP	
Anchor:		⚓

Areas dealt with by this plan:
Buried pipe:
Power line: ONLP
Buried cable: C
Tree line:
Vegetation change:

Surface Land Status: Crown
Public Land Standing Search Date: Mar 7, 2023

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2. Unless otherwise noted, Wetlands shown on this plan were not identified by a qualified Wetlands Specialist and this plan is not intended to be used for Water Act approvals.

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Easting: 592267.95
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Projection / Datum: UTM, NAD83 (CSRS) EPOCH 2002
Reference Meridian: 117° W (Zone 11)
Combined scale factor: 0.999534
Bearings are grid, derived from GNSS observations.
Distances are ground and in metres and decimals thereof.

KIWETINOHK ENERGY

SKETCH PLAN SHOWING
LOCATION OF

STORAGE SITE (STOCKPILE)

WITHIN

SW 1/4 SEC. 15, TWP. 64, RGE. 11, W5M.

AND WITHIN THEORETICAL

SE 1/4 SEC. 15, TWP. 64, RGE. 11, W5M.

BIG LAKES COUNTY

SCALE: 1:5000

0 250 500 METRES

AREAS REQUIRED

Type	Hectares	Acres
Storage Site	2.111	5.22
Total	**2.111**	**5.22**

Rev	Date	Description	pc	dwn	chk
00	Mar 8/23	Original Issue	kd	lfl	ma
01	-	-	-	-	-
02	-	-	-	-	-
03	-	-	-	-	-
04	-	-	-	-	-

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22GLOG9042

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Appendix I – Equipment List

Mechanical Equipment List

Project Name: Kiwetinohk Energy Corporation Maskwa Combined Cycle wit
Project No: 412155
Description: 1x1 Combined Cycle Single Shaft with CCS
Revision: 0
Revision Purpose Issued for Permitting
Date: 15-Dec-2022

Install Spec Legend

77.1000	Mechanical Construction
73.0200	Electrical Construction
71.0402	Substructures

Note

1. Skid mounted equipment may not be listed separately from the skid itself unless the skid mounted equipment requires power wiring.
2. Hydrants, silencers, strainers and desuperheaters are not included in this list.
3. Refer to the tab 'Siemens Sound Power Levels' for estimated sound power levels of major Siemens supplied equipment

	GENERAL DATA									CAPACITY				ELECTRICAL DATA								DIMENSIONS & WEIGHT						MISCELLANEOUS PUMP AUXILIARY POWER								
Site Arrangement Item Number	Equipment Name	P&ID	Qty Installed	Qty Units	Skid Designation	Category	Resp Dept	Purchase Spec	Install Spec	Value	Units	Value	Units	Power Wiring?	Med Voltage?	Motor Nameplate (hp)	Motor Voltage (V)	Total Load (kW)	Total Load (KVA)	Rated Motor Speed (RPM)	Diameter (ft)	Width (ft)	Length (ft)	Height (ft)	Shipping Weight (lb)	Op Weight (lb)	Qty Operating During 1 - 1x1	Qty Operating During 2 - 1x1	Operating Factor, %	SG	Pump Efficiency	Motor Efficiency	Motor Input Power EACH (kW)	Total Aux Load (kW)	Aux Power Notes
	Combustion Turbine - Siemens SGT6-9000HL 1.6 (H2 Cooled)																																			
1	COMBUSTION TURBINE - 9000HL - Indoor		1	EA	UMB	CT	M	67.9120	77.1000					Y	N							14.25	36.87	14.85	638,452		1								Included with Siemens total auxiliary power
	COMBUSTION TURBINE ENCLOSURE		1	EA	UMB	CT	M	67.9120	77.1000					Y	N	See Fans																			Included with Siemens total auxiliary power
	COMBUSTION TURBINE ENCLOSURE VENT FANS		3	EA	UMB	CT	M	67.9120	77.1000	46,600	cfm			Y	N	13.2	600	10	12																Included with Siemens total auxiliary power
	COMBUSTION TURBINE IGNITER PANEL		2	EA	UMB	CT	M	67.9120	77.1000					Y	N	2kVA	600	1.7	2																Included with Siemens total auxiliary power
2	COMBUSTION TURBINE GENERATOR - SGen6-3000W - (H2 COOLED)		1	EA	MKA01	CT	M	67.9120	77.1000					N	N							12.67	37.02	20.34	681,624		1								Included with Siemens total auxiliary power
	COMBUSTION TURBINE GENERATOR (H2 COOLED) ROTOR		1	EA	MKA01	CT	M	67.9120	77.1000					N	N								37.02		116,000										Included with Siemens total auxiliary power
	COMBUSTION TURBINE GENERATOR (H2 COOLED) COLLECTOR		1	EA	MKA01	CT	M	67.9120	77.1000					N	N								10.33		23,500										Included with Siemens total auxiliary power
	COMBUSTION TURBINE GENERATOR FIXATORS		1	LOT	UMB	CT	M	67.9120	77.1000					N	N																				Included with Siemens total auxiliary power
	COMBUSTION TURBINE GENERATOR ALIGNMENT KEYS & PINS		1	LOT	UMB	CT	M	67.9120	77.1000					N	N																				No electrical load.
	COMBUSTION TURBINE MAIN FUEL GAS FILTER/SEPARATOR		1	EA	MBP	CT	M	67.9120	77.1000					N	N						4.00				10,000										Included with Siemens total auxiliary power
	COMBUSTION TURBINE TURNING GEAR		1	EA	N/A	CT	M	67.9120	77.1000					Y	N	10	600	7	9			4.00	8.00	4.00	10,000										Included with Siemens total auxiliary power
35	COMBUSTION TURBINE LUBE OIL SKID (INCLUDES RESERVOIR, PUMPS, ETC)		1	EA	MBV GT Lube Oil Skid	CT	M	67.9120	77.1000					N	N							12.50	33.50	12.00	75,000										Included with Siemens total auxiliary power
	COMBUSTION TURBINE LUBE OIL AC PUMP (MAIN)		2	EA	MBV GT Lube Oil Skid	CT	M	67.9120	77.1000					Y	N	100	600	75	88								1	1					2.2	2.2	Included with Siemens total auxiliary power
	COMBUSTION TURBINE LUBE OIL PUMP (EMERGENCY DC)		1	EA	MBV GT Lube Oil Skid	CT	M	67.9120	77.1000					Y	N	100	125	75	88																Included with Siemens total auxiliary power
	COMBUSTION TURBINE LUBE OIL VAPOR EXTRACTOR		2	EA	MBV GT Lube Oil Skid	CT	M	67.9120	77.1000					Y	N	5	600	4	4																Included with Siemens total auxiliary power
	COMBUSTION TURBINE LUBE OIL RESERVOIR HEATER		2	EA	MBV GT Lube Oil Skid	CT	M	67.9120	77.1000					Y	N	60kW	600	60	71																Included with Siemens total auxiliary power
	COMBUSTION TURBINE LUBE OIL PACKAGE COMFORT HEATER		1	EA	MBV GT Lube Oil Skid	CT	M	67.9120	77.1000					Y	N	5kW	600	5	6																Included with Siemens total auxiliary power
	COMBUSTION TURBINE LUBE OIL PACKAGE VENT FAN		1	EA	MBV GT Lube Oil Skid	CT	M	67.9120	77.1000					Y	N	1	600	1	1																Included with Siemens total auxiliary power
	COMBUSTION TURBINE LUBE OIL COOLER (DUPLEX PLATE & FRAME w/ TRANSFER VALVE)		1	EA	MBV GT Lube Oil Skid	CT	M	67.9120	77.1000					N	N																				Included with Siemens total auxiliary power
	COMBUSTION TURBINE LUBE OIL FILTRATION		1	EA	MBV GT Lube Oil Skid	CT	M	67.9120	77.1000					N	N																				Included with Siemens total auxiliary power
35	COMBUSTION TURBINE LIFT OIL SYSTEM		2	EA	MBV GT Lube Oil Skid	CT	M	67.9120	77.1000					Y	N	100	600	75	88																Included with Siemens total auxiliary power
35	COMBUSTION TURBINE HYDRAULIC CLEARANCE OPTIMIZATION (HCO) SKID		1	EA	A12-HCO Skid	CT	M	67.9120	77.1000					Y	N	See Pump																			Included with Siemens total auxiliary power
	COMBUSTION TURBINE HYDRAULIC CLEARANCE OPTIMIZATION (HCO) SKID PUMPS (2X100% PER SKID)		2	EA	A12-HCO Skid	CT	M	67.9120	77.1000					Y	N	3	600	2	3																Included with Siemens total auxiliary power
35	COMBUSTION TURBINE HYDRAULIC CONTROL OIL SYSTEM (Includes redundant pumps, air coolers, oil reservoir with immersion heaters & duplex supply and polishing filters.)		1	EA	A2-Hydraulic Skid	CT	M	67.9120	77.1000					Y	N	SEE COMPONENTS						5.00	6.00		5,000										Included with Siemens total auxiliary power
	COMBUSTION TURBINE HYDRAULIC CONTROL OIL SYSTEM - PUMPS (2X100% PER SKID)		1	EA	A2-Hydraulic Skid	CT	M	67.9120	77.1000					Y	N	40	600	30	35																Included with Siemens total auxiliary power
	COMBUSTION TURBINE HYDRAULIC CONTROL OIL SYSTEM - RESERVOIR HEATERS (2X100% PER SKID)		2	EA	A2-Hydraulic Skid	CT	M	67.9120	77.1000					Y	N	2kW	600	2	2																Included with Siemens total auxiliary power
	COMBUSTION TURBINE HYDRAULIC CONTROL OIL SYSTEM - FAN (1X100% PER SKID)		1	EA	A2-Hydraulic Skid	CT	M	67.9120	77.1000					Y	N	0.25	600	0.2	0.2																Included with Siemens total auxiliary power
	COMBUSTION TURBINE HYDRAULIC CONTROL OIL IGV AND VGV CONTROL OIL CONNECTIONS (Hoses/Connectors)		8	EA	CT	CT	M	66.2000	77.1000					N	N																				Included with Siemens total auxiliary power
34	COMBUSTION TURBINE INSTRUMENT AIR COMPRESSOR		1	EA	A3-Instrument Air Package	CT	M	67.9120	77.1000					N	N																				Included with Siemens total auxiliary power
4	COMBUSTION TURBINE INLET AIR FILTER HOUSE		1	EA	MBL	CT	M	67.9120	77.1000					N	N																				Included with Siemens total auxiliary power
	COMBUSTION TURBINE INLET AIR DUCT		1	EA	MBL	CT	M	67.9120	77.1000					N	N							5.50	60.00	38.50											Included with Siemens total auxiliary power
	COMBUSTION TURBINE INLET AIR PLENUM		1	EA	MBL	CT	M	67.9120	77.1000					N	N																				Included with Siemens total auxiliary power
	COMBUSTION TURBINE INLET AIR SUPPORT STEEL		1	EA	MBL	CT	M	67.9120	77.1000					N	N																				Included with Siemens total auxiliary power
	COMBUSTION TURBINE INLET AIR PLATFORMING/LADDERS/STAIRS		1	EA	MBL	CT	M	67.9120	77.1000					N	N																				Included with Siemens total auxiliary power
	COMBUSTION TURBINE INLET AIR HOIST (500LBS)		1	EA	MBL	CT	M	67.9120	77.1000					Y	N	5	600																		Included with Siemens total auxiliary power
	COMBUSTION TURBINE INLET AIR CLNG PULSE AIR PIPING/NOZZLES		1	LOT	MBL	CT	M	67.9120	77.1000					N	N																				Included with Siemens total auxiliary power
	COMBUSTION TURBINE INLET AIR EVAP COOLER (N/A)		0	EA	MBL	CT	M	67.9120	77.1000					N	N																				Included with Siemens total auxiliary power
	COMBUSTION TURBINE INLET AIR EVAP COOLER PUMPS (N/A)		0	EA	MBL	CT	M	67.9120	77.1000					Y	N	30	600																		Included with Siemens total auxiliary power
	EVAP COOLER CALCITE FILTER SKID (EACH SKID INCLUDES 2X100% FILTERS) (N/A)		0	EA	CALCITE FILTER SKID	BOP	C	65.1410	77.1000					N	N							10.0	20.0	12.0	5,000		1		100%				0.0	0.0	No electrical load.
	COMBUSTION TURBINE INLET AIR ANTI-ICING SYSTEM		1	EA	MBL	CT	M	67.9120	77.1000					N	N																				Included with Siemens total auxiliary power
	COMBUSTION TURBINE INLET AIR DEHUMIDIFIER		1	EA	MBL	CT	M	67.9120	77.1000					Y	N	15kW	600																		Included with Siemens total auxiliary power
	COMBUSTION TURBINE INLET AIR FILTER HOUSE LIGHTING		1	EA	MBL	CT	M	67.9120	77.1000					Y	N	10kW	600																		Included with Siemens total auxiliary power
	COMBUSTION TURBINE INLET AIR DAMPER MOTOR		1	EA	MBL	CT	M	67.9120	77.1000					Y	N	8kW	600																		Included with Siemens total auxiliary power
	COMBUSTION TURBINE EXHAUST DIFFUSER		1	EA	MBR	CT	M	67.9120	77.1000					N	N																				Included with Siemens total auxiliary power
	COMBUSTION TURBINE EXHAUST TRANSITION DUCT		1	EA	N/A	CT	M	67.9120	77.1000					N	N																				Included with Siemens total auxiliary power
	COMBUSTION TURBINE AFT FACE FLANGE EXHAUST DIFFUSER EXPANSION JOINT		1	EA	N/A	CT	M	67.9120	77.1000					N	N																				Included with Siemens total auxiliary power

Site Arrangement Item Number	Equipment Name	P&ID	Qty Installed	Qty Units	Skid Designation	Category	Resp Dept	Purchase Spec	Install Spec	Value	Units	Value	Units	Power Wiring?	Med Voltage?	Motor Nameplate (hp)	Motor Voltage (V)	Total Load (kW)	Total Load (KVA)	Rated Motor Speed (RPM)	Diameter (ft)	Width (ft)	Length (ft)	Height (ft)	Shipping Weight (lb)	Op Weight (lb)	Qty Operating During 1 - 1x1	Qty Operating During 2 - 1x1	Operating Factor, %	SG	Pump Efficiency	Motor Efficiency	Motor Input Power EACH (kW)	Total Aux Load (kW)	Aux Power Notes
	COMBUSTION TURBINE INSTRUMENT AIR SYSTEM SKID		1	EA	N/A	CT	M	67.9120	77.1000					N	N																				Included with Siemens total auxiliary power
	COMBUSTION TURBINE HVAC SYSTEM		1	EA	N/A	CT	M	67.9120	77.1000					N	N																				Included with Siemens total auxiliary power
	COMBUSTION TURBINE GENERATOR LIQUID DETECTOR RACK		1	EA	MBE	CT	M	67.9120	77.1000					N	N																				Included with Siemens total auxiliary power
	COMBUSTION TURBINE GENERATOR WASTE GAS SYSTEM SKID		1	EA	MBE	CT	M	67.9120	77.1000					N	N																				Included with Siemens total auxiliary power
	COMBUSTION TURBINE HYDROGEN BOTTLE RACK (AND REGULATOR)		1	EA	A-10 H2 Bottle Rack	CT	M	67.9120	77.1000					N	N																				Included with Siemens total auxiliary power
41	COMBUSTION TURBINE HYDROGEN GAS SKID		1	EA	A-9 H2 Gas Skid	CT	M	67.9120	77.1000					Y	N	2.6kW	600																		Included with Siemens total auxiliary power
40	COMBUSTION TURBINE HYDROGEN GAS DRYER JBX		1	EA	A-9 H2 Gas Skid	CT	M	67.9120	77.1000					Y	N	1.3kW	600					2.00	2.00	3.50	400										Included with Siemens total auxiliary power
	COMBUSTION TURBINE CO2 SUPPLY RACK w/ EXPANDER		1	EA	A-11 CO2 Supply Rack	CT	M	67.9120	77.1000					N	N																				Included with Siemens total auxiliary power
	COMBUSTION TURBINE CO2 GAS CONTROL MEASURING RACK		1	EA		CT	M	67.9120	77.1000					N	N																				Included with Siemens total auxiliary power
	COMBUSTION TURBINE CO2 SKID FEEDER		1	EA		CT	M	67.9120	77.1000					Y	N	50.5kW	600																		Included with Siemens total auxiliary power
38	COMBUSTION TURBINE GENERATOR SEAL OIL SKID (Includes pumps, duplex plate & frame cooler, loop seal tank, seal oil vapor extractor.)		1	EA	A-8 Seal Oil Skid	CT	M	67.9120	77.1000					Y	N	See Pump						7.50	10.50	7.50	11,000	11,440									Included with Siemens total auxiliary power
	COMBUSTION TURBINE GENERATOR SEAL OIL PUMP		2	EA	A-8 Seal Oil Skid	CT	M	67.9120	77.1000					Y	N	15	600					7.50	10.50	7.50	11,000	11,440									Included with Siemens total auxiliary power
	COMBUSTION TURBINE GENERATOR EXHUAST BLOWER		2	EA		CT	M	67.9120	77.1000					Y	N	2	600					7.50	10.50	7.50	11,000	11,440									Included with Siemens total auxiliary power
	COMBUSTION TURBINE GENERATOR HYDROGEN COOLERS		2	EA		ST	M	67.9110	77.1000					N	N										13,885										Included with Siemens total auxiliary power
37	COMBUSTION TURBINE GENERATOR BEARING VAPOR EXHAUSTER		2	EA		ST	M	67.9110	77.1000					Y	N																				Included with Siemens total auxiliary power
37	GENERATOR SEAL OIL SKID ASSEMBLY (includes duplex filters, cooler, 2 AC pumps, 1 DC pump)		1	EA	SEAL OIL SKID	ST	M	67.9110	77.1000					Y	N							7.56	15.42	7	12,100	12,540									Included with Siemens total auxiliary power
	GENERATOR MAIN SEAL OIL PUMP		2	EA	SEAL OIL SKID	ST	M	67.9110	77.1000					Y	N	15	600	11	13																Included with Siemens total auxiliary power
	GENERATOR EMERGENCY SEAL OIL PUMP		1	EA	SEAL OIL SKID	ST	M	67.9110	77.1000					Y	N	1.5	125 DC	1	1																Included with Siemens total auxiliary power
37	GENERATOR SEAL OIL STORAGE TANK		1	EA		ST	M	67.9110	77.1000					N	N							2	17	3	5,500.00	8,000.00									Included with Siemens total auxiliary power
	COMBUSTION TURBINE - WATER MIST FIRE PROTECTION SKID		1	EA	SGL	CT	M	67.9120	77.1000					N	N							3.00	6.00		1,000										Included with Siemens total auxiliary power
32	COMBUSTION TURBINE WASH WATER SKID		1	EA	MBY	CT	M	67.9120	77.1000					Y	N	See Pump																			Included with Siemens total auxiliary power
	COMBUSTION TURBINE WASH WATER SKID PUMP		1	EA	COMBUSTION TURBINE WASH WATER SKID	CT	M	67.9120	77.1000					Y	N	7.5	600	6	7																Included with Siemens total auxiliary power
	COMBUSTION TURBINE WASH WATER DRAINS TANK		1	EA		CT	S	61.2005	71.0402	1,000	gal			N	N						4.00		11.00	9.00	2,800										No electrical load.
	COMBUSTION TURBINE STATIC EXCITATION/STATIC FREQUENCY CONVERTER PACKAGE (SEE/SFC)		1	EA	CJT	CT	M	67.9120	77.1000					Y	N	60kVA	600	51	60																Included with Siemens total auxiliary power
	COMBUSTION TURBINE STATIC EXCITATION TRANSFORMER (SEE TRANSFORMER)		1	EA	MKC01	CT	M	67.9120	77.1000					Y	N																				Included with Siemens total auxiliary power
	COMBUSTION TURBINE STATIC FREQUENCY CONVERTER TRANSFORMER (SFC TRANSFORMER)		1	EA	MBJ	CT	M	67.9120	77.1000					Y	N																				Included with Siemens total auxiliary power
	COMBUSTION TURBINE STATIC FREQUENCY CONVERTER CROSSOVER SWITCH CUBICLE (SFC CROSSOVER CUBICLE)		1	EA	BAB02	CT	M	67.9120	77.1000					Y	N																				Included with Siemens total auxiliary power
	COMBUSTION TURBINE STATIC VOLTAGE TRANSFORMER SURGE CUBICLE (VT & SURGE CUBICLE)		1	EA	BAB01	CT	M	67.9120	77.1000					Y	N																				Included with Siemens total auxiliary power
64	COMBUSTION TURBINE POWER CONTROL CENTER (PCC)		1	EA	UBA01	CT	M	67.9120	77.1000					Y	N																				Included with Siemens total auxiliary power
	COMBUSTION TURBINE BATTERY CHARGER		1	EA		CT	M	67.9120	77.1000					Y	N	43kW	600	43	51																Included with Siemens total auxiliary power
	COMBUSTION TURBINE ELECTRICAL PACKAGE HVAC		3	EA		CT	M	67.9120	77.1000					Y	N	11kW	600	11	13																Included with Siemens total auxiliary power
	COMBUSTION TURBINE ELECTRICAL PACKAGE LV PANELBOARD TRANSFORMER		1	EA		CT	M	67.9120	77.1000					Y	N	39kW	600	39	46																Included with Siemens total auxiliary power
	COMBUSTION TURBINE PIPING SHIPPED LOOSE		1	LOT		CT	M	67.9120	77.1000					N	N																				Included with Siemens total auxiliary power
	COMBUSTION TURBINE INSIDE PACKAGE INSULATION & LAGGING RAW BULK SUPPLY		1	LOT		CT	M	67.9120	77.1000					N	N																				Included with Siemens total auxiliary power
	COMBUSTION TURBINE FUEL GAS PULSE AIR COMPRESSOR		2	EA		CT	M	67.9120	77.1000		scfm	150	psig	Y	N	40	600	30	35			5.2	8.8	6.0	7,500		0								Pulse Air Compressor not Operating During Auxiliary Power Testing
	COMBUSTION TURBINE FUEL GAS PURGE AIR FILTER		1	EA		CT	M	67.9120	77.1000		scfm			N	N							5.4	5.8	7.3	2,017										No electrical load.
45	COMBUSTION TURBINE FUEL GAS PURGE AIR RECEIVER		1	EA		CT	M	67.9120	77.1000	500	gal			N	N						4.0			6.0											No electrical load.
34	COMBUSTION TURBINE INSTRUMENT AIR RECEIVER		1	EA		CT	M	67.9120	77.1000	500	gal			N	N						4.0			6.0											No electrical load.
	STATOR WATER UNIT		1	EA		CT	M	67.9120	77.1000					Y	N							8.0	20.0	6.0	10,000										Included with Siemens total auxiliary power
	Steam Turbine - Siemens - SST-5000																																		
3	STEAM TURBINE		1	EA		ST	M	67.9110	77.1000					N	N							11.5	19.0	13.0	308,000		1								Included with Siemens total auxiliary power
43	STEAM TURBINE GLAND STEAM CONDENSER MODULE		1	EA	GSC Module	ST	M	67.9110	77.1000					N	N							6.00	10.00	9.00	7,495	10,802									Included with Siemens total auxiliary power
	STEAM TURBINE GLAND STEAM CONDENSER EXHAUSTER		2	EA	GSC Module	ST	M	67.9110	77.1000					Y	N	15	600	11	13																Included with Siemens total auxiliary power
42	ST ELECTROHYDRUALIC SUPPLY UNIT (FRF) (includes 2x100% main fluid pumps, heater, fluid filter, 2 circulating pumps, 2 fluid coolers, 2 polishing filters.)		1	EA	STG FRF FLUID SUPPLY UNIT	ST	M	67.9110	77.1000					Y	N	25	600	19	22			5.41	8.40	9.51	8,820	10,805									Included with Siemens total auxiliary power
	STEAM TURBINE HP STOP CONTROL VALVE		2	EA		ST	M	67.9110	77.1000					N	N												2								Included with Siemens total auxiliary power
	STEAM TURBINE LP STOP CONTROL VALVE		1	EA		ST	M	67.9110	77.1000					N	N												1								Included with Siemens total auxiliary power
	STEAM TURBINE COMBINED REHEAT VALVE		2	EA		ST	M	67.9110	77.1000					N	N												2								Included with Siemens total auxiliary power
	STEAM TURBINE TURNING GEAR		1	EA		ST	M	67.9110	77.1000					Y	N	10	600	7	9						9,730	12,500									Included with Siemens total auxiliary power
	LP STEAM STRAINER		1	EA		ST	M	67.9110	77.1000					N	N							3.40	5.00		4,151										No Electrical load
	SELF SYNCHRONIZING CLUTCH (Between ST and Generator)		1	EA		ST	M	67.9110	77.1000					N	N							3.40	5.00		4,151										No Electrical load
	HRSG																																		
10	HRSG (HEAT RECOVERY STEAM GENERATOR)		1	EA		HRSG	M	67.6130	77.1000					N	N							58.0	167.3	149.0											Included with Siemens total auxiliary power
29	HRSG STACK (160 ft tall x 23 ft, M220)		1	EA		HRSG	M	67.6130	77.1000					N	N						22.0			240.0											Included with Siemens total auxiliary power
	HRSG STACK DAMPER		1	EA		HRSG	M	67.6130	77.1000					Y	N	<1kW	600	1	1			28.0	22.0	3.0	17,640										Included with Siemens total auxiliary power
50	CONDENSATE **(ECONOMIZER)** RECIRCULATION PUMPS	M2343D	1	EA		HRSG	M	67.6130	77.1000	542	gpm	528	ft	Y	N	200	600	149	176																Included with Siemens total auxiliary power
11	HRSG BLOWDOWN TANK		1	EA		HRSG	M	67.6130	77.1000					N	N						9.3			22.3	23,369	58,202									Included with Siemens total auxiliary power
	HRSG DUCT BURNERS (N/A)		0	LOT		HRSG	M	67.6130	77.1000					N	N																				Included with Siemens total auxiliary power
	HRSG DUCT BURNERS FUEL GAS SKID (N/A)		0	EA	EKT	HRSG	M	67.6130	77.1000					N	N							4.3	37.6	7.9	5,512										Included with Siemens total auxiliary power
	HRSG DUCT BURNERS FUEL GAS SKID TO BURNERS PIPING (N/A)		0	LOT		HRSG	M	67.6130	77.1000					N	N																				Included with Siemens total auxiliary power
	Auxiliary Boiler																																		
30	AUXILIARY BOILER (275 psig @ 414F)	M2061	1	EA		BOP	M	67.6150	77.1000	37,000	lb/hr	net		N	N																				In Standby, but not operating during testing.

Site Arrangement Item Number	Equipment Name	P&ID	Qty Installed	Qty Units	Skid Designation	Category	Resp Dept	Purchase Spec	Install Spec	Value	Units	Value	Units	Power Wiring?	Med Voltage?	Motor Nameplate (hp)	Motor Voltage (V)	Total Load (kW)	Total Load (KVA)	Rated Motor Speed (RPM)	Diameter (ft)	Width (ft)	Length (ft)	Height (ft)	Shipping Weight (lb)	Op Weight (lb)	Qty Operating During 1 - 1x1	Qty Operating During 2 - 1x1	Operating Factor, %	SG	Pump Efficiency	Motor Efficiency	Motor Input Power EACH (kW)	Total Aux Load (kW)	Aux Power Notes
31	AUXILIARY BOILER STACK (60')	M2061	1	EA		BOP	M	67.6150	77.1000					N	N						4.0			240.0											No electrical load.
	AUXILIARY BOILER FD FAN	M2061	1	EA		BOP	M	67.6150	77.1000					Y	N	100	600	75	88																In Standby, but not operating during testing.
	AUXILIARY BOILER DEAERATOR SKID	M2061	1	EA	Aux Boiler DA Skid	BOP	M	67.6150	77.1000					Y	N	SEE Pump																			No electrical load.
	AUXILIARY BOILER DEAERATOR (ON SKID)	M2061	1	EA	Aux Boiler DA Skid	BOP	M	67.6150	77.1000					Y	N	SEE Pump																			No electrical load.
	AUXILIARY BOILER FEED PUMPS (ON SKID WITH DEAERATOR)	M2061	2	EA	Aux Boiler DA Skid	BOP	M	67.6150	77.1000					Y	N	50	600	37	44																In Standby, but not operating during testing.
	AUXILIARY BOILER DEAERATOR REGULATING SKID	M2061	1	EA	Aux Boiler DA Reg Skid	BOP	M	67.6150	77.1000					N	N																				No electrical load.
	AUXILIARY BOILER FEEDWATER REGULATING SKID	M2061	1	EA	Aux Boiler DA Reg Skid	BOP	M	67.6150	77.1000					N	N																				No electrical load.
	AUXILIARY BOILER MAKEUP WATER REGULATING SKID	M2061	1	EA	Aux Boiler DA Reg Skid	BOP	M	67.6150	77.1000					N	N																				No electrical load.
	AUXILIARY BOILER FUEL GAS REGULATING SKID	M2061	1	EA	Aux Boiler DA Reg Skid	BOP	M	67.6150	77.1000					N	N																				No electrical load.
	AUXILIARY BOILER BLOWDOWN QUENCH WATER REGULATING SKID	M2061	1	EA	Aux Boiler DA Reg Skid	BOP	M	67.6150	77.1000					N	N																				No electrical load.
	AUXILIARY BOILER BLOWDOWN TANK	M2061	1	EA		BOP	M	67.6150	77.1000					N	N						3.0			13.5											No electrical load.
	AUXILIARY BOILER BLOWDOWN TANK SILENCER	M2061	1	EA		BOP	M	67.6150	77.1000					N	N						3.0			13.5											No electrical load.
	AUXILIARY BOILER BMS CABINET (NOT SKID MOUNTED)	M2061	1	EA		BOP	M	67.6150	77.1000					N	N																				No electrical load.
	AUXILIARY BOILER INLET AIR LOUVER	M2061	1	EA		BOP	M	67.6150	77.1000					N	N																				No electrical load.
	AUXILIARY BOILER INLET STEAM HEATING COILS	M2061	1	EA		BOP	M	67.6150	77.1000					N	N																				No electrical load.
	AUXILIARY BOILER INLET STEAM HEATING COIL SUPPLY SKID	M2061	1	EA		BOP	M	67.6150	77.1000					Y	N																				No electrical load.
	AUXILIARY BOILER INLET STEAM HEATING COIL NORMAL RETURN SKID	M2061	1	EA		BOP	M	67.6150	77.1000					N	N																				No electrical load.
	AUXILIARY BOILER INLET STEAM HEATING COIL STARTUP RETURN SKID	M2061	1	EA		BOP	M	67.6150	77.1000					N	N																				No electrical load.
	AUXILIARY BOILER SILENCERS	M2061	3	EA		BOP	M	67.6150	77.1000					N	N																				No electrical load.
	AUXILIARY BOILER SAMPLE COOLER	M2061	2	EA		BOP	M	67.6150	77.1000					N	N																				No electrical load.
	SEAL STEAM ELECTRIC SUPERHEATER	M2061	1	EA		BOP	M	67.4104	77.1000					Y	N	175kW	600	175	206																In Standby, but not operating during testing.
	Compressed Air																																		
	AIR COMPRESSOR - WATER COOLED	M2182A	2	EA		BOP	M	67.4101	77.1000	430	scfm	125	psig	Y	N	100	600	75	88	3585		4.75	7	7	4,200		1		100%		80%	93%	75.0	75.0	Reference 2
	DESSICANT AIR DRYER SKIDs	M2182A	2	EA		BOP	M	67.4101	77.1000	430	scfm			N	N							4	6	7.6	2500										No electrical load.
	AIR RECEIVER	M2182A	2	EA		BOP	M	67.4101	77.1000	1,000	gal			N	N						4			12	1800										No electrical load.
	WATER TREATMENT AIR RECEIVER	M2182A	1	EA		BOP	M	67.4101	77.1000	200	gal			N	N						2			6	500										No electrical load.
	AIR VOLUME TANKS (furnished by Siemens fo Bypass Valves)	NOT SHOWN	2	EA		BOP	M	67.9120	77.1000	40	gal			N	N						2.0			5.0										No electrical load.
	Compressed Gasses (Nitrogen, Hydrogen & CO2 Equipment																																		
	NITROGEN GENERATOR	M2482	1	EA		BOP	M	67.5720	77.1000	9	scfm			N	N							4.5	7.0	8.0	800									0.5	
	OWNER-FURNISHED NITROGEN STORAGE (BOTTLES)	M2482	1	LOT		BOP	M	99.2400	77.1000					N	N																				No electrical load.
	OWNER-FURNISHED CARBON DIOXIDE STORAGE (BOTTLES)	M2202	1	LOT		BOP	M	99.2400	77.1000					N	N																				No electrical load.
	OWNER-FURNISHED HYDROGEN STORAGE (TRAILER)	M2201	1	LOT		BOP	M	99.2400	77.1000	1,120	scfm			N	N																				No electrical load.
	Closed Cycle Cooling Water System																																		
	CLOSED CYCLE COOLING WATER PUMP (2x100%)	M2322A	2	EA	NA	BOP	M	67.9211	77.1000	8,000	gpm	220	ft	Y	Y	500	6900	373	439	1784		3.0	12.0	6.0	11,500		1	1	100%	1.00	75%	95%	355.0	355.0	Calculated based on flow, head, pump efficiency and motor efficiency
	CLOSED CYCLE COOLING WATER EXPANSION TANK	M2322A	1	EA	NA	BOP	M	67.5300	77.1000	1,500	gal			N		-	-				6.5		-	6.2	5,000	-									
	CLOSED CYCLE COOLING WATER CHEMICAL MIXING POT (1x100%)	M2322A	1	EA	NA	BOP	M	67.5300	77.1000	2	gal			N		-	-				1.0	-	-	2.0	70.0	-									
16	CLOSED CYCLE COOLING WATER-TO-AIR HEAT EXCHANGER - (8 cells/ bays)	M2322A	1	EA	NA	BOP	M	67.7500	77.1000					N		320	600	239	281	900	-	34.5	82.5	20.0	92,050.0		8	8	100%	1.00			239.0	239.0	
	Fuel Gas																																		
59	FUEL GAS CALORIE METER	M2381A	1	EA	NA	CT	M	67.9120	77.1000					N	N																				No electrical load.
59	FUEL GAS KNOCKOUT DRUM	M2381A	1	EA	EKC	BOP	M	67.4104	77.1000					N	N						2.5			6.0	5,000										No electrical load.
59	FUEL GAS DRAINS TANK	M2381A	1	EA	NA	BOP	M	67.4104	77.1000	200	gal			N	N						2.8		8.0		1,145										No electrical load.
59	MAIN FUEL GAS REGULATING SKID (INCLUDES MULTIPLE REGULATORS and RELIEF VALVES). ALOS INCLUDES PRIMARY SEPARATOR OF 38" DIA AND 10' HEIGHT	M2381A	1	EA	MAIN FUEL GAS REGULATING SKID	BOP	M	67.4104	77.1000					N	N							0.5	4.0	1.0	25,000										No electrical load.
59	FUEL GAS FIRED DEWPOINT HEATER (WATER BATH)	M2381A	1	EA	MAIN FUEL GAS FIRED HTR	BOP	M	67.6220	77.1000	4	MBtu/hr			Y	N			5	5			7.0	30.0	12.0	78,000	8,175	1						5.0	5.0	
59	BUILDING HEATING FUEL GAS DEW POINT HEATER (ELECTRIC)	M2381B	1	EA	NA	BOP	M	67.4104	77.1000	30				Y	Y	30 kW	6900	30	35			4.4	10.0	2.0	2,000		1						30.0	30.0	
	HRSG DB FUEL GAS DEW POINT HEATER (ELECTRIC) (N/A)	M2381B	0	EA	NA	BOP	M	67.4104	77.1000	102				Y	Y																				No electrical load.
	AUXILIARY BOILER FUEL GAS FLOWMETER	M2381B	1	EA	NA	BOP	M	67.4104	77.1000					N	N																				No electrical load.
	HRSG FUEL GAS FLOWMETER	M2381B	1	EA	NA	BOP	M	67.4104	77.1000					N	N																				No electrical load.
47	CT FUEL GAS FLOW METERING STATION	M2381	1	EA	NA	CT	M	67.9120	77.1000					N	N						2.0		2.0		200										No electrical load.
46	CT FUEL GAS PERFORMANCE HEATERS SHELL & TUBE (ONE SKID PER CTG, LOCATED NEAR CTGs)	M2381B	1	EA	EKC	CT	M	67.9120	77.1000					N	N						3.0		34.0		50,000										No electrical load.
46	CT FUEL GAS SCRUBBER (ONE SKID PER CTG, LOCATED D/S PERFORMANCE HEATER)	M2381B	1	EA	EKC	CT	M	67.9120	77.1000					N	N						4.0		10.5		5,000										No electrical load.
46	CT SCRUBBER DRAINS TANK	M2381B	1	EA	EKC	CT	M	67.4104	77.1000	200	gal			N	N							15.0	25.0	8.0	1,145										No electrical load.
46	CT FUEL GAS FINAL FILTER SEPARATOR (AT CT)	M2381B	1	EA	MBP	CT	M	67.9120	77.1000					N	N						2.0			13.0	6,664										No electrical load.
	Fire Protection																																		
	FIRE PROTECTION EQUIPMENT		1	LS	NA	BOP	M	72.0820	72.0820					N	N																				No electrical load.
	FIRE WATER PUMP ELECTRIC-MOTOR DRIVEN	M2547	1	EA	Fire Pump Enclosure	BOP	M	67.9275	77.1000	2,500	gpm	110	psig	Y	N	280	600					13.0	36.0	14.5	58,000										In Standby, but not operating during testing.
	FIRE WATER PRESSURE MAINTENANCE (JOCKEY) PUMP	M2547	1	EA	Fire Pump Enclosure	BOP	M	67.9275	77.1000	25	gpm	115	psig	Y	N	20	600					INCL ABOVE	INCL ABOVE	INCL ABOVE	INCL ABOVE										In Standby, but not operating during testing.
	FIRE WATER PUMP-DIESEL ENGINE DRIVEN	M2547	1	EA	Fire Pump Enclosure	BOP	M	67.9275	77.1000	2,500	gpm	110	psig	N	N							INCL ABOVE	INCL ABOVE	INCL ABOVE	INCL ABOVE										No electrical load.
	DIESEL FIRE PUMP FUEL TANK	M2547	1	EA	Fire Pump Enclosure	BOP	M	67.9275	77.1000					N	N							INCL ABOVE	INCL ABOVE	INCL ABOVE	INCL ABOVE										No electrical load.
	Boiler Feedwater																																		

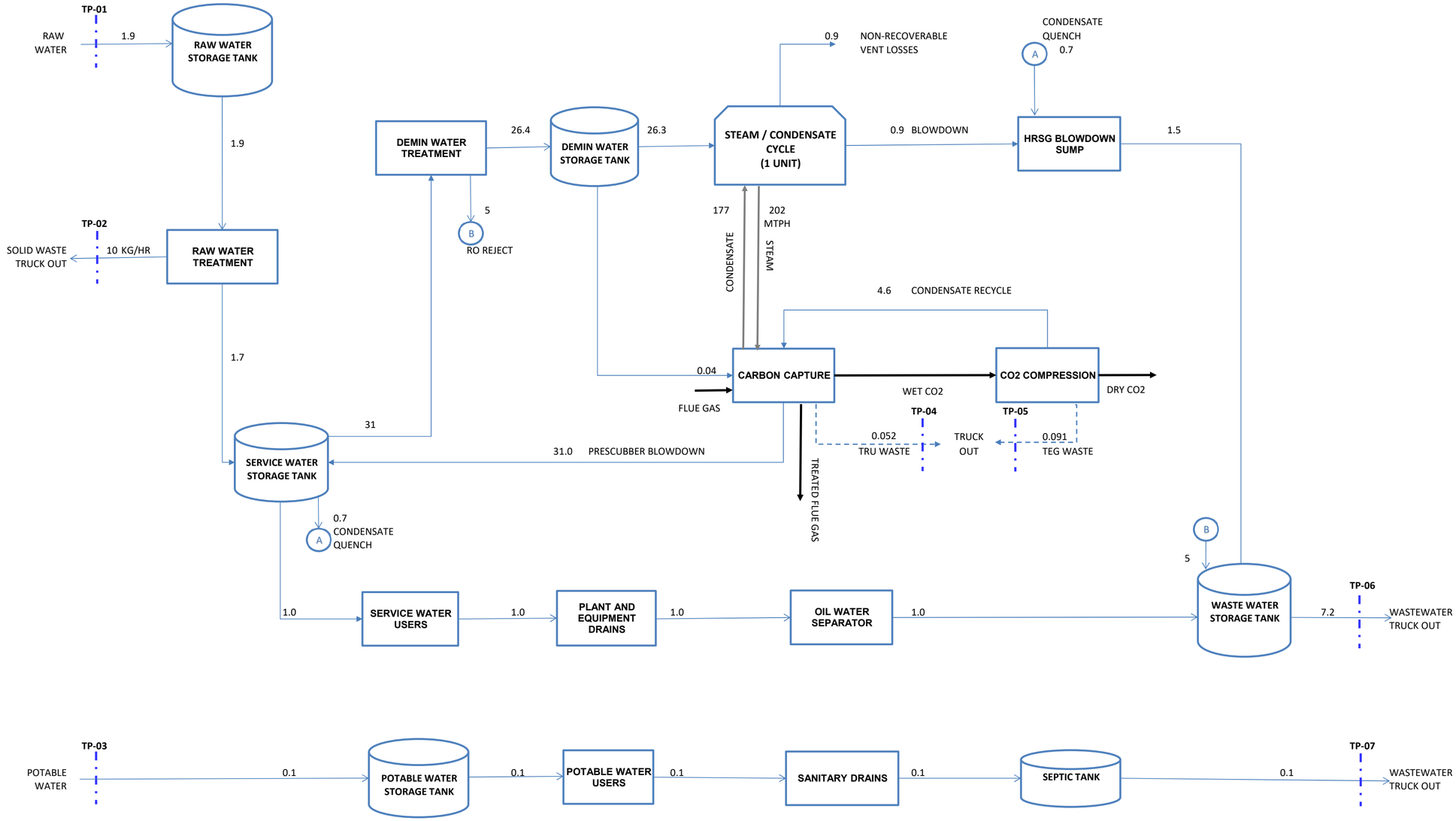
Site Arrangement Item Number	Equipment Name	P&ID	Qty Installed	Qty Units	Skid Designation	Category	Resp Dept	Purchase Spec	Install Spec	Value	Units	Value	Units	Power Wiring?	Med Voltage?	Motor Nameplate (hp)	Motor Voltage (V)	Total Load (kW)	Total Load (kVA)	Rated Motor Speed (RPM)	Diameter (ft)	Width (ft)	Length (ft)	Height (ft)	Shipping Weight (lb)	Op Weight (lb)	Qty Operating During 1 - 1x1	Qty Operating During 2 - 1x1	Operating Factor, %	SG	Pump Efficiency	Motor Efficiency	Motor Input Power EACH (kW)	Total Aux Load (kW)	Aux Power Notes
17	BOILER FEEDWATER PUMPS (2x100% per HRSG)	M2341A	2	EA	BFP Skid	BOP	M	67.9271	77.1000	2,575	gpm			Y	Y	6250	6900	4663	5485	3570		8.0	28.0	11.0	29,000		1							4662.5	4662.5	
	BOILER FEEDWATER PUMP LUBE OIL SKID (on common skid with pumps)	Not shown	1	EA	BFP Skid	BOP	M	67.9271	77.1000					Y	N							7.0	8.0	5.0	3,400		1								Included with Siemens total auxiliary power
	BOILER FEEDWATER PUMP BASKET STRAINER	M2341A	2	EA	BFP Skid	BOP	M	66.2173	77.1000					N	N																				No electrical load.
	Air Cooled Condenser and Condensate																																		
8	AIR COOLED CONDENSER - (15 cells; 3 streets X 5 cells/street)	M2661A	1	EA		BOP	M	67.8200	77.1000					N																					See fans below
	AIR COOLED CONDENSER - FANS 15 FANS/UNIT	M2661A	15	EA		BOP	M	67.8200	77.1000					Y	Y	200	600	149	176	1200							15	15	100%			95%	1840.0	1840.0	Reference 5
	AIR COOLED CONDENSER - FANS SHROUD AND MESH GUARDS	M2661A	15	EA		BOP	M	67.8200	77.1000					N																					No electrical load
	AIR COOLED CONDENSER - STRUCTURAL STEEL	not shown	1	LOT		BOP	M	67.8200	71.0000					N																					No electrical load
	AIR COOLED CONDENSER - DECK, WALKWAYS, STAIRS	not shown	1	LOT		BOP	M	67.8200	77.1000					N																					No electrical load
	AIR COOLED CONDENSER - STEAM DUCT HEADER (ST EXHAUST)	M2661B	1	LOT		BOP	M	67.8200	77.1000					N																					No electrical load
	AIR COOLED CONDENSER - STEAM DUCT HEADER EXPANSION JOINT (ST EXHAUST)	M2661B	1	LOT		BOP	M	67.8200	77.1000					N																					No electrical load
	AIR COOLED CONDENSER - STEAM DUCT HEADER (ST EXHAUST) STRUCTURAL STEEL SUPPORT	not shown	1	LOT		BOP	M	67.8200	71.0000					N																					No electrical load
	AIR COOLED CONDENSER - STEAM DUCT HEADER TURBINE BYPASS SECTION & BAFFLES	M2661B	1	LOT		BOP	M	67.8200	77.1000					N																					No electrical load
	AIR COOLED CONDENSER - STEAM DUCT RUPTURE DISK	M2661B	1	LOT		BOP	M	67.8200	77.1000					N																					No electrical load
	AIR COOLED CONDENSER - STEAM DUCT HEADER BLANKING PLATE	M2661B	1	LOT		BOP	M	67.8200	77.1000					N																					No electrical load
	AIR COOLED CONDENSER - STEAM DUCT HEADER DRAIN POT	M2661C	1	EA		BOP	M	67.8200	77.1000					N							5.0		13.5												No electrical load
	AIR COOLED CONDENSER - STEAM DUCT HEADER DRAIN POT PUMP SKID	M2661C	1	EA		BOP	M	67.8200	77.1000					N								3	8.0	4.0											See pumps below
	AIR COOLED CONDENSER - STEAM DUCT HEADER DRAIN POT PUMPS	M2661D	1	EA		BOP	M	67.8200	77.1000					Y	Y	22	600					2	2.0	2.0			1	2	100%			85.0%	67.7	135.3	Calculated based on motor rating and motor efficiency
	AIR COOLED CONDENSER - STEAM DUCT DISTRIBUTION HEADER (ACC)	M2661B	1	LOT		BOP	M	67.8200	77.1000					N																					No electrical load
	AIR COOLED CONDENSER - STEAM DUCT DISTRIBUTION HEADER (ACC) EXPANSION JOINTS	M2661B	1	LOT		BOP	M	67.8200	77.1000					N																					No electrical load
	AIR COOLED CONDENSER - FIN TUBE CLEANING SYSTEM PIPING/NOZZLES	M2661E	1	LOT		BOP	M	67.8200	77.1000					N																					No electrical load
	AIR COOLED CONDENSER - FIN TUBE CLEANING SYSTEM SKID PUMPS	M2661E	1	LOT		BOP	M	67.8200	77.1000	70	gpm			Y	N	45						3	8.0	4.0	2,000										Not operating during test
	AIR COOLED CONDENSER - DEAERATOR	M2661D	1	EA		BOP	M	67.8200	77.1000					N							12.0		45.0		75,120										No electrical load
55	AIR COOLED CONDENSER - CONDENSATE COLLECTION TANK (ON PLATFORM)	M2661D	1	EA		BOP	M	67.8200	77.1000					N							9.0		16.0		INCL ABOVE										No electrical load
	AIR COOLED CONDENSER - DEAERATOR/CONDENSATE COLLECTION TANK SUPPORT STEEL	not shown	1	EA		BOP	M	67.8200	77.1000					N																					No electrical load
	AIR COOLED CONDENSER - CONDENSATE COLLECTION SYSTEM PIPING	M2661D	1	LOT		BOP	M	67.8200	77.1000					N																					No electrical load
	AIR COOLED CONDENSER - EQUALIZATION SYSTEM PIPING	M2661D	1	LOT		BOP	M	67.8200	77.1000					N																					No electrical load
	AIR COOLED CONDENSER - AIR REMOVAL SYSTEM PIPING	M2661D	1	LOT		BOP	M	67.8200	77.1000					N																					No electrical load
	VACUUM PUMP SKID	M2662A	2	EA	VACUUM PUMP SKID	BOP	M	67.8200	77.1000					Y	N							4.50	20.00	10.00	18,500	9,100										See pumps below
	VACUUM PUMP SKID - LIQUID RING VACUUM PUMPS (1X100% HOLDING, 2 x100% ON DURING SU HOGGING, PER TRAIN)	M2662A	2	EA	VACUUME PUMP SKID	BOP	M	67.8200	77.1000	18	scfm			Y	Y	244	600					See Skid	See Skid	See Skid			1	2	100%			95%	182.0	182.0	Reference 11
54	CONDENSATE EXTRACTION PUMPS - HORIZONTAL (2X100% PER TRAIN)	M2343A	2	EA		BOP	M	67.9273	77.1000	2,736	gpm	735	ft	Y	Y	690	6900	515	606	1787					18,740		1	2	100%			90%	463.3	463.3	Reference 8
	Cycle Makeup and Storage																																		
	DEMINERALIZED WATER TRANSFER PUMPS	M2346A	2	EA	DEMIN WATER PUMP	BOP	M	67.9211	77.1000	360	gpm	200	ft	Y	N	40	600					2.0	5.0		1,154		1		100%	1.00	66%	90%	30.0	27.0	Operating during Case 2 testing.
13	DEMINERALIZED WATER TANK	M2346A	1	EA	NA	BOP	M	77.5450	77.5450	200,000	gal			N	N						34.0			34.5										No electrical load.
	DEMINERALIZED WATER TANK HEATER	M2346A	1	EA	NA	BOP	M	77.5450	77.5450					Y	N	20 kW	600																20.0	In Standby, but not operating during testing.
	Service Water Treatment																																		
52	RAW WATER STORAGE TANK	M2661	1	EA		BOP	M	77.5450	77.1000	250,000	gal										37.5			35.0										
	RAW WATER STORAGE TANK HEATER	M2661	2	EA		BOP	M	77.5450	77.1000					Y	N	25 kW	600								930									
	RAW WATER PUMPS (2x100%)	M2661	2	EA		BOP	M	67.9211	77.1000	528	gpm					20						1.8	4.8	2.5										
	MULTIMEDIA FILTERS	M2682	2	EA		BOP	C	65.1410	77.1000					N	N						8.0			10.0	2,000									
	BACKWASH WATER PUMPS	M2682	2	EA		BOP	C	65.1410	77.1000					Y	N	10	600					4.0	6.0	7.0	1,500									
	MM AIR COMPRESSOR S	M2682	2	EA		BOP	C	65.1410	77.1000					Y	N	5	600					3.0	3.0	6.0	1,000									
	SODIUM HYPOCHLORITE FEED PUMPS	M2682	2	EA	SODIUM HYPOCHLORITE FEED SKID	BOP	C	65.1410	77.1000					Y	N	1	600					4.0	6.0	7.0	1,000									
	CHEMICAL TOTE	M2682	1	EA		BOP	C	99.2400	77.1000					N	N							4.0	4.0	4.0	500									
	Service Water																																		
12	FIREWATER / SERVICE WATER STORAGE TANK	M2663A	2	EA		BOP	M	77.5450	77.5450	750,000	gal			N	N						57.0			41.0										No electrical load.
	FIREWATER / SERVICE WATER STORAGE TANK HEATER	M2663A	4	EA	NA	BOP	M	77.5450	77.5450					Y	N	25 kW	600																	In Standby, but not operating during testing.
	SERVICE WATER PUMPS (2x100%)	M2663A	2	EA	NA	BOP	M	67.9211	77.1000	400	gpm	196	ft	Y	N		600	22	26	3555		2.2	5.3	2.5	3,300	3,500	1		100%	1.00	66%	90%	22.4	22.4	Reference 5, 1 pump operating
	Potable Water																																		

Site Arrangement Item Number	Equipment Name	P&ID	Qty Installed	Qty Units	Skid Designation	Category	Resp Dept	Purchase Spec	Install Spec	Value	Units	Value	Units	Power Wiring?	Med Voltage?	Motor Nameplate (hp)	Motor Voltage (V)	Total Load (kW)	Total Load (KVA)	Rated Motor Speed (RPM)	Diameter (ft)	Width (ft)	Length (ft)	Height (ft)	Shipping Weight (lb)	Op Weight (lb)	Qty Operating During 1 - 1x1	Qty Operating During 2 - 1x1	Operating Factor, %	SG	Pump Efficiency	Motor Efficiency	Motor Input Power EACH (kW)	Total Aux Load (kW)	Aux Power Notes
	POTABLE WATER TANK (HDPE)	M2664	1	EA	NO	BOP	C	65.4100	77.1000	2,641	gal			N	N						7.5			10.5	510										No electrical load.
	POTABLE WATER TRANSFER PUMPS (2x100%)	M2664	2	EA	NA	BOP	M	67.9211	77.1000	128	gpm	196	ft	Y	N	15	600					1.5	3.8	2.0	630	3,500	1		100%	1.00	66%	90%	22.4	22.4	Reference 5, 1 pump operating
	POTABLE WATER TREATMENT SKID	M2664	1	EA	NA	BOP	C	65.4100	77.1000				ft	Y	N		600					10.0	20.0	7.0	5,000		1		100%	1.00	66%	90%	0.0	0.0	Reference 5, 1 pump operating
	SAFETY SHOWER HEATER (TEMPERING) SKIDS	M2664	2	EA	NO	BOP	C	65.4100	77.1000					Y		9	240					4.0	6.0	7.0	1,000		1		100%	1.00	66%	90%	16.4570	16.5	Operating during testing. Estimated using Westmoreland
	INDOOR SAFETY SHOWERS	M2664	5	EA	NO	BOP	C	65.4100	77.1000					N	N							2.0	1.0	7.0	25										No electrical load.
	OUTDOOR SAFETY SHOWERS	M2664	0	EA	NO	BOP	C	65.4100	77.1000					N	N							2.0	1.0	7.0	25										No electrical load.
	Cycle Chemical Feed Equipment																																		
	HRSG AQUEOUS AMMONIA FEED PUMPS (2 PUMPS PER SKID) IN ENCLOSURE (N/A)		0	EA	ENCLOSURE	BOP	C	65.1110	77.1000					Y	N	2	600					7.5	20.7	7.0	5,000		1		100%						Estimated.
	AUXILIARY BOILER AQUEOUS AMMONIA FEED PUMPS (2 PUMPS PER SKID) IN ENCLOSURE		0	EA	ENCLOSURE	BOP	C	65.1110	77.1000					Y	N	2	600					7.5	20.7	7.0	5,000										In Standby, but not operating during testing.
	HRSG HP PHOSPHATE FEED PUMPS (2 PUMPS PER SKID) IN ENCLOSURE	M2345	2	EA	ENCLOSURE	BOP	C	65.1110	77.1000					Y	N	2	600					7.5	20.7	7.0	5,000		2		100%						Estimated.
	HRSG IP PHOSPHATE FEED PUMPS (2 PUMPS PER SKID) IN ENCLOSURE	M2345	2	EA	ENCLOSURE	BOP	C	65.1110	77.1000					Y	N	2	600					7.5	20.7	7.0	5,000		2		100%						Estimated.
	AUXILIARY BOILER PHOSPHATE FEED PUMPS (2 PUMPS PER SKID) IN ENCLOSURE	M2345	1	EA	ENCLOSURE	BOP	C	65.1110	77.1000					Y	N	2	600					7.5	20.7	7.0	5,000		2		100%						Estimated.
	CHEMICAL TOTE	M2345	4	EA			M	99.2400	77.1000	400	gal			N	N																				No electrical load.
	Sampling & Analysis																																		
	STEAM CYCLE SAMPLE PANEL (IN ENCLOSURE)	M2523	2	EA	ENCLOSURE	BOP	C	65.1461	77.1000					Y	N	5	600					10.0	25.0	10.0	8,000		1		100%				3.7	3.7	Estimated.
	SECONDARY SAMPLE CHILLER	M2523	2	EA	SKID	BOP	C	65.1461	77.1000					Y	N	2	600					3.0	4.0	4.0	700		1		100%				1.5	1.5	Estimated.
	Cycle Makeup Treatment																																		
	CARTRIDGE FILTER	M2684	2	EA	CARTRIDGE FILTER SKID	BOP	C	65.1410	77.1000					N	N							4.0	8.0	7.0	4,500		1		100%				0.0	0.0	No electrical load.
	FIRST PASS RO BOOSTER (RO FEED) PUMPS	M2684	2	EA	RO UNITS SKID	BOP	C	65.1410	77.1000					Y	N	60	600					8.0	8.0	7.0	5,500		1		100%				44.7	44.7	Estimated. On for Case 2 Only
	FIRST PASS RO UNITS	M2684	2	EA	RO UNITS SKID	BOP	C	65.1410	77.1000					N	N							7.0	24.0	9.0	9,000		1		100%				0.0	0.0	No electrical load.
	SECOND PASS RO BOOSTER PUMPS	M2684	2	EA	RO UNITS SKID	BOP	C	65.1410	77.1000					Y	N	50	600					8.0	8.0	7.0	5,500		1		100%				37.3	37.3	Estimated. On for Case 2 Only
	SECOND PASS RO UNITS	M2684	2	EA	RO UNITS SKID	BOP	C	65.1410	77.1000					N								7.0	24.0	9.0	9,000		1		100%				0.0	0.0	No electrical load.
	RO CHEMICAL CLEANING (CLEAN IN PLACE) PUMP	M2684	1	EA	RO CLEAN IN PLACE SKID	BOP	C	65.1410	77.1000					Y	N	3	600					4.0	6.0	7.0	4,000		1		100%				2.2	2.2	Estimated. On for Case 2 Only
	RO CHEMICAL CLEANING TANK	M2684	1	EA	RO CLEAN IN PLACE SKID	BOP	C	65.1410	77.1000					N	N							on above skid					1		100%				0.0	0.0	No electrical load.
	RO CHEMICAL CLEANING FILTER	M2684	1	EA	RO CLEAN IN PLACE SKID	BOP	C	65.1410	77.1000					N	N							on above skid					1		100%				0.0	0.0	No electrical load.
	RO CHEMICAL CLEANING TANK MIXER	M2684	1	EA	RO CLEAN IN PLACE SKID	BOP	C	65.1410	77.1000					Y	N	1	600					on above skid					1		100%				0.7	0.7	Estimated. On for Case 2 Only
	RO CHEMICAL CLEANING TANK HEATER	M2684	1	EA	RO CLEAN IN PLACE SKID	BOP	C	65.1410	77.1000					Y	N	24	600					on above skid					1		100%				18.0	18.0	Estimated. On for Case 2 Only
	RO SODIUM BISULFITE FEED PUMPS	M2684	2	EA	RO SODIUM BISULFITE FEED SKID	BOP	C	65.1410	77.1000					Y	N	1	120					4.0	6.0	7.0	1,000		1		100%				0.7	0.7	Estimated. On for Case 2 Only
	RO ANTISCALANT FEED PUMPS	M2684	2	EA	RO ANTISCALANT FEED SKID	BOP	C	65.1410	77.1000					Y	N	1	120					4.0	6.0	7.0	1,000		1		100%				0.7	0.7	Estimated. On for Case 2 Only
	RO CAUSTIC FEED PUMPS	M2684	2	EA	RO CAUSTIC FEED SKID	BOP	C	65.1410	77.1000					Y	N	1	120					4.0	6.0	7.0	1,000		1		100%				0.7	0.7	Estimated. On for Case 2 Only
	RO PRODUCT WATER STORAGE TANK	M2684	1	EA	NA	BOP	C	65.1410	77.1000					N	N						9.0			11.0	2,200		1		100%				0.0	0.0	No electrical load.
	EDI SUPPLY PUMPS	M2684	2	EA	EDI SUPPLY PUMPS SKID	BOP	C	65.1410	77.1000					Y	N	10						6.0	8.0	7.0	4,000		1		100%				7.5	7.5	Estimated. On for Case 2 Only
	ELECTRODEIONIZATION UNITS	M2684	2	EA	EDI UNITS SKID	BOP	C	65.1410	77.1000					Y	N	40						5.0	7.0	5.0	4,000		1		100%				29.8	29.8	Estimated. On for Case 2 Only
	LEASED EXCHANGER MANIFOLD PIPING	M2684	1	EA	MANIFOLD PIPING SKID	BOP	C	65.1410	77.1000					N	N							5.0	5.0	7.0	1,000		1		100%				0.0	0.0	No electrical load.
	ANALYZER STAND	M2684	1	EA	ANALYZER STAND	BOP	C	65.1410	77.1000					Y	N	1	120					3.0	5.0	7.0	1,000		1		100%				0.7	0.7	Estimated. On for Case 2 Only
	CHEMICAL TOTES	M2684	3	EA	NA	BOP	C	99.2400	77.1000													4.0	4.0	4.0	4,000										No electrical load.
	Wastewater																																		
	HRSG BLOWDOWN SUMP PUMPS	M2643B	2	EA	NA	BOP	M	67.9231	77.1000	430	gpm	36	ft	Y	N	8	600					2.0	2.0	15.0	800		0		0%	1.00	80%	90%	4.0	0.0	In Standby, but not operating during testing.
	WATER TREATMENT AREA SUMP PUMPS	M2643A	1	EA	NA	BOP	M	67.9231	77.1000	200	gpm	201	ft	Y	N	10	600					3.0	3.0	15.0	1,250		1		20%				7.5	1.5	One pump @ 20% capacity factor
	WASTEWATER COLLECTION SUMP PUMPS	M2643A	2	EA	NA	BOP	M	67.9231	77.1000	750	gpm	19	ft	Y	N	10	600					3.0	3.0	10.0	1,250		1		20%				7.5	1.5	One pump @ 20% capacity factor
53	WASTEWATER STORAGE TANK	M2643A	1	EA	NA	BOP	M	77.5450	77.5450	100,000	gal			N	N						28.0			24.0										No electrical load.
	WASTEWATER STORAGE TANK HEATER	M2643A	1	EA	NA	BOP	M	77.5450	77.5450					Y	N	33.5	600	25																In Standby, but not operating during testing.
	AUXILIARY BOILER BUILDING SUMP PUMPS	M2643A	1	EA	NA	BOP	M	67.9231	77.1000	200	gpm	201	ft	Y	N	10	600					3.0	3.0	15.0	1,250		1		20%				7.5	1.5	One pump @ 20% capacity factor
58	PACKAGED OIL WATER SEPARATOR	M2644	1	EA	NA	BOP	S	61.2005	71.0402	13,209	gal			Y	N	15	600					3.0	3.0	10.0	1,000										No electrical load.
	OIL WATER SEPARATOR PUMPS (LOCATED WITHIN PKGD OWS)	M2644	1	EA	NA	BOP	S	61.2005	71.0402					Y	N	15	600					1.0	1.0	1.0	50		0		20%				11.2	0.0	In Standby, but not operating during testing.
	SANITARY LIFT PUMPS	M2642	1	EA	PKGD SANITARY LIFT STATION	BOP	S	61.2009	71.0402					Y	N	1	120																0.7	0.0	In Standby, but not operating during testing.
	SEPTIC TANK	M2642	1	EA		BOP	S	61.2009	71.0402					N	N																				
	STEAM SYSTEMS (Bypass Valves, Terminal Attemperators)																																		
	HP TO CRH STEAM TURBINE BYPASS VALVES	M2587	1	EA	NA	BOP	M	67.9110	77.1000					Y	N	CONTROL																			No electrical load.
	LP TO CONDENSER STEAM TURBINE BYPASS VALVES	M2588	1	EA	NA	BOP	M	67.9110	77.1000					Y	N	CONTROL																			No electrical load.
	HRH TO CONDENSER STEAM TURBINE BYPASS VALVES	M2590	1	EA	NA	BOP	M	67.9110	77.1000					Y	N	CONTROL																			No electrical load.
	ELECTRICAL EQUIPMENT																																		
103	HV Circuit Breaker		1	EA		BOP	E	63.0000	73.0200			2,000	amp				245000																		
104	Disconnect Switch		2	EA		BOP	E	63.0000	73.0200			2,000	amp				245000																		
105	CCVT		1	EA		BOP	E	63.0000	73.0200								245000																		
106	Surge Arrester		2	EA		BOP	E	63.0000	73.0200																										
	Starting		1	EA		BOP	E	63.0000	73.0200								6900																		
	Excitation		1	EA		BOP	E	63.0000	73.0200								6900																		
7	Generator Step Up Transformer		1	EA		BOP	E	63.0000	73.0200								240000																		
60	Generator Circuit Breaker (52-G)		1	EA		BOP	E	63.0000	73.0200			15,000	amp				25000																		
	Isolated Phase Bus Duct		1	EA		BOP	E	63.0000	73.0200			5,000	amp				22000																		

Site Arrangement Item Number	Equipment Name	P&ID	Qty Installed	Qty Units	Skid Designation	Category	Resp Dept	Purchase Spec	Install Spec	Value	Units	Value	Units	Power Wiring?	Med Voltage?	Motor Nameplate (hp)	Motor Voltage (V)	Total Load (kW)	Total Load (kVA)	Rated Motor Speed (RPM)	Diameter (ft)	Width (ft)	Length (ft)	Height (ft)	Shipping Weight (lb)	Op Weight (lb)	Qty Operating During 1 - 1x1	Qty Operating During 2 - 1x1	Operating Factor, %	SG	Pump Efficiency	Motor Efficiency	Motor Input Power EACH (kW)	Total Aux Load (kW)	Aux Power Notes
6	Main Auxiliary Transformer		1	EA		BOP	E	63.0000	73.0200								22000																		
61	13.8 KV Switchgear Bus		1	EA		BOP	E	63.0000	73.0200			3,000	amp				13800																		
61	6.9 KV Switchgear Bus 1		1	EA		BOP	E	63.0000	73.0200			3,000	amp				6900																		
61	6.9 KV Switchgear Bus 2		1	EA		BOP	E	63.0000	73.0200			3,000	amp				6900																		
64	SUS Transformer 1		1	EA		BOP	E	63.0000	73.0200								6900		3000																
26	SUS Transformer 2		1	EA		BOP	E	63.0000	73.0200								6900		3000																
26	SUS Transformer 3		1	EA		BOP	E	63.0000	73.0200								6900		3000																
9	SUS Transformer 4		1	EA		BOP	E	63.0000	73.0200								6900		3000																
100	SUS Transformer 5		1	EA		BOP	E	63.0000	73.0200								6900		3000																
64	600 V Switchgear 1		1	EA		BOP	E	63.0000	73.0200			3,000	amp				600																		
26	600 V Switchgear 2		1	EA		BOP	E	63.0000	73.0200			3,000	amp				600																		
26	600 V Switchgear 3		1	EA		BOP	E	63.0000	73.0200			3,000	amp				600																		
9	600 V Switchgear 4		1	EA		BOP	E	63.0000	73.0200			3,000	amp				600																		
100	600 V Switchgear 5		1	EA		BOP	E	63.0000	73.0200			3,000	amp				600																		
64	600 V Motor Control Center - HRSG		1	EA		HRSG	E	63.0000	73.0200			1,200	amp				600																		
64	600 V Motor Control Center - CT		1	EA		CT	E	63.0000	73.0200			1,200	amp				600																		
26	600 V Motor Control Center - ACC		1	EA		ACC	E	63.0000	73.0200			1,200	amp				600																		
26	600 V Motor Control Center - ACC		1	EA		ACC	E	63.0000	73.0200			1,200	amp				600																		
26	600 V Motor Control Center - ACC		1	EA		ACC	E	63.0000	73.0200			1,200	amp				600																		
26	600 V Motor Control Center - BOP		1	EA		BOP	E	63.0000	73.0200			1,200	amp				600																		
26	600 V Motor Control Center - BOP		1	EA		BOP	E	63.0000	73.0200			1,200	amp				600																		
9	600 V Motor Control Center - COND AIR CLR		1	EA		CCS	E	63.0000	73.0200			800	amp				600																		
9	600 V Motor Control Center - LEAN AMINE CLR		1	EA		CCS	E	63.0000	73.0200			1,200	amp				600																		
9	600 V Motor Control Center - WATER WASH CLR 1		1	EA		CCS	E	63.0000	73.0200			1,200	amp				600																		
9	600 V Motor Control Center - WATER WASH CLR 2		1	EA		CCS	E	63.0000	73.0200			1,200	amp				600																		
100	600 V Motor Control Center (GLE)		1	EA		CO2 COMP	E	60.0100	73.0200			1,200	amp				600																		
64	600 V EMER Motor Control Center (SIEMENS)		1	EA		CT	E	67.9200	73.0200			800	amp				600																		
100	600 V EMER Motor Control Center (GLE)		1	EA		CO2 COMP	E	60.0100	73.0200			600	amp				600																		
57	Emergency Diesel Generator		1	EA		BOP	E	63.0000	73.0200								600		1500																
64	Automatic Transfer Switch 1		1	EA		BOP	E	63.0000	73.0200			800	amp				600																		
100	Automatic Transfer Switch 2		1	EA		BOP	E	63.0000	73.0200			800	amp				600																		
	Miscellaneous																																		
23	CONTINUOUS EMISSIONS MONITORING SYSTEM (CEMS) ENCLOSURES	not shown	1	EA	CEMS SKID	HRSG	E	65.3600	77.1000	0		0		Y	N							SEE DWG	SEE DWG	SEE DWG	SEE DWG		1		0%	0.00	0%	0%	0.0	0.0	Included with Siemens total auxiliary power
	HVAC (for aux power only)		1	LS		BOP	M	62.3201	72.0400					Y	N												1		100%				1825.0	1825.0	Reference 6
	BATTERY INVERTERS (for aux power only)		1	LS		BOP	E							Y	N												1		100%				0.0	10.0	Reference 8
	PEMB (for aux power only)		1	LS		BOP	E							Y	N												1		100%					67.1	Reference 7
	LIGHTING (for aux power only)		1	LS		BOP	E							Y	N												1		100%					87.3	Reference 8
	DCS (for aux power only)		1	LS		ST	E							Y	N												1		100%				0.0	0.0	Included with battery inverters above.
	HEAT TRACING (for aux power only)		1	LS		BOP	E							Y	N												1		100%					0.0	Not operating during test (Spring Test)
	CATHODIC PROTECTION (for aux power only)		1	LS		BOP	E							Y	N												1		100%					0.0	Reference 8
	Storm Water																																		
25	STORM WATER RETENTION POND		1	EA		BOP	S	71.0402	71.0402					N	N																		0.0	0.0	No electrical load.
	CCS SYSTEM EQUIPMENT LIST																																		
	CCS- Columns																																		
112	PRESCRUBBER		1	EA		CCS	M	60.1200	77.1000					N	N						-	43.96	52.5	82.7 (T/T)			1		100%						No electrical load.
110	CO2 ABSORBER (INCLUDING WATERWASH SECTION)		1	EA		CCS	M	60.1200	77.1000					N	N						-	52.5	52.5	195.2 (T/T)			1		100%						No electrical load.
111	CO2 STRIPPER		1	EA		CCS	M	60.1200	77.1000					N	N						27.2	-	-	91.5 (T/T)			1		100%						No electrical load.
	CCS- Vessels & Tanks																																		
131	LEAN FLASH TANK		1	EA		CCS	M	60.1200	77.1000	78,406	gal			N	N						20.0	-	-	33.4 (T/T)			1		100%						No electrical load.
132	CONDENSATE FLASH TANK		1	EA		CCS	M	60.1200	77.1000	4,042	gal			N	N						7.0	-	-	14.0 (T/T)			1		100%						No electrical load.
130	STRIPPER OVERHEAD ACCUMULATOR		1	EA		CCS	M	60.1200	77.1000	13,738	gal			N	N						12.5	-	-	15.0 (T/T)			1		100%						No electrical load.
127	LEAN AMINE TANK		1	EA		CCS	M	60.1200	77.1000	607,332	gal			N	N						41.0	-	-	61.5 (T/T)			1		100%						No electrical load.
128	MAKEUP AMINE TANK		1	EA		CCS	M	60.1200	77.1000	26,681	gal			N	N						13.5	-	-	25.0 (T/T)			1		100%						No electrical load.
129	AMINE DRAIN TANK		1	EA		CCS	M	60.1200	77.1000	1,955	gal			N	N						5.5	-	-	11.0 (T/T)			1		100%						No electrical load.
	CCS- Heat Exchangers																																		
22	PRESCRUBBER AIR COOLER		1	EA		CCS	M	60.1200	77.1000					N	N												1		100%						No electrical load.
22	WATER WASH AIR COOLER		1	EA		CCS	M	60.1200	77.1000					N	N												1		100%						No electrical load.
114	LEAN/RICH EXCHANGER		5	EA		CCS	M	60.1200	77.1000					N	N													5	100%						No electrical load.
113	STRIPPER REBOILER		1	EA		CCS	M	60.1200	77.1000					N	N												1		100%						No electrical load.
22	AIR COOLED STRIPPER CONDENSER		1	EA		CCS	M	60.1200	77.1000					N	N												1		100%						No electrical load.
22	LEAN AMINE AIR COOLER		1	EA		CCS	M	60.1200	77.1000					N	N												1		100%						No electrical load.
	CCS- Pumps																																		
121	AMINE FEED PUMPS / PRESCRUBBER WATER CIRCULATION PUMPS		2	EA		CCS	M	60.1200	77.1000	14,710	gpm	38	psi	Y		400												1							Pump configuration is 2x100%
123	WATER WASH PUMP		2	EA		CCS	M	60.1200	77.1000	25,303	gpm	35	psi	Y		600												1							Pump configuration is 2x100%
118	RICH AMINE PUMP		2	EA		CCS	M	60.1200	77.1000	12,131	gpm	82	psi	Y		700												1							Pump configuration is 2x100%
119	LEAN AMINE PUMP		1	EA		CCS	M	60.1200	77.1000	12,749	gpm	31	psi	Y		300												1							
120	STRIPPER REFLUX PUMP		2	EA		CCS	M	60.1200	77.1000	186	gpm	73	psi	Y		10												1							Pump configuration is 2x100%
122	MAKEUP AMINE PUMP		1	EA		CCS	M	60.1200	77.1000	1,275	gpm	20	psi	Y		20												1							
	CCS- Fans & Compressors																																		
115	LEAN FLASH COMPRESSOR		1	EA		CCS	M	60.1200	77.1000	771,363	gpm	15	psi	Y		6872											1								
116	BOOSTER FAN		1	EA		CCS	M	60.1200	77.1000	10,672,408	gpm	0.7	psi	Y		5002											1								
22	PRESCUBBER AIR COOLER FAN		1	EA		CCS	M	60.1200	77.1000	TBC		0.002	psi	Y		TBC											1								
22	CONDENSER AIR COOLER FAN		1	EA		CCS	M	60.1200	77.1000	21,622,278	gpm	0.002	psi	Y		500											1								
22	LEAN AMINE AIR COOLER FAN		1	EA		CCS	M	60.1200	77.1000	34,215,009	gpm	0.002	psi	Y		800											1								
22	WATERWASH COOLER FAN		1	EA		CCS	M	60.1200	77.1000	76,833,117	gpm	0.002	psi	Y		2001											1								
	CCS- Packaged Equipment																																		
124	LEAN AMINE PRE-FILTER (CARTRIDGE TYPE)		1	EA		CCS	M	60.1200	77.1000	5% of solvent flow				N													1								
125	ACTIVATED CARBON (ACTIVATED CARBON)		1	EA		CCS	M	60.1200	77.1000	2.5% of solvent flow				N													1								
126	LEAN AMINE POST-FILTER (CARTRIDGE TYPE)		1	EA		CCS	M	60.1200	77.1000	2.5% of solvent flow				N													1								

Site Arrangement Item Number	Equipment Name	P&ID	Qty Installed	Qty Units	Skid Designation	Category	Resp Dept	Purchase Spec	Install Spec	Value	Units	Value	Units	Power Wiring?	Med Voltage?	Motor Nameplate (hp)	Motor Voltage (V)	Total Load (kW)	Total Load (KVA)	Rated Motor Speed (RPM)	Diameter (ft)	Width (ft)	Length (ft)	Height (ft)	Shipping Weight (lb)	Op Weight (lb)	Qty Operating During 1 - 1x1	Qty Operating During 2 - 1x1	Operating Factor, %	SG	Pump Efficiency	Motor Efficiency	Motor Input Power EACH (kW)	Total Aux Load (kW)	Aux Power Notes
109	THERMAL RECLAIMER		1	EA		CCS	M	60.1200	77.1000	3,590	lb/hr			N													1								
	CO2 COMPRESSION SYSTEM EQUIPMENT LIST																																		
	CO2 COMPRESSOR TRAIN																																		
66	K-XXXX 8 STAGE INTEGRALLY GEARED CENTRIFUGAL COMPRESSOR		2	EA		CO2 COMP	M	60.0100	77.1000	214,238	lb/hr	2,000	psi	Y													2		50%						Compressor configuration is 2X50%
67	KM-XXXX SYNCHRONOUS ELECTRIC MOTOR		2	EA		CO2 COMP	M	60.0100	77.1000					Y		13000		9698	11409	1800														
71	V-XXX1 FIRST STAGE SUCTION SCRUBBER		2	EA		CO2 COMP	M	60.0100	77.1000																									
72	IC-XXX1 FIRST STAGE COOLER		2	EA		CO2 COMP	M	60.0100	77.1000																									
73	V-XXX2 SECOND STAGE SUCTION SCRUBBER		2	EA		CO2 COMP	M	60.0100	77.1000																									
74	IC-XXX2 SECOND STAGE COOLER		2	EA		CO2 COMP	M	60.0100	77.1000																									
75	V-XXX3 THIRD STAGE SUCTION SCRUBBER		2	EA		CO2 COMP	M	60.0100	77.1000																									
76	IC-XXX3 THIRD STAGE COOLER		2	EA		CO2 COMP	M	60.0100	77.1000																									
77	V-XXX4 FOURTH STAGE SUCTION SCRUBBER		2	EA		CO2 COMP	M	60.0100	77.1000																									
78	IC-XXX5 FIFTH STAGE COOLER		2	EA		CO2 COMP	M	60.0100	77.1000																									
79	V-XXX5 FIFTH STAGE DISCHARGE SCRUBBER		2	EA		CO2 COMP	M	60.0100	77.1000																									
80	IC-XXX8 EIGHTH STAGE COOLER		2	EA		CO2 COMP	M	60.0100	77.1000																									
81	V-XXX6 SIXTH STAGE SUCTION SCRUBBER		2	EA		CO2 COMP	M	60.0100	77.1000																									
	COMPRESSED CO2 DEHYDRATION UNIT TRAIN																																		
82	V-XXX1 GLYCOL CONTACTOR		2	EA		CO2 COMP	M	60.0100	77.1000																			2	50%						
82	BH-XXX1 ELECTRIC BUILING HEATER		2	EA		CO2 COMP	M	60.0100	77.1000					Y		47	600											2	50%						Intermittent duty
82	BH-XXX2 ELECTRIC BUILING HEATER		2	EA		CO2 COMP	M	60.0100	77.1000					Y		47	600											2	50%						Intermittent duty
82	V-XXX2 GLYCOL FLASH TANK		2	EA		CO2 COMP	M	60.0100	77.1000																			2	50%						
82	F-XXX1 PARTICULATE FILTER		2	EA		CO2 COMP	M	60.0100	77.1000																			2	50%						
82	F-XXX2 PARTICULATE FILTER		2	EA		CO2 COMP	M	60.0100	77.1000																			2	50%						
82	P-XXX1 LEAN GLYCOL PUMP		2	EA		CO2 COMP	M	60.0100	77.1000																			2	50%						
82	PM-XXX1 LEAN GLYCOL PUMP MOTOR		2	EA		CO2 COMP	M	60.0100	77.1000					Y		15	600											2	50%						
82	P-XXX2 LEAN GLYCOL PUMP		2	EA		CO2 COMP	M	60.0100	77.1000																			2	50%						Stand-by Pump
82	PM-XXX2 LEAN GLYCOL PUMP MOTOR		2	EA		CO2 COMP	M	60.0100	77.1000					Y		15	600											2	50%						Stand-by Pump
82	AC-XXX1 LEAN GLYCOL EXCHANGER		2	EA		CO2 COMP	M	60.0100	77.1000																			2	50%						
82	E-XXX1 PREHEAT COIL		2	EA		CO2 COMP	M	60.0100	77.1000																			2	50%						
82	V-XXX1 GLYCOL ACCUMMULATOR		2	EA		CO2 COMP	M	60.0100	77.1000																			2	50%						
82	EF-XXX1 EXHAUST FAN		2	EA		CO2 COMP	M	60.0100	77.1000																			2	50%						
82	EFM-XXX1 EXHAUST FAN MOTOR		2	EA		CO2 COMP	M	60.0100	77.1000					Y		1	600											2	50%						Intermittent duty
82	EF-XXX2 EXHAUST FAN		2	EA		CO2 COMP	M	60.0100	77.1000																			2	50%						
82	EFM-XXX2 EXHAUST FAN MOTOR		2	EA		CO2 COMP	M	60.0100	77.1000					Y		1	600											2	50%						Intermittent duty
82	H-XXX1 GLYCOL REGENERATOR		2	EA		CO2 COMP	M	60.0100	77.1000																			2	50%						
82	AC-XXX1 GLYCOL STILL VENT COOLER		2	EA		CO2 COMP	M	60.0100	77.1000																			2	50%						
82	ACM-XXX1 GLYCOL STILL VENT COOLER FAN		2	EA		CO2 COMP	M	60.0100	77.1000																			2	50%						
	CO2 COMPRESSION SYSTEM TANKS																																		
101	TK-XXX1 STILL VENT CONDENSING TANK		2	EA		CO2 COMP	M	60.0100	77.1000	4,200	gal			N							11.1	-	-	6.0			1		100%						No electrical load.
102	TK-XXX2 GLYCOL MAKE-UP TANK		1	EA		CO2 COMP	M	60.0100	77.1000	1,057	gal			N							-	8.9	6.9	5.0			1		100%						No electrical load.

Appendix J – Water Mass Balance



DESIGN PARAMETERS:

COMBUSTION FUEL	Natural Gas	
NET PLANT OUTPUT (KW)	460017	
No. COMBUSTION TURBINES	1	
TURBINE CONFIGURATION	1X1	
AMBIENT TEMP (F) / RH(%)	3	46.2
EVAP COOLER	NA	
CARBON CAPTURE	On	

BOILER CYCLES OF CONCENTRATION	30

TERMINATION POINTS

TP-01	SURFACE WATER
TP-02	SOLID WASTE DISPOSAL
TP-03	POTABLE WATER
TP-04	TRU WASTE
TP-05	TEG WASTE
TP-06	PROCESS WASTE
TP-07	SANITARY WASTE

NOTES:
1. FLOWS ARE IN CUBIC METERS PER HOUR UNLESS NOTED OTHERWISE.
2 - - - - - LINES REPRESENT INTERMITTENT FLOWS.
3 — · — · — LINES REPRESENT TERMINATION POINTS.

NO	DATE	REVISIONS AND RECORD OF ISSUE	DRN	CHK
			DRS	GMT
0	12/15/22	ISSUED FOR PERMITTING	DRS	GMT

BLACK & VEATCH Building a world of difference.

Eng: DRS Dwg: DRS
Check: GMT Date: 12/15/2022

HEAT BALANCE CASE #
8 Average Day

AVERAGE DAY 1X1 460 MW + CC ON

KIWETINOHK
BLACK BEAR COMBINED CYCLE WITH CARBON CAPTURE

SURFACE WATER TBD	Project	Drawing Number	REV
	412155	WMB-8	0

Appendix K – ACIMS Data Search Results

Date: 19/10/2022
Requestor: Consultant
Reason for Request: Site Assessment
SEC: 15 **TWP:** 064 **RGE:** 11 **MER:** 5

Alberta Parks

Non-sensitive EOs (updated: June 2022)

M_RR_TTT_SS	EO_ID	ECODE	S_RANK	SNAME	SCOMNAME	LAST_OBS_D

No Non-sensitive EOs Found: Next Steps - See FAQ

Sensitive EOs (updated: June 2022)

M-RR-TTT	EO_ID	ECODE	S_RANK	SNAME	SCOMNAME	LAST_OBS_D

No Sensitive EOs Found: Next Steps - See FAQ

Appendix L – Surface Draining and Civil Grading

DRAWING INDEX

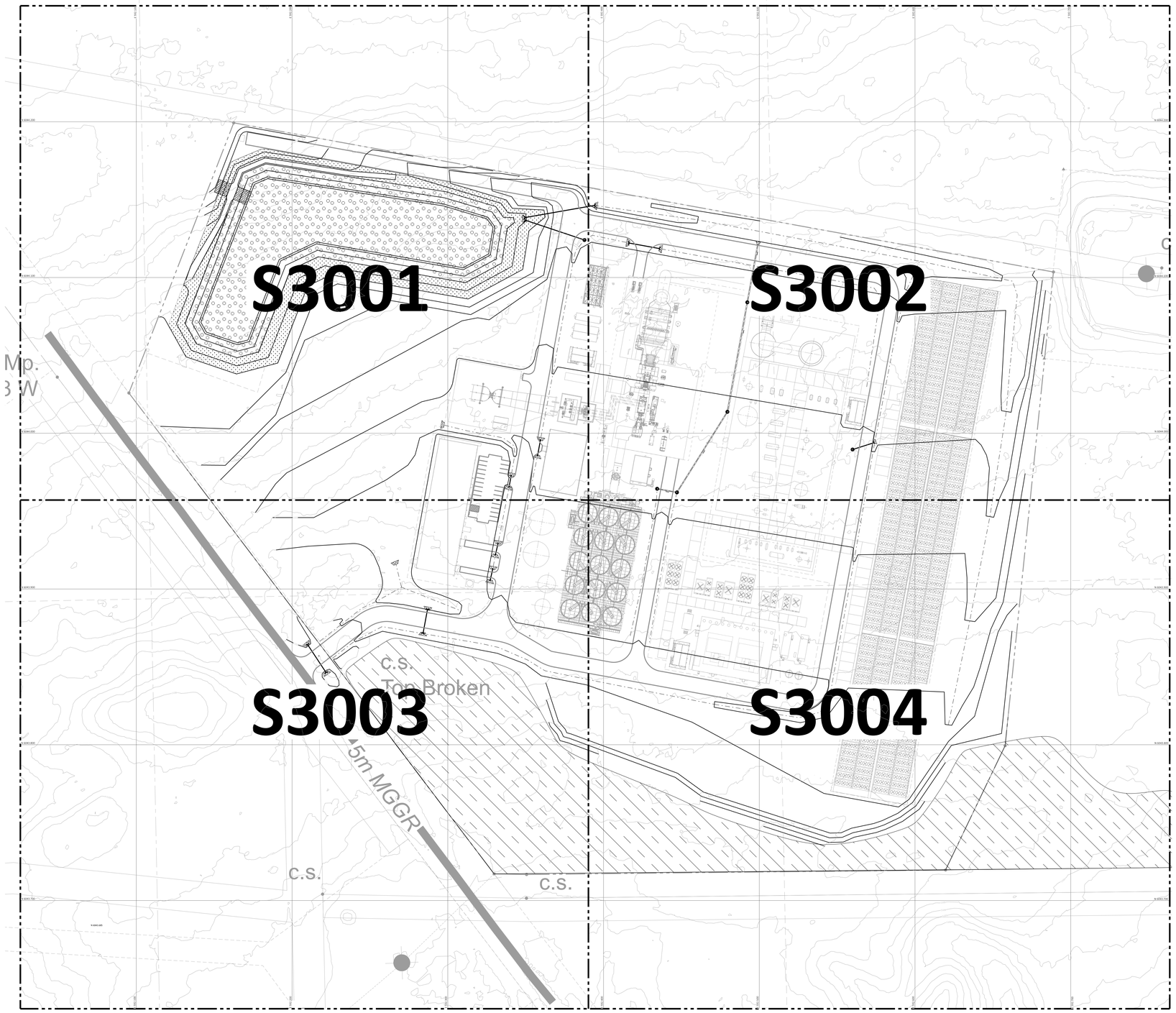
DWG NO.	DWG SERIES	DESCRIPTION
412155-00AAA-61000	G1000	GENERAL SITE ARRANGEMENT
412155-00STF-S3000	S3000	PRELIMINARY GRADING AND DRAINAGE PLANS
412155-00STF-S3001	S3001	GRADING AND DRAINAGE PLAN - 1
412155-00STF-S3002	S3002	GRADING AND DRAINAGE PLAN - 2
412155-00STF-S3003	S3003	GRADING AND DRAINAGE PLAN - 3
412155-00STF-S3004	S3004	GRADING AND DRAINAGE PLAN - 4
412155-00STF-S3901	S3901	RETENTION POND CROSS SECTIONS

GENERAL NOTES
APPLICABLE TO ALL S3000 SERIES DRAWINGS

1. KIWETINOHK PLANT GRID SYSTEM IS BASED ON N 699.009, E 146.552 (EXISTING GEO REFERENCE CONTROL POINT RP-1). THIS POINT CORRESPONDS TO N 5930433.00, E 526445.55 IN UTM83 ZONE 11N.
2. GRADE SHALL SLOPE UNIFORMLY BETWEEN FINISH SPOT ELEVATIONS AND CONTOURS SHOWN ON THE PLANS AND AS INDICATED BY DIRECTION OF FLOW ARROWS.
3. A SMOOTH VERTICAL TRANSITION SHALL BE PROVIDED AT ROAD INTERSECTIONS.
4. SLOPES SHALL BE 3(H):1(V) OR FLATTER, UNLESS NOTED OTHERWISE.
5. THE CONTRACTOR IS RESPONSIBLE FOR TYING FINISHED CONTOURS INTO EXISTING CONTOURS IN AREAS WHERE THERE IS INSUFFICIENT SURVEY DATA OF THE EXISTING GRADE.
6. SPOT ELEVATIONS AND CONTOURS ON S3000 SERIES DRAWINGS ARE TOP OF FINISHED GRADE AND TOP OF ASPHALT SURFACING. CONTRACTOR SHALL SUBTRACT FINISH SURFACING MATERIAL THICKNESS TO OBTAIN TOP OF SUBGRADE.
7. ALL AREAS OUTSIDE OF POWER BLOCK DISTURBED DURING CONSTRUCTION SHOULD BE RESTORED TO THEIR PRE-CONSTRUCTION CONDITIONS, AND STABILIZED UNLESS NOTED OTHERWISE. DISTURBED AREAS NOT RECEIVING AGGREGATE, ASPHALT, OR CONCRETE SURFACING SHALL BE SEEDED/SODDED PER SURFACING PLANS, SEE S3200 SERIES DRAWINGS.
8. GRADING SHALL SLOPE TO THE NEAREST DRAINAGE DITCH OR AS INDICATED BY FLOW ARROWS TO ALLOW FOR PROPER DRAINAGE DURING CONSTRUCTION WITH A MINIMUM SLOPE OF 1.5% UNLESS OTHERWISE INDICATED ON THE DRAWINGS.
9. NO WORK SHALL COMMENCE WITHOUT PERMIT APPROVAL.
10. NO WORK SHALL EXTEND BEYOND THE LIMITS OF DISTURBANCE OR PROPERTY LINES UNLESS AUTHORIZED.
11. SURVEY INFORMATION PROVIDED BY KIWETINOHK ENERGY AND PREFORMED BY BEAIRSTO & ASSOCIATES. SITE PLAN FOR MASKAWA POWER PLANT DATED AUGUST 11, 2022.

LEGEND
APPLICABLE TO ALL S3000 SERIES DRAWINGS

- PROPERTY LINE
- LIMIT OF DISTURBED AREA
- NEW SECURITY FENCE
- SWITCHYARD FENCE
- CONSTRUCTION FENCE
- EXISTING FENCE
- NEW CONTOUR (48)
- EXISTING CONTOUR (48)
- NEW STORM WATER SYSTEM
- AREA INLET
- NEW CULVERT
- DITCH/SWALE FLOW INDICATOR
- GRADE SURFACE FLOW INDICATOR
- NEW SPOT ELEVATION (48.8 +)
- SURVEY CONTROL MONUMENT
- TO BE DEMOLISHED
- PROPOSED STORM STRUCTURE
- PROPOSED DRAINAGE CL
- PROPOSED UNDEGROUND STORM PIPE
- ASPHALT SURFACING
- AGGREGATE SURFACING
- REINFORCED CONCRETE
- EARTH
- RIPRAP
- GRASS
- WETLANDS
- EXISTING TREE
- SECTION OR DETAIL NUMBER (1 / S3000)
- DRAWING DESIGNATION NUMBER
- PROPOSED RIP-RAP



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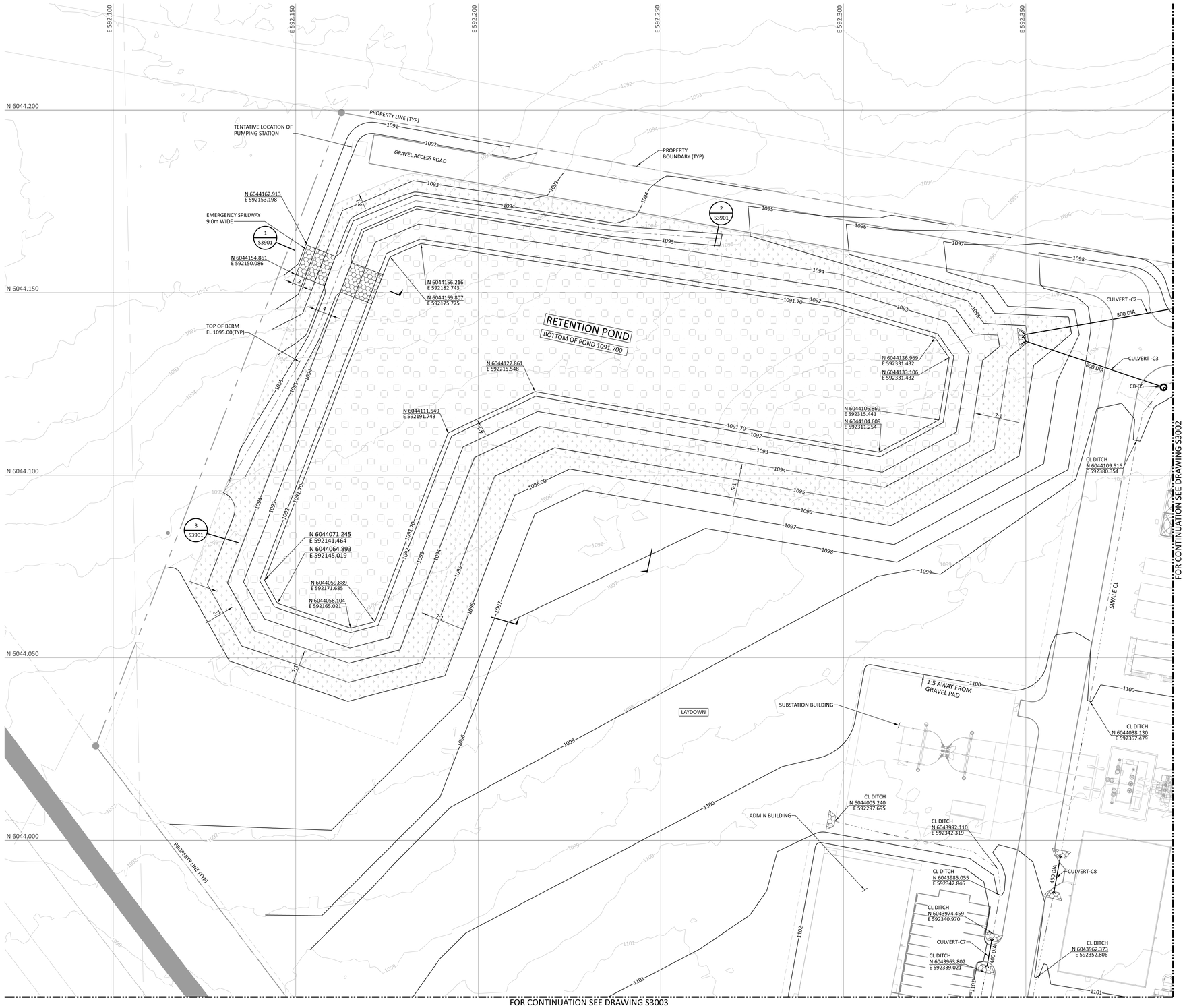
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CHECKED	DATE

KIWETINOHK ENERGY CORP
BLACK BEAR COMBINED CYCLE WITH CCS
GRADING AND DRAINAGE - SITE
KEY PLAN, GENERAL NOTES AND LEGEND

PROJECT	DRAWING NUMBER	REV
412155-00STF-S3000		A
CODE		
AREA		

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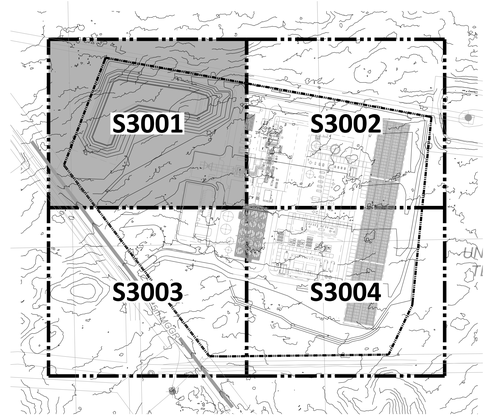
NOTES

1. SEE DRAWING 00STF-S3000 FOR GRADING AND DRAINAGE NOTES AND LEGEND.
2. SEE DRAWINGS S3900-S3903 FOR GRADING AND DRAINAGE SECTIONS AND DETAILS.
3. SPOT ELEVATIONS AND CONTOURS ON S3000 SERIES DRAWINGS ARE TOP OF FINISHED GRADE. CONTRACTOR SHALL SUBTRACT FINISH SURFACING MATERIAL THICKNESS TO OBTAIN TOP OF SUBGRADE.
4. GRADE SHALL SLOPE UNIFORMLY BETWEEN FINISH SPOT ELEVATIONS AND CONTOURS SHOWN ON THE PLANS AND AS INDICATED BY DIRECTION OF FLOW AND SLOPE ARROWS.

SuDS CUT/FILL VOLUME

TYPE	DESCRIPTION	VOLUME (CUBIC METER)
CUT	SuDS#01	180994
FILL		40045
MATERIAL SURPLUS (REQUIRED TO DISPOSE)		140948

KEY PLAN



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SCALE IN MILLIMETERS

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DESIGNER	DRAWN APJ
CHECKED	DATE

KIWETINOHK ENERGY CORP
BLACK BEAR COMBINED CYCLE WITH CCS
PRELIMINARY GRADING & DRAINAGE - SITE PLAN AREA - 1

PROJECT	DRAWING NUMBER	REV
412155-00STF-S3001		A
CODE		
AREA	412155-00STF-S3001	

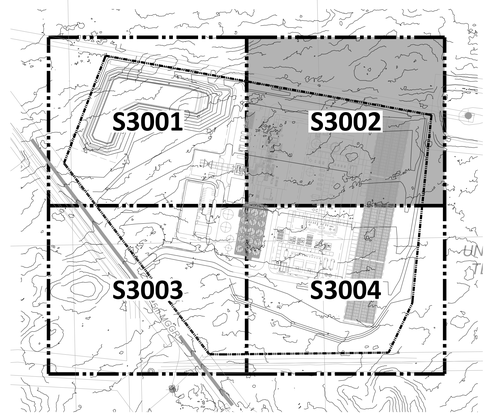
MicroStation v10.15.0.74
Full Size 1:1

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NOTES

1. SEE DRAWING 00STF-S3000 FOR GRADING AND DRAINAGE NOTES AND LEGEND.
2. SEE DRAWINGS S3900-S3903 FOR GRADING AND DRAINAGE SECTIONS AND DETAILS.
3. SPOT ELEVATIONS AND CONTOURS ON S3000 SERIES DRAWINGS ARE TOP OF FINISHED GRADE. CONTRACTOR SHALL SUBTRACT FINISH SURFACING MATERIAL THICKNESS TO OBTAIN TOP OF SUBGRADE.
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KEY PLAN



FOR CONTINUATION SEE DRAWING S3001

FOR CONTINUATION SEE DRAWING S3004

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SCALE IN MILLIMETERS

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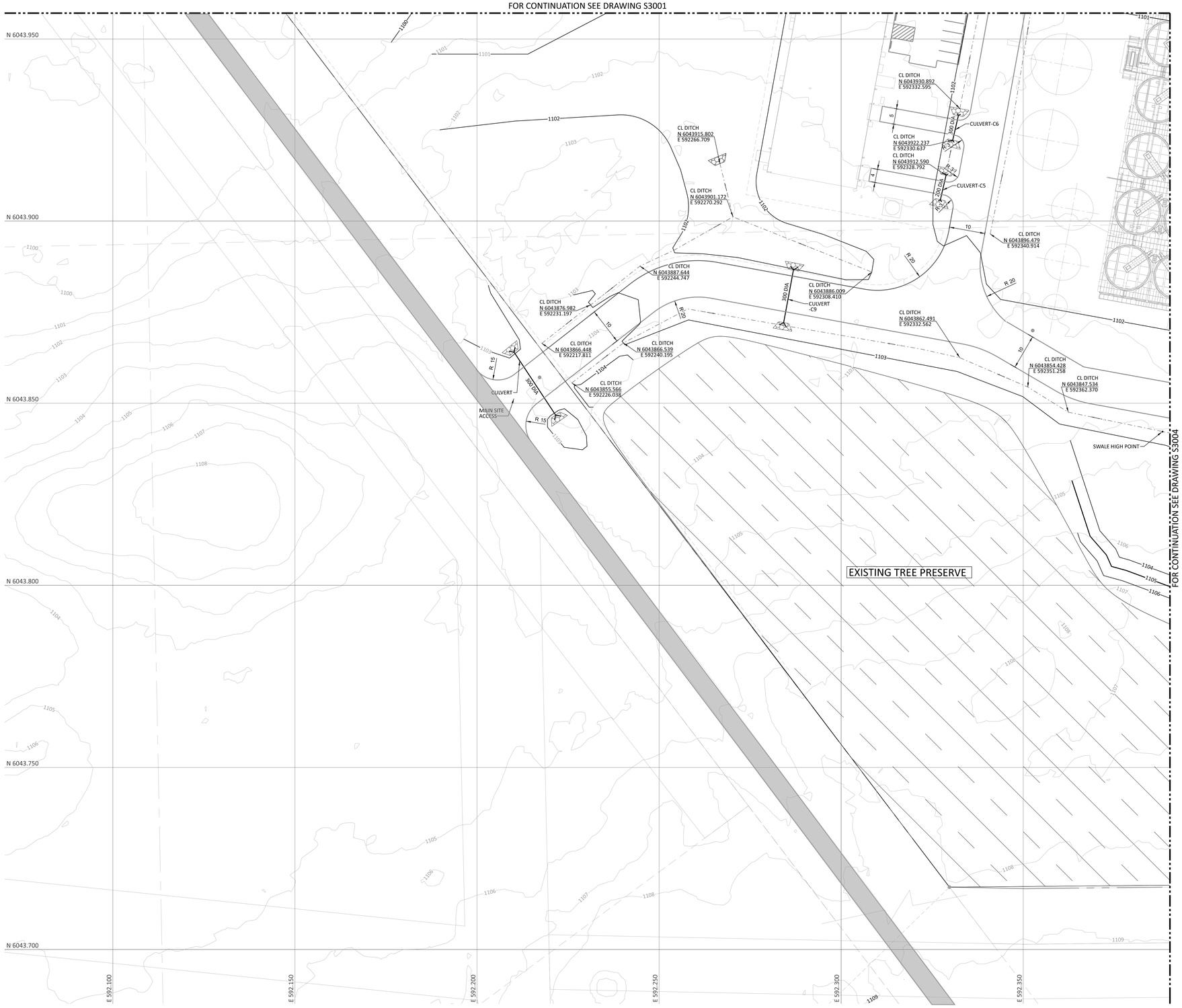
KIWETINOHK ENERGY CORP
BLACK BEAR COMBINED CYCLE WITH CCS
GRADING & DRAINAGE - SITE
PLAN AREA - 2

PROJECT	DRAWING NUMBER	REV
412155-00STF-S3002		A
CODE		
AREA	412155-00STF-S3002	

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Full Size 1:1

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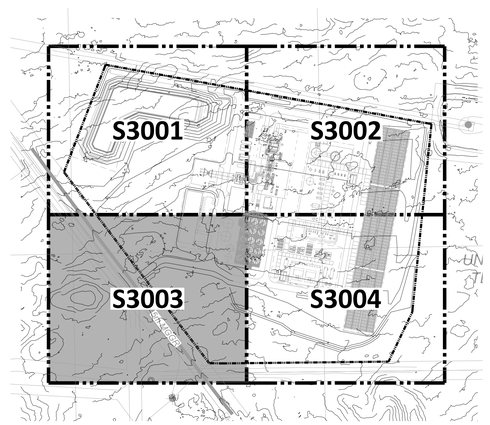
FOR CONTINUATION SEE DRAWING S3001



NOTES

1. SEE DRAWING 00STF-S3000 FOR GRADING AND DRAINAGE NOTES AND LEGEND.
2. SEE DRAWINGS S3900-S3903 FOR GRADING AND DRAINAGE SECTIONS AND DETAILS.
3. SPOT ELEVATIONS AND CONTOURS ON S3000 SERIES DRAWINGS ARE TOP OF FINISHED GRADE. CONTRACTOR SHALL SUBTRACT FINISH SURFACING MATERIAL THICKNESS TO OBTAIN TOP OF SUBGRADE.
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KEY PLAN



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KIWETINOHK ENERGY CORP
BLACK BEAR COMBINED CYCLE WITH CCS
GRADING & DRAINAGE - SITE
PLAN AREA - 3

PROJECT 412155-00STF-S3003 | DRAWING NUMBER | REV A

CODE | AREA 412155-00STF-S3003

MicroStation v10.15.0.74
Full Size 1 = 1

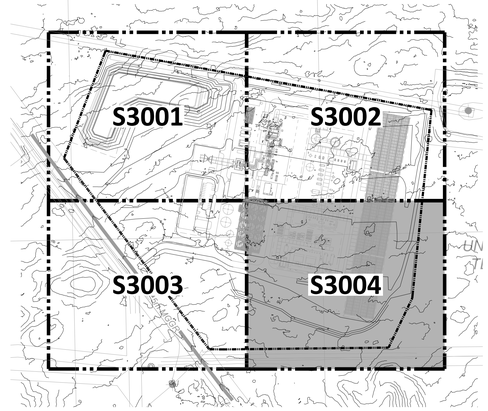
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NOTES

1. SEE DRAWING 00STF-S3000 FOR GRADING AND DRAINAGE NOTES AND LEGEND.
2. SEE DRAWINGS S3900-S3903 FOR GRADING AND DRAINAGE SECTIONS AND DETAILS.
3. SPOT ELEVATIONS AND CONTOURS ON S3000 SERIES DRAWINGS ARE TOP OF FINISHED GRADE. CONTRACTOR SHALL SUBTRACT FINISH SURFACING MATERIAL THICKNESS TO OBTAIN TOP OF SUBGRADE.
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KEY PLAN



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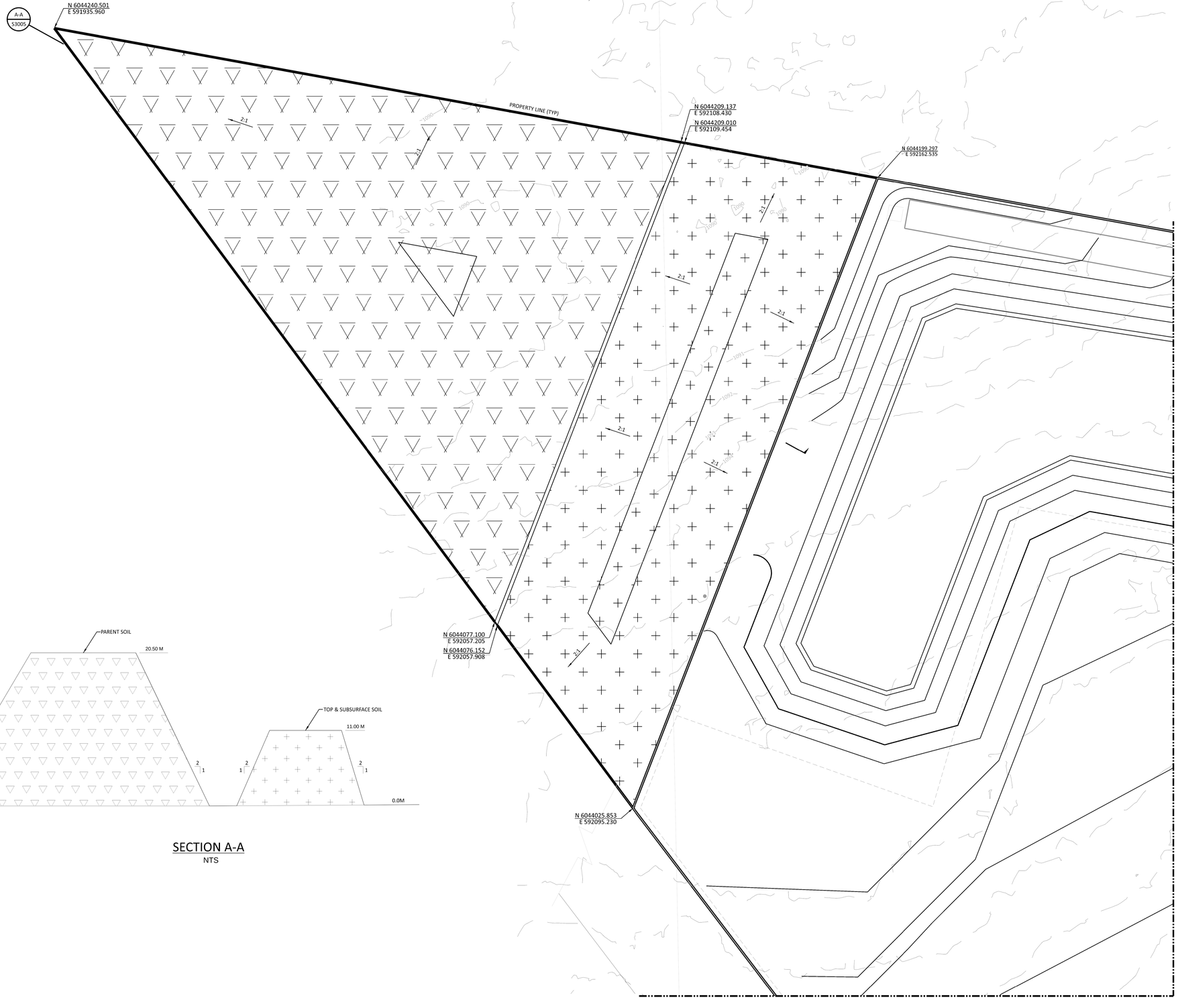
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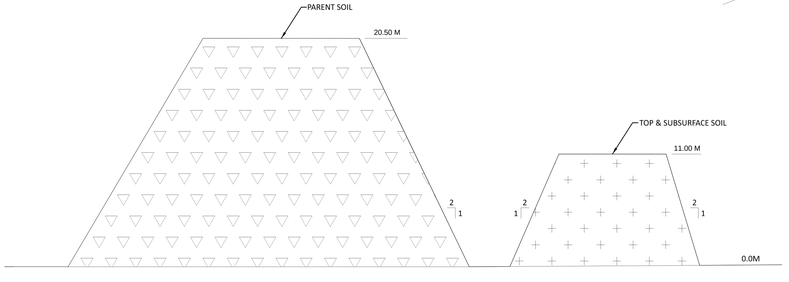
KIWETINOHK ENERGY CORP
BLACK BEAR COMBINED CYCLE WITH CCS
GRADING & DRAINAGE - SITE
PLAN AREA - 4

PROJECT	DRAWING NUMBER	REV
412155-00STF-S3004		A
CODE		
AREA	412155-00STF-S3004	

MicroStation v10.15.0.74
Full Size 1 : 1

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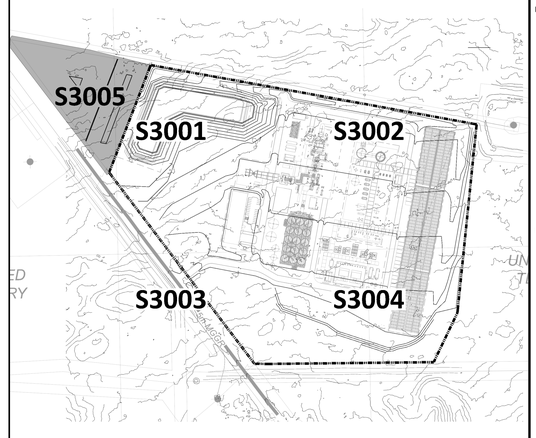


SECTION A-A
NTS

NOTES

1. SEE DRAWING 00STF-S3000 FOR GRADING AND DRAINAGE NOTES AND LEGEND.
2. SEE DRAWINGS S3001-S3004 FOR GRADING AND DRAINAGE SECTIONS AND DETAILS.
3. SPOT ELEVATIONS AND CONTOURS ON S3000 SERIES DRAWINGS ARE TOP OF FINISHED GRADE. CONTRACTOR SHALL SUBTRACT FINISH SURFACING MATERIAL THICKNESS TO OBTAIN TOP OF SUBGRADE.
4. GRADE SHALL SLOPE UNIFORMLY BETWEEN FINISH SPOT ELEVATIONS AND CONTOURS SHOWN ON THE PLANS AND AS INDICATED BY DIRECTION OF FLOW AND SLOPE ARROWS.

KEY PLAN



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JH	DSP
CHECKED	DATE
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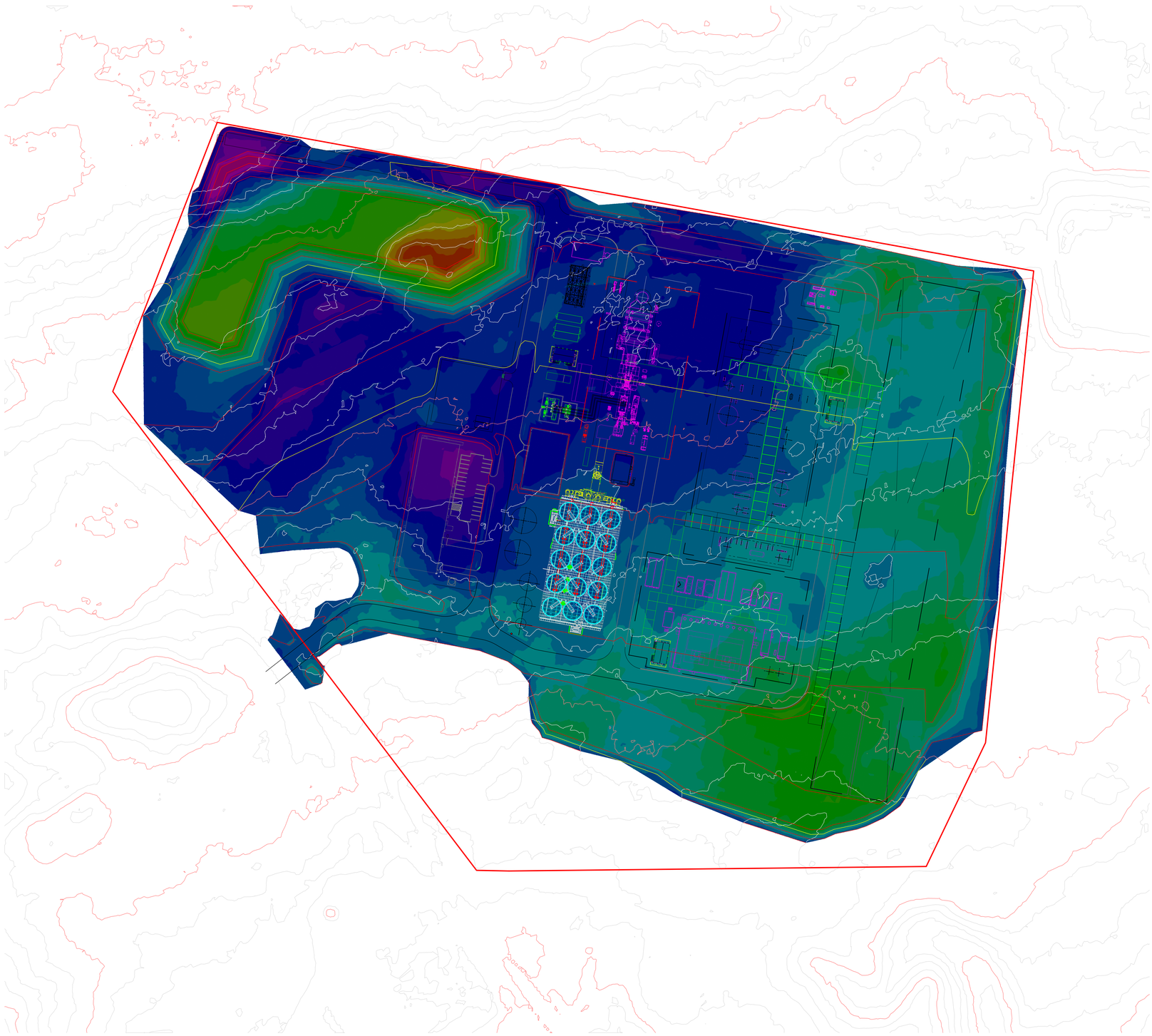
KIWETINOHK ENERGY CORP
BLACK BEAR COMBINED CYCLE WITH CCS

STOCKPILE DETAILS AND CROSS SECTION

PROJECT	DRAWING NUMBER	REV
412155-00STF-S3005		A
CODE		
AREA	412155-00STF-S3005	

MicroStation v10.15.0.74
Full Size 1: 1

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NOTES

1. SEE DRAWING 00STF-S3000 FOR GRADING AND DRAINAGE NOTES AND LEGEND.
2. SEE DRAWINGS S3900-S3903 FOR GRADING AND DRAINAGE SECTIONS AND DETAILS.
3. SPOT ELEVATIONS AND CONTOURS ON S3000 SERIES DRAWINGS ARE TOP OF FINISHED GRADE.
   CONTRACTOR SHALL SUBTRACT FINISH SURFACING MATERIAL THICKNESS TO OBTAIN TOP OF SUBGRADE.
4. GRADE SHALL SLOPE UNIFORMLY BETWEEN FINISH SPOT ELEVATIONS AND CONTOURS SHOWN ON THE PLANS AND AS INDICATED BY DIRECTION OF FLOW AND SLOPE ARROWS.

Elevations Table

Number	Minimum Elevation (Above MSL)	Maximum Elevation (Above MSL)	Area	Color
1	−7.50 m	−7.00 m	0.30 Sq.m	
2	−7.00 m	−6.50 m	336.75 Sq.m	
3	−6.50 m	−6.00 m	591.57 Sq.m	
4	−6.00 m	−5.50 m	421.88 Sq.m	
5	−5.50 m	−5.00 m	440.53 Sq.m	
6	−5.00 m	−4.50 m	481.29 Sq.m	
7	−4.50 m	−4.00 m	1438.31 Sq.m	
8	−4.00 m	−3.50 m	2775.36 Sq.m	
9	−3.50 m	−3.00 m	9070.55 Sq.m	
10	−3.00 m	−2.50 m	8380.82 Sq.m	
11	−2.50 m	−2.00 m	10548.09 Sq.m	
12	−2.00 m	−1.50 m	17082.84 Sq.m	
13	−1.50 m	−1.00 m	27613.27 Sq.m	
14	−1.00 m	−0.50 m	19279.87 Sq.m	
15	−0.50 m	0.00 m	15783.85 Sq.m	
16	0.00 m	0.50 m	28044.80 Sq.m	
17	0.50 m	1.00 m	23694.57 Sq.m	
18	1.00 m	1.50 m	7108.85 Sq.m	
19	1.50 m	2.00 m	2825.18 Sq.m	
20	2.00 m	2.50 m	812.81 Sq.m	
21	2.50 m	3.00 m	213.57 Sq.m	
22	3.00 m	3.50 m	226.29 Sq.m	

Cut/Fill Summary

Name	Cut Factor	Fill Factor	2d Area	Cut	Fill	Net
VOL_EG vs FG	1.00	1.00	176829.45sq.m	180994.39 Cu. M.	40045.55 Cu. M.	140948.84 Cu. M.<Cut>
Totals			176829.45sq.m	180994.39 Cu. M.	40045.55 Cu. M.	140948.84 Cu. M.<Cut>

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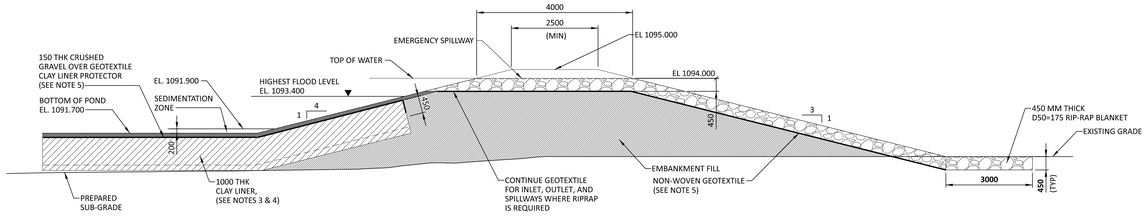
BLACK & VEATCH

DESIGNER	DRAWN APJ
CHECKED	DATE

KIWETINOHK ENERGY CORP
BLACK BEAR COMBINED CYCLE WITH CCS
GRADING & DRAINAGE - SITE
CUT FILL HEAT MAP

PROJECT	DRAWING NUMBER	REV
412155-00STF-S3010		A
CODE		
AREA	412155-00STF-S3010	

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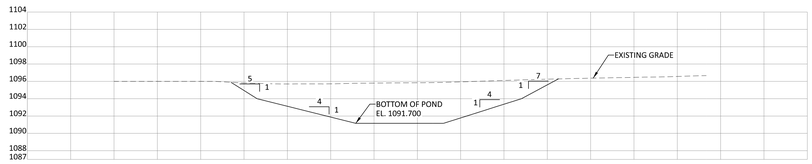
SECTION 1

REFER DRAWING 412155-00STF-S3001
NO SCALE



SECTION 2

REFER DRAWING 412155-00STF-S3001
NO SCALE



SECTION 3

REFER DRAWING 412155-00STF-S3001
NO SCALE

LEGEND

AGGREGATE SURFACING

RIPRAP

GRASS

NOTES

1. SEE DRAWING 00STF-S3000 FOR GRADING AND DRAINAGE NOTES, LEGEND AND ABBREVIATIONS.
2. SEE THE SITE DEVELOPMENT SPECIFICATION FOR THE CLAY LINER MATERIALS, COMPACTION, AND TESTING REQUIREMENTS. REQUIRED FIELD AND LABORATORY SOIL TESTS SHALL BE COMPLETED AS LINER IS BEING PLACED. CLAY LINER PLACED AT DENSITIES LOWER THAN SPECIFIED MINIMUM DENSITY OR AT MOISTURE CONTENTS LOWER THAN OPTIMUM MOISTURE CONTENT OR OTHERWISE NOT CONFORMING TO THE REQUIREMENTS OF THE SPECIFICATIONS SHALL BE REWORKED TO MEET THE SPECIFICATIONS OR REMOVED AND REPLACED. THE REPLACEMENT CLAY AND THE FOUNDATION AND FILL SURFACES UPON WHICH IT IS PLACED SHALL CONFORM TO ALL REQUIREMENTS OF THIS SPECIFICATION FOR FOUNDATION PREPARATION, APPROVAL, PLACEMENT, MOISTURE CONTROL AND COMPACTION.
3. CLAY LINER SHALL YIELD A SUFFICIENTLY LOW PERMEABILITY TO ACHIEVE THE REQUIRED HYDRAULIC CONDUCTIVITY OF 1X10-9 M/S OR LESS UNDER A 0.3M HEAD OF WATER. A MINIMUM OF TWO HYDRAULIC CONDUCTIVITY TESTS (ASTM D5084) SHALL BE PERFORMED ON UNDISTURBED SAMPLES OBTAINED FROM THE CONSTRUCTED CLAY LINER IN TWO DIFFERENT LOCATIONS WITHIN THE POND BOTTOM. THE SAME UNDISTURBED SAMPLES SHALL ALSO BE TESTED FOR ATTERBERG LIMITS (ASTM D4318), AND GRAIN SIZE DISTRIBUTION (ASTM D422).
4. GEOTEXTILE MATERIAL SHALL BE INSTALLED WHERE INDICATED. GEOTEXTILE SHALL BE NILEX 4516 NON-WOVEN GEOSYNTHETIC FABRIC OR APPROVED EQUAL. LINER PROTECTIVE GRAVEL LAYER SHALL EXTEND TO THE MAXIMUM WATER LEVEL ELEVATION.
5. ALL DIMENSIONS ARE IN MILLIMETERS (MM) AND ELEVATIONS IN METERS (M) UNLESS NOTED OTHERWISE.
6. STORM WATER FROM THE SITE SHALL BE RETAINED, RELEASED, AND MONITORED IN COMPLIANCE WITH THE WETLAND MONITORING PLAN AND INDUSTRIAL STORMWATER MANAGEMENT PLAN.
7. EROSION CONTROL BLANKETS ALONG WITH TOPSOIL, SEED AND MULCH SHALL BE PROVIDE ON ALL POND CUT AND FILL SLOPES GREATER THAN 3:1 WITH THE EXCEPTION FOR AREAS REQUIRING A SPECIFIC LINER, ROCK, OR RIPRAP SURFACING. ALL OTHER AREAS WITHIN THE POND INTERIOR AND EXTERIOR SURFACES NOT ALREADY DEFINED WITH A SPECIFIC LINER, ROCK, OR RIPRAP SURFACE SHALL BE SEEDED USING TOPSOIL AND MULCH.

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BLACK & VEATCH

DESIGNER	DRAWN	PROJECT	DRAWING NUMBER	REV
	APJ	KIWETINOHK ENERGY CORP BLACK BEAR COMBINED CYCLE WITH CCS	412155-00STF-S3901	A
CHECKED	DATE	RETENTION POND CROSS SECTIONS	CODE	
			AREA	

MicroStation v10.15.0.74
Full Size 1" = 1"

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Appendix M – LAT Report

Landscape Analysis Tool (LAT) Report

LAT Number:	000005F4B1	**LAT Date:** 2023-03-09	10:30:54
Project Name:	22GLOG9042		
Project Description:	POWER STATION SITE (ELECTRICAL)		
Disposition Type:	DML	Miscellaneous Lease	
Purpose Type:	EDRA	Electrical	
Activity Type:	EDRA02DMLP	Power Station / Substation	

Responsibility of Applicants:

It is the applicant's responsibility to conduct a full review of the generated LAT Report, ensuring that you are aware and have a full understanding of the identified standards and conditions, and any additional limitations that may also be imposed by an approved higher level plan, reservation or notation or any other law or Order of the Province or the Government of Canada that may impact the placement, construction or operation of the proposed disposition, purpose and activity.

The applicant must assess if the proposed disposition, purpose and activity can meet the applicable standards, conditions and any limitations which will subsequently determine if the application can be submitted to the regulatory body. Applicants should complete a thorough review of regulatory and application processes including supporting procedural documents and the generated LAT Reports prior to making this determination.

Where the applicant chooses not to meet, or is not able to meet, one or more Approval Standards or higher level plans within the generated LAT Report as submitted as part of the application, or any affected reservations as identified within the land status report, the applicant is required to complete the appropriate mitigation as part of their supplement submission that addresses individually each of the items not being met.

The information provided within the LAT Tool is a spatial representation of features provided to the applicant for activity and land use planning. The accuracy of these layers varies depending on the resource value being represented. The regulatory body insists that site visits, wildlife surveys and groundtruthing efforts are completed to ensure that you, the applicant can meet the procedures detailed within the *Pre-Application Requirements for Formal Dispositions*, the identified approval standards, operating conditions and *Best Management Practices* as represented within the *Master Schedule of Standards and Conditions*.

Proximity to Watercourse/Waterbodies:

Applicants will ensure that standards or conditions for Watercourse/Waterbody features as identified within the generated LAT Report are followed. It is the responsibility of the applicant to ensure the identified setbacks and buffers are properly established through a pre-site assessment and maintained.

NOTE: Be aware that the submission of a LAT Report as part of an application submission does not imply approval of the activity. The standards and conditions identified within the LAT Report may be subject to change based on regulatory review.

Landscape Analysis Tool (LAT) Report

Base Features

Green/White Area	Green Area
Municipality	Big Lakes County
FMA	Blue Ridge Lumber Inc.
FMU	W14
Provincial Grazing Reserve	
Rocky Mountain Forest Reserve	
PLUZ Areas	
Protected Areas	

Provincial Sanctuaries

Wildlife Corridors	
Restricted Area	
Game Bird	Zone 2
Seasonal	

Higher Level Plans

Integrated Resource Plan (Local)	
Integrated Resource Plan (Subregional)	
Access Management Plan	
Landscape Management Plan	

Additional Application Requirements

Wildlife Survey		DND Area	

Historical Resources

HRV Rating	Category

Historic Resources Application Required: No

While no specific historic resource concerns have been identified within the proposed activity area, Section 31 of the *Historical Resources Act* states that "a person who discovers a historic resource in the course of making an excavation for a purpose other than for the purpose of seeking historic resources shall forthwith notify the Minister of the discovery." Should a historic resource be encountered with the construction or operation of this disposition, information on who to contact can be found on the Ministry of Culture and Tourism's website in; Standard Requirements under the Historical Resources Act: Reporting the Discovery of Historic Resources.

Sensitive Features

Wildlife and Other Sensitive Species

	Intersected
Burrowing Owl Range	
Caribou Range	
Caribou Range - Zone A	
Caribou Range - Zone B	
Colonial Nesting Birds	
Critical Habitat of Aquatic Species at Risk	
Endangered and Threatened Plants Ranges	
Greater Short-horned Lizard Habitat	
Greater Short-horned Lizard Range	
Greater Sage Grouse Core Area	
Greater Sage Grouse Recovery Area	
Greater Sage Grouse Leks and Buffer	
Grizzly Bear Core Access Management Area	
Grizzly Bear Habitat Linkage	
Grizzly Bear Secondary Access Management Area	Yes
Grizzly Bear Support Zone	
High Risk Watersheds	Yes

	Intersected
Key Wildlife and Biodiversity Areas	
Mountain Goat and Sheep Areas Disease Buffer	
Mountain Goat and Sheep Zone	
Ord's Kangaroo Rat Range	
Ord's Kangaroo Rat Key Habitat Area	
Piping Plover Waterbodies	
Provincial Hibernacula Buffer	
Sensitive Amphibian Ranges	
Sensitive Raptor Range	
Sensitive Snake Habitat	
Sensitive Snake Hibernacula Range	
Sharp-tailed Grouse Leks and Buffer	
Sharp-tailed Grouse Survey	
Special Access Area	
Swift Fox Range	
Trumpeter Swan Waterbodies/Watercourse	
Trumpeter Swan Watercourse Buffer	

Federal Orders:

	Intersected
Greater Sage Grouse	

Grassland and Natural Regions:

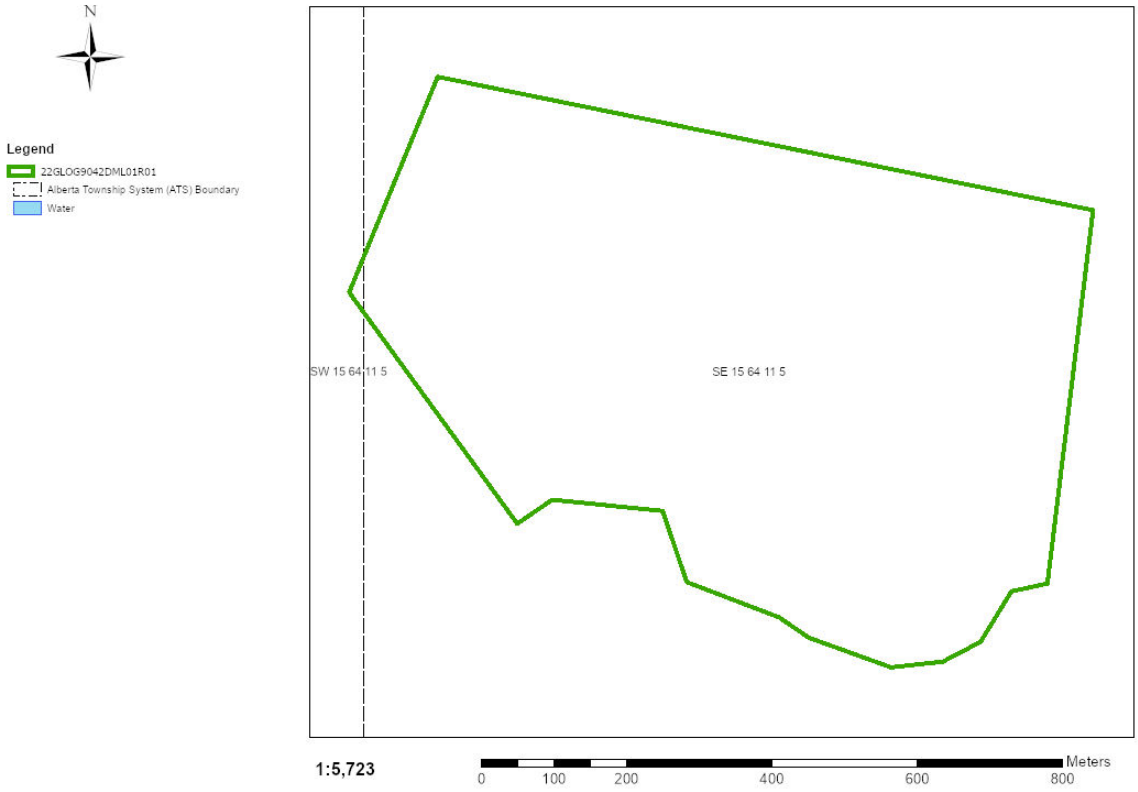
	Intersected
Central Parkland	
Central Parkland and Northern Fescue	
Chinook Grasslands	
Dry Mixed Grass	
Foothills Fescue	
Foothills Parkland Grasslands	
Grassland and Parkland Natural Region	

	Intersected
Mixed Grass Sub-region layer	
Montane	
Northern Fescue	
Peace River Parkland	
Permafrost	
Rough Fescue PNT	
Subalpine or Alpine	

Alberta Township System (ATS) Land List

Quarter	Section	Township	Range	Meridian	Road Allow.	Sensitive Features Identified
SE	15	64	11	5		Green / White Area,High Risk Watersheds,Grizzly Bear Secondary Access Management Area
SW	15	64	11	5		Green / White Area,High Risk Watersheds,Grizzly Bear Secondary Access Management Area

Landscape Analysis Tool (LAT) Report



Land Management

Report ID	Approval	Condition
1	1030-AS	Where an Integrated Resource Plan or a Reservation/Protective Notation identifies a greater set back, the greater set back will prevail.
2	1031-AS	Where a Higher Level Plan* exists, the Disposition Holder must follow any direction provided within that plan.
3	1033-AS	With the exception of pipelines, for activities that fall within any Protective Notation (PNT) lands with a purpose code 400 Series encompassing a section of land (259 hectares) or less, located in the Provincial White Area, the Disposition Holder must construct all activities within lands previously disturbed or cleared. Where no previous disturbance exists, activities must occur within 100 metres of the PNT.
4	1041	The Disposition Holder must maintain proper drainage of surface water.
5	1044-AS	The Disposition Holder must not locate activities within 45 metres from the top of any coulees* with the exception of activities such as; access, pipelines and linear easements crossing those features.
6	1049	The Disposition Holder must remove all garbage and waste material from this site.
7	1053	The Disposition Holder must not enter the boundaries of any research or sample plot unless consent is received from the reservation holder.
8	1061	Where FireSmart activities are considered, the Disposition Holder must follow Information Letter- “Authorization of FireSmart Activities on Public Land” as amended from time to time.

Vegetation

Report ID	Approval	Condition
9	1300	The disposition holder must manage all regulated weeds to the satisfaction of the regulatory body.
10	1302	"The Disposition Holder must remove all deciduous or coniferous merchantable timber from the Activity as per the following utilization standards; - Deciduous Timber: 15 cm Base/10 cm Top - Coniferous Timber: 15 cm Base/11cm Top and haul said timber to the location of end use."
11	1304	For fire control purposes on forested lands, the Disposition Holder must dispose of excess coarse woody debris* not utilized for rollback* or stockpiled for reclamation*.
12	1305	Within FireSmart Community Zones*, the Disposition Holder must dispose of coarse woody debris* by burning unless a Debris Management Plan has been approved under the Forest and Prairie Protection Act.

Soil

Report ID	Approval	Condition
13	1356	The Disposition Holder must not conduct the Activity during adverse ground conditions*.
14	1357	The Disposition Holder must prevent erosion* and sedimentation on to adjacent* Lands or Water bodies * that results from the activity.
15	1359-AS	The Disposition Holder must not remove from the Lands topsoil* or subsoil* unless approved in writing by the Regulatory Body.
16	1360	"Where activities have occurred on the Lands that do not involve minimal disturbance* construction, the Disposition Holder must salvage topsoil* for land reclamation as follows: a. Salvage all topsoil* from: i. Mineral soils ii. Shallow organic soils* iii. Reclaimed soils b. Where the depth of the topsoil* is less than 15 cm, the topsoil* and part of the subsoil* to a total depth of 15 centimetres must be salvaged, unless the upper subsoil* is considered chemically unsuitable*."
17	1363	All reclamation material* must be considered suitable as defined in the May 2001 Salt Contamination Assessment Guidelines and meet the February 2016 Alberta Tier 1 Soil and Groundwater Remediation Guidelines, as amended or replaced from time to time.
18	1365	"The Disposition Holder must store reclamation material* in accordance with all of the following: a. reclamation material* must not be placed beneath the ground surface or buried in any way; b. coarse woody debris* stored for reclamation purposes for greater than 12 months must be mixed with topsoil*; and c. topsoil* and subsoil* must be stored separately."
19	1367	The Disposition Holder must not mix wood chips with any reclamation material*.
20	1368	The Disposition Holder must not apply wood chips to the lands at a depth greater than five (5) centimeters.
21	1369	The Disposition Holder must manage wood chips in accordance with the directive ID 2009-01 Management of Wood Chips on Public Land as amended from time to time.
22	1370	The Disposition Holder must not store piles or windrows of reclamation material* within standing timber.
23	1371	The Disposition Holder must not use soil sterilant on the Lands.

Watercourse / Waterbody

Report ID	Approval	Condition
24	1402-AS	The Disposition Holder must not conduct the Activity within the following watercourse* setbacks from the top of the breaks: a. Intermittent watercourses* including springs must have a setback of at least 45 metres. b. Small Permanent watercourses* must have a setback of at least 45 metres. c. Large Permanent watercourses* must have a setback of at least 100 metres.
25	1412	The Disposition Holder must acquire an authorization for access (off-disposition) for water withdrawal activities.
26	1419	For use of equipment within the bed of a water body*, the Disposition Holder must prior to operations follow the “Decontamination Protocol for Work in or Near Water”, as amended from time to time.
27	1420	The Disposition Holder must provide a completed Record of Decontamination form as proof of decontamination to the Regulatory Body upon request.

Reclamation

Report ID	Approval	Condition
28	1451	For progressive reclamation* on forested lands*, the Disposition Holder must replace all reclamation materials* that have been salvaged in accordance with all of the following: a. all salvaged subsoil* must be replaced, then all salvaged topsoil*; and b. reclamation materials* must be replaced over the entire progressive reclamation area*; unless otherwise approved in writing by the Regulatory Body.
29	1453	The Disposition Holder must complete temporary reclamation* on the Lands within 1 growing season of construction phase* for all topsoil* and subsoil* stockpiles required for final reclamation*.
30	1454	The Disposition Holder must prior to seeding herbaceous seed in forested* or peatlands* submit a Request for Seeding in writing to the Regulatory Body that contains all of the following: a. rationale for conducting seeding of herbaceous species*; b. a description of the proposed site for seeding including information with respect to the following: i. whether the Lands are subject to high erosion* and; ii. whether the Lands are prone to invasion from agronomic or weed species. c. a proposed seed mix composition for re-vegetation of the Lands in accordance with the Native Plant Revegetation Guidelines for Alberta, 2001 as amended or replaced from time to time or a rationale for alternate species; d. provide a seed certificate in accordance with the Seed Act for the seed mixed mix to be used for re-vegetation* and; any other information requested by the Regulatory Body.

31	1455	The Disposition Holder must only conduct seeding in accordance with the written authorization of the Regulatory Body.
32	1456	The Disposition Holder must when seeding cultivated lands*; a. use agronomic or forage seed that meets or exceeds Certified #1 as outlined in the Seeds Act and Seeds Regulations; b. use seed mixes that are free of species listed in the Weed Control Act and; c. provide a seed certificate to the Regulatory Body within 30 days of request.
33	1457	Within the Green Area* of the Province, the Disposition Holder must re-vegetate the Lands with trees or shrubs that meet the requirements of the December 2016 Alberta Forest Genetic Resource Management and Conservation Standards document, as amended or replaced from time to time.
34	1459	The Disposition Holder must not have slash and rollback* accumulations within five (5) metres of the perimeter of the disposition boundary, greater than the percent ground cover on the surrounding undisturbed forest floor.
35	1461	The Disposition Holder must complete progressive reclamation* on forested lands* for all associated and incidental disturbances to the Disposition.
36	1462	The following activities are excluded from progressive reclamation* requirement on forested lands*: a) Lands that have received authorization for clay pad construction; and b) Lands with a 4:1 or steeper slopes where a cut and fill has been constructed to level the ground surface.
37	1463	For final reclamation*, the Disposition Holder must complete all of the following: a. contour the disturbed land to the pre-disturbance landform or to the landform approved by the Regulatory body; b. replace all stockpiled subsoil*, then replace all stockpiled topsoil*; c. spread all coarse woody debris* on forested lands* and; d. reclamation materials* must be replaced over the entire area from which they were removed unless otherwise approved in writing by the Regulatory Body.
38	1464	The Disposition Holder must reclaim the Lands to the pre-disturbance land use type* unless otherwise authorized in writing by the Regulatory Body.

Wildlife

Report ID	Approval	Condition
39	1600	The Disposition Holder must conduct a complete and immediate Wildlife Sweep* of the Lands subject to the disposition prior to any activity, as per the “Wildlife Sweep Protocol”.
40	1601	The Disposition Holder must submit observations from a Wildlife Sweep* to the Fisheries and Wildlife Management Information System (FWMIS) and notify the issuing Regulatory Body in writing upon request that the Wildlife Sweep* was completed.

41	1602-AS	The Disposition Holder must incorporate a buffer* zone of a minimum width of 100m undisturbed vegetation, where an established buffer* does not already exist for any and all key habitat features including, but not limited to leks*, nests, dens and houses identified in the Wildlife Sweep*.
42	1603	When Wildlife Surveys* are required, the Disposition Holder must submit results as defined by the sensitive species inventory guidelines from Wildlife Survey* to the Fisheries and Wildlife Management Information System (FWMIS).
43	1608	The Disposition Holder must incorporate buffers*, setbacks and activity timing restrictions for any and all key habitat features including, but not limited to leks*, nests, dens and houses identified in the wildlife survey*.

Grizzly Bear

Report ID	Approval	Condition
44	1934-AS	The Disposition Holder must construct within 100 metres of an existing arterial all-weather permanent access.
45	1935	The Disposition Holder must not seed legumes.
46	1936	The Disposition Holder must re-vegetate activities, associated facilities and clearings to vegetative species compatible and consistent with the adjacent vegetation type.

Landscape Analysis Tool (LAT) Report

LAT Number:	000005F4B5	**LAT Date:** 2023-03-09	10:42:42
Project Name:	22GLOG9042		
Project Description:	STORAGE SITE (STOCKPILE)		
Disposition Type:	DML	Miscellaneous Lease	
Purpose Type:	SRNP	Storage	
Activity Type:	SRNP04DMLP	Stockpile	

Responsibility of Applicants:

It is the applicant's responsibility to conduct a full review of the generated LAT Report, ensuring that you are aware and have a full understanding of the identified standards and conditions, and any additional limitations that may also be imposed by an approved higher level plan, reservation or notation or any other law or Order of the Province or the Government of Canada that may impact the placement, construction or operation of the proposed disposition, purpose and activity.

The applicant must assess if the proposed disposition, purpose and activity can meet the applicable standards, conditions and any limitations which will subsequently determine if the application can be submitted to the regulatory body. Applicants should complete a thorough review of regulatory and application processes including supporting procedural documents and the generated LAT Reports prior to making this determination.

Where the applicant chooses not to meet, or is not able to meet, one or more Approval Standards or higher level plans within the generated LAT Report as submitted as part of the application, or any affected reservations as identified within the land status report, the applicant is required to complete the appropriate mitigation as part of their supplement submission that addresses individually each of the items not being met.

The information provided within the LAT Tool is a spatial representation of features provided to the applicant for activity and land use planning. The accuracy of these layers varies depending on the resource value being represented. The regulatory body insists that site visits, wildlife surveys and groundtruthing efforts are completed to ensure that you, the applicant can meet the procedures detailed within the *Pre-Application Requirements for Formal Dispositions*, the identified approval standards, operating conditions and *Best Management Practices* as represented within the *Master Schedule of Standards and Conditions*.

Proximity to Watercourse/Waterbodies:

Applicants will ensure that standards or conditions for Watercourse/Waterbody features as identified within the generated LAT Report are followed. It is the responsibility of the applicant to ensure the identified setbacks and buffers are properly established through a pre-site assessment and maintained.

NOTE: Be aware that the submission of a LAT Report as part of an application submission does not imply approval of the activity. The standards and conditions identified within the LAT Report may be subject to change based on regulatory review.

Base Features

Green/White Area	Green Area
Municipality	Big Lakes County
FMA	Blue Ridge Lumber Inc.
FMU	W14
Provincial Grazing Reserve	
Rocky Mountain Forest Reserve	
PLUZ Areas	
Protected Areas	

Provincial Sanctuaries

Wildlife Corridors	
Restricted Area	
Game Bird	Zone 2
Seasonal	

Higher Level Plans

Integrated Resource Plan (Local)	
Integrated Resource Plan (Subregional)	
Access Management Plan	
Landscape Management Plan	

Additional Application Requirements

Wildlife Survey		DND Area	

Historical Resources

HRV Rating	Category

Historic Resources Application Required: No

While no specific historic resource concerns have been identified within the proposed activity area, Section 31 of the *Historical Resources Act* states that "a person who discovers a historic resource in the course of making an excavation for a purpose other than for the purpose of seeking historic resources shall forthwith notify the Minister of the discovery." Should a historic resource be encountered with the construction or operation of this disposition, information on who to contact can be found on the Ministry of Culture and Tourism's website in; Standard Requirements under the Historical Resources Act: Reporting the Discovery of Historic Resources.

Sensitive Features

Wildlife and Other Sensitive Species

	Intersected
Burrowing Owl Range	
Caribou Range	
Caribou Range - Zone A	
Caribou Range - Zone B	
Colonial Nesting Birds	
Critical Habitat of Aquatic Species at Risk	
Endangered and Threatened Plants Ranges	
Greater Short-horned Lizard Habitat	
Greater Short-horned Lizard Range	
Greater Sage Grouse Core Area	
Greater Sage Grouse Recovery Area	
Greater Sage Grouse Leks and Buffer	
Grizzly Bear Core Access Management Area	
Grizzly Bear Habitat Linkage	
Grizzly Bear Secondary Access Management Area	Yes
Grizzly Bear Support Zone	
High Risk Watersheds	Yes

	Intersected
Key Wildlife and Biodiversity Areas	
Mountain Goat and Sheep Areas Disease Buffer	
Mountain Goat and Sheep Zone	
Ord's Kangaroo Rat Range	
Ord's Kangaroo Rat Key Habitat Area	
Piping Plover Waterbodies	
Provincial Hibernacula Buffer	
Sensitive Amphibian Ranges	
Sensitive Raptor Range	
Sensitive Snake Habitat	
Sensitive Snake Hibernacula Range	
Sharp-tailed Grouse Leks and Buffer	
Sharp-tailed Grouse Survey	
Special Access Area	
Swift Fox Range	
Trumpeter Swan Waterbodies/Watercourse	
Trumpeter Swan Watercourse Buffer	

Federal Orders:

	Intersected
Greater Sage Grouse	

Grassland and Natural Regions:

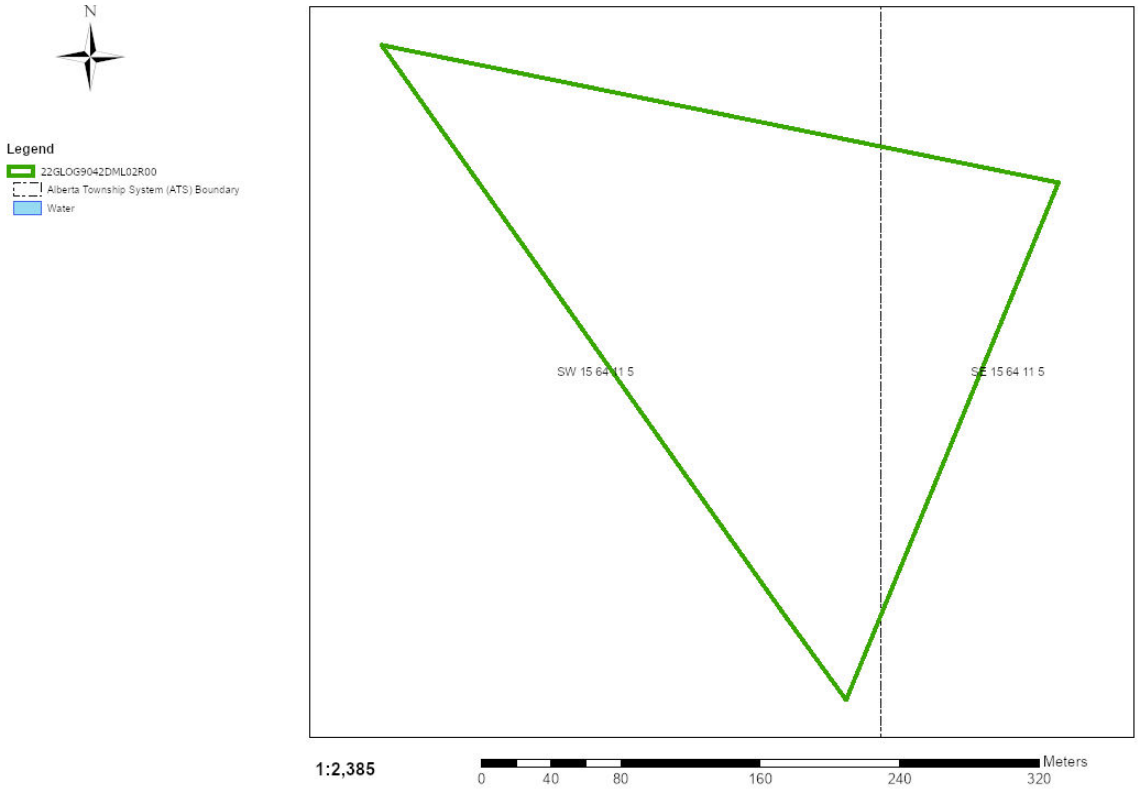
	Intersected
Central Parkland	
Central Parkland and Northern Fescue	
Chinook Grasslands	
Dry Mixed Grass	
Foothills Fescue	
Foothills Parkland Grasslands	
Grassland and Parkland Natural Region	

	Intersected
Mixed Grass Sub-region layer	
Montane	
Northern Fescue	
Peace River Parkland	
Permafrost	
Rough Fescue PNT	
Subalpine or Alpine	

Alberta Township System (ATS) Land List

Quarter	Section	Township	Range	Meridian	Road Allow.	Sensitive Features Identified
SE	15	64	11	5		Green / White Area,High Risk Watersheds,Grizzly Bear Secondary Access Management Area
SW	15	64	11	5		Green / White Area,High Risk Watersheds,Grizzly Bear Secondary Access Management Area

Landscape Analysis Tool (LAT) Report



Land Management

Report ID	Approval	Condition
1	1004-AS	The Disposition Holder must not conduct the Activity within natural forest openings (>10 hectares) such as meadows .
2	1015-AS	The Disposition Holder must not construct laydown, storage or stockpile sites to a total area greater than 1.1 hectares inclusive of all incidental activities* required for the construction and operation of the wellsite.
3	1019-AS	The Disposition Holder must construct the site where the combined maximum of cut and fill must not exceed an elevation difference of 10 metres in height.
4	1030-AS	Where an Integrated Resource Plan or a Reservation/Protective Notation identifies a greater set back, the greater set back will prevail.
5	1031-AS	Where a Higher Level Plan* exists, the Disposition Holder must follow any direction provided within that plan.
6	1033-AS	With the exception of pipelines, for activities that fall within any Protective Notation (PNT) lands with a purpose code 400 Series encompassing a section of land (259 hectares) or less, located in the Provincial White Area, the Disposition Holder must construct all activities within lands previously disturbed or cleared. Where no previous disturbance exists, activities must occur within 100 metres of the PNT.
7	1041	The Disposition Holder must maintain proper drainage of surface water.
8	1044-AS	The Disposition Holder must not locate activities within 45 metres from the top of any coulees* with the exception of activities such as; access, pipelines and linear easements crossing those features.
9	1049	The Disposition Holder must remove all garbage and waste material from this site.
10	1050	The Disposition Holder must ensure any wildlife attractant* remaining on site overnight is placed in secure bear resistant containers and ensure that these containers are emptied on a regular basis to avoid excess garbage being present on the land or when the Disposition Holder will be off the land for more than two days.
11	1053	The Disposition Holder must not enter the boundaries of any research or sample plot unless consent is received from the reservation holder.
12	1061	Where FireSmart activities are considered, the Disposition Holder must follow Information Letter- “Authorization of FireSmart Activities on Public Land” as amended from time to time.

Vegetation

Report ID	Approval	Condition
13	1300	The disposition holder must manage all regulated weeds to the satisfaction of the regulatory body.

14	1302	"The Disposition Holder must remove all deciduous or coniferous merchantable timber from the Activity as per the following utilization standards; - Deciduous Timber: 15 cm Base/10 cm Top - Coniferous Timber: 15 cm Base/11cm Top and haul said timber to the location of end use."
15	1304	For fire control purposes on forested lands, the Disposition Holder must dispose of excess coarse woody debris* not utilized for rollback* or stockpiled for reclamation*.
16	1305	Within FireSmart Community Zones*, the Disposition Holder must dispose of coarse woody debris* by burning unless a Debris Management Plan has been approved under the Forest and Prairie Protection Act.

Soil

Report ID	Approval	Condition
17	1356	The Disposition Holder must not conduct the Activity during adverse ground conditions*.
18	1357	The Disposition Holder must prevent erosion* and sedimentation on to adjacent* Lands or Water bodies * that results from the activity.
19	1359-AS	The Disposition Holder must not remove from the Lands topsoil* or subsoil* unless approved in writing by the Regulatory Body.
20	1360	"Where activities have occurred on the Lands that do not involve minimal disturbance* construction, the Disposition Holder must salvage topsoil* for land reclamation as follows: a. Salvage all topsoil* from: i. Mineral soils ii. Shallow organic soils* iii. Reclaimed soils b. Where the depth of the topsoil* is less than 15 cm, the topsoil* and part of the subsoil* to a total depth of 15 centimetres must be salvaged, unless the upper subsoil* is considered chemically unsuitable*."
21	1363	All reclamation material* must be considered suitable as defined in the May 2001 Salt Contamination Assessment Guidelines and meet the February 2016 Alberta Tier 1 Soil and Groundwater Remediation Guidelines, as amended or replaced from time to time.
22	1365	"The Disposition Holder must store reclamation material* in accordance with all of the following: a. reclamation material* must not be placed beneath the ground surface or buried in any way; b. coarse woody debris* stored for reclamation purposes for greater than 12 months must be mixed with topsoil*; and c. topsoil* and subsoil* must be stored separately."
23	1367	The Disposition Holder must not mix wood chips with any reclamation material*.
24	1368	The Disposition Holder must not apply wood chips to the lands at a depth greater than five (5) centimeters.

25	1369	The Disposition Holder must manage wood chips in accordance with the directive ID 2009-01 Management of Wood Chips on Public Land as amended from time to time.
26	1370	The Disposition Holder must not store piles or windrows of reclamation material* within standing timber.
27	1371	The Disposition Holder must not use soil sterilant on the Lands.

Watercourse / Waterbody

Report ID	Approval	Condition
28	1401-AS	The Disposition Holder must not construct activities within 15 metres of temporary wetlands* or ephemeral watercourses*.
29	1402-AS	The Disposition Holder must not conduct the Activity within the following watercourse* setbacks from the top of the breaks: a. Intermittent watercourses* including springs must have a setback of at least 45 metres. b. Small Permanent watercourses* must have a setback of at least 45 metres. c. Large Permanent watercourses* must have a setback of at least 100 metres.
30	1412	The Disposition Holder must acquire an authorization for access (off-disposition) for water withdrawal activities.
31	1419	For use of equipment within the bed of a water body*, the Disposition Holder must prior to operations follow the “Decontamination Protocol for Work in or Near Water”, as amended from time to time.
32	1420	The Disposition Holder must provide a completed Record of Decontamination form as proof of decontamination to the Regulatory Body upon request.

Reclamation

Report ID	Approval	Condition
33	1451	For progressive reclamation* on forested lands*, the Disposition Holder must replace all reclamation materials* that have been salvaged in accordance with all of the following: a. all salvaged subsoil* must be replaced, then all salvaged topsoil*; and b. reclamation materials* must be replaced over the entire progressive reclamation area*; unless otherwise approved in writing by the Regulatory Body.
34	1453	The Disposition Holder must complete temporary reclamation* on the Lands within 1 growing season of construction phase* for all topsoil* and subsoil* stockpiles required for final reclamation*.

35	1454	The Disposition Holder must prior to seeding herbaceous seed in forested* or peatlands* submit a Request for Seeding in writing to the Regulatory Body that contains all of the following: a. rationale for conducting seeding of herbaceous species*; b. a description of the proposed site for seeding including information with respect to the following: i. whether the Lands are subject to high erosion* and; ii. whether the Lands are prone to invasion from agronomic or weed species. c. a proposed seed mix composition for re-vegetation of the Lands in accordance with the Native Plant Revegetation Guidelines for Alberta, 2001 as amended or replaced from time to time or a rationale for alternate species; d. provide a seed certificate in accordance with the Seed Act for the seed mixed mix to be used for re-vegetation* and; any other information requested by the Regulatory Body.
36	1455	The Disposition Holder must only conduct seeding in accordance with the written authorization of the Regulatory Body.
37	1456	The Disposition Holder must when seeding cultivated lands*; a. use agronomic or forage seed that meets or exceeds Certified #1 as outlined in the Seeds Act and Seeds Regulations; b. use seed mixes that are free of species listed in the Weed Control Act and; c. provide a seed certificate to the Regulatory Body within 30 days of request.
38	1457	Within the Green Area* of the Province, the Disposition Holder must re-vegetate the Lands with trees or shrubs that meet the requirements of the December 2016 Alberta Forest Genetic Resource Management and Conservation Standards document, as amended or replaced from time to time.
39	1459	The Disposition Holder must not have slash and rollback* accumulations within five (5) metres of the perimeter of the disposition boundary, greater than the percent ground cover on the surrounding undisturbed forest floor.
40	1461	The Disposition Holder must complete progressive reclamation* on forested lands* for all associated and incidental disturbances to the Disposition.
41	1462	The following activities are excluded from progressive reclamation* requirement on forested lands*: a) Lands that have received authorization for clay pad construction; and b) Lands with a 4:1 or steeper slopes where a cut and fill has been constructed to level the ground surface.

42	1463	For final reclamation*, the Disposition Holder must complete all of the following: a. contour the disturbed land to the pre-disturbance landform or to the landform approved by the Regulatory body; b. replace all stockpiled subsoil*, then replace all stockpiled topsoil*; c. spread all coarse woody debris* on forested lands* and; d. reclamation materials* must be replaced over the entire area from which they were removed unless otherwise approved in writing by the Regulatory Body.
43	1464	The Disposition Holder must reclaim the Lands to the pre-disturbance land use type* unless otherwise authorized in writing by the Regulatory Body.

Wildlife

Report ID	Approval	Condition
44	1600	The Disposition Holder must conduct a complete and immediate Wildlife Sweep* of the Lands subject to the disposition prior to any activity, as per the “Wildlife Sweep Protocol”.
45	1601	The Disposition Holder must submit observations from a Wildlife Sweep* to the Fisheries and Wildlife Management Information System (FWMIS) and notify the issuing Regulatory Body in writing upon request that the Wildlife Sweep* was completed.
46	1602-AS	The Disposition Holder must incorporate a buffer* zone of a minimum width of 100m undisturbed vegetation, where an established buffer* does not already exist for any and all key habitat features including, but not limited to leks*, nests, dens and houses identified in the Wildlife Sweep*.
47	1603	When Wildlife Surveys* are required, the Disposition Holder must submit results as defined by the sensitive species inventory guidelines from Wildlife Survey* to the Fisheries and Wildlife Management Information System (FWMIS).
48	1608	The Disposition Holder must incorporate buffers*, setbacks and activity timing restrictions for any and all key habitat features including, but not limited to leks*, nests, dens and houses identified in the wildlife survey*.

Grizzly Bear

Report ID	Approval	Condition
49	1935	The Disposition Holder must not seed legumes.
50	1936	The Disposition Holder must re-vegetate activities, associated facilities and clearings to vegetative species compatible and consistent with the adjacent vegetation type.

Appendix N – Air Quality Assessment

Kiwetinohk Energy Corp.
Black Bear Power Plant
Air Quality Assessment

Prepared By: Horizon Compliance Group Inc.
Author: Ms. Annie Sun, PhD, EP
Date: April 2023
Revision: 0

HORIZON
COMPLIANCE

Executive Summary

Kiwetinohk Energy Corp. (KEC) is proposing to construct and operate the 460 MW Black Bear Combined Cycle Power Plant (BBPP), which will be located within Section 15-064-11 W5M in Big Lake County, approximately 21 km south of Swan Hills, Alberta. Horizon Compliance Group Inc. (Horizon Compliance) has been retained to prepare and submit this Air Quality Assessment (AQA) report for the proposed BBPP in support of the *Environmental Protection and Enhancement Act* (*EPEA)* Approval Application and the Alberta Utilities Commission (AUC) Rule 007 filings.

BBPP is a combined cycle power plant with carbon capture consisting of one natural gas fired combustion turbine generator (CTG), one steam turbine (ST), one carbon capture package with one carbon dioxide (CO_2) compression and dehydration package. High temperature exhaust from the CTG is vented to a heat recovery steam generator (HRSG) to produce steam for the ST. The HRSG will be equipped with selective catalytic reduction (SCR) to reduce nitrogen oxide (NO_X) emissions. Once carbon capture system (CCS) is commissioned, the HRSG outlet flue gas will be directed to a series of CCS packages to remove CO_2 from the flue gases, dehydrate the CO_2 gas stream and compress the CO_2 for injection. Dehydration will include the use of use two natural gas fired triethylene glycol (TEG) heaters.

An auxiliary natural gas fired boiler will intermittently provide supplemental heat during start-up, maintenance or emergency operating conditions. The BBPP will have an emergency diesel generator (EDG) for onsite utilities.

The primary substance of concern from the BBPP is NO_x from the combustion of natural gas. Secondary substances of concern from natural gas combustion in the emission sources include carbon monoxide (CO), particulate matter less than 2.5 microns in diameter ($PM_{2.5}$) and total suspended particulate matter (TSP). Potential ammonia (NH_3) resulting from operation of the SCR system has also been evaluated. Air quality modelling has been completed to assess the potential air quality effects of BBPP on the surrounding environment to ensure the predicted maximum concentrations comply with the current *Alberta Ambient Air Quality Objectives* (*AAAQOs*; AEP, 2019).

Dispersion modelling was performed utilizing CALPUFF in accordance with the requirements outlined within the Alberta Environment and Protected Areas (AEPA) *Air Quality Model Guideline* (*AQMG*). In total, five modelling cases have been assessed. The results of the dispersion modelling, summarized in Tables 1 and 2, respectively, indicate that the predicted maximum ground-level concentrations (MGLCs) of nitrogen dioxide (NO_2), CO, $PM_{2.5}$, TSP and NH_3 associated with various operating conditions comply with the applicable *AAAQOs*.

Table 1 NO_2 Dispersion Modelling Results

Modelling Case	Description of Modelling Case	NO_2 MGLC	
		1-Hour ($\mu g/m^3$)	Annual ($\mu g/m^3$)
Baseline Case (B1)	Existing background industrial emission sources only	162.7	42.1
Project Case 1 (P1)	Emissions from proposed BBPP without CCS	106.7	7.8
Project Case 2 (P2)	Emissions from proposed BBPP with CCS	108.0	7.3
Cumulative Case (C1)	Emission sources included in B1 and P1	162.7	42.3
Cumulative Case (C2)	Emission sources included in B1 and P2	162.7	42.3
	AAAQO	**300**	**45**

Table 2 Dispersion Modelling Results For Other Substances

Modelling Case	CO MGLC		$PM_{2.5}$ MGLC		TSP MGLC		NH_3 MGLC
	1-Hour ($\mu g/m^3$)	8-Hour ($\mu g/m^3$)	1-Hour ($\mu g/m^3$)	24-Hour ($\mu g/m^3$)	24-Hour ($\mu g/m^3$)	Annual ($\mu g/m^3$)	1-Hour ($\mu g/m^3$)
B1	472.6	439.0	11.8	11.1	32.8	11.9	-
P1	416.9	403.8	15.5	12.3	34.1	12.0	12.4
P2	417.0	403.9	15.5	12.1	33.9	12.0	12.8
C1	473.0	439.0	15.5	12.3	34.1	12.0	-
C2	473.0	439.0	15.5	12.1	33.9	12.0	-
AAAQO	**15000**	**6000**	**80[(a)]**	**29**	**100**	**60**	**1400**

[(a)] *Alberta Ambient Air Quality Guidelines Summary* (*AAAQO*, AEP 2019).

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1 INTRODUCTION

Kiwetinohk Energy Corp. (KEC) is proposing to construct and operate the 460 MW Black Bear Combined Cycle Power Plant (BBPP). Horizon Compliance Group Inc. (Horizon Compliance) has been retained to prepare and submit this Air Quality Assessment (AQA) report for the proposed BBPP in support of the *Environmental Protection and Enhancement Act* (*EPEA)* Approval Application and the Alberta Utilities Commission (AUC) Rule 007 filings.

BBPP will be located within Section 15-064-11 W5M in Big Lake County, approximately 21 km south of Swan Hills and 45 km north of Whitecourt, Alberta, Canada. Road access to the BBPP is a medium grade gravel road that runs along the southwest border of the site. From Highway 32, it is approximately 9 km to the northwest to the BBPP site. A Project Area Map is included in Figure 1 within Appendix A.

2 DISPERSION MODELLING APPROACH

Dispersion modelling was performed using the United States Environmental Protection Agency (U.S. EPA) CALPUFF dispersion mode, in accordance with the requirements outlined within the Alberta Environment and Parks (AEP) *Air Quality Model Guideline* (*AQMG*; AEP, 2021a). Details of dispersion modelling approach are presented in the following sections.

2.1 Refined Model

Dispersion modelling was performed using the latest version of the CALPUFF Version 7.2.1 dispersion model. The modelling options used in this assessment adhere to the default and recommended/allowed non-default options as presented in Appendix D of the AEP *AQMG* (AEP, 2021a). Dispersion model options used in this AQA are also provided in the Tables of Appendix B.

2.2 Meteorological Data

Five years of meteorological data were extracted from the Weather Research Forecast (WRF) V4.2.1 Meteorological Dataset from Alberta Environment and Parks for 2015-2019 (AEP, 2021b), using *Multi Model Extraction Utility 2* (*MMEU2*; AEP, 2021c). The extracted WRF subdomain is 30 km by 30 km and centred on the geographical point at 54.535°N and 115.572°W, respectively.

Seasonal geo.dat files that provide the geophysical data inputs required by the CALMET model were also generated using *MMEU2* when extracting meteorological data. These inputs include land use types, elevation, surface parameters (surface roughness length, albedo, Bowen ratio, soil heat flux parameter, vegetation leaf area index), and anthropogenic heat flux. The surface parameters and anthropogenic heat flux are provided in the appendix of the *MMEU2* User Manual. As indicated in the manual, the land use data used by *MMEU2* are rasterized data resampled at 30-meter resolution from the 2015 Land Cover of Canada dataset issued by Natural Resources Canada (NRCAN, 2022a). The DEM data are 25-meter resolution CDEM data sourced from GeoBase NRCAN, 2022b). Figure 2 in Appendix A presents the terrain elevations above sea-level for the 10 km radius surrounding the BBPP site.

The meteorological data were processed in CALMET Version 6.5.0 to produce meteorological files suitable for use in CALPUFF along with the geo.dat files. The CALMET model options used in this assessment are the default options and recommended deviations as presented in Appendix D of the AEP *AQMG* (AEP, 2021a). CALMET model options used in this AQA are also provided in the Tables of Appendix B.

The CALMET-derived winds for the BBPP area are presented in Figures 3 and 4 within Appendix A. The wind rose indicates that the prevailing surface wind direction in this region is from the west. Wind speeds between 2 and 4 m/s occurred for 46.8% of all 43,824 observations, while calm winds (i.e., when values are less than 0.5 m/s) were reported 1.62% of the time. The average wind speed at this site is approximately 2.55 m/s.

2.3 Modelling Receptor

The following receptor grids were used in the modelling as per the latest revision of the *AQMG*:

- 20 m receptor spacing in the general area of maximum impact and the plant boundary;
- 20 m receptor spacing within 0.5 km from the centroid of sources;
- 250 m receptor spacing within 2 km from the centroid of sources;
- 500 m spacing within 5 km from the centroid of sources; and,
- 1,000 m spacing beyond 5 km.

2.4 Building Downwash

The U.S. EPA Building Profile Input Program (BPIP) was used to determine the effects of building downwash on dispersion of emissions. The peak roof height for the buildings is provided in Table 3. The detailed BPIP input and output files are provided in Appendix B while the Plot Plan indicating the source and building locations is provided in Appendix C.

Table 3 Building Heights

Building ID	Building Height (m)
22	5.0
135	10.0
59	10.0
20	30.0
9	5.0
21	7.5
72	5.0
74	5.0
76	5.0
78	5.0
80	5.0
89	5.0
91	5.0
93	5.0

Building ID	Building Height (m)
95	5.0
97	5.0
61	7.5
82	3.5
99	3.5
100	5.0
66	5.0
67	5.0
69	5.0
70	5.0
83	5.0
84	5.0
86	5.0
87	5.0
30	10.0
64a	5.0
64bc	5.0
6164	5.0
133	5.0
6	5.0
7	5.0
60	5.0
15	15.0
65	5.0
14	10.0
18	3.5
8	10.0
63	20.0
48	10.0
12a	10.0
12b	10.0
13	10.0
52	10.0
4	30.0
10	24.0
132	5.0
115	5.0
127	5.0
111	5.0
53	10.0

2.5 Air Quality Criteria

To protect human and the environmental health, governments have been working collaboratively to improve air quality by implementing the Air Quality Management System (AQMS). One of key elements is that ambient air quality standards/criteria - maximum ambient air concentration limits have been established. For the purposes of this assessment, all ambient air quality concentrations are compared against the AAAQOs in Table 4.

Table 4 Applicable Ambient Air Quality Criteria

Substance	Averaging Period	Rank	Air Quality Criteria (µg/m^3) [(a)]
NO_2	1-Hour	9th Highest	300
	Annual	Overall maximum prediction	45
CO	1-Hour	9th Highest	15,000
	8-Hour	2nd-Highest	6,000
$PM_{2.5}$	1-Hour	9th Highest	80
	24-Hour	Overall maximum prediction	29
NH_3	1-Hour	9th Highest	1,400

[(a)] *Alberta Ambient Air Quality Objectives and Guidelines Summary* (*AAAQO*, AEP 2019).

2.6 NO_x to NO_2 Conversion Method

In accordance with the *AQMG*, the conversion of nitrogen oxide (NO_X) to nitrogen dioxide (NO_2) in the atmosphere must be considered in all the NO_2 modelling (AEP, 2021a). The Alberta *AQMG* recommends four methods for converting NO_x to NO_2, including the total conversion method (TCM), the ambient ratio method (ARM/ARM2), the plume volume molar ratio method (PVMRM), and the ozone limiting method (OLM). The results from the TCM must be presented as part of the assessment. The MGLCs of NO_2 in this assessment were evaluated using the TCM and ARM2, respectively.

TCM assumes that NO_x emissions are converted entirely to NO_2 in the atmosphere. The actual quantity of NO_x converted to NO_2 in an equilibrium state is dependent on numerous factors, including ozone (O_3) concentrations and baseline NO_2 concentrations. This method provides a conservative estimate of predicted NO_2 concentrations and often serves as an initial screening approach.

The ARM method applies a ratio of NO_2 to total NO_X in the atmosphere to calculate NO_2 concentrations based on predicted NO_X concentrations. The ARM2 method is an extension of the ARM method based upon the statistics of the ratio of NO_2/NO_x derived from many ambient monitoring stations. The recommended ratio of NO_2 to NO_x for Alberta within the *AQMG* was used for this assessment.

3 EMISSIONS

3.1 BBPP Emission Sources

BBPP is a combined cycle power plant with carbon capture consisting of one natural gas fired CTG, one ST, one carbon capture package with one carbon dioxide (CO_2) compression and dehydration package. High temperature exhaust from the CTG is vented to a heat recovery steam generator (HRSG) to produce steam for the ST. The HRSG will be equipped with selective catalytic reduction (SCR) to reduce

nitrogen oxide (NO_X) emissions. Once carbon capture system (CCS) is commissioned, the HRSG outlet flue gas will be directed to a series of CCS packages to remove CO_2 from the flue gases, dehydrate the CO_2 gas stream and compress the CO_2 for injection. Dehydration will include the use of use two natural gas fired triethylene glycol (TEG) heaters. An auxiliary natural gas fired boiler will intermittently provide supplemental heat during start-up, maintenance or emergency operating conditions. The BBPP will have an emergency diesel generator (EDG) for onsite utilities.

It is possible that the carbon capture, utilization, and storage (CCUS) hub may not be operational when the BBPP is commissioned. As such, the BBPP may operate for a period without CCS. Similarly, in the event that the CCUS hub is down for maintenance or experiences and unplanned outages, the BBPP will operate without CCS. The number of emission sources and release points change when operating with and without CCS. Horizon Compliance has modelled the BBPP under continuous operations, with and without CCS, to ensure that all MGLCs of ambient air quality are compliant regardless of the operational configuration.

The primary substance of concern from the BBPP is NO_x from the combustion of natural gas. Secondary substances of concern from natural gas combustion in the emission sources include carbon monoxide (CO), particulate matter less than 2.5 microns in diameter ($PM_{2.5}$) and total suspended particulate matter (TSP). Potential ammonia (NH_3) resulting from operation of the SCR system has also been evaluated. Table 5 lists the release parameters for the proposed sources associated with these sources.

3.2 Background Industrial Emission Sources

In accordance with the *AQMG*, the cumulative air quality conditions expected to result from the existing and approved industrial developments, especially those near the plant, should be assessed at the same time with the plant for a more accurate representation of predicted impacts within the modelling domain (AEP, 2021a).

Determined using the National Pollutant Release Inventory (NPRI) database, two Conifer Energy Inc. facilities within a 5 km radius of the BBPP were identified as significant NO_x emitters: Judy Creek Gas Conservation Plant (Judy Creek Production Complex (JCPC) at LSD 14-06-064-10 W5M) and Judy Creek Gas Conservation Plant (License No. F14146 and F14148 at LSD 15-25-064-11 W5M). The emission and stack parameters for the JCPC sources were obtained from the *Air Quality Dispersion Modelling Assessment for Conifer Energy Inc. 16 MW Judy Creek Production Complex - ATCO Export Facility* (Calvin Consulting, 2021d). Two emission sources at the Judy Creek Clean Gas to Power Plant and Judy Creek Power Plant presented in the AQA report for the JCPC were also included in the modelling. In addition, there are two other active facilities (gas batteries) emitting NO_x within 5km of BBPP (Abacus Datagraphics Ltd., 2023; 2023; AER, 2023). Table 6 lists the release parameters for the background industrial emission sources included in this AQA.

Table 5 Proposed BBPP Emission Sources

Operational Configuration	Source Type	ID	Stack Height (m)	Stack Diameter (m)	Exit Velocity (m/s)	Exit Temp (°C)	NO_x Emission Rate (kg/h)	CO Emission Rate (kg/h)	$PM_{2.5}$ Emission Rate (kg/h)	NH_3 Emission Rate (kg/h)
No CCS	HRSG	HRSG	48.76	6.6	14.7	70.9	141.6	31.7	4.6	11.6
No CCS	HRSG Stack with SCR						46.0			
Both	Auxiliary Boiler Stack	ABS	18.3	0.965	16.7	272.0	2.127	1.787	0.162	0.000
CCS Only	CCS Absorber Stack	CCSAS	57.3	5.8	18.3	70.9	141.6	31.7	4.6	11.6
CCS Only	CCS Absorber with SCR						46.0			
CCS Only	TEG Train 1 Stack	TEG1	4.0	0.457	6.0	350.0	0.057	0.048	0.004	0.000
CCS Only	TEG Train 2 Stack	TEG1	4.0	0.457	6.0	350.0	0.057	0.048	0.004	0.000

Table 6 Background Industrial Emission Sources

Source Type	Source ID	Stack Height (m)	Stack Diameter (m)	Exit Velocity (m/s)	Exit Temp (K)	NO_x Emission Rate (g/s)	CO Emission Rate (g/s)	$PM_{2.5}$ Emission Rate (g/s)
Conifer Energy Judy Creek Production Complex (JCPC)[a]								
Solar Turbine T60 Generator 1	G9210	11.30	1.100	56.73	783.2	0.9081	0.1999	0.0046
Solar Turbine T60 Generator 2	G9220	11.30	1.100	56.73	783.2	0.9081	0.1999	0.0046
Solar Turbine T60 Generator 3	G9230	11.30	1.100	56.73	783.2	0.9081	0.1999	0.0046
K1101 Clark HBA-6T.C	K1103	10.99	0.510	25.00	683.2	Standby		
K1103 Clark HBA-6T.C	K1103	10.99	0.510	25.00	683.2	3.3343	1.8821	0.0194
P1103 Solar Centaur	P1103	10.63	1.340	23.00	853.2	2.2065	0.1167	0.0027
P1104 Solar Centaur	P1104	10.47	1.360	23.00	853.2	2.2065	0.1167	0.0027
GH-1 Southend Heating[b]	GH1	5.11	0.360	2.10	477.6	0.0153	0.0097	0.0002
GH-2 Southend Heating[b]	GH2	5.10	0.350	2.23	477.6	0.0153	0.0097	0.0002
GH3 Heating Boiler[b]	GH3	5.88	0.425	0.86	477.6	0.0019	0.0012	0.0000
R3 Reboiler TEG [b]	R3	7.37	0.305	4.55	477.6	0.0246	0.0155	0.0004
T-2 Treater	T2n	10.15	1.075	1.16	477.6	0.0658	0.0415	0.0009
T-2 Treater	T2s	10.15	1.075	1.16	477.6	0.0658	0.0415	0.0009

H-2000 PWIP	H2000	7.87	0.430	1.35	477.6	0.0130	0.0000	0.0000
Judy Creek Clean Gas to Power Plant								
Turbine	T130	15.00	1.800	10.80	763.2	1.0417	0.0000	0.0000
Judy Creek Power Plant								
Turbine	HX	10.00	1.800	10.80	763.2	1.0417	0.0000	0.0000
F14146 Facility and F14148 Facility[(c)]								
Compressor	K502	10.9	0.440	39.200	833.1	1.4636	1.5321	0.0158
Compressor	K503	10.9	0.440	39.200	833.1	1.4636	1.5321	0.0158
Compressor	K504	10.9	0.440	39.200	833.1	1.4086	1.4746	0.0152
Compressor	K505	10.9	0.440	39.200	833.1	1.4667	1.5353	0.0159
Compressor	K506	10.9	0.440	39.200	833.1	1.3979	1.4634	0.0151
Compressor	K451	9.4	0.610	34.900	628.2	1.3525	2.6853	0.0277
Compressor	K507	10.9	0.440	39.200	698.1	1.3674	1.4314	0.0148
Compressor	K508	10.9	0.440	39.200	698.1	1.3674	1.4314	0.0148
Compressor	K509	10.9	0.440	39.200	698.1	1.3674	1.4314	0.0148
Compressor	K550	8.4	0.310	27.000	673.1	3.1297	0.7869	0.0081
Compressor	K551	8.4	0.310	27.000	673.1	3.1297	0.7869	0.0081
Compressor	K452	9.4	0.610	34.900	628.2	1.3525	2.6853	0.0277
Compressor	K453	9.4	0.610	34.900	628.2	1.3525	2.6853	0.0277
F42371 Facility at LSD 12-06-064-10 W5M[(c)]								
Compressor	C10825	10.2	0.336	50.000	870.0	0.3212	1.9672	0.0203
Compressor	C20825	10.2	0.336	50.000	870.0	0.3212	1.9672	0.0203
Pump	P10825	10.2	0.336	50.000	870.0	0.1230	1.9672	0.0203
F38519 Facility at LSD 08-25-064-11 W5M[(c)]								
Compressor	C11206	6.0	0.102	28.000	830.0	0.2639	0.0992	0.0010

(a) Calvin Consulting Group Ltd. Air Quality Dispersion Modelling Assessment for Conifer Energy Inc. 16 Mw Judy Creek Production Complex - ATCO Export Facility, June 2021. The currently approved K1104 and H-1801 units at the JCPC are no longer in operation.

(b) Stack equipped with raincap.

(c) Emissions were calculated based on facility licence and release parameters have been estimated based on similar compressors or units.

3.3 Ambient Baseline Concentrations

In accordance with the *AQMG*, ambient baseline concentrations must be added to the concentrations predicted by the model for a more accurate representation of cumulative effects (AEP, 2021a). Ambient baseline concentrations are assumed to represent the air quality contribution of both natural and human-caused sources that are not included in the modelling. Baseline concentrations are calculated using representative ambient monitoring data.

BBPP is located within the West Central Airshed Society (WCAS). The nearest continuous ambient air monitoring stations that contain publicly available data for NO_2, CO, NH_3 and $PM_{2.5}$ are presented in Table 6. No available data for TSP meet data completeness criteria. Measured 1-Hour PM_{10} data from Bruderheim air monitoring station were used to calculate baseline concentrations for TSP. Measured 1-Hour NO_2, CO, $PM_{2.5}$, PM_{10} and NH_3 from these stations were used to estimate the 90th percentile concentrations for each averaging period as per the *AQMG*. The calculated 90th percentile baseline concentrations of NO_2, CO, $PM_{2.5}$, PM_{10} and NH_3 are shown in Table 7. The calculated baseline concentrations were added to the ground-level concentrations predicted by the dispersion modelling to calculate the MGLC. The MGLC is defined as the sum of the predicted and the baseline concentration.

Table 7 Ambient Baseline Concentrations Used in this Assessment

Substance	Air Monitoring Station	Distance between Air Monitoring Station and BBPP (km)	Data Period Used in this Assessment	Averaging Period	Ambient Baseline Concentration (µg/m^3)
NO_2	Carrot Creek	100	January 1, 2020 to December 31, 2022	1-Hour	18.6
				Annual	5.5
CO	Grande Praire-Henry Pirker	210	January 1, 2020 to December 31, 2022	1-Hour	388.2
				8-Hour	387.7
$PM_{2.5}$	Smoky Heights	115	January 1, 2020 to December 31, 2022	1-Hour	11.3
				24-Hour	10.8
PM_{10}	Bruderheim	189	May 1, 2012 to April 30, 2015	24-Hour	32.6
				Annual	11.8
NH_3	Redwater	171	January 1, 2020 to December 31, 2022	1-Hour	2.4

4 DISPERSION MODELLING RESULTS

Dispersion modelling has been completed for the following cases:

- **Baseline Case (B1):** This case assessed NO_x, CO, $PM_{2.5}$ and TSP emissions from nearby background industrial emission sources only.
- **Project Case 1 (P1):** This case assessed NO_x, CO, $PM_{2.5}$, and TSP emissions from HRSG without SCR, and emissions from the auxiliary boiler.
- **Project Case 2 (P2):** This case assessed NO_x, CO, $PM_{2.5}$, and TSP emissions from the CCS absorber when CCS is commissioned and the SCR system is offline, and emissions from the auxiliary boiler and two TEG reboilers.

- **Cumulative Case 1 (C1):** This case assessed NO_x, CO, $PM_{2.5}$, and TSP emissions from HRSG without SCR, and emissions from the auxiliary boiler, as well as the emission sources included in the Baseline Case.
- **Cumulative Case 1 (C2):** This case assessed NO_x, CO, $PM_{2.5}$, and TSP emissions from the CCS absorber when CCS is commissioned and the SCR system is offline, and emissions from the auxiliary boiler and two TEG reboilers, as well as the emission sources included in the Baseline Case.

It should be noted that there are no significant background NH_3 emission sources within the 5 km of BBPP and only NH3 emissions resulting from the operation of the SCR system were assessed. It assumed that Cases P1 to C2 have the same NH_3 emission rates as the operating conditions with the operation of SCR.

4.1 NO_2 Modelling Results

The predicted NO_2 concentrations using the TCM, including baseline NO_2, are provided in 8. As indicated, the MGLCs of NO_2 associated with project cases comply with the applicable *AAAQOs* for NO_2. However, the MGLCs of NO_2 for the baseline and cumulative cases exceed the applicable *AAAQOs.*

Table 8 Predicted Maximum Ground-Level NO_2 Concentrations Using TCM

Case	Averaging Period	UTM Coordinates		Predicted (µg/m³)	Baseline (µg/m³)	MGLC (µg/m³)	*AAAQO* (µg/m³)
		(m E)	(m N)				
B1	1-hour	596084	6047792	**392.3**	18.6	**411.0**	**300**
	Annual	596084	6047812	**47.9**	5.5	**53.4**	**45**
P1	1-hour	593048	6044272	125.8	18.6	144.5	**300**
	Annual	592848	6043922	3.3	5.5	8.8	**45**
P2	1-hour	593148	6044272	127.6	18.6	146.3	**300**
	Annual	592998	6043872	2.6	5.5	8.1	**45**
C1	1-hour	596084	6047792	**392.3**	18.6	**411.0**	**300**
	Annual	596084	6047812	**48.1**	5.5	**53.6**	**45**
C2	1-hour	596084	6047792	**392.3**	18.6	**411.0**	**300**
	Annual	596084	6047812	**48.1**	5.5	**53.6**	**45**

As the TCM is a conservative estimate of predicted NO_2 concentrations, and often serves as an initial screening approach, the ARM2 was applied to evaluate NO_2 concentrations as per the *AQMG*. The predicted NO_2 concentrations using the ARM2, including baseline NO_2, are provided in Table 9. As indicated, both the 1-hour average and annual MGLCs of NO_2 for all the cases considered in this AQA comply with the applicable *AAAQOs*. The isopleths presenting the modelling results are shown in Figures 5 through 14 within Appendix A, while an example of modelling output files is provided in Appendix B.

Table 9 Predicted Maximum Ground-Level NO_2 Concentrations Using ARM2

Case	Averaging Period	UTM Coordinates (m E)	UTM Coordinates (m N)	Predicted (µg/m³)	Baseline (µg/m³)	MGLC (µg/m³)	*AAAQO* (µg/m³)
B1	1-hour	596084	6047792	144.1	18.6	162.7	**300**
	Annual	596084	6047812	36.6	5.5	42.1	**45**
P1	1-hour	593048	6044272	88.1	18.6	106.7	**300**
	Annual	592848	6043922	2.3	5.5	7.8	**45**
P2	1-hour	593148	6044272	89.3	18.6	108.0	**300**
	Annual	592998	6043872	1.80	5.5	7.3	**45**
C1	1-hour	596084	6047792	144.1	18.6	162.7	**300**
	Annual	596084	6047812	36.8	5.5	42.3	**45**
C2	1-hour	596084	6047792	144.1	18.6	162.7	**300**
	Annual	596084	6047812	36.8	5.5	42.3	**45**

4.2 CO Modelling Results

The predicted CO concentrations, including baseline CO, are provided in 10. As indicated, both the 1-hour and 8-hour average MGLCs of CO associated with all the modelling cases are predicted to comply with the applicable *AAAQOs*. There are small differences in the concentrations among the modelling cases for each average period. As such, the isopleths presenting the modelling results associated with Cases C1 and C2 are shown in Figures 15 through 18 within Appendix A, while an example of modelling output files is provided in Appendix B.

Table 10 Predicted Maximum Ground-Level CO Concentrations

Case	Averaging Period	UTM Coordinates (m E)	UTM Coordinates (m N)	Predicted (µg/m³)	Baseline (µg/m³)	MGLC (µg/m³)	*AAAQO* (µg/m³)
B1	1-hour	596086	6047752	84.4	388.2	472.6	**15000**
	8-hour	596084	6047792	51.4	387.7	439.0	**6000**
P1	1-hour	593048	6044272	28.7	388.2	416.9	**15000**
	8-hour	591998	6044172	16.2	387.7	403.8	**6000**
P2	1-hour	593148	6044272	28.8	388.2	417.0	**15000**
	8-hour	592128	6044142	16.2	387.7	403.9	**6000**
C1	1-hour	596086	6047752	84.8	388.2	473.0	**15000**
	8-hour	596084	6047792	51.4	387.7	439.0	**6000**
C2	1-hour	596086	6047752	84.8	388.2	473.0	**15000**
	8-hour	596084	6047792	51.4	387.7	439.0	**6000**

4.3 $PM_{2.5}$ and TPM Modelling Results

The predicted $PM_{2.5}$ concentrations, including baseline $PM_{2.5}$, are provided in 11. As indicated, both the 1-hour and 24-hour average MGLCs of $PM_{2.5}$ associated with all the cases are predicted to comply with the applicable *AAAQOs*. There are little differences in the concentrations among the modelling cases for each average period. As such, the isopleths presenting the modelling results associated with Cases C1 and C2 are shown in Figures 19 through 22 within Appendix A, while an example of modelling output files is provided in Appendix B.

Table 11 Predicted Maximum Ground-Level $PM_{2.5}$ Concentrations

Case	Averaging Period	UTM Coordinates (m E)	UTM Coordinates (m N)	Predicted (µg/m³)	Baseline (µg/m³)	MGLC (µg/m³)	*AAAQO* (µg/m³)
B1	1-hour	596740	6041777	0.5	11.3	11.8	**80**[a]
	24-hour	597522	6041060	0.2	10.8	11.1	**29**[b]
P1	1-hour	593048	6044272	4.2	11.3	15.5	**80**[a]
	24-hour	592128	6044182	1.5	10.8	12.3	**29**[b]
P2	1-hour	593148	6044272	4.2	11.3	15.5	**80**[a]
	24-hour	592234	6044185	1.3	10.8	12.1	**29**[b]
C1	1-hour	593048	6044272	4.2	11.3	15.5	**80**[a]
	24-hour	592128	6044182	1.5	10.8	12.3	**29**[b]
C2	1-hour	593148	6044272	4.2	11.3	15.5	**80**[a]
	24-hour	592234	6044185	1.3	10.8	12.1	**29**[b]

[a] *Alberta Ambient Air Quality Guideline* [b] *Alberta Ambient Air Quality Objective*

The predicted TPM concentrations, including baseline PM_{10}, are provided in 12. The 24-hour average and annual MGLCs associated with all the modelling cases are predicted to comply with the applicable *AAAQOs*. It is noted that as mentioned in Section 3.3, no air monitoring data for TSP are available and measured 1-Hour PM_{10} data were used to calculate baseline concentrations for TSP. All particulate matter emitted from BBPP and background facilities was considered to be $PM_{2.5}$. As such, TPM and $PM_{2.5}$ will have the same spatial distributions for 24-hour average concentrations, and the predicted annual TPM concentrations are negligible. No isopleths presenting TSP modelling results are needed.

Table 12 Predicted Maximum Ground-Level TPM Concentrations

Case	Averaging Period	UTM Coordinates (m E)	UTM Coordinates (m N)	Predicted (µg/m³)	Baseline PM_{10} (µg/m³)	MGLC (µg/m³)	*AAAQO* (µg/m³)
B1	24-hour	597522	6041060	0.20	32.6	32.8	**100**
	Annual	597062	6041457	0.03	11.8	11.9	**60**
P1	24-hour	592128	6044182	1.50	32.6	34.1	**100**
	Annual	592848	6043922	0.10	11.8	12.0	**60**
P2	24-hour	592234	6044185	1.30	32.6	33.9	**100**
	Annual	592998	6043872	0.10	11.8	12.0	**60**
C1	24-hour	592128	6044182	1.50	32.6	34.1	**100**
	Annual	592848	6043922	0.10	11.8	12.0	**60**
C2	24-hour	592234	6044185	1.30	32.6	33.9	**100**
	Annual	592848	6043922	0.10	11.8	12.0	**60**

4.4 NH_3 Modelling Results

As previously mentioned, there are no significant background NH_3 emission sources within the 5 km of BBPP and only NH_3 emissions resulting from operation of the SCR system were assessed. The predicted NH_3 concentrations, including baseline NH_3, are provided in 13. As indicated, the predicted 1-hour average MGLCs of NH_3 associated with project cases comply with the applicable *AAAQO*. The isopleths presenting the modelling results are not provided as the predicted 1-hour average MGLCs are less than 1% of the AAAQO for NH_3, while an example of modelling output files is provided in Appendix B.

Table 13 Predicted Maximum Ground-Level NH_3 Concentrations

Case	Averaging Period	UTM Coordinates (m E)	UTM Coordinates (m N)	Predicted (µg/m³)	Baseline (µg/m³)	MGLC (µg/m³)	*AAAQO* (µg/m³)
P1	1-hour	593048	6044272	10.0	2.4	12.4	**1400**
P2	1-hour	593148	6044272	10.4	2.4	12.8	**1400**

5 CONCLUSION

At the request of KEC, Horizon Compliance has completed an AQA for the proposed BBPP. The results of the dispersion modelling indicate that the predicted maximum ground-level concentrations of NO_2, CO, $PM_{2.5}$, TSP and NH_3 associated with various operating conditions comply with the applicable *AAAQOs*.

Horizon Compliance appreciated the opportunity to work on this project. If we can provide clarification of any part of this report, please contact the undersigned at (587) 885-0863.

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Cody Halleran, B.Sc., EP Manager
Co-Founder & Managing Partner
Air Quality & Regulatory Services

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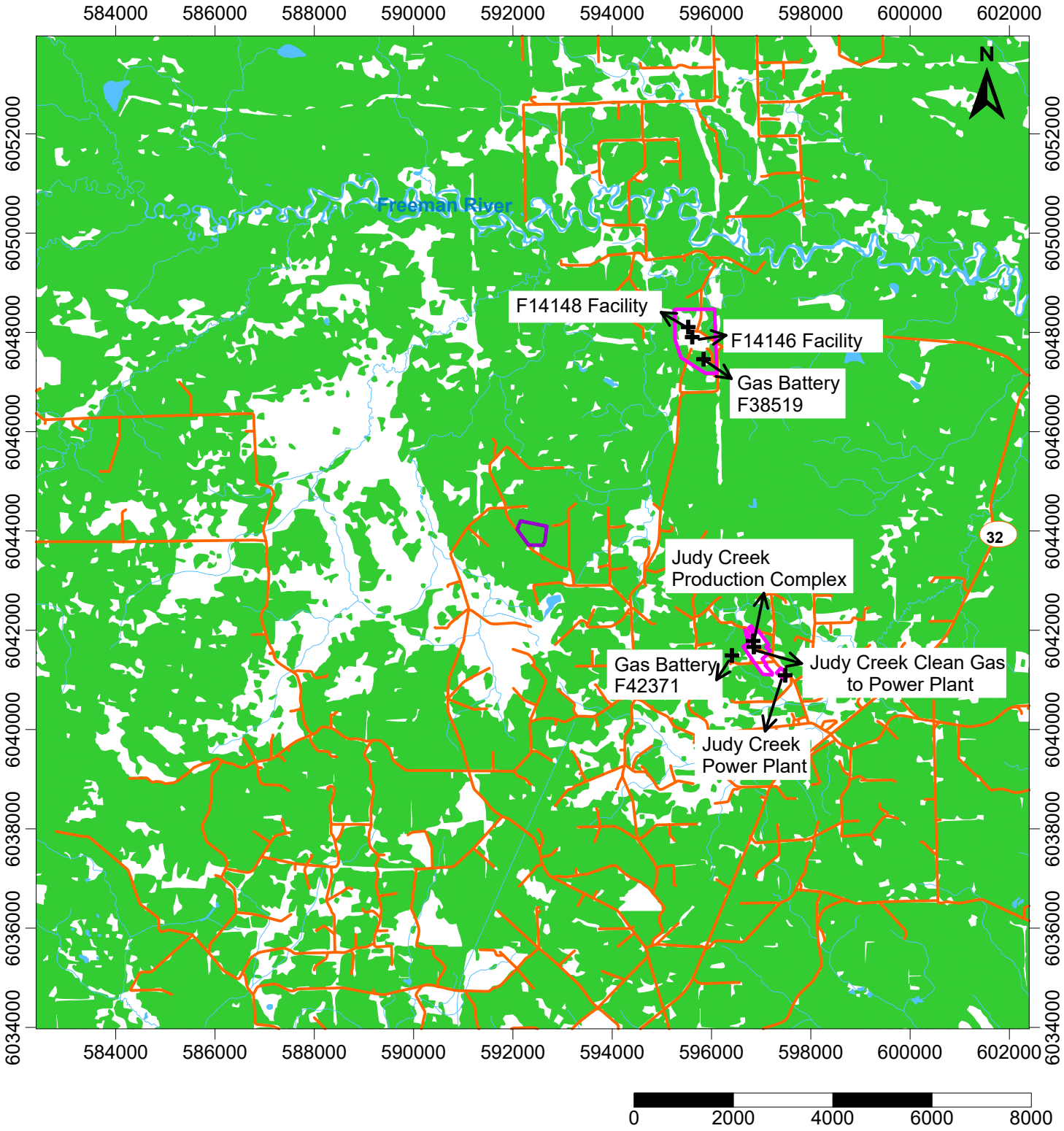
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APPENDIX A

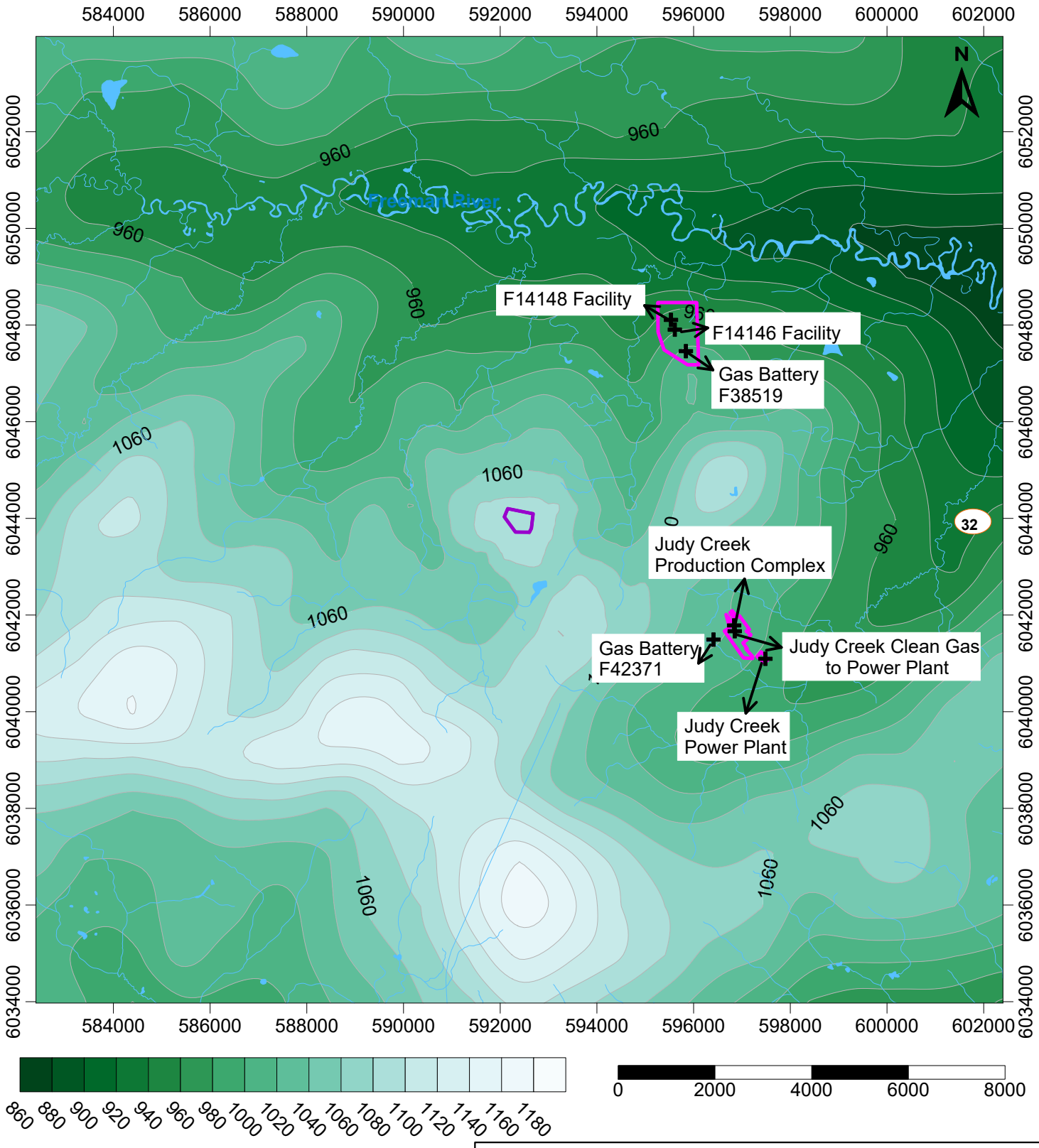
FIGURES



LEGEND

- Black Bear Power Plant Boundary
- Background Industrial Facilities
- Plant Boundary
- Water Body
- Road
- Wooded Area

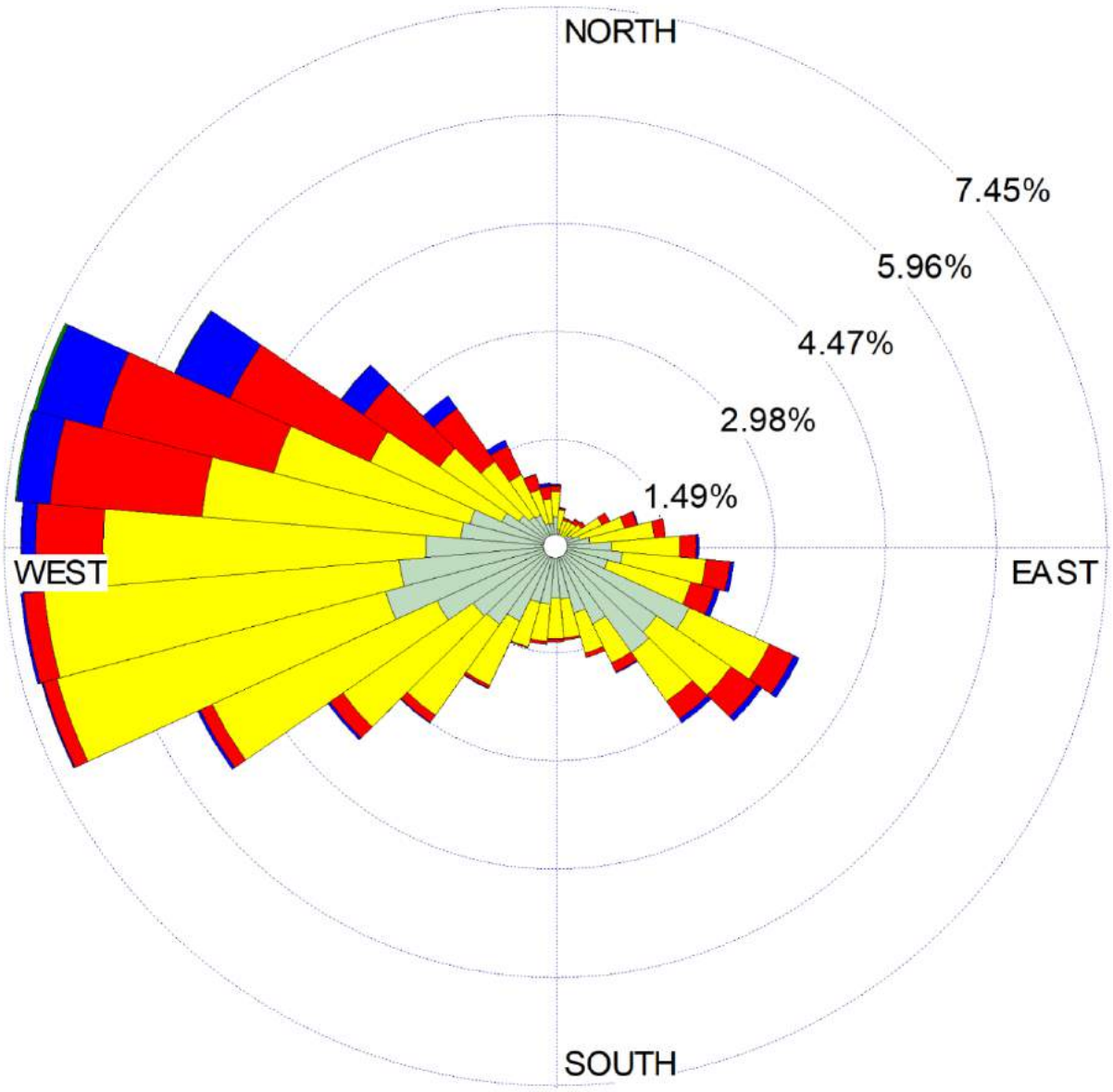
PROJECT	Kiwetinohk Energy Corp. Black Bear Power Plant
TITLE	**Project Area Map**
DATE	April 6, 2023
	FIGURE 1



LEGEND

- Black Bear Power Plant Boundary
- Background Industrial Facilities
- Plant Boundary
- Water Body

PROJECT	Kiwetinohk Energy Corp. Black Bear Power Plant
TITLE	**Topographical Map**
DATE	April 6, 2023
	FIGURE 2

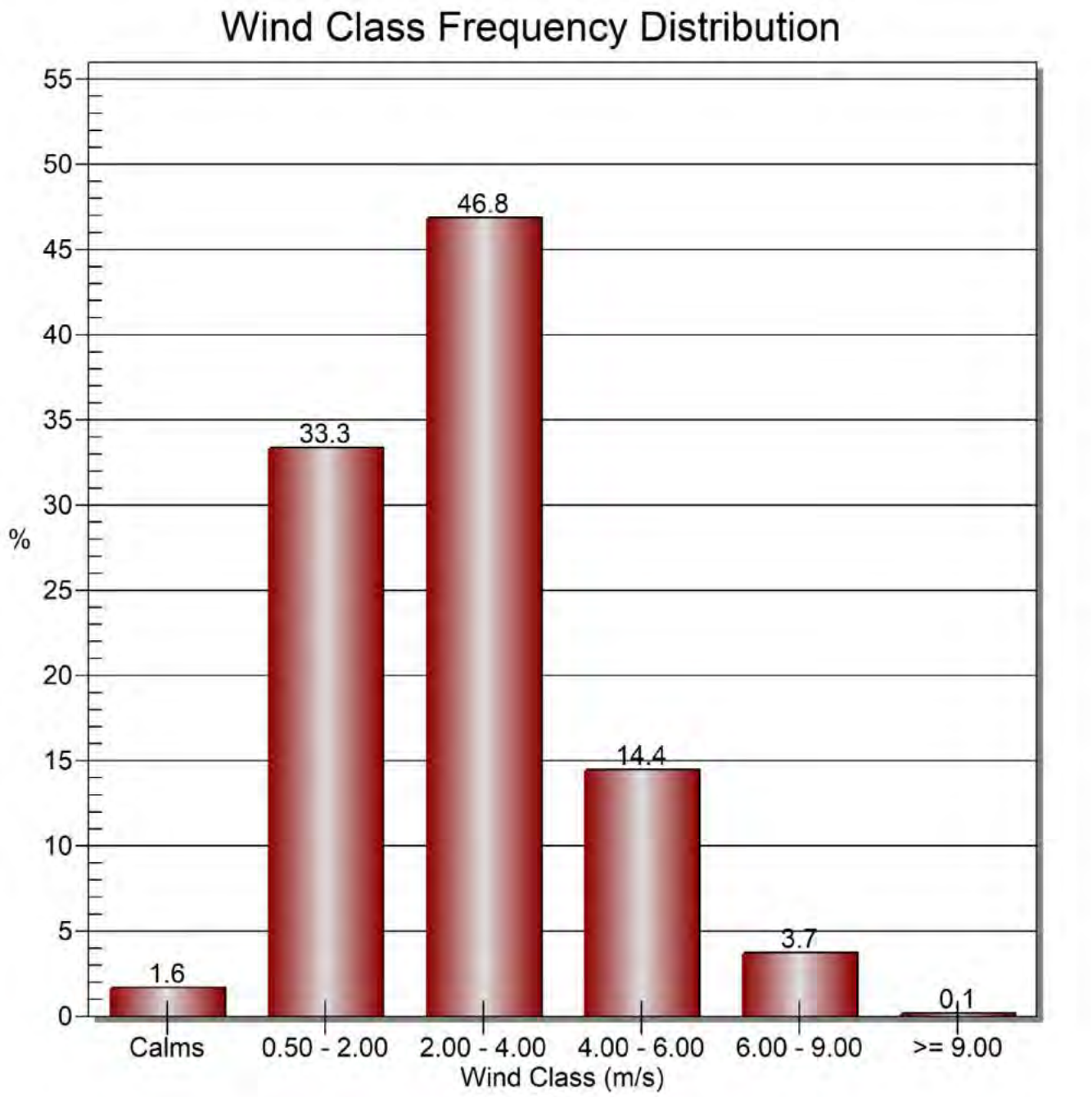


WIND SPEED
(m/s)

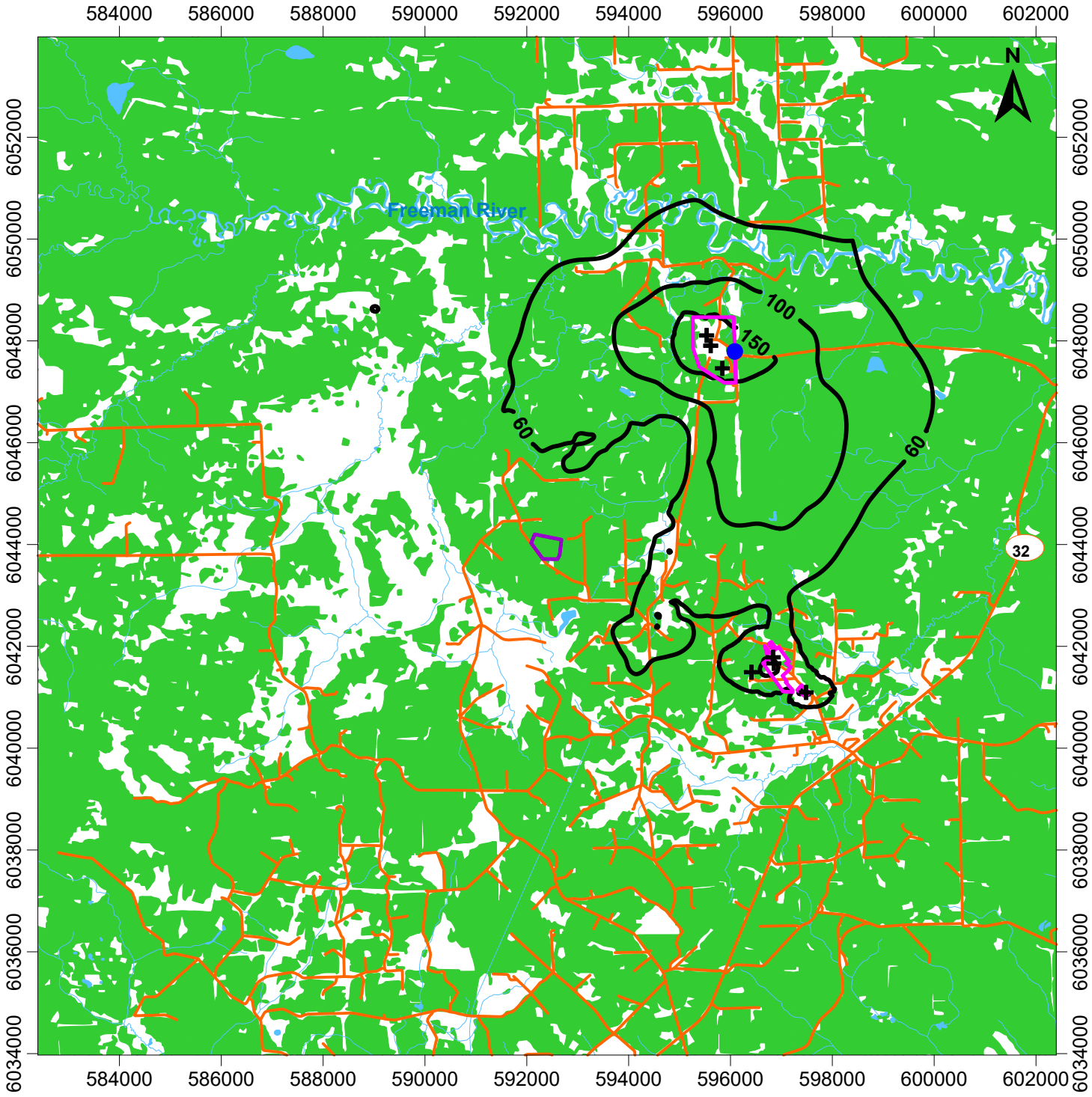
- >= 9.00
- 6.00 - 9.00
- 4.00 - 6.00
- 2.00 - 4.00
- 0.50 - 2.00

Calms: 1.62%

PROJECT	Kiwetinohk Energy Corp. Black Bear Plower Plant
TITLE	**Wind Rose Plot at the Project Area (2015 to 2019)**
HORIZON COMPLIANCE	DATE: April 6, 2023
	FIGURE 3



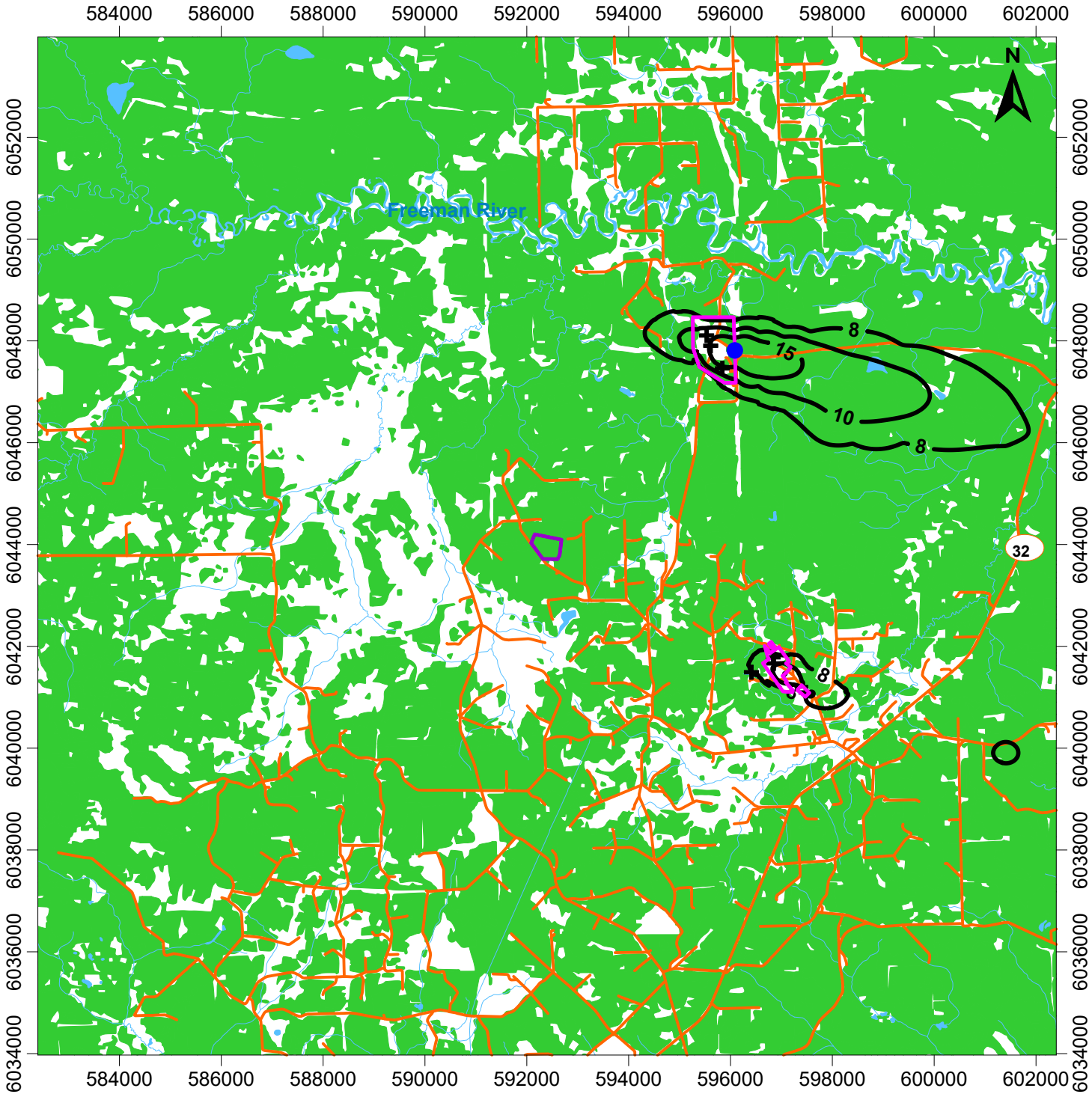
PROJECT	Kiwetinohk Energy Corp. Black Bear Plower Plant
TITLE	**Wind Class Frequency Distribution at the Project Area (2015 to 2019)**
HORIZON COMPLIANCE	DATE: April 6, 2023
	FIGURE 4



LEGEND

- Maximum Ground Level Concentration (MGLC)
- Black Bear Power Plant Boundary
- Background Industrial Facilities
- Plant Boundary
- Water Body
- Road
- Wooded Area

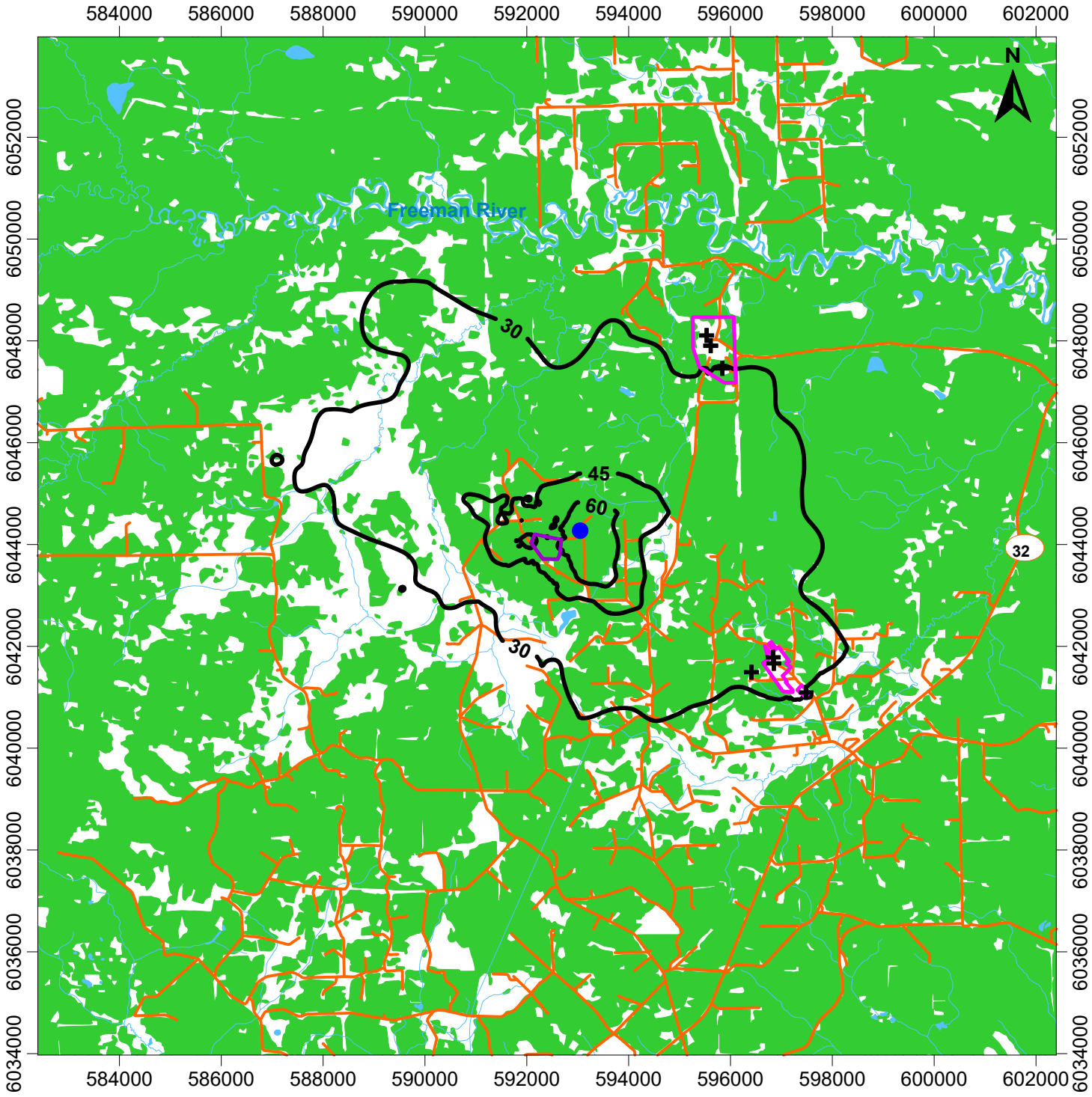
PROJECT	Kiwetinohk Energy Corp. Black Bear Power Plant
TITLE	**Baseline Case:** **99.9th Percentile of Predicted 1-Hour Average NO_2 Concentrations**
HORIZON COMPLIANCE	MGLC: NO_2 = 162.7 (µg/m³)
	FIGURE 5



LEGEND

- Maximum Ground Level Concentration (MGLC)
- Black Bear Power Plant Boundary
- Background Industrial Facilities
- Plant Boundary
- Water Body
- Road
- Wooded Area

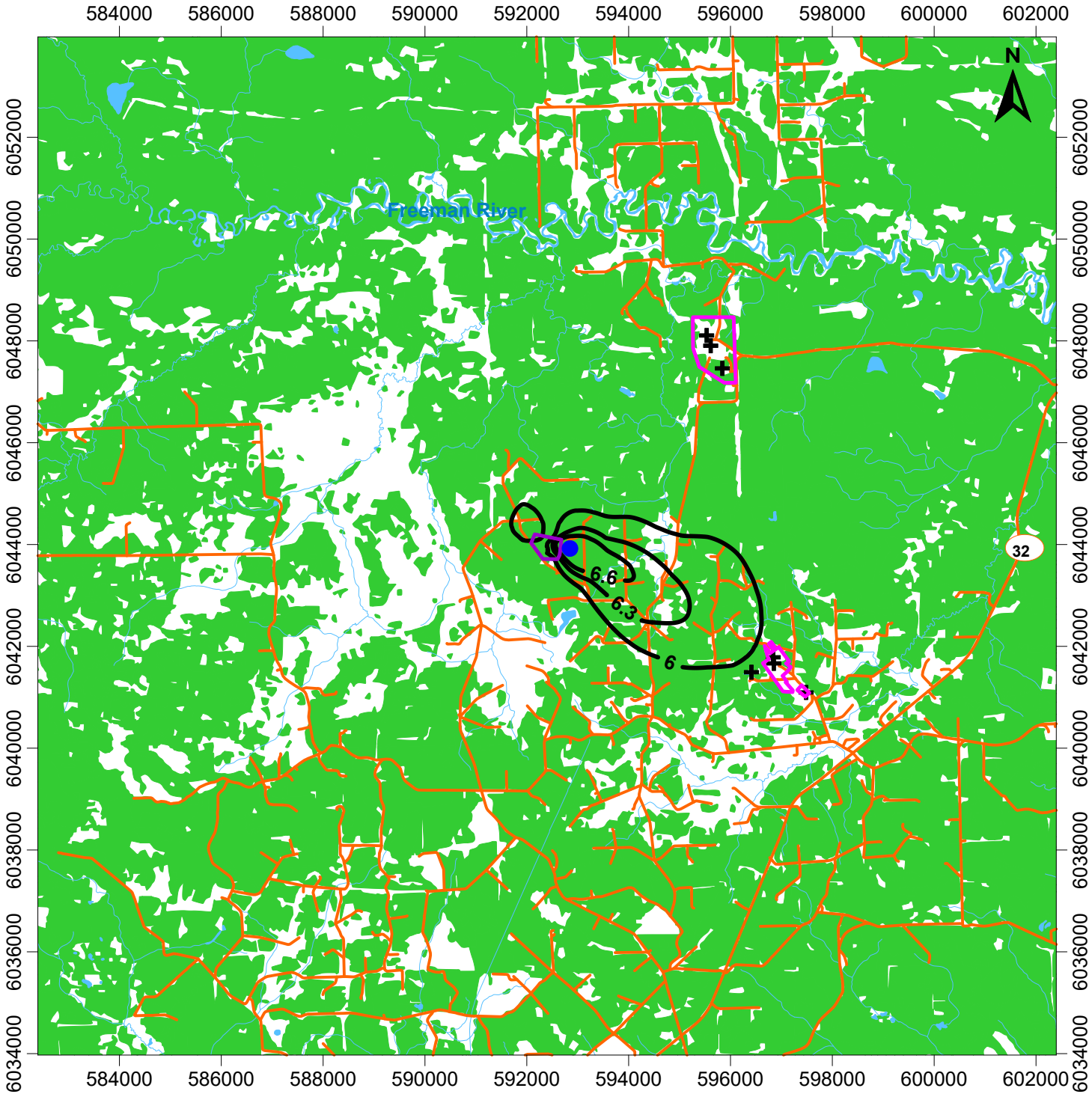
PROJECT	Kiwetinohk Energy Corp. Black Bear Power Plant
TITLE	**Baseline Case:** **Maximum Predicted Annual NO_2 Concentrations**
HORIZON COMPLIANCE	MGLC: NO_2 = 42.1 (µg/m^3)
	FIGURE 6



LEGEND

- Maximum Ground Level Concentration (MGLC)
- Black Bear Power Plant Boundary
- Background Industrial Facilities
- Plant Boundary
- Water Body
- Road
- Wooded Area

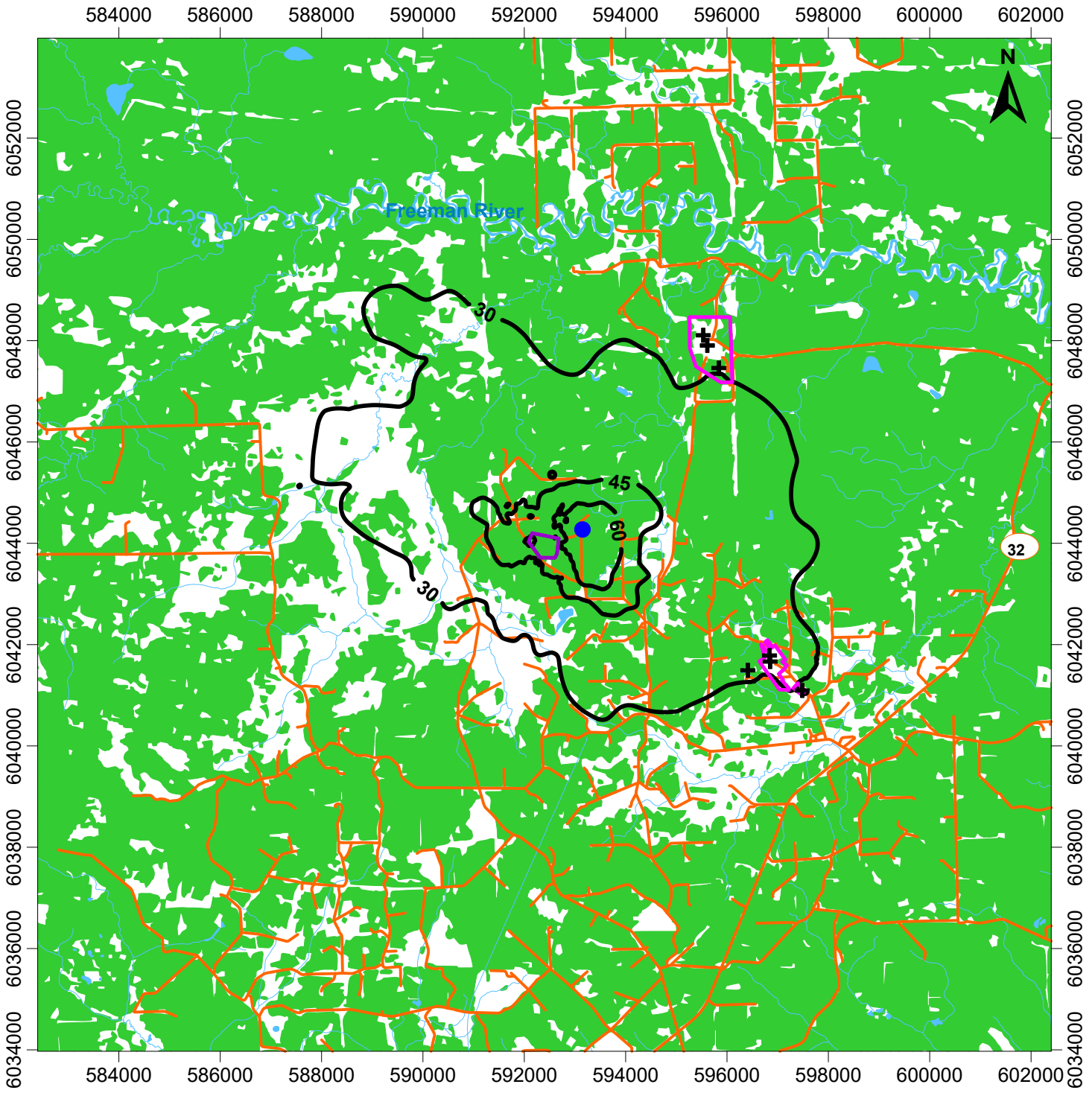
PROJECT	Kiwetinohk Energy Corp. Black Bear Power Plant
TITLE	**Project Case 1:** **99.9th Percentile of Predicted 1-Hour Average NO_2 Concentrations**
HORIZON COMPLIANCE	MGLC: NO_2 = 106.7 (µg/m³)
	FIGURE 7



LEGEND

- Maximum Ground Level Concentration (MGLC)
- Black Bear Power Plant Boundary
- Background Industrial Facilities
- Plant Boundary
- Water Body
- Road
- Wooded Area

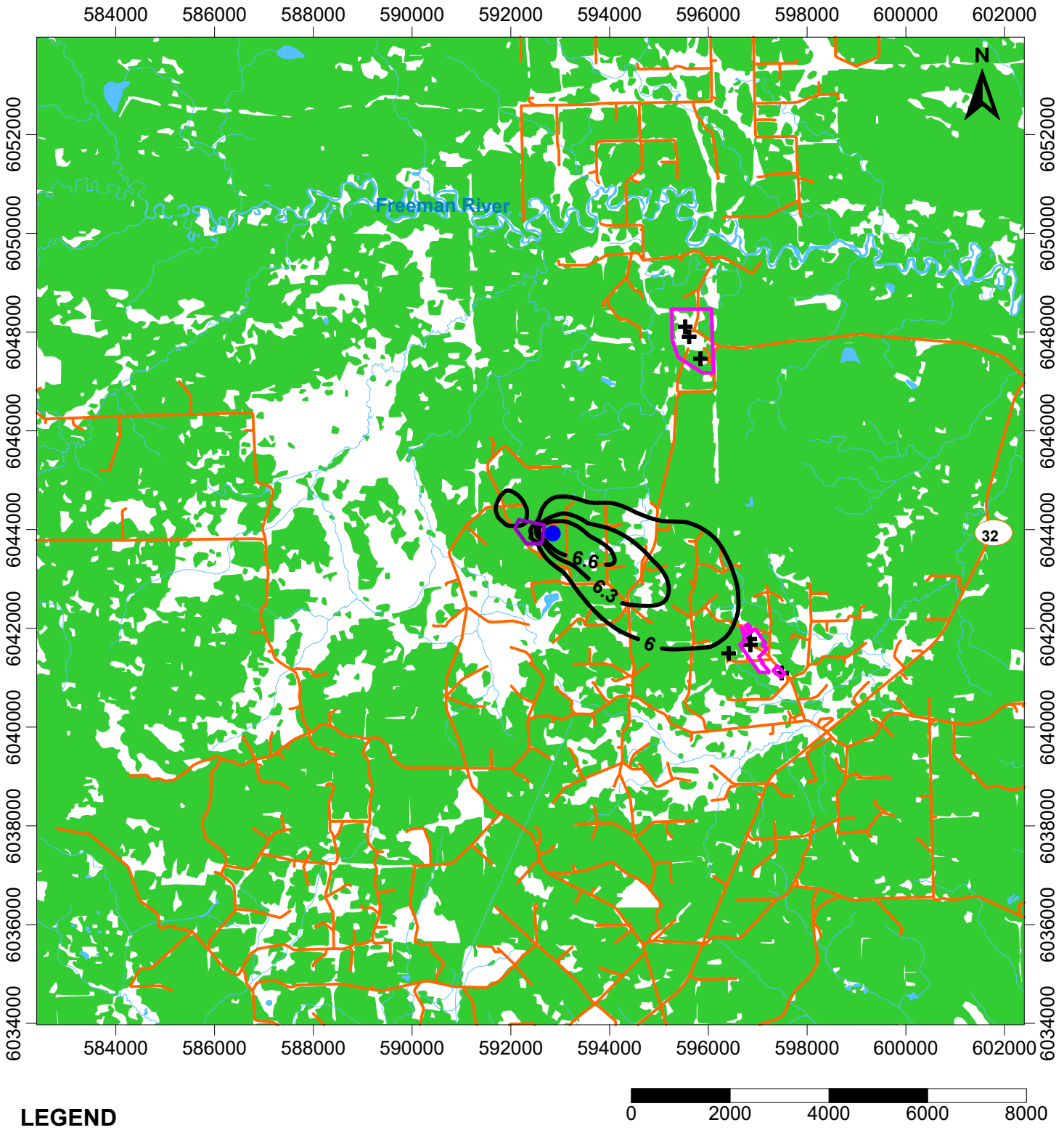
PROJECT	Kiwetinohk Energy Corp. Black Bear Power Plant
TITLE	**Project Case 1:** **Maximum Predicted Annual NO_2 Concentrations**
HORIZON COMPLIANCE	MGLC: NO_2 = 7.8 (µg/m³)
	FIGURE 8



LEGEND

- Maximum Ground Level Concentration (MGLC)
- Black Bear Power Plant Boundary
- Background Industrial Facilities
- Plant Boundary
- Water Body
- Road
- Wooded Area

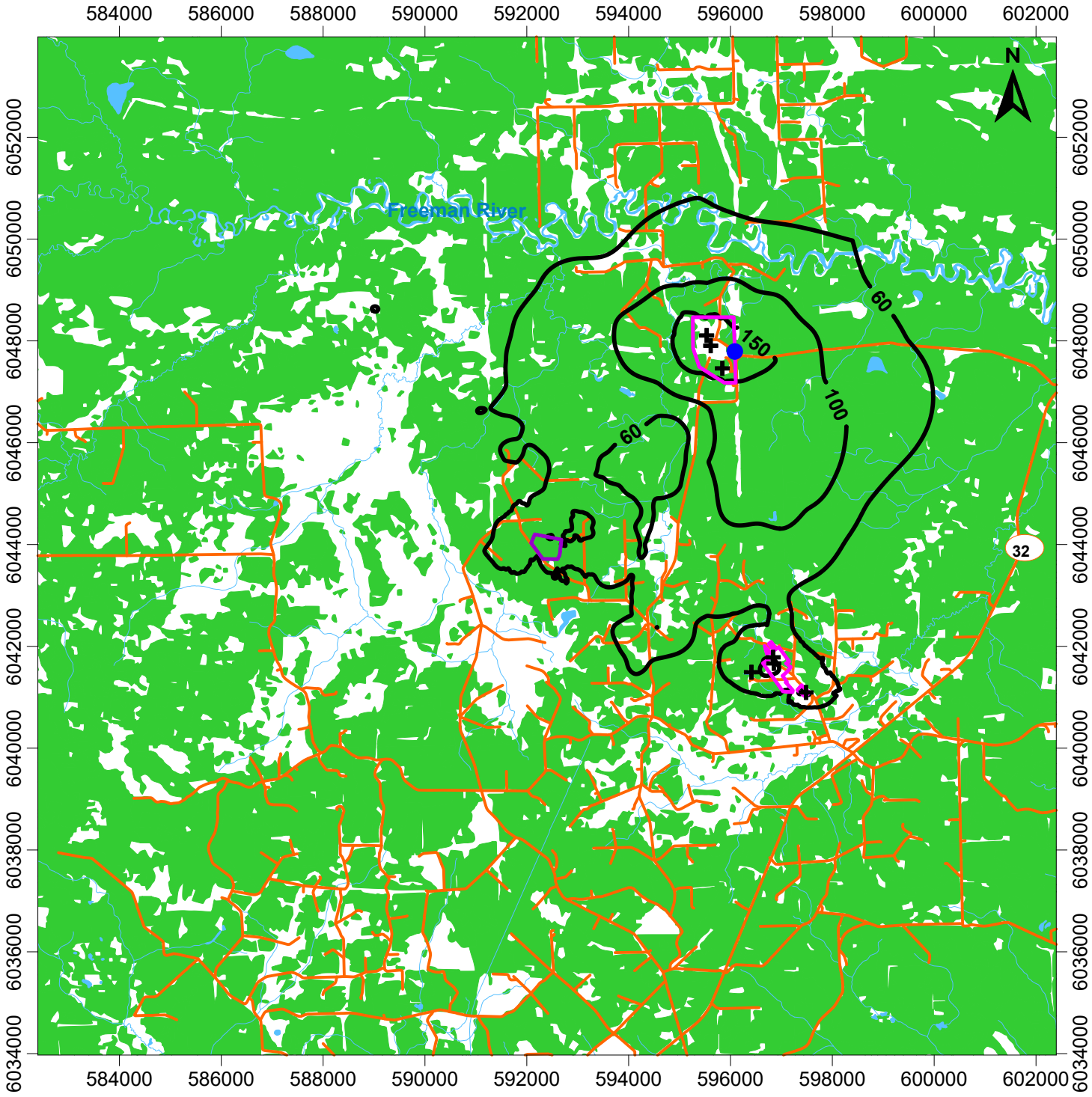
PROJECT	Kiwetinohk Energy Corp. Black Bear Power Plant
TITLE	**Project Case 2:** **99.9th Percentile of Predicted 1-Hour Average NO_2 Concentrations**
HORIZON COMPLIANCE	MGLC: NO_2 = 108.0 (µg/m³)
	FIGURE 9



LEGEND

- Maximum Ground Level Concentration (MGLC)
- Black Bear Power Plant Boundary
- Background Industrial Facilities
- Plant Boundary
- Water Body
- Road
- Wooded Area

PROJECT	Kiwetinohk Energy Corp. Black Bear Power Plant
TITLE	**Project Case 2:** **Maximum Predicted Annual NO_2 Concentrations**
HORIZON COMPLIANCE	MGLC: NO_2 = 7.3 (µg/m³)
	FIGURE 10



LEGEND

- Maximum Ground Level Concentration (MGLC)
- Black Bear Power Plant Boundary
- Background Industrial Facilities
- Plant Boundary
- Water Body
- Road
- Wooded Area

PROJECT

Kiwetinohk Energy Corp.
Black Bear Power Plant

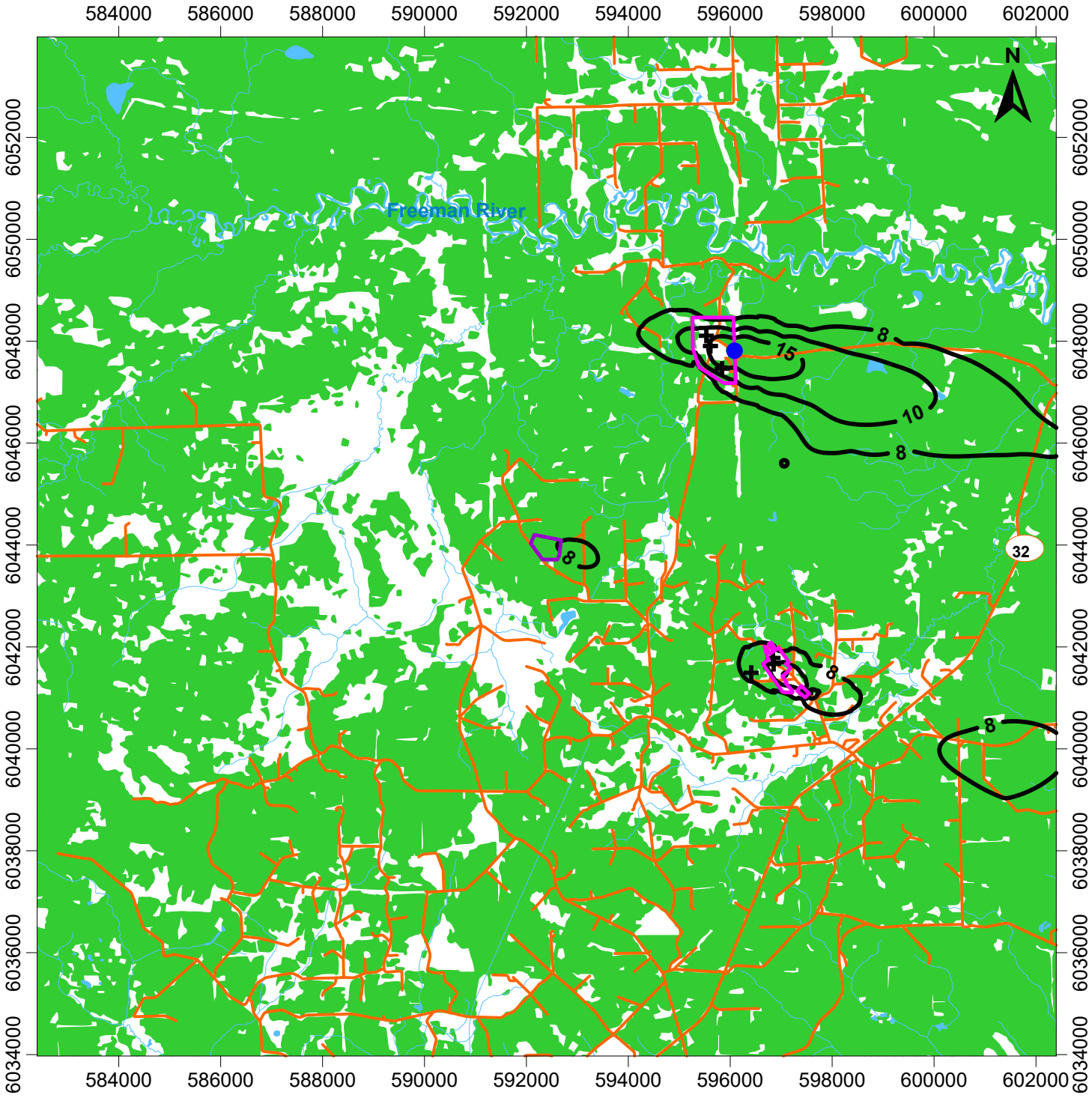
TITLE

Cumulative Case 1:
99.9th Percentile of Predicted 1-Hour Average NO_2 Concentrations

HORIZON COMPLIANCE

MGLC: NO_2 = 162.7 (µg/m³)

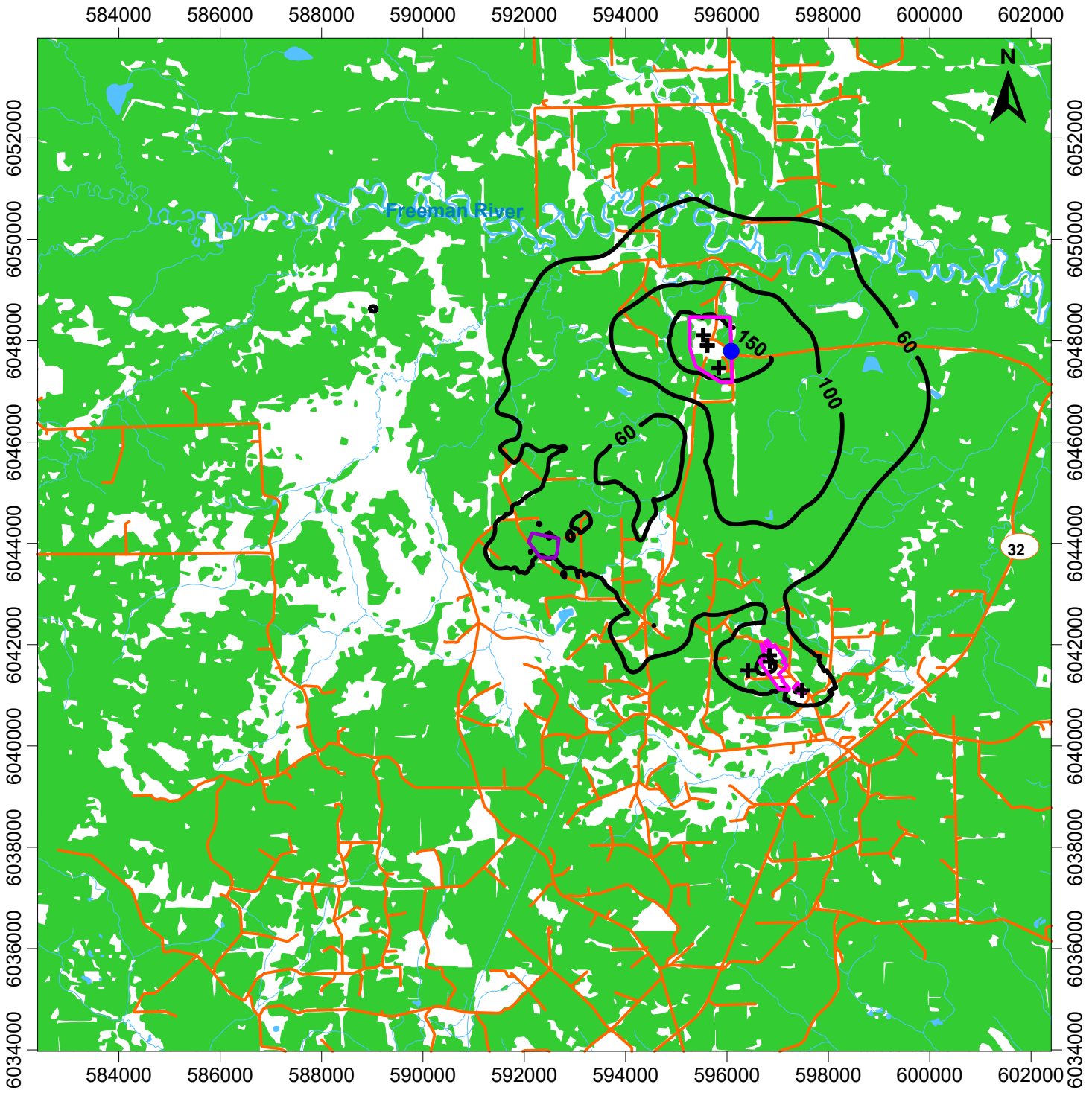
FIGURE 11



LEGEND

- Maximum Ground Level Concentration (MGLC)
- Black Bear Power Plant Boundary
- Background Industrial Facilities
- Plant Boundary
- Water Body
- Road
- Wooded Area

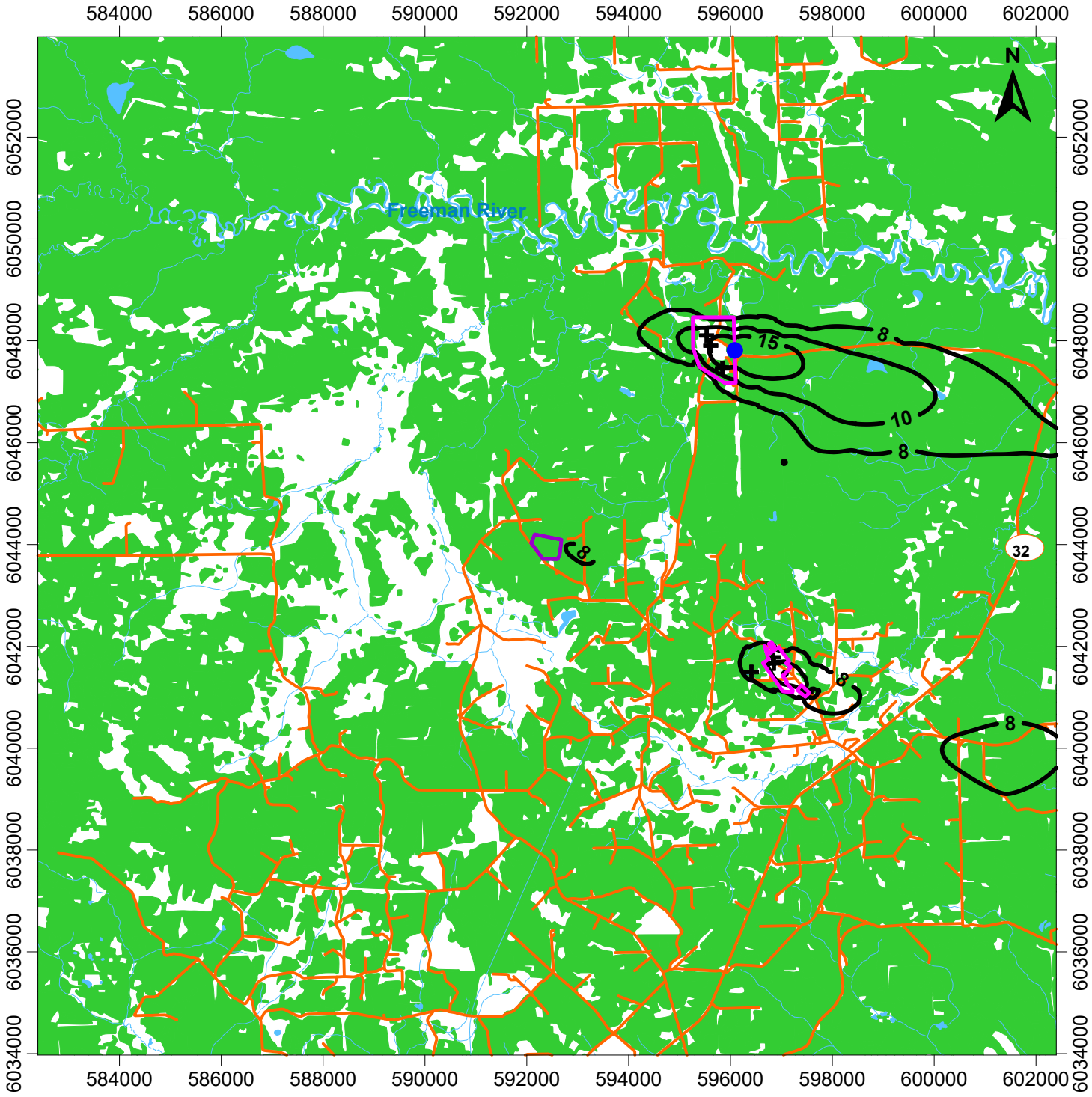
PROJECT	Kiwetinohk Energy Corp. Black Bear Power Plant
TITLE	**Cumulative Case 1:** **Maximum Predicted Annual NO_2 Concentrations**
HORIZON COMPLIANCE	MGLC: NO_2 = 42.3 (µg/m^3)
	FIGURE 12



LEGEND

- Maximum Ground Level Concentration (MGLC)
- Black Bear Power Plant Boundary
- Background Industrial Facilities
- Plant Boundary
- Water Body
- Road
- Wooded Area

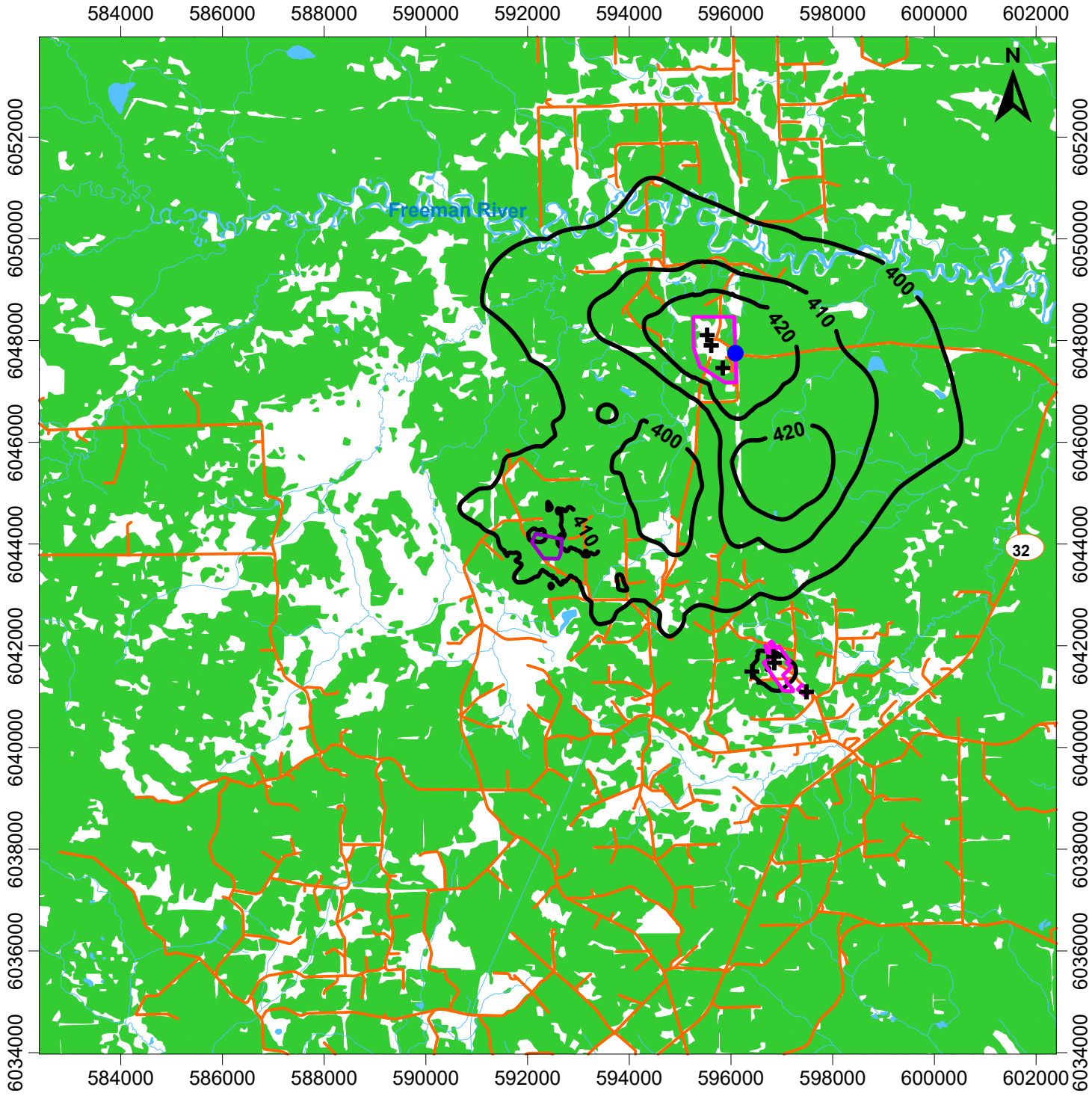
PROJECT	Kiwetinohk Energy Corp. Black Bear Power Plant
TITLE	**Cumulative Case 2:** **99.9th Percentile of Predicted 1-Hour Average NO_2 Concentrations**
HORIZON COMPLIANCE	MGLC: NO_2 = 162.7 (µg/m³)
	FIGURE 13



LEGEND

- Maximum Ground Level Concentration (MGLC)
- Black Bear Power Plant Boundary
- Background Industrial Facilities
- Plant Boundary
- Water Body
- Road
- Wooded Area

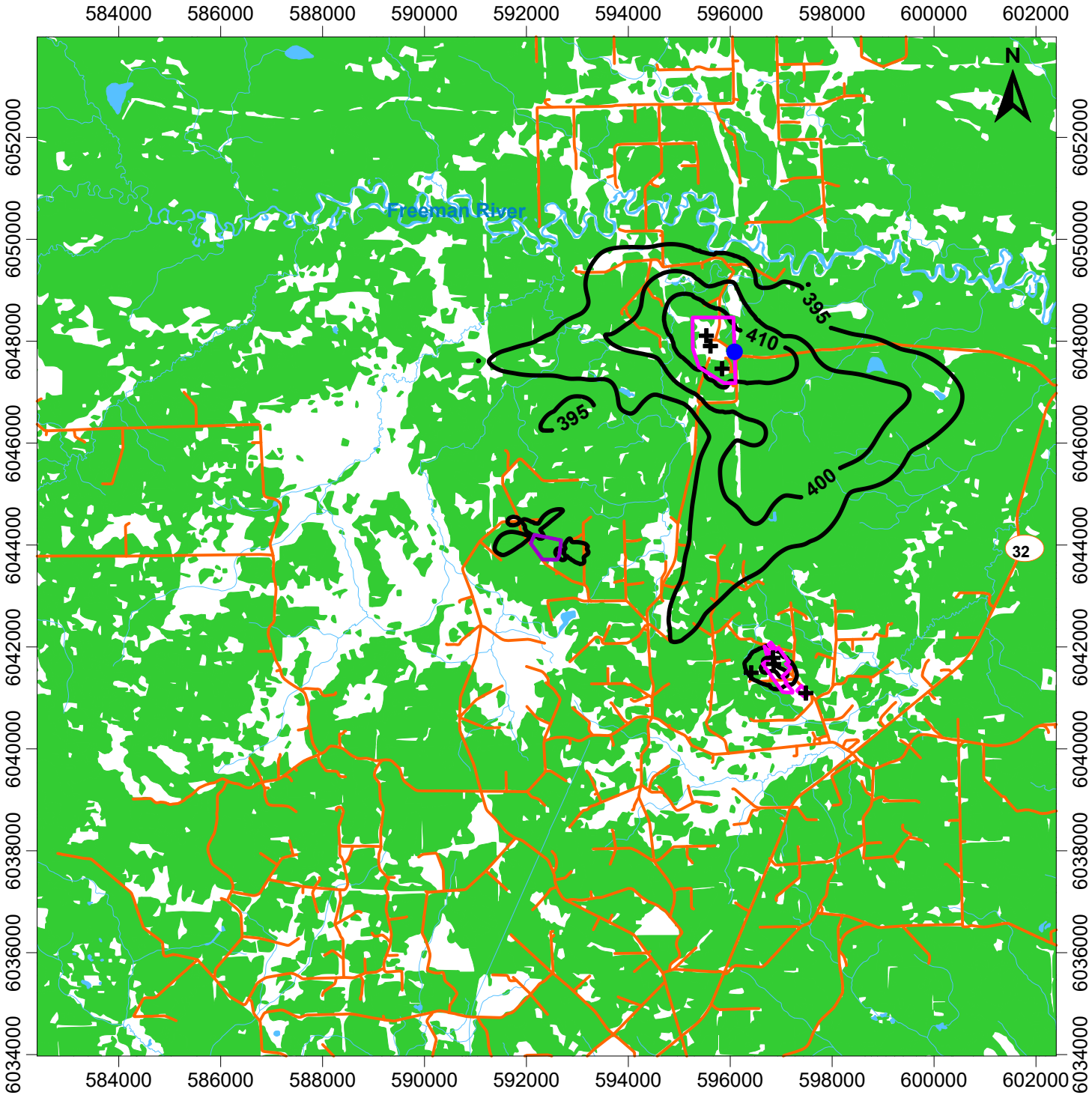
PROJECT	Kiwetinohk Energy Corp. Black Bear Power Plant
TITLE	**Cumulative Case 2:** **Maximum Predicted Annual NO_2 Concentrations**
HORIZON COMPLIANCE	MGLC: NO_2 = 42.3 (µg/m^3)
	FIGURE 14



LEGEND

- Maximum Ground Level Concentration (MGLC)
- Black Bear Power Plant Boundary
- Background Industrial Facilities
- Plant Boundary
- Water Body
- Road
- Wooded Area

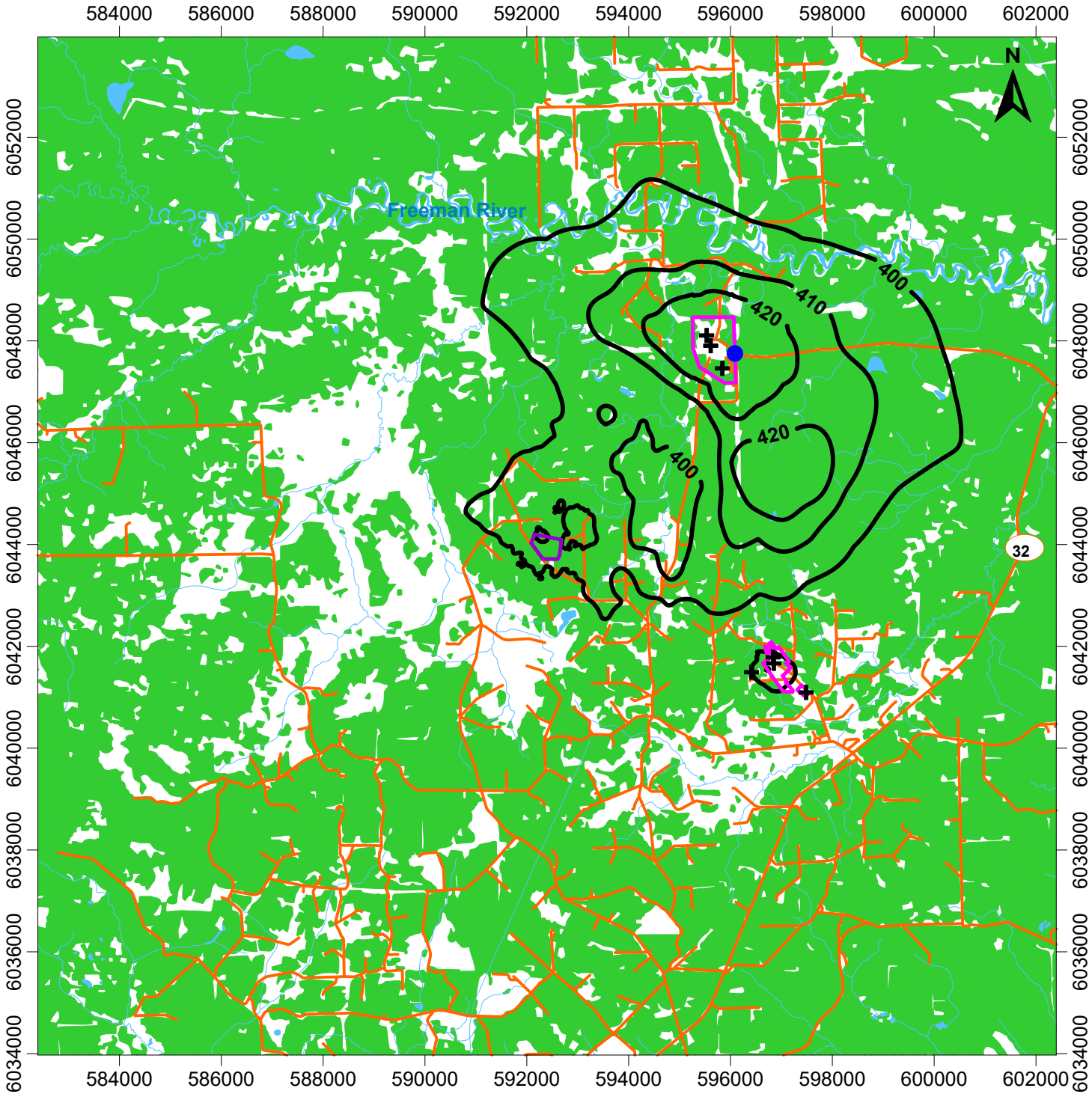
PROJECT	Kiwetinohk Energy Corp. Black Bear Power Plant
TITLE	**Cumulative Case 1:** **99.9th Percentile of Predicted 1-Hour Average CO Concentrations**
HORIZON COMPLIANCE	MGLC: CO = 473.0 (µg/m³)
	FIGURE 15



LEGEND

- Maximum Ground Level Concentration (MGLC)
- Black Bear Power Plant Boundary
- Background Industrial Facilities
- Plant Boundary
- Water Body
- Road
- Wooded Area

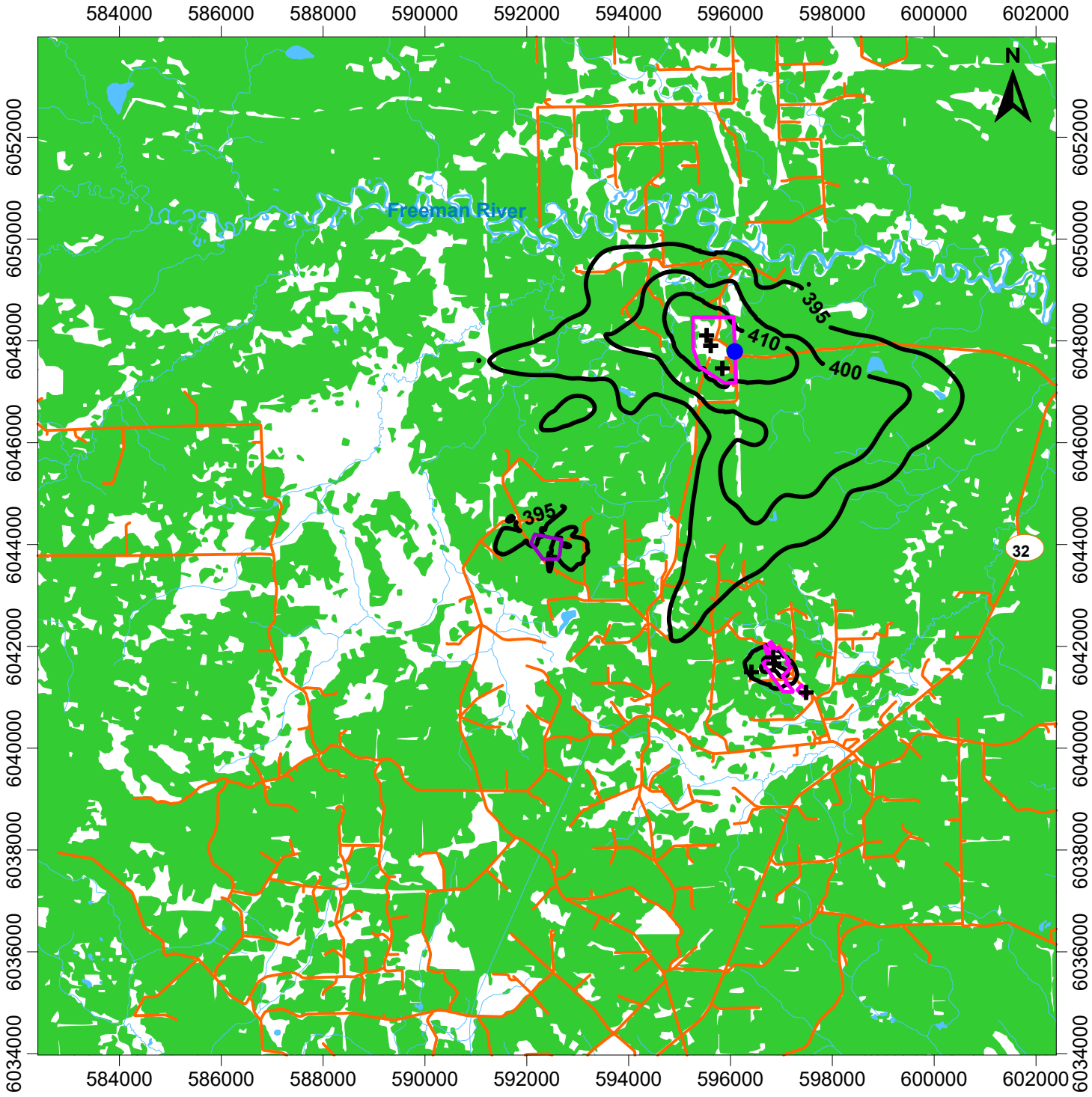
PROJECT	Kiwetinohk Energy Corp. Black Bear Power Plant
TITLE	**Cumulative Case 1: Second Highest Predicted 8-Hour Average CO Concentrations**
HORIZON COMPLIANCE	MGLC: CO = 439.0 (µg/m³)
	FIGURE 16



LEGEND

- Maximum Ground Level Concentration (MGLC)
- Black Bear Power Plant Boundary
- Background Industrial Facilities
- Plant Boundary
- Water Body
- Road
- Wooded Area

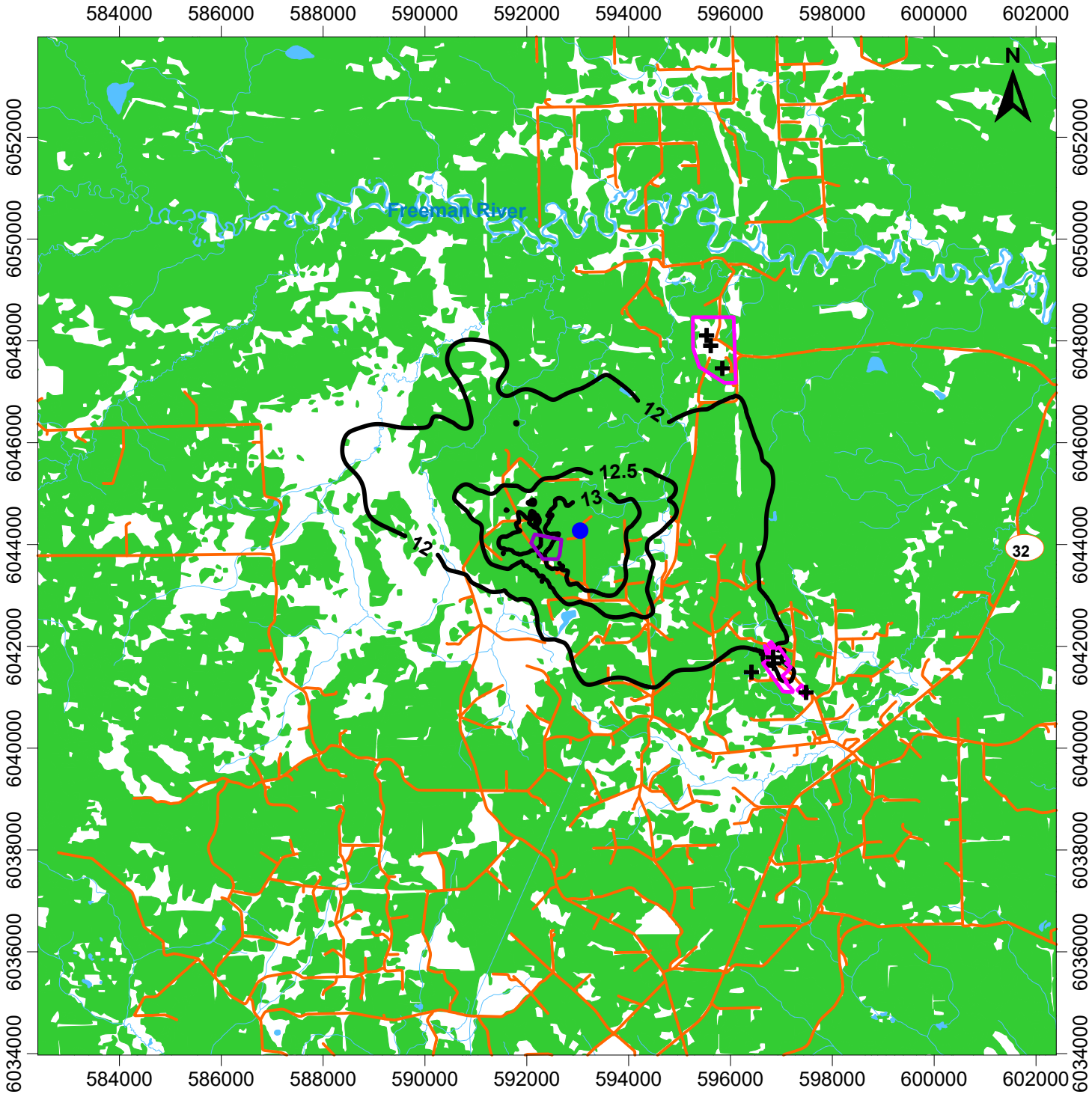
PROJECT	Kiwetinohk Energy Corp. Black Bear Power Plant
TITLE	**Cumulative Case 2:** **99.9th Percentile of Predicted 1-Hour Average CO Concentrations**
HORIZON COMPLIANCE	MGLC: CO = 473.0 (µg/m³)
	FIGURE 17



LEGEND

- Maximum Ground Level Concentration (MGLC)
- Black Bear Power Plant Boundary
- Background Industrial Facilities
- Plant Boundary
- Water Body
- Road
- Wooded Area

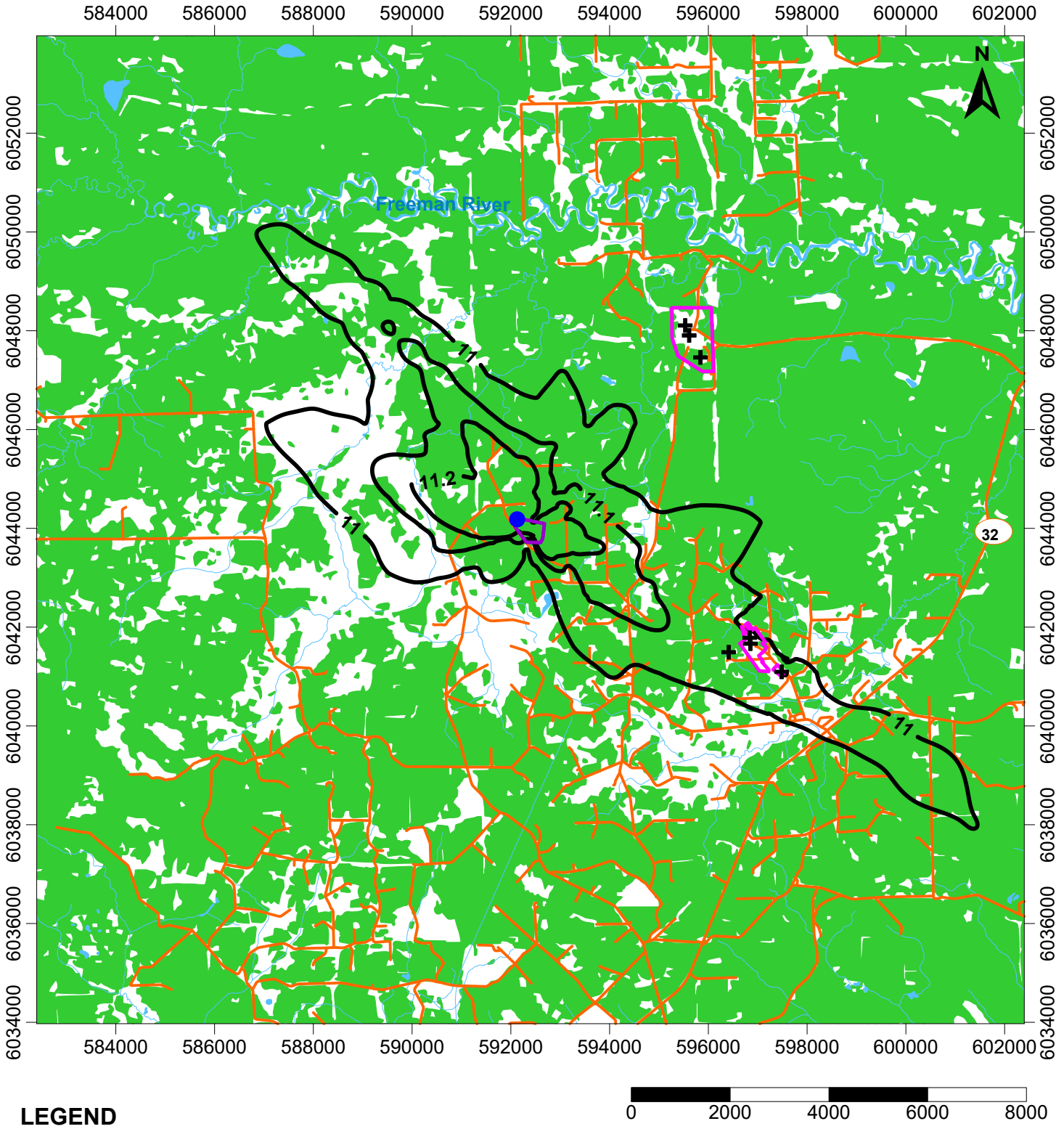
PROJECT	Kiwetinohk Energy Corp. Black Bear Power Plant
TITLE	**Cumulative Case 2: Second Highest Predicted 8-Hour Average CO Concentrations**
HORIZON COMPLIANCE	MGLC: CO = 439.0 (µg/m³)
	FIGURE 18



LEGEND

- Maximum Ground Level Concentration (MGLC)
- Black Bear Power Plant Boundary
- Background Industrial Facilities
- Plant Boundary
- Water Body
- Road
- Wooded Area

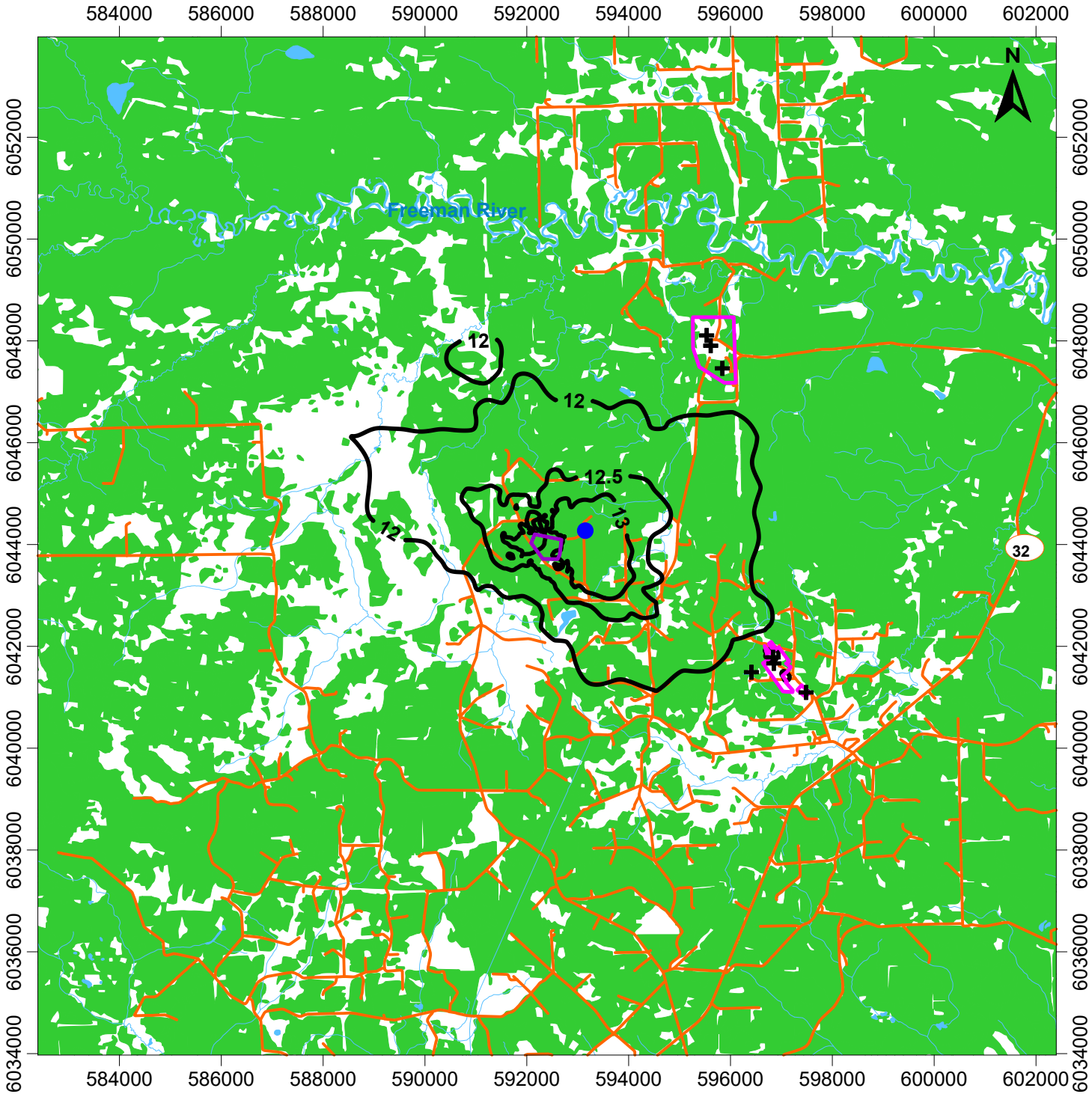
PROJECT	Kiwetinohk Energy Corp. Black Bear Power Plant
TITLE	**Cumulative Case 1:** **99.9th Percentile of Predicted 1-Hour Average $PM_{2.5}$ Concentrations**
HORIZON COMPLIANCE	MGLC: $PM_{2.5}$ = 15.5 (µg/m³)
	FIGURE 19



LEGEND

- Maximum Ground Level Concentration (MGLC)
- Black Bear Power Plant Boundary
- Background Industrial Facilities
- Plant Boundary
- Water Body
- Road
- Wooded Area

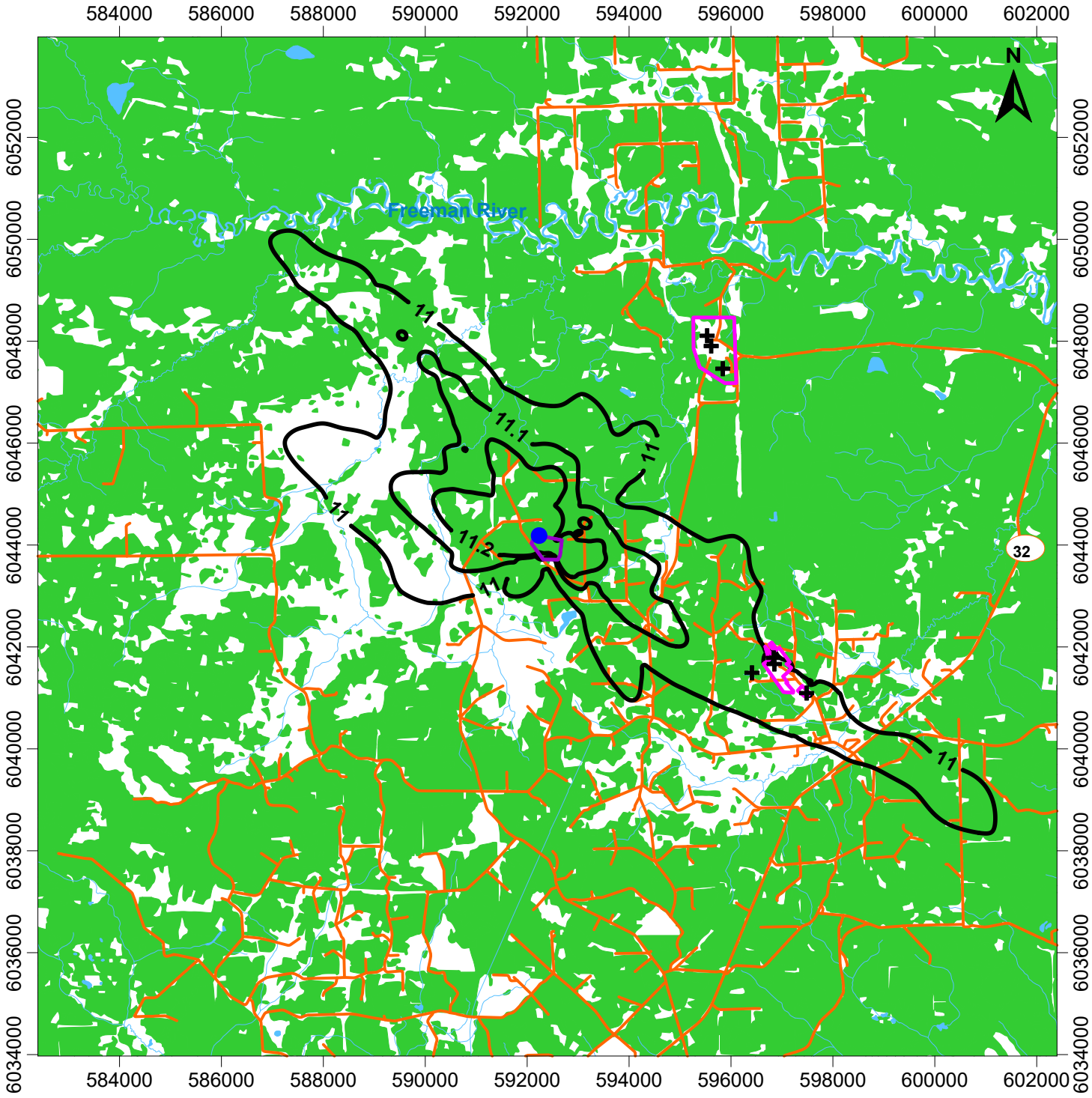
PROJECT	Kiwetinohk Energy Corp. Black Bear Power Plant
TITLE	**Cumulative Case 1: Maximum Predicted 24-Hour Average $PM_{2.5}$ Concentrations**
HORIZON COMPLIANCE	MGLC: $PM_{2.5}$ = 12.3 (µg/m³)
	FIGURE 20



LEGEND

- Maximum Ground Level Concentration (MGLC)
- Black Bear Power Plant Boundary
- Background Industrial Facilities
- Plant Boundary
- Water Body
- Road
- Wooded Area

PROJECT	Kiwetinohk Energy Corp. Black Bear Power Plant
TITLE	**Cumulative Case 2:** **99.9th Percentile of Predicted 1-Hour Average $PM_{2.5}$ Concentrations**
HORIZON COMPLIANCE	MGLC: $PM_{2.5}$ = 15.5 (µg/m³)
	FIGURE 21



LEGEND

- Maximum Ground Level Concentration (MGLC)
- Black Bear Power Plant Boundary
- Background Industrial Facilities
- Plant Boundary
- Water Body
- Road
- Wooded Area

PROJECT	Kiwetinohk Energy Corp. Black Bear Power Plant
TITLE	**Cumulative Case 2: Maximum Predicted 24-Hour Average $PM_{2.5}$ Concentrations**
HORIZON COMPLIANCE	MGLC: $PM_{2.5}$ = 12.1 (µg/m³)
	FIGURE 22

APPENDIX B

MODELLING INPUT AND OUTPUT FILES

CALPUFF Model Options

Table 2B-1 Input Group 1: General Run Control Parameters

Parameter	Default	Project	Comments
METRUN	0	0	Run period explicitly defined below
IBYR	-	2015	Starting year
IBMO	-	1	Starting month
IBDY	-	1	Starting day
IBHR	-	0	Starting hour
IBMIN	-	0	Starting minute
IBSEC	-	0	Starting second
IEYR	-	2020	Ending year
IEMO	-	1	Ending month
IEDY	-	1	Ending day
IEHR	-	0	Ending hour
IEMIN	-	0	Ending minute
IESEC	-	0	Ending second
ABTZ	-	UTC-7	Base time zone (MST = UTC-0700)
NSECDT	3600	3600	Length of modeling time-step (seconds)
NSPEC	5	4	Number of chemical species
NSE	3	4	Number of chemical species to be emitted
ITEST	2	2	Program is executed after SETUP phase
MRESTART	0	0	Do not read or write a restart file
METFM	1	1	CALMET binary file (CALMET.MET)
AVET	60	60	Averaging time in minutes
PGTIME	60	60	PG Averaging time in minutes

Table 2B-2 Input Group 2: Technical Options

Parameter	Default	Project	Comments
MGAUSS	1	1	Gaussian distribution used in the near field
MCTADJ	3	3	Partial plume path terrain adjustment
MCTSG	0	0	Subgrid-scale complex terrain not modelled
MSLUG	0	0	Near-field puffs not modelled as elongated slugs
MTRANS	1	1	Transitional plume rise modelled
MTIP	1	1	Stack tip downwash used
MRISE	1	1	Briggs plume rise used for point sources not subject to building downwash point sources not subject to building
MBDW	1	2	PRIME Method is used to simulate building downwash
MSHEAR	0	0	(0,1) Vertical wind shear (not modelled, modelled)
MSPLIT	0	0	Puffs are not split
MCHEM	1	0	Chemical transformation not modelled
MTILT	0	0	Gravitational settling (plume tilt) is not modeled
MDISP	3	2	Dispersion coefficients from internally calculated sigma v, sigma w using micrometeorological variables (u*, w*, L, etc.)
MTAULY	0	0	Draxler default 617.284 (s)
MTAUADV	0	0	No turbulence advection
MCTURB	1	1	Standard CALPUFF subroutines used
MROUGH	0	0	PG σy and σz is not adjusted for roughness
MPARTL	1	1	Partial plume penetration of elevated inversion modeled
MPDF	1	1	PDF used for dispersion under convective conditions
MSGTIBL	0	0	Sub-grid TIBL module not used for shoreline
MBCON	0	0	Boundary concentration conditions not modelled
MSOURCE	0	0	Individual source contributions not saved
MREG	1	0	Do not test options specified to see if they conform to regulatory values

Table 2B-3 Input Group 3: Species List-Chemistry Options

CSPEC	Modelled[1]	Emitted[2]	Dry Deposition[3]	Output Group Number
NO_x	1	1	0	0
CO	1	1	0	0
$PM_{2.5}$	1	1	0	0
NH_3	1	1	0	0

NOTES:
[1] 0=no, 1=yes
[2] 0=no, 1=yes
[3] 0=none, 1=computed-gas, 2=computed particle, 3=user-specified

Table 2B-4 Input Group 4: Map Projection and Grid Control Parameters

Parameter	Default	Project	Comments
PMAP	UTM	UTM	Universal Transverse Mercator
IUTMZN	-	11	UTM zone
UTMHEM	N	N	Northern Hemisphere for UTM projection
DATUM	WGS-84	NAR-C	Used for output coordinates
NX	-	30	Number of X grid cells in meteorological grid
NY		30	Number of Y grid cells in meteorological grid
NZ	-	11	Number of vertical layers in meteorological grid
DGRIDKM	-	1	Grid spacing (km) to match CALMET
ZFACE	-	0., 20., 40., 80.,120.,280., 520., 880., 1320., 1820., 2380., 3000.,4000.	Cell face heights (m)
XORIGKM	-	577.398	Reference X coordinate for SW corner of grid cell (1,1) of meteorological grid (km)
YORIGKM	-	6028.972	Reference Y coordinate for SW corner of grid cell (1,1) of meteorological grid (km)
IBCOMP	-	1	X index of lower left corner of the computational grid
JBCOMP	-	1	Y index of lower left corner of the computational grid
IECOMP	-	60	X index of the upper right corner of the computational grid
JECOMP	-	60	Y index of the upper right corner of the computational grid

Table 2B-5 Input Group 5: Output Option

Parameter	Default	Project	Comments					
ICON	1	1	Output file CONC.DAT containing concentrations is created					
LCOMPRS	T	T	Use data compression in output file					
IQAPLOT	1	1	Create a standard series of output files (e.g., locations of sources, receptors, grids ...) suitable for plotting					
IPFTRAK	0	0	Puff locations and properties is not reported					
IMESG	2	2	Messages tracking the progress of run are written on screen					
Species	Concentrations Printed (0= no, 1 = yes)		Dry Fluxes Printed (0 = no, 1 = yes)		Wet Fluxes Printed (0 = no, 1 = yes)		Mass Flux	
	Printed	**Saved to Disk**	**Printed**	**Saved to Disk**	**Printed**	**Saved to Disk**	**Printed**	**Saved to Disk**
NO_x	0	1	0	0	0	0	0	0
CO	0	1	0	0	0	0	0	0
$PM_{2.5}$	0	1	0	0	0	0	0	0
NH_3	0	1	0	0	0	0	0	0

Table 2B-6 Input Group 12: Diffusion/Computational Parameters

Parameters	Default	Project	Comments
SYTDEP	550	550	Horizontal size of a puff in metres beyond which the time dependant dispersion equation of Heffter (1965) is used
MHFTSZ	0	0	Do not use Heffter formulas for sigma z
JSUP	5	5	Stability class used to determine dispersion rates for puffs above boundary layer
CONK1	0.01	0.01	Vertical dispersion constant for stable conditions
CONK2	0.1	0.1	Vertical dispersion constant for neutral/stable conditions
TBD	0.5	0.5	Use ISC transition point for determining the transition point between the Schulman-Scire (Schulman et al., 1998) to Huber-Snyder Building Downwash scheme
MXNEW	99	99	Maximum number of puffs or slugs released from one source during one time step
MXSAM	99	99	Maximum number of sampling steps during one time step for a puff or slug
NCOUNT	2	2	Number of iterations used when computing the transport wind for a sampling step that includes transitional plume rise
SYMIN	1	1	Minimum sigma y in metres for a new puff or slug
SZMIN	1	1	Minimum sigma z in metres for a new puff or slug
SZCAP_M	5.0E06	5.0E06	Maximum sigma z in metres to avoid numerical problem in calculating time or distance

Stability Class	Parameter (Default and Project)			
	SVMIN		SWMIN	
	Minimum turbulence (σv) (m/s)		Minimum turbulence (σv) (m/s)	
	Land	Water	Land	Water
A	0.5	0.37	0.2	0.2
B	0.5	0.37	0.12	0.12
C	0.5	0.37	0.08	0.08
D	0.5	0.37	0.06	0.06
E	0.5	0.37	0.03	0.03
F	0.5	0.37	0.016	0.016

Parameters	Default	Project	Comments
CDIV	0.0, 0.0	0.0, 0.0	Divergence criteria for dw/dz in met cells
NLUTBIL	4	4	Search radius for nearest land and water cells used in the subgrid TIBL module
WSCALM	0.5	0.5	Minimum wind speed allowed for non-calm conditions (m/s)
XMAXZI	3000	3000	Maximum mixing height in metres
XMINZI	50	50	Minimum mixing height in metres

Table 2B-7 Input Group 13: Point Source Parameters

Parameters	Default	Project	Comments
NPT1	-	36	Number of point sources
IPTU	1	1	Units for point source emission rates are g/s

CALMET Model Options

Table 2B-8 INPUT GROUP: 4 -- Meteorological Data Options

Parameter	Default	Project	Comment
NOOBS	0	2	No observation mode
Number of Surface & Precipitation Meteorological Stations:			
NSSTA	-	0	Number of surface stations
NPSTA	-	-1	Using AEP provided meteorological data only
Cloud Data Options:			
MCLOUD	0	4	Using AEP provided meteorological data only

Table 2B-9 INPUT GROUP: 5 -- Wind Field Options and Parameters

Parameter	Default	Project	Comment
Wind Field Model Options:			
IWFCOD	1	1	Model selection variable
IFRADJ	1	1	Compute Froude number adjustment
IKINE	0	0	Compute kinematic effects
IOBR	0	0	Use O'Brien procedure for adjustment of the vertical velocity
ISLOPE	1	1	Compute slope flow effects
IEXTRP	-4	1	No extrapolation is done
IPROG	0	14	Use gridded prognostic wind field model output fields as input to the diagnostic wind field model.
ISTEPPG	3600	3600	Timestep (seconds) of the prognostic model input data
IGFMET	0	0	Use coarse CALMET fields as initial guess fields
Other Wind Field Input Parameters:			
RMIN	0.1	0.1	Minimum radius of influence used in the wind field interpolation (km)
TERRAD	-	8	Radius of influence of terrain features (km)
DIVLIM	5.0E-6	5.0E-6	Maximum acceptable divergence in the divergence minimization procedure
NITER	50	50	Maximum number of iterations in the divergence minimization procedure
NSMTH (NZ)	2, (mxnz-1) *4	2, 4,4,4,4, 4,4,4	Number of passes in the smoothing procedure For NZ level 1, the CALMET default value 2 was used for the Project. For other levels, value 4 was used as CALMET input 4km WRF data already provided high resolution spatial wind fields
CRITFN	1.0	1.0	Critical Froude number
ALPHA	0.1	0.1	Empirical factor controlling the influence of kinematic effects
Diagnostic Module Data Input Options:			
IDIOPT1	0	0	Surface temperature from prognostic fields
IDIOPT2	0	0	Lapse rate used in the computation of terrain-induced circulations from prognostic fields
ZUPT	200	200	Depth through which the domain-scale lapse rate is computed (m)
IDIOPT3	0	0	Initial guess field winds from prognostic wind fields

Table 2B-10 INPUT GROUP: 6 - Mixing Height, Temperature and Precipitation Parameters

Parameter	Default	Project	Comment
Empirical Mixing Height Constants:			
CONSTB	1.41	1.41	Neutral, mechanical equation
CONSTE	0.15	0.15	Convective mixing height equation
CONSTN	2400	2400	Stable mixing height equation
CONSTW	0.16	0.16	Over water mixing height equation
FCORIO	1.0E-4	1.0E-04	Absolute value of Coriolis (s^{-1})
Spatial Averaging of Mixing Heights:			
IAVEZI	1	1	Conduct spatial averaging
MNMDAV	1	10	Maximum search radius in averaging process (grid cells)
HAFANG	30	30	Half-angle of upwind looking cone for averaging
ILEVZI	1	1	Layer of winds used in upwind averaging
Convective Mixing Heights Options:			
IMIXH	1	1	Method to compute the convective mixing height
THRESHL	0	0	Threshold buoyancy flux required to sustain convective mixing height growth overland (W/m3)
THRESHW	0.05	0.05	Threshold buoyancy flux required to sustain convective mixing height growth overwater (W/m3)
ITWPROG	0	0	Prognostic lapse rates and prognostic delta T is used for overwater lapse rates in convective mixing height growth
ILUOC3D	16	16	Land Use category ocean in 3D.DAT datasets
Other Mixing Height Variables:			
DPTMIN	0.001	0.001	Minimum potential temperature lapse rate in the stable layer above the current convective mixing height (K/m)
DZZI	200	200	Depth of layer above current convective mixing height through which lapse rate is computed (m)
ZIMIN	50	50	Minimum overland mixing height (m)
ZIMAX	3,000	3,000	Maximum overland mixing height (m)
ZIMINW	50	50	Minimum overwater mixing height (m)
ZIMAXW	3,000	3,000	Maximum overwater mixing height (m)
Overwater Surface Fluxes Method and Parameters:			
ICOARE	10	10	Overwater surface fluxes method Set to 10 means COARE with no wave parameterization
DSHELF	0	0	Coastal/Shallow water length scale (km)
IWARM	0	0	COARE warm layer computation
ICOOL	0	0	COARE cool skin layer computation
Relative Humidity Parameters:			
IRHPROG	0	1	Using prognostic relative humidity
Temperature Parameters:			
ITPROG	0	2	Using MM5/3D for surface and upper air data
IRAD	1	1	Interpolation type
TRADKM	500	8	Radius of influence for temperature interpolation (km)

Table 2B-10 INPUT GROUP: 6 - Mixing Height, Temperature and Precipitation Parameters (cont'd)

Parameter	Default	Project	Comment
Temperature Parameters:			
NUMTS	5	5	Maximum number of stations to include in temperature interpolation
IAVET	1	1	Conduct spatial averaging of temperatures (1 = yes)
TGDEFB	-0.0098	-0.0098	Default temperature gradient below the mixing height over water (K/m)
TGDEFA	-0.0045	-0.0045	Default temperature gradient above the mixing height over water (K/m)
JWAT1	-	999	Beginning land use categories for temperature interpolation over water, making bigger than largest land use to disable
JWAT2	-	999	Ending land use categories for temperature interpolation over water, making bigger than largest land use to disable
Precipitation Interpolation Parameters:			
NFLAGP	2	2	Method of interpolation
CUTP	0.01	0.01	Minimum Precipitation rate cut-off (mm/h)

BPIP INPUT

```
bpip.pro'
'P'
'METERS'  1.00000000
'UTMY'  0.0000
54
'22'  1       1078.85  '1'
   4          5.00
         592598.41     6044093.11
         592644.29     6044083.61
         592579.43     6043760.65
         592533.29     6043769.35
'135'  1       1077.04  '2'
   4         10.00
         592527.44     6044092.50
         592533.22     6044091.38
         592530.61     6044077.58
         592524.64     6044078.79
'59'  1       1077.04  '3'
   4         10.00
         592533.97     6044091.76
         592558.32     6044086.81
         592555.43     6044071.98
         592531.17     6044077.20
'20'  1       1077.32  '4'
   4         30.00
         592485.45     6044070.47
         592552.32     6044056.99
         592547.36     6044031.81
         592480.64     6044045.16
'9'  1       1077.66  '5'
   4          5.00
         592548.18     6044018.03
         592558.48     6044016.28
         592554.90     6043999.35
         592544.87     6044001.36
'21'  1       1078.77  '6'
   4          7.50
         592474.46     6043930.34
         592523.11     6043920.54
         592520.75     6043908.85
         592472.01     6043918.56
'72'  1       1079.79  '7'
   4          5.00
         592430.24     6043915.92
         592439.20     6043914.22
         592435.90     6043896.68
         592426.85     6043898.38
'74'  1       1079.89  '8'
   4          5.00
         592447.87     6043903.47
```

```
        592453.91     6043902.53
        592452.21     6043893.29
        592446.27     6043894.52
'76'  1       1079.91  '9'
   4         5.00
        592454.85     6043903.94
        592458.25     6043903.57
        592456.17     6043892.63
        592452.49     6043893.29
'78'  1       1079.94  '10'
   4         5.00
        592460.89     6043901.68
        592465.69     6043900.74
        592463.53     6043891.22
        592459.19     6043891.88
'80'  1       1079.97  '11'
   4         5.00
        592466.26     6043901.59
        592472.48     6043900.46
        592470.13     6043889.80
        592464.00     6043890.93
'89'  1       1078.91  '12'
   4         5.00
        592476.82     6043906.68
        592485.68     6043904.98
        592482.29     6043887.73
        592473.24     6043889.05
'91'  1       1079.00  '13'
   4         5.00
        592489.92     6043894.99
        592495.96     6043893.95
        592494.17     6043884.90
        592488.32     6043886.22
'93'  1       1079.01  '14'
   4         5.00
        592496.62     6043895.36
        592500.11     6043894.99
        592498.13     6043884.05
        592494.45     6043884.90
'95'  1       1079.05  '15'
   4         5.00
        592504.07     6043892.82
        592508.31     6043891.88
        592506.80     6043882.35
        592502.18     6043883.48
'97'  1       1079.06  '16'
   4         5.00
        592508.88     6043892.54
        592515.29     6043891.40
        592513.21     6043881.13
        592506.99     6043882.35
'61'  1       1080.14  '17'
```

```
   4         7.50
         592432.63     6043864.33
         592442.81     6043862.36
         592439.30     6043845.43
         592429.21     6043847.57
'82'  1       1080.37  '18'
   4         3.50
         592503.69     6043868.69
         592508.56     6043867.92
         592505.31     6043851.33
         592500.35     6043852.61
'99'  1       1079.32  '19'
   4         3.50
         592514.29     6043866.72
         592519.25     6043865.61
         592516.00     6043849.19
         592510.95     6043850.05
'100'  1       1080.02  '20'
   4         5.00
         592439.73     6043881.60
         592445.46     6043880.66
         592443.58     6043871.00
         592437.76     6043872.19
'66'  1       1080.20  '21'
   4         5.00
         592454.86     6043865.70
         592469.48     6043862.79
         592467.77     6043853.98
         592453.07     6043856.97
'67'  1       1080.24  '22'
   4         5.00
         592456.66     6043856.12
         592462.30     6043855.01
         592461.11     6043849.28
         592455.46     6043850.39
'69'  1       1080.27  '23'
   4         5.00
         592461.79     6043853.38
         592464.78     6043852.78
         592463.50     6043846.97
         592460.51     6043847.57
'70'  1       1080.21  '24'
   4         5.00
         592446.14     6043853.90
         592449.48     6043853.13
         592448.37     6043847.40
         592444.86     6043848.25
'83'  1       1080.30  '25'
   4         5.00
         592474.36     6043861.68
         592488.89     6043858.68
         592487.35     6043850.05
```

```
        592472.48     6043853.04
'84'  1       1080.35  '26'
   4         5.00
        592475.98     6043851.84
        592481.46     6043850.65
        592480.34     6043845.35
        592475.13     6043846.37
'86'  1       1080.38  '27'
   4         5.00
        592481.28     6043849.45
        592484.28     6043848.94
        592483.08     6043842.95
        592480.26     6043843.46
'87'  1       1080.44  '28'
   4         5.00
        592488.64     6043845.35
        592492.31     6043844.58
        592491.03     6043838.93
        592487.61     6043839.53
'30'  1       1076.63  '29'
   4        10.00
        592385.47     6044121.03
        592404.87     6044116.72
        592402.93     6044107.23
        592383.64     6044111.33
'64a'  1       1076.94  '30'
   4         5.00
        592374.37     6044075.12
        592389.67     6044072.21
        592388.92     6044068.12
        592373.62     6044071.35
'64bc'  1       1077.01  '31'
   4         5.00
        592373.08     6044068.66
        592388.38     6044065.53
        592386.23     6044056.27
        592371.03     6044059.61
'6164'  1       1077.14  '32'
   4         5.00
        592369.85     6044053.79
        592386.66     6044050.34
        592384.83     6044040.53
        592368.34     6044043.87
'133'  1       1077.24  '33'
   4         5.00
        592366.83     6044037.19
        592382.02     6044033.96
        592380.95     6044029.22
        592365.65     6044032.99
'6'  1       1077.43  '34'
   4         5.00
        592375.81     6044010.24
```

```
        592380.86     6044009.03
        592381.41     6044015.30
        592376.58     6044016.51
'7'  1       1077.39  '35'
   4         5.00
        592367.23     6044020.58
        592371.41     6044019.81
        592368.99     6044008.37
        592364.81     6044009.25
'60'  1       1077.48  '36'
   4         5.00
        592385.70     6044013.65
        592392.19     6044012.44
        592390.98     6044005.85
        592384.38     6044007.06
'15'  1       1078.33  '37'
   4        15.00
        592356.02     6044000.79
        592379.87     6043996.17
        592372.07     6043958.02
        592348.43     6043962.86
'65'  1       1078.02  '38'
   4         5.00
        592320.28     6044010.13
        592329.30     6044008.59
        592327.98     6044001.01
        592318.86     6044002.55
'14'  1       1077.73  '39'
   4        10.00
        592285.17     6043998.23
        592309.59     6043993.38
        592292.90     6043909.04
        592268.03     6043914.05
'18'  1       1078.07  '40'
   4         3.50
        592300.49     6043906.16
        592305.34     6043905.55
        592304.43     6043900.24
        592299.58     6043901.46
'8'  1       1078.54  '41'
   4        10.00
        592375.27     6043962.28
        592414.86     6043953.64
        592398.17     6043869.60
        592358.43     6043877.80
'63'  1       1077.52  '42'
   4        20.00
        592405.69     6044068.37
        592413.07     6044066.89
        592408.81     6044045.26
        592401.34     6044046.82
'48'  1       1078.01  '43'
```

```
   4        10.00
         592398.91     6044002.81
         592408.90     6044000.91
         592407.00     6043992.57
         592397.52     6043994.47
'12a'  1       1078.02  '44'
   8        10.00
         592349.48     6043950.46
         592343.47     6043947.97
         592340.98     6043941.96
         592343.47     6043935.95
         592349.48     6043933.46
         592355.49     6043935.95
         592357.98     6043941.96
         592355.49     6043947.97
'12b'  1       1078.13  '45'
   8        10.00
         592345.24     6043929.68
         592339.22     6043927.19
         592336.74     6043921.18
         592339.22     6043915.17
         592345.24     6043912.68
         592351.25     6043915.17
         592353.74     6043921.18
         592351.25     6043927.19
'13'  1       1078.50  '46'
   8        10.00
         592351.76     6043907.91
         592347.51     6043906.16
         592345.76     6043901.91
         592347.51     6043897.67
         592351.76     6043895.91
         592356.00     6043897.67
         592357.76     6043901.91
         592356.00     6043906.16
'52'  1       1078.56  '47'
   8        10.00
         592349.03     6043892.50
         592345.49     6043891.04
         592344.03     6043887.50
         592345.49     6043883.97
         592349.03     6043882.50
         592352.56     6043883.97
         592354.03     6043887.50
         592352.56     6043891.04
'4'  1       1077.34  '49'
   10        30.00
         592386.72     6044042.63
         592395.50     6044040.90
         592393.90     6044032.92
         592405.08     6044030.92
         592407.87     6044027.33
```

```
        592407.47     6044024.40
        592403.75     6044022.27
        592392.31     6044024.93
        592390.71     6044016.69
        592381.66     6044018.55
'10'  1       1077.53
   8         24.00
        592421.40     6044084.61
        592435.89     6044081.50
        592431.18     6044055.91
        592425.07     6044046.78
        592423.37     6044039.72
        592416.97     6044040.95
        592418.48     6044048.19
        592416.31     6044058.83
'132'  1       1078.38
   4          5.00
        592485.77     6043971.38
        592497.81     6043968.88
        592496.19     6043963.75
        592484.89     6043966.24
'115'  1       1078.48
   4          5.00
        592485.92     6043957.73
        592495.61     6043955.67
        592494.87     6043952.59
        592485.77     6043954.64
'127'  1       1077.70
   8          5.00
        592482.69     6044013.06
        592478.44     6044011.30
        592476.69     6044007.06
        592478.44     6044002.82
        592482.69     6044001.06
        592486.93     6044002.82
        592488.69     6044007.06
        592486.93     6044011.30
'111'  1       1078.47
   8          5.00
        592516.02     6043963.05
        592513.19     6043961.88
        592512.02     6043959.05
        592513.19     6043956.22
        592516.02     6043955.05
        592518.85     6043956.22
        592520.02     6043959.05
        592518.85     6043961.88
'53'  1       1078.62
   8         10.00
        592346.45     6043878.72
        592343.97     6043877.69
        592342.95     6043875.22
```

```
        592343.97     6043872.74
        592346.45     6043871.72
        592348.92     6043872.74
        592349.95     6043875.22
        592348.92     6043877.69
37
'G9210'       1016.68     11.30     596838.17     6041784.58
'G9220'       1016.71     11.30     596872.75     6041820.50
'G9230'       1016.54     11.30     596883.00     6041807.33
'K1103'       1015.10     10.99     596828.43     6041585.67
'P1103'        995.07     10.63     597451.31     6041102.36
'P1104'        994.95     10.47     597458.49     6041107.09
'GH1'         1014.87      5.11     596943.94     6041360.91
'GH2'         1014.87      5.10     596946.55     6041362.86
'GH3'         1014.85      5.88     596895.54     6041640.94
'R3'          1014.87      7.37     596899.85     6041635.96
'T2N'         1015.22     10.15     596910.95     6041554.15
'T2S'         1015.24     10.15     596912.40     6041549.92
'H2000'        995.16      7.87     597459.57     6041130.81
'T130'        1014.83     15.00     596850.86     6041665.38
'HX'           994.21     10.00     597485.06     6041094.15
'K502'         976.41     10.90     595675.99     6047915.95
'K503'         976.74     10.90     595675.99     6047911.12
'K504'         977.10     10.90     595675.99     6047905.28
'K505'         977.60     10.90     595675.99     6047897.95
'K506'         977.83     10.90     595675.99     6047894.28
'K451'         962.40      9.40     595531.66     6048094.28
'K507'         975.01     10.90     595675.99     6047937.62
'K508'         975.34     10.90     595675.99     6047932.45
'K509'         975.73     10.90     595675.99     6047926.62
'K550'         975.52      8.40     595611.49     6047905.12
'K551'         976.18      8.40     595611.49     6047893.28
'K452'         960.24      9.40     595531.66     6048106.28
'K453'         959.76      9.40     595531.66     6048118.78
'C10825'      1003.17     10.20     595844.77     6047411.55
'C20825'      1003.39     10.20     595840.25     6047459.53
'P10825'      1003.42     10.20     595853.67     6047504.39
'C11206'      1021.59      6.00     596411.83     6041491.67
'HRSG'        1077.32     48.76     592428.92     6044084.09
'ABS'         1077.10     18.30     592406.79     6044111.75
'CCSAS'       1077.35     57.30     592524.23     6044046.40
'TEG1'        1079.22      4.00     592504.09     6043866.56
'TEG2'        1079.27      4.00     592514.78     6043864.39
```

BPIP OUTPUT

BPIP (Dated: 04274)
DATE : 3/28/2023
TIME : 15:17:53
D:\Modelling\BlackBear\MODELLING\NOx\bpip.pro

==========
BPIP PROCESSING INFORMATION:
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The P flag has been set for preparing downwash related data
for a model run utilizing the PRIME algorithm.

Inputs entered in METERS will be converted to meters using
a conversion factor of 1.0000. Output will be in meters.

The UTMP variable is set to UTMY. The input is assumed to be in
UTM coordinates. BPIP will move the UTM origin to the first pair of
UTM coordinates read. The UTM coordinates of the new origin will
be subtracted from all the other UTM coordinates entered to form
this new local coordinate system.

Plant north is set to 0.00 degrees with respect to True North.

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PRELIMINARY* GEP STACK HEIGHT RESULTS TABLE
(Output Units: meters)

Stack Name	Stack Height	Stack-Building Base Elevation Differences	Preliminary* GEP** EQN1	GEP Stack Height Value
G9210	11.30	N/A	0.00	65.00
G9220	11.30	N/A	0.00	65.00
G9230	11.30	N/A	0.00	65.00
K1103	10.99	N/A	0.00	65.00
P1103	10.63	N/A	0.00	65.00
P1104	10.47	N/A	0.00	65.00
GH1	5.11	N/A	0.00	65.00
GH2	5.10	N/A	0.00	65.00
GH3	5.88	N/A	0.00	65.00
R3	7.37	N/A	0.00	65.00
T2N	10.15	N/A	0.00	65.00
T2S	10.15	N/A	0.00	65.00
H2000	7.87	N/A	0.00	65.00
T130	15.00	N/A	0.00	65.00

HX	10.00	N/A	0.00	65.00
K502	10.90	N/A	0.00	65.00
K503	10.90	N/A	0.00	65.00
K504	10.90	N/A	0.00	65.00
K505	10.90	N/A	0.00	65.00
K506	10.90	N/A	0.00	65.00
K451	9.40	N/A	0.00	65.00
K507	10.90	N/A	0.00	65.00
K508	10.90	N/A	0.00	65.00
K509	10.90	N/A	0.00	65.00
K550	8.40	N/A	0.00	65.00
K551	8.40	N/A	0.00	65.00
K452	9.40	N/A	0.00	65.00
K453	9.40	N/A	0.00	65.00
C10825	10.20	N/A	0.00	65.00
C20825	10.20	N/A	0.00	65.00
P10825	10.20	N/A	0.00	65.00
C11206	6.00	N/A	0.00	65.00
HRSG	48.76	0.00	75.00	75.00
ABS	18.30	-0.22	75.22	75.22
CCSAS	57.30	0.03	74.97	74.97
TEG1	4.00	-1.22	13.72	65.00
TEG2	4.00	0.21	12.29	65.00

* Results are based on Determinants 1 & 2 on pages 1 & 2 of the GEP Technical Support Document. Determinant 3 may be investigated for additional stack height credit. Final values result after Determinant 3 has been taken into consideration.

** Results were derived from Equation 1 on page 6 of GEP Technical Support Document. Values have been adjusted for any stack-building base elevation differences.

Note: Criteria for determining stack heights for modeling emission limitations for a source can be found in Table 3.1 of the GEP Technical Support Document.

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BPIP output is in meters

SO BUILDHGT G9210	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDHGT G9210	0.00	0.00	0.00	0.00	0.00	0.00

```
SO BUILDHGT HRSG     30.00  30.00  30.00  30.00  30.00  24.00
SO BUILDHGT HRSG     24.00  24.00  30.00  24.00  30.00  30.00
SO BUILDHGT HRSG     30.00  30.00  24.00  24.00  24.00  24.00
SO BUILDHGT HRSG     30.00  24.00  30.00  30.00  30.00  24.00
SO BUILDHGT HRSG     24.00  24.00  30.00  30.00  30.00  30.00
SO BUILDHGT HRSG     30.00  30.00  24.00  24.00  24.00  24.00
SO BUILDWID HRSG     24.40  25.73  27.09  27.61  27.30  39.86
SO BUILDWID HRSG     42.86  44.55  38.66  43.87  35.63  46.09
SO BUILDWID HRSG     55.14  62.51  36.66  31.65  25.67  54.23
SO BUILDWID HRSG     24.40  37.24  27.09  27.61  27.30  39.86
SO BUILDWID HRSG     42.86  44.55  38.66  27.32  35.63  46.09
SO BUILDWID HRSG     55.14  62.51  36.66  31.65  25.67  54.23
SO BUILDLEN HRSG     24.85  25.74  26.28  26.02  25.89  36.66
SO BUILDLEN HRSG     31.65  25.67  71.68  15.35  71.40  72.95
SO BUILDLEN HRSG     72.28  69.41  39.86  42.86  44.55  67.92
SO BUILDLEN HRSG     24.85  77.70  26.28  26.02  25.89  36.66
SO BUILDLEN HRSG     31.65  25.67  71.68  68.54  71.40  72.95
SO BUILDLEN HRSG     72.28  69.41  39.86  42.86  44.55  67.92
SO XBADJ   HRSG    -73.01 -77.75 -80.39 -80.58 -78.33 -31.92
SO XBADJ   HRSG    -25.98 -19.26  51.72  -8.03  57.78  55.77
SO XBADJ   HRSG     52.06  46.77  -4.21  -3.06  -1.82  -0.52
SO XBADJ   HRSG     48.16   0.05  54.11  54.57  52.44  -4.74
SO XBADJ   HRSG     -5.66  -6.41 -123.40 -126.23 -129.18 -128.71
SO XBADJ   HRSG   -124.34 -116.18 -35.65 -39.80 -42.73 -67.40
SO YBADJ   HRSG     22.96  12.61   2.27  -8.13 -18.29 -15.72
SO YBADJ   HRSG    -18.37 -20.46 -32.95 -22.73  -1.08  15.19
SO YBADJ   HRSG     30.99  45.85 -13.59 -10.16  -6.42 -20.14
SO YBADJ   HRSG    -22.96  -6.86  -2.27   8.13  18.29  15.72
SO YBADJ   HRSG     18.37  20.46  32.95  17.26   1.08 -15.19
SO YBADJ   HRSG    -30.99 -45.85  13.59  10.16   6.42  20.14


SO BUILDHGT ABS      30.00  30.00  10.00  10.00  10.00  10.00
SO BUILDHGT ABS      10.00  10.00  10.00  10.00  10.00  24.00
SO BUILDHGT ABS      24.00  24.00  24.00  24.00  24.00  24.00
SO BUILDHGT ABS      24.00  24.00  10.00  10.00  10.00  10.00
SO BUILDHGT ABS      10.00  10.00  10.00  10.00  30.00  30.00
SO BUILDHGT ABS      30.00  30.00  24.00  24.00  30.00  30.00
SO BUILDWID ABS      24.40  25.73  22.02  22.25  21.79  20.68
SO BUILDWID ABS      18.94  16.62  13.80  10.56  12.33  44.58
SO BUILDWID ABS      43.22  40.56  36.66  31.65  25.67  54.23
SO BUILDWID ABS      42.47  37.24  22.02  22.25  21.79  20.68
SO BUILDWID ABS      18.94  16.62  13.80  10.56  35.63  46.09
SO BUILDWID ABS      55.14  62.51  36.66  31.65  27.34  26.21
SO BUILDLEN ABS      24.85  25.74  15.28  17.78  19.73  21.08
SO BUILDLEN ABS      21.79  21.84  21.23  19.97  21.13  24.15
SO BUILDLEN ABS      30.36  35.65  39.86  42.86  44.55  67.92
SO BUILDLEN ABS      72.22  77.70  15.28  17.78  19.73  21.08
SO BUILDLEN ABS      21.79  21.84  21.23  19.97  71.40  72.95
SO BUILDLEN ABS      72.28  69.41  39.86  42.86  26.24  25.94
SO XBADJ   ABS     -96.41 -96.17 -11.94 -15.20 -18.00 -20.26
SO XBADJ   ABS     -21.90 -22.87 -23.15 -22.73 -23.21  26.22
```

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SO XBADJ   ABS      28.64  30.18  30.81  30.50  29.26  27.14
SO XBADJ   ABS      24.19  18.47  -3.34  -2.57  -1.72  -0.82
SO XBADJ   ABS       0.10   1.03   1.92   2.75 -159.43 -161.71
SO XBADJ   ABS    -159.07 -151.59 -70.67 -73.36 -90.82 -95.06
SO YBADJ   ABS      -3.64 -17.65  12.09  11.17   9.92   8.36
SO YBADJ   ABS       6.54   4.53   2.38   0.16  -2.15 -33.94
SO YBADJ   ABS     -26.08 -17.43  -8.25   1.18  10.57   1.99
SO YBADJ   ABS      12.67  23.40 -12.09 -11.17  -9.92  -8.36
SO YBADJ   ABS      -6.54  -4.53  -2.38  -0.16  19.50  -2.30
SO YBADJ   ABS     -24.03 -45.03   8.25  -1.18  27.26  12.02


SO BUILDHGT CCSAS   30.00  30.00  30.00  30.00  30.00  30.00
SO BUILDHGT CCSAS   30.00  30.00  30.00  30.00  30.00  30.00
SO BUILDHGT CCSAS   30.00  30.00  30.00  30.00  30.00  30.00
SO BUILDHGT CCSAS   30.00  30.00  30.00  30.00  30.00  30.00
SO BUILDHGT CCSAS   30.00  30.00  30.00  30.00  30.00  30.00
SO BUILDHGT CCSAS   30.00  30.00  30.00  30.00  30.00  30.00
SO BUILDWID CCSAS   68.54  71.40  72.95  72.28  69.41  64.44
SO BUILDWID CCSAS   57.50  48.82  38.66  27.32  35.63  46.09
SO BUILDWID CCSAS   55.14  62.51  67.99  71.40  72.65  71.68
SO BUILDWID CCSAS   68.54  71.40  72.95  72.28  69.41  64.44
SO BUILDWID CCSAS   57.50  48.82  38.66  27.32  35.63  46.09
SO BUILDWID CCSAS   55.14  62.51  67.99  71.40  72.65  71.68
SO BUILDLEN CCSAS   27.32  35.63  46.09  55.14  62.51  67.99
SO BUILDLEN CCSAS   71.40  72.65  71.68  68.54  71.40  72.95
SO BUILDLEN CCSAS   72.28  69.41  64.44  57.50  48.82  38.66
SO BUILDLEN CCSAS   27.32  35.63  46.09  55.14  62.51  67.99
SO BUILDLEN CCSAS   71.40  72.65  71.68  68.54  71.40  72.95
SO BUILDLEN CCSAS   72.28  69.41  64.44  57.50  48.82  38.66
SO XBADJ   CCSAS   -10.35 -16.07 -22.87 -28.97 -34.19 -38.37
SO XBADJ   CCSAS   -41.39 -43.14 -43.59 -42.71 -44.67 -45.62
SO XBADJ   CCSAS   -45.18 -43.37 -40.24 -35.88 -30.44 -24.07
SO XBADJ   CCSAS   -16.97 -19.56 -23.22 -26.17 -28.33 -29.62
SO XBADJ   CCSAS   -30.02 -29.50 -28.09 -25.82 -26.73 -27.33
SO XBADJ   CCSAS   -27.10 -26.04 -24.20 -21.62 -18.38 -14.59
SO YBADJ   CCSAS    8.44   8.97   9.15   9.04   8.66   8.02
SO YBADJ   CCSAS    7.13   6.03   4.74   3.31   1.74   0.17
SO YBADJ   CCSAS   -1.40  -2.93  -4.37  -5.68  -6.82  -7.75
SO YBADJ   CCSAS   -8.44  -8.97  -9.15  -9.04  -8.66  -8.02
SO YBADJ   CCSAS   -7.13  -6.03  -4.74  -3.31  -1.74  -0.17
SO YBADJ   CCSAS    1.40   2.93   4.37   5.68   6.82   7.75


SO BUILDHGT TEG1    3.50   3.50   5.00   5.00   5.00   5.00
SO BUILDHGT TEG1    5.00   5.00   5.00   3.50   3.50   3.50
SO BUILDHGT TEG1    3.50   5.00   5.00   5.00   5.00   5.00
SO BUILDHGT TEG1    5.00   5.00   5.00   5.00   3.50   3.50
SO BUILDHGT TEG1    3.50   3.50   3.50   3.50   3.50   3.50
SO BUILDHGT TEG1    3.50   3.50   5.00   3.50   3.50   3.50
SO BUILDWID TEG1    5.43   7.46   5.28   5.96  28.14  28.04
SO BUILDWID TEG1   27.08  25.30  26.77  16.90  17.19  17.36
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SO BUILDWID TEG1     17.01  18.95  21.30  21.81  14.29  13.11
SO BUILDWID TEG1      6.60   7.97   9.45  10.65  14.34  15.84
SO BUILDWID TEG1     16.87  17.38  17.36  16.90  17.19  17.36
SO BUILDWID TEG1     17.01  16.13  21.30  12.95  10.74   8.21
SO BUILDLEN TEG1     16.90  17.19   6.72   6.89  16.39  17.03
SO BUILDLEN TEG1     17.35  18.06  39.24   5.43   7.46  10.08
SO BUILDLEN TEG1     12.40  20.53  20.62  19.05  13.10  11.69
SO BUILDLEN TEG1     10.48  11.34  11.99  12.27  16.13  14.77
SO BUILDLEN TEG1     12.95  10.74   8.21   5.43   7.46  10.08
SO BUILDLEN TEG1     12.40  14.34  20.62  16.87  17.38  17.36
SO XBADJ    TEG1    -14.79 -14.39 -31.65 -31.30 -33.10 -34.14
SO XBADJ    TEG1    -34.33 -33.48 -51.02  -1.26  -1.10  -1.41
SO XBADJ    TEG1     -1.68 -30.89 -28.68 -29.62 -25.86 -26.26
SO XBADJ    TEG1    -26.42 -27.17 -27.11 -26.23  -4.30  -4.55
SO XBADJ    TEG1     -4.67  -4.64  -4.47  -4.17  -6.36  -8.67
SO XBADJ    TEG1    -10.72 -12.45   8.06 -14.73 -15.21 -15.23
SO YBADJ    TEG1     -1.45  -2.63   0.14  -4.78   1.30  -3.38
SO YBADJ    TEG1     -7.96 -12.29 -14.25  -6.34  -5.79  -5.27
SO YBADJ    TEG1     -4.59  10.03  11.47   8.12   8.20   4.64
SO YBADJ    TEG1      3.42  -0.40  -4.11  -7.70   5.28   5.88
SO YBADJ    TEG1      6.30   6.52   6.55   6.34   5.79   5.27
SO YBADJ    TEG1      4.59   3.77 -11.47   1.81   0.73  -0.37


SO BUILDHGT TEG2     3.50   3.50   3.50   3.50   3.50   3.50
SO BUILDHGT TEG2     3.50   3.50   3.50   3.50   3.50   3.50
SO BUILDHGT TEG2     5.00   5.00   5.00   5.00   5.00   5.00
SO BUILDHGT TEG2     3.50   3.50   3.50   3.50   3.50   3.50
SO BUILDHGT TEG2     3.50   3.50   3.50   3.50   3.50   3.50
SO BUILDHGT TEG2     3.50   3.50   3.50   3.50   3.50   3.50
SO BUILDWID TEG2     5.47   7.60  10.08  12.40  14.34  15.84
SO BUILDWID TEG2    16.87  17.38  17.36  16.90  17.19  17.36
SO BUILDWID TEG2    17.19  20.14  11.71  10.89   9.75   8.30
SO BUILDWID TEG2     5.47   7.60  10.08  12.40  14.34  15.84
SO BUILDWID TEG2    16.87  17.38  17.36  16.90  17.19  17.36
SO BUILDWID TEG2    17.01  16.36  14.97  13.12  10.88   8.30
SO BUILDLEN TEG2    17.00  17.46  17.36  17.01  16.13  14.77
SO BUILDLEN TEG2    12.95  10.74   8.21   5.43   7.46  10.08
SO BUILDLEN TEG2    21.06  21.56  12.05  12.20  11.99  11.41
SO BUILDLEN TEG2    17.00  17.46  17.36  17.01  16.13  14.77
SO BUILDLEN TEG2    12.95  10.74   8.21   5.43   7.46  10.08
SO BUILDLEN TEG2    12.40  14.53  16.04  17.06  17.56  17.53
SO XBADJ    TEG2    -14.79 -14.79 -17.42 -18.30 -18.63 -18.39
SO XBADJ    TEG2    -17.59 -16.26 -14.43 -12.17 -11.89 -11.75
SO XBADJ    TEG2    -38.71 -35.40 -27.33 -28.47 -28.75 -28.15
SO XBADJ    TEG2     -2.21  -2.68   0.05   1.29   2.50   3.62
SO XBADJ    TEG2      4.64   5.51   6.22   6.74   4.43   1.67
SO XBADJ    TEG2     -1.14 -12.43 -13.77 -14.70 -15.18 -15.20
SO YBADJ    TEG2     -1.45  -2.54   6.71   5.06   3.25   1.35
SO YBADJ    TEG2     -0.60  -2.53  -4.38  -6.05  -7.41  -8.73
SO YBADJ    TEG2      8.31   7.68   8.09   4.27   0.32  -3.64
SO YBADJ    TEG2      1.45   2.54  -6.71  -5.06  -3.25  -1.35
```

SO YBADJ	TEG2	0.60	2.53	4.38	6.05	7.41	8.73
SO YBADJ	TEG2	9.80	3.97	3.00	1.94	0.82	-0.32

ONE-HOUR AVERAGE NO_2 DISPERSION MODELLING OUTPUT
Project Case 2

```
**********************************************************************************************************
                              CALPOST  Version 7.1.0       Level 141010
**********************************************************************************************************
                                    SUMMARY SECTION
                                    NO2         1
                                     (ug/m**3)

 (Data are processed only in Hours: 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24)

 RECEPTOR     COORDINATES (km)    TYPE     PEAK (YEAR,DAY,START TIME)     FOR RANK    FOR AVERAGE PERIOD

   1523     593.148  6044.472  DISCRETE   2.3741E+02 (2016,057,1000)      RANK  1        1   HOUR
   1487     593.098  6044.422  DISCRETE   1.6153E+02 (2016,068,0900)      RANK  2        1   HOUR
   1398     593.148  6044.272  DISCRETE   8.9343E+01 (2016,317,1000)      RANK  9        1   HOUR

   1216     593.048  6043.822  DISCRETE   1.5723E+00                RANK  1      8784   HOUR
```

Annual NO_2 DISPERSION MODELLING OUTPUT
Project Case 2

```
**********************************************************************************************************
                              CALPOST  Version 7.1.0       Level 141010
**********************************************************************************************************
                                    SUMMARY SECTION
                                    NO2         1
                                     (ug/m**3)

 (Data are processed only in Hours: 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24)

 RECEPTOR     COORDINATES (km)    TYPE     PEAK (YEAR,DAY,START TIME)     FOR RANK    FOR AVERAGE PERIOD

   3247     592.487  6044.134  DISCRETE   3.7044E+02 (2018,169,1900)      RANK  1        1   HOUR
    538     592.428  6044.202  DISCRETE   2.0902E+02 (2018,073,0900)      RANK  2        1   HOUR
   1340     593.248  6044.122  DISCRETE   7.5121E+01 (2018,083,1500)      RANK  9        1   HOUR

   1235     592.998  6043.872  DISCRETE   1.8008E+00                RANK  1      8760   HOUR
```

ONE-HOUR AVERAGE CO DISPERSION MODELLING OUTPUT
Cumulative Case 2

```
**********************************************************************************************************
                              CALPOST  Version 7.1.0       Level 141010
**********************************************************************************************************
                                    SUMMARY SECTION
                                    CO         1
                                     (ug/m**3)


 (Data are processed only in Hours: 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24)

 RECEPTOR     COORDINATES (km)   TYPE     PEAK (YEAR,DAY,START TIME)     FOR RANK    FOR AVERAGE PERIOD

   3062     596.082  6047.851  DISCRETE   1.5555E+02 (2018,328,1300)     RANK  2       1  HOUR
   3067     596.086  6047.752  DISCRETE   8.4773E+01 (2018,147,1900)     RANK  9       1  HOUR

   3063     596.083  6047.831  DISCRETE   4.5554E+01 (2018,083,0800)     RANK  2       8  HOUR
   3065     596.084  6047.792  DISCRETE   4.0371E+01 (2018,090,0800)     RANK  9       8  HOUR
```

EIGHT-HOUR AVERAGE CO DISPERSION MODELLING OUTPUT
Cumulative Case 2

```
**********************************************************************************************************
                              CALPOST  Version 7.1.0       Level 141010
**********************************************************************************************************
                                    SUMMARY SECTION
                                    CO         1
                                     (ug/m**3)


 (Data are processed only in Hours: 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24)

 RECEPTOR     COORDINATES (km)   TYPE     PEAK (YEAR,DAY,START TIME)     FOR RANK    FOR AVERAGE PERIOD

   3060     596.081  6047.891  DISCRETE   1.9897E+02 (2017,223,0600)     RANK  2       1  HOUR
   3052     596.076  6048.049  DISCRETE   8.1474E+01 (2017,207,0600)     RANK  9       1  HOUR

   3065     596.084  6047.792  DISCRETE   5.1353E+01 (2017,343,0000)     RANK  2       8  HOUR
   3064     596.084  6047.812  DISCRETE   4.0120E+01 (2017,352,0800)     RANK  9       8  HOUR
```

ONE-HOUR AVERAGE $PM_{2.5}$ DISPERSION MODELLING OUTPUT
Project Case 1

```
**************************************************************************************************
                         CALPOST  Version 7.1.0       Level 141010
**************************************************************************************************
                                SUMMARY SECTION
                                PM2.5         1
                                 (ug/m**3)

      (Data are processed only in Hours: 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24)

   RECEPTOR    COORDINATES (km)   TYPE     PEAK (YEAR,DAY,START TIME)     FOR RANK   FOR AVERAGE PERIOD

        1521    593.048  6044.472  DISCRETE   1.1808E+01 (2016,057,1000)     RANK  1       1  HOUR
        1451    593.048  6044.372  DISCRETE   7.2776E+00 (2016,068,0900)     RANK  2       1  HOUR
        1396    593.048  6044.272  DISCRETE   4.1955E+00 (2016,147,0600)     RANK  9       1  HOUR

         698    592.748  6044.282  DISCRETE   1.0358E+00 (2016,167,0000)     RANK  1      24  HOUR
        1312    592.848  6044.072  DISCRETE   7.8056E-01 (2016,155,0000)     RANK  2      24  HOUR
        1272    592.848  6043.972  DISCRETE   5.7779E-01 (2016,169,0000)     RANK  9      24  HOUR

        1252    592.848  6043.922  DISCRETE   1.1535E-01                     RANK  1    8784  HOUR
```

24-HOUR AVERAGE $PM_{2.5}$ DISPERSION MODELLING OUTPUT
Project Case 1

```
**************************************************************************************************
                         CALPOST  Version 7.1.0       Level 141010
**************************************************************************************************
                                SUMMARY SECTION
                                PM2.5         1
                                 (ug/m**3)

(Data are processed only in Hours: 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24)

 RECEPTOR    COORDINATES (km)   TYPE     PEAK (YEAR,DAY,START TIME)     FOR RANK   FOR AVERAGE PERIOD

        1271    592.798  6043.972  DISCRETE   2.0610E+01 (2018,340,1300)     RANK  1       1  HOUR
         523    592.128  6044.202  DISCRETE   1.1501E+01 (2018,073,1400)     RANK  2       1  HOUR
        1398    593.148  6044.272  DISCRETE   3.8294E+00 (2018,043,1000)     RANK  9       1  HOUR

         492    592.128  6044.182  DISCRETE   1.4893E+00 (2018,073,0000)     RANK  1      24  HOUR
        1271    592.798  6043.972  DISCRETE   1.0124E+00 (2018,178,0000)     RANK  2      24  HOUR
        1252    592.848  6043.922  DISCRETE   7.4859E-01 (2018,163,0000)     RANK  9      24  HOUR

        1252    592.848  6043.922  DISCRETE   1.3165E-01                     RANK  1    8760  HOUR
```

ONE-HOUR AVERAGE NH_3 DISPERSION MODELLING OUTPUT
Project Case 1

```
**********************************************************************************************************
                         CALPOST  Version 7.1.0       Level 141010
**********************************************************************************************************
                                SUMMARY SECTION
                                NH3       1
                                 (ug/m**3)


      (Data are processed only in Hours: 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24)

    RECEPTOR     COORDINATES (km)    TYPE     PEAK (YEAR,DAY,START TIME)     FOR RANK    FOR AVERAGE PERIOD

        1521     593.048  6044.472  DISCRETE   2.8884E+01 (2016,057,1000)     RANK  1       1  HOUR
        1451     593.048  6044.372  DISCRETE   1.7497E+01 (2016,068,0900)     RANK  2       1  HOUR
        1396     593.048  6044.272  DISCRETE   9.9701E+00 (2016,201,0600)     RANK  9       1  HOUR
```

ONE-HOUR AVERAGE NH_3 DISPERSION MODELLING OUTPUT
Project Case 2

```
**********************************************************************************************************
                         CALPOST  Version 7.1.0       Level 141010
**********************************************************************************************************
                                SUMMARY SECTION
                                NH3       1
                                 (ug/m**3)

(Data are processed only in Hours: 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24)

 RECEPTOR     COORDINATES (km)    TYPE     PEAK (YEAR,DAY,START TIME)     FOR RANK    FOR AVERAGE PERIOD

    1523     593.148  6044.472  DISCRETE   2.7453E+01 (2016,057,1000)     RANK  1       1  HOUR
    1487     593.098  6044.422  DISCRETE   1.8610E+01 (2016,068,0900)     RANK  2       1  HOUR
    1398     593.148  6044.272  DISCRETE   1.0382E+01 (2016,317,1000)     RANK  9       1  HOUR
```

APPENDIX C

PLOT PLAN

ITEM NO.	EQUIPMENT NAME
128	MAKEUP AMINE TANK
129	AMINE DRAIN TANK
130	STRIPPER OVERHEAD ACCUMULATOR
131	LEAN FLASH TANK
132	CONDENSATE FLASH TANK
133	HYDROGEN STORAGE TRAILER
134	HRSG DRUM PENTHOUSE
135	FUEL GAS COMPRESSOR BUILDING

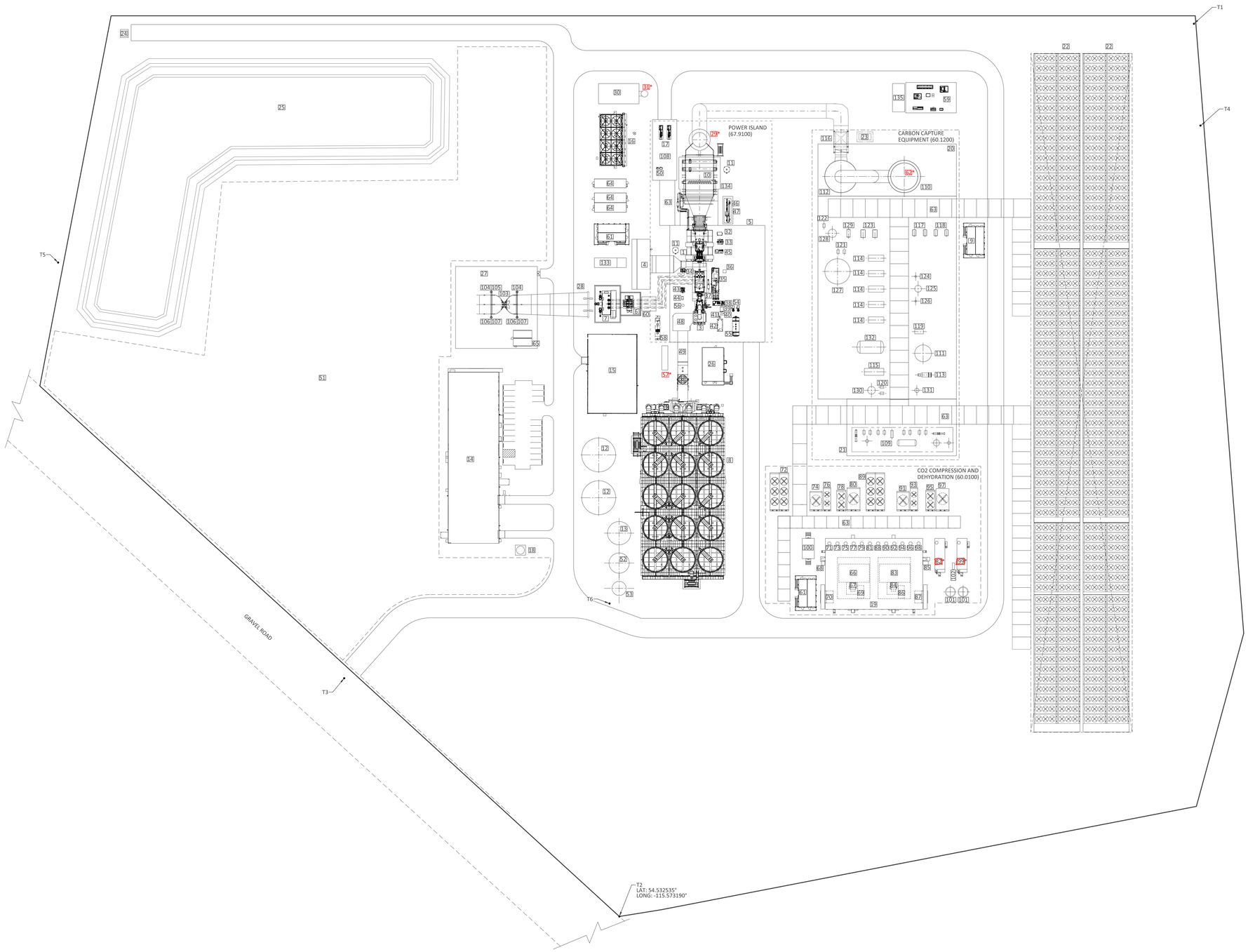
ITEM NO.	EQUIPMENT NAME
111	CO2 STRIPPER
112	PRESCRUBBER
113	STRIPPER REBOILER
114	LEAN / RICH EXCHANGER
115	LEAN FLASH COMPRESSOR
116	BOOSTER FAN
117	WASH WATER PUMPS
118	RICH AMINE PUMPS
119	LEAN AMINE PUMP
120	STRIPPER REFLUX PUMPS
121	AMINE FEED PUMPS
122	MAKEUP AMINE PUMP
123	WATER WASH PUMPS
124	LEAN AMINE PRE-FILTER
125	ACTIVATED CARBON FILTER
126	LEAN AMINE POST-FILTER
127	LEAN AMINE TANK

ITEM NO.	EQUIPMENT NAME
94	FOURTH STAGE SUCTION SCRUBBER (TRAIN-2)
95	FIFTH STAGE COOLER (TRAIN-2)
96	FIFTH STAGE DISCHARGE SCRUBBER (TRAIN-2)
97	EIGHTH STAGE COOLER (TRAIN-2)
98	SIXTH STAGE SUCTION SCRUBBER (TRAIN-2)
99*	CO2 DEHYDRATION PACKAGE (TRAIN-2)
100	LOW VOLTAGE MCC BUILDING
101	STILL VENT CONDENSING TANK
102	GLYCOL MAKE-UP TANK
103	240 KV CIRCUIT BREAKER
104	240 KV LINE DISCONNECT
105	240 KV CCVT
106	240 KV SURGE ARRESTOR
107	240 KV H-FRAME
108	BOILER FEEDWATER PUMP BUILDING
109	THERMAL RECLAIMER
110	CO2 ABSORBER

ITEM NO.	EQUIPMENT NAME
77	FOURTH STAGE SUCTION SCRUBBER (TRAIN-1)
78	FIFTH STAGE COOLER (TRAIN-1)
79	FIFTH STAGE DISCHARGE SCRUBBER (TRAIN-1)
80	EIGHTH STAGE COOLER (TRAIN-1)
81	SIXTH STAGE SUCTION SCRUBBER (TRAIN-1)
82*	CO2 DEHYDRATION PACKAGE (TRAIN-1)
83	8 STAGE INTEGRALLY GEARED CENTRIFUGAL COMPRESSOR (TRAIN-2)
84	9.7 MW SYNCHRONOUS ELECTRIC MOTOR (TRAIN-2)
85	SYNCHRONOUS ELECTRIC MOTOR COOLING AIR HANDLER (TRAIN-2)
86	COMPRESSOR LUBE OIL SKID (TRAIN-2)
87	COMPRESSOR LUBE OIL COOLER (TRAIN-2)
88	FIRST STAGE SUCTION SCRUBBER (TRAIN-2)
89	FIRST STAGE COOLER (TRAIN-2)
90	SECOND STAGE SUCTION SCRUBBER (TRAIN-2)
91	SECOND STAGE COOLER (TRAIN-2)
92	THIRD STAGE SUCTION SCRUBBER (TRAIN-2)
93	THIRD STAGE COOLER (TRAIN-2)

ITEM NO.	EQUIPMENT NAME
39	STEAM TURBINE HYDRAULIC SKID
40	H2 GAS DRYER
41	H2 GAS SKID
42	STATOR WATER COOLING SKID
43	GLAND STEAM CONDENSER
44	GENERATOR NEUTRAL GROUNDING CUBICLE
45	FUEL GAS PURGE AIR COMPRESSOR AND TANK
46	FUEL GAS FINAL FILTER & PREHEATER SKID
47	FUEL GAS FINAL FILTER & PREHEATER ENCLOSURE
48	HOT BOX
49	ACC MAIN STEAM DUCT
50	CONDENSATE RECIRC. PUMP
51	LAYDOWN AREA (APPROX 20 ACRES)
52	RAW WATER STORAGE TANK
53	WASTEWATER STORAGE TANK
54	CONDENSATE EXTRACTION PUMPS
55	CONDENSATE COLLECTION TANK
56	STEAM TURBINE DRAINS TANK
57*	EMERGENCY DIESEL GENERATOR
58	OIL WATER SEPARATOR (BELOW GRADE)
59	FUEL GAS YARD
60	GENERATOR BREAKER
61	MV PDC
62*	ABSORBER STACK
63	UTILITY RACK
64	GT/ST/AUXILIARY POWER CONTROL CENTER
65	240KV CONTROL BUILDING
66	8 STAGE INTEGRALLY GEARED CENTRIFUGAL COMPRESSOR (TRAIN-1)
67	9.7 MW SYNCHRONOUS ELECTRIC MOTOR (TRAIN-1)
68	SYNCHRONOUS ELECTRIC MOTOR COOLING AIR HANDLER (TRAIN-1)
69	COMPRESSOR LUBE OIL SKID (TRAIN-1)
70	COMPRESSOR LUBE OIL COOLER (TRAIN-1)
71	FIRST STAGE SUCTION SCRUBBER (TRAIN-1)
72	FIRST STAGE COOLER (TRAIN-1)
73	SECOND STAGE SUCTION SCRUBBER (TRAIN-1)
74	SECOND STAGE COOLER (TRAIN-1)
75	THIRD STAGE SUCTION SCRUBBER (TRAIN-1)
76	THIRD STAGE COOLER (TRAIN-1)

ITEM NO.	EQUIPMENT NAME
1	COMBUSTION TURBINE GENERATOR
2	TURBINE GENERATOR
3	STEAM TURBINE
4	INLET AIR FILTER
5	GENERATION BUILDING
6	AUXILIARY TRANSFORMER
7	GENERATOR STEP-UP TRANSFORMER
8	AIR COOLED CONDENSER
9	LV CCS PDC
10	HEAT RECOVERY STEAM GENERATOR
11	BLOW DOWN TANK
12	FIREWATER / SERVICE WATER STORAGE TANKS
13	DEMINERALIZED WATER TANK
14	ADMIN BUILDING
15	WATER TREATMENT BUILDING
16	AUXILIARY COOLING HEAT EXCHANGER
17	BOILER FEEDWATER PUMPS
18	SANITARY DRAINS STORAGE TANK
19	MAIN CO2 COMPRESSION BUILDING
20	CARBON CAPTURE BUILDING
21	THERMAL RECLAIMER BUILDING
22	CARBON CAPTURE AIR COOLERS
23	CEMS
24	STORMWATER PUMP BUILDING
25	STORM RETENTION POND
26	LV ACC PDC
27	SWITCH YARD
28	240 KV OVERHEAD LINES
29*	HRSG STACK
30	AUXILIARY BOILER
31*	AUXILIARY BOILER STACK
32	MOBILE COMPRESSED CLEANING SKID
33	THERMAL MANAGEMENT BLOWER SKID
34	INST. AIR COMPRESSOR & AIR RECEIVER TANKS
35	LUBE OIL & HYDRAULIC SKID
36	MOBILE LUBE OIL PURIFIER
37	BEARING EXHAUSTER SKID & SEAL OIL STORAGE TANK
38	SEAL OIL SKID



TERMINAL POINTS	
T1	FUEL GAS
T2	RAW WATER FROM CARSON LAKE
T3	PLANT ACCESS ROAD
T4	WELL WATER FROM JUDY CREEK
T5	240kV TRANSMISSION LINES
T6	WASTEWATER (HAUL BY TRUCK)

NOTES

1. SITE PLAN IS CONCEPTUAL IN NATURE. NOT ALL EQUIPMENT IS REPRESENTED OR OF ACTUAL SIZE.
2. ALL EMISSION SOURCES ON THE SITE ARE DENOTED WITH AN ASTERISK (*) AND IN RED FONT.

SYMBOLS

- PROJECT BOUNDARY
- CO2 COMPRESSION AND DEHYDRATION (61.0100)
- CARBON CAPTURE EQUIPMENT (60.1200)
- POWER ISLAND (67.9100)

NOT TO BE USED FOR CONSTRUCTION

THE DISTRIBUTION AND USE OF THE NATIVE FORMAT CAD FILE OF THIS DRAWING IS UNCONTROLLED. THE USER SHALL VERIFY TRACEABILITY OF THIS DRAWING TO THE LATEST CONTROLLED VERSION.

NO	DATE	REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	PDE	APP
					GMT	JEB	
1	08/FEB/23	REVISED PROJECT NAME AND SHIFTED SITE	PDN	JSH	GMT	JEB	
0	15/DEC/22	ISSUED FOR PERMITTING	PDN	JSH	GMT	JEB	

1:750 — 0 20 40 60 — SCALE IN METERS

BLACK & VEATCH

DESIGNER	DRAWN
JSH	PDN
CHECKED	DATE

KIWETINOHK ENERGY CORP
BLACK BEAR COMBINED CYCLE WITH CCS

GENERAL
SITE ARRANGEMENT

PROJECT	DRAWING NUMBER	REV
412155-00AAA-G1000		1
CODE		
AREA		

MicroStation v10.11.0.36
Full Size 1:1
02/DEC/2023 12:18 PM
sam55714

Appendix O – Emissions Intensity Report

Kiwetinohk Energy Corp.
Black Bear Power Plant
Emissions Intensity Report

Prepared By: Horizon Compliance Group Inc.

Date: October 2023

Revision: 0

HORIZON
COMPLIANCE

Executive Summary

Kiwetinohk Energy Corp. (KEC) is proposing to construct and operate the 460 MW Black Bear Combined Cycle Power Plant (BBPP), which will be located within Section 15-064-11 W5M in Big Lake County, approximately 21 km south of Swan Hills, Alberta. Horizon Compliance Group Inc. (Horizon Compliance) has been retained to prepare this Emissions Intensity Report in order to assess federal regulatory compliance at the BBPP.

The BBPP is a combined cycle power plant with carbon capture. The plant consists of one natural gas fired combustion turbine generator, one steam turbine, one carbon capture package with one carbon dioxide (CO_2) compression and dehydration package. High temperature exhaust from the combustion turbine generator is vented to a heat recovery steam generator to produce steam for the steam turbine. The heat recovery steam generator will be equipped with selective catalytic reduction (SCR) to reduce nitrogen oxide (NO_X) emissions. Once the carbon capture system (CCS) is commissioned, the heat recovery steam generator outlet flue gas will be directed to a series of CCS packages to remove CO_2 from the flue gases, dehydrate the CO_2 gas stream and compress the CO_2 for injection. Dehydration will include the use of two natural gas fired triethylene glycol heaters. An auxiliary natural gas fired boiler will intermittently provide supplemental heat during start-up, maintenance, or emergency operating conditions. The BBPP will have an emergency diesel generator for onsite utilities.

The combustion of natural gas at the BBPP will result in atmospheric emissions of greenhouse gases (GHGs): CO_2, methane (CH_4), and nitrogen dioxide (N_2O); and other pollutants, namely NO_x and particulate matter less than 2.5 microns in diameter ($PM_{2.5}$). Air emissions are expected to occur during the construction, operation, and decommissioning phases of the BBPP; however, for the purposes of this report, only direct emissions during the operations phase are discussed.

Current GHG regulations applicable to the BBPP include the federal *Regulations Limiting Carbon Dioxide Emissions from Natural Gas-fired Generation of Electricity* Table 1 summarizes the carbon intensity for the BBPP, with and without CCS, for comparison with federal limits.

Table 1. Carbon Intensity Results

Jurisdiction	Project without CCS	Project with CCS
Federal		
CO_2 Emission Intensity (tCO_2/GWh)	383	19
CO_2 Emission Intensity Limit (tCO_2/GWh)	420	

Additionally, the *Canadian Ambient Air Quality Standards* (*CAAQS*) are also applicable to the BBPP. To understand the BBPP's potential impact on local air quality, an Air Quality Assessment (AQA) was completed to ensure the predicted maximum ground-level concentrations (MGLC) comply with the applicable *CAAQS*. The predicted MGLC of NO_2 and $PM_{2.5}$ are provided in Tables 2 and 3, respectively.

Table 2. NO_2 Dispersion Modelling Results

Case	Averaging Period	UTM Coordinates		Predicted (µg/m³)	Baseline (µg/m³)	MGLC (µg/m³)	*CAAQS*	
		(m E)	(m N)				(ppb*)	(µg/m³)
P1	1-hour	593048	6044322	29.1	60	89.1	**60**	**113**
	Annual	592848	6043922	1.0	8.5	9.5	**17.0**	**32**
P2	1-hour	593148	6044372	27.2	60	87.2	**60**	**113**
	Annual	592848	6043922	0.9	8.5	9.4	**17.0**	**32**

Table 3. $PM_{2.5}$ Dispersion Modelling Results

Case	Averaging Period	UTM Coordinates		Predicted (µg/m³)	Baseline (µg/m³)	MGLC (µg/m³)	CAAQS
		(m E)	(m N)				(µg/m³)
P1	24-hour	592848	6043922	0.6	21	21.6	**27**
	Annual	592848	6043922	0.1	4.9	5.0	**8.8**
P2	24-hour	592998	6043922	0.5	21	21.5	**27**
	Annual	592948	6043872	0.1	4.9	5.0	**8.8**

The results of the report indicate the BBPP will meet the federal *Regulations Limiting Carbon Dioxide Emissions from Natural Gas-fired Generation of Electricity* and comply with the applicable *CAAQS* during the facility's operations phase, with or without the commissioning of the CCS.

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Figure 2 Project Case 1: Maximum predicted annual average NO_2 concentrations, including ambient baseline NO_2
Figure 3 Project Case 2: Three-year average of the annual 98_{th} percentile of the daily-maximum 1-hour average NO_2 concentrations, including ambient baseline NO_2
Figure 4 Project Case 2: Maximum predicted annual average NO_2 concentrations, including ambient baseline NO_2
Figure 5 Project Case 1: Three-year average of the annual 98_{th} percentile of the daily 24-hour average $PM_{2.5}$ concentrations, including ambient baseline $PM_{2.5}$
Figure 6 Project Case 1: Three-year average of the annual average $PM_{2.5}$ concentrations, including ambient baseline $PM_{2.5}$
Figure 7 Project Case 2: Three-year average of the annual 98_{th} percentile of the daily 24-hour average $PM_{2.5}$ concentrations, including ambient baseline $PM_{2.5}$
Figure 8 Project Case 2: Three-year average of the annual average $PM_{2.5}$ concentrations, including ambient baseline $PM_{2.5}$

List of Appendices

Appendix A Figures

1 INTRODUCTION

Kiwetinohk Energy Corp. (KEC) is proposing to construct and operate the 460 MW Black Bear Combined Cycle Power Plant (BBPP). Horizon Compliance Group Inc. (Horizon Compliance) has been retained to prepare this Emissions Intensity Report in order to assess energy efficiency at the BBPP.

The BBPP will be located within Section 15-064-11 W5M in Big Lake County, approximately 21 km south of Swan Hills and 45 km north of Whitecourt, Alberta, Canada.

2 FACILITY DESCRIPTION

The BBPP is a combined cycle power plant with carbon capture. The plant consists of one natural gas fired combustion turbine generator, one steam turbine, one carbon capture package with one carbon dioxide (CO_2) compression and dehydration package. High temperature exhaust from the combustion turbine generator is vented to a heat recovery steam generator to produce steam for the steam turbine. Dehydration will include the use of two natural gas fired triethylene glycol heaters. An auxiliary natural gas fired boiler will intermittently provide supplemental heat during start-up, maintenance, or emergency operating conditions. The BBPP will have an emergency diesel generator for onsite utilities.

3 AIR QUALITY CONSIDERATIONS

The combustion of natural gas will result in atmospheric emissions of greenhouse gases (GHGs): CO_2, methane (CH_4), and nitrogen dioxide (N_2O); and other pollutants, namely nitrogen oxide (NO_x) and particulate matter less than 2.5 microns in diameter ($PM_{2.5}$).

The BBPP will use the most efficient technology available today to produce electricity from natural gas combustion. To minimize NO_x emissions, the exhaust system will be equipped with selective catalytic reduction (SCR). Once the carbon capture system (CCS) is commissioned, it is expected that 95% of produced CO_2 will be recovered from the exhaust system's flue gases for geological sequestration.

Air emissions are expected to occur during the construction, operation, and decommissioning phases of the BBPP; however, for the purposes of this report, only direct emissions during the operations phase are discussed as this phase has the greatest potential for emissions.

4 GREENHOUSE GAS EMISSIONS

4.1 Regulatory Background

The federal government is expected to establish new emission intensity benchmarks for electricity generation under the proposed *Clean Electricity Regulations*. As of April 2023, the federal *Regulations Limiting Carbon Dioxide Emissions from Natural Gas-fired Generation of Electricity* (SOR/2018-261) is the current regulation that sets an emission intensity limit for natural gas power generation facilities

capable of producing 25 MW or more. For a combustion unit with a generation capacity greater than 150 MW, such as that of BBPP, the electricity generated cannot exceed 420 tCO_2e/GWh during a calendar year, on average.

4.2 Annual Project Greenhouse Gas Emissions

The annual operations based GHG emissions for the BBPP were calculated using the Alberta *Greenhouse Gas Quantification Methodologies* (*AQM*; Version 2.2; AEP, 2021a) using the estimated volume of natural gas consumed if the CTG operated at 100% capacity all year without any downtime. Total GHG emissions, expressed as CO_2e, were estimated using Global Warming Potential (GWP) factors as outlined in the *Standard for Completing Greenhouse Gas Compliance and Forecasting Reports* (AEP, 2021b). Table 5 summarizes the estimated annual GHG emissions for the BBPP with and without the CCS.

Table 4. Estimated Annual Greenhouse Gas emissions

Greenhouse Gas	Without CCS			With CCS		
	Tonnes of Gas	Tonnes of CO_2e	Total GHG Emissions (tCO_2e)	Tonnes of Gas	Tonnes of CO_2e	Total GHG Emissions (tCO_2e)
Carbon dioxide (CO_2)	1,434,337	1,434,337	1,445,685	82,947	82,947	96,045
Methane (CH_4)	93	2,591		107	2,990	
Nitrous oxide (N_2O)	33	8,757		38	10,107	

Note: Global Warming Potential for CH_4 = 28 and N_2O = 265

The values expressed in Table 5 are subject to change with the inclusion of other GHG sources and sinks to reflect the net GHG emissions quantification requirements of the federal *Strategic Assessment of Climate Change (Revised)* (ECCC, 2020).

4.3 Carbon Intensity

The federal *Regulations Limiting Carbon Dioxide Emissions from Natural Gas-fired Generation of Electricity*requires that the carbon intensity be calculated using the gross electricity produced and CO_2 emissions only. The carbon intensity for the BBPP was calculated according to the requirements of the federal Regulations. Calculations integrated conservative values, where maximum power generation (100% load) is assumed to occur continuously over the course of a year. Table 6 summarizes the carbon intensity for the BBPP, with and without CCS, for comparison with federal limits.

Table 5. Federal and Provincial Carbon Intensities

Jurisdiction	Project without CCS	Project with CCS
Federal		
CO_2 Emission Intensity (tCO_2/GWh)	383	19
CO_2 Emission Intensity Limit (tCO_2/GWh)	420	

Without CCS the BBPP is calculated to meet the 420 tCO_2/GWh intensity limit as required by the federal *Regulations Limiting Carbon Dioxide Emissions from Natural Gas-fired Generation of Electricity*. With the commissioning of CCS, the BBPP is calculated to reduce its CO_2 emission intensity to 19 tCO_2/GWh.

5 DISPERSION MODELLING

5.1 Regulatory Background

In 2012, federal, provincial, and territorial ministers of the environment agreed to implement the Air Quality Management System (AQMS) to better protect human health and the environment. The objective was to achieve continuous improvement of air quality in Canada through implementation of air quality mechanisms. The *Canadian Ambient Air Quality Standards* (*CAAQS*) are considered the driving force behind the AQMS. Through the *CAAQS*, standards have been developed for nitrogen dioxide (NO_2) and $PM_{2.5}$ (CCME, 2023). To understand the BBPP's potential impact on local air quality, an Air Quality Assessment (AQA) was completed to ensure the predicted maximum ground-level concentrations (MGLC) comply with the applicable *CAAQS*.

5.2 Emission Sources

As mentioned, the BBPP is a combined cycle power plant with CCS. Emissions sources at the BBPP include one natural gas fired combustion turbine generator which vents to the heat recovery steam generator, one auxiliary boiler stack, one CCS absorber stack, and two triethylene glycol heaters.

It is possible that the carbon capture, utilization, and storage (CCUS) hub may not be operational when the BBPP is commissioned. As such, the BBPP may operate for a period without CCS. Similarly, in the event that the CCUS hub is down for maintenance or experiences unplanned outages, the BBPP will operate without CCS. The number of emission sources and release points change when operating with and without CCS. Dispersion modelling of the BBPP was conducted under continuous operations, with and without CCS, to ensure that all MGLC of ambient air quality are compliant regardless of the operational configuration. Table 7 lists the release parameters for the proposed sources.

Table 6. Emissions Sources

Operational Configuration	Source Type	Stack Height	Stack Diameter	Exit Velocity	Exit Temp	NO_x Emission Rate	$PM_{2.5}$ Emission Rate
		(m)	(m)	(m/s)	(°C)	(kg/h)	(kg/h)
No CCS	HRSG Stack with SCR	48.76	6.6	14.7	70.9	46.0	4.6
Both	Auxiliary Boiler Stack	18.3	0.965	16.7	272.0	2.127	0.162
CCS Only	CCS Absorber with SCR	57.3	5.8	18.3	70.9	46.0	4.6
CCS Only	TEG Train 1 Stack	4.0	0.457	6.0	350.0	0.057	0.004
CCS Only	TEG Train 2 Stack	4.0	0.457	6.0	350.0	0.057	0.004

5.3 Results

Dispersion modelling results are presented for the following cases:

- **Project Case 1 (P1):** This case assessed NO_x and $PM_{2.5}$ emissions from the heat recovery steam generator equipped with SCR, and emissions from the auxiliary boiler.
- **Project Case 2 (P2):** This case assessed NO_x and $PM_{2.5}$ emissions from the CCS absorber when CCUS has been commissioned and the SCR system is in operation, and emissions from the auxiliary boiler and two TEG heaters.

The predicted NO_2 concentrations using the ambient ratio method (ARM) are provided in Table 8. As indicated, the MGLCs of NO_2 associated with project cases comply with the *CAAQS* for NO_2. The isopleths presenting the modelling results are shown in Figures 1 through 4 within Appendix A.

Table 7. Predicted MGLC of NO_2 using ARM

Case	Averaging Period	UTM Coordinates		Predicted (µg/m³)	Baseline (µg/m³)	MGLC (µg/m³)	*CAAQS*	
		(m E)	(m N)				(ppb*)	(µg/m³)
P1	1-hour	593048	6044322	29.1	60	89.1	**60**	**113**
	Annual	592848	6043922	1.0	8.5	9.5	**17.0**	**32**
P2	1-hour	593148	6044372	27.2	60	87.2	**60**	**113**
	Annual	592848	6043922	0.9	8.5	9.4	**17.0**	**32**

The predicted $PM_{2,5}$ concentrations, including baseline and background, are provided in Table 9. As indicated, the MGLCs of $PM_{2.5}$ associated with project cases comply with the *CAAQS* for $PM_{2.5}$. The isopleths presenting the modelling results are shown in Figures 5 through 8 within Appendix A.

Table 8. Predicted MGLC of $PM_{2.5}$

Case	Averaging Period	UTM Coordinates		Predicted (µg/m³)	Baseline (µg/m³)	MGLC (µg/m³)	CAAQS
		(m E)	(m N)				(µg/m³)
P1	24-hour	592848	6043922	0.6	21	21.6	**27**
	Annual	592848	6043922	0.1	4.9	5.0	**8.8**
P2	24-hour	592998	6043922	0.5	21	21.5	**27**
	Annual	592948	6043872	0.1	4.9	5.0	**8.8**

6 CONCLUSION

At the request of KEC, Horizon Compliance has completed this Emissions Intensity Report for the proposed BBPP. The results of the report indicate the BBPP will meet the federal *Regulations Limiting Carbon Dioxide Emissions from Natural Gas-fired Generation of Electricity* and comply with the applicable *CAAQS* during the facility's operations phase, with or without the commissioning of the CCS. Horizon Compliance appreciated the opportunity to work on this project. If we can provide clarification of any part of this report, please contact the undersigned at (587) 885-0863.

Horizon Compliance Group Inc.

<original signed by>

Cody Halleran, B.Sc., EP Manager
Co-Founder & Managing Partner
Air Quality & Regulatory Services

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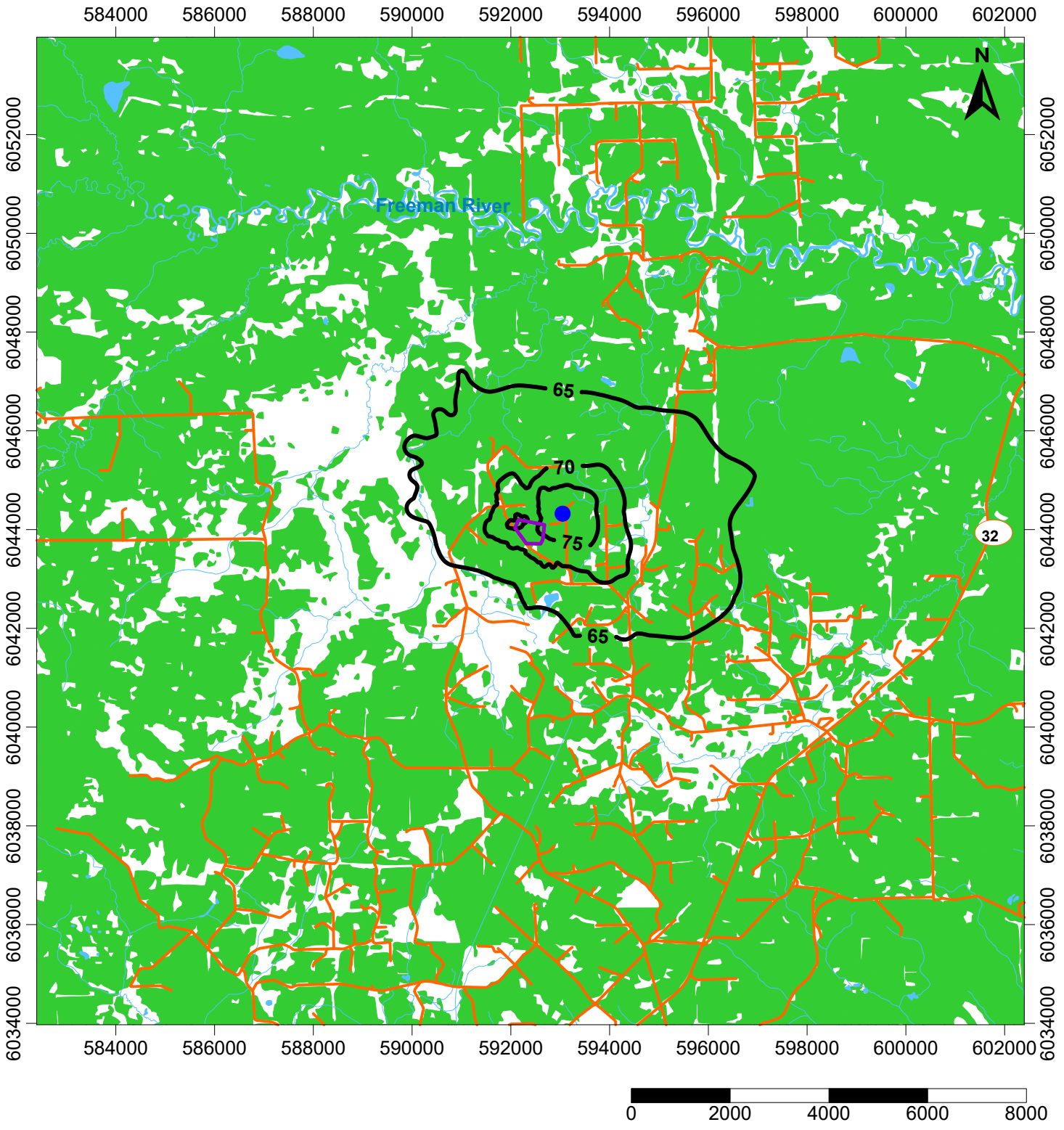
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APPENDIX A

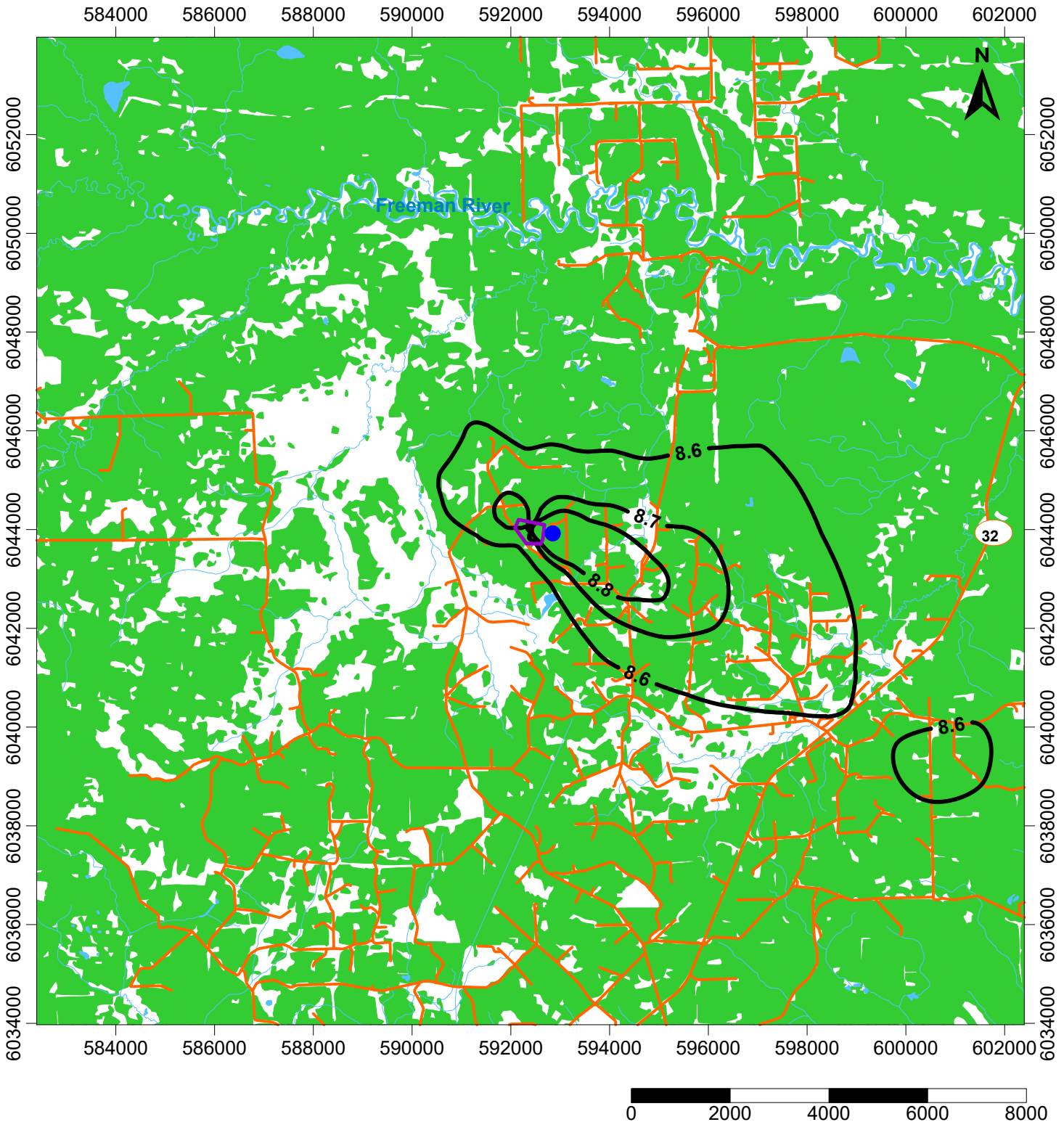
FIGURES



LEGEND

- Maximum Ground Level Concentration (MGLC)
- Black Bear Power Plant Boundary
- Water Body
- Road
- Wooded Area

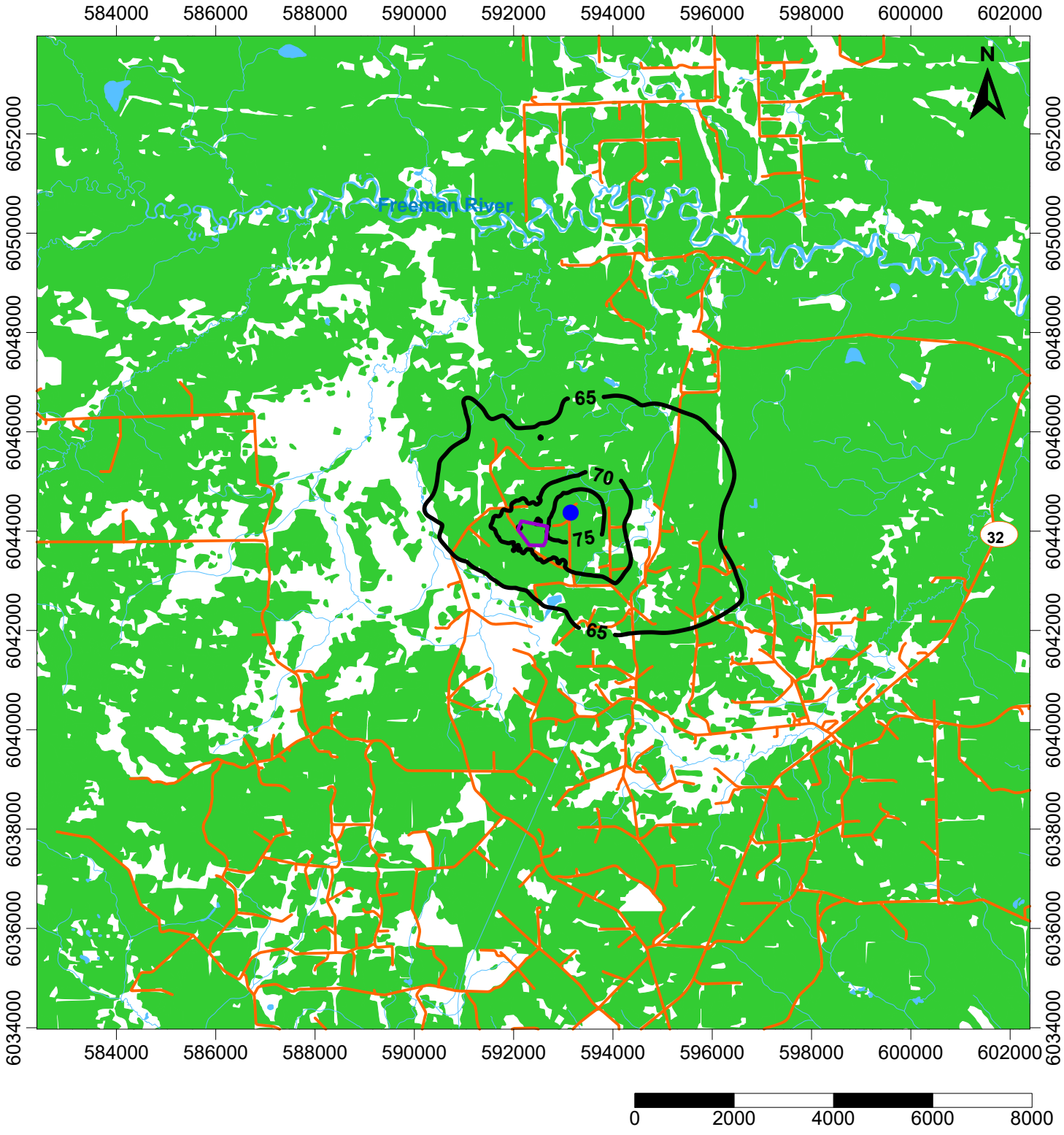
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TITLE	Project Case 1: Three-year average of the annual 98th percentile of the daily-maximum 1-hour average NO_2 concentrations, including ambient baseline NO_2
HORIZON COMPLIANCE	MGLC: NO_2 = 89.1 (µg/m³)
	FIGURE 1



LEGEND

- Maximum Ground Level Concentration (MGLC)
- Black Bear Power Plant Boundary
- Water Body
- Road
- Wooded Area

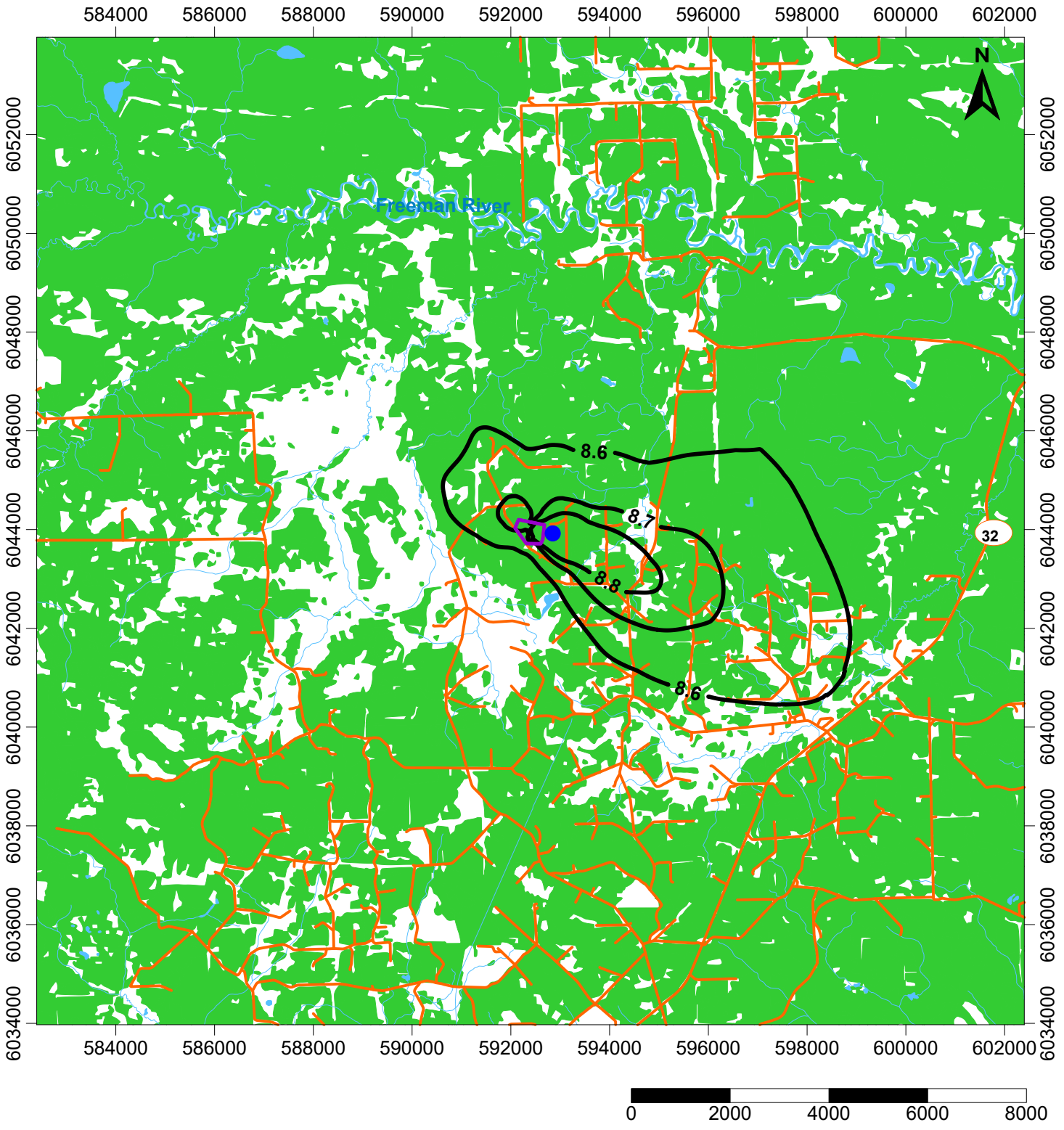
PROJECT	Kiwetinohk Energy Corp. Black Bear Power Plant
TITLE	Project Case 1: Maximum predicted annual average NO_2 concentrations, including ambient baseline NO_2
HORIZON COMPLIANCE	MGLC: NO_2 = 9.5 (µg/m³)
	FIGURE 2



LEGEND

- Maximum Ground Level Concentration (MGLC)
- Black Bear Power Plant Boundary
- Water Body
- Road
- Wooded Area

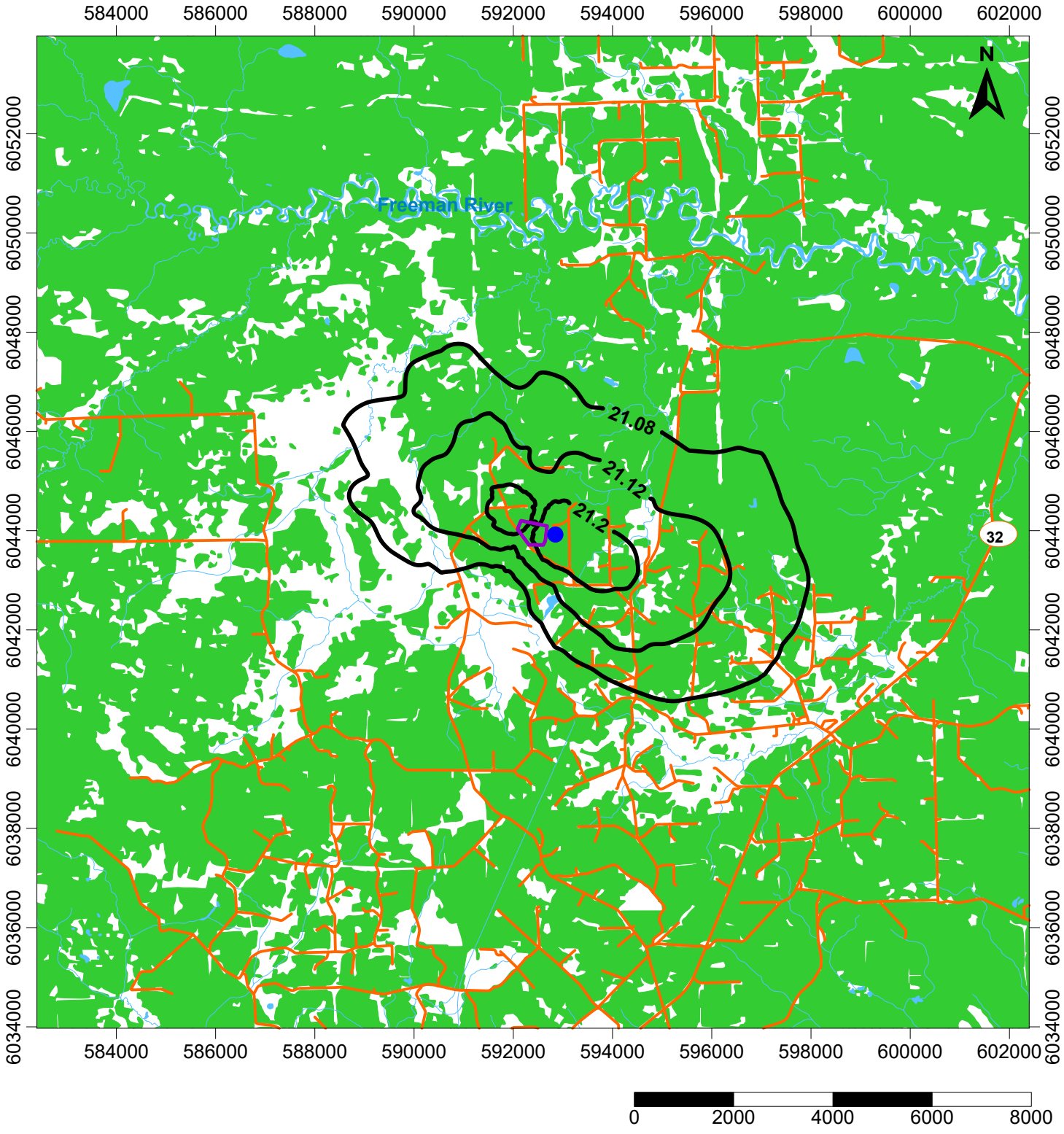
PROJECT	Kiwetinohk Energy Corp. Black Bear Power Plant
TITLE	Project Case 2: Three-year average of the annual 98th percentile of the daily-maximum 1-hour average NO_2 concentrations, including ambient baseline NO_2
HORIZON COMPLIANCE	MGLC: NO_2 = 87.2 (µg/m³)
	FIGURE 3



LEGEND

- Maximum Ground Level Concentration (MGLC)
- Black Bear Power Plant Boundary
- Water Body
- Road
- Wooded Area

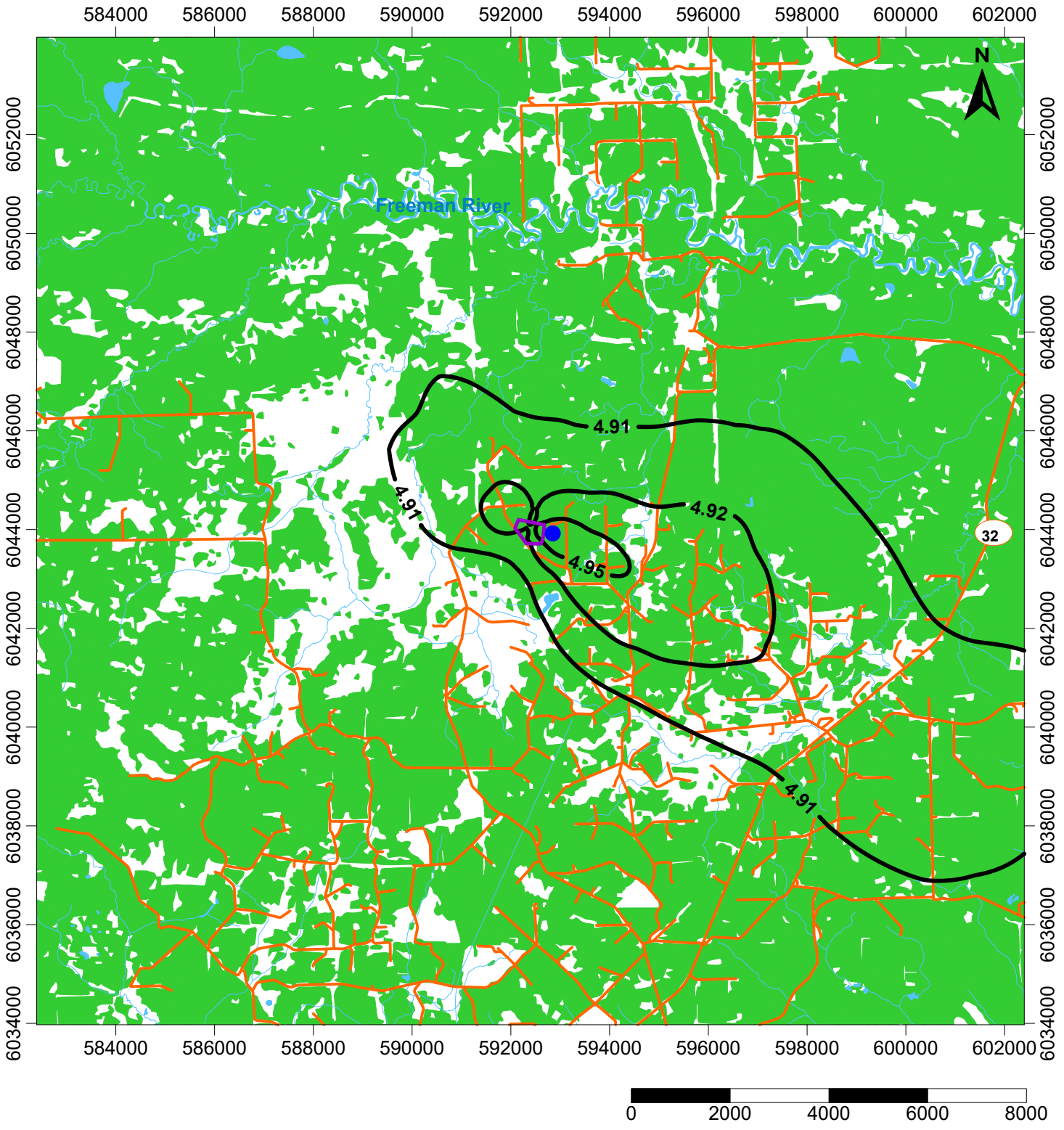
PROJECT	Kiwetinohk Energy Corp. Black Bear Power Plant
TITLE	Project Case 2: Maximum predicted annual average NO_2 concentrations, including ambient baseline NO_2
HORIZON COMPLIANCE	MGLC: NO_2 = 9.4 (µg/m³)
	FIGURE 4



LEGEND

- Maximum Ground Level Concentration (MGLC)
- Black Bear Power Plant Boundary
- Water Body
- Road
- Wooded Area

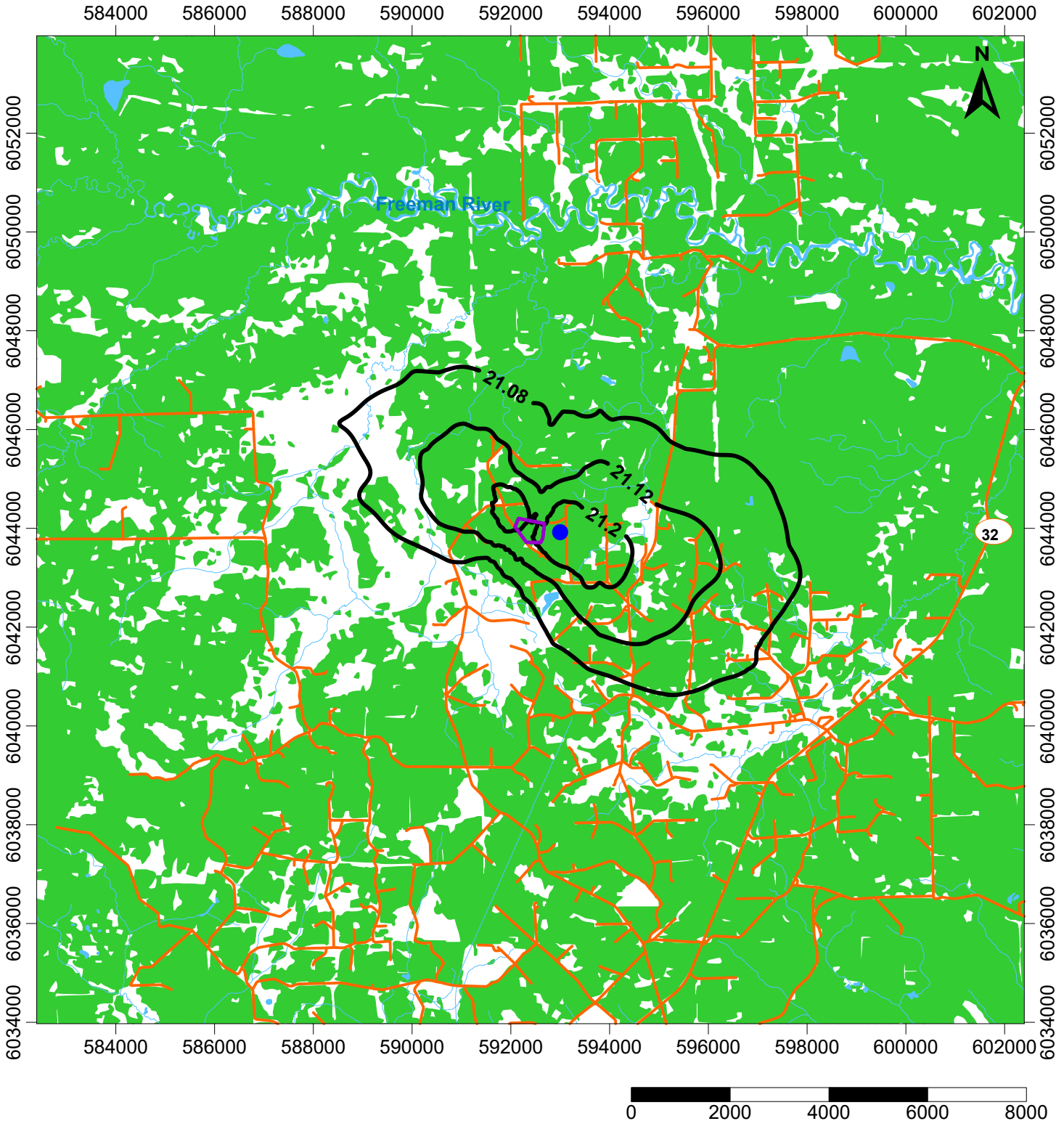
PROJECT	Kiwetinohk Energy Corp. Black Bear Power Plant
TITLE	Project Case 1: Three-year average of the annual 98th percentile of the daily 24-hour average $PM_{2.5}$ concentrations, including ambient baseline $PM_{2.5}$
HORIZON COMPLIANCE	MGLC: $PM_{2.5}$ = 21.6 (µg/m³)
	FIGURE 5



LEGEND

- Maximum Ground Level Concentration (MGLC)
- Black Bear Power Plant Boundary
- Water Body
- Road
- Wooded Area

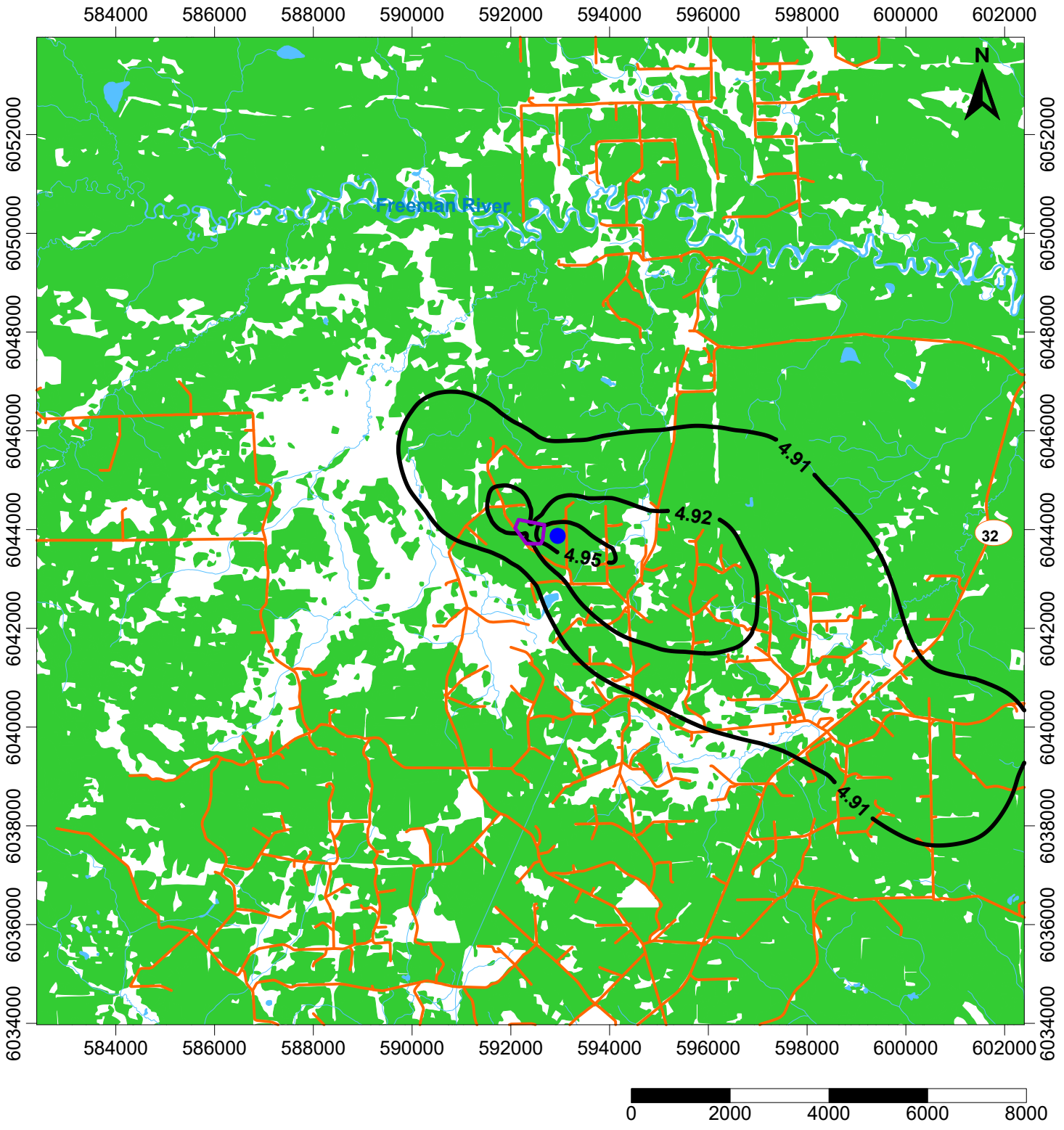
PROJECT	Kiwetinohk Energy Corp. Black Bear Power Plant
TITLE	Project Case 1: Three-year average of the annual average $PM_{2.5}$ concentrations, including ambient baseline $PM_{2.5}$
HORIZON COMPLIANCE	MGLC: $PM_{2.5}$ = 5.0 (µg/m³)
	FIGURE 6



LEGEND

- Maximum Ground Level Concentration (MGLC)
- Black Bear Power Plant Boundary
- Water Body
- Road
- Wooded Area

PROJECT	Kiwetinohk Energy Corp. Black Bear Power Plant
TITLE	Project Case 2: Three-year average of the annual 98th percentile of the daily 24-hour average $PM_{2.5}$ concentrations, including ambient baseline $PM_{2.5}$
HORIZON COMPLIANCE	MGLC: $PM_{2.5}$ = 21.5 (µg/m³)
	FIGURE 7



LEGEND

- Maximum Ground Level Concentration (MGLC)
- Black Bear Power Plant Boundary
- Water Body
- Road
- Wooded Area

PROJECT	Kiwetinohk Energy Corp. Black Bear Power Plant
TITLE	Project Case 2: Three-year average of the annual average $PM_{2.5}$ concentrations, including ambient baseline $PM_{2.5}$
HORIZON COMPLIANCE	MGLC: $PM_{2.5}$ = 5.0 (µg/m³)
	FIGURE 8

Appendix P – Geotechnical Report

TETRA TECH

Geotechnical Desktop Study
Maskwa Project
Southwest of Swan Hills, Alberta



PRESENTED TO
kîwetinohk Resources Corp.

NOVEMBER 4, 2022
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APPENDICES

Appendix A TETRA TECH's Limitations on the Use of This Document
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Appendix C Geological Maps
Appendix D Water Well Records
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LIMITATIONS OF REPORT

This report and its contents are intended for the sole use of kîwetinohk Resources Corp. (kîwetinohk) and their agents. Tetra Tech Inc. (Tetra Tech) does not accept any responsibility for the accuracy of any of the data, the analysis, or the recommendations contained or referenced in the report when the report is used or relied upon by any Party other than kîwetinohk, or for any Project other than the proposed development at the subject site. Any such unauthorized use of this report is at the sole risk of the user. Use of this document is subject to the Limitations on the Use of this Document attached in Appendix A or Contractual Terms and Conditions executed by both parties.

1.0 INTRODUCTION

As requested by kîwetinohk Resources Corp. (kîwetinohk), Tetra Tech Inc. (Tetra Tech) has conducted a geotechnical desktop study for the proposed Maskwa Combined Cycle Power Generation Facility (CCPGF) located approximately 5 km southwest of the Judy Creek Gas Plant near Swan Hills, Alberta.

The proposed project site is in an area of undeveloped land with an approximate perimeter and area of 1.8 km and 0.2 km^2 respectively. An existing gravel access road connects the proposed project site to Highway No. 32 and is approximately 9.6 km in length.

This report presents the results of the Maskwa geotechnical desktop study. Aspects of the Project including analysis of seismic, topographic, and flood conditions have been excluded from the scope of this report. Review of land titles, zoning, archaeology, and aquifers are also not addressed in this report and will require a separate environmental and archaeology assessment.

1.1 Purpose of This Document

The objective of this report is to assist kîwetinohk in assessing the geotechnical conditions for the proposed project area and construction of a CCPGF by identifying any potential geotechnical constraints that may affect the design and construction of the proposed development. Based on the geotechnical risks identified, preliminary recommendations to mitigate these risks are provided for consideration to address potential design and construction issues. Further intrusive and/or non-intrusive geotechnical evaluations (e.g., boreholes, test pits, probes, geophysical exploration, etc.) are expected in future stages of the project to refine and confirm the findings presented herein, and to further investigate the areas identified as having potential geotechnical concerns.

The geotechnical desktop study comprised the following scope of work:

- Review publicly available records of water wells, oil and gas developments, and utility records;
- Review existing borehole data and geotechnical reports publicly available and from Tetra Tech's internal database;
- Review published geological maps and reports;
- Review historical aerial photographs;
- Conduct a site reconnaissance;
- Provide a summary of reviewed information;
- Describe the geotechnical risks and hazards identified; and
- Provide preliminary recommendations to address the identified risks and for the project in general.

2.0 PROJECT DESCRIPTION

Tetra Tech understands that the Maskwa CCPGF (Project) will be integrated with post-combustion carbon capture facility and that each facility will be sized to deliver up to a 460 MW net power using advanced-class gas turbines. A conceptual site layout dated April 28, 2022, has been provided by kîwetinohk that identifies key infrastructure including buildings, generators, turbines, transformers, tanks, coolers, storm retention pond, and associated electrical generating equipment.

The Project site is located approximately 5 km southwest of the Judy Creek Gas Plant and 9 km west of Highway No. 32. The Project site can be accessed via an existing gravel road. A site plan illustrating the location of the proposed project area is presented in Figure 1.

The geotechnical commentary provided in this report may require revision if the details above are altered during future stages of the project.

3.0 HISTORICAL AERIAL PHOTOGRAPH REVIEW

Historical aerial photographs were obtained from the Government of Alberta Air Photo Library. The historical aerial photographs were reviewed to identify potential constraints, geotechnical concerns, hazards, or other features of interest. The features in each aerial photograph were compared against the next available historical aerial photograph to determine changes in both the project area and surrounding areas.

The history of former land usage and development were determined through a review of the following historical aerial photographs provided in Appendix B:

- Historical aerial photograph from May 10, 1971 (Figure B1);
- Historical aerial photograph from October 2, 1978 (Figure B2);
- Historical aerial photograph from July 14, 1991 (Figure B3);
- Historical aerial photograph from March 6, 1994 (Figure B4); and
- Historical aerial photograph from April 21, 2005 (Figure B5).

Historical aerial photographs were also purchased for the years 1949 and 1958 however, the scales of the photographs and lack of identifiable features did not facilitate an adequate review of the project area. Based on the aerial imagery available, it is assumed that the project area was completely undeveloped prior to 1958 and that construction activities near the proposed site were completed between 1958 and 1971.

3.1 1971 Aerial Imagery

The 1971 aerial photograph (Figure B1) indicates no evidence of development or construction activities within the project area. The monitoring water wells and overall gravel access road layout surrounding the project area have been developed prior to this period. The lack of tree growth northwest of the project area indicates potential clearing activities in this region. Within the project area, there are regions of lighter color shading which indicate smaller cleared areas. There is one cutline aligned north-south that passes through the project area and may indicate that potential smaller access routes have been developed. The overall vegetation growth within the project area indicates dense mature trees.

3.2 1978 Aerial Imagery

The 1978 aerial photograph (Figure B2) indicates several key differences when compared to the 1971 aerial photograph. Adjacent to the east and south extents of the project area, there have been significant clearing activities and development of roadways since 1971. In the region east of the project area, the lighter blue shading may indicate locations cleared for equipment access or infrastructure development. These regions appear to be interconnected and based on the topographical layout of the site may facilitate runoff during high rainfall periods. Significant clearing has also occurred within the project area, near its the southern limits.

The region northwest of the project area appears similar to the conditions in 1971 and natural vegetation growth has increased in this area. Within the project area, dense mature tree growth is prevalent, and a single cutline remains visible.

3.3 1991 Aerial Imagery

The 1991 aerial photograph (Figure B3) highlights the development of the water well adjacent to the northeast extent of the project area which was also documented as part of the site reconnaissance. The overall vegetation growth in the regions east and south of the project area has increased and development within these regions appears limited to water wells. Based on the site reconnaissance conducted, a series of buried pipeline infrastructure exists south of the project area which was likely constructed after the clearing efforts observed in the 1978 aerial photograph. The overall vegetation growth in the surrounding areas has increased indicating minimal development activities during this period and vegetation growth within the project area remains consistent. The north-south cut line visible in the earlier photographs is no longer distinguishable. The access roads surrounding the site appear to have been widened suggesting increased access road usage within the surrounding areas and possibly increased development in other areas near the site.

3.4 1994 Aerial Imagery

The 1994 aerial photograph (Figure B4) in comparison to the 1991 imagery indicates minimal to no development within and surrounding the project area during this period as indicated by the increased vegetation growth.

3.5 2005 Aerial Imagery

The 2005 aerial photograph (Figure B5) shows significant evidence of clearing activities within and north of the project area. The majority of the mature tree growth within the project area appears to have been removed and a well-defined cutline or trail has developed along the northern extent of the project area connecting the gravel access road on the west to the water well site to the east. These features have been documented as part of the site reconnaissance for this report, where a prominent cutline and evidence of track marks are still visible to the north of the project area. The tree growth within the project area was also noted to be significantly shorter than the mature trees observed near the cutline in addition to evidence of fallen tree debris and stumps throughout the site. Local roadways appear to have been developed within the project area, but no evidence of infrastructure development is visible within the project area. It is possible that these clearing activities were completed for investigation purposes as the 2018 Google Earth imagery (Figure 1) shows significant vegetation and tree growth within the project area since 2005.

The gravel access road running along the western extent of the project area also appears wider and more well-defined in comparison to the 1994 aerial photograph. There were also more developments west of the gravel access road evident in the 2005 aerial photo. Based on the site reconnaissance, it is likely that during the 1994 to 2005 period, the trees adjacent to the gravel access road were cleared to facilitate the future development of the buried pipelines and transmission line facilities.

4.0 SUBSURFACE CONDITIONS

The subsurface conditions analyzed for the project area include bedrock geology, bedrock topography, sediment thickness, surficial geology, and hydrogeology. A review of Tetra Tech's internal borehole database indicated several shallow boreholes less than 10 m in depth and offset greater than 1 km west of the project area. These boreholes were drilled as part of a transmission line construction line project to determine the surficial geology and have been excluded from analysis in this report. No publicly available geotechnical investigation reports near the project area were found online using publicly available databases. Additional information for subsurface conditions was obtained using the Government of Alberta water well records online database.

4.1 Surficial Geology

The surficial geology of the project area was determined through a review of the Alberta Geological Survey (AGS) and Geological Survey of Canada (GSC) maps which are presented in the following figures:

- Sediment Thickness of Alberta map (Figure C1);
- Surficial Geology of Alberta Map (Figure C2); and
- Surficial Geology of Whitecourt Map (Figure C3).

The Sediment Thickness map (Figure C1) shows an approximate thickness of 6 m to 20 m of sediment deposit above the bedrock. Lighter shaded regions exist near the project area which indicate sediment thickness less than 5 m and is consistent with the findings of the bedrock topography map indicating the potential presence of exposed bedrock formations.

The Surficial Geology of Alberta map (Figure C2) shows that the project area is located near the division of the Moraine and Fluvial Deposit units. The Moraine unit is based in the Pleistocene period resulting from diamicton (till) deposition from glacial ice onto the subglacial landscape during a period of glacial ice movement. The till is a heterogeneous material composed of clay, silt, sand, and minor coarse aggregate content in addition to local lenses of glaciolacustrine and/or glaciofluvial sediment. The Fluvial Deposits are classified under the Holocene period and are sediments deposited via stream and river flows occurring in channels and overbank flows. These deposits can vary in the sorting and size of sand, gravel, silt, clay, and organic sediments. The physiographic region of the project area is classified as Southern Alberta Plains.

The Surficial Geology of Whitecourt map (Figure C3) was analyzed to confirm the findings from Figure C2 and it also indicates that the project area is located near the division of the Ground Moraine, Alluvium, and Colluvium. The topography of the area is classified as rolling to flat terrain which is confirmed by the findings of the site reconnaissance. Figure C3 also indicates the potential for bogs and marshes near the project area which includes the presence of saturated organic materials such as peat. Although the presence of bogs and smaller water bodies was not confirmed during the site reconnaissance, a large amount of saturated organic material was observed.

4.2 Bedrock Geology

The bedrock geology of the project area was determined through a review of the AGS and Alberta Research Council (ARC) maps which are presented in the following figures:

- Bedrock Geology of Alberta Map (Figure C4);
- Bedrock Topography of the Whitecourt Area Map (Figure C5); and
- Hydrogeological Map of Whitecourt (Figure C6).

The Bedrock Geology of Alberta Map (Figure C4) indicates that the project area is located within the Central Plains region with a bedrock composition of Paskapoo Formation which is described as recessively weathering grey mudstone and siltstone with bedded and cross-stratified sandstone as the major lithology. This formation is nonmarine and contains minor conglomerates, mollusc coquina, and coal inclusions.

The Bedrock Topography map (Figure C5) indicates a top of bedrock elevation greater than 914.4 m for the project area. Bedrock surface contour lines within the project area are limited and it can be estimated the top of bedrock is between 914.4 m and 975.4 m (the largest mapped contour line) however the available contour lines indicate these are approximated elevations. Based on the ground surface contour lines, the surface elevation can be estimated to be approximately 1067 m. Google Earth topographical data indicates ground surface elevations greater than 1096 m which may be impacted by the significant tree growth in the area. Using a minimum ground surface elevation of 1067 m and a conservative top of bedrock elevation of 975.5 m, the bedrock topography map indicates greater than 90 m of cover. An additional drift thickness map in Figure C5 indicates that 90 m of cover is likely conservative as the project area is classified under less than 15.2 m of drift thickness with the potential for exposed bedrock in some areas. Using information from both maps and the water well records presented in Section 4.3, shallow bedrock ranging from 21.3 m to the ground surface may be encountered.

The Hydrogeological Map of Whitecourt (Figure C6) confirmed the bedrock composition as Paskapoo Formation.

4.3 Water Well Records

Water well records for the project site were obtained using the publicly available Alberta Water Well Information Database Map developed by the Government of Alberta. Five water wells were identified within and adjacent to the project area as illustrated in Figure D1 and water well drilling reports are provided in Appendix D. A summary of the lithological descriptions is provided in Table 1.

Table 1: Water Well Record Summary

GIC Well ID	Total Depth Drilled (m)	Casing Depth (m)	Depth Below Ground Level (m)	Lithological Description (Unit)
1064214*	67.1	Surface Casing from 0.0 to 24.4 Well casing from 0 to 48.8 Perforations from 48.8 to 54.9	0.0 to 21.3 21.3 to 67.1	Sandy Clay Bentonitic Sandstone and Shale
1064215**	91.4	Surface Casing from 0.0 to 36.6 Well casing from 0.0 to 54.9 Perforations from 42.7 to 54.9	0.0 to 4.6 4.6 to 21.3 21.3 to 91.4	Clay and Gravel Clay Sandstone and Shale
396265	152.4	N/A	0.0 to 5.5 5.5 to 152.4	Clay Sandstone and Shale
396266	158.5	N/A	0.0 to 10.7 10.7 to 158.7	Till Sandstone and Shale
396267	67.1	N/A	0.0 to 10.7 10.7 to 67.1	Till Sandstone and Shale

* Yield test performed on 2002/11/27 indicated a static water level of 32.0 m at a water removal rate of 68.19 liters per minute
** Yield test performed on 2002/11/27 indicated a static water level of 32.0 m at a water removal rate of 59.10 liters per minute

Based on the drilling records above, bedrock was encountered at depths of approximately 5.5 m to 21.3 m below the existing grade. It appears the depth to bedrock is shallower in the southern and western areas compared northeast section of the project area.

5.0 SITE RECONNAISSANCE

A site reconnaissance was conducted on September 12, 2022, by Osama Javid (E.I.T) and Mohamed Mohamed of Tetra Tech. The purpose of this site visit was to determine the current conditions both along the perimeter and within the proposed project area and to assess the condition of the gravel access road. Observations were made to highlight any potential geotechnical concerns and risks related to the transportation of materials and equipment along the access road, and construction within the project area. The site reconnaissance was split into the following sections with photo location references provided in brackets:

- Northwest to northeast perimeter (Locations L-1 to L-10, Photos1-20);
- Northeast to southeast extent of project area (Locations L-10 to L-17, Photos 21-34);
- Southeast to northwest extent of project area (Locations L-17 to L-25, Photos 35-50); and
- Gravel access road (Locations R-1 to R-11, Photos 51-84).

Figures E1 and E2 are provided for reference in Appendix E. They present the photo locations and approximate route traversed during the site reconnaissance on a site plan.

The following observations were made during the walk along the northwest (L-1) to northeast (L-10) perimeter of the project area:

- Within the cutline the vegetation varies significantly. It includes short trees, mostly ranging from 5 ft to 7 ft in height, short shrubs up to ankle height, tall grasses up to 5 ft in height in some areas, trees bearing red berries, various flowers, weeds, and mushroom growth.
- The density of vegetation varies throughout; however, it can be predominantly described as dense to very dense in most areas along this perimeter with scattered fallen tree debris near the edge of the cutline.
- The trees adjacent to the cutline are approximately 30 ft in height or higher and have a significantly reduced quantity of foliage. These trees are likely dead remnants of previous tree clearing activities, and are likely to will fall in the future.
- Multiple species of trees were observed within and adjacent to the cutline which potentially include Aspen Poplar, Balsam Poplar, Alpine Fir, and Balsam Fir.
- Soft organic materials comprising peat and moss were identified at the surface in areas along the cutline. Generally, patches of moist to wet organic materials were found adjacent to shrub growth. In areas with fallen tree debris or surrounding tree stumps, saturated thick patches of moss up to 6 inches in depth were observed.
- The ground had uneven surface and typically sloped upwards towards the east and sloped downwards towards the northwest. The slope to the east varied in magnitude from approximately 10° to 20° and flattened in some areas.
- The terrain can be described as undulating with a typically moist ground surface. Some areas can be described as saturated, such as areas near moss growth, while others were very dry, such as areas near the northeast extent of the site.
- Some large gravel pieces and cobble-sized materials were observed adjacent to the cutline.
- Potential tracks from previous clearing activities were observed within the cutline and these localized depressions are up to 4 ft wide and 1 ft deep in some areas.

- An active water well pumping facility was observed at the northeast extent of the project area.

The following observations were made during the walk along the northeast (L-10) to southeast (L-17) extent of the project area:

- Within the project area the vegetation varies significantly and includes short trees mostly ranging from 10 ft to 15 ft in height, short shrubs up to ankle height, tall grass up to 4 ft in height in some areas, trees bearing red berries, various flowers, weeds, and mushroom growth.
- The vegetation was generally dense to very dense with some areas having less dense tree cover. Areas with less dense tree cover typically included an increase in fallen tree debris and organic material growth.
- Multiple species of trees were observed which potentially include Aspen Poplar, Balsam Poplar, Alpine Fir, and Balsam Fir.
- Soft organic materials comprising peat and moss were identified in some areas. Generally, very thick patches of saturated moss growth up to 1.5 ft in depth were observed in areas with fallen tree debris or surrounding tree stumps.
- The ground had uneven surface and typically sloped downwards towards the south to southwest direction with a magnitude of approximately 10° to 20° and flattened in some areas.
- The terrain can be described as undulating with a typically moist ground surface. Some areas can be described as saturated such as near moss growth while other areas were dry.
- The fallen tree debris was typically very dry material and broke into smaller pieces very easily when stepped on.
- An area with plant (unidentified) growth was identified near the southeast extent of the project area.
- Localized depressions ranging from 6 inches to 2 ft deep were observed throughout.

The following observations were made during the walk from the southeast (L-17) to northwest (L-25) extent of the project area:

- Within the project area the vegetation varies significantly which includes short trees mostly ranging from 10 ft to 15 ft in height, short shrubs up to 3 ft in height, short grasses up to ankle height, red berry trees, various flowers, weeds, and mushroom growth.
- The vegetation was generally dense to very dense with some areas with less dense tree cover. Areas with less dense tree cover typically included an increase in fallen tree debris and organic material growth.
- Multiple species of trees were observed which potentially include Aspen Poplar, Balsam Poplar, Alpine Fir, and Balsam Fir.
- Soft organic materials comprising peat and moss were identified in some areas. Generally, very thick patches of saturated moss growth up to 1.5 ft in depth were observed in areas with fallen tree debris or surrounding tree stumps.
- The ground surface was uneven and typically sloped downwards towards the north to northwest direction with a magnitude of approximately 10° to 20° and flattened in some areas. Near Location L-22 the ground surface was observed to have the greatest downward slope in the north direction of approximately 30°.
- The terrain can be described as undulating with a typically moist ground surface. Some areas can be described as saturated such as near moss growth while other areas were dry.

- The fallen tree debris was typically very dry material and broke into smaller pieces very easily when stepped on.

- Near Location L-22 blue posts were observed with a collection of tags which are assumed to be for a tree monitoring program. The blue posts were marked as property of Blue Ridge Lumber Inc. and at the time of the site visit, it is unclear whether this program is ongoing, as some tree trunks are still marked with blue paint.

The following observations were made during the drive along the gravel access road starting at the roadway intersection northwest of the project area (R-1) and ending at the intersection with Highway No. 32 (R-11). Table 2 below presents a summary of the roadway conditions including the road width, culverts, powerline offsets and crossing.

- The conditions of the gravel access road vary along the approximately 9.6 km length of the road. From Locations R-1 to R-5, the road conditions can be described as good with some small cracks observed. From Locations R-5 to R-8 the road conditions become visibly worse with more frequent larger cracks, small potholes, and ground rutting observed. The worst road conditions were observed at R-8 with large rutting up to 7 ft in width and 8 inches to 10 inches in depth. The road conditions were very good from R-9 to R-11 with minimal cracking observed.

- A roadside ditch composed of gravel materials was present along most areas of the gravel access road. This roadside ditch was very well-defined in some areas such as R-10 and contained small alligator cracks. Standing water in the roadside ditch was observed near the intersection at R-1; however, it can be described as dry in all other locations.

- The edges of the gravel access road contained side slopes which are intended to promote drainage away from the roadway surface. For areas along R-1 to R-2 and R-6 to R-7 these side slopes are very flat while R-3 to R-5 and R-8 to R-11 the side slopes are generally steeper and more well defined. The side slopes are steepest at R-5 and R-11 near the culvert locations and are approximated to be 1:1 (H: V) slope or flatter.

- The grade (elevation) of the access road varies significantly along the roadway length, and traffic signage for steep upslopes and downslopes was observed such as at Locations R-5 and R-9. Some sharp bends were observed in areas with steep side slopes such as near Locations R-5 and R-6.

- The width of the roadway varied significantly and is summarized in Table 2. Generally, the roadway can facilitate two-way traffic. However, in areas with steep side slopes and narrow roadway width, only one-way traffic would be expected for large vehicles.

- Several active pipeline pumping infrastructure and power transmission facilities were observed along the roadway length. These facilities were generally well offset from the main roadway and can be observed in the aerial imagery provided in Figure E2. Representative photographs for typical facilities are also provided in Photos 55 and 56.

- Several underground pipeline crossings were noted along the roadway length including crude oil, poison gas, flammable liquids, and high-pressure natural gas lines.

- A corrugated steel pipe culvert was observed under the roadway at Location R-5 with a diameter and cover of approximately 1.5 ft and 1 ft respectively. Both the inlet and outlet are unblocked, however, no flow was observed at the time of the visit. Scour was observed below the outlet and a channel approximately 6 inches in diameter conveyed flow to the main channel located downstream. Some standing water was observed in the main channel and some slope stabilization efforts were noted near the outlet.

- A PVC pipe culvert was observed near Location R-10, and it appeared the pipe had been destroyed. Washed sand material was observed at both the inlet and outlet and red tinted standing water near the inlet potentially indicates contamination in the area. The vegetation south of the outlet was distinct compared to the rest of the area and likely contains greater moisture because of seepage in the area. Another fully destroyed and buried culvert was observed further east with some small amounts of standing water noted.
- A large corrugated steel pipe culvert was observed near Location R-11 with at least a 10 ft cover under the roadway. The side slopes in this area were too steep to measure the culvert diameter and side slope angles. The inlet channel and outlet ponds were well-defined and active flow was observed at the time of the site visit.
- Transmission powerlines were observed adjacent to the roadway including several overhead crossings which are summarized in Table 2. The shortest overhead powerline crossings are estimated to be approximately 25 ft tall at Locations R-7 and R-8.
- An active construction site was observed near Location R-9 which is likely intended to replace old pipeline infrastructure in the area. A large pile of wooden rig mats was also observed which indicates large equipment movement historically along the gravel access road and above the buried pipeline infrastructure.

Table 2: Gravel Access Road Condition Summary

Location	Road Width (ft)	Horizontal Offset to Powerline (ft) [Direction]*	Overhead Powerline Crossing Height (ft)**	Culverts
R1	23	N/A	45	N/A
R2	19	N/A	N/A	N/A
R3	15	N/A	N/A	N/A
R4	12	23 [S]	N/A	N/A
R5	12	22 [E]	45	Corrugated steel pipe
R6	14	25 [N]	N/A	N/A
R7	16	6 [E]	25 (x2)	N/A
R8	12	10 [N]	25 (x2)	N/A
R9	18	20 [N]	40'	N/A
R10	21	30 [N]	N/A	Buried PVC pipe Damaged pipe (unknown material)
R11	29	25 [S]	45	Corrugated steel pipe

Notes:
* Offset distance represents the shortest offset found from the roadway to an adjacent powerline with the direction indicated in brackets.
** Approximate height of overhead powerline crossing estimated using the height of onsite personnel.

6.0 DISCUSSION

6.1 General

The geotechnical conclusions and commentary provided in this report are valid for the proposed project details discussed in Section 2.0, as understood by Tetra Tech at the time of this report's preparation. These geotechnical conclusions and commentary may require revision if the details are altered at a later stage of the project.

The following commentary is based on the interpretation of existing geological and publicly available information, which is provided for consideration and planning purposes, with the intent to identify areas of potential geotechnical concerns and to address project-specific design and construction issues arising from the desk study.

6.2 Areas of Potential Geotechnical Risk

Based on the review of data and findings presented in this report, several factors could exist within the project area and along the gravel road that could impact the proposed construction, including:

- Uneven terrain and poor drainage;
- Existing development near the site;
- Potential presence of surficial fill soils;
- Presence of peat, moss, and organic soils;
- Presence of soft and wet near-surface soils;
- Potential for highly plastic near-surface soils and the potential for soil swelling;
- Potential of rafted bedrock;
- Presence of a shallow groundwater table;
- Seeping and sloughing of subsurface soil;
- Potential for inadequate thickness of gravel along the road; and
- Presence of frost-susceptible soils.

The preliminary design(s) should take the uneven terrain into account. Significant cuts or fills may be required, which should be assessed in conjunction with the thickness of moss, organic soils, and any potential surficial fill. The extent and presence of any surficial fill soils and the high compressibility of moss or organic soils must be considered to limit post-construction movements of surface-supported structures.

Groundwater may be shallow, as wet conditions were observed at the surface at some locations during the site reconnaissance. Site grading plans should be developed with consideration to direct surface runoff to the edges of the site. Suggested site grades should be a minimum of 1% and preferably 2% to promote runoff.

Shallow foundations are not likely to be a suitable foundation type due to the presence and potential variability in the thickness of the fill and peat, sloughing conditions and groundwater seepage in excavations. Also the soils expected near the surface may not have adequate bearing capacity for the loads expected from the equipment and facilities. If shallow foundations are considered, the risks of post-construction settlement may be reduced by founding on native soils underlying the fill and peat, or on structural fill. All settlement-sensitive structures should be placed on piles.

Deep foundations such as conventional bored cast in place friction and end bearing piles are considered feasible within the project area. However, groundwater seepage and sloughing conditions may be encountered during drilling. Casing should be made available during pile construction to seal off zones where soil sloughs into pile bores. Alternatively, a continuous flight auger (CFA) pile installation method could be considered, which will eliminate the requirement for casing. For both installation methods, extending the piles into competent bedrock is recommended for heavier loads, with rock sockets within the bottom portions. However, piles based within the expected stiff clay till may be adequate for lighter statically loaded structures. The need for lateral pile capacity, the effects of pile groups, and dynamic foundation design will also need to be assessed. Site-specific drilling is required in order to confirm the most economically feasible foundation type.

Based on the desk study data, driven steel piles are considered technically feasible. Driven steel piles would be expected to encounter driving refusal in competent bedrock. Helical piles may be considered for any lightly loaded facilities which are not settlement sensitive. However, they are not recommended for moderately to heavily loaded structures nor for those subject to dynamic loading, due to the risk of excessive movements. The choice of foundation type will depend on the site-specific drilling expected during the detailed geotechnical investigation stage.

Although the existing gravel road generally appears in good condition in most areas, the thickness of the gravel overlying the subgrade is unknown. Acknowledging that heavy loads will be transported on the gravel road, adequate cover will be required over the subgrade soils to reduce rutting. The areas where deep rutting was observed along the access road may require remediation prior to transporting heavy loads. The cover over the culverts and specifically the pipelines under the gravel road will have to be assessed to confirm that the applied pressures will not adversely impact the pipelines.

The above assessments will establish whether the existing gravel road can be used to transport heavy loads which may only be possible when a pre-determined frost penetration has occurred and has been verified.

The existing road may require scarifying, compaction, and possible reworking or replacement of the near surface subgrade soils before placement of a gravel structure that will support the transportation of heavy loads. The extent of these requirements will be dependent on the consistency and strength of the subgrade.

7.0 RECOMMENDATIONS

The following recommendations are provided to address concerns presented in this geotechnical desktop study and to fill in data gaps identified in Section 4.0.

To better define the areas of potential risk identified above, a detailed geotechnical investigation (e.g., boreholes or probes, geophysical exploration) is recommended for the future stages of the project.

The intrusive investigation should be planned and implemented prior to or once the preliminary design(s) have been selected, to confirm subsurface conditions, determine the depth to competent bearing strata for foundations (clay till and bedrock), and geotechnical design parameters including but not limited to pile design and settlement. The investigation should also account for determining the thickness of the gravel along the existing road and the strength and consistency or relative density of the underlying soil. The installation of standpipe piezometers is also recommended to monitor groundwater elevations, and geotechnical laboratory testing should include strength testing on selected samples.

The investigation will require the clearing and mulching of vegetation within the project area. The clearing may require an environmental study and approvals such as a Temporary Field Authorization (TFA). The investigation may be required to be outside of nesting seasons, and due to the potential of soft and wet near-surface soils, it is recommended that the investigation occurs once frost penetration has occurred. Alternatively, the geotechnical investigation may require track-mounted drill rigs in unfrozen conditions.

To more accurately assess the condition of the gravel road that connects the site to Highway 32, an assessment using a Falling Weight Deflectometer (FWD) should be undertaken. This will provide an assessment of the current gravel road condition and what improvements would be required to provide adequate support for the traffic that will be imposed during construction.

8.0 CLOSURE

Tetra Tech trusts this geotechnical desktop study meets the present requirements of kîwetinohk Resources Corp. Tetra Tech would be pleased to provide further information that may be needed during design, and to advise on the geotechnical aspects of specifications for inclusion in the contract documents.

Should additional information be required, or to arrange review services, please contact the undersigned.

Tetra Tech Canada Inc.

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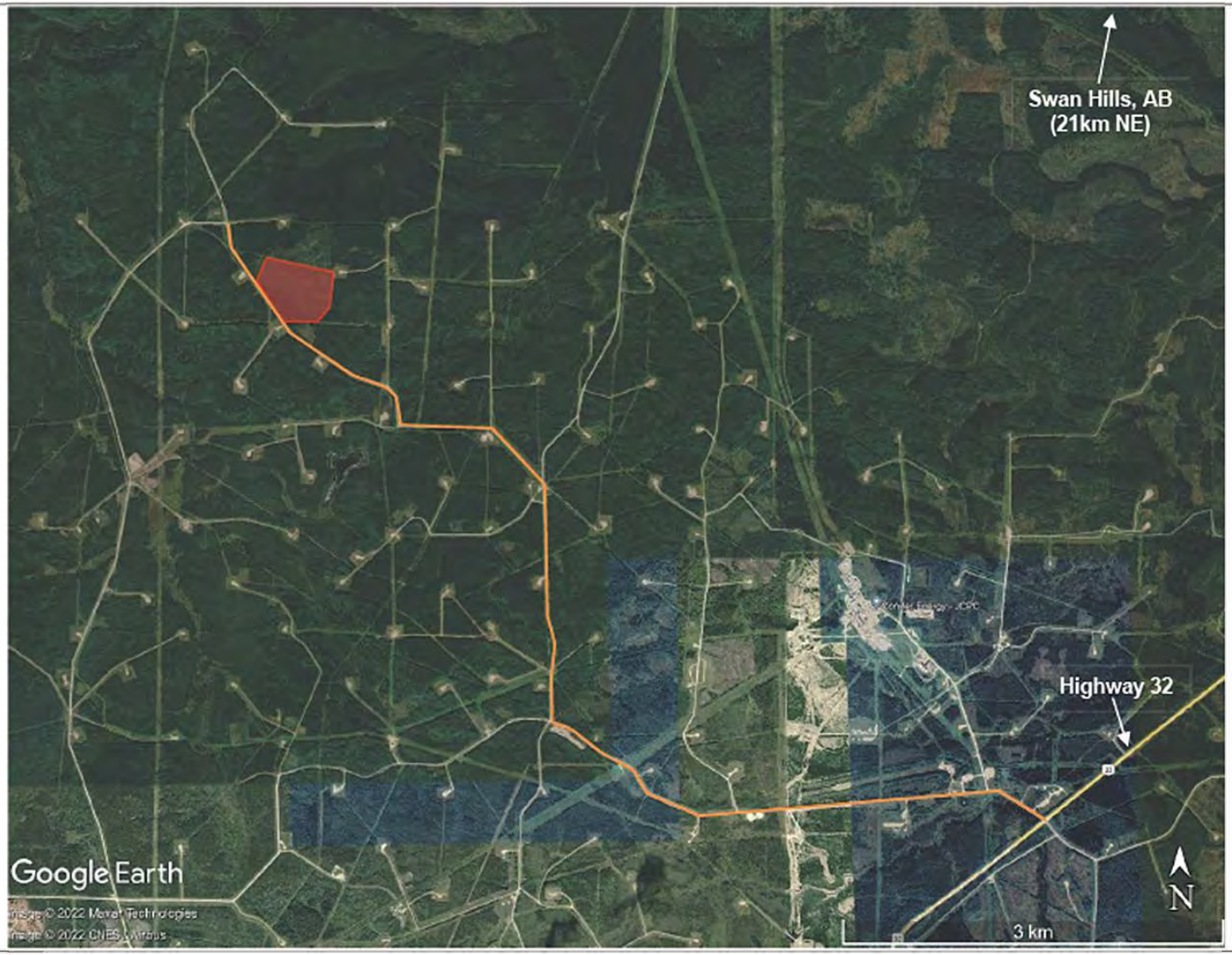
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FIGURE

Figure 1 Site Plan Showing Proposed Project Area



LEGEND

- Proposed Project Area
- Gravel Access Road

NOTES
-Imagery obtained from Google Earth (dated September 2018)

-Image scale produced by Google Earth

STATUS
ISSUED FOR REVIEW

CLIENT
kiwetinohk energy

TETRA TECH

Maskwa Geotechnical Desktop Study

Site Plan Showing Proposed Project Area

PROJECT NO.	DWN	CKD	APVD	REV
704-ENG.EGEO04132-01	OJ	VO		
OFFICE: EBA-EDM	DATE: September 14, 2022			

Figure 1

APPENDIX A
TETRA TECH'S LIMITATIONS ON THE USE OF THIS DOCUMENT

LIMITATIONS ON USE OF THIS DOCUMENT

GEOTECHNICAL

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The Client, and any Authorized Party, acknowledges that the Professional Document is based on limited data and that the conclusions, opinions, and recommendations contained in the Professional Document are the result of the application of professional judgment to such limited data.

The Professional Document is not applicable to any other sites, nor should it be relied upon for types of development other than those to which it refers. Any variation from the site conditions present, or variation in assumed conditions which might form the basis of design or recommendations as outlined in this document, at or on the development proposed as of the date of the Professional Document requires a supplementary exploration, investigation, and assessment.

TETRA TECH is neither qualified to, nor is it making, any recommendations with respect to the purchase, sale, investment or development of the property, the decisions on which are the sole responsibility of the Client.

1.7 ENVIRONMENTAL AND REGULATORY ISSUES

Unless stipulated in the report, TETRA TECH has not been retained to explore, address or consider and has not explored, addressed or considered any environmental or regulatory issues associated with development on the subject site.

1.8 NATURE AND EXACTNESS OF SOIL AND ROCK DESCRIPTIONS

Classification and identification of soils and rocks are based upon commonly accepted systems, methods and standards employed in professional geotechnical practice. This report contains descriptions of the systems and methods used. Where deviations from the system or method prevail, they are specifically mentioned.

Classification and identification of geological units are judgmental in nature as to both type and condition. TETRA TECH does not warrant conditions represented herein as exact, but infers accuracy only to the extent that is common in practice.

Where subsurface conditions encountered during development are different from those described in this report, qualified geotechnical personnel should revisit the site and review recommendations in light of the actual conditions encountered.

1.9 LOGS OF TESTHOLES

The testhole logs are a compilation of conditions and classification of soils and rocks as obtained from field observations and laboratory testing of selected samples. Soil and rock zones have been interpreted. Change from one geological zone to the other, indicated on the logs as a distinct line, can be, in fact, transitional. The extent of transition is interpretive. Any circumstance which requires precise definition of soil or rock zone transition elevations may require further investigation and review.

1.10 STRATIGRAPHIC AND GEOLOGICAL INFORMATION

The stratigraphic and geological information indicated on drawings contained in this report are inferred from logs of test holes and/or soil/rock exposures. Stratigraphy is known only at the locations of the test hole or exposure. Actual geology and stratigraphy between test holes and/or exposures may vary from that shown on these drawings. Natural variations in geological conditions are inherent and are a function of the historical environment. TETRA TECH does not represent the conditions illustrated as exact but recognizes that variations will exist. Where knowledge of more precise locations of geological units is necessary, additional exploration and review may be necessary.

1.11 PROTECTION OF EXPOSED GROUND

Excavation and construction operations expose geological materials to climatic elements (freeze/thaw, wet/dry) and/or mechanical disturbance which can cause severe deterioration. Unless otherwise specifically indicated in this report, the walls and floors of excavations must be protected from the elements, particularly moisture, desiccation, frost action and construction traffic.

1.12 SUPPORT OF ADJACENT GROUND AND STRUCTURES

Unless otherwise specifically advised, support of ground and structures adjacent to the anticipated construction and preservation of adjacent ground and structures from the adverse impact of construction activity is required.

1.13 INFLUENCE OF CONSTRUCTION ACTIVITY

Construction activity can impact structural performance of adjacent buildings and other installations. The influence of all anticipated construction activities should be considered by the contractor, owner, architect and prime engineer in consultation with a geotechnical engineer when the final design and construction techniques, and construction sequence are known.

1.14 OBSERVATIONS DURING CONSTRUCTION

Because of the nature of geological deposits, the judgmental nature of geotechnical engineering, and the potential of adverse circumstances arising from construction activity, observations during site preparation, excavation and construction should be carried out by a geotechnical engineer. These observations may then serve as the basis for confirmation and/or alteration of geotechnical recommendations or design guidelines presented herein.

1.15 DRAINAGE SYSTEMS

Unless otherwise specified, it is a condition of this report that effective temporary and permanent drainage systems are required and that they must be considered in relation to project purpose and function. Where temporary or permanent drainage systems are installed within or around a structure, these systems must protect the structure from loss of ground due to mechanisms such as internal erosion and must be designed so as to assure continued satisfactory performance of the drains. Specific design details regarding the geotechnical aspects of such systems (e.g. bedding material, surrounding soil, soil cover, geotextile type) should be reviewed by the geotechnical engineer to confirm the performance of the system is consistent with the conditions used in the geotechnical design.

1.16 DESIGN PARAMETERS

Bearing capacities for Limit States or Allowable Stress Design, strength/stiffness properties and similar geotechnical design parameters quoted in this report relate to a specific soil or rock type and condition. Construction activity and environmental circumstances can materially change the condition of soil or rock. The elevation at which a soil or rock type occurs is variable. It is a requirement of this report that structural elements be founded in and/or upon geological materials of the type and in the condition used in this report. Sufficient observations should be made by qualified geotechnical personnel during construction to assure that the soil and/or rock conditions considered in this report in fact exist at the site.

1.17 SAMPLES

TETRA TECH will retain all soil and rock samples for 30 days after this report is issued. Further storage or transfer of samples can be made at the Client's expense upon written request, otherwise samples will be discarded.

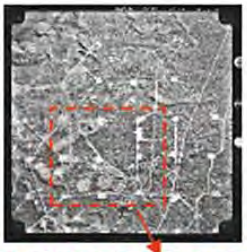
1.18 APPLICABLE CODES, STANDARDS, GUIDELINES & BEST PRACTICE

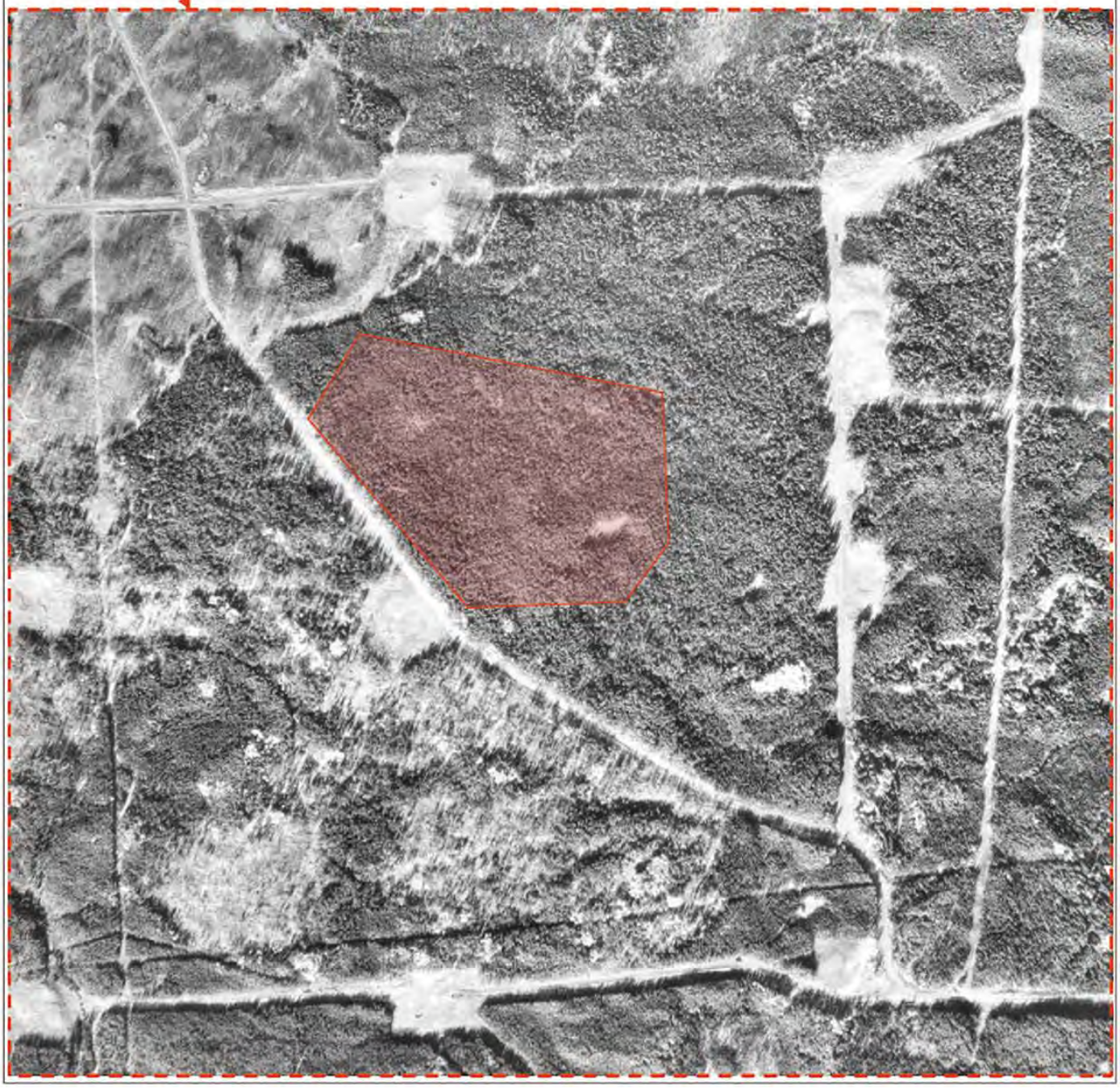
This document has been prepared based on the applicable codes, standards, guidelines or best practice as identified in the report. Some mandated codes, standards and guidelines (such as ASTM, AASHTO Bridge Design/Construction Codes, Canadian Highway Bridge Design Code, National/Provincial Building Codes) are routinely updated and corrections made. TETRA TECH cannot predict nor be held liable for any such future changes, amendments, errors or omissions in these documents that may have a bearing on the assessment, design or analyses included in this report.

APPENDIX B
HISTORICAL AERIAL PHOTOGRAPHS

Figure B1 1971 Aerial Photograph
Figure B2 1978 Aerial Photograph
Figure B3 1991 Aerial Photograph
Figure B4 1994 Aerial Photograph
Figure B5 2005 Aerial Photograph

Original Aerial Photograph (1:21,210)





LEGEND

Approximate Project Area

NOTES
-Imagery obtained from Alberta Air Photo Library

-Imagery is enlarged to show features (not to scale)

STATUS
ISSUED FOR REVIEW

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Maskwa Geotechnical Desktop Study

1971 Aerial Photograph

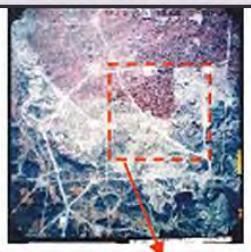
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704-ENG.EGED04132-01	CJ	VO		

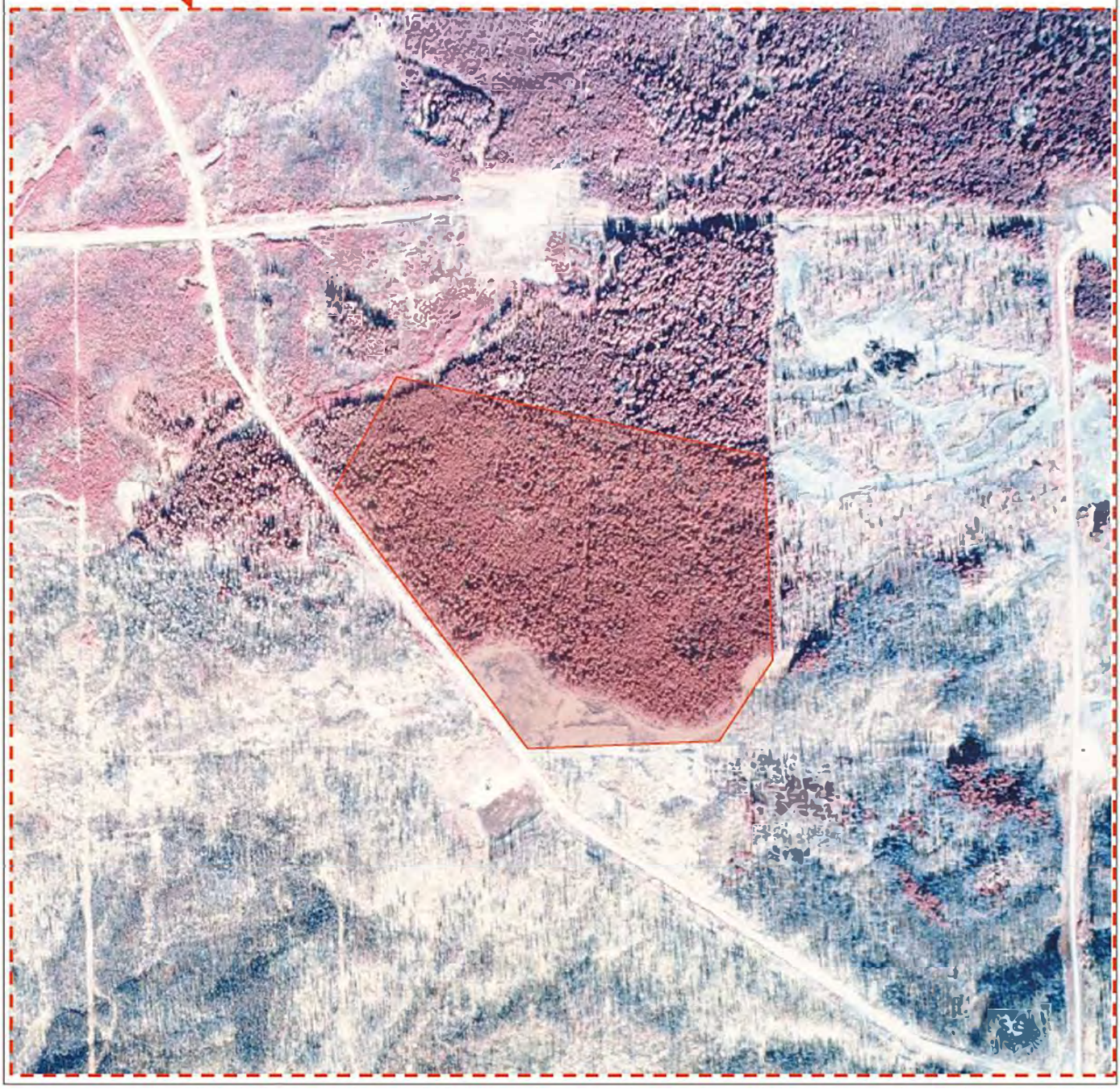
OFFICE: EBA-EDM

DATE: September 14, 2022

Figure B1

Original Aerial Photograph (1:15,000)





LEGEND

Approximate Project Area

NOTES

-Imagery obtained from Alberta Air Photo Library

-Imagery is enlarged to show features (not to scale)

STATUS

ISSUED FOR REVIEW

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TETRA TECH

Maskwa Geotechnical Desktop Study

1978 Aerial Photograph

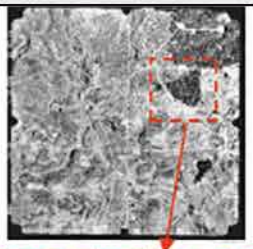
PROJECT NO.	DWN	CKD	APVD	REV
704-ENG.EGED04132-01	CJ	VO		

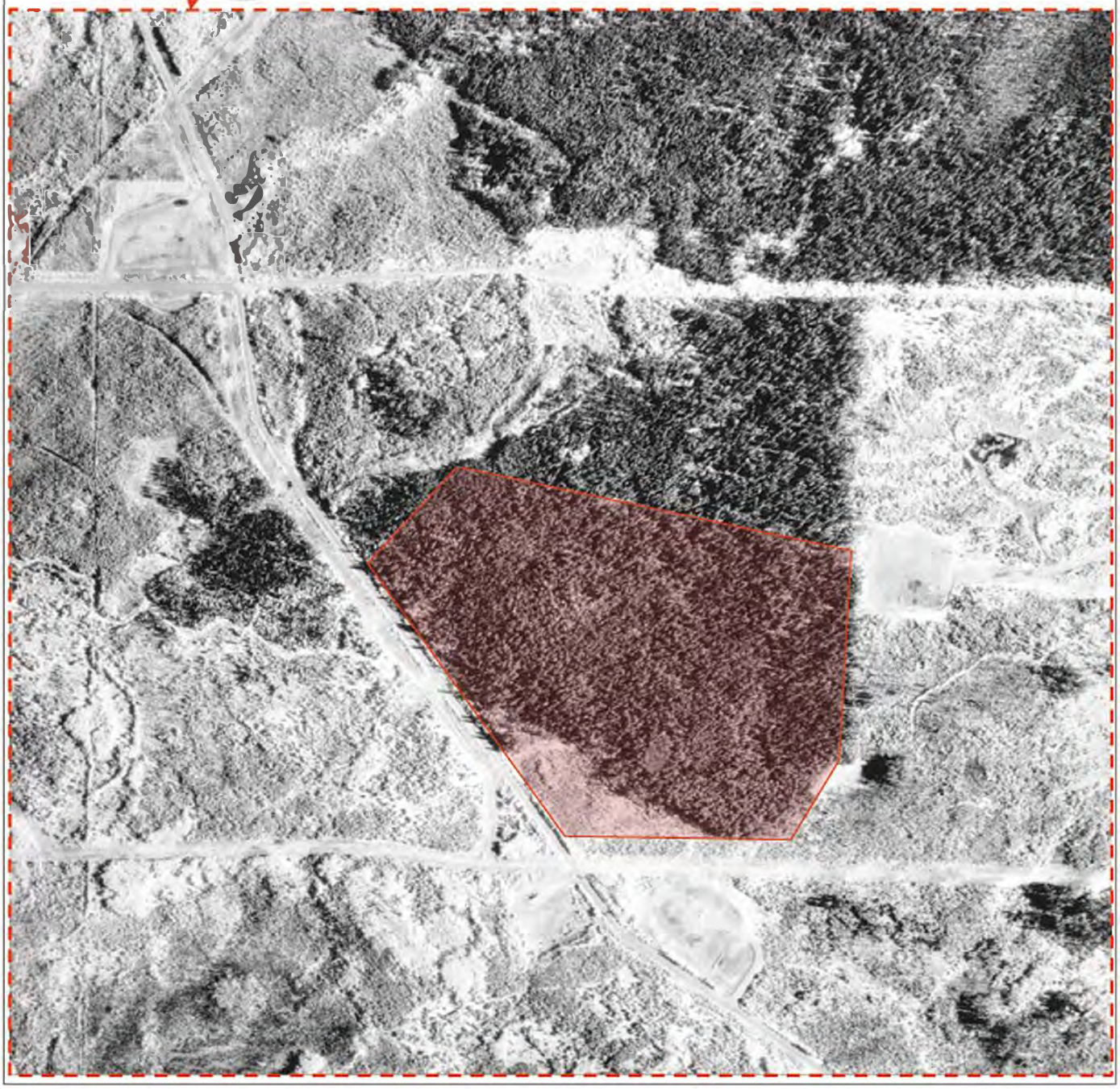
OFFICE: EBA-EDM

DATE: September 14, 2022

Figure B2

Original Aerial Photograph (1:20,000)





LEGEND

Approximate Project Area

NOTES

-Imagery obtained from Alberta Air Photo Library

-Imagery is enlarged to show features (not to scale)

STATUS

ISSUED FOR REVIEW

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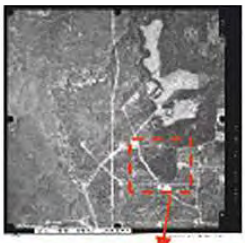
1991 Aerial Photograph

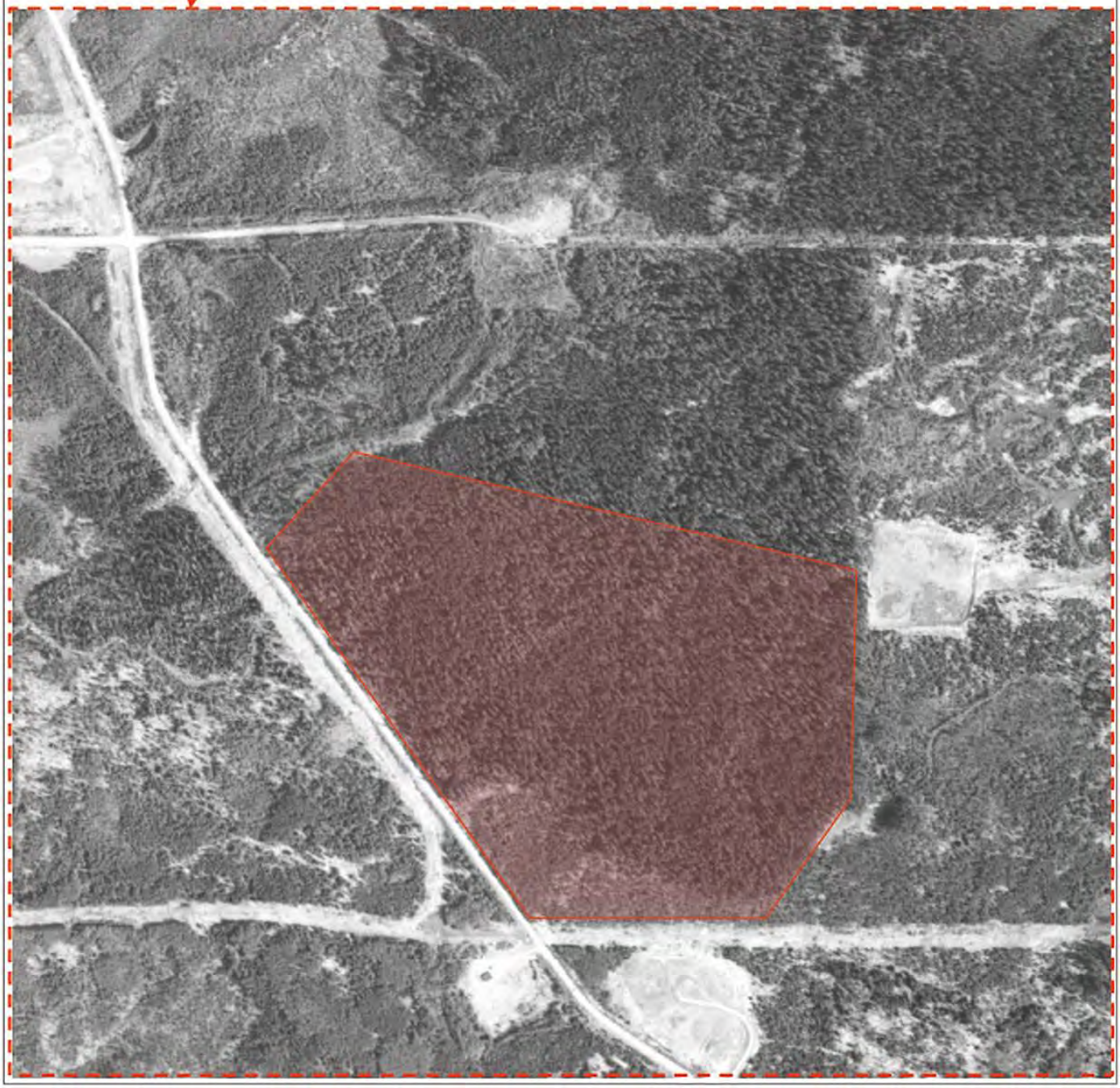
PROJECT NO.	DWN	CKD	APVD	REV
704-ENG.EGED04132-01	CJ	VO		

OFFICE	DATE
EBA-EDM	September 14, 2022

Figure B3

Original Aerial Photograph (1:20,000)





LEGEND

Approximate Project Area

NOTES

-Imagery obtained from Alberta Air Photo Library

-Imagery is enlarged to show features (not to scale)

STATUS

ISSUED FOR REVIEW

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TETRA TECH

Maskwa Geotechnical Desktop Study

1994 Aerial Photograph

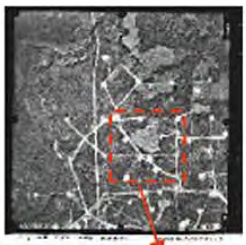
PROJECT NO.	DWN	CKD	APVD	REV
704-ENG.EGED04132-01	CJ	VO		

OFFICE: EBA-EDM

DATE: September 14, 2022

Figure B4

Original Aerial Photograph (1:20,000)





LEGEND

Approximate Project Area

NOTES
-Imagery obtained from Alberta Air Photo Library

-Imagery is enlarged to show features (not to scale)

STATUS
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Maskwa Geotechnical Desktop Study

2005 Aerial Photograph

PROJECT NO.	DWN	CKD	APVD	REV
704-ENG.EGED04132-01	CJ	VO		

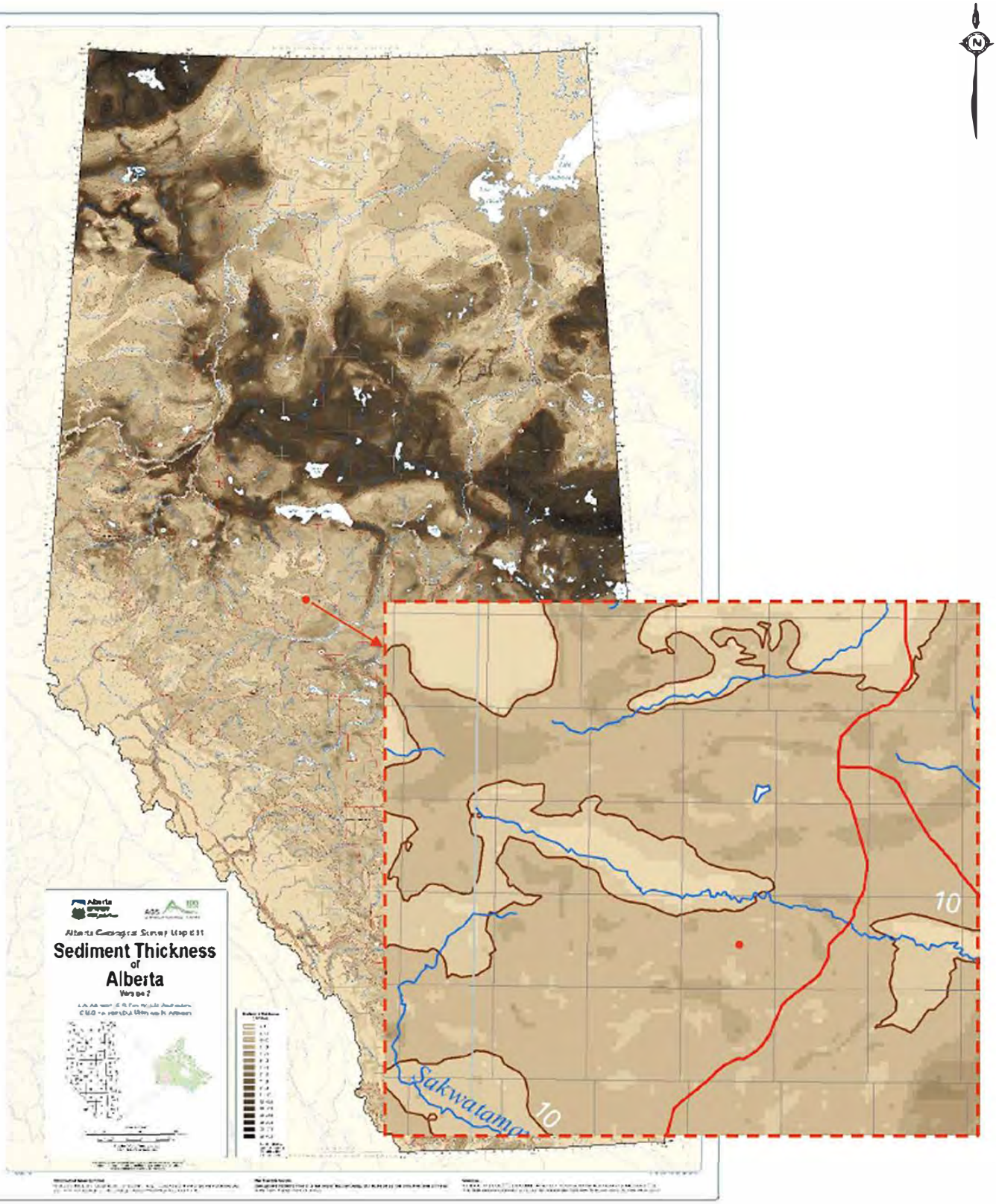
OFFICE: EBA-EDM

DATE: September 14, 2022

Figure B5

APPENDIX C
GEOLOGICAL MAPS

Figure C1 Sediment Thickness of Alberta Map
Figure C2 Surficial Geology of Alberta Map
Figure C3 Surficial Geology of Whitecourt Map
Figure C4 Bedrock Geology of Alberta Map
Figure C5 Bedrock Topography of the Whitecourt Area Map
Figure C6 Hydrogeological Map of Whitecourt



LEGEND

- Approximate Location of Project Area

Sediment Thickness (metres)

- 0 - 5
- 6 - 10
- 11 - 20
- 21 - 30

NOTES

- Map obtained from Alberta Geological Survey (Map 611)
- Imagery is enlarged to show project area (not to scale)

STATUS
ISSUED FOR REVIEW

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Maskwa Geotechnical Desktop Study

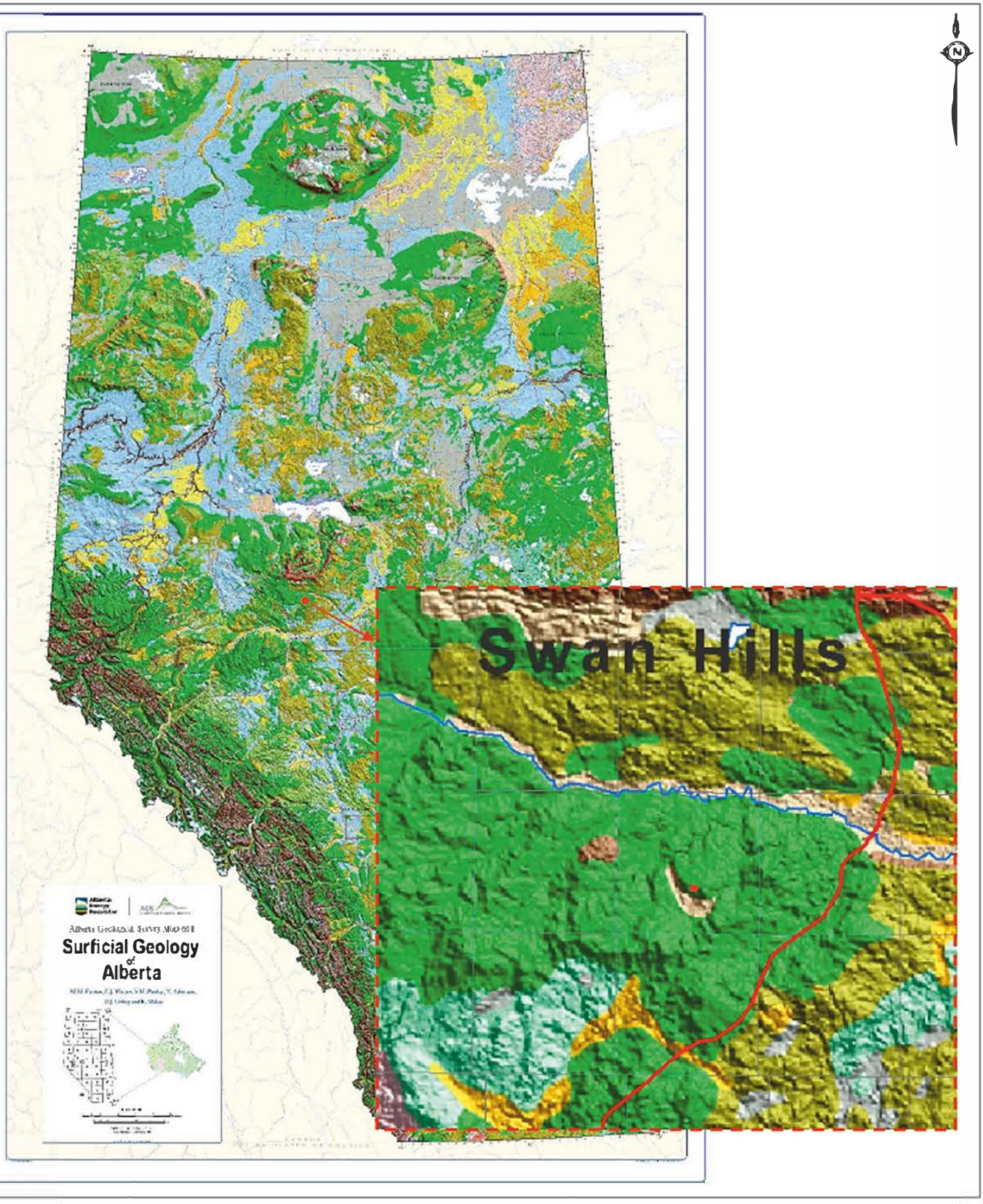
Sediment Thickness of Alberta Map

PROJECT NO.	DWN	CKD	APVD	REV
704-ENG.EGED04132-01	CJ	VO		

OFFICE: EBA-EDM

DATE: September 14, 2022

Figure C1



LEGEND

- Approximate Location of Project Area
- Pleistocene
- Holocene

NOTES
-Map obtained from Alberta Geological Survey (Map 601)
-Imagery is enlarged to show project area (not to scale)

STATUS
ISSUED FOR REVIEW

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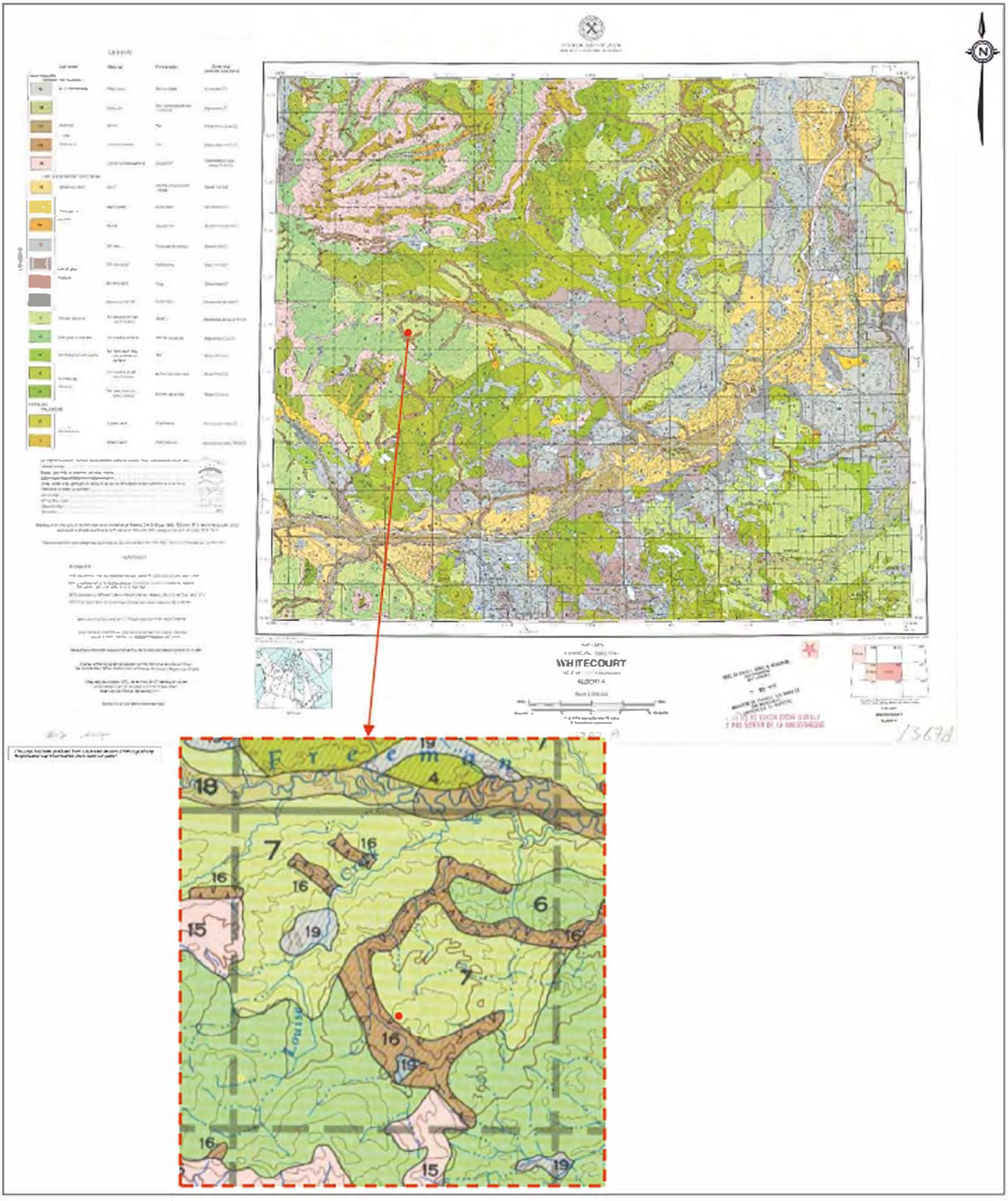
Maskwa Geotechnical Desktop Study

Surficial Geology of Alberta Map

PROJECT NO.	DWN	CKD	APVD	REV
704-ENG.EGE00413201-01	OJ	VO		

OFFICE: EBA-EDM
DATE: September 14, 2022

Figure C2



LEGEND

Approximate Location of Project Area

NOTES

-Map obtained from Geological Survey of Canada (Map 1367A)

-Imagery is enlarged to show project area (not to scale)

STATUS
ISSUED FOR REVIEW

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TETRA TECH

Maskwa Geotechnical Desktop Study

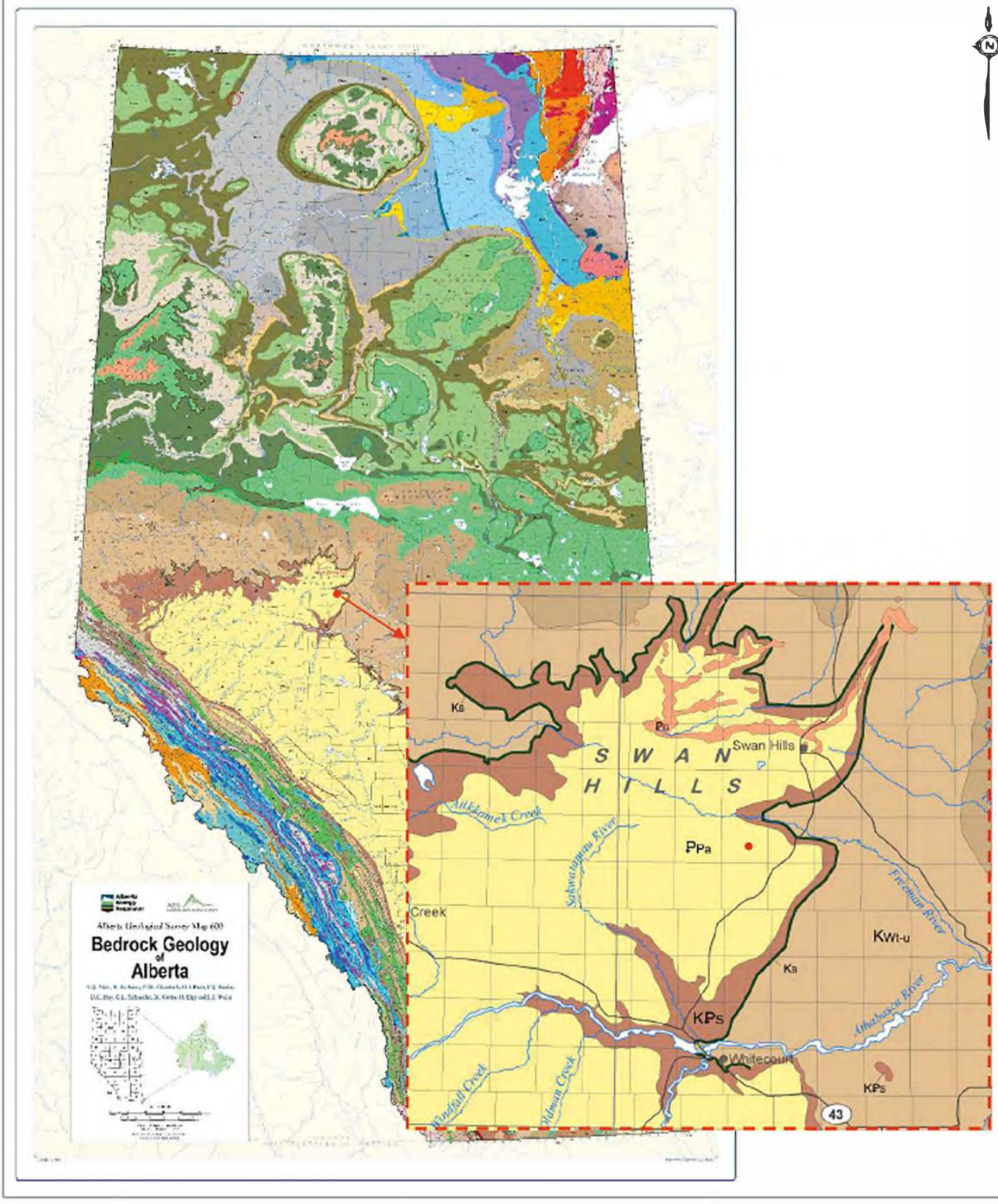
Surficial Geology of Whitecourt Map

PROJECT NO.	DWN	CKD	APVD	REV
704-ENG.EGED04132-01	CJ	VO		

OFFICE: EBA-EDM

DATE: September 14, 2022

Figure C3



LEGEND

- Approximate Location of Project Area

Central Plains

NOTES

-Map obtained from Alberta Geological Survey (Map 600)

-Imagery is enlarged to show project area (not to scale)

STATUS
ISSUED FOR REVIEW

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Maskwa Geotechnical Desktop Study

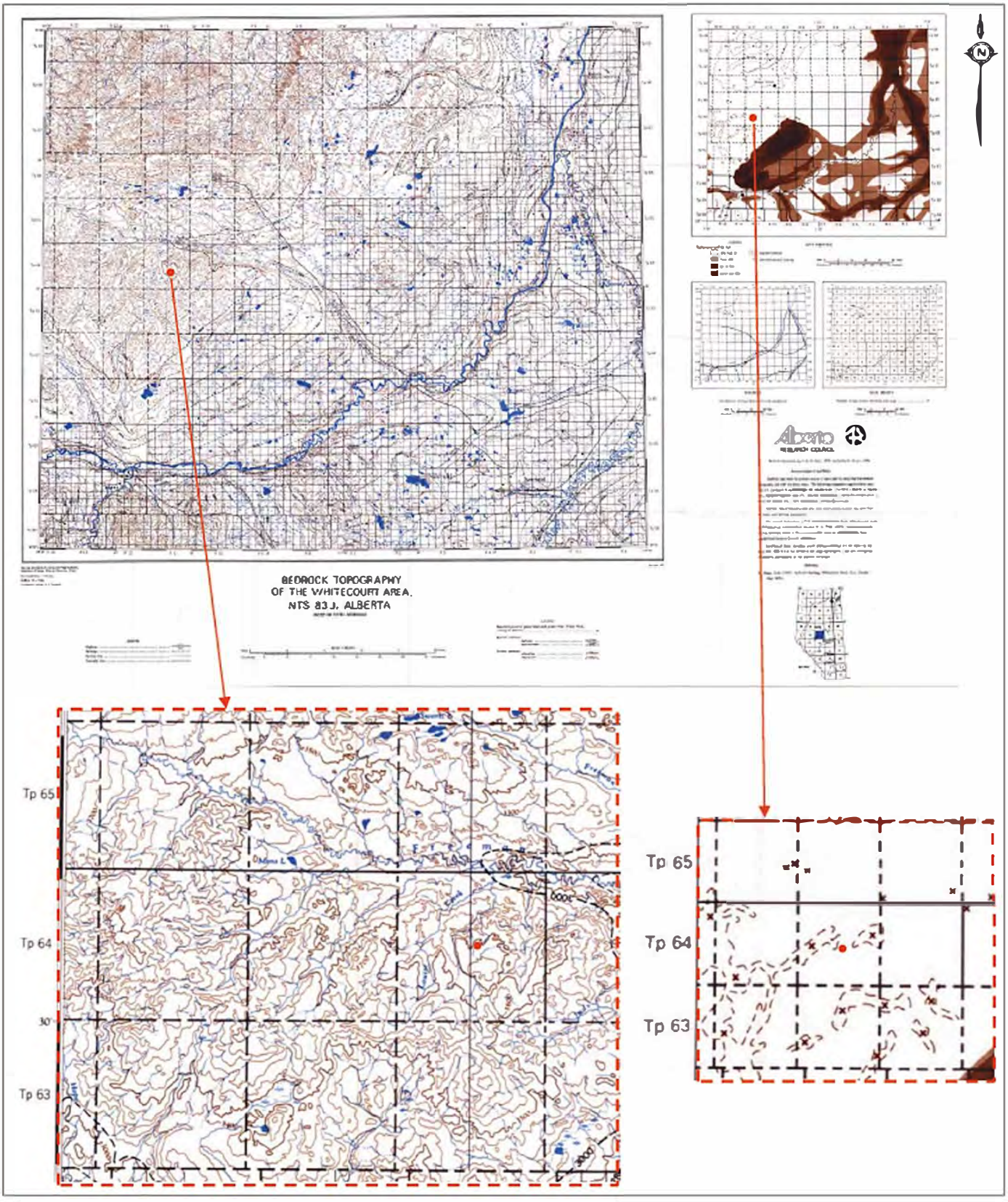
Bedrock Geology of Alberta Map

PROJECT NO.	DWN	CKD	APVD	REV
704-ENG.EGED04132-01	CJ	VO		

OFFICE
EBA-EDM

DATE
September 14, 2022

Figure C4



LEGEND

Approximate Location of Project Area

NOTES

- Map obtained from Alberta Research Council
- Imagery is enlarged to show project area (not to scale)

STATUS
ISSUED FOR REVIEW

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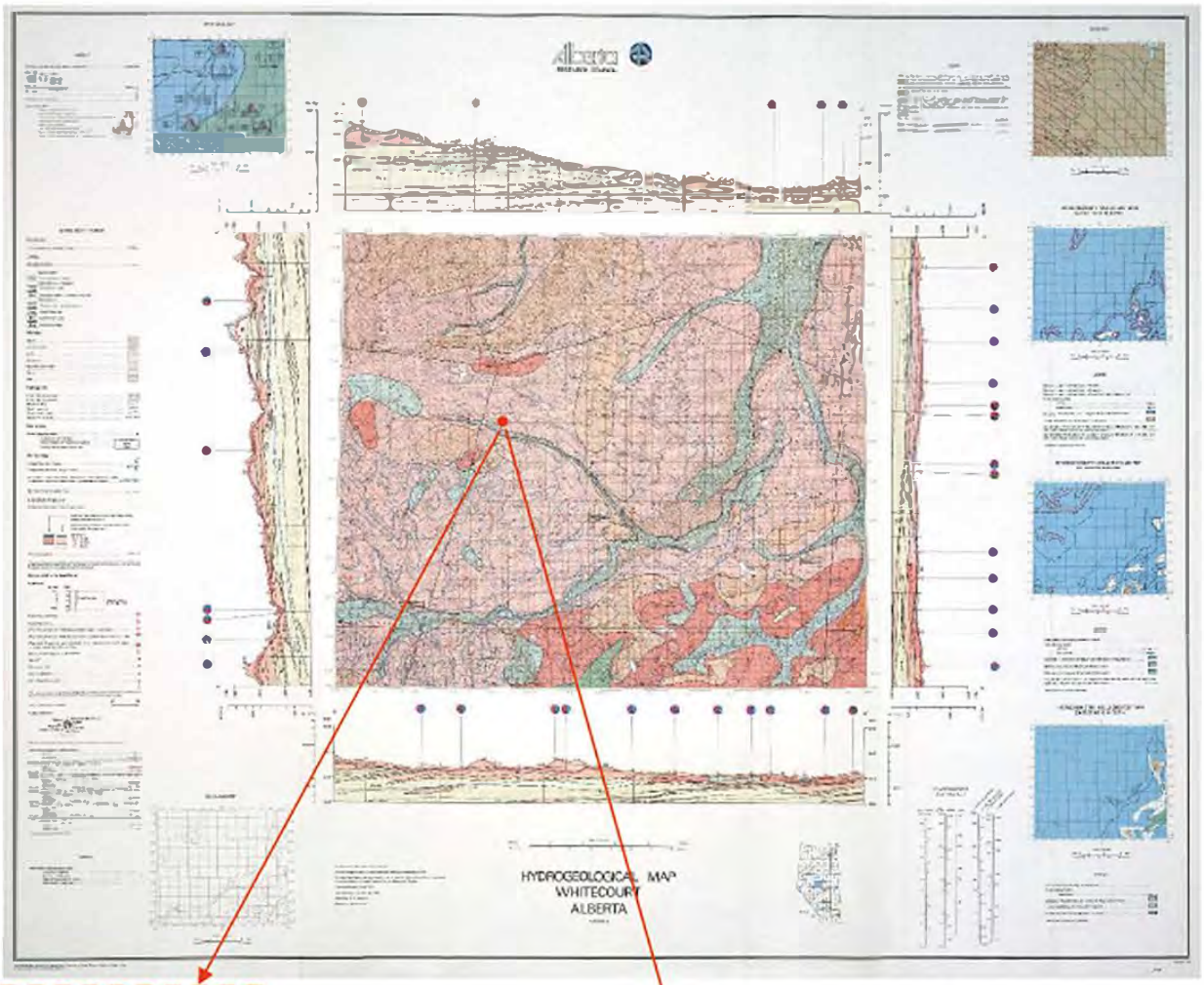
Maskwa Geotechnical Desktop Study

Bedrock Topography of The Whitecourt Area Map

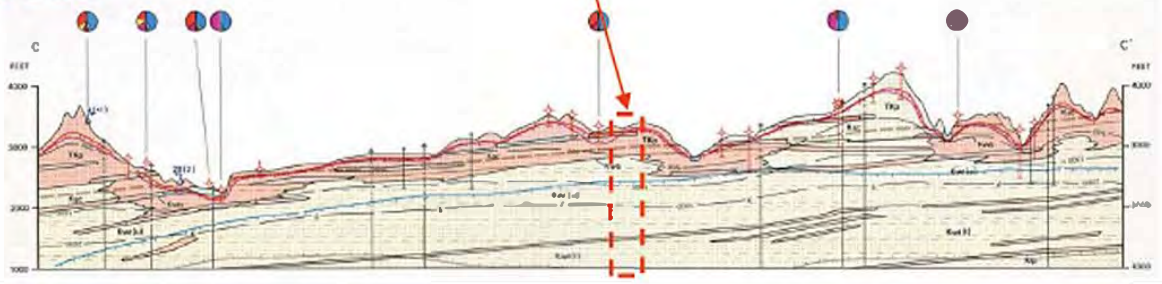
PROJECT NO.	DWN	CKD	APVD	REV
704-ENG.EGED04132-01	CJ	VO		

OFFICE	DATE
EBA-EDM	September 14, 2022

Figure C5







LEGEND

Approximate Location of Project Area



NOTES

-Map obtained from Alberta Research Council

-Imagery is enlarged to show project area (not to scale)

STATUS
ISSUED FOR REVIEW

CLIENT
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TETRA TECH

Maskwa Geotechnical Desktop Study

Hydrogeological Map of Whitecourt

PROJECT NO.	DWN	CKD	APVD	REV
704-ENG.EGS00413201-01	CJ	VO		

OFFICE	DATE
EBA-EDM	September 14, 2022

Figure C6

APPENDIX D
WATER WELL RECORDS

Figure D1 Site Plan Showing Water Well Locations

Record No.1 Water Well Drilling Report ID No. 1064214
Record No.2 Water Well Drilling Report ID No. 1064215
Record No.3 Water Well Drilling Report No. 396265
Record No.4 Water Well Drilling Report No. 396266
Record No.5 Water Well Drilling Report No. 396267



LEGEND

- Proposed Project Area
- Water Well Location

NOTES
-Imagery obtained from Alberta Water Well Information Database
-Image not to scale

STATUS
ISSUED FOR REVIEW

CLIENT
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Maskwa Geotechnical Desktop Study

Site Plan Showing Water Well Locations

PROJECT NO.	DWN	CKD	APVD	REV
704-ENG.MGE004132-01	CJ	VO		
OFFICE: EBA-EDM	DATE: September 14, 2022			

Figure D1

Water Well Drilling Report

View in Metric | Export to Excel

The driller supplies the data contained in this report. The Province disclaims responsibility for its accuracy. The information on this report will be retained in a public database.

GOWN ID

GIC Well ID 1064214
GOA Well Tag No.
Drilling Company Well ID
Date Report Received

Well Identification and Location

Measurement in Imperial

Owner Name	Address	Town	Province	Country	Postal Code
PENGROWTH (NABORS #12)	P.O. BOX 390	SWAN HILLS	AB	CA	T0G 2C0

Location	1/4 or LSD	SEC	TWP	RGE	W of MER	Lot	Block	Plan	Additional Description
	B	15	64	11	5				RIG WELL

Measured from Boundary of
ft from
ft from

GPS Coordinates in Decimal Degrees (NAD 83)
Latitude 54.535910 Longitude -115.568190
How Location Obtained
Not Verified

Elevation ft
How Elevation Obtained
Not Obtained

Drilling Information

Method of Drilling
Rotary

Proposed Well Use
Industrial

Type of Work
Existing Well-Decommissioned

Plugged 2003/01/14
Plugged with Bentonite Product
Amount

Formation Log

Measurement in Imperial

Depth from ground level (ft)	Water Bearing	Lithology Description
30.00		Brown Sandy Clay
70.00		Brown See Comments Clay
95.00		Gray Shale
160.00		Gray Bentonitic Sandstone
220.00		Gray See Comments Shale

Yield Test Summary

Measurement in Imperial

Recommended Pump Rate 13.00 igpm

Test Date	Water Removal Rate (igpm)	Static Water Level (ft)
2002/11/27	13.00	105.00

Well Completion

Measurement in Imperial

Total Depth Drilled	Finished Well Depth	Start Date	End Date
220.00 ft		2002/11/27	2002/11/27

Borehole

Diameter (in)	From (ft)	To (ft)
5.00	0.00	220.00

Surface Casing (if applicable)
Steel
Size OD : 5.56 in
Wall Thickness : 0.258 in
Bottom at : 80.00 ft

Well Casing/Liner
Steel
Size OD : 4.50 in
Wall Thickness : 0.237 in
Top at : 0.00 ft
Bottom at : 160.00 ft

Perforations

From (ft)	To (ft)	Diameter or Slot Width (in)	Slot Length (in)	Hole or Slot Interval (in)
160.00	180.00	0.375		0.38

Perforated by Torch

Annular Seal Driven
Placed from 0.00 ft to 80.00 ft
Amount

Other Seals

Type	At (ft)

Screen Type
Size OD : in

From (ft)	To (ft)	Slot Size (in)

Attachment
Top Fittings
Bottom Fittings

Pack
Type Unknown
Grain Size
Amount Unknown

Contractor Certification

Name of Journeyman responsible for drilling/construction of well
KRIS SCHINDEL

Certification No
40628A

Company Name
ALKEN BASIN DRILLING LTD.

Copy of Well report provided to owner
Date approval holder signed

Water Well Drilling Report

View in Metric | Export to Excel

The driller supplies the data contained in this report. The Province disclaims responsibility for its accuracy. The information on this report will be retained in a public database.

GIC Well ID 1064214
GOA Well Tag No.
Drilling Company Well ID
Date Report Received

GOWN ID

Well Identification and Location

Measurement in Imperial

Owner Name	Address	Town	Province	Country	Postal Code
PENGROWTH (NABORS #12)	P.O. BOX 3 90	SWAN HILLS	AB	CA	T0G 2C0

Location	1/4 or LSD	SEC	TWP	RGE	W of MER	Lot	Block	Plan	Additional Description
	8	15	64	11	5				RIG WELL

Measured from Boundary of
ft from
ft from

GPS Coordinates In Decimal Degrees (NAD 83)
Latitude 54.535910 Longitude -115.568190
How Location Obtained
Not Verified

Elevation ft
How Elevation Obtained
Not Obtained

Additional Information

Measurement in Imperial

Distance From Top of Casing to Ground Level 36.00 in
Is Artesian Flow
Rate igpm
Is Flow Control Installed
Describe

Recommended Pump Rate 13.00 igpm
Recommended Pump Intake Depth (From TOC) 160.00 ft
Pump Installed Yes Depth ft
Type SUB @ 160' Make GOULDS H.P. 3
Model (Output Rating)

Did you Encounter Saline Water (>4000 ppm TDS) Depth ft
Gas Depth ft
Remedial Action Taken
Well Disinfected Upon Completion
Geophysical Log Taken
Submitted to ESRD

Sample Collected for Potability Submitted to ESRD

Additional Comments on Well

LITHOLOGY 30' - 70' CLAY BROWN SILTY STRINGERS, 160' - 220' SHALE GRY SILTY STRINGERS, MATERIALS USED TO RECLAIM WELL - CEMENT & BENTONITE PRODUCT.

Yield Test

Taken From Ground Level
Depth to water level

Measurement in Imperial

Test Date 2002/11/27
Start Time 12:00 AM
Static Water Level 105.00 ft

Method of Water Removal
Type Unknown
Removal Rate 13.0 igpm
Depth Withdrawn From 220.00 ft

If water removal period was < 2 hours, explain why
DRILL PIPE IN HOLE

Pumping (ft)	Elapsed Time Minutes:Sec	Recovery (ft)
	0:00	220.00
	1:00	203.00
	2:00	190.00
	3:00	177.00
	4:00	163.00
	5:00	150.00
	6:00	140.00
	7:00	132.00
	8:00	125.00
	9:00	119.00
	10:00	115.00
	12:00	110.00
	14:00	107.00
	16:00	105.00
	20:00	105.00
	25:00	105.00
	30:00	105.00
	35:00	105.00
	40:00	105.00
	50:00	105.00
	60:00	105.00
	75:00	105.00
	90:00	105.00
	105:00	105.00
	120:00	105.00

Water Diverted for Drilling

Water Source	Amount Taken	Diversion Date & Time
	ig	

Contractor Certification

Name of Journeyman responsible for drilling/construction of well
KRIS SCHINDEL

Certification No
40628A

Company Name
ALKEN BASIN DRILLING LTD.

Copy of Well report provided to owner

Date approval holder signed

Water Well Drilling Report

View in Metric | Export to Excel

The driller supplies the data contained in this report. The Province disclaims responsibility for its accuracy. The information on this report will be retained in a public database.

GOWN ID

GIC Well ID 1064215
GOA Well Tag No.
Drilling Company Well ID
Date Report Received

Well Identification and Location

Measurement in Imperial

Owner Name	Address	Town	Province	Country	Postal Code
PENGROWTH (NABORS #12)	P.O. BOX 390	SWAN HILLS	AB	CA	T0G 2C0

Location	1/4 or LSD	SEC	TWP	RGE	W of MER	Lot	Block	Plan	Additional Description
	B	15	64	11	5				RIG WELL

Measured from Boundary of
ft from
ft from

GPS Coordinates in Decimal Degrees (NAD 83)
Latitude 54.535910 Longitude -115.568190
How Location Obtained
Not Verified

Elevation ft
How Elevation Obtained
Not Obtained

Drilling Information

Method of Drilling
Rotary

Proposed Well Use
Industrial

Type of Work
Existing Well-Decommissioned

Plugged 2003/01/14
Plugged with Bentonite Product
Amount

Formation Log

Measurement in Imperial

Depth from ground level (ft)	Water Bearing	Lithology Description
15.00		Brown Clay & Rocks
70.00		Brown See Comments
100.00		Gray See Comments
115.00		Gray Bentonitic Sandstone
140.00		Gray See Comments
300.00		Gray See Comments

Yield Test Summary

Measurement in Imperial

Recommended Pump Rate 15.00 igpm

Test Date	Water Removal Rate (igpm)	Static Water Level (ft)
2002/11/27	15.00	105.00

Well Completion

Measurement in Imperial

Total Depth Drilled	Finished Well Depth	Start Date	End Date
300.00 ft		2002/11/26	2002/11/27

Borehole

Diameter (in)	From (ft)	To (ft)
5.50	0.00	300.00

Surface Casing (if applicable)
Steel
Size OD : 5.56 in
Wall Thickness : 0.258 in
Bottom at : 120.00 ft

Well Casing/Liner
Steel
Size OD : 5.56 in
Wall Thickness : 0.237 in
Top at : 0.00 ft
Bottom at : 180.00 ft

Perforations

From (ft)	To (ft)	Diameter or Slot Width (in)	Slot Length (in)	Hole or Slot Interval (in)
140.00	180.00	0.375		0.38

Perforated by Torch

Annular Seal Driven & Bentonite
Placed from 0.00 ft to 120.00 ft
Amount

Other Seals

Type	At (ft)

Screen Type
Size OD : in

From (ft)	To (ft)	Slot Size (in)

Attachment
Top Fittings
Bottom Fittings

Pack
Type Unknown
Grain Size
Amount Unknown

Contractor Certification

Name of Journeyman responsible for drilling/construction of well
KRIS SCHINDEL

Certification No
40628A

Company Name
ALKEN BASIN DRILLING LTD.

Copy of Well report provided to owner
Date approval holder signed

Water Well Drilling Report

View in Metric | Export to Excel

The driller supplies the data contained in this report. The Province disclaims responsibility for its accuracy. The information on this report will be retained in a public database.

GIC Well ID 1064215
GOA Well Tag No.
Drilling Company Well ID
Date Report Received

GOWN ID

Well Identification and Location

Measurement in Imperial

Owner Name	Address	Town	Province	Country	Postal Code
PENGROWTH (NABORS #12)	P.O. BOX 390	SWAN HILLS	AB	CA	T0G 2C0

Location	1/4 or LSD	SEC	TWP	RGE	W of MER	Lot	Block	Plan	Additional Description
	8	15	64	11	5				RIG WELL

Measured from Boundary of
ft from
ft from

GPS Coordinates In Decimal Degrees (NAD 83)
Latitude 54.535910 Longitude -115.568190
How Location Obtained: Not Verified

Elevation ft
How Elevation Obtained: Not Obtained

Additional Information

Measurement in Imperial

Distance From Top of Casing to Ground Level: 36.00 in
Is Artesian Flow
Rate igpm
Is Flow Control Installed
Describe

Recommended Pump Rate: 15.00 igpm
Recommended Pump Intake Depth (From TOC): 140.00 ft
Pump Installed: Yes Depth: ft
Type: SUB @ 140' Make: GOULDS H.P.: 3
Model (Output Rating)

Did you Encounter Saline Water (>4000 ppm TDS) Depth: ft
Gas Depth: ft
Well Disinfected Upon Completion
Geophysical Log Taken
Remedial Action Taken
Submitted to ESRD

Sample Collected for Potability Submitted to ESRD

Additional Comments on Well

LITHOLOGY 15' - 70' CLAY BROWN SHALE STRINGERS, 70' - 100' SHALE GRY SILTY STRINGERS. 115' - 140' SHALE GRY SS STRINGERS FINE, 140' - 300' SHALE GRY SILTY STRINGERS. MATERIALS USED TO RECLAIM WELL - CEMENT & BENTONITE PRODUCT

Yield Test

Taken From Ground Level
Depth to water level

Measurement in Imperial

Test Date	Start Time	Static Water Level
2002/11/27	12:00 AM	105.0 ft

Method of Water Removal
Type: Pump & Air
Removal Rate: 165.0 igpm
Depth Withdrawn From: 300.00 ft

If water removal period was < 2 hours, explain why
DRILLPIPE IN HOLE

Pumping (ft)	Elapsed Time Minutes:Sec	Recovery (ft)
	0:00	300.00
	1:00	281.00
	2:00	266.00
	3:00	248.00
	4:00	230.00
	5:00	213.00
	6:00	192.00
	7:00	178.00
	8:00	163.00
	9:00	151.00
	10:00	139.00
	12:00	105.00
	14:00	105.00
	16:00	105.00
	20:00	105.00
	25:00	105.00
	30:00	105.00
	35:00	105.00
	40:00	105.00
	50:00	105.00
	60:00	105.00
	75:00	105.00
	90:00	105.00
	105:00	105.00
	120:00	105.00

Water Diverted for Drilling

Water Source	Amount Taken	Diversion Date & Time
	ig	

Contractor Certification

Name of Journeyman responsible for drilling/construction of well: KRIS SCHINDEL
Certification No: 40628A
Company Name: ALKEN BASIN DRILLING LTD.
Copy of Well report provided to owner
Date approval holder signed

Water Well Drilling Report

View in Metric | Export to Excel

The driller supplies the data contained in this report. The Province disclaims responsibility for its accuracy. The information on this report will be retained in a public database.

GIC Well ID 396265
GOA Well Tag No.
Drilling Company Well ID
Date Report Received 1984/12/12

GOWN ID

Well Identification and Location

Measurement in Imperial

Owner Name	Address	Town	Province	Country	Postal Code
ESSO#RIG 1					

Location	1/4 or LSD	SEC	TWP	RGE	W of MER	Lot	Block	Plan	Additional Description
	2	15	64	11	5				

Measured from Boundary of
ft from
ft from

GPS Coordinates In Decimal Degrees (NAD 83)
Latitude 54.532389 Longitude -115.573352
How Location Obtained
Not Verified

Elevation ft
How Elevation Obtained
Not Obtained

Drilling Information

Method of Drilling
Rotary

Proposed Well Use
Industrial

Type of Work
Dry Hole

Formation Log

Measurement in Imperial

Depth from ground level (ft)	Water Bearing	Lithology Description
18.00		Clay
220.00		Shale
234.00		Sandstone
360.00		Shale
372.00		Sandstone
500.00		Shale

Yield Test Summary

Measurement in Imperial

Recommended Pump Rate igpm

Test Date	Water Removal Rate (igpm)	Static Water Level (ft)

Well Completion

Measurement in Imperial

Total Depth Drilled	Finished Well Depth	Start Date	End Date
500.00 ft		1984/12/03	1984/12/03

Borehole

Diameter (in)	From (ft)	To (ft)
0.00	0.00	500.00

Surface Casing (if applicable)
Size OD : 0.00 in
Wall Thickness : 0.000 in
Bottom at : 0.00 ft

Well Casing/Liner
Size OD : 0.00 in
Wall Thickness : 0.000 in
Top at : 0.00 ft
Bottom at : 0.00 ft

Perforations

From (ft)	To (ft)	Diameter or Slot Width (in)	Slot Length (in)	Hole or Slot Interval (in)

Perforated by

Annular Seal
Placed from 0.00 ft to 0.00 ft
Amount

Other Seals

Type	At (ft)

Screen Type
Size OD : 0.00 in

From (ft)	To (ft)	Slot Size (in)

Attachment
Top Fittings
Bottom Fittings

Pack
Type
Grain Size
Amount

Contractor Certification

Name of Journeyman responsible for drilling/construction of well
UNKNOWN NA DRILLER

Certification No
1

Company Name
MID-WEST WATER WELLS LTD.

Copy of Well report provided to owner

Date approval holder signed

Water Well Drilling Report

View in Metric | Export to Excel

The driller supplies the data contained in this report. The Province disclaims responsibility for its accuracy. The information on this report will be retained in a public database.

GIC Well ID 396265
GOA Well Tag No.
Drilling Company Well ID
Date Report Received 1984/12/12

GOWN ID

Well Identification and Location

Measurement in Imperial

Owner Name	Address	Town	Province	Country	Postal Code
ESSO#RIG 1					

Location	1/4 or LSD	SEC	TWP	RGE	W of MER	Lot	Block	Plan	Additional Description
	2	15	64	11	5				

Measured from Boundary of
ft from
ft from

GPS Coordinates in Decimal Degrees (NAD 83)
Latitude 54.532389 Longitude -115.573352
How Location Obtained
Not Verified

Elevation ft
How Elevation Obtained
Not Obtained

Additional Information

Measurement in Imperial

Distance From Top of Casing to Ground Level in
Is Artesian Flow
Rate igpm
Is Flow Control Installed
Describe

Recommended Pump Rate igpm
Recommended Pump Intake Depth (From TOC) ft
Pump Installed
Type
Depth ft
Make
H.P.
Model (Output Rating)

Did you Encounter Saline Water (>4000 ppm TDS)
Depth ft
Gas
Depth ft
Well Disinfected Upon Completion
Geophysical Log Taken
Submitted to ESRD
Remedial Action Taken

Sample Collected for Potability
Submitted to ESRD
Additional Comments on Well

Yield Test

Taken From Ground Level | Measurement in Imperial

Test Date	Start Time	Static Water Level
		ft

Method of Water Removal
Type
Removal Rate igpm
Depth Withdrawn From ft

If water removal period was < 2 hours, explain why

Water Diverted for Drilling

Water Source	Amount Taken	Diversion Date & Time
	ig	

Contractor Certification

Name of Journeyman responsible for drilling/construction of well
UNKNOWN NA DRILLER

Certification No
1

Company Name
MID-WEST WATER WELLS LTD.

Copy of Well report provided to owner
Date approval holder signed

Water Well Drilling Report

View in Metric | Export to Excel

The driller supplies the data contained in this report. The Province disclaims responsibility for its accuracy. The information on this report will be retained in a public database.

GIC Well ID 396266
GOA Well Tag No.
Drilling Company Well ID
Date Report Received 1985/01/23

GOWN ID

Well Identification and Location

Measurement in Imperial

Owner Name	Address	Town	Province	Country	Postal Code
ESSO#RIG 1					

Location	1/4 or LSD	SEC	TWP	RGE	W of MER	Lot	Block	Plan	Additional Description
	11	15	64	11	5				

Measured from Boundary of
ft from
ft from

GPS Coordinates in Decimal Degrees (NAD 83)
Latitude 54.539631 Longitude -115.579573
How Location Obtained
Not Verified

Elevation ft
How Elevation Obtained
Not Obtained

Drilling Information

Method of Drilling
Rotary

Proposed Well Use
Industrial

Type of Work
New Well-Decommissioned
View Decommissioning Report

Plugged 1985/01/05
Plugged with Cement
Amount

Formation Log

Measurement in Imperial

Depth from ground level (ft)	Water Bearing	Lithology Description
35.00		Till
90.00		Sandstone
520.00		Shale & Sandstone Ledges

Yield Test Summary

Measurement in Imperial

Recommended Pump Rate igpm

Test Date	Water Removal Rate (igpm)	Static Water Level (ft)

Well Completion

Measurement in Imperial

Total Depth Drilled	Finished Well Depth	Start Date	End Date
520.00 ft			1985/01/05

Borehole

Diameter (in)	From (ft)	To (ft)
0.00	0.00	520.00

Surface Casing (if applicable)
Size OD : 0.00 in
Wall Thickness : 0.000 in
Bottom at : 0.00 ft

Well Casing/Liner
Size OD : 0.00 in
Wall Thickness : 0.000 in
Top at : 0.00 ft
Bottom at : 0.00 ft

Perforations

From (ft)	To (ft)	Diameter or Slot Width(in)	Slot Length (in)	Hole or Slot Interval(in)

Perforated by

Annular Seal
Placed from 0.00 ft to 0.00 ft
Amount

Other Seals

Type	At (ft)

Screen Type
Size OD : 0.00 in

From (ft)	To (ft)	Slot Size (in)

Attachment
Top Fittings
Bottom Fittings

Pack
Type
Grain Size
Amount

Contractor Certification

Name of Journeyman responsible for drilling/construction of well
UNKNOWN NA DRILLER

Certification No
1

Company Name
MID-WEST WATER WELLS LTD.

Copy of Well report provided to owner

Date approval holder signed

Water Well Drilling Report

View in Metric | Export to Excel

The driller supplies the data contained in this report. The Province disclaims responsibility for its accuracy. The information on this report will be retained in a public database.

GIC Well ID 396266
GOA Well Tag No.
Drilling Company Well ID
Date Report Received 1985/01/23

GOWN ID

Well Identification and Location

Measurement in Imperial

Owner Name	Address	Town	Province	Country	Postal Code
ESSO#RIG 1					

Location	1/4 or LSD	SEC	TWP	RGE	W of MER	Lot	Block	Plan	Additional Description
	11	15	64	11	5				

Measured from Boundary of
ft from
ft from

GPS Coordinates in Decimal Degrees (NAD 83)
Latitude 54.539631 Longitude -115.579573
How Location Obtained
Not Verified

Elevation ft
How Elevation Obtained
Not Obtained

Additional Information

Measurement in Imperial

Distance From Top of Casing to Ground Level in
Is Artesian Flow
Rate igpm
Is Flow Control Installed
Describe

Recommended Pump Rate igpm
Recommended Pump Intake Depth (From TOC) ft
Pump Installed
Type
Depth ft
Make
H.P.
Model (Output Rating)

Did you Encounter Saline Water (>4000 ppm TDS)
Depth ft
Gas
Depth ft
Well Disinfected Upon Completion
Geophysical Log Taken
Submitted to ESRD
Remedial Action Taken

Sample Collected for Potability
Submitted to ESRD
Additional Comments on Well

Yield Test

Taken From Ground Level | Measurement in Imperial

Test Date	Start Time	Static Water Level
		ft

Method of Water Removal
Type
Removal Rate igpm
Depth Withdrawn From ft

If water removal period was < 2 hours, explain why

Water Diverted for Drilling

Water Source	Amount Taken	Diversion Date & Time
	ig	

Contractor Certification

Name of Journeyman responsible for drilling/construction of well
UNKNOWN NA DRILLER

Certification No
1

Company Name
MID-WEST WATER WELLS LTD.

Copy of Well report provided to owner
Date approval holder signed

Water Well Drilling Report

View in Metric | Export to Excel

The driller supplies the data contained in this report. The Province disclaims responsibility for its accuracy. The information on this report will be retained in a public database.

GOWN ID

GIC Well ID 396267
GoA Well Tag No.
Drilling Company Well ID
Date Report Received 1985/01/23

Well Identification and Location

Measurement in Imperial

Owner Name	Address	Town	Province	Country	Postal Code
ESSO#RIG 1					

Location	1/4 or LSD	SEC	TWP	RGE	W of MER	Lot	Block	Plan	Additional Description
	11	15	64	11	5				

Measured from Boundary of
ft from
ft from

GPS Coordinates in Decimal Degrees (NAD 83)
Latitude 54.539631 Longitude -115.579573
How Location Obtained
Not Verified

Elevation ft
How Elevation Obtained
Not Obtained

Drilling Information

Method of Drilling
Rotary

Proposed Well Use
Industrial

Type of Work
New Well-Decommissioned
View Decommissioning Report

Plugged 1985/01/05
Plugged with Cement
Amount

Formation Log

Measurement in Imperial

Depth from ground level (ft)	Water Bearing	Lithology Description
35.00		Till
220.00		Sandstone & Shale Ledges

Yield Test Summary

Measurement in Imperial

Recommended Pump Rate igpm

Test Date	Water Removal Rate (igpm)	Static Water Level (ft)

Well Completion

Measurement in Imperial

Total Depth Drilled	Finished Well Depth	Start Date	End Date
220.00 ft		1985/01/05	1985/01/05

Borehole

Diameter (in)	From (ft)	To (ft)
0.00	0.00	220.00

Surface Casing (if applicable)
Size OD : 0.00 in
Wall Thickness : 0.000 in
Bottom at : 0.00 ft

Well Casing/Liner
Size OD : 0.00 in
Wall Thickness : 0.000 in
Top at : 0.00 ft
Bottom at : 0.00 ft

Perforations

From (ft)	To (ft)	Diameter or Slot Width (in)	Slot Length (in)	Hole or Slot Interval (in)

Perforated by

Annular Seal
Placed from 0.00 ft to 0.00 ft
Amount

Other Seals

Type	At (ft)

Screen Type
Size OD : 0.00 in

From (ft)	To (ft)	Slot Size (in)

Attachment
Top Fittings
Bottom Fittings

Pack
Type
Grain Size
Amount

Contractor Certification

Name of Journeyman responsible for drilling/construction of well
UNKNOWN NA DRILLER

Certification No
1

Company Name
MID-WEST WATER WELLS LTD.

Copy of Well report provided to owner

Date approval holder signed

Water Well Drilling Report

View in Metric | Export to Excel

The driller supplies the data contained in this report. The Province disclaims responsibility for its accuracy. The information on this report will be retained in a public database.

GIC Well ID 396267
GOA Well Tag No.
Drilling Company Well ID
Date Report Received 1985/01/23

GOWN ID

Well Identification and Location

Measurement in Imperial

Owner Name	Address	Town	Province	Country	Postal Code
ESSO#RIG 1					

Location	1/4 or LSD	SEC	TWP	RGE	W of MER	Lot	Block	Plan	Additional Description
	11	15	64	11	5				

Measured from Boundary of
ft from
ft from

GPS Coordinates in Decimal Degrees (NAD 83)
Latitude 54.539631 Longitude -115.579573
How Location Obtained
Not Verified

Elevation ft
How Elevation Obtained
Not Obtained

Additional Information

Measurement in Imperial

Distance From Top of Casing to Ground Level in
Is Artesian Flow
Rate igpm
Is Flow Control Installed
Describe

Recommended Pump Rate igpm
Recommended Pump Intake Depth (From TOC) ft
Pump Installed
Type
Depth ft
Make
H.P.
Model (Output Rating)

Did you Encounter Saline Water (>4000 ppm TDS)
Depth ft
Gas
Depth ft
Well Disinfected Upon Completion
Geophysical Log Taken
Remedial Action Taken
Submitted to ESRD

Sample Collected for Potability
Submitted to ESRD

Additional Comments on Well

Yield Test

Taken From Ground Level Measurement in Imperial

Test Date	Start Time	Static Water Level
		ft

Method of Water Removal
Type
Removal Rate igpm
Depth Withdrawn From ft

If water removal period was < 2 hours, explain why

Water Diverted for Drilling

Water Source	Amount Taken	Diversion Date & Time
	ig	

Contractor Certification

Name of Journeyman responsible for drilling/construction of well
UNKNOWN NA DRILLER

Certification No
1

Company Name
MID-WEST WATER WELLS LTD.

Copy of Well report provided to owner
Date approval holder signed

APPENDIX E
SITE RECONNAISSANCE

Figure E1 Site Reconnaissance Photo Locations within Proposed Project Area
Figure E2 Site Reconnaissance Photo Locations along Gravel Access Road

Photos 1-50 Site Reconnaissance within Proposed Project Area
Photos 51-84 Site Reconnaissance along Gravel Access Road



LEGEND

- Proposed Project Area
- Photo Location (L-XX)
- Approximate Site Reconnaissance Route

NOTES
-Imagery obtained from Google Earth (dated September 2018)

-Image scale produced by Google Earth

STATUS
ISSUED FOR REVIEW

CLIENT
kiwetinohk energy

TETRA TECH

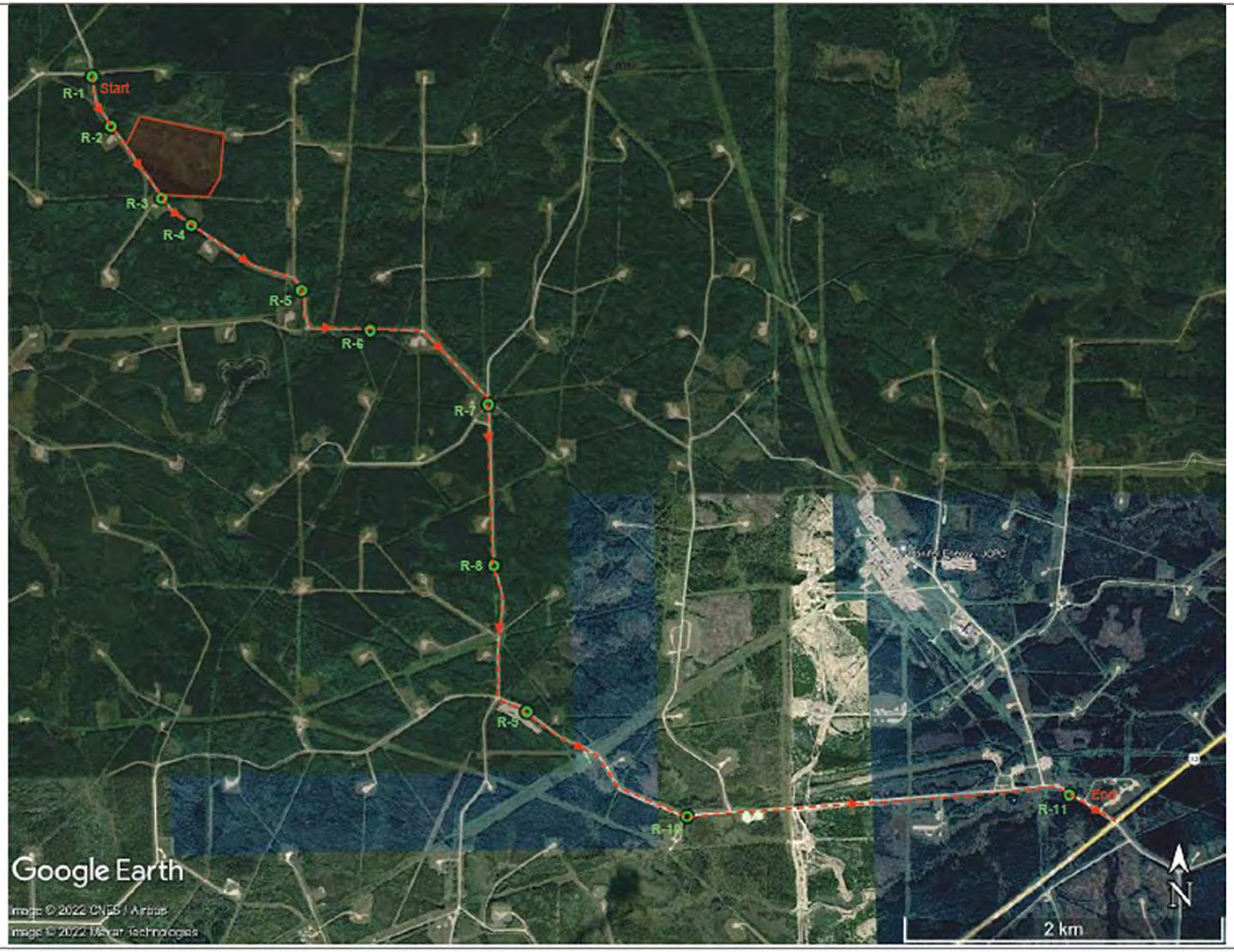
Maskwa Geotechnical Desktop Study

Site Reconnaissance Photo Locations within Proposed Project Area

PROJECT NO.	DWN	CKD	APVD	REV
704-ENG.IGE004132-01	CJ	VO		

OFFICE	DATE
EBA-EDM	September 14, 2022

Figure E1



LEGEND

- Proposed Project Area
- Photo Location (R-XX)
- Approximate Site Reconnaissance Route

NOTES
-Imagery obtained from Google Earth (dated September 2018)

-Image scale produced by Google Earth

STATUS
ISSUED FOR REVIEW

CLIENT
kiwetinohk energy

TETRA TECH

Maskwa Geotechnical Desktop Study

Site Reconnaissance Photo Locations along Gravel Access Road

PROJECT NO.	DWN	CKD	APVD	REV
704-ENG.MGE004132-01	CJ	VO		
OFFICE: EBA-EDM	DATE: September 14, 2022			

Figure E2



Photo 1: Location L-1 looking south towards the project area; view of large trees lining the cutline in the background.



Photo 2: Location L-1 looking west towards the representative dense vegetation growth along the cutline. Downslope towards the northwest.



Photo 3: Location L-1 evidence of moss growth and tall grass.



Photo 4: Location L-1 evidence of saturated ground conditions and moss growth near fallen tree trunks and stumps.



Photo 5: Location L-2 looking southeast towards project area; evidence of short trees bearing red berries.



Photo 6: Location L-2 looking west at large trees along the cutline.

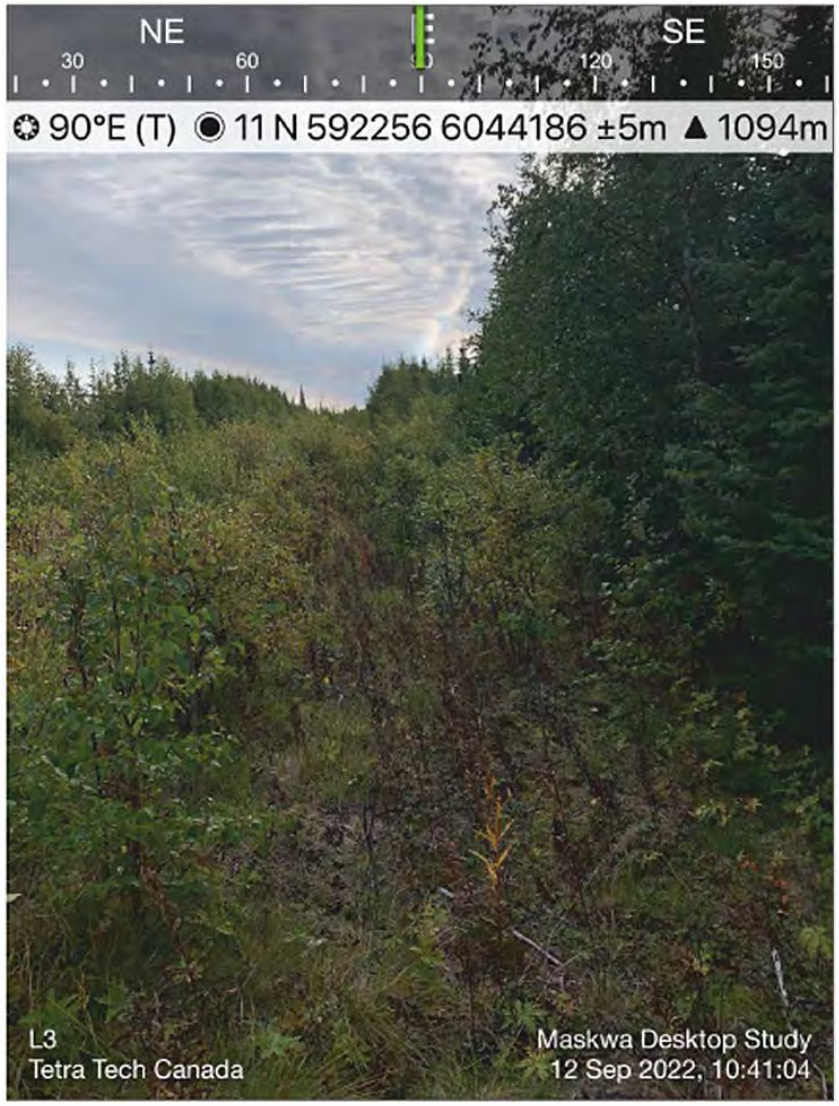


Photo 7: Location L-3 looking east along the cutline; view of dense small tree growth. Slope along cutline relatively flat to gently sloping upwards in easterly direction.



Photo 8: Location L-3 looking south towards the project; view of small tree height relative to onsite personnel (6'-3").



Photo 9: Location L-4 evidence of short shrub growth.

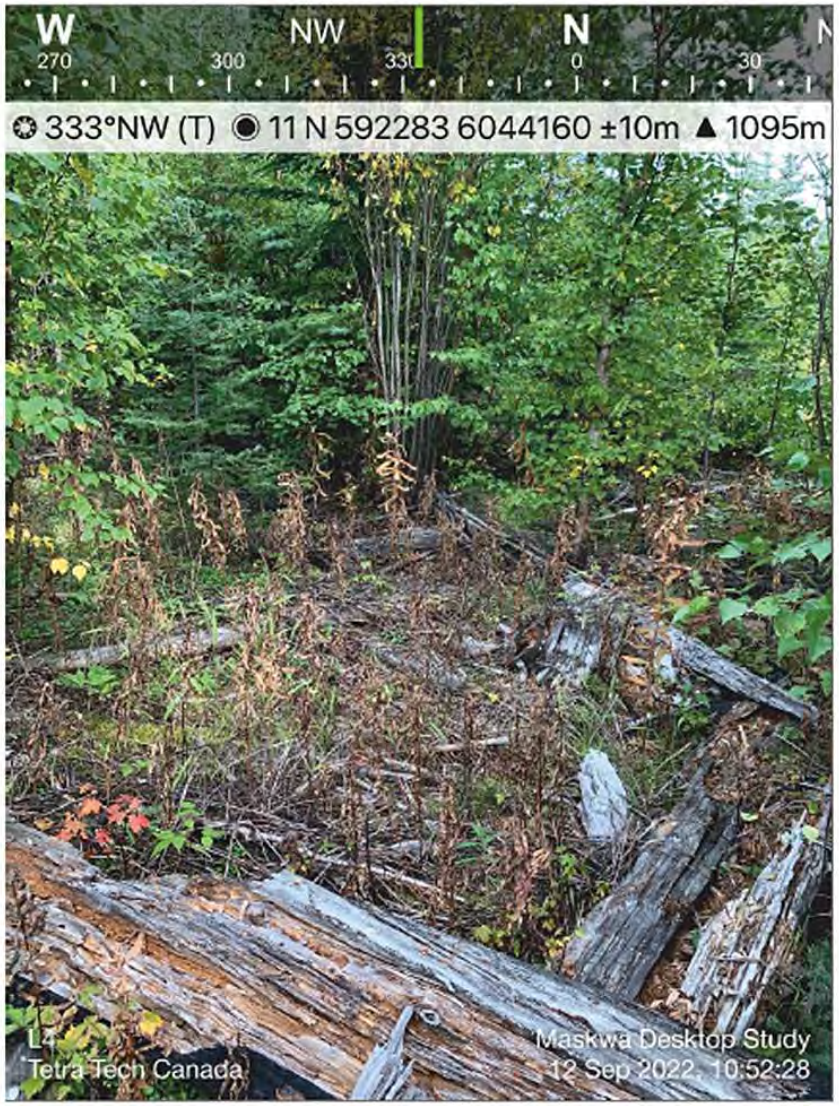


Photo 10: Location L-4 evidence of very dry fallen tree debris.



Photo 11: Location L-5 evidence of gravel materials up to cobble size in some areas.

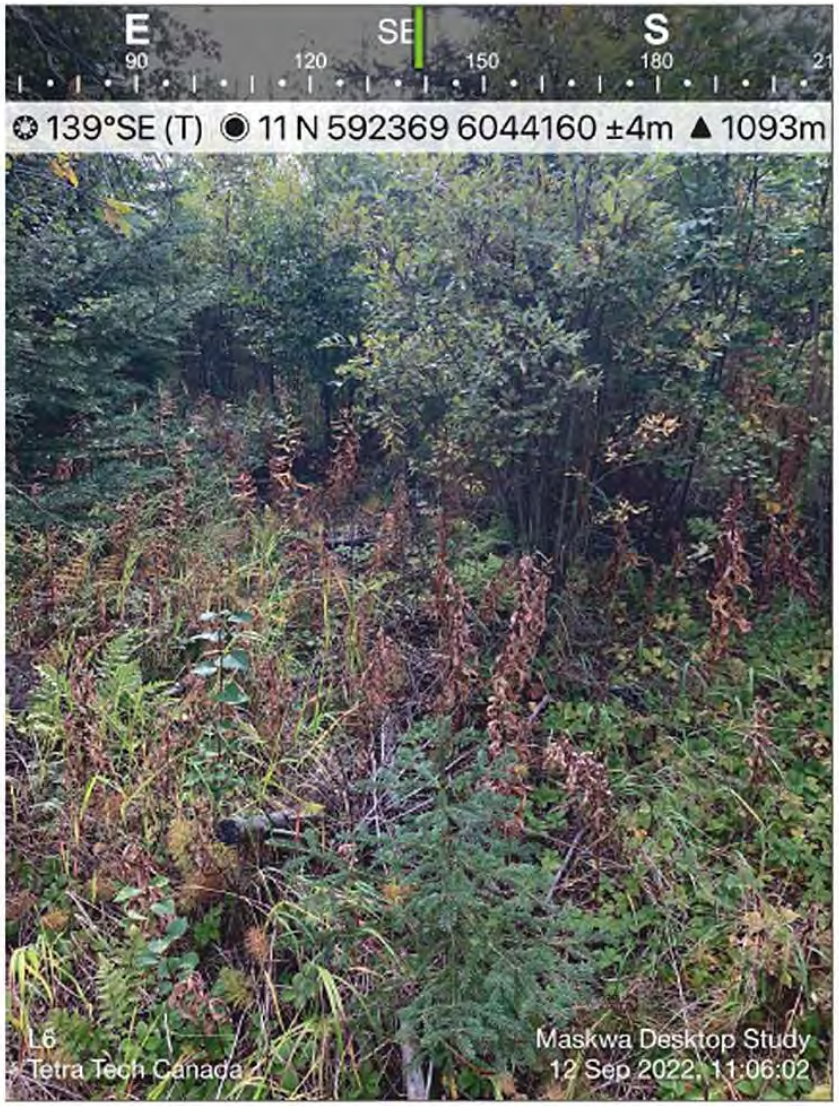


Photo 12: Location L-6 looking southeast towards the project area; view of representative vegetation growth along the cutline.



Photo 13: Location L-7 looking southwest along the cutline; view of dense tall grass growth.



Photo 14: Location L-8 looking southeast towards the project area; view of uneven ground surface and growth of grass patches.

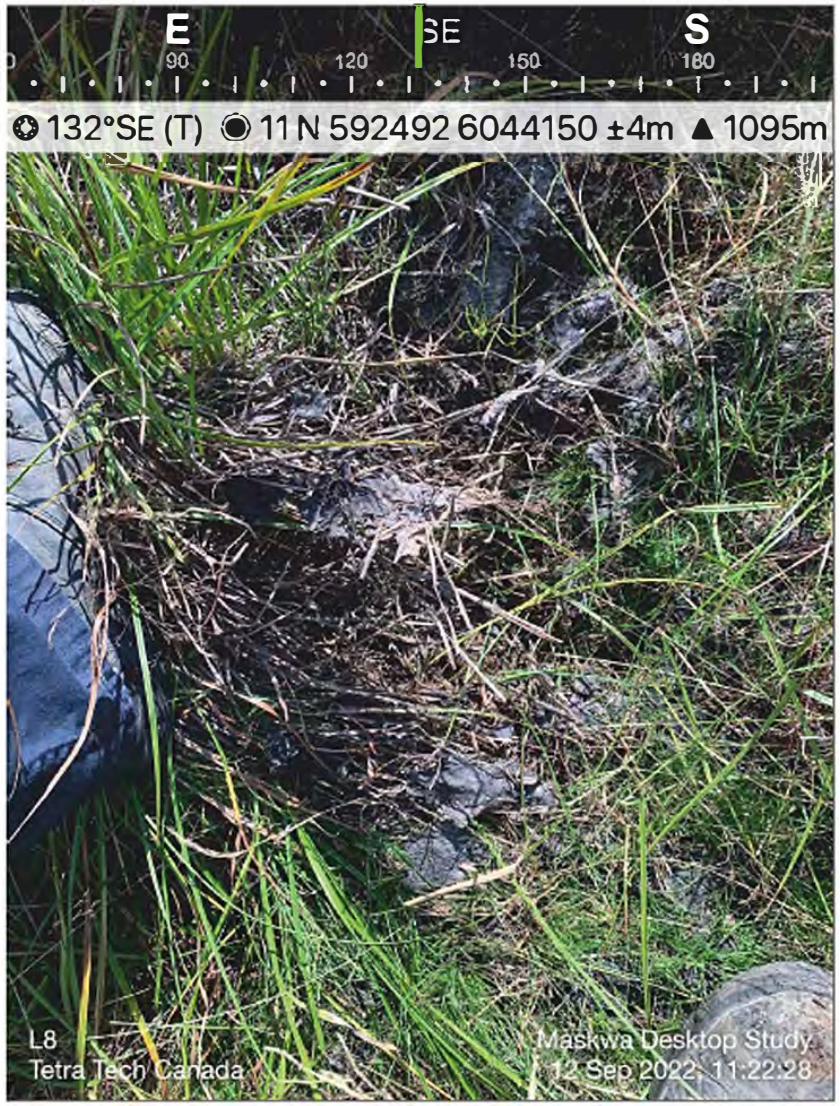


Photo 15: Location L-8 evidence of wet to saturated ground conditions within topsoil of grass growth.

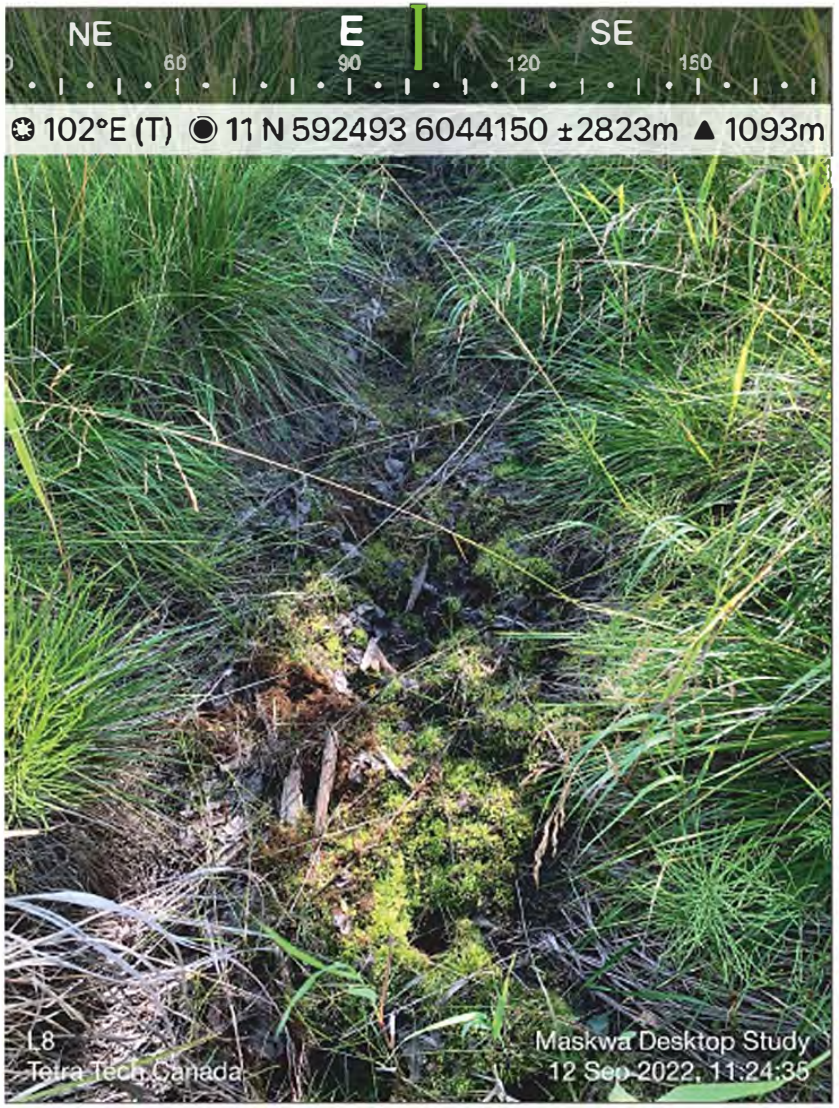


Photo 16: Location L-8 evidence of potential track marks from previous construction activities within the cutline.



Photo 17: Location L-8 looking east along the cutline; view of flower growth and ground gently sloping upwards.

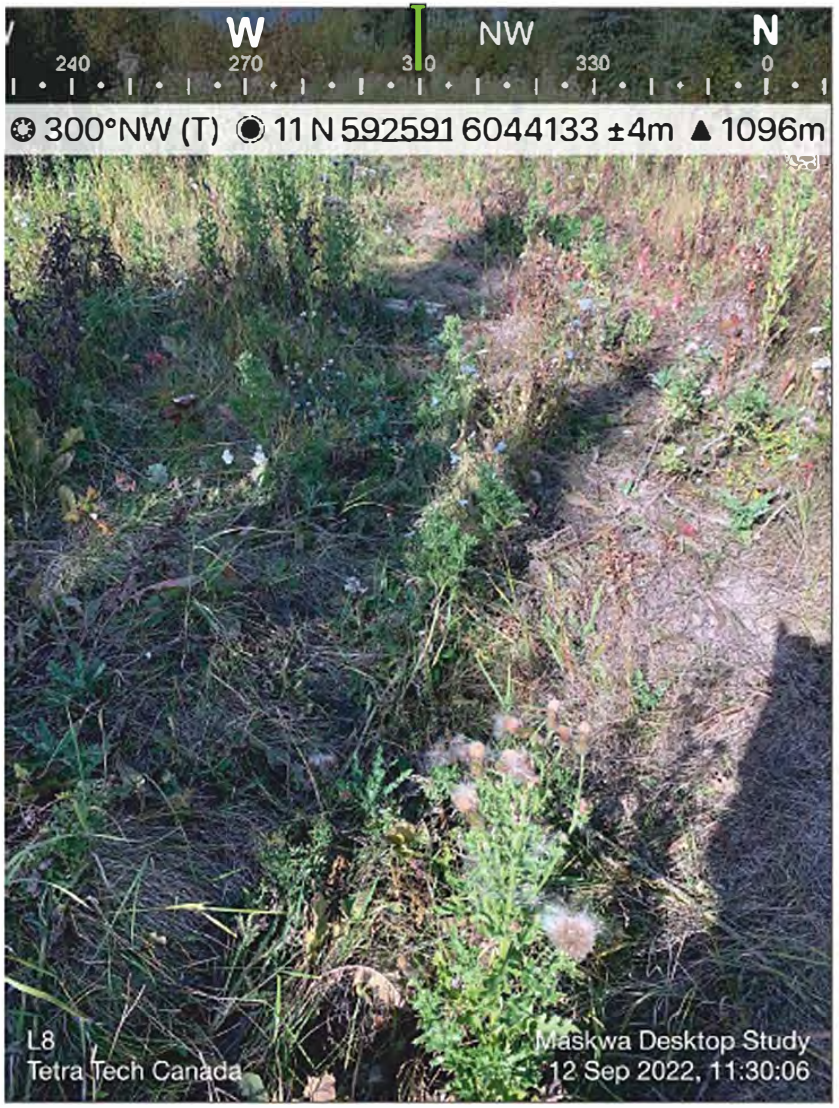


Photo 18: Location L-8 evidence of uneven ground surface and less dense tree growth within the cutline.



Photo 19: Location L-9 evidence of very dry ground conditions.

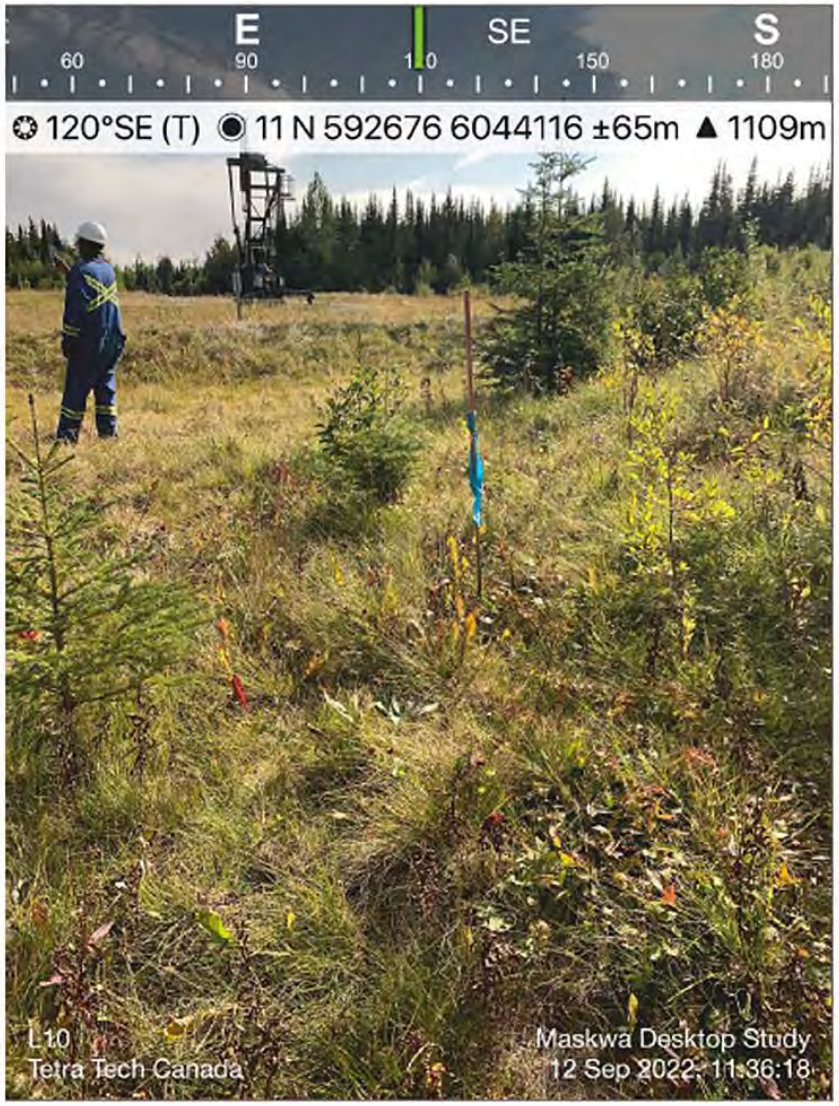


Photo 20: Location L-10 looking east from the northeast extent of the project area. View of active water well pumping activities in the background.



Photo 21: Location L-10 evidence of thick moss growth and wet ground conditions.



Photo 22: Location L-11 evidence of large fallen tree trunks.



Photo 23: Location L-11 looking south; view of moss and organic material growth. Ground surface is uneven, soft, and sloping downwards towards the southwest direction.

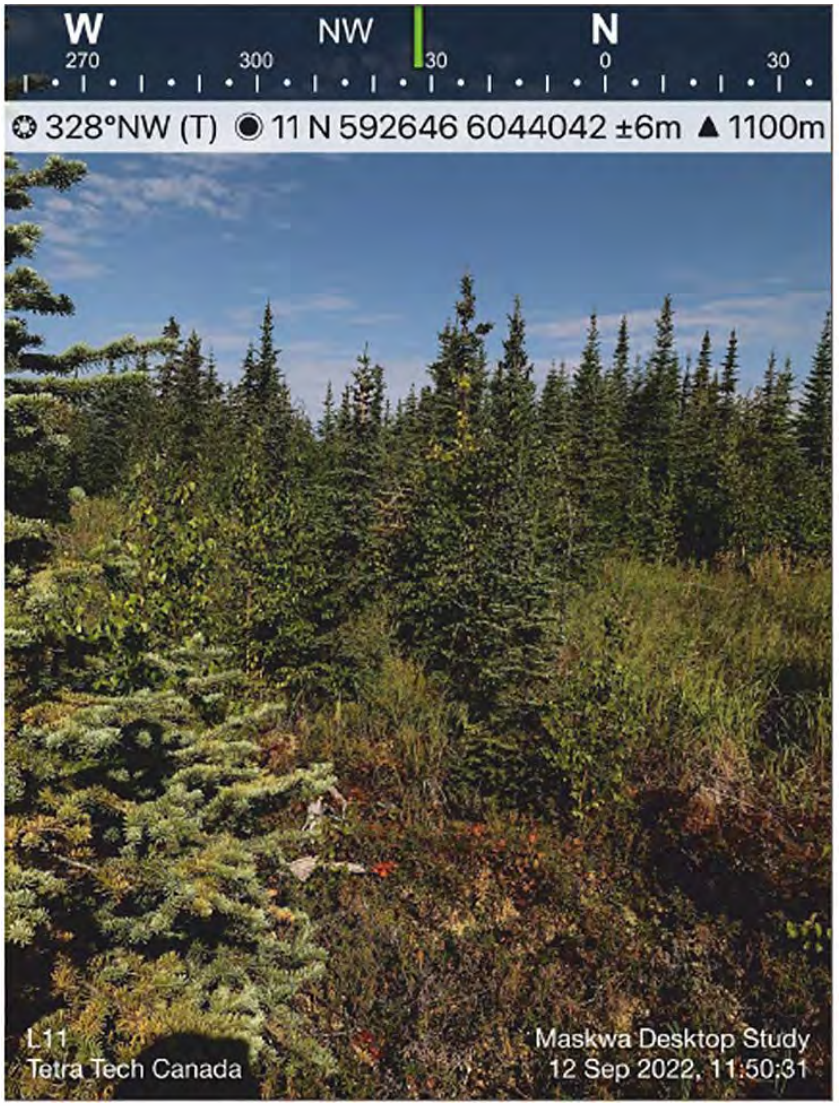


Photo 24: Location L-11 looking northwest at dense large tree growth.

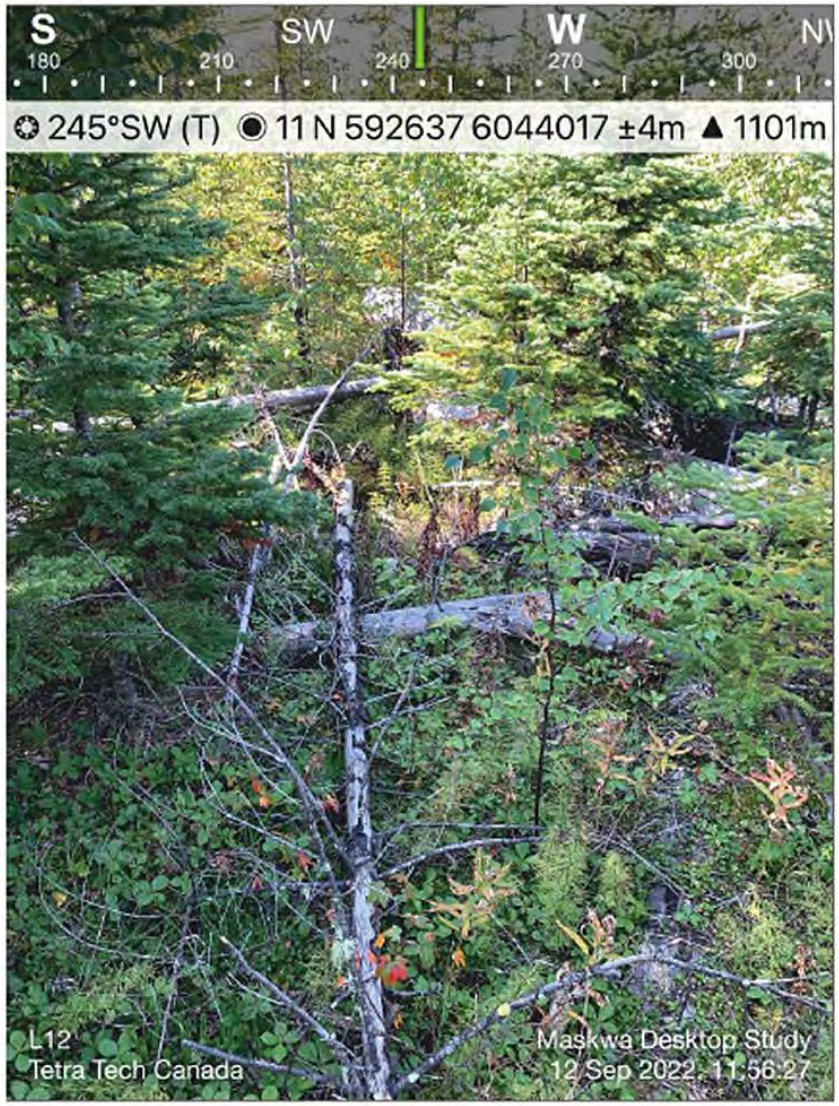


Photo 25: Location L-12 looking west at location of large collection of fallen tree trunks and branches. Ground surface sloping downwards towards south to southwest.

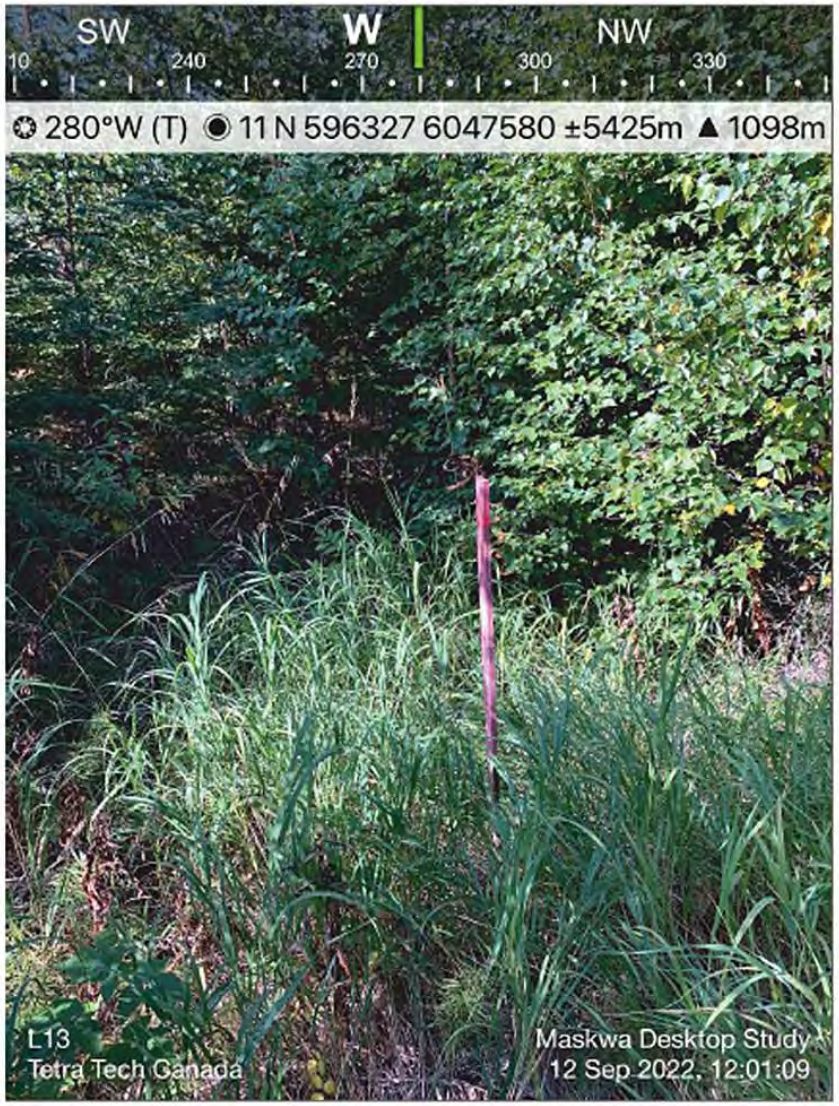


Photo 26: Location L-13 looking west at tall grass growth and ground surface sloping towards west to southwest direction.

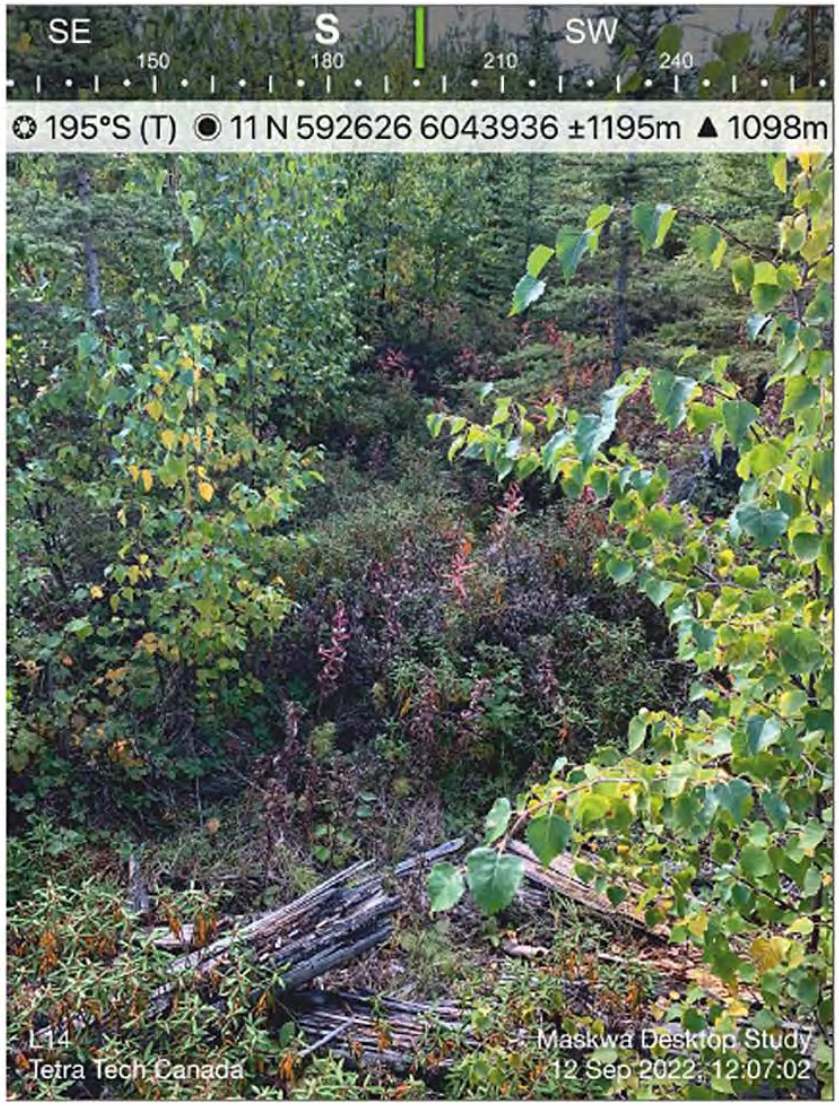


Photo 27: Location L-14 looking south from highpoint on a tree stump at representative vegetation growth.

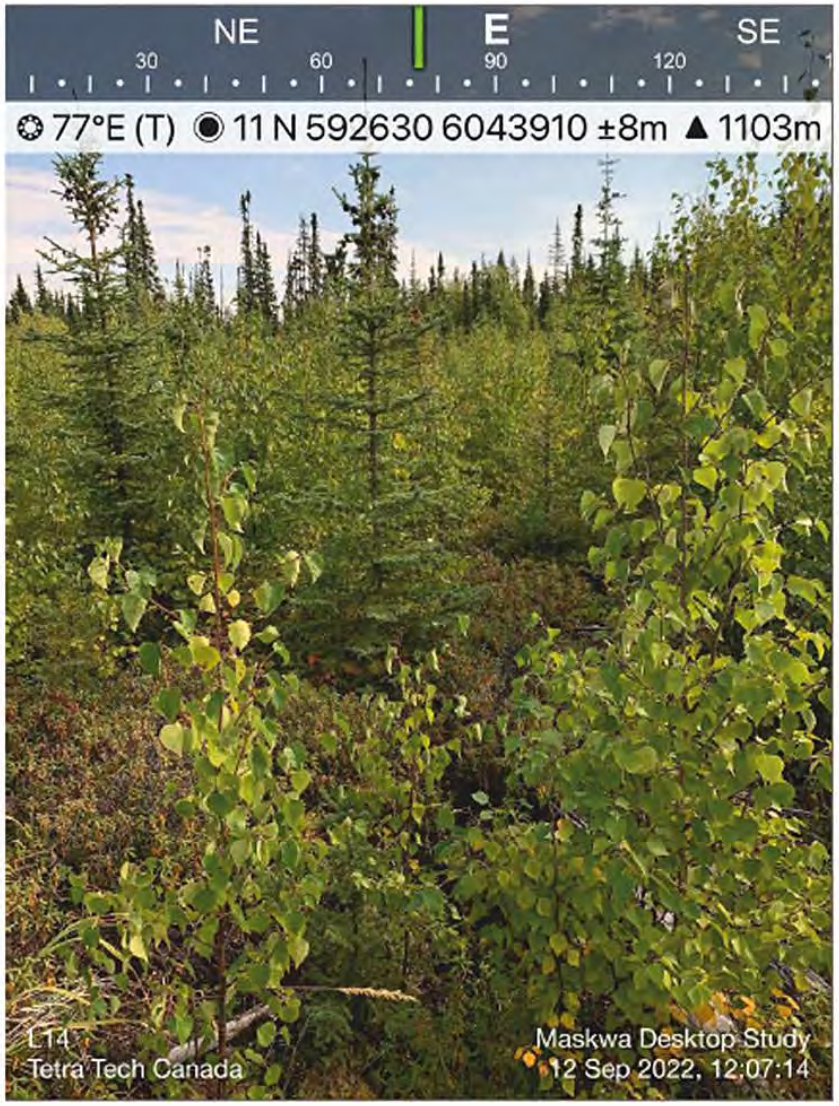


Photo 28: Location L-14 looking east at dense short tree growth.



Photo 29: Location L-15 evidence of dry ground surface and patches of moss growth.



Photo 30: Location L-16 looking west at potential wheat growth and area of sparse tree growth. Ground surface is soft, uneven, and sloping towards south direction.

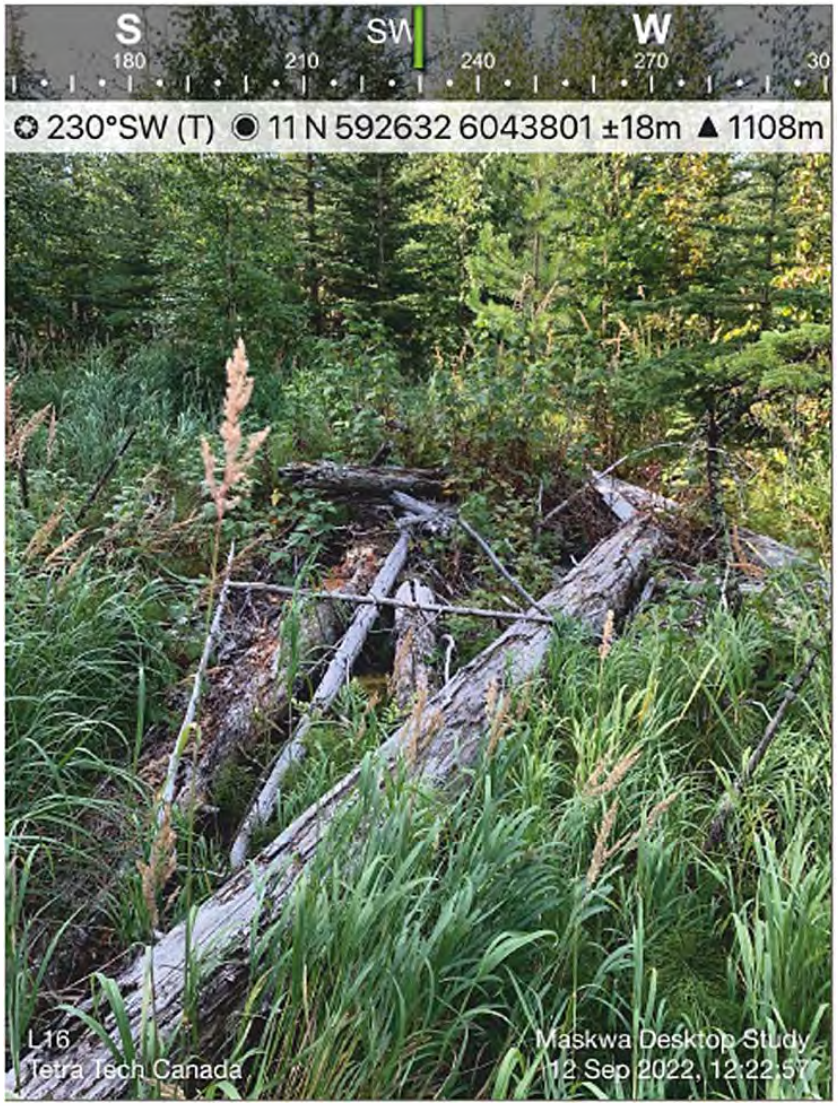


Photo 31: Location L-16 looking southwest from the wheat growth; view of fallen tree trunks and dense short tree growth.

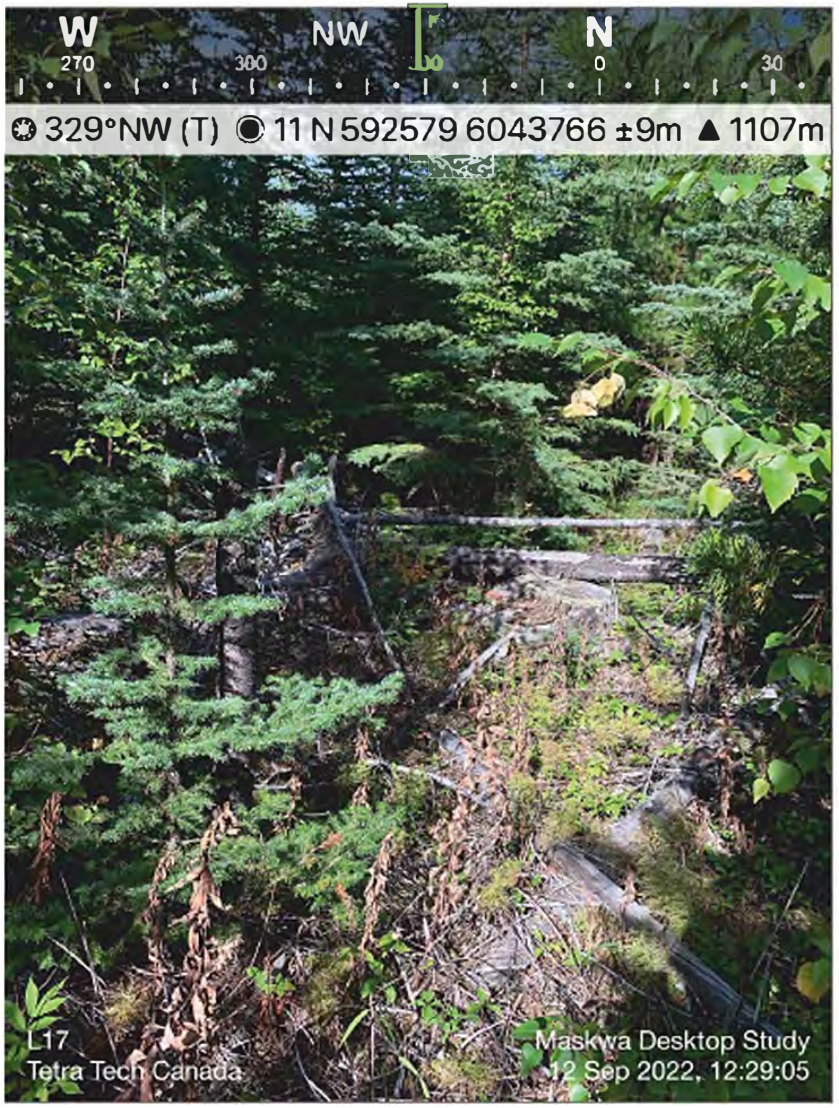


Photo 32: Location L-17 looking northwest at very dry ground surface covered in fallen tree debris and sloping gently downwards towards the west.



Photo 33: Location L-17 evidence of very dry fallen tree debris.



Photo 34: Location L-17 evidence of very dry ground surface and sparse vegetation growth.

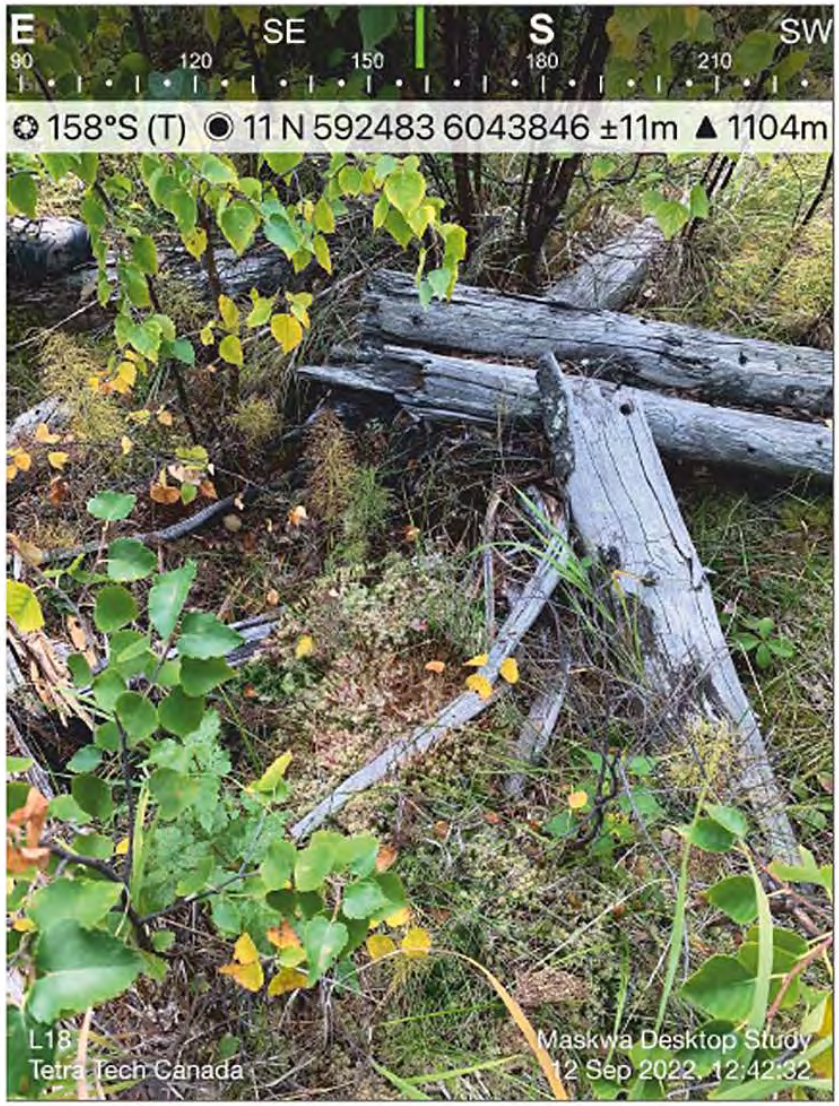


Photo 35: Location L-18 evidence of moss and organic material growth near fallen tree trunks.

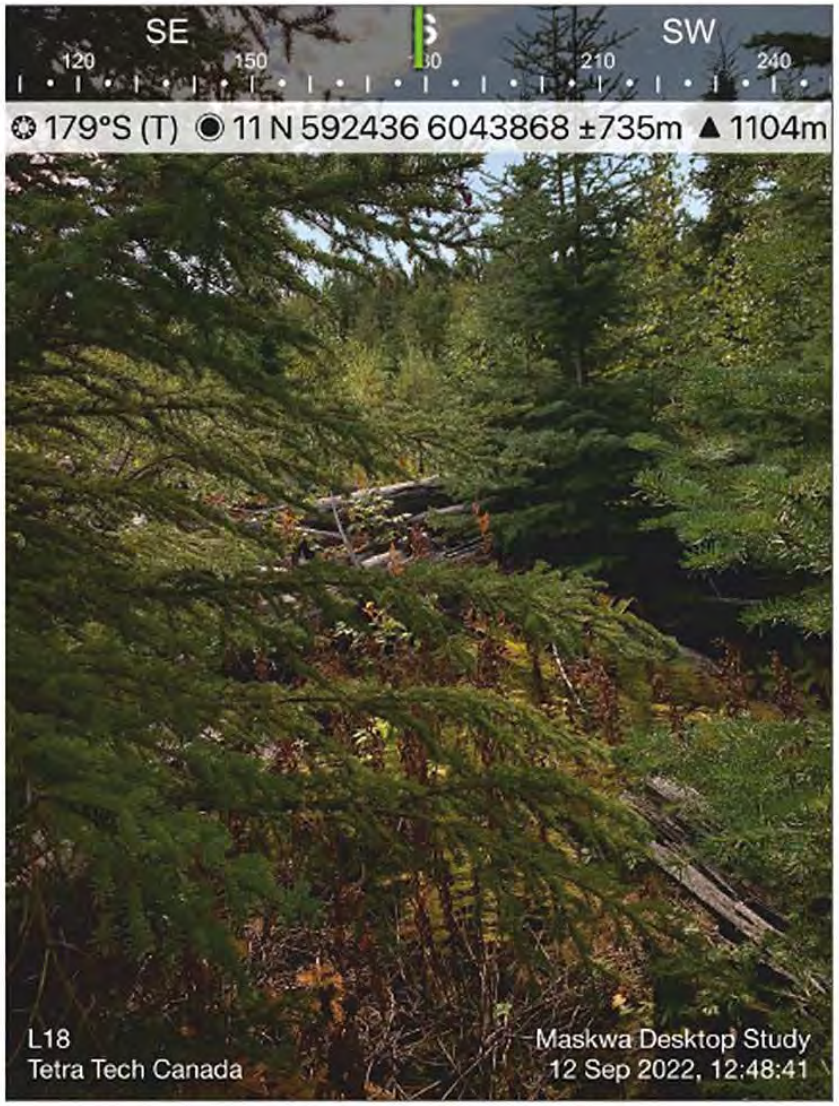


Photo 36: Location L-18 looking south towards large pile of fallen tree trunks. Ground surface is sloping gently downwards towards the southwest direction.



Photo 37: Location L-19 evidence of thick peat and moss growth.



Photo 38: Location L-20 looking southwest; view of representative thick vegetation growth including short shrubs and short trees.



Photo 39: Location L-20 evidence of small ground depressions.

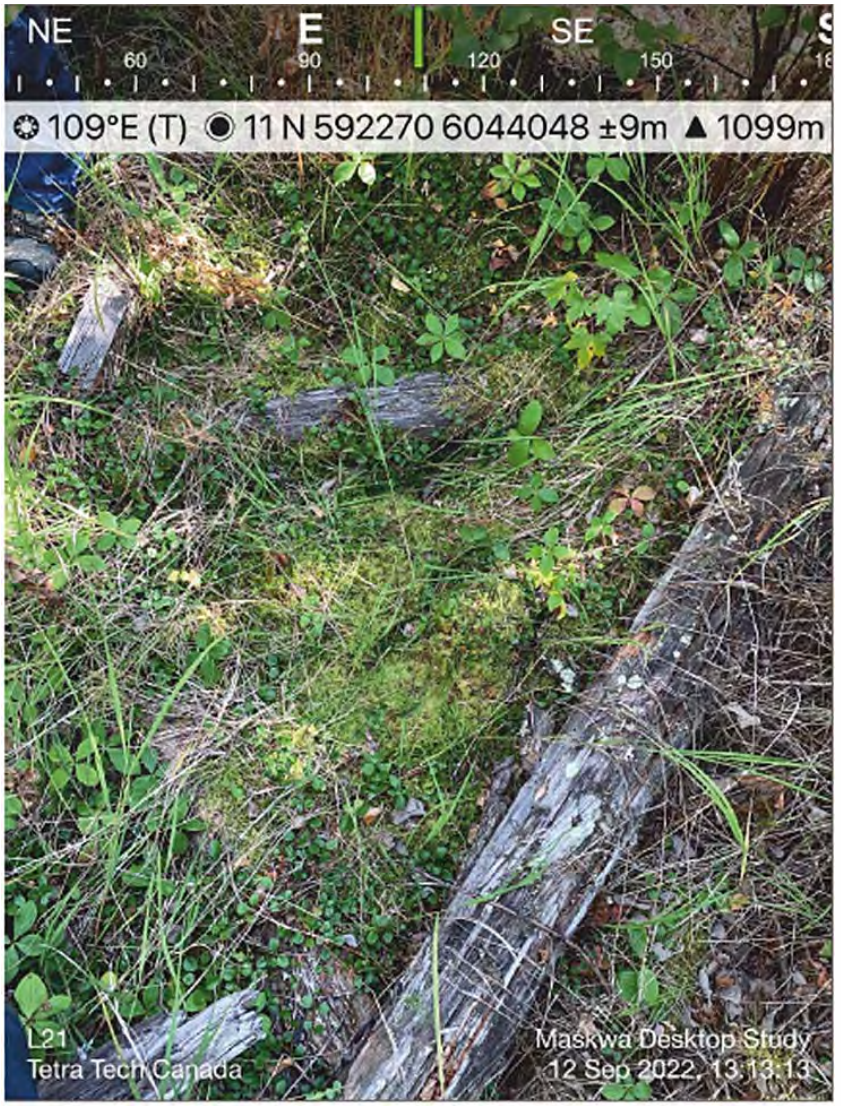


Photo 40: Location L-21 evidence of moss and organic material growth near fallen tree debris.



Photo 41: Location L-21 evidence of tree monitoring program by Blue Ridge Lumber Inc.

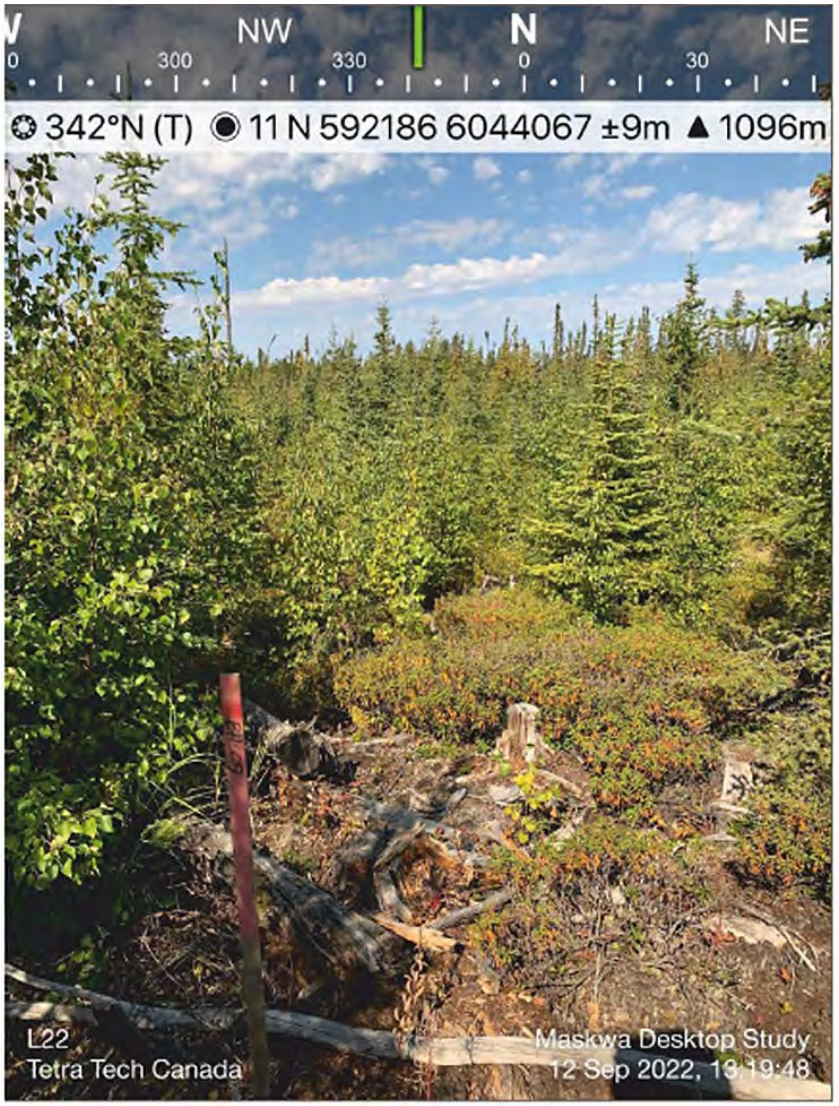


Photo 42: Location L-22 looking north at very dense short tree growth. The ground surface is sloping downwards to the north. Evidence of dry topsoil material in the foreground.



Photo 43: Location L-22 evidence of very dry topsoil material at surface.

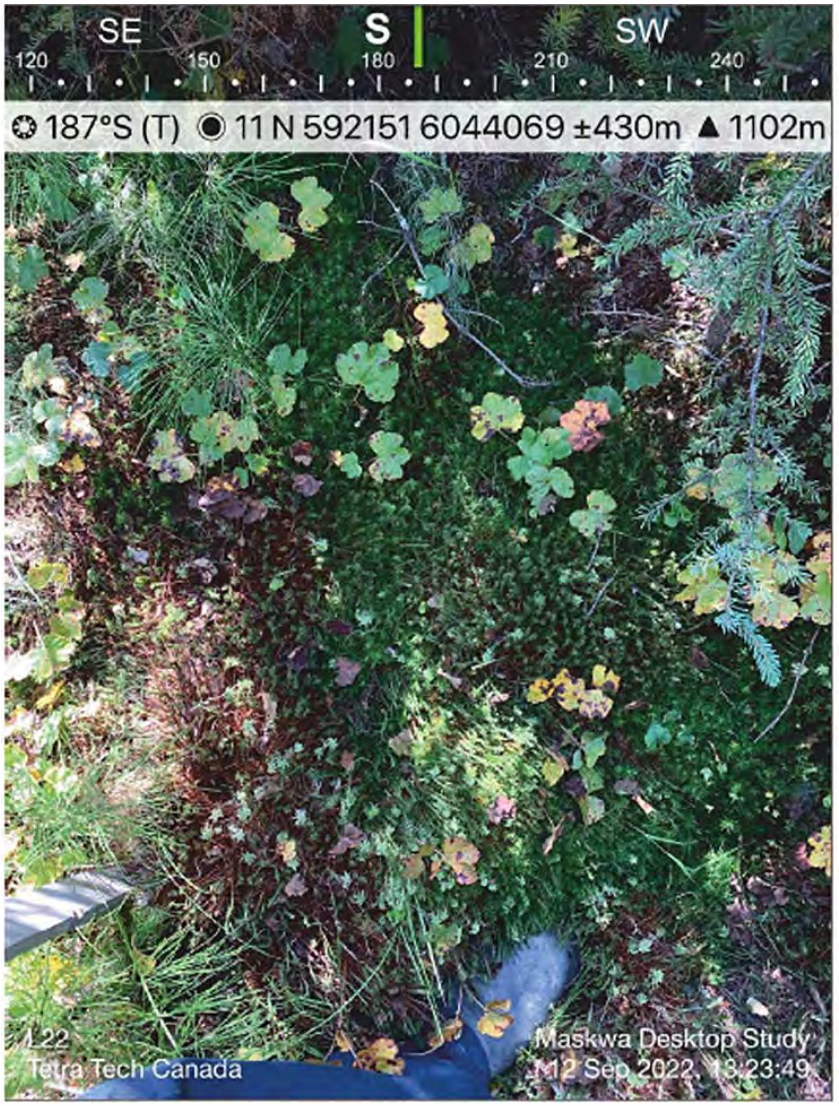


Photo 44: Location L-22 evidence of thick moss growth.

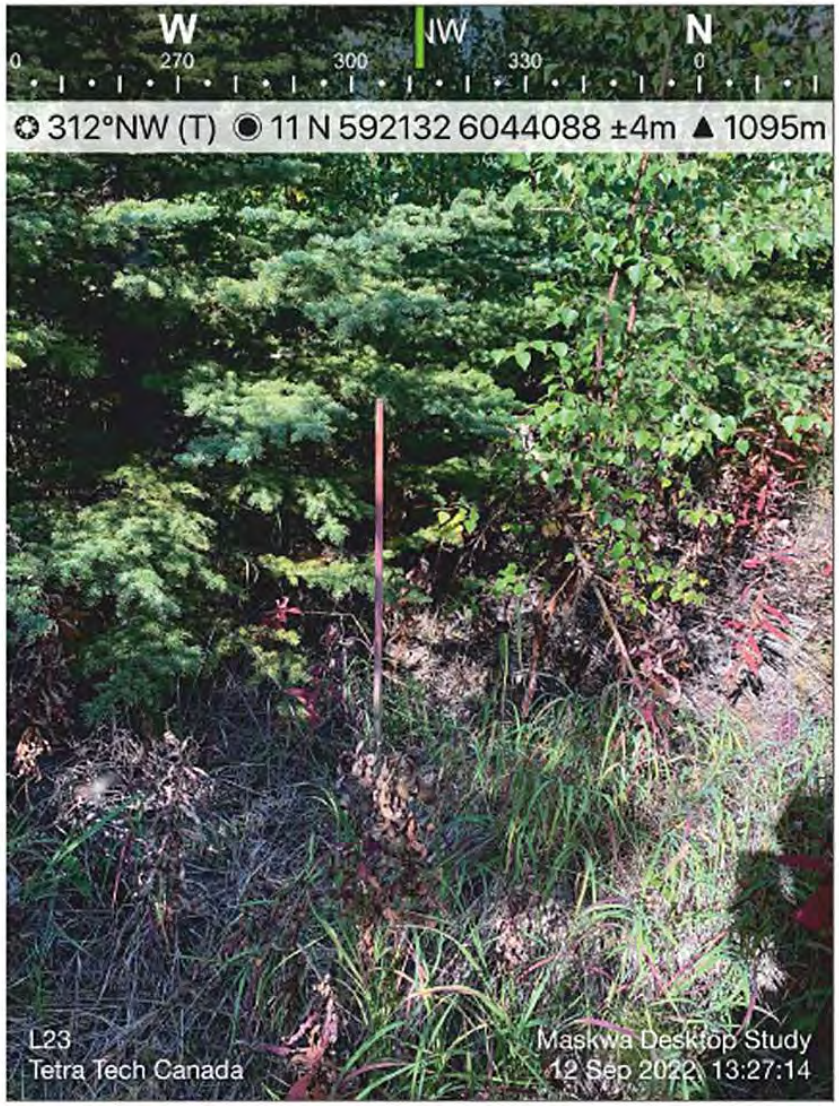


Photo 45: Location L-23 looking northwest at representative vegetation growth including tall grass and short trees.

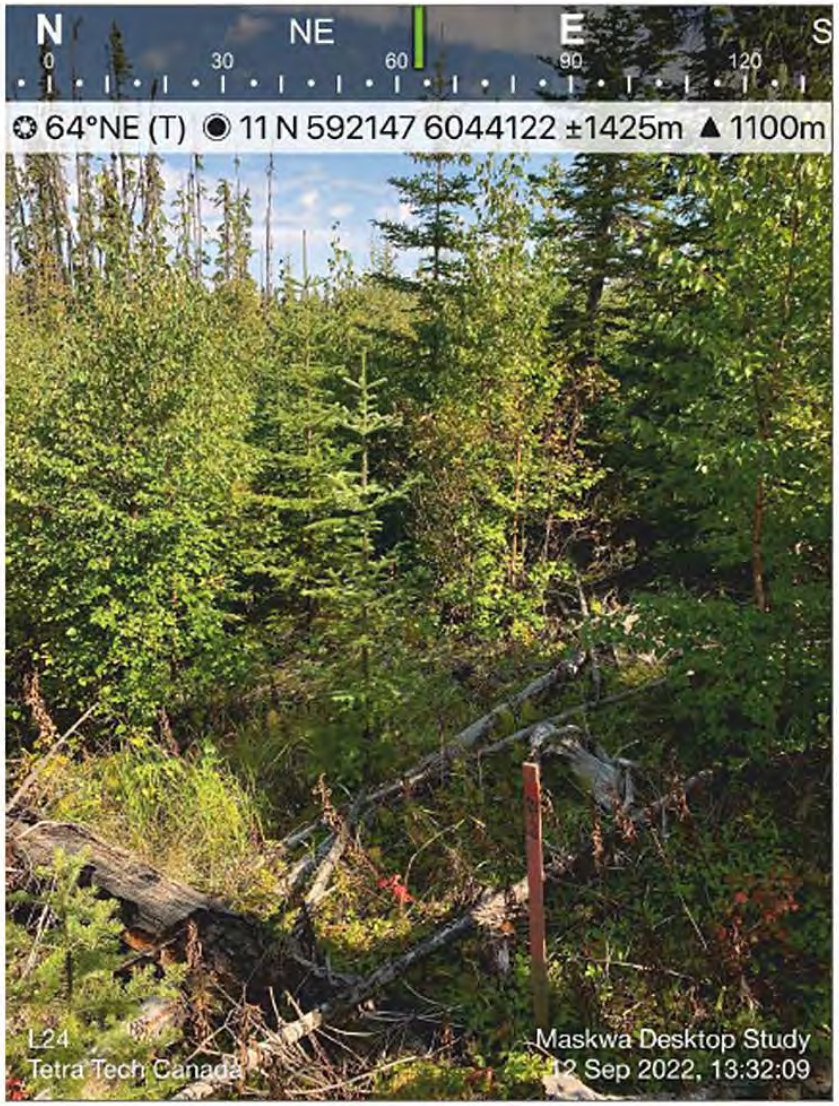


Photo 46: Location L-24 looking northeast at increased density of short tree growth. The ground surface is continuing to slope downwards towards the north.



Photo 47: Location L-24 evidence of small ground depressions.

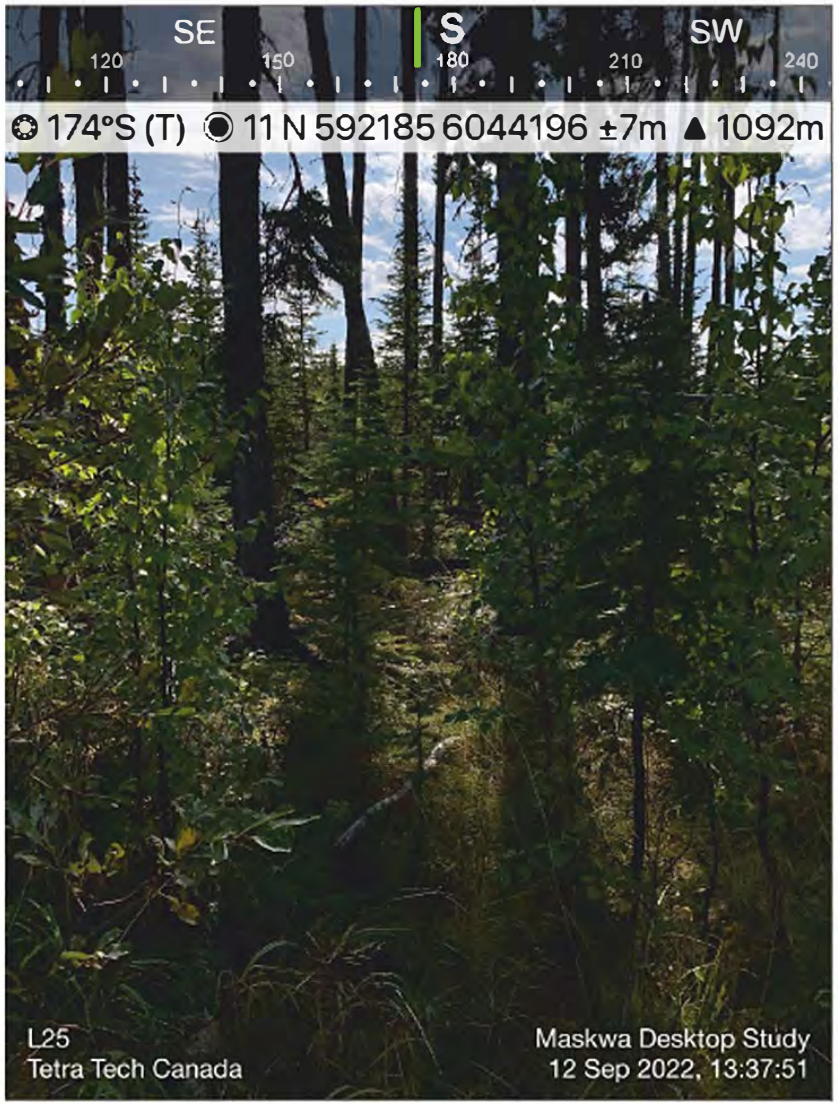


Photo 48: Location L-25 looking south; view of short tree growth relative to large tree growth along the cutline.

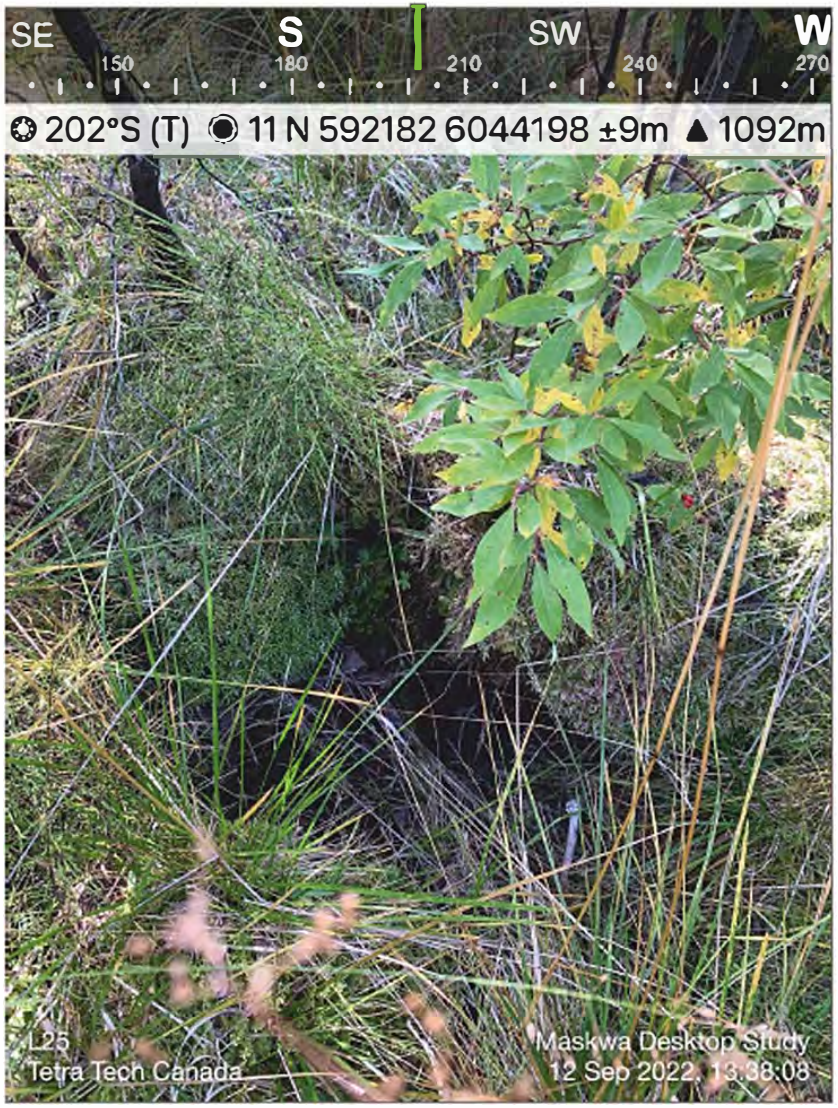


Photo 49: Location L-25 evidence of potential animal burrowing activities.

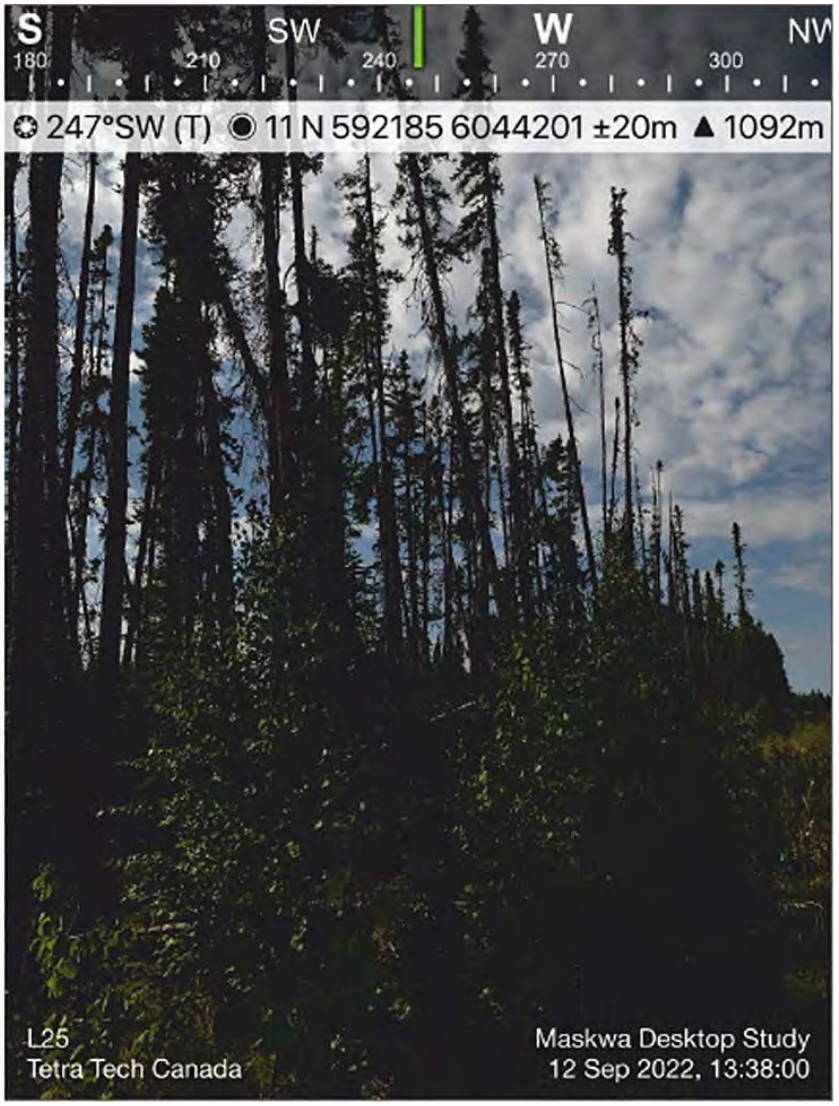


Photo 50: Location L-25 looking southwest at large tree growth along the cutline.

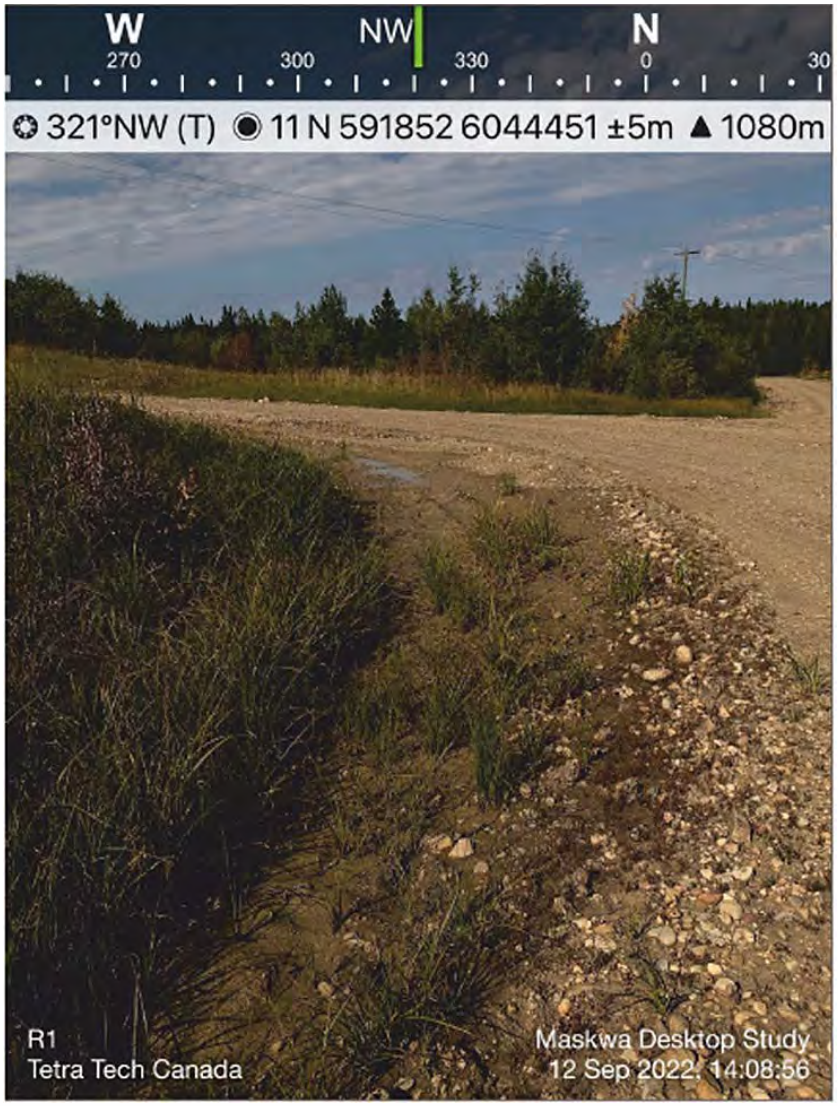


Photo 51: Location R-1 looking northwest at standing water within roadside ditch at the intersection.

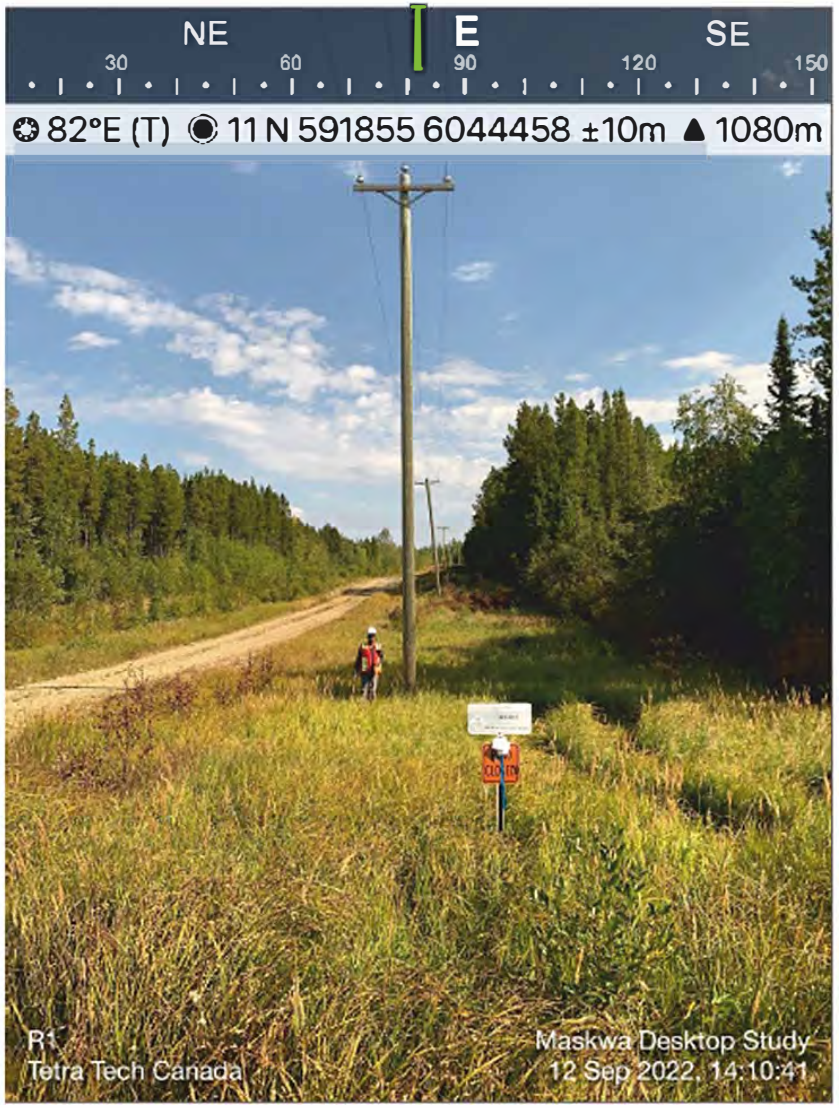


Photo 52: Location R-1 looking east from the intersection at overhead powerline crossing. Onsite personnel in background for reference (6'3").

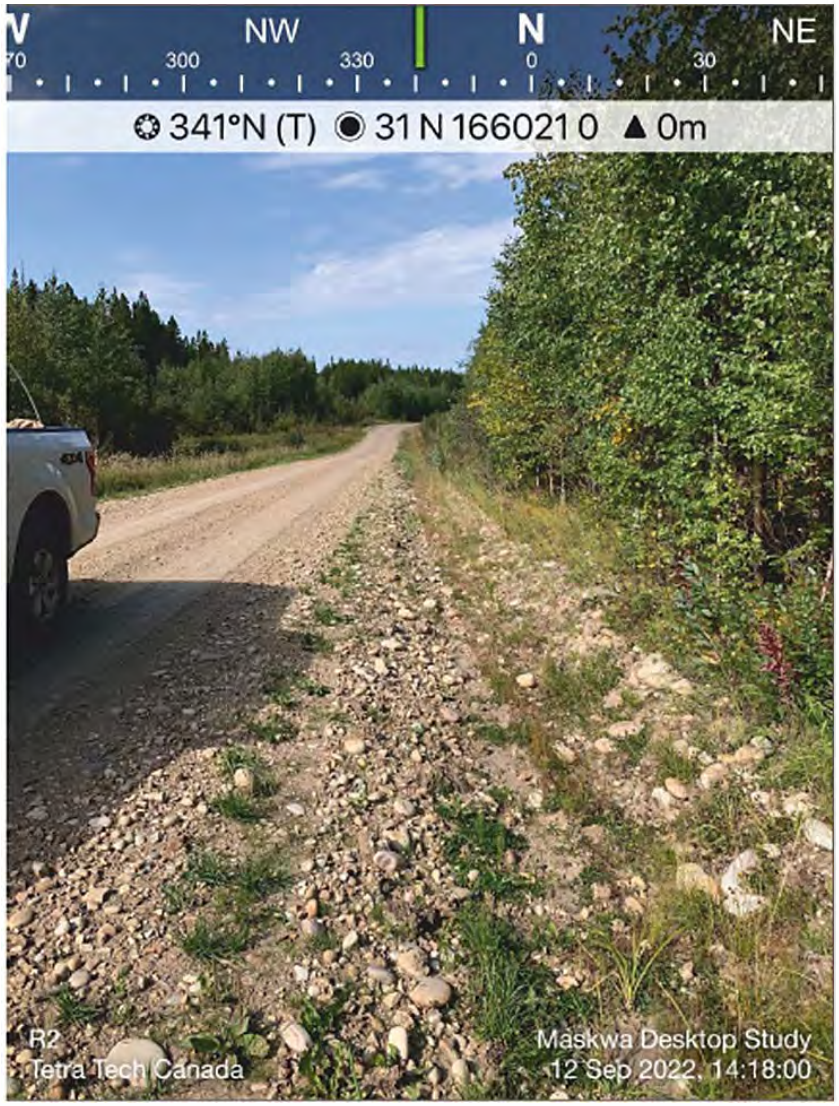


Photo 53: Location R-2 looking northwest at gravel access road and condition of roadside ditch.



Photo 54: Location R-2 close-up view of gravel access road.

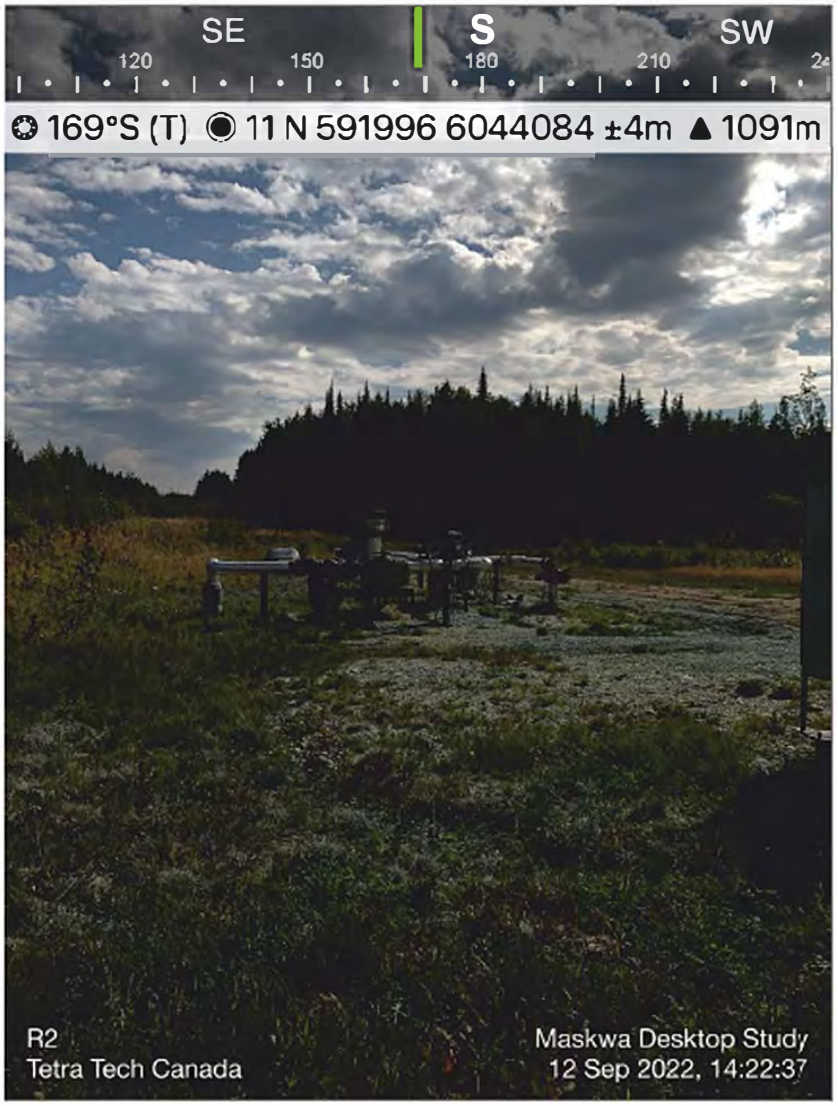


Photo 55: Location R-2 view of nearby pipeline facility. Similar facilities observed along the extent of the gravel access road.

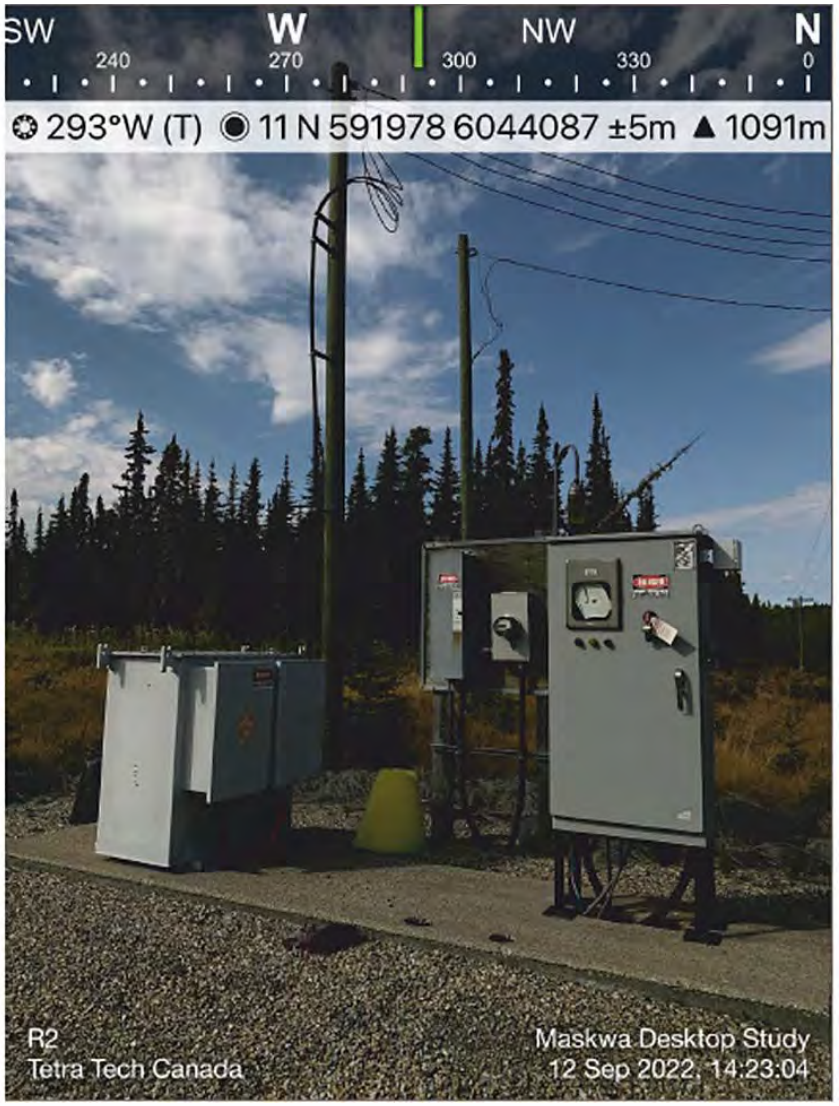


Photo 56: Location R-2 view of nearby power transmission facility. Similar facilities observed along the extent of the gravel access road.

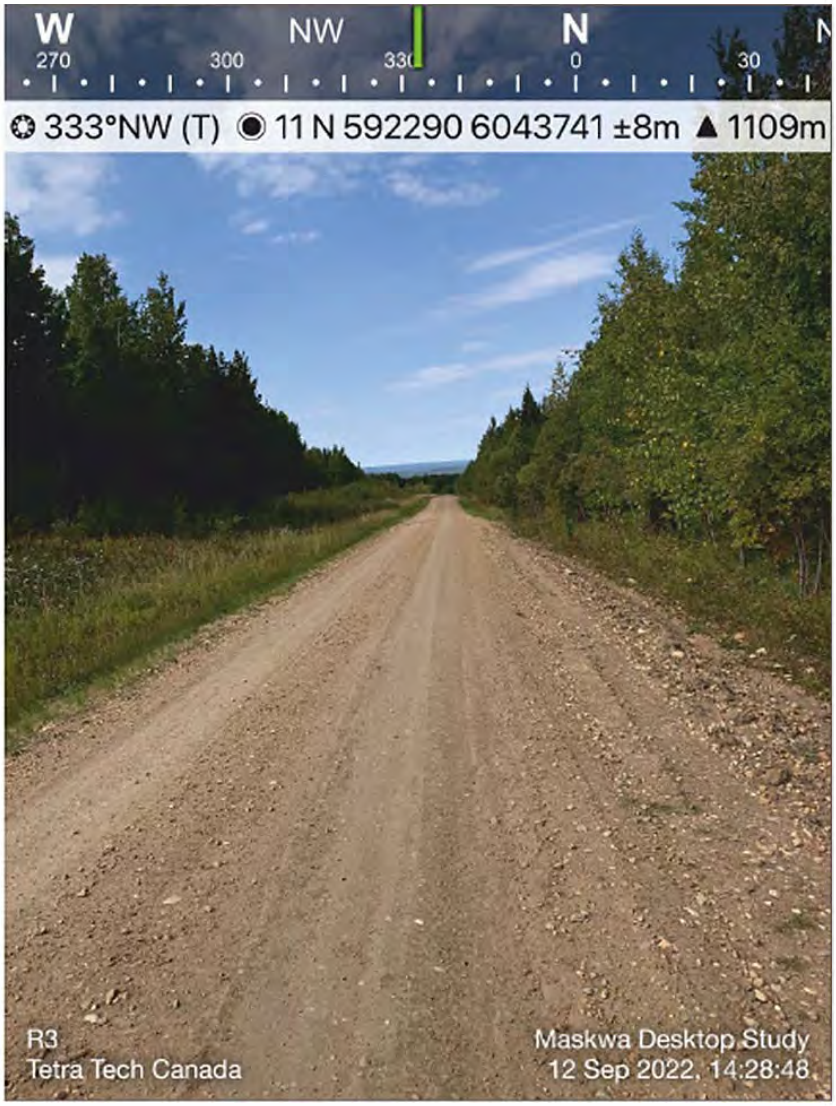


Photo 57: Location R-3 looking north at condition of gravel access road. Roadside ditch is less defined road surface gently sloping upwards towards the north.



Photo 58: Location R-3 evidence of small alligator cracks along the roadside ditch.



Photo 59: Location R-3 view of ground surface at nearby power transmission facility. Evidence of ground rutting and deformation from tire tracks.

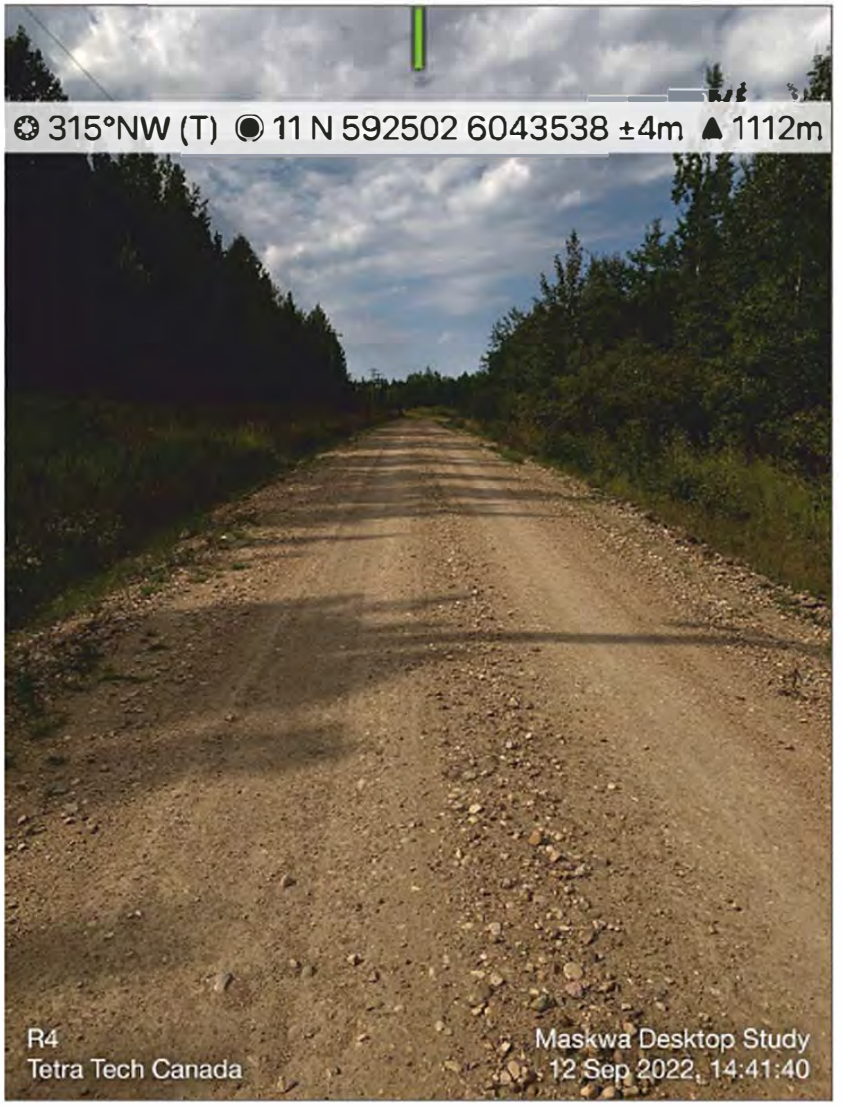


Photo 60: Location R-4 looking northwest at narrowing gravel access road.

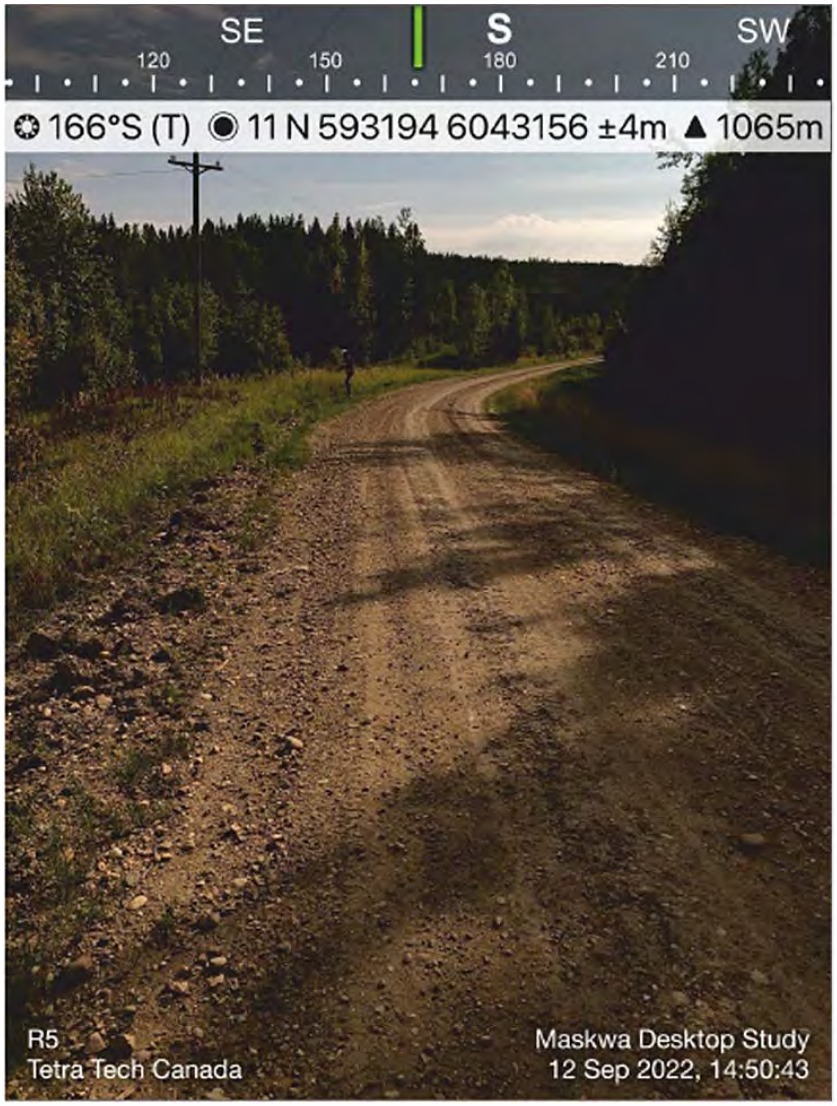


Photo 61: Location R-5 looking south at sharp bend and downslope of gravel access road.

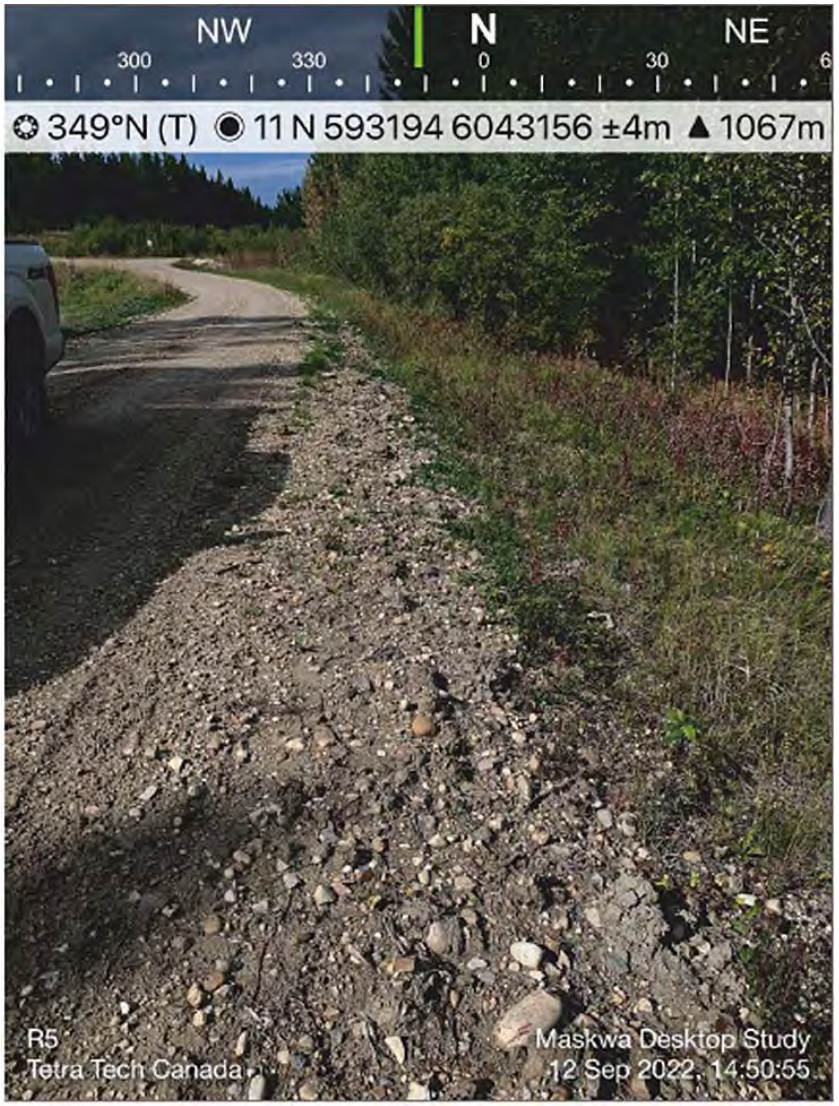


Photo 62: Location R-5 evidence of less well defined roadside ditch and steeper sideslopes.



Photo 63: Location R-5 looking east at culvert inlet below road surface. Corrugated steel culver opening is free of blockages and 1.5' in diameter.

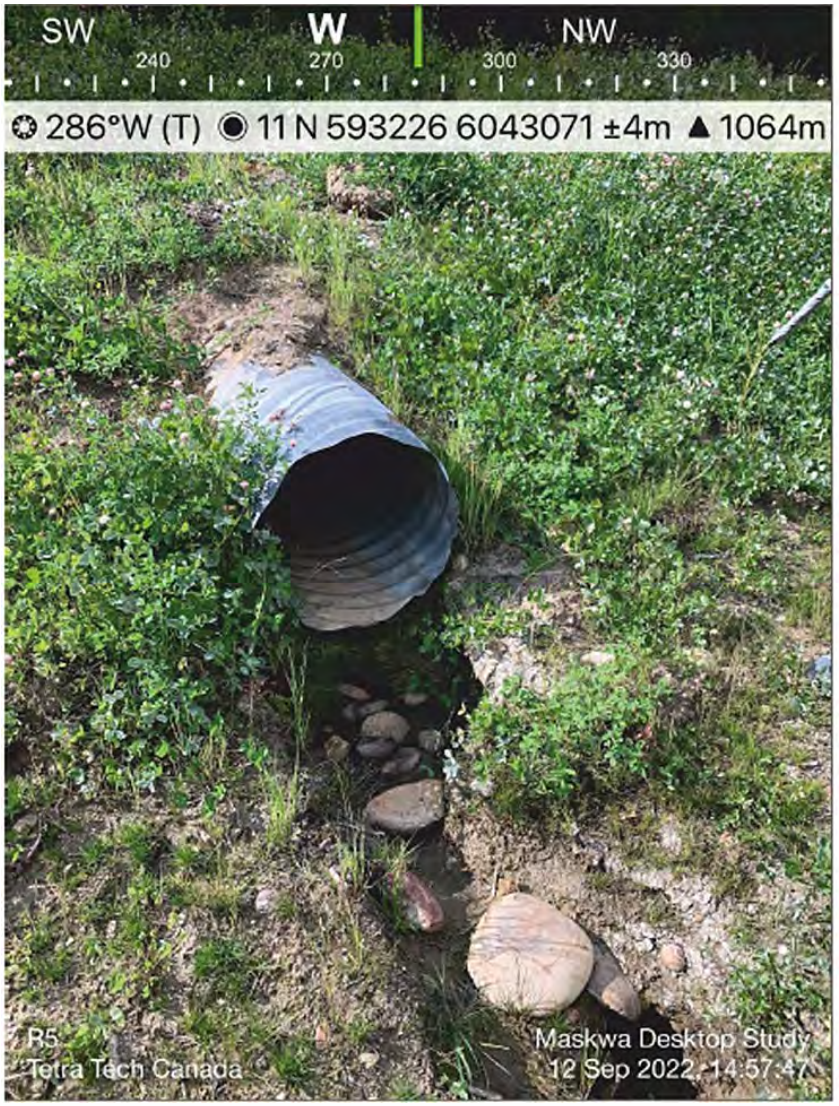


Photo 64: Location R-5 looking west at culvert outlet. Evidence of scour below the outlet and no flow observed.



Photo 65: Location R-5 looking east from culvert outlet at erosion caused by previous channel flow. Channel width is 6" and dry.



Photo 66: Location R-5 looking southeast at slope adjacent to culvert channel. Evidence of previous erosion control efforts.

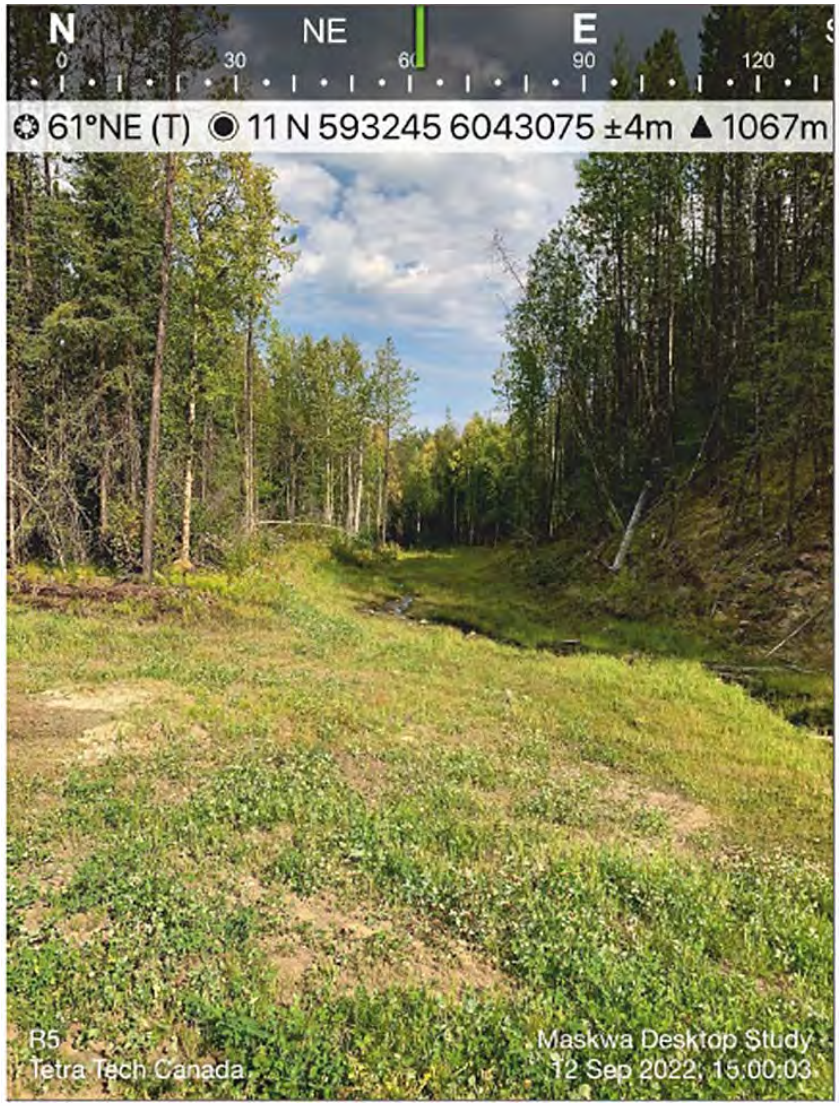


Photo 67: Location R-5 view of channel downstream from culvert. Standing water observed in the channel.

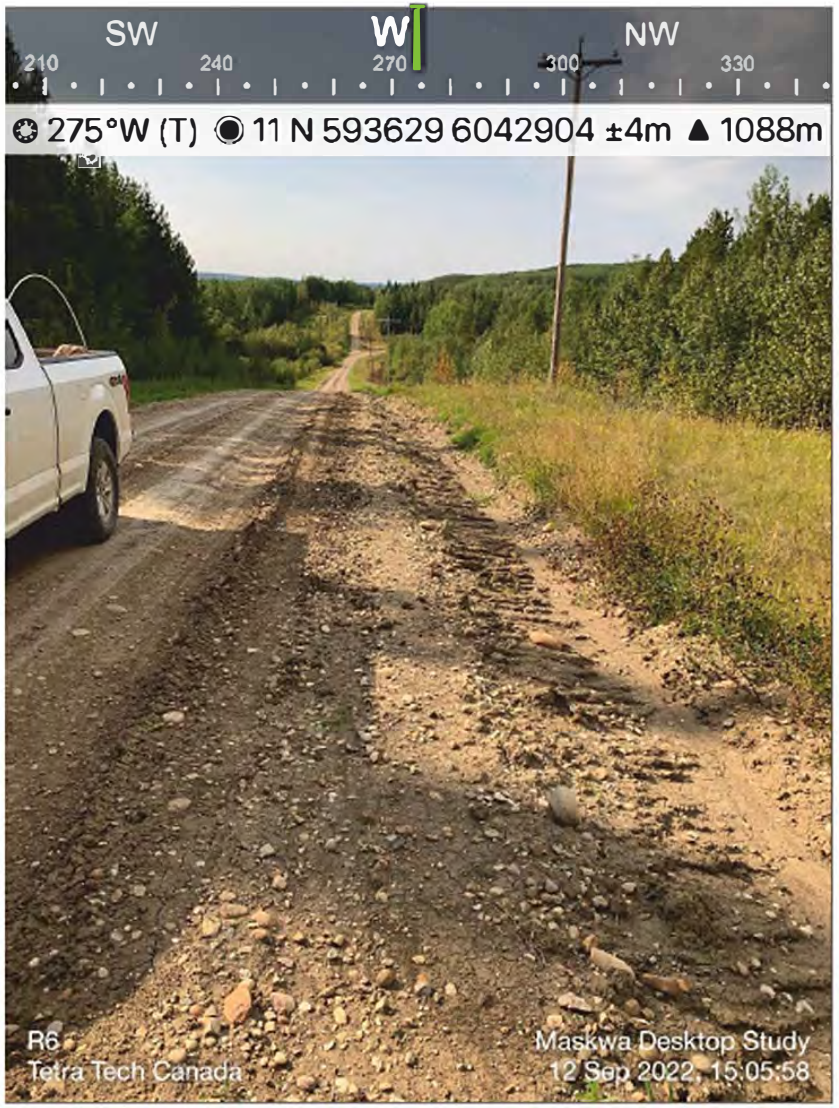


Photo 68: Location R-6 looking west at downslope and condition of roadside ditch. Evidence of larger cracks within ditch and gravel access road.



Photo 69: Location R-6 evidence of larger cracks along gravel access road surface.

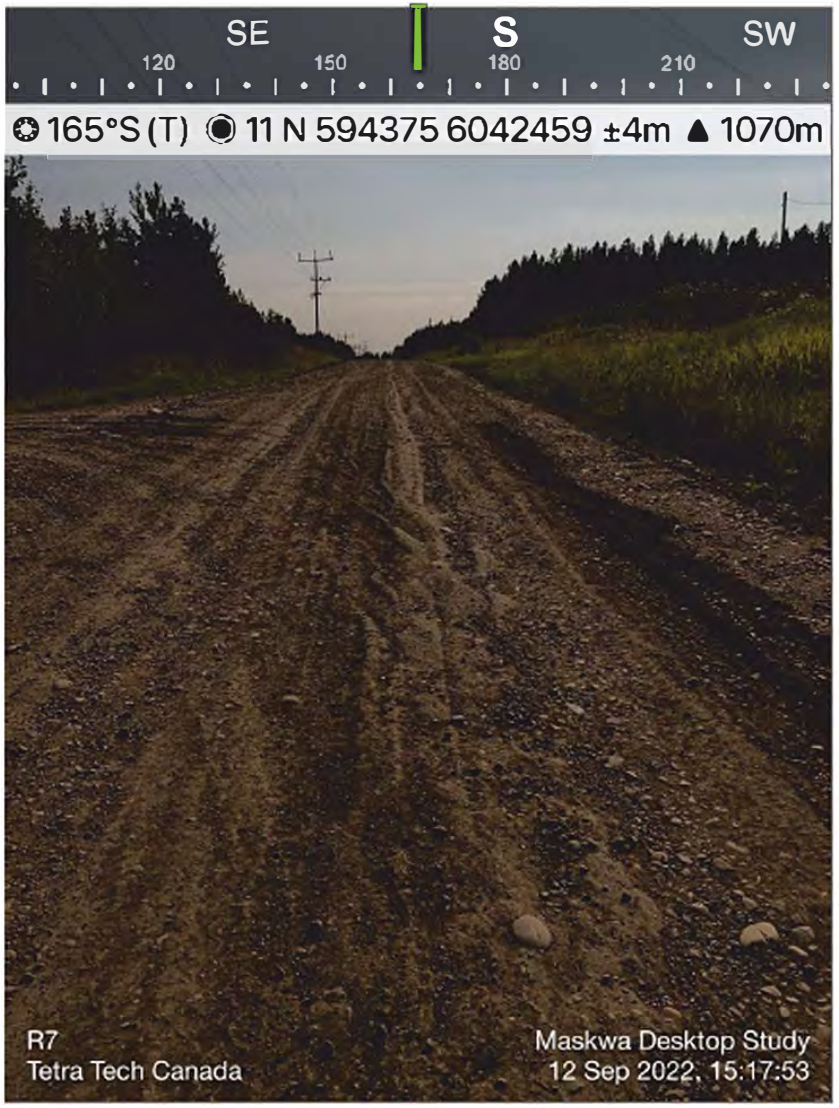


Photo 70: Location R-7 looking south at visibly worse conditions; evidence of cracks, rutting, and small potholes along gravel access road.

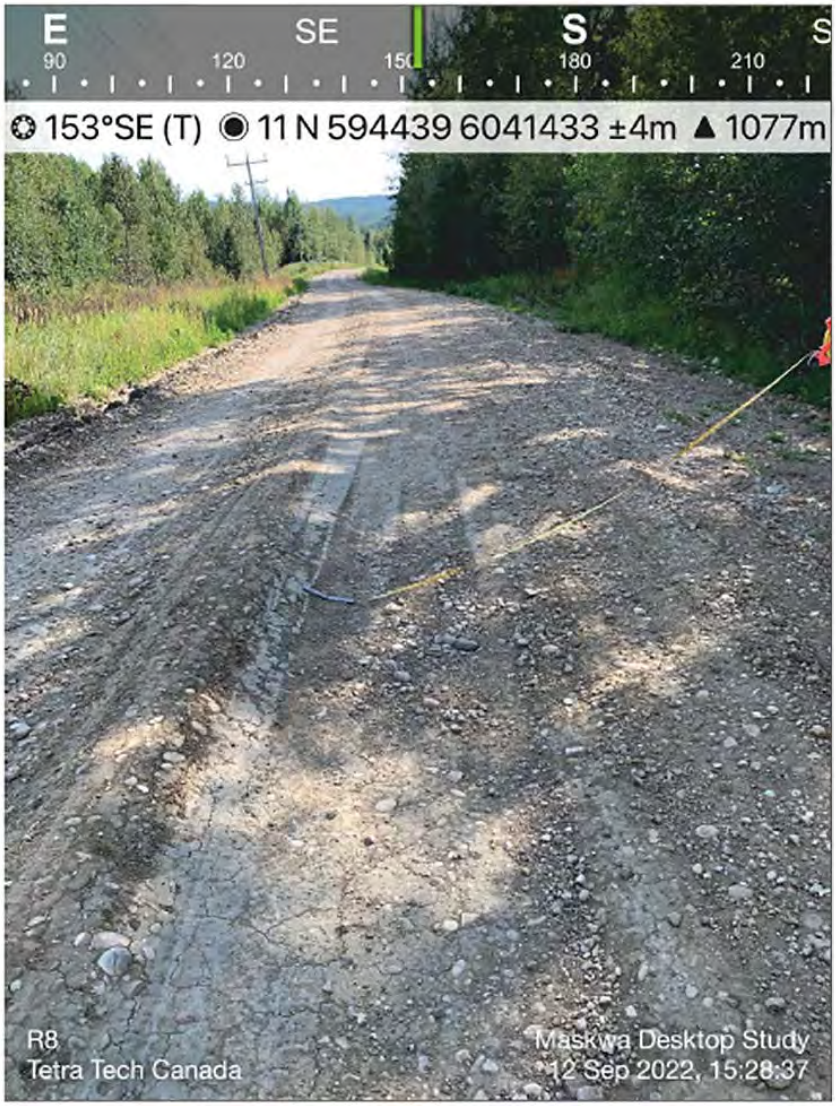


Photo 71: Location R-8 looking southeast; view of large rutting along gravel access road 7' in width and 8" depth.



Photo 72: Location R-9 looking southeast; view roadside ditch filled with sand, gravel, and topsoil materials.

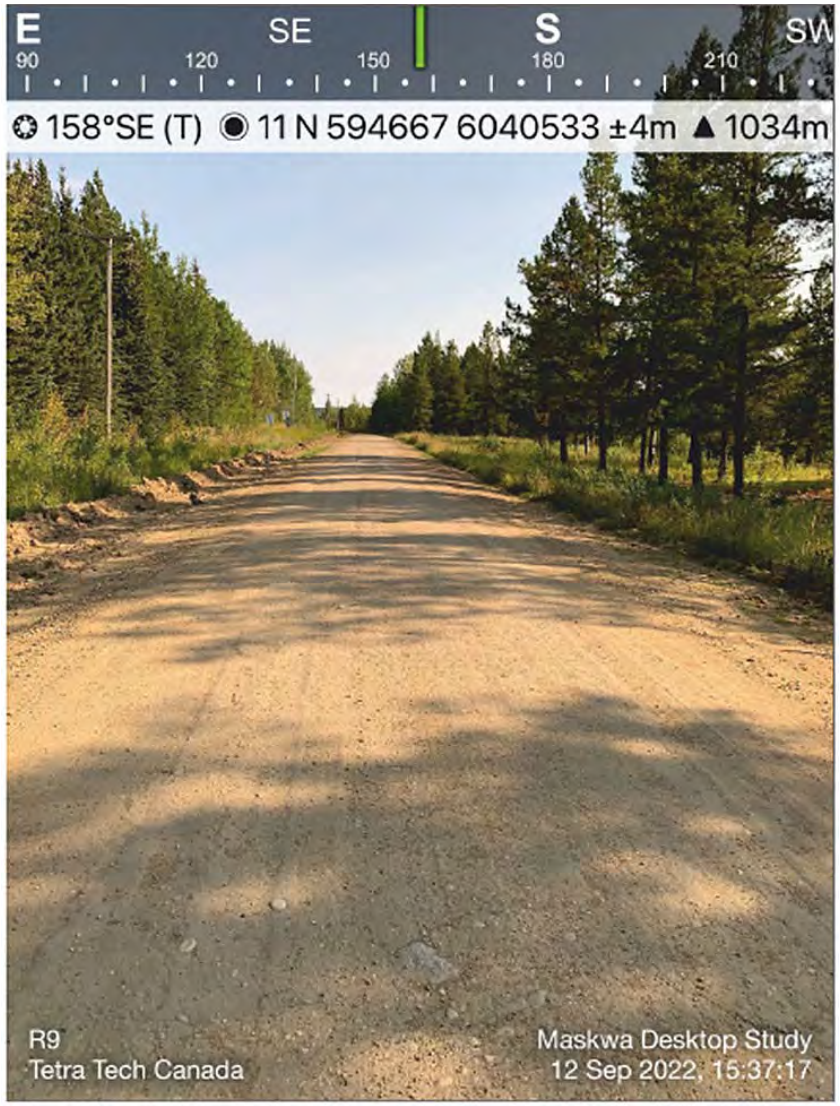


Photo 73: Location R-9 looking southeast; view of increased quality of gravel access road.



Photo 74: Location R-9 looking south towards nearby construction activities and potential replacement of pipeline infrastructure.

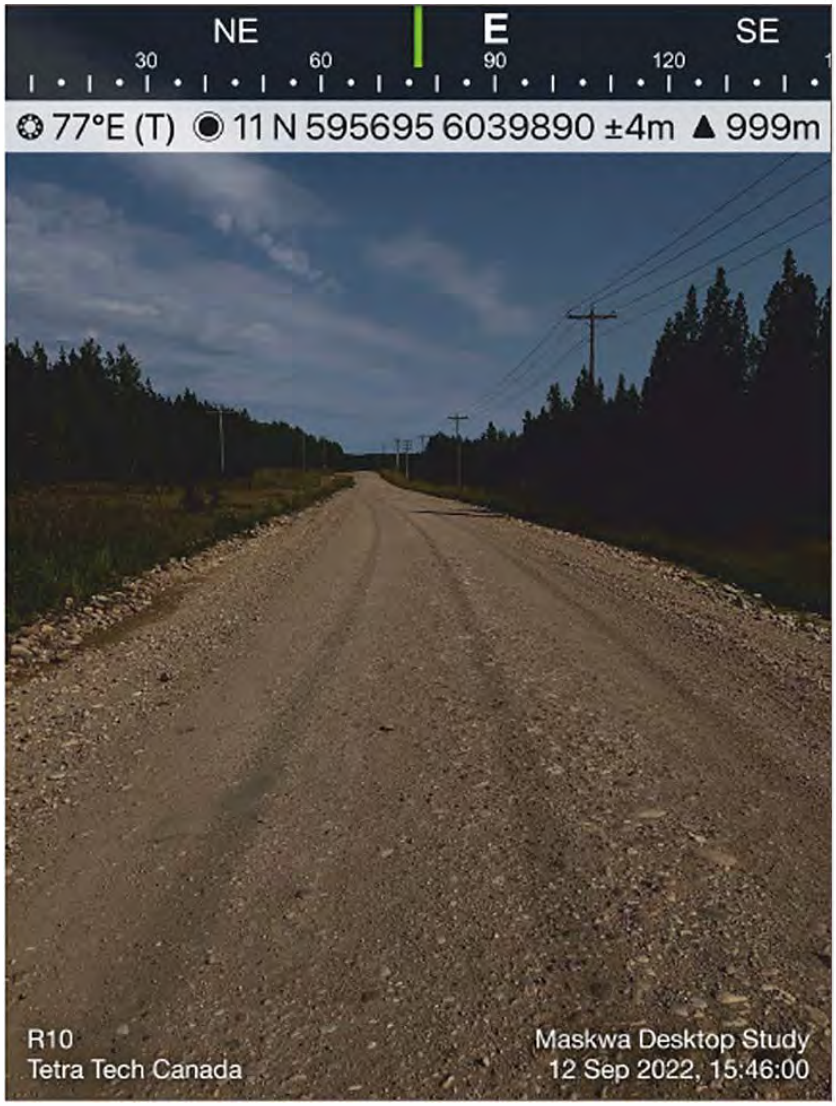


Photo 75: Location R-10 looking east at gravel access road conditions.



Photo 76: Location R-10 looking at outlet of buried PVC pipe culvert and washed sand material.

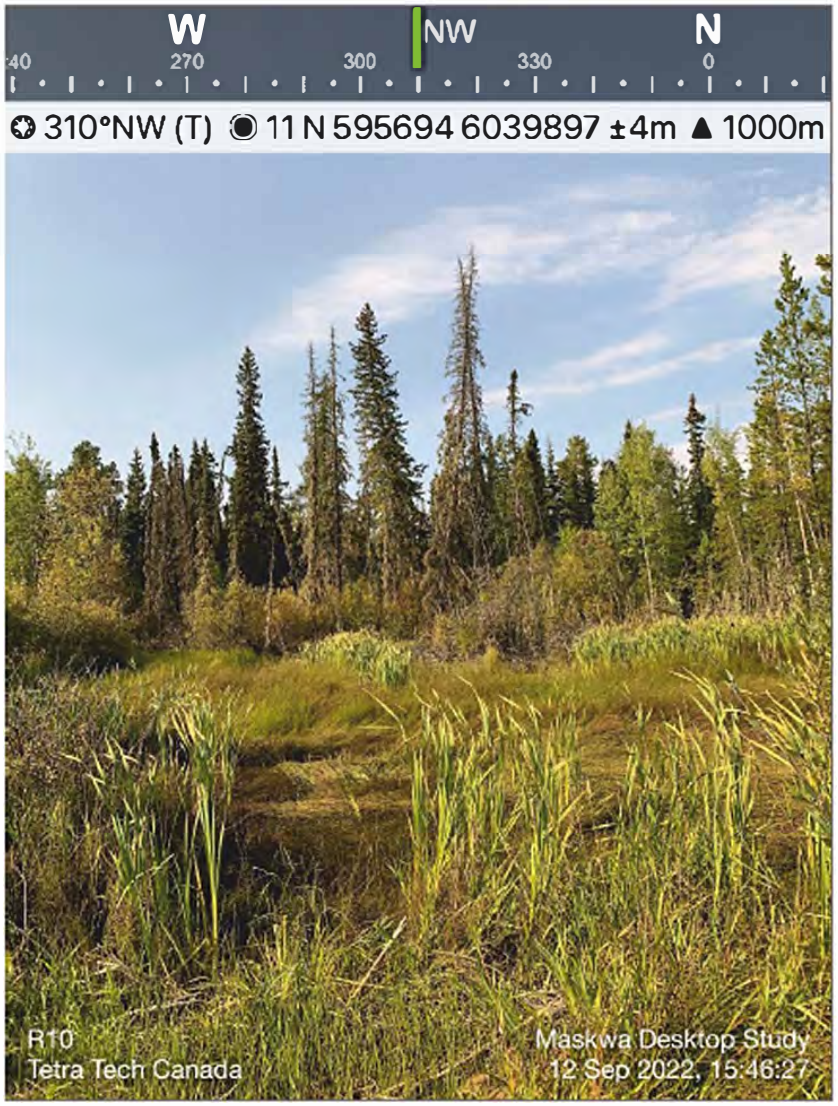


Photo 77: Location R-10 looking northwest downstream of buried culvert; evidence of wet ground condition and vegetation growth.



Photo 78: Location R-10 looking at inlet of buried PVC pipe culvert. Standing water has red tint indicating potential contamination. Washed sand material in foreground.



Photo 79: Location R-10 looking at the outlet of a buried culvert located east of the PVC pipe culvert.

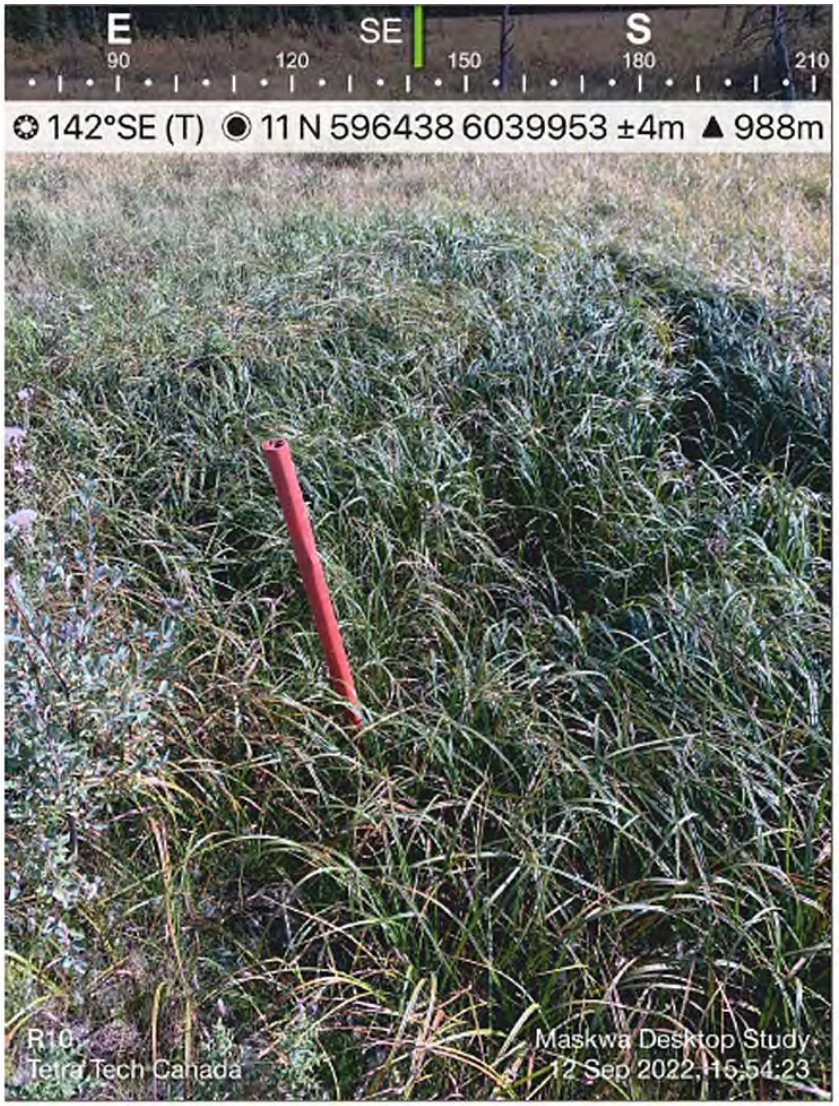


Photo 80: Location R-10 looking at the inlet of a buried culvert located east of the PVC pipe culvert.

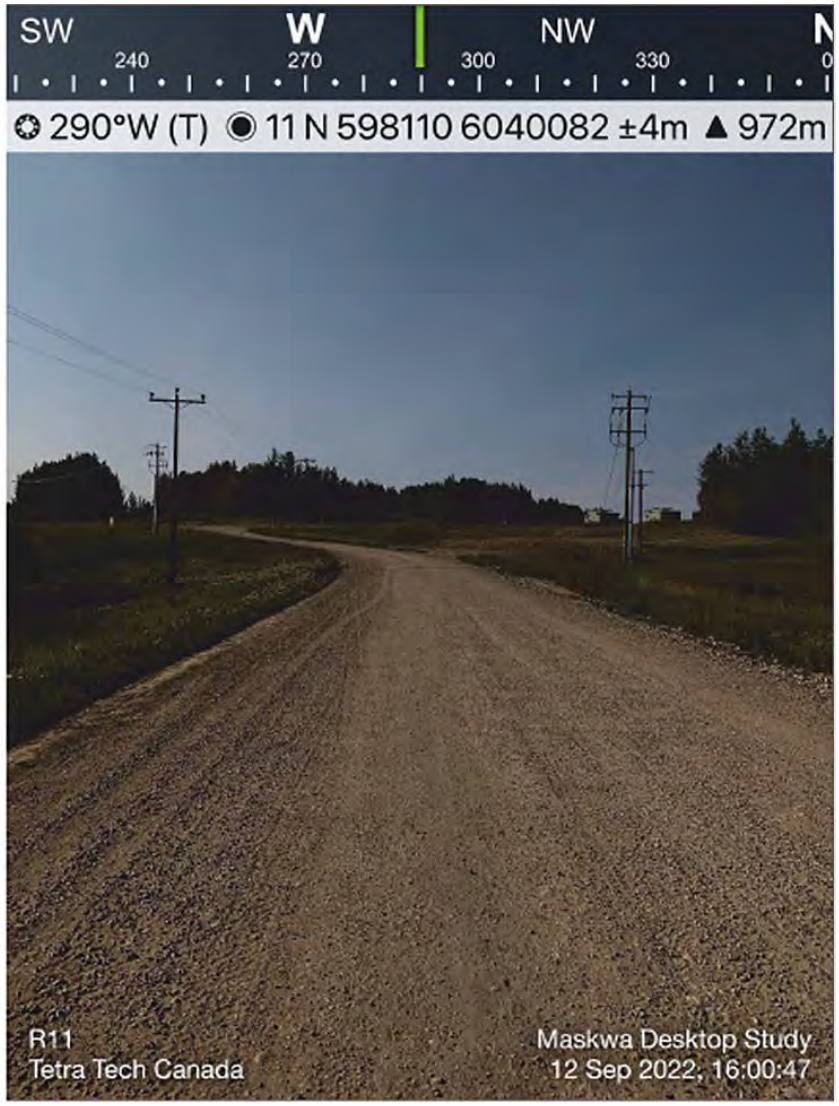


Photo 81: Location R-11 looking west at gravel access road conditions and sharp bend in roadway.

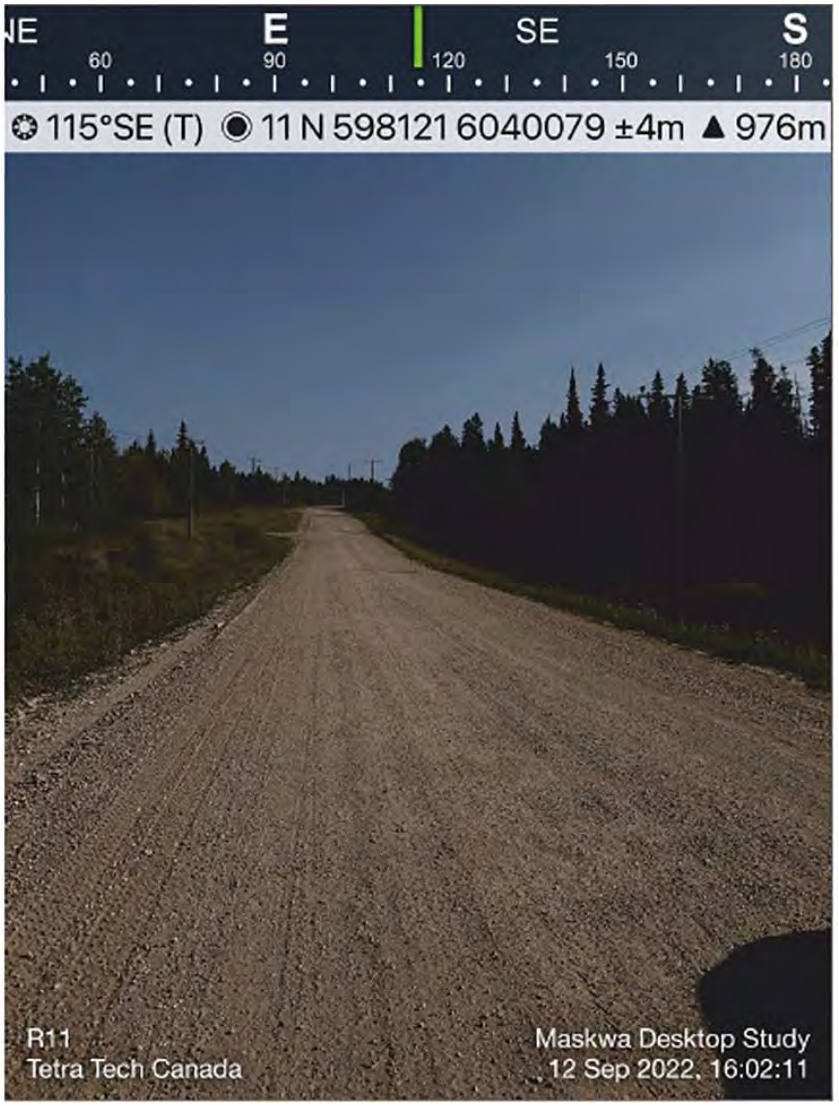


Photo 82: Location R-11 looking east at gravel access road conditions.

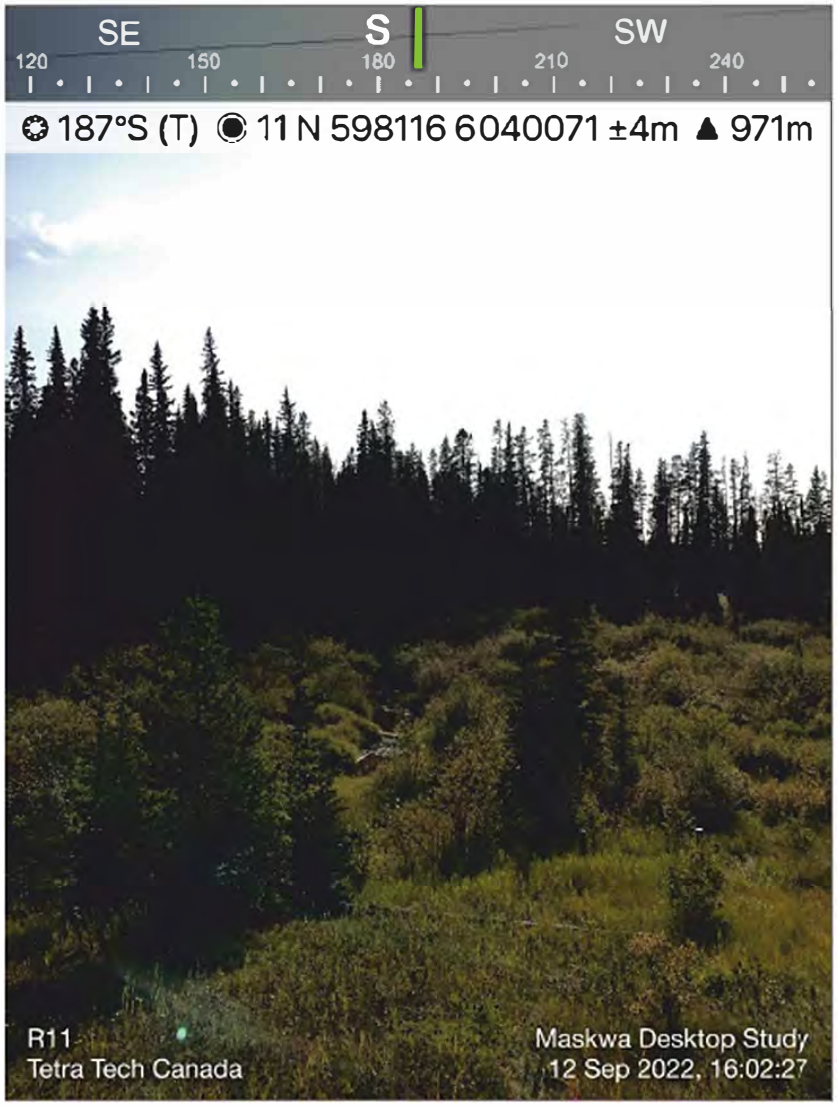


Photo 83: Location R-11 looking south at inlet of a corrugated steel pipe culvert near the Highway 32 intersection. Well defined channel with active flow and steep roadside slopes.

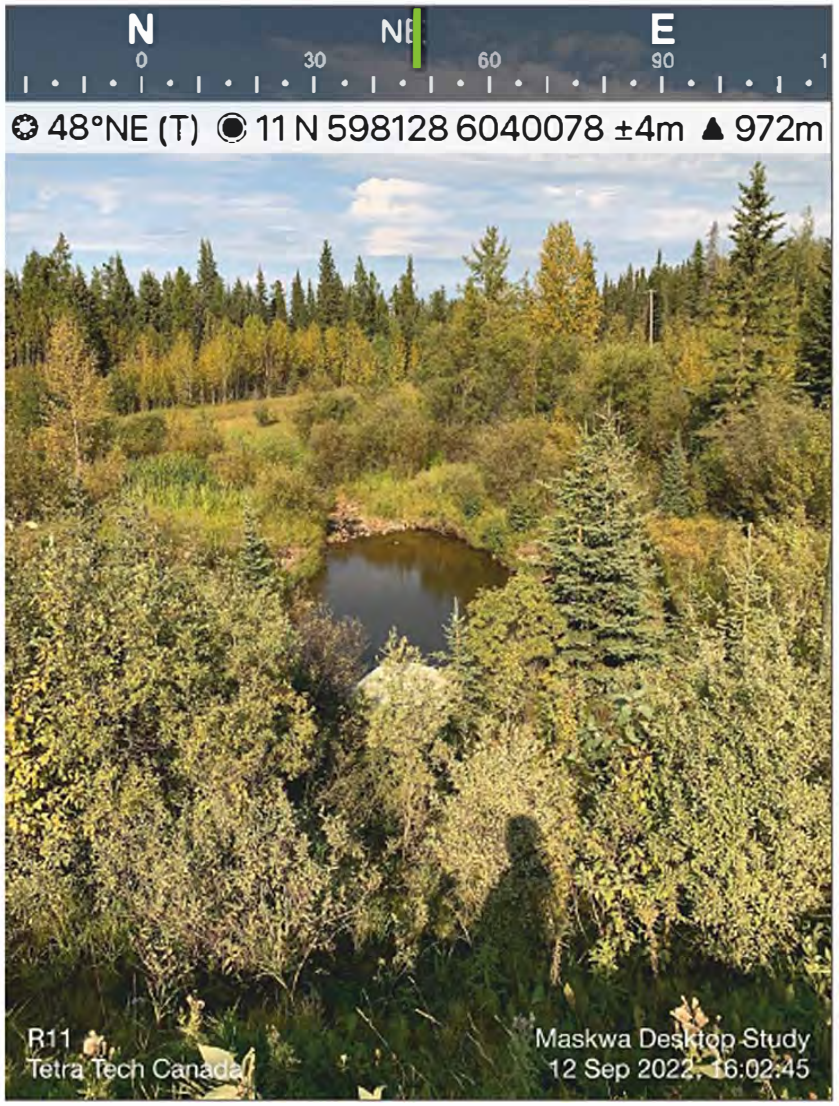


Photo 84: Location R-11 looking northeast at outlet of a corrugated steel pipe culvert near the Highway 32 intersection. Well defined pond with active flow and steep roadside slopes.

Appendix Q – Noise Impact Assessment

FINAL REPORT

BLACK BEAR POWER PLANT

BIG LAKES COUNTY, ALBERTA

NOISE IMPACT ASSESSMENT
RWDI # 2302933
April 13, 2023

SUBMITTED TO

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EXECUTIVE SUMMARY

Kiwetinohk Energy Corp. (KEC) is proposing to construct and operate Black Bear Power Plant on crown land approximately 24 km south of the Town of Swan Hills, Alberta. This Noise Impact Assessment (NIA) was prepared by RWDI to address the submission requirements for Kiwetinohk Energy Corp. Alberta Utilities Commission (AUC) Rule 007 application and was prepared in accordance with AUC Rule 012: Noise Control (AUC 2021).

The Black Bear project will see the development of 460 MW Black Bear Combined Cycle Power Plant, with a carbon capture plant (CCP), and a 240kV substation known as Gemini 1008S. The Project is a combined cycle power plant with carbon capture consisting of one natural gas fired combustion turbine, one steam turbine, one carbon capture package and one CO2 compression and dehydration package.

This assessment was prepared to demonstrate that the requirements of AUC Rule 012: Noise Control (AUC 2021) have been addressed for site equipment and technologies. It predicts the cumulative impact of noise generating equipment from the Project and any existing and approved energy related facilities that can potentially affect receptors.

No dwellings were identified within 1.5 km from the Project, therefor boundary receptors along a cumulative 1.5 km criteria boundary were identified and assessed for compliance. The project is located in a heavily developed with oil and gas due mainly to active pumping wells which have been included in the assessment.

Predicted noise levels were evaluated against permissible sound levels established within Rule 012 for the nearest receptors. The Project is found to comply with AUC Rule 012.

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VERSION HISTORY

Index	Date	Pages	Author
1	April 6 2023	All	Jim Nelligan
1	April 13 2023	All	Daniel Kremer

REPORT SIGNATURES

<original signed by>

Daniel Kremer, M.Sc..

1 INTRODUCTION

Kiwetinohk Energy Corp proposing the development of the Black Bear project located in Big Lakes County, AB. This Noise Impact Assessment (NIA) was prepared by RWDI to address the submission requirements for Kiwetinohk Energy Corp Alberta Utilities Commission (AUC) Rule 007 application and was prepared in accordance with AUC Rule 012: Noise Control (AUC 2021).

The Black Bear Project will see the development of 460 MW Black Bear Combined Cycle Power Plant, with a carbon capture plant (CCP), and a 240kV substation facility.

A noise model was generated, and compliance was determined per AUC Rule 012. All work was completed by technical staff experienced in acoustic assessment, as detailed in Appendix A.

2 ASSESSMENT APPROACH

Noise from the proposed Project has been estimated using predictive modelling to determine the impact at the nearest receptors. The assessment was completed by:

- Identifying receptors and respective PSLs per Rule 012;
- Determining existing ambient conditions per Rule 012;
- Estimating sound emissions from existing or approved nearby facilities;
- Estimating sound emissions from the proposed Project;
- Modelling the sound emissions to predict noise levels at receptors; and
- Comparing the predictions to the Rule 012 PSLs.

This report describes methods of the noise assessment, as well as general noise mitigation recommendations for the Project required to meet the PSLs.

2.1 Environmental Noise Descriptors

As environmental noise varies over time, a single number descriptor known as the Energy Equivalent Sound Level or L_{EQ} is used to quantify noise. It is defined as the steady continuous sound level, over a specified time period, that has the same acoustic energy as the actual varying sound levels occurring over the same time period. The L_{EQ} values are reported as A-weighted sound levels expressed in units of dBA (A-weighted decibels). The A-weightings are assigned to account for the frequency response of the human ear, which is most sensitive to mid-frequency sounds. The L_{EQ} in dBA is the primary sound level criteria addressed by AER Directive 038 criteria.

Directive 038 has different allowable sound levels for daytime, which it defines as 07:00 to 22:00 hours, and nighttime, which it defines as 22:00 to 07:00 hours. The L_{EQ} during daytime periods is the 15-hour A-weighted energy equivalent sound level and is denoted as the L_{EQ} Day. Similarly, the L_{EQ} during nighttime periods is a 9-hour A-weighted energy equivalent sound level and is denoted as the L_{EQ} Night.

In addition to assessing A-weighted L_{EQ} sound levels, Directive 038 recommends that low frequency noise (LFN) be assessed at the NIA stage where data is available. LFN is measured using C-weighted L_{EQ} sound levels, expressed in dBC, which represent a nearly flat frequency response. The C-weighted levels are considered because A-weighted levels may not indicate the potential for disturbance caused by high levels of LFN. Directive 038 assesses the potential for LFN complaints based on the difference between the dBC and dBA levels, and whether there is tonality of the sound within the LFN frequencies.

A detailed glossary of terms is provided in Appendix B to aid the non-technical reader.

2.2 Computer Modelling

Modelling for this assessment was conducted using Cadna/A (Version 2023 MR1 – 191-5229) sound level prediction software set to use the environmental sound propagation calculation methods prescribed by the ISO Standard 9613 (ISO 1993, 1996). The ISO 9613 sound propagation method predicts sound levels under moderately developed temperature inversion and downwind conditions, which enhance sound propagation to the receptor. The evaluation is based on typical summertime weather conditions, as outlined in Rule 012. Table 1 describes the configuration of the calculation parameters used to complete the noise modelling.

Table 1: Model Configuration Parameters

Parameter	Model Settings	Description/Notes
Calculation Standard	ISO 9613 only	All sources and attenuators treated as required by the cited standard.
Source Directivity	Vertical sources applied to larger structures	Directivity of the source emission and the barrier effect of the unit itself were included.
Ground Absorption	0.8 (index value 0 to 1)	Values used for soft ground. Applied to the entire modelling domain.
	0.4	Value used for crushed rock and gravel in the Project Area.
	0.0	Open Water
Temperature and Humidity	10°C/70% Relative Humidity	Average summer conditions resulting in the least atmospheric attenuation.
Wind Conditions	Default ISO 9613	The propagation conditions in the ISO (1996) standard are valid for wind speeds between 4 and 18 km/h; all points are considered downwind.
	ISO 1996 – moderate inversion condition	
Terrain	Terrain applied	Terrain in the area is modelled at 5 m resolution to account for any natural barriers within the study area (CDEM 2011).
Reflections	0	One reflection is taken into account for reflections from on-site structures.
Search Radius	5000m	All sources within this radius of a receptor or grid point are calculated.

The sound emissions for all sources considered in the Cadna/A modelling were established by reviewing proposed equipment lists, site layouts and activity descriptions. Sound emissions were identified for each type of equipment using, in order of preference: manufacturer data, measured data from similar equipment, public literature or theoretical calculation.

3 STUDY AREA AND RECEPTORS

Rule 012 defines a noise-sensitive receptor as any permanent or seasonally occupied dwelling within 1.5 km of a facility. In areas where there are no nearby residents, Rule 012 sets a limit on the sound levels at a distance of 1.5 km from the Project fenceline, referred to here as the 1.5 km Criteria Boundary. To be consistent with other applications to the AUC, the property line, as supplied in site drawings, has been defined as the Project fenceline.

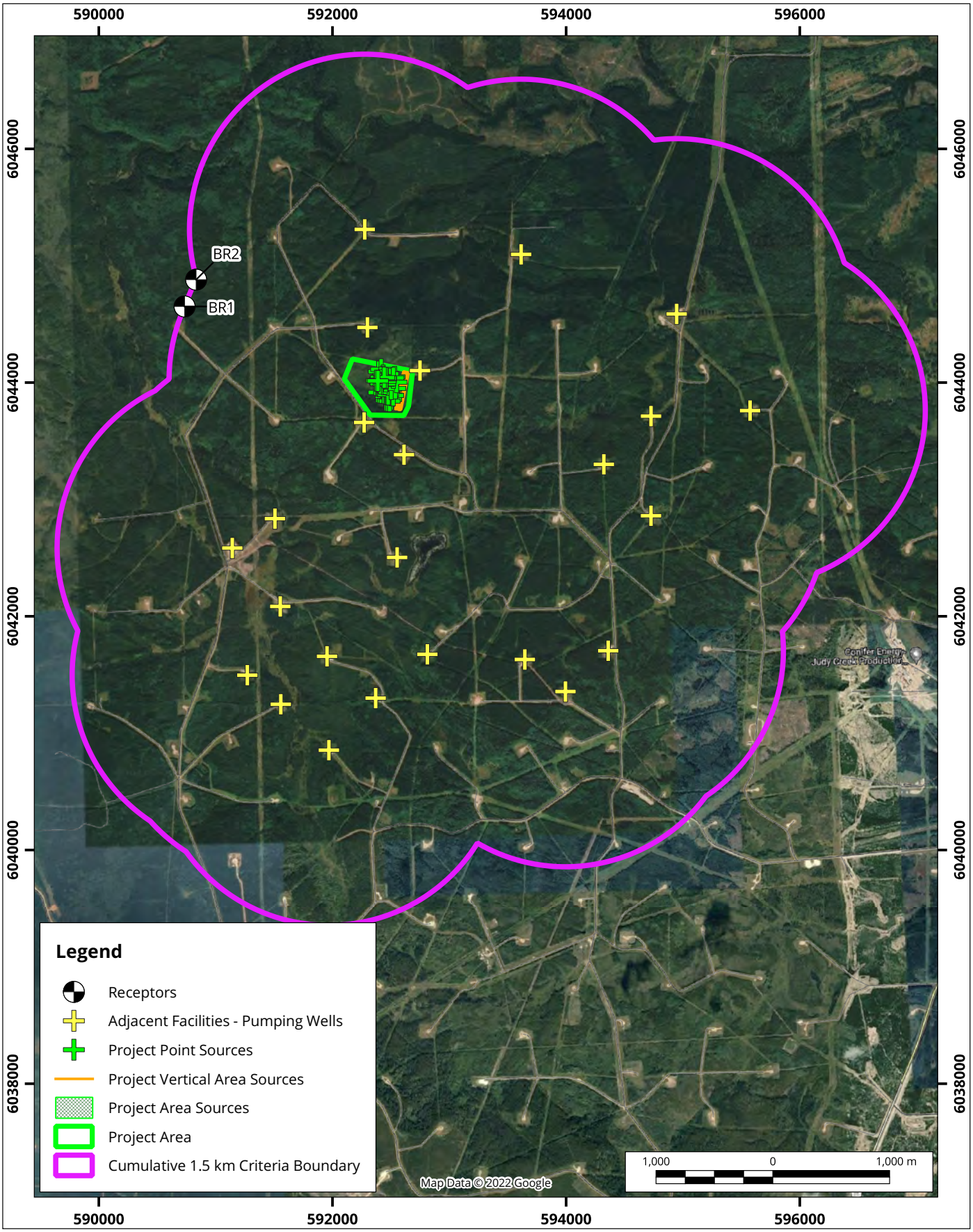
In the case where other noise regulated energy facilities are located near the Project, a cumulative 1.5 km Criteria Boundary is defined. Fencelines for the adjacent facilities are assigned and 1.5 km Criteria Boundaries for each facility created. Overlapping facility boundaries are merged to create a continuous cumulative 1.5 km Criteria Boundary for all the facilities, which was used for the assessment. Facilities in operation within 3.0 km of Project facility fenceline are included in the study area. Specific details on the adjacent facilities are discussed in Section 5 of this report.

No permanent or seasonally occupied dwellings are located within 1.5 km of the cumulative Criteria Boundary perimeter. Boundary receptors are assigned based on the points of greatest predicted sound level along the 1.5 km Criteria Boundary. The boundary receptor BR1 is the location with the greatest contribution from the Project. The Boundary receptor BR2 is the location with the greatest cumulative contribution from the Project and adjacent facilities.

The location is determined from the cumulative analysis done in Section 6.2. Table 2 shows the geographic coordinate, distance, and direction of the identified receptors for the Project. Figure 1 shows the location of the Project, identified receptors, and the resulting 1.5 km Criteria boundary. Table 2 shows the geographic coordinates, distance, and direction of the noise-sensitive receptors within 1.5 km from the Project fenceline. Figure 1 shows the location of the Project, identified receptors, and the 1.5 km Criteria Boundary.

Table 2: Location of Receptors and Spatial Locations from Project

Receptor ID	Receptor Type	Height (m)	UTM Coordinates (NAD 83, Zone 12)	
			Easting (m)	Northing (m)
BR1	Greatest Project Contribution	1.5	590735	6044652
BR2	Greatest Cumulative Contribution	1.5	590833	6044882



Black Bear Combined Cycle Power Plant

Project Overview - Project Location, Adjacent Facilities, Criteri Boundary, and Boundary Receptors

Map Projection:
Big Lakes County - Alberta

True North

Project #: 2302933

Drawn by: DJK	Figure: 1
Approx. Scale:	1:45,000
Date Revised:	Apr 02, 2023

Map Document: C:\DJK\Jobs - Sync\2302933 - LN - BlackBear Power Plant\03WorkItems\QGIS\20230214 - Black Bear.qgz

4 RULE 012 CRITERIA

4.1 Ambient Conditions

AUC Rule 012 requires the consideration of ambient levels in the determination of PSLs and compliance of proposed projects. In areas where the assumed ambient described in Table 1 of Rule 012 is not representative of an area, measured values may be used in establishing the PSLs such as areas meeting the definition of 'pristine' in the rule or may be influenced by non-noise regulated development. The project area does not meet the definition of pristine according to Rule 012, which states:

> A natural area that might have a dwelling but no industrial presence, including energy, agricultural, forestry, manufacturing, recreational or other industries that affect the noise environment.

The project area is typical of rural Alberta, primarily oil and gas energy development. No non-noise regulated industry was identified that would influence noise levels at the Project receptors.

The use of the assumed ambient sound level as being 5 dB less than the BSL is well founded and may be considered a reasonable approach to establishing the PSL for all dwellings in this assessment.

4.2 PSL Determination

The requirements of Rule 012 limit the amount of sound contribution at a receptor location that may be generated by facilities. The sound level limits for a receptor are set by calculating permissible sound levels (PSLs) according to the procedures in Rule 012. If a PSL has been previously approved for a receptor, the approved PSL must be used.

A PSL is determined using a Basic Sound Level (BSL) modified by any allowed adjustments. Where no special conditions exist, the PSL is determined as follows:

Permissible Sound Level	=	Basic Sound Level (Table 1 in Rule 012)	+	Daytime Adjustment (If applicable)

No special ambient conditions were identified, the BSL is determined based on dwelling density and proximity to heavily travelled roadways per Table 1 in Rule 012. For all receptors identified in Table 3, the PSLs are the BSL of 40 dBA night and adjusted 50 dBA day. All receptors are rural residences with a dwelling density of less than 8 dwellings per quarter section, and the resulting PSL is 40 dBA for nighttime and 50 dBA for daytime. A summary of the PSLs is provided in Table 3.

Where no permanent or seasonally occupied human dwelling exists within a distance of 1.5 km from the Project, Rule 012 requires that the cumulative sound level at 1.5 km from the Project "fenceline" not exceed 40 dBA L_{EQ} during nighttime hours. Two boundary receptors meeting the definition of a dwelling according to Rule 012 have

been identified. Table 3 shows the permissible sound levels for the Project. Figure 2 shows the Project boundary, boundary receptors, and the 1.5 km boundary.

Table 3: Daytime and Nighttime Permissible Sound Levels

Receptor ID	Nighttime BSL[1]	Assumed Ambient Sound Level[2] (dBA)		Permissible Sound Level[3] (dBA)	
		Night[4]	Day [5]	Night[4]	Day [5]
BR1	40	35	45	40	50
BR2	40	35	45	40	50

4.3 Low Frequency Noise

Regarding low frequency noise (LFN), Rule 012 states that a complaint condition may exist where the difference between Project contributed time weighted average dBA and dBC levels is equal to or greater than 20 dB, and where a clear tonal component exists at a frequency below 250 Hz.

5 EXISTING AND APPROVED FACILITIES

AUC Rule 012 requires that a cumulative assessment be considered for the development of any energy related facilities (regulated through AUC or AER) in Alberta. The cumulative assessment must include the contributions from both existing and approved (but not yet built) facilities.

5.1 AER Regulated Facilities

To identify facilities that may contribute to the acoustic environment, publicly available databases were reviewed to determine the locations of potential energy-related contributors. The following databases were consulted to determine the locations of facilities in the vicinity of the Project:

- Alberta Energy Regulator ST37 – Alberta well listing (AER 2023a)
- Alberta Energy Regulator ST102 – Alberta facility list (AER 2023b)

A 3 km search area from the Project boundary was considered for the detailed database search. A visual review of satellite mapping to approximately 5 km distance was completed to identify if large facilities that may be a cumulative noise contributor at farther distances were present. The satellite imagery indicates that the area is heavily developed for oil and gas.

The results from the ST37 database search indicates numerous wells both active and inactive adjacent to the Project. Twenty-four (24) active pumping gas wells were present within 3km of the Project and have the potential to influence the acoustic environment. These have been modelled using RWDI reference levels of typical pumping

wells based on historical measurements for the area. Table 4 lists the identified active wells including in the noise model including the locations and the estimated sound power levels.

Table 4: AER ST37 Active Pumping Wells Locations and Sound Power Levels

Item	Location NAD83 UTM 11		Levels at Octave Band Center Frequencies (dB)									Overall Sound Power	
	Easting (m)	Northing (m)	31.5	63	125	250	500	1,000	2,000	4,000	8,000	(dBA)	(dB)
Operational Pumping Wells - AER ST37													
CFR JUDYCK 4-13-64-11	594728	6043714	105	101	98	90	89	84	83	82	78	91.7	107.2
CFR JUDYCK 10-3-64-11	592370	6041300	105	101	98	90	89	84	83	82	78	91.7	107.2
CFR JUDYCK 12-10-64-11	591508	6042836	105	101	98	90	89	84	83	82	78	91.7	107.2
CFR JUDYCK 10-15-64-11	592300	6044472	105	101	98	90	89	84	83	82	78	91.7	107.2
CFR JUDYCK 12-3-64-11	591558	6041248	105	101	98	90	89	84	83	82	78	91.7	107.2
CFR JUDYCK 4-10-64-11	591554	6042085	105	101	98	90	89	84	83	82	78	91.7	107.2
CFR JUDYCK 2-22-64-11	592276	6045312	105	101	98	90	89	84	83	82	78	91.7	107.2
CFR JUDYCK 2-13-64-11	595576	6043761	105	101	98	90	89	84	83	82	78	91.7	107.2
CFR JUDYCK 2-15-64-11	592272	6043660	105	101	98	90	89	84	83	82	78	91.7	107.2
CFR JUDYCK 16-11-64-11	594324	6043301	105	101	98	90	89	84	83	82	78	91.7	107.2
CFR JUDYCK 14-14-64-11	593615	6045098	105	101	98	90	89	84	83	82	78	91.7	107.2
CFR JUDYCK 10-2-64-11	593995	6041357	105	101	98	90	89	84	83	82	78	91.7	107.2
CFR JUDYCK 6-3-64-11	591970	6040855	105	101	98	90	89	84	83	82	78	91.7	107.2
CFR JUDYCK 14-2-64-11	593648	6041631	105	101	98	90	89	84	83	82	78	91.7	107.2
CFR JUDYCK 16-3-64-11	592813	6041675	105	101	98	90	89	84	83	82	78	91.7	107.2
CFR JUDYCK 16-2-64-11	594361	6041706	105	101	98	90	89	84	83	82	78	91.7	107.2
CFR JUDYCK 14-3-64-11	591954	6041658	105	101	98	90	89	84	83	82	78	91.7	107.2
CFR JUDYCK 8-10-64-11	592554	6042505	105	101	98	90	89	84	83	82	78	91.7	107.2
CFR JUDYCK 16-10-64-11	592613	6043383	105	101	98	90	89	84	83	82	78	91.7	107.2
CFR JUDYCK 12-12-64-11	594728	6042861	105	101	98	90	89	84	83	82	78	91.7	107.2
CFR JUDYCK 8-15-64-11	592750	6044103	105	101	98	90	89	84	83	82	78	91.7	107.2
CFR JUDYCK 15-14-64-11	594947	6044589	105	101	98	90	89	84	83	82	78	91.7	107.2

Item	Location NAD83 UTM 11		Levels at Octave Band Center Frequencies (dB)									Overall Sound Power	
	Easting (m)	Northing (m)	31.5	63	125	250	500	1,000	2,000	4,000	8,000	(dBA)	(dB)
Operational Pumping Wells - AER ST37													
CFR JUDYCK 16-4-64-11	591272	6041496	105	101	98	90	89	84	83	82	78	91.7	107.2
CFR JUDYCK 8-9-64-11	591143	6042584	105	101	98	90	89	84	83	82	78	91.7	107.2

5.2 Existing Noise Contributions

Table 5 lists the contributions from the identified adjacent facilities at the boundary receptors. Existing levels are compliant with AUC Rule 012 PSLs.

Table 5: Contribution of Existing and Approved Facilities at Receptors

Receptor ID	Existing and Approved Facilities Contributions
BR1	13.3
BR2	13.6

6 PREDICTION RESULTS

6.1 Noise Sources and Mitigations

The Project update consists of 460 MW Black Bear Combined Cycle Power Plant, with a carbon capture plant (CCP), and a 240kV substation known as Gemini 1008S Substation. The Project is a combined cycle power plant with carbon capture consisting of one natural gas fired combustion turbine, one steam turbine, one carbon capture package and one CO2 compression and dehydration package.

6.1.1 Required Mitigations

The Project will require specific mitigations to meet the identified PSLs at boundary receptors. The HRSG stack will require silencing. A linear reduction of 20 dB was calculated and an overall target sound power level defined below in Table 6.

Table 6: Target Sound Power Levels for the HRSG Stack

Source	Required Reductions (dB)	Target Sound Power Levels at Octave Band Center Frequencies (dB)									Overall Sound Power	
		31.5	63	125	250	500	1,000	2,000	4,000	8,000	(dBA)	(dB)
Power Island HRSG Stack	20	98	92	93	99	110	103	91	97	81	108.9	111.6

Breakout noise from modelled buildings have been considered using typical transmission loss for oil and gas buildings. Table 7 lists the assumed building transmission loss for all buildings.

Table 7: Modelled Building Transmission Loss

Item	Building Transmission Loss at Octave Band Center Frequencies (dB)								
	31.5	63	125	250	500	1,000	2,000	4,000	8,000
Modelled Building Transmission Loss - Typical Oil and Gas Building Construction STC 26	8	9	11	15	24	27	29	33	35

A listing of the proposed sources that were modelled are presented in table 6. No other sound generating equipment has been identified on the site. All sources have been conservatively modelled as running 24 hours per day.

Table 8: Project Noise Sources and Modelled Sound Power Levels

Item[1]	Source Type[2]	Levels at Octave Band Center Frequencies (dB)									Overall Sound Power	
		31.5	63	125	250	500	1,000	2,000	4,000	8,000	(dBA)	(dB)
Power Island												
Boiler house and Generators												
Power Island Auxiliary Boiler Stack	P	100.7	99.7	96.7	94.7	82.7	75.7	67.7	64.7	50.7	88.3	104.6
Boiler Feedwater Pump Building												
Boiler Feedwater Pump Building Roof	H	103.9	104.7	103.5	98.9	90.9	88.9	85.9	78.7	69.9	95.6	109.3
Boiler Feedwater Pump Building Sides	V	99.1	99.9	98.7	94.1	86.1	84.1	81.1	73.9	65.1	90.9	104.6
Boiler Feedwater Pump Building Sides	V	95.2	96	94.8	90.2	82.2	80.2	77.2	70	61.2	86.9	100.7
Boiler Feedwater Pump Building Sides	V	99.1	99.9	98.7	94.1	86.1	84.1	81.1	73.9	65.1	90.9	104.6
Boiler Feedwater Pump Building Sides	V	95.2	96	94.8	90.2	82.2	80.2	77.2	70	61.2	86.9	100.7
Transformers												
Power Island Generator Step Up Transformer	P	100.5	106.5	108.5	103.5	103.5	97.5	92.5	87.5	80.5	103.9	112.5
Power Island Main Auxiliary Transformer	P	100.5	106.5	108.5	103.5	103.5	97.5	92.5	87.5	80.5	103.9	112.5
Coolers												
Power Island Aux Cooling Heat Exchanger	P		111.9	106.2	100.6	93	94.3	84	77.3	71.4	98.5	113.3
Power Island Air Cooled Condenser	P		112	112	109	106	104	100	93	87	108.8	116.8
Generation Building												
Power Island GT Inlet Filter House	P	118	112	108	99	87	90	79	96	105	105.3	119.5
Total HRSG Main Body (B1&B2)	P	126	116	104	101	106	104	105	107	80	111.8	126.6
Total HRSG Inlet Transition (T1&T2)	P	129	116	104	103	111	110	111	115	88	118.6	129.6
Power Island HRSG Stack	P	98	92	93	99	110	103	91	97	81	108.9	111.6
Power Island Generation Building Louvers	P	99.9	102	98.8	91.5	95.5	89.4	88.6	94.1	78.5	98.6	106.3
Power Island Generation Building Louvers	P	99.9	102	98.8	91.5	95.5	89.4	88.6	94.1	78.5	98.6	106.3
Power Island Generation Building Louvers	P	99.9	102	98.8	91.5	95.5	89.4	88.6	94.1	78.5	98.6	106.3
Power Island Generation Building Louvers	P	99.9	102	98.8	91.5	95.5	89.4	88.6	94.1	78.5	98.6	106.3
Power Island Generation Building Louvers	P	99.9	102	98.8	91.5	95.5	89.4	88.6	94.1	78.5	98.6	106.3
Power Island Generation Building Louvers	P	99.9	102	98.8	91.5	95.5	89.4	88.6	94.1	78.5	98.6	106.3
Power Island Generation Building Louvers	P	99.9	102	98.8	91.5	95.5	89.4	88.6	94.1	78.5	98.6	106.3
Power Island Generation Building Louvers	P	99.9	102	98.8	91.5	95.5	89.4	88.6	94.1	78.5	98.6	106.3
Power Island Generation Building Louvers	P	99.9	102	98.8	91.5	95.5	89.4	88.6	94.1	78.5	98.6	106.3

Item[1]	Source Type[2]	Levels at Octave Band Center Frequencies (dB)									Overall Sound Power	
		31.5	63	125	250	500	1,000	2,000	4,000	8,000	(dBA)	(dB)
Power Island Generation Building Louvers	P	99.9	102	98.8	91.5	95.5	89.4	88.6	94.1	78.5	98.6	106.3
Power Island Generation Building Roof	H	121.1	122.2	117.1	105.7	100.8	91.6	88.9	90.4	72.8	105	125.5
Power Island Generation Building Sides	V	111	112.1	107	95.6	90.7	81.5	78.8	80.3	62.7	94.8	115.3
Power Island Generation Building Sides	V	111.8	112.9	107.8	96.4	91.5	82.3	79.6	81.1	63.5	95.7	116.2
Power Island Generation Building Sides	V	111	112.1	107	95.6	90.7	81.5	78.8	80.3	62.7	94.8	115.3
Power Island Generation Building Sides	V	111.8	112.9	107.8	96.4	91.5	82.3	79.6	81.1	63.5	95.7	116.2
Power Island Generation Building Ridge Vent	L	112.5	114.6	111.5	104.1	108.2	102	101.3	106.7	91.1	111.2	118.9
Carbon Capture Coolers and Building												
Carbon Capture Building												
Carbon Capture Building Louvre	P	87.5	88.1	87.6	86.2	87.6	88.6	90	88.2	83.6	95.3	97.3
Carbon Capture Building Louvre	P	87.5	88.1	87.6	86.2	87.6	88.6	90	88.2	83.6	95.3	97.3
Carbon Capture Building Louvre	P	87.5	88.1	87.6	86.2	87.6	88.6	90	88.2	83.6	95.3	97.3
Carbon Capture Building Louvre	P	87.5	88.1	87.6	86.2	87.6	88.6	90	88.2	83.6	95.3	97.3
Carbon Capture Building Louvre	P	87.5	88.1	87.6	86.2	87.6	88.6	90	88.2	83.6	95.3	97.3
Carbon Capture Building Louvre	P	87.5	88.1	87.6	86.2	87.6	88.6	90	88.2	83.6	95.3	97.3
Carbon Capture Building Roof	H	111.7	111.3	108.7	103.4	95.8	93.8	93.2	87.4	80.7	101.1	115.9
Carbon Capture Building Sides	V	101.2	100.8	98.2	92.9	85.3	83.3	82.7	76.9	70.2	90.6	105.4
Carbon Capture Building Sides	V	99.6	99.2	96.6	91.3	83.7	81.7	81.1	75.3	68.6	89	103.7
Carbon Capture Building Sides	V	101.2	100.8	98.2	92.9	85.3	83.3	82.7	76.9	70.2	90.6	105.4
Carbon Capture Building Sides	V	99.6	99.2	96.6	91.3	83.7	81.7	81.1	75.3	68.6	89	103.7
Carbon Capture Coolers												
Unit 1												
22 - Carbon Capture Coolers 19 x 2 Section Exhaust	H		119.1	118.1	115.1	110.1	108.1	102.1	96.1	90.1	113.1	123
22 - Carbon Capture Coolers 19 x 2 Section Sides	V		110.5	109.5	106.5	101.5	99.5	93.5	87.5	81.5	104.4	114.3
22 - Carbon Capture Coolers 19 x 2 Section Sides	V		104.2	103.2	100.2	95.2	93.2	87.2	81.2	75.2	98.2	108.1

Item[1]	Source Type[2]	Levels at Octave Band Center Frequencies (dB)									Overall Sound Power	
		31.5	63	125	250	500	1,000	2,000	4,000	8,000	(dBA)	(dB)
22 - Carbon Capture Coolers 19 x 2 Section Sides	V		110.5	109.5	106.5	101.5	99.5	93.5	87.5	81.5	104.4	114.3
22 - Carbon Capture Coolers 19 x 2 Section Sides	V		104.2	103.2	100.2	95.2	93.2	87.2	81.2	75.2	98.2	108.1
Unit 2												
22 - Carbon Capture Coolers 19 x 2 Section Exhaust	H		119.1	118.1	115.1	110.1	108.1	102.1	96.1	90.1	113.1	123
22 - Carbon Capture Coolers 19 x 2 Section Sides	V		110.5	109.5	106.5	101.5	99.5	93.5	87.5	81.5	104.4	114.3
22 - Carbon Capture Coolers 19 x 2 Section Sides	V		104.2	103.2	100.2	95.2	93.2	87.2	81.2	75.2	98.2	108.1
22 - Carbon Capture Coolers 19 x 2 Section Sides	V		110.5	109.5	106.5	101.5	99.5	93.5	87.5	81.5	104.4	114.3
22 - Carbon Capture Coolers 19 x 2 Section Sides	V		104.2	103.2	100.2	95.2	93.2	87.2	81.2	75.2	98.2	108.1
Unit 3												
22 - Carbon Capture Coolers 27 x 2 Section Exhaust	H		120.7	119.7	116.7	111.7	109.7	103.7	97.7	91.7	114.7	124.6
22 - Carbon Capture Coolers 27 x 2 Section Sides	V		112.1	111.1	108.1	103.1	101.1	95.1	89.1	83.1	106.1	115.9
22 - Carbon Capture Coolers 27 x 2 Section Sides	V		104.3	103.3	100.3	95.3	93.3	87.3	81.3	75.3	98.3	108.2
22 - Carbon Capture Coolers 27 x 2 Section Sides	V		112.1	111.1	108.1	103.1	101.1	95.1	89.1	83.1	106.1	115.9
22 - Carbon Capture Coolers 27 x 2 Section Sides	V		104.3	103.3	100.3	95.3	93.3	87.3	81.3	75.3	98.3	108.2
Unit 4												
22 - Carbon Capture Coolers 27 x 2 Section Exhaust	H		120.7	119.7	116.7	111.7	109.7	103.7	97.7	91.7	114.7	124.6
22 - Carbon Capture Coolers 27 x 2 Section Sides	V		112.1	111.1	108.1	103.1	101.1	95.1	89.1	83.1	106.1	115.9

Item[1]	Source Type[2]	Levels at Octave Band Center Frequencies (dB)									Overall Sound Power	
		31.5	63	125	250	500	1,000	2,000	4,000	8,000	(dBA)	(dB)
22 - Carbon Capture Coolers 27 x 2 Section Sides	V		104.3	103.3	100.3	95.3	93.3	87.3	81.3	75.3	98.3	108.2
22 - Carbon Capture Coolers 27 x 2 Section Sides	V		112.1	111.1	108.1	103.1	101.1	95.1	89.1	83.1	106.1	115.9
22 - Carbon Capture Coolers 27 x 2 Section Sides	V		104.3	103.3	100.3	95.3	93.3	87.3	81.3	75.3	98.3	108.2
Unit 5												
22 - Carbon Capture Coolers 19 x 2 Section Exhaust	H		119.1	118.1	115.1	110.1	108.1	102.1	96.1	90.1	113.1	123
22 - Carbon Capture Coolers 19 x 2 Section Sides	V		110.5	109.5	106.5	101.5	99.5	93.5	87.5	81.5	104.4	114.3
22 - Carbon Capture Coolers 19 x 2 Section Sides	V		104.2	103.2	100.2	95.2	93.2	87.2	81.2	75.2	98.2	108.1
22 - Carbon Capture Coolers 19 x 2 Section Sides	V		110.5	109.5	106.5	101.5	99.5	93.5	87.5	81.5	104.4	114.3
22 - Carbon Capture Coolers 19 x 2 Section Sides	V		104.2	103.2	100.2	95.2	93.2	87.2	81.2	75.2	98.2	108.1
Unit 6												
22 - Carbon Capture Coolers 19 x 2 Section Exhaust	H		119.1	118.1	115.1	110.1	108.1	102.1	96.1	90.1	113.1	123
22 - Carbon Capture Coolers 19 x 2 Section Sides	V		110.5	109.5	106.5	101.5	99.5	93.5	87.5	81.5	104.4	114.3
22 - Carbon Capture Coolers 19 x 2 Section Sides	V		104.2	103.2	100.2	95.2	93.2	87.2	81.2	75.2	98.2	108.1
22 - Carbon Capture Coolers 19 x 2 Section Sides	V		110.5	109.5	106.5	101.5	99.5	93.5	87.5	81.5	104.4	114.3
22 - Carbon Capture Coolers 19 x 2 Section Sides	V		104.2	103.2	100.2	95.2	93.2	87.2	81.2	75.2	98.2	108.1
Co2 Compression and Dehydration												
Train 1												
CO2 Compression - First Stage Cooler Train 1 and 2	P	105.2	108.2	108.2	105.2	102.2	98.2	95.2	92.2	84.2	104.4	113.6

Item[1]	Source Type[2]	Levels at Octave Band Center Frequencies (dB)									Overall Sound Power	
		31.5	63	125	250	500	1,000	2,000	4,000	8,000	(dBA)	(dB)
CO2 Compression - Second Stage Cooler Train 1 and 2	P	97.4	100.4	100.4	97.4	94.4	90.4	87.4	84.4	76.4	96.6	105.8
CO2 Compression - Third Stage Cooler Train 1 and 2	P	100.4	103.4	103.4	100.4	97.4	93.4	90.4	87.4	79.4	99.6	108.8
CO2 Compression - Fifth Stage Cooler Train 1 and 2	P	100.4	103.4	103.4	100.4	97.4	93.4	90.4	87.4	79.4	99.6	108.8
CO2 Compression - Eighth Stage Cooler Train 1 and 2	P	95.8	98.8	98.8	95.8	92.8	88.8	85.8	82.8	74.8	95	104.2
Train 2												
CO2 Compression - First Stage Cooler Train 1 and 2	P	105.2	108.2	108.2	105.2	102.2	98.2	95.2	92.2	84.2	104.4	113.6
CO2 Compression - Second Stage Cooler Train 1 and 2	P	97.4	100.4	100.4	97.4	94.4	90.4	87.4	84.4	76.4	96.6	105.8
CO2 Compression - Third Stage Cooler Train 1 and 2	P	100.4	103.4	103.4	100.4	97.4	93.4	90.4	87.4	79.4	99.6	108.8
CO2 Compression - Fifth Stage Cooler Train 1 and 2	P	100.4	103.4	103.4	100.4	97.4	93.4	90.4	87.4	79.4	99.6	108.8
CO2 Compression - Eighth Stage Cooler Train 1 and 2	P	95.8	98.8	98.8	95.8	92.8	88.8	85.8	82.8	74.8	95	104.2
Main CO2 Compression Building												
Main CO2 Compression Building Louvres	P	89.4	88	86.2	83.6	84.6	86.3	90.5	88.6	84.5	95.1	97
Main CO2 Compression Building Louvres	P	89.4	88	86.2	83.6	84.6	86.3	90.5	88.6	84.5	95.1	97
Main CO2 Compression Building Louvres	P	89.4	88	86.2	83.6	84.6	86.3	90.5	88.6	84.5	95.1	97
Main CO2 Compression Building Louvres	P	89.4	88	86.2	83.6	84.6	86.3	90.5	88.6	84.5	95.1	97
Main CO2 Compression Building Louvres	P	89.4	88	86.2	83.6	84.6	86.3	90.5	88.6	84.5	95.1	97
Main CO2 Compression Building Louvres	P	89.4	88	86.2	83.6	84.6	86.3	90.5	88.6	84.5	95.1	97
Main CO2 Compression Building Louvres	P	89.4	88	86.2	83.6	84.6	86.3	90.5	88.6	84.5	95.1	97
Main CO2 Compression Building Louvres	P	89.4	88	86.2	83.6	84.6	86.3	90.5	88.6	84.5	95.1	97
Main CO2 Compression Building Ridge Vent	L	107.9	106.5	104.7	102.1	103.1	104.8	108.9	107.1	103	113.5	115.5
Main CO2 Compression Building Roof	H	113.6	111.2	107.4	100.8	92.8	91.5	93.7	87.8	81.7	99.8	116.3

Item[1]	Source Type[2]	Levels at Octave Band Center Frequencies (dB)									Overall Sound Power	
		31.5	63	125	250	500	1,000	2,000	4,000	8,000	(dBA)	(dB)
Main CO2 Compression Building Wall E	V	105.9	103.5	99.7	93.1	85.1	83.8	86	80.1	74	92.1	108.7
Main CO2 Compression Building Wall N	V	107.2	104.8	101	94.4	86.4	85.1	87.3	81.4	75.3	93.4	109.9
Main CO2 Compression Building Wall W	V	105.9	103.5	99.7	93.1	85.1	83.8	86	80.1	74	92.1	108.7
Main CO2 Compression Building Wall S	V	107.2	104.8	101	94.4	86.4	85.1	87.3	81.4	75.3	93.4	109.9

Notes: 1 – All equipment are either manufacturer specifications or are based on power ratings provided by the client and were determined using empirical formulae from (Bies 2009 and Crocker 2008).
2 – Represents the following source types: P – Point Source, L – Line Source, A – Area Source, and V – Vertical Area Source.

6.2 Operation Results

Table 9 and Table 10 show the nighttime and daytime compliance determination with the PSLs. The results indicate that the Black bear will comply with the PSLs. Figure 2 shows the predicted contours for the Project and identified adjacent facilities.

Table 9: Assessment of Compliance with Nighttime PSLs

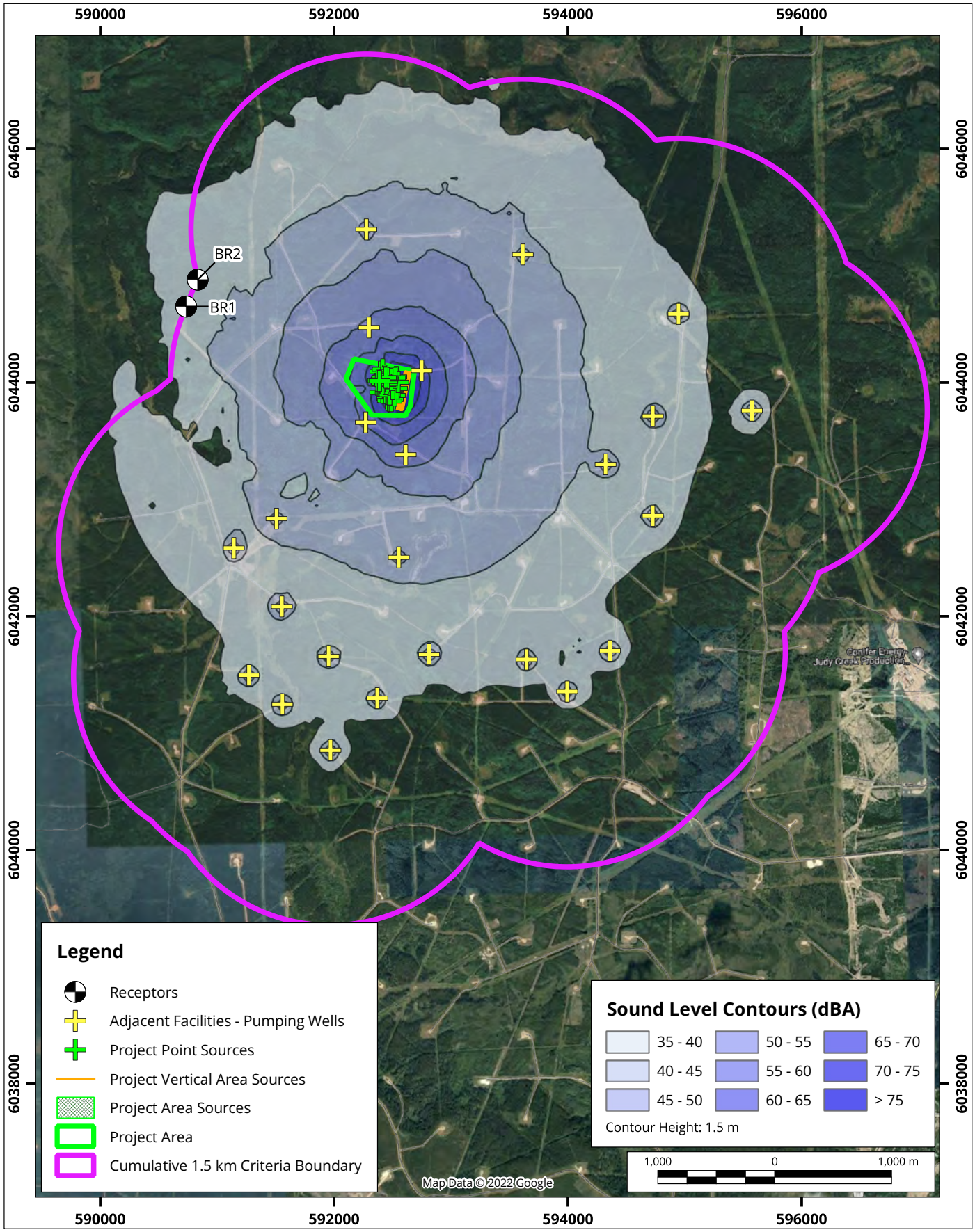
Receptor ID	Assumed Ambient Sound Level[1] (dBA)	Existing and Approved Facilities Contributions[2] (dBA)	Proposed Project Contribution (dBA)	Calculated Cumulative Sound Level[3] (dBA)	Cumulative Sound Level[4] (dBA)	PSL[5] (dBA)	Complies with AUC Rule 012? (Y/N)
Nighttime (22:00 - 07:00)							
BR1	35.0	13.3	38.7	40.3	40	40	Y
BR2	35.0	13.6	38.7	40.3	40	40	Y

Notes: 1 - Ambient Sound Level as outlined by AUC Rule 012, Table 1.
2 – As calculated in Table 5.
3 – The calculated cumulative sound level is the logarithmic sum of the ambient, adjacent facilities, and the project contribution, rounded to integer precision.
4 – The cumulative sound level is the logarithmic sum of the ambient, adjacent facilities, and the project contribution.
5 - Permissible sound level as outlined by AUC Rule 012.

Table 10: Assessment of Compliance with Daytime PSLs

Receptor ID	Assumed Ambient Sound Level (dBA)	Existing and Approved Facilities Contributions[2] (dBA)	Proposed Project Contribution (dBA)	Calculated Cumulative Sound Level[3] (dBA)	Cumulative Sound Level[4] (dBA)	PSL[5] (dBA)	Complies with AUC Rule 012? (Y/N)
Daytime (07:00 - 22:00)							
BR1	45.0	13.3	38.7	46.0	46	50	Y
BR2	45.0	13.6	38.7	46.0	46	50	Y

Notes: 1 - Ambient Sound Level as outlined by AUC Rule 012, Table 1.
2 – As calculated in Table 5.
3 – The calculated cumulative sound level is the logarithmic sum of the ambient, adjacent facilities, and the project contribution, rounded to integer precision.
4 – The cumulative sound level is the logarithmic sum of the ambient, adjacent facilities, and the project contribution.
5 - Permissible sound level as outlined by AUC Rule 012.



Black Bear Combined Cycle Power Plant

Predicted Noise Contours - Project and Adjacent Facilities

True North

Map Projection:
Big Lakes County - Alberta

Project #: 2302933

Drawn by: DJK	Figure: 2
Approx. Scale:	1:45,000
Date Revised:	Apr 02, 2023

Map Document: C:\DJK\Jobs - Sync\2302933 - LN - BlackBear Power Plant\03WorkItems\QGIS\20230214 - Black Bear.qgz

6.3 Low Frequency Noise

The C-Weighted sound level results from the predictive model were reviewed for the receptors to determine if there is potential for LFN due to the Project sources alone. The greatest difference between C- and A-weighted values from all modelled sources is 17.2 dB, as shown in table 9 indicating that the potential for a LFN condition is low.

Table 11: Low Frequency Noise Potential

Receptor ID	C-Weighted Sound Level	A-Weighted Sound Level	dBC-dBA
BR1	55.9	38.7	17.2
BR2	55.9	38.7	17.2

7 CONCLUSION

The NIA shows that the Black bear will comply with PSLs at identified boundary receptors as defined in AUC Rule 012, indicating that the Project will comply at the cumulative 1.5 km criteria boundary. The cumulative results consider the contributions from the Black Bear power plant, CO2 compression plant, and all associated cooling components, as well as adjacent energy-related facilities. Mitigation to the HRSG stack is required to achieve compliance,

Potential for LFN from the project is considered low, as no tonal component was found in the turbine one-third octave band spectrum according to AUC Rule 012 Section 4.5.

8 STATEMENT OF LIMITATION

This report entitled Black Bear Project Noise Impact Assessment dated April 13, 2023 was prepared by RWDI AIR Inc. ("RWDI") for Kiwetinohk Energy Corp. ("Client"). The findings and conclusions presented in this report have been prepared for the Client and are specific to the project described herein ("Project"). The conclusions and recommendations contained in this report are based on the information available to RWDI when this report was prepared. Because the contents of this report may not reflect the final design of the Project or subsequent changes made after the date of this report, RWDI recommends that it be retained by Client during the final stages of the project to verify that the results and recommendations provided in this report have been correctly interpreted in the final design of the Project.

The conclusions and recommendations contained in this report have also been made for the specific purpose(s) set out herein. Should the Client or any other third party utilize the report and/or implement the conclusions and recommendations contained therein for any other purpose or project without the involvement of RWDI, the Client or such third party assumes any and all risk of any and all consequences arising from such use and RWDI accepts

no responsibility for any liability, loss, or damage of any kind suffered by Client or any other third party arising therefrom.

Finally, it is imperative that the Client and/or any party relying on the conclusions and recommendations in this report carefully review the stated assumptions contained herein and to understand the different factors which may impact the conclusions and recommendations provided.

9 REFERENCES

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2. Alberta Energy Regulator (AER). (2023b), ST102: Facility List formerly Battery Codes and Facility Codes, March 2023. AER website last accessed March 1, 2023. Retrieved from https://www.aer.ca/providing-information/data-and-reports/statistical-reports/st102 ,
3. Alberta Utilities Commission (AUC). (2021), Rule 012: Noise Control. March 1, 2021. Calgary, Alberta.
4.
5. Crocker, M.J. (2007), Handbook of Noise and Vibration Control. Published by John Wiley & Sons, Inc., Hoboken, New Jersey.
6. International Organization for Standardization (ISO). (1996), International Standard ISO 9613-2, Acoustics - Attenuation of Sound During Propagation Outdoors - Part 2: General Method of Calculation. Geneva, Switzerland.
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APPENDIX A

APPENDIX A: PRACTITIONER BIOGRAPHIES

Jim Nelligan, B.Sc. (MIOA) Scientist

Jim graduated from the Trinity College Dublin with a Diploma in Acoustics and Noise Control in 2020 and an Undergraduate BSc (Hons) in Environmental and Natural Resource Management 2013. He joined RWDI in 2023 working with the NAV team on projects in environmental noise, vibration, and acoustics. He primarily worked in the field of environmental noise, with focus on Construction, Environmental Compliance Approval. Recently, Jim has been involved in noise impact assessment projects in western Canada for hydraulic fracking and renewable energy in accordance with Alberta and British Columbia energy regulators.

Daniel Kremer, M.Sc. Senior Scientist.

Daniel joined RWDI in 2013 as a Noise & Vibration Scientist specializing in environmental noise. He has completed many environmental noise studies for regulatory compliance in Alberta and British Columbia. His work has focused on long-term monitoring programs, sound source measurements and predictive modelling for noise and acoustics to support regulatory requirements (AUC Rule 012, AER Directive 038).

His experience is focused on environmental noise related to energy, oil & gas, and mining applications in Western Canada and includes oil sands mining, in-situ oil sands projects, conventional oil and gas extraction, and wind turbine projects. His expertise has been to model and develop noise strategies for large scale projects for future developments at the provincial and federal levels.

Daniel has experience in the planning and post construction stages of wind power development, and in providing analysis and reporting to meet regulatory requirements (AUC Rule 012). He has provided detailed analysis on the relationships between meteorological conditions and turbine operating parameters, and the effects at receptors, including conducting comprehensive post-construction sound level surveys for wind turbines.

APPENDIX B

APPENDIX B: ENVIRONMENTAL NOISE DESCRIPTORS AND TERMINOLOGY

Abnormal noise events

Noises that are sufficiently infrequent as to be uncharacteristic of an area or that occur so close to the microphone as to dominate the measurements in an unrealistic manner. Consideration must be given to deleting occurrences of abnormal noise from the measurements to obtain a reasonably accurate representation of the sound environment. Examples of abnormal noises include a dog barking close to the microphone, a vehicle passing nearby, people talking in the vicinity of the microphone in a quiet environment, or a passing road grader.

Airborne Sound

Sound that reaches the point of interest by propagation through air.

Ambient noise or sound

All noises that exist in an area and are not related to a facility under study. Ambient noise may include sound from other existing industrial facilities, transportation sources, animals, and nature. Context for ambient noise should be defined for each project.

Attenuation

The reduction of sound intensity by various means (e.g., air, humidity, porous materials, etc.)

A-weighted sound level

The sound level as measured on a sound level meter using a setting that emphasizes the middle frequency components similar to the frequency response of the human ear.

A-weighting shows that the measured sound pressure levels have been filtered using a frequency weighting network that mimics the response of the human ear.

The resultant sound pressure level with the associated unit “dBA” is therefore a representative of the subjective response of the human ear. The weightings are assigned in a way to reflect the higher sensitivity of human ear to sound in the mid and high frequency band as shown in the curve labelled A-weighting in Figure B-1.

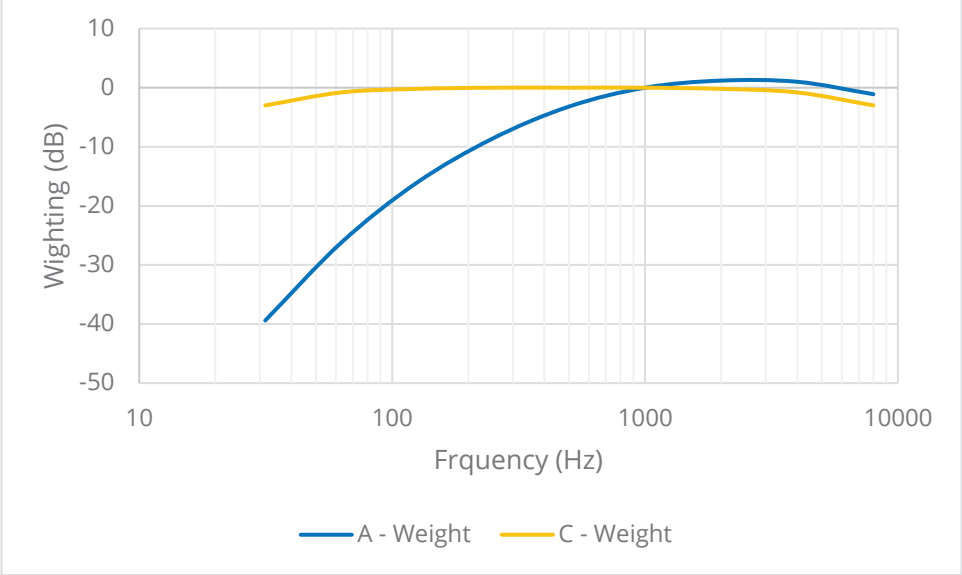


Figure B-1 Sound Weighting Network

Calibration

The procedure used for the adjustment of a sound level meter using a reference source of a known sound pressure level and frequency. Calibration must take place before and after the sound level measurements.

C-Weighted Sound Level

The sound level as measured on a sound level meter using a setting that emphasizes the low and middle frequency components. The weightings are assigned as shown in the curve labelled C-weighting in Figure B-1. The resultant sound pressure level is reported with the associated unit “dBC”

Daytime

Defined as the hours from 07:00 to 22:00.

dB (decibel)

A unit of measure of sound pressure that compresses a large range of numbers into a more meaningful scale. Hearing tests indicate that the lowest audible pressure is approximately 2 x 10-5 Pa (0 dB), while the sensation of pain is approximately 2 x 102 Pa (120 dB). Generally, an increase of 10 dB is perceived as twice as loud.

dBA

The decibel (dB) sound pressure level filtered through the A filtering network to approximate human hearing response at low frequencies.

dBC

The decibel (dB) sound pressure level filtered through the C filtering network to highlight low and middle frequencies.

Dwelling

Any permanently or seasonally occupied residence with the exception of an employee or worker residence, dormitory, or construction camp located within an industrial plant boundary. Trailer parks and campgrounds may qualify as a dwelling unit if it can be demonstrated that they are in regular and consistent use during the applicable season.

Energy equivalent sound level (Leq)

The Leq is the average A-weighted sound level over a specified period of time. It is a single-number representation of the cumulative acoustical energy measured over a time interval. If a sound level is constant over the measurement period, the Leq will equal the constant sound level where f is the fraction of time the constant level L is present.

Standardized Wind Speed at 10 m

The standardized wind speed at a height of 10 m is calculated in accordance with IEC 614000-11 (2012) and is given below. In the case of calculating the standardized wind speed for turbines in Alberta, a roughness length of 0.05 m is used, which is representative of farmland with vegetation.

$$V_H = V_{10}\left[\frac{\ln\left(\frac{H}{z_{0ref}}\right)}{\ln\left(\frac{10}{z_{0ref}}\right)}\right]$$

Where:

V_H is the wind speed at hub height z (m), determined from the power curve;

V_{10} is the standardized wind speed at 10m;

z_{0ref} is the reference roughness length of 0.05 m; and

H is the rotor centre height (m).

Far Field

Describes a region in free space where the sound pressure level from a source obeys the inverse-square law (the sound pressure level decreases 6 dB with each doubling of distance from the source). Also, in this region the sound particle velocity is in phase with the sound pressure. Closer to the source where these two conditions do not hold constitutes the “near field” region.

Frequency

The number of times per second that the sine wave of sound or of a vibrating object repeats itself. The unit is expressed in hertz (Hz), formerly in cycles per second (cps).

Human Perception of Sound

The human perception of noise impact is an important consideration in qualifying the noise effects caused by projects. The following table presents a general guideline.

Table B-1 Human Perception of Sound

Increase in Noise Level (dBA)	Perception
1 to 3	Imperceptible to possibly perceptible
4 to 5	just-noticeable difference
6 to 9	marginally significant
10 or more	significant, perceived as a doubling of sound level

Impulsive Noise

Single or multiple sound pressure peak(s) (with either a rise time less than 200 milliseconds or total duration less than 200 milliseconds) spaced at least by 500 millisecond pauses. A sharp sound pressure peak occurring in a short interval of time.

L_{EQ}

See Energy equivalent sound level.

Nighttime

Defined as the hours from 22:00 to 07:00.

Noise

Generally defined as the unwanted portion of sound.

Noise Level

This is the same as sound level except that it is applied to unwanted sounds, general the sound level at a point of reception.

Sound

A dynamic (fluctuating) pressure.

Sound level meter (SLM)

An instrument designed and calibrated to respond to sound and to give objective, reproducible measurements of sound pressure level. It normally has several features that would enable its frequency response and averaging times to be changed to make it suitable to simulate the response of the human ear.

Sound Pressure Level (SPL)

The logarithmic ratio of the RMS sound pressure to the sound pressure at the threshold of hearing. The sound pressure level is defined by equation (1) where P is the RMS pressure due to a sound and P0 is the reference pressure. P0 is usually taken as 2.0 × 10-5 Pascals.

(1) SPL (dB) = 20 log(PRMS/P0)

Sound Power Level (PWL)

The logarithmic ratio of the instantaneous sound power (energy) of a noise source to that of an international standard reference power. The sound power level is defined by equation (2) where W is the sound power of the source in watts, and W0 is the reference power of 10-12 watts.

(2) PWL (dB) = 10 log(W/W0)

Interrelationships between sound pressure level (SPL) and sound power level (PWL) depend on the location and type of source.

Spectrum

The description of a sound wave's resolution into its components of frequency and amplitude.

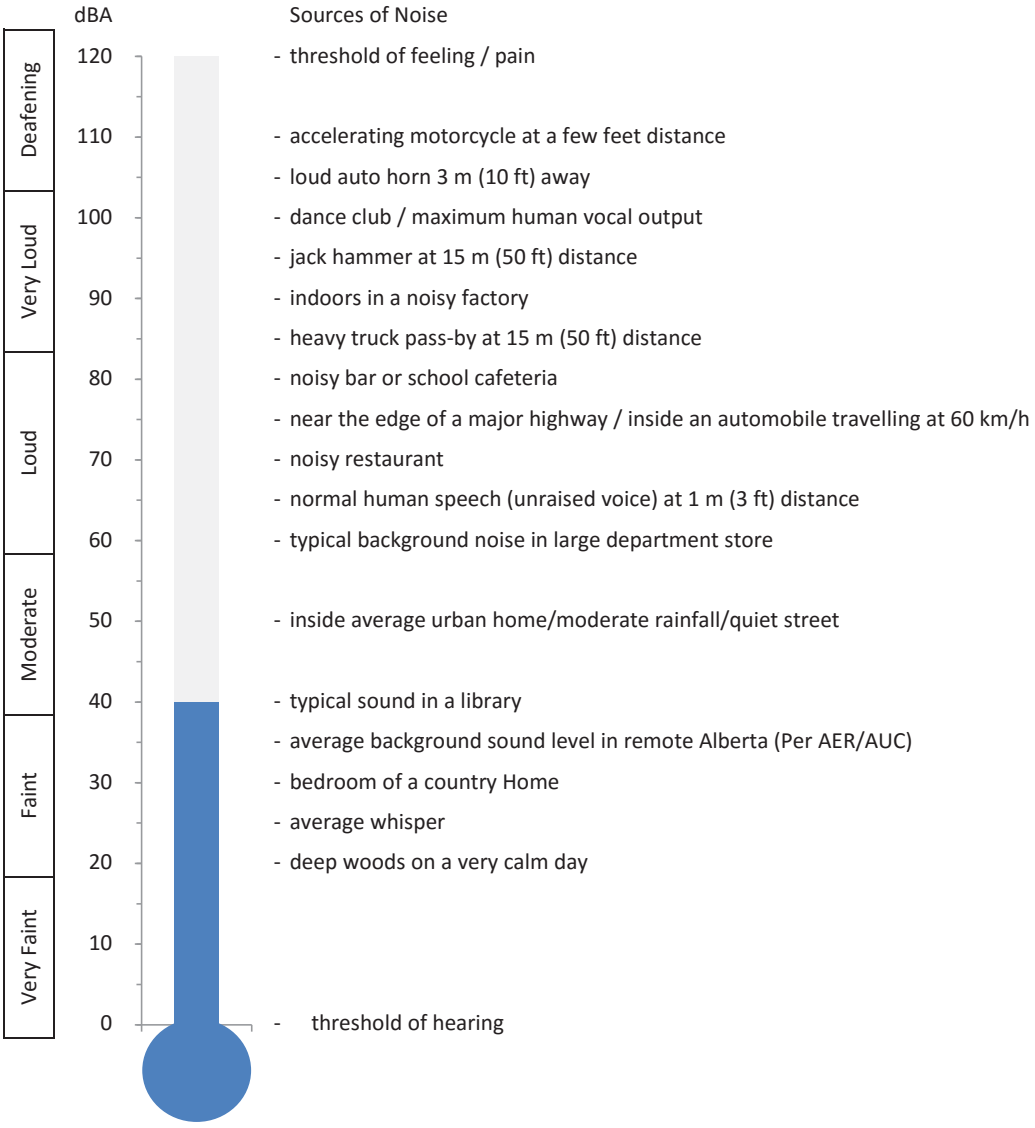
Speed of Sound in Air

344 m/s at 70°F (21°C) in air at sea level.

Tonal Components

Some industrial facilities typically exhibit a tonal component. Examples of tonal components are transformer hum, sirens, and piping noise. The test for the presence of tonal components consists of two parts. The first part must demonstrate that the sound pressure level of any one of the slow-response, A-weighted, 1/3-octave bands between 20 and 16000Hz is 10 dBA or more than the sound pressure level of at least one of the adjacent bands within two 1/3-octave bandwidths. In addition, there must be a minimum of a 5 dBA drop from the band containing the tone within 2 bandwidths on the opposite side. The second part is that the tonal component must be a pronounced peak clearly obvious within the spectrum.

RELATIONSHIPS BETWEEN EVERYDAY SOUNDS



APPENDIX C

ITEM NO.	EQUIPMENT NAME
128	MAKEUP AMINE TANK
129	AMINE DRAIN TANK
130	STRIPPER OVERHEAD ACCUMULATOR
131	LEAN FLASH TANK
132	CONDENSATE FLASH TANK
133	HYDROGEN STORAGE TRAILER
134	HRSG DRUM PENTHOUSE
135	FUEL GAS COMPRESSOR BUILDING

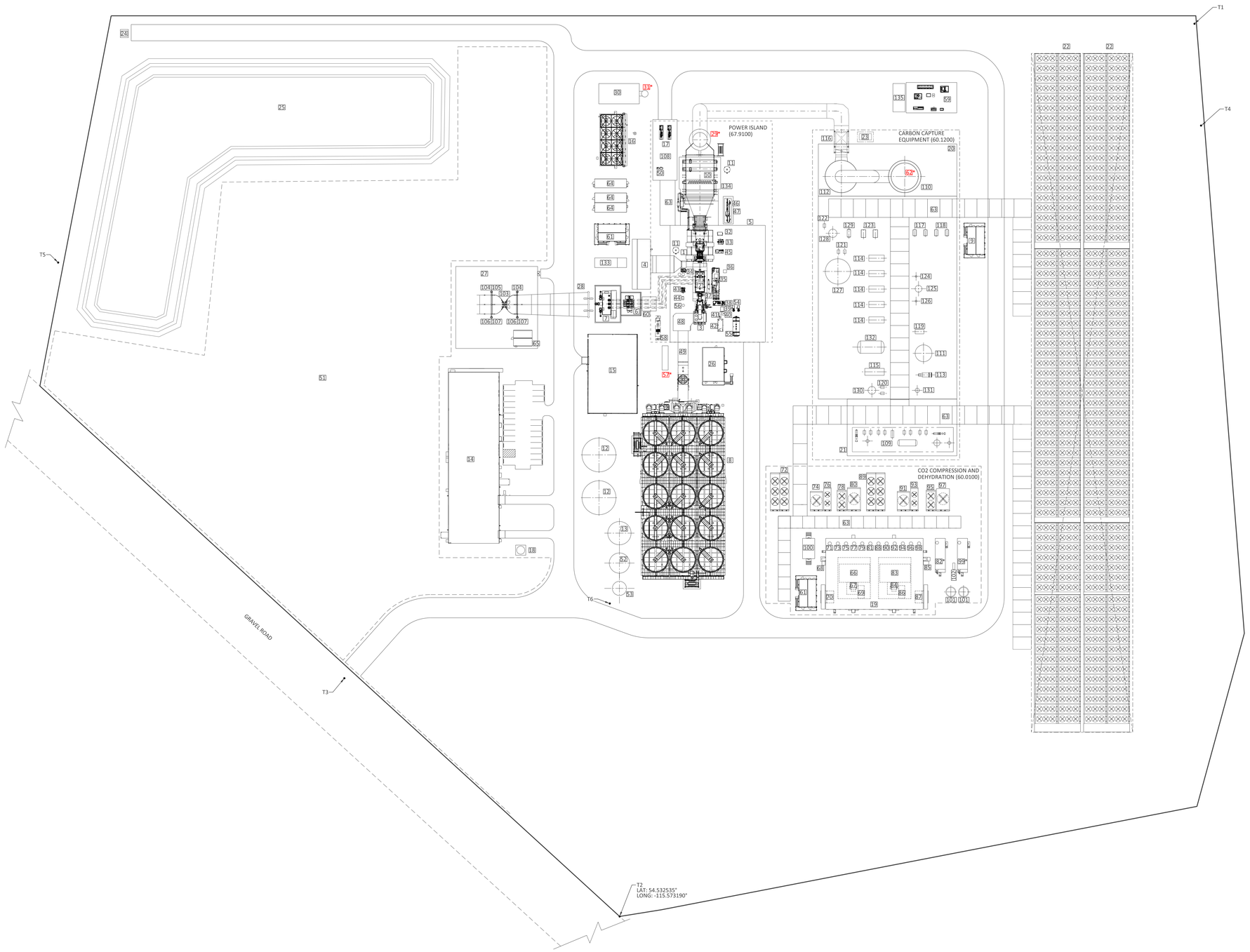
ITEM NO.	EQUIPMENT NAME
111	CO2 STRIPPER
112	PRESCRUBBER
113	STRIPPER REBOILER
114	LEAN / RICH EXCHANGER
115	LEAN FLASH COMPRESSOR
116	BOOSTER FAN
117	WASH WATER PUMPS
118	RICH AMINE PUMPS
119	LEAN AMINE PUMP
120	STRIPPER REFLUX PUMPS
121	AMINE FEED PUMPS
122	MAKEUP AMINE PUMP
123	WATER WASH PUMPS
124	LEAN AMINE PRE-FILTER
125	ACTIVATED CARBON FILTER
126	LEAN AMINE POST-FILTER
127	LEAN AMINE TANK

ITEM NO.	EQUIPMENT NAME
94	FOURTH STAGE SUCTION SCRUBBER (TRAIN-2)
95	FIFTH STAGE COOLER (TRAIN-2)
96	FIFTH STAGE DISCHARGE SCRUBBER (TRAIN-2)
97	EIGHTH STAGE COOLER (TRAIN-2)
98	SIXTH STAGE SUCTION SCRUBBER (TRAIN-2)
99*	CO2 DEHYDRATION PACKAGE (TRAIN-2)
100	LOW VOLTAGE MCC BUILDING
101	STILL VENT CONDENSING TANK
102	GLYCOL MAKE-UP TANK
103	240 KV CIRCUIT BREAKER
104	240 KV LINE DISCONNECT
105	240 KV CCVT
106	240 KV SURGE ARRESTOR
107	240 KV H-FRAME
108	BOILER FEEDWATER PUMP BUILDING
109	THERMAL RECLAIMER
110	CO2 ABSORBER

ITEM NO.	EQUIPMENT NAME
77	FOURTH STAGE SUCTION SCRUBBER (TRAIN-1)
78	FIFTH STAGE COOLER (TRAIN-1)
79	FIFTH STAGE DISCHARGE SCRUBBER (TRAIN-1)
80	EIGHTH STAGE COOLER (TRAIN-1)
81	SIXTH STAGE SUCTION SCRUBBER (TRAIN-1)
82*	CO2 DEHYDRATION PACKAGE (TRAIN-1)
83	8 STAGE INTEGRALLY GEARED CENTRIFUGAL COMPRESSOR (TRAIN-2)
84	9.7 MW SYNCHRONOUS ELECTRIC MOTOR (TRAIN-2)
85	SYNCHRONOUS ELECTRIC MOTOR COOLING AIR HANDLER (TRAIN-2)
86	COMPRESSOR LUBE OIL SKID (TRAIN-2)
87	COMPRESSOR LUBE OIL COOLER (TRAIN-2)
88	FIRST STAGE SUCTION SCRUBBER (TRAIN-2)
89	FIRST STAGE COOLER (TRAIN-2)
90	SECOND STAGE SUCTION SCRUBBER (TRAIN-2)
91	SECOND STAGE COOLER (TRAIN-2)
92	THIRD STAGE SUCTION SCRUBBER (TRAIN-2)
93	THIRD STAGE COOLER (TRAIN-2)

ITEM NO.	EQUIPMENT NAME
39	STEAM TURBINE HYDRAULIC SKID
40	H2 GAS DRYER
41	H2 GAS SKID
42	STATOR WATER COOLING SKID
43	GLAND STEAM CONDENSER
44	GENERATOR NEUTRAL GROUNDING CUBICLE
45	FUEL GAS PURGE AIR COMPRESSOR AND TANK
46	FUEL GAS FINAL FILTER & PREHEATER SKID
47	FUEL GAS FINAL FILTER & PREHEATER ENCLOSURE
48	HOT BOX
49	ACC MAIN STEAM DUCT
50	CONDENSATE RECIRC. PUMP
51	LAYDOWN AREA (APPROX 20 ACRES)
52	RAW WATER STORAGE TANK
53	WASTEWATER STORAGE TANK
54	CONDENSATE EXTRACTION PUMPS
55	CONDENSATE COLLECTION TANK
56	STEAM TURBINE DRAINS TANK
57*	EMERGENCY DIESEL GENERATOR
58	OIL WATER SEPARATOR (BELOW GRADE)
59	FUEL GAS YARD
60	GENERATOR BREAKER
61	MV PDC
62*	ABSORBER STACK
63	UTILITY RACK
64	GT/ST/AUXILIARY POWER CONTROL CENTER
65	240KV CONTROL BUILDING
66	8 STAGE INTEGRALLY GEARED CENTRIFUGAL COMPRESSOR (TRAIN-1)
67	9.7 MW SYNCHRONOUS ELECTRIC MOTOR (TRAIN-1)
68	SYNCHRONOUS ELECTRIC MOTOR COOLING AIR HANDLER (TRAIN-1)
69	COMPRESSOR LUBE OIL SKID (TRAIN-1)
70	COMPRESSOR LUBE OIL COOLER (TRAIN-1)
71	FIRST STAGE SUCTION SCRUBBER (TRAIN-1)
72	FIRST STAGE COOLER (TRAIN-1)
73	SECOND STAGE SUCTION SCRUBBER (TRAIN-1)
74	SECOND STAGE COOLER (TRAIN-1)
75	THIRD STAGE SUCTION SCRUBBER (TRAIN-1)
76	THIRD STAGE COOLER (TRAIN-1)

ITEM NO.	EQUIPMENT NAME
1	COMBUSTION TURBINE GENERATOR
2	TURBINE GENERATOR
3	STEAM TURBINE
4	INLET AIR FILTER
5	GENERATION BUILDING
6	AUXILIARY TRANSFORMER
7	GENERATOR STEP-UP TRANSFORMER
8	AIR COOLED CONDENSER
9	LV CCS PDC
10	HEAT RECOVERY STEAM GENERATOR
11	BLOW DOWN TANK
12	FIREWATER / SERVICE WATER STORAGE TANKS
13	DEMINERALIZED WATER TANK
14	ADMIN BUILDING
15	WATER TREATMENT BUILDING
16	AUXILIARY COOLING HEAT EXCHANGER
17	BOILER FEEDWATER PUMPS
18	SANITARY DRAINS STORAGE TANK
19	MAIN CO2 COMPRESSION BUILDING
20	CARBON CAPTURE BUILDING
21	THERMAL RECLAIMER BUILDING
22	CARBON CAPTURE AIR COOLERS
23	CEMS
24	STORMWATER PUMP BUILDING
25	STORM RETENTION POND
26	LV ACC PDC
27	SWITCH YARD
28	240 KV OVERHEAD LINES
29*	HRSG STACK
30	AUXILIARY BOILER
31*	AUXILIARY BOILER STACK
32	MOBILE COMPRESSED CLEANING SKID
33	THERMAL MANAGEMENT BLOWER SKID
34	INST. AIR COMPRESSOR & AIR RECEIVER TANKS
35	LUBE OIL & HYDRAULIC SKID
36	MOBILE LUBE OIL PURIFIER
37	BEARING EXHAUSTER SKID & SEAL OIL STORAGE TANK
38	SEAL OIL SKID



TERMINAL POINTS

T1	FUEL GAS
T2	RAW WATER FROM CARSON LAKE
T3	PLANT ACCESS ROAD
T4	WELL WATER FROM JUDY CREEK
T5	240kV TRANSMISSION LINES
T6	WASTEWATER (HAUL BY TRUCK)

NOTES

1. SITE PLAN IS CONCEPTUAL IN NATURE. NOT ALL EQUIPMENT IS REPRESENTED OR OF ACTUAL SIZE.
2. ALL EMISSION SOURCES ON THE SITE ARE DENOTED WITH AN ASTERISK (*) AND IN RED FONT.

SYMBOLS

- PROJECT BOUNDARY
- CO2 COMPRESSION AND DEHYDRATION (61.0100)
- CARBON CAPTURE EQUIPMENT (60.1200)
- POWER ISLAND (67.9100)

PERMIT TO PRACTICE
BLACK & VEATCH CANADA COMPANY
RM APEGA # 89528
2023-02-09
PERMIT NUMBER: P09065
The Association of Professional Engineers and Geoscientists of Alberta

NOT TO BE USED FOR CONSTRUCTION

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PROFESSIONAL ENGINEER — JUSTIN E. DUCHHOP — 2023-02-09 — ASSOCIATION OF PROFESSIONAL ENGINEERS AND GEOSCIENTISTS OF ALBERTA — ENGINEER TO PRACTICE
NO. 114041

NO	DATE	REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	PDE	APP
					GMT	JEB	
1	08/FEB/23	REVISED PROJECT NAME AND SHIFTED SITE	PDN	JSH	GMT	JEB	
0	15/DEC/22	ISSUED FOR PERMITTING	PDN	JSH	GMT	JEB	

1:750 — 0 20 40 60 — SCALE IN METERS

BLACK & VEATCH

DESIGNER JSH | DRAWN PDN | CHECKED | DATE

KIWETINOHK ENERGY CORP
BLACK BEAR COMBINED CYCLE WITH CCS
GENERAL
SITE ARRANGEMENT

PROJECT 412155 | DRAWING NUMBER 00AAA-G1000 | REV 1
CODE | AREA

MicroStation v10.11.0.36
Full Size 1:1
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02/08/2023 12:18 PM
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