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File MC0094

# Big Bear Contracting Ltd.

Initial Project Description - Big Bear  
Camp Aerodrome  
Near La Loche, SK





25 June 2024

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## List of Acronyms

AF	Activity Factor
AGN	Aircraft Group Number
AHPP	Aquatic Habitat Protection Permit
AWOS	Automated Weather Observation Station
Clifton	Clifton Engineering Group Inc.
CF	Conversion Factor
CH <sub>4</sub>	Methane
CO <sub>2</sub>	Carbon Dioxide
CO <sub>2e</sub>	Carbon Dioxide Equivalent
CRDN	Clearwater River Dene Nation
DPD	Detailed Project Description
DTC	Duty to Consult
EA	Environmental Assessment
EASB	Saskatchewan Environmental Assessment and Stewardship Branch
EDI	EDI Environmental Dynamics
EF	Emission Factor
EIA	Environmental Impact Assessment
GHG	Greenhouse Gas
GWP	Global Warming Potential
HABISask	Hunting, Angling, and Biodiversity in Saskatchewan
HCB	Heritage Conservation Branch
IAAC	Impact Assessment Agency of Canada
ISED	Innovation, Science and Economic Development Canada
IK	Indigenous Knowledge
IPD	Initial Project Description
IPCC	International Panel on Climate Change
LSA	Local Study Area
LSD	Legal Subdivision
MBS	Migratory Bird Sanctuary
MCEL	Misty Clifton Engineering Ltd.
PAPI	Precision Approach Path Indicator
PLS	Patterson Lake South
RCMP	Royal Canadian Mounted Police
RSA	Regional Study Area
SARRC	Saskatchewan Association for Resource Recovery Corporation
SKCDC	Saskatchewan Conservation Data Centre
SOCC	Species of Conservation Concern
USEPA	United States Environmental Protection Agency
WSA	Water Security Agency

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## 1.0 Introduction

This Initial Project Description (IPD) is being submitted by Misty Clifton Engineering Ltd. (MCEL) on behalf of Big Bear Contracting Ltd. (Big Bear) for their proposed Big Bear Camp Aerodrome Project at their existing Big Bear Camp. This document conforms with the requirements of an initial project description under the Government of Canada's *Impact Assessment Act, 2019*. This IPD is being presented to the Impact Assessment Agency of Canada (IAAC) under the *Impact Assessment Act* in support of the construction of a new aerodrome located near Grygar Lake, SK (Site/Project).

Big Bear is solely Indigenous-owned by members of the Clearwater River Dene Nation (CRDN) and operates as an Indigenous-owned business on Crown Land. Big Bear provides a range of services for uranium exploration in the region, including accommodations at the Big Bear Camp, exploration services, and construction services. The camp is currently accessible via Highway 955.

The information included in this application has been prepared in accordance with Annex I – Contents of an Initial Project Description, which aligns with Schedule 1 of the Information and Management of Time Limits Regulation.

Throughout the report under the headings there is orange italicized text which includes the guidance language from Annex I to which the section is directly applicable. This was included for the convenience of the reviewer and reader to correlate the content with the guidelines and demonstrate concordance with the Annex I.

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## 2.0 General Information

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### 2.1 Project's Name, Type/Sector, and Proposed Location

*The project's name, type or sector, and proposed location.*

General project information is provided in Table 2.1. The Project is located approximately 145 km (approximately 175 km drivable distance) north of the Northern Village of La Loche along Highway 955.

The location of the Project is depicted in Figure 2.1.

<b>Table 2.1 – General Project Information</b>	
<b>Name</b>	Big Bear Camp Aerodrome
<b>Type/Sector</b>	Aerodrome
<b>Proposed Location of the Aerodrome</b>	Approximate GPS Coordinates: N57.777813, W109.466969 Legal Subdivision (LSD): 24-101-22 W3M

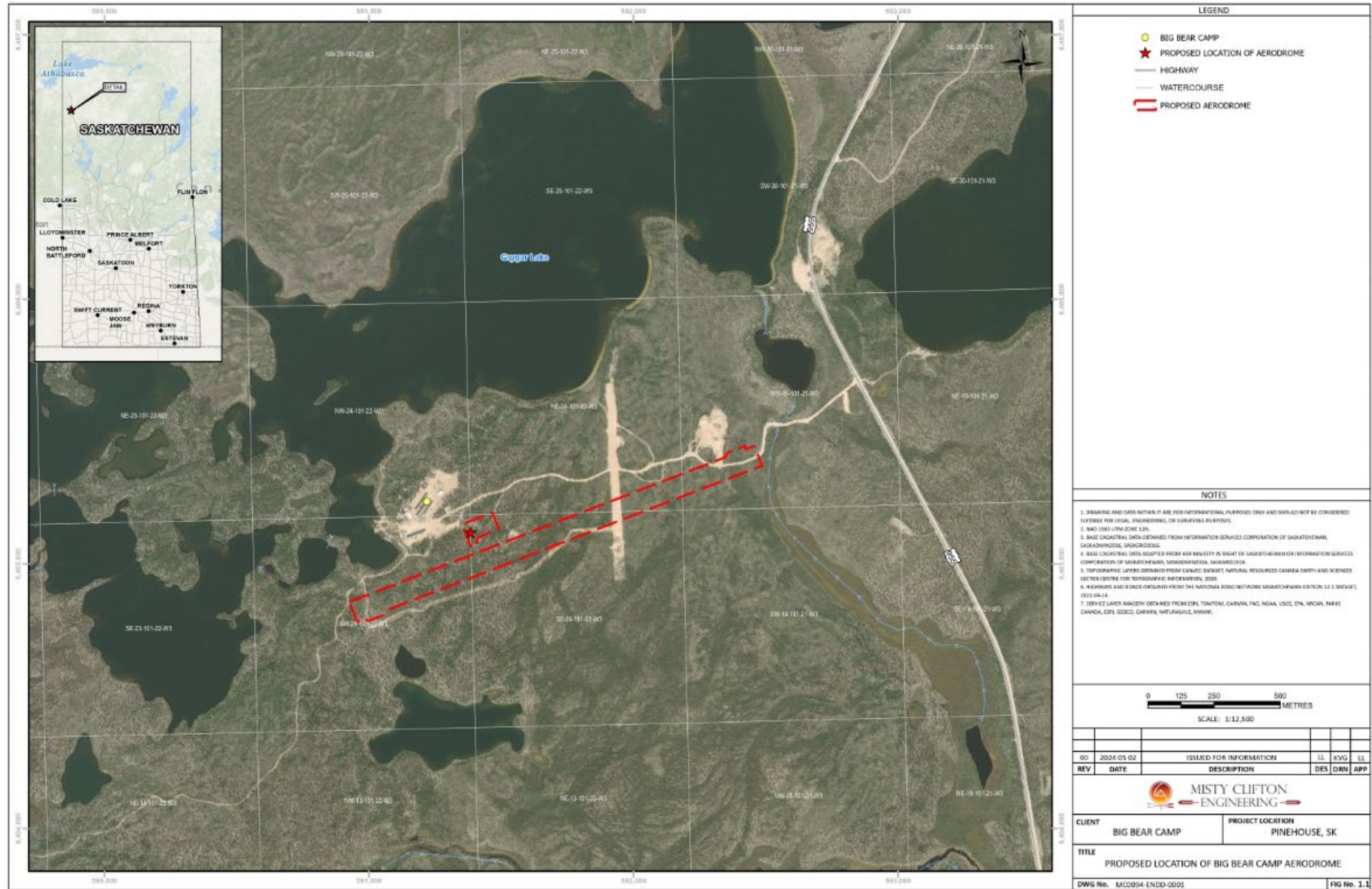


Figure 2.1 – Site Location with Big Bear Camp Located Immediately to the North of the Proposed Aerodrome

## 2.2 Proponent Contact Information

*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.*

The proponent contact information for the purpose of this application is detailed in Table 2.2.

Table 2.2 – Proponent Information	
<b>Name of Project</b>	Big Bear Camp Aerodrome
<b>Name of Proponent</b>	Big Bear Contracting Ltd.
<b>Proponent's Contact Information</b>	PO Box 5108 Clearwater River, SK S0M 3H0
<b>Primary Representative</b>	Dean Balaneski Big Bear Camp General Manager
<b>Primary Representative's Contact Information</b>	bigbeargm@hotmail.com dbalaneski@hotmail.com 1-306-822-7378

## 2.3 Engagement with Jurisdictions or Agencies

*A summary of any engagement undertaken with any jurisdiction or other party, including a summary of the key issues raised and the results of engagement, and brief description of any plan for future engagement.*

This application to the IAAC will be submitted in conjunction with a technical proposal to the Saskatchewan Environmental Assessment and Stewardship Branch (EASB). MCEL contacted the EASB on July 3, 2024, to advise of the upcoming submission.

Table 2.3 below presents a summary of agencies or parties that will be engaged or contacted throughout the planning and permitting phase of the Project, along with forecasted engagement activities for each of the agencies.

## 2.3.1 Federal Stakeholder Engagement

### 2.3.1.1 *Impact Assessment Agency of Canada*

Correspondence with IAAC took place in late 2023. MCEL contacted IAAC to discuss the project and notify them that a project summary would be submitted in the coming months.

### 2.3.1.2 *Transport Canada*

Aviation and aerodromes are regulated by the federal government through Transport Canada's Canadian Aviation Regulations SOR96/433. Prior to construction, Big Bear must notify Transport Canada of its proposal to construct and operate an aerodrome. This notification must contain information such as company and contact information, location, size and orientation of the proposed aerodrome, and a list of the organizations, authorities, companies and landowners to be consulted, including any aerodromes within 30 nautical miles. A minimum of 45 days is to be allocated for comments or objections and the proposed mitigations of the concerns.

At the end of the comment period for the proposal to Transport Canada, the proponent is required to prepare a summary report listing comments or concerns received from each organization, the proposed mitigations and identifying any objections not addressed with the rationale for not doing so. This report is provided to Transport Canada and other interested parties and is available for up to 5 years.

Transport Canada has 30 days to assess the report. Barring any additional requirements from Transport Canada, construction of the aerodrome can start after the 30 days. Transport Canada will also notify Nav Canada Data Management of their acceptance of this report.

### 2.3.1.3 *Innovation, Science and Economic Development Canada*

Innovation, Science and Economic Development (ISED) does not directly regulate aerodromes; however they provide guidance for the technical requirements for mobile stations in the aeronautical service in Canada. The ISED also operates a service centre for issuing aerodrome radio operator certification throughout Canada.

### 2.3.1.4 *Nav Canada*

Although not a federal regulator, Big Bear will be required to notify Nav Canada who is the sole service provider for air navigation in Canada. A General Submission Form will be required for Nav Canada to conduct an initial assessment and provide a formal response with actions that are required to proceed in the building and approval of the Project.

## 2.3.2 Provincial Stakeholder Engagement

In Saskatchewan, the environmental assessment (EA) and the licensing process are separate and sequential, as the EA process must be completed prior to the issuance of specific licenses and permits. The first step in the EA process is to submit a Technical Proposal (formerly the project proposal) to the

Saskatchewan EASB for Environmental Assessment Screening to determine whether the project requires a full environmental impact assessment (EIA – meets the definition of a Development) or it can proceed to licensing.

#### **2.3.2.1 Saskatchewan Environmental Assessment and Stewardship Branch**

MCEL has prepared a technical proposal document for submission to the EASB for review. MCEL has contacted the EASB on July 3, 2024 to advise of the submission of the technical proposal.

#### **2.3.2.2 Saskatchewan Ministry of Parks, Culture and Sport – Heritage Conservation Branch**

Heritage resources are the property of the Provincial Crown and are protected under *The Heritage Property Act*. A Heritage Sensitivity Screening Report was completed and required the Project area to be submitted to the Heritage Conservation Branch (HCB) for further review. Further details on the HCB submission are included in Section 6.3.

#### **2.3.2.3 Other Provincial Stakeholders**

The other provincial stakeholders involved with the Project (listed in Table 2.3) will be engaged during the design/construction phase of the Project.

#### **2.3.3 Municipal Stakeholder Engagement**

The Project is owned by members of the CRDN and therefore no municipal stakeholder engagement is required.

#### **2.3.4 Landowner Engagement**

The Project is owned by members of the CRDN. CRDN is in full support of the project moving forward. A letter of support has been received from CRDN and is included in Appendix A.

#### **2.3.5 Resident Stakeholder Engagement**

There are no surrounding resident stakeholders who require engagement given the land and surrounding land is Indigenous owned by CRDN. No residences are located within 50+ km of the Project.

#### **2.3.6 Industry Stakeholder Engagement**

No industry stakeholder has been completed for the project. Through operations at Big Bear Camp, the Proponent has had discussions with mining companies and outfitters in the area that may utilize the aerodrome. Notable mining projects in the area include NexGen Energy Ltd. (NexGen) Rook I project and the Fission Uranium Corp. (Fission) Patterson Lake South (PLS) project.

#### **2.3.7 Summary of Engagement with Jurisdictions or Agencies**

Engagement activities related to public, industry, government and regulatory stakeholders, and their status, is summarized in Table 2.3 below. The table also includes agencies identified for future engagement during design and construction stages.

**Table 2.3 – Public and Regulatory Stakeholders**

Stakeholder Organization	Engagement Summary
<ul style="list-style-type: none"> <li>• IAAC</li> </ul>	<ul style="list-style-type: none"> <li>• MCEL contacted IAAC in late 2023 to notify them of the Project.</li> <li>• IAAC made recommendations on draft initial project description in April 2024.</li> <li>• Engagement with IAAC will be ongoing.</li> </ul>
<ul style="list-style-type: none"> <li>• Transport Canada</li> <li>• ISED</li> <li>• Nav Canada</li> </ul>	<ul style="list-style-type: none"> <li>• Plan to engage prior to construction, following the submissions and reviews from IAAC and SKENV.</li> </ul>
<ul style="list-style-type: none"> <li>• Saskatchewan Environmental Assessment and Stewardship Branch</li> </ul>	<ul style="list-style-type: none"> <li>• Big Bear has discussed intent of the Project with EASB; MCEL advised the EASB of the upcoming technical proposal submission (July 2024).</li> <li>• TPD will be submitted to the EASB in Q3 of 2024.</li> <li>• Engagement with EASB will be continuous throughout the duration of the Project.</li> </ul>
<ul style="list-style-type: none"> <li>• Saskatchewan Ministry of Environment – Environmental Protection Branch</li> <li>• Saskatchewan Ministry of Labour Relations and Workplace Safety (occupational health and safety)</li> <li>• Saskatchewan Ministry of Agriculture (Forest Product permit for land clearing)</li> <li>• Saskatchewan Ministry of Highways (highway access)</li> <li>• Saskatchewan Ministry of Health (camp, hygiene, water and sewage treatment)</li> <li>• Saskatchewan Public Safety Agency</li> </ul>	<ul style="list-style-type: none"> <li>• Engagement with these agencies will start at the design/construction phase of the Project.</li> </ul>
<ul style="list-style-type: none"> <li>• Saskatchewan Ministry of Environment Resource Management Division – Lands Branch (surface leases)</li> </ul>	<ul style="list-style-type: none"> <li>• Big Bear has discussed the Project with the Lands Branch; the intent moving forward is that once the TPD has been reviewed that an extension to the Big Bear Camp.</li> </ul>

**Table 2.3 – Public and Regulatory Stakeholders**

Stakeholder Organization	Engagement Summary
	<p>industrial lease permit will be extended to include the aerodrome Project.</p>
<p>Saskatchewan Ministry of Parks, Culture and Sport Heritage Conservation Branch</p>	<ul style="list-style-type: none"> <li>• The Project area was submitted to HCB for review; a heritage resource impact assessment will be completed prior to construction activities (see details in Section 6.3).</li> <li>• Big Bear will work with HCB throughout the construction phase of the Project.</li> </ul>
<p>Municipal stakeholders</p>	<ul style="list-style-type: none"> <li>• Not applicable; no municipal groups have been identified that require engagement.</li> </ul>
<p>Landowner or Residential Stakeholders</p>	<ul style="list-style-type: none"> <li>• The Project is located on the traditional territory of CRDN; CRDN is in full support of the Project and continual engagement with CRDN will take place throughout the duration of the Project.</li> <li>• No other residential landowners within proximity of the Project have been identified that require engagement.</li> </ul>
<p>Industry Stakeholder Engagement</p>	<ul style="list-style-type: none"> <li>• Big Bear plans to advise the mining companies in the area on the intent of the Project.</li> </ul>

## 2.4 Indigenous Engagement

*A list of Indigenous groups that may be affected by the carrying out of the project, a summary of any engagement undertaken with the 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.*

The proponent for this project is Indigenous and the Project is located on their traditional territory. Big Bear has informed the Indigenous groups in Table 2.4 about their intentions to develop the Big Bear Camp

Aerodrome Project. Comments received from each group will be summarized in the regulatory submissions and will help to inform the regulators. The list of Indigenous groups that were contacted was derived from the engagement which was completed for the Fission PLS mine site due to the close proximity of the mine site to the Project.

Big Bear commits to future engagement with the Indigenous groups as the Project progresses. Forecasted engagement is also summarized in Table 2.4.

Table 2.4 – Name of Indigenous Community or Group	
Indigenous Community or Organization	Engagement Summary
Clearwater River Dene Nation (CRDN)	<ul style="list-style-type: none"> <li>• Letter sent to Chief Teddy Clarke on 31 January 2024. A letter of support for the Project was received from CRDN on 10 April 2024 which has been attached in Appendix A.</li> <li>• No concerns have been made from CRDN.</li> <li>• Big Bear will continually work with CRDN throughout the Project.</li> <li>• Follow-up phone call with Cameron Willier (CRDN Engagement Lead) on 16 May 2024 indicates they strongly support the project.</li> </ul>
Birch Narrows Dene Nation	<ul style="list-style-type: none"> <li>• Letter sent via email to Chief Jonathon Sylvestre on 18 March 2024. No response received. A copy of the letter sent to Birch Narrows Dene Nation is included in Appendix A.</li> <li>• Attempted follow-up phone call to Chief Jonathon Sylvestre on 16 May 2024 to inquire about comments/concerns. No answer and left a voicemail. Awaiting response.</li> <li>• Will provide an update to the group once the review process from IAAC and EASB has been complete.</li> </ul>
Buffalo River Dene Nation	<ul style="list-style-type: none"> <li>• Letter sent via email to Chief Norma Catarat on 18 March 2024. No response received. A copy of the letter sent to Buffalo River Dene Nation is included in Appendix A.</li> </ul>

**Table 2.4 – Name of Indigenous Community or Group**

Indigenous Community or Organization	Engagement Summary
	<ul style="list-style-type: none"> <li>• Attempted a follow-up phone call on 16 May 2024 to inquire about comments/concerns. Unable to reach Chief or band office. Awaiting response.</li> <li>• Will provide an update to the group once the review process from IAAC and EASB has been complete.</li> </ul>
<p>Ya' Thi Néné Lands and Resources (organization representing seven First Nations in the Athabasca basin)</p>	<ul style="list-style-type: none"> <li>• Letter sent via email to Mr. Garret Schmidt on 18 March 2024. No response received. A copy of the letter sent to Ya' Thi Néné is included in Appendix A.</li> <li>• Attempted follow-up phone call to Dana Kellet (Manager of Environment) on 16 May 2024 to inquire about comments/concerns. No answer and left a voicemail Awaiting response.</li> <li>• Will provide an update to the group once the review process from IAAC and EASB has been complete.</li> </ul>
<p>Athabasca Chipewyan First Nation</p>	<ul style="list-style-type: none"> <li>• Letter sent via email to Chief Allan Adam on 18 March 2024. No response received. A copy of the letter sent to Athabasca Chipewyan First Nation is included in Appendix A.</li> <li>• Attempted follow-up phone call on 16 May 2024 to inquire about comments/concerns. Chief Allan Adam indicated he would call back at a more convenient time. Awaiting response.</li> <li>• Will provide an update to the group once the review process from IAAC and EASB has been complete.</li> </ul>
<p>Clearwater Clear Lake Metis Region, Metis Nation - Saskatchewan (MN-S)</p>	<ul style="list-style-type: none"> <li>• Letter sent via email to Mr. Leonard Montgrand on 29 January 2024.</li> <li>• Response received via phone call on 31 January 2024.</li> <li>• No issues or concerns from the group.</li> <li>• A copy of the letter sent to Clearwater Clear Lake Metis Region MN-S is included in Appendix A.</li> </ul>

**Table 2.4 – Name of Indigenous Community or Group**

Indigenous Community or Organization	Engagement Summary
	<ul style="list-style-type: none"> <li>• Follow-up phone call with Leonard Montgrand on 16 May 2024 to inquire about comments/concerns. Response was no comment at this time.</li> <li>• Will provide an update to the group once the review process from IAAC and EASB has been complete.</li> </ul>

## 2.5 Studies and Plans

*Any study or plan relevant to the project that is being or has been conducted of the region where the project is to be carried out, including any Regional Assessment carried out under the Impact Assessment Act, or by any jurisdiction including by or on behalf of an Indigenous governing body, where the study or plan is available to the public.*

An aerodrome pre-feasibility study was completed for the Project by Tetra Tech in July 2022 (*Big Bear Camp Aerodrome Feasibility Design*, Tetra Tech, 2022). The study included design basis development and feasibility level design. The proposed aerodrome will have a single runway approximately measuring 5,000 feet (1,524 m) in length and 110 feet (36 m) in width. A graveled firebreak is located in close proximity to the Big Bear Camp, and the proposed new runway will run east-west perpendicular to the firebreak.

The feasibility study was desktop based and involved the design analyses of the proposed runway including recommending an orientation perpendicular to the runway-like firebreak. The design basis focused on a feasibility-level analysis of the Site for an Aircraft Group Number (AGN) IIIA aircraft capable, gravel surfaced aerodrome including airfield lighting. AGN IIIA aircraft include those currently servicing northern Saskatchewan such as 44 passenger ATR-42.

Recommendations from the pre-feasibility study included engineering studies required for construction, such as completion of a Lidar survey, a geotechnical study for specifications and design of the runway, taxiway and apron structures, and a hydrology study for drainage requirements. These studies should be completed prior to final design of the Project.

CRDN has completed traditional land use studies of the surrounding areas for the NexGen and Fission mine sites, which are located approximately 20 km south of the proposed aerodrome. These studies were not available for review by MCEL; however, they have been incorporated into the EAs for the mine sites which are publicly available online. Big Bear will work closely with CRDN throughout the Project to ensure traditional land uses are protected during the design and construction phases.

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## 2.6 Strategic Assessments

*Any strategic assessment, relevant to the project, that is being or has been carried out under Section 95 of the Act.*

The Strategic Assessment of Climate Change, published in 2020, would be relevant to the project; it is a strategic assessment conducted under subsection 95(2) of the *Impact Assessment Act*, and it applies to all designated projects under the *Impact Assessment Act*. The Strategic Assessment of Climate Change was considered during the Project's greenhouse gas (GHG) emissions estimate (refer to Section 6.6).

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## 3.0 Project Information

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### 3.1 Project Purpose and Need

*A statement of purpose of and need for the project, including any potential benefits.*

The purpose of the Project is to improve accessibility to the northwestern area of the Province and to provide economic growth and employment opportunities for the local communities, including Indigenous groups such as CRDN. With accessibility comes amenities such as emergency medical services, which will enhance safety to the northern communities.

The airstrip is designed to support local communities and business development, including tourism, logistics support, and support to mining and exploration companies in the northwest. The graveled surfaced aerodrome will service AGN IIIA aircraft (or similar). These are aircraft that have a landing approach speed of 169 km/h (91kt) or less. The main types of aircraft that would use such a strip are ATR 42 (twin engine and up to 44 passengers), SAAB 340 A/B (twin engine and up to 34 passengers), Beechcraft 1900D (twin engine and up to 19 passengers), DeHavilland Twin Otter (twin engine and up to 19 passengers), and smaller aircraft (Rise Air website, April 2024).

The Project will serve the transportation needs of the northwestern portion of the province and looks to fill a niche similar to that filled by the Points North Landing operation on the east side of the Athabasca Basin (IATA airport code YNL). In this role, the Project can provide the following services:

- Support regional tourism.
- Service the expanding needs of the mining industry both for exploration projects and the proposed mining projects in the area (e.g. NexGen Rook I project and Fission PLS project), including facilitating and increasing capacity with crew changes and movement of supplies, and adding a helicopter base.
- Access to Big Bear Camp services for food and lodging.

- Scheduled air services.
- Emergency services support (e.g., medivacs) for the northern regions.
- Provide a potential base for the Saskatchewan Public Safety Agency, wildfire services, including accommodation of crews and aircraft support.
- Serve as a delivery/courier service for northern communities.

The Project is anticipated to create positive socio-economic outcomes for local community members through increased employment and training opportunities and community capacity building.

The airstrip will have the potential to support other business activities in northern Saskatchewan including providing an airstrip for emergency operations such as evacuations and wildfire support, especially as accommodations are available on site.

While initially most flights would be charters, there is the potential to base aircraft at the airstrip and have commercial flights, if the demand warrants. Through support of mining and exploration projects, it will provide a conduit for job holders from small northern communities, similar to what was done on the east side of the province.

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### 3.2 Project Applicable Physical Activities Regulation

*The provisions in the schedule to the Physical Activities Regulations describing the project, in whole or in part. Proponents must detail how the project meets the description, threshold, and the criteria in any of the other provisions.*

The project is subject to Section 46 (a) of the Physical Activities Regulation which states the following:

- (a) a new aerodrome with a runway length of 1,000 m or more.

The proposed aerodrome is to be approximately 1,524 m in length.

There are no other criteria presented in the Physical Activities Regulation which would be applicable to the project. Transport Canada regulates aviation projects in Canada.

Big Bear is aware of the need to comply with the *Migratory Birds Convention Act* and the *Species at Risk Act* in developing the Project.

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### 3.3 Project Activities, Infrastructure, and Physical Works

*A list of all activities, infrastructure, permanent or temporary structures and physical works to be included in and associated with the construction, operation, decommissioning of the project.*

### **3.3.1 Proposed New Infrastructure and Project Activities**

The proposed aerodrome will be a non-certified, single runway with a compacted gravel top approximately 5,000 feet (1,524 m) in length and up to 197 feet (60 m) in width for the runway strip allowance. Other features will include a taxiway that will connect the runway to a parking apron. The parking apron will be designed to accommodate a variety of aircraft and will include tie-down areas for aircraft that are not in use. A small terminal building will also be constructed that will provide basic amenities for passengers, such as restrooms, seating areas, and vending machines. The terminal will also include a small baggage handling area for passengers arriving and departing on flights. The proposed site layout and facility information is shown in Figure 3.1.

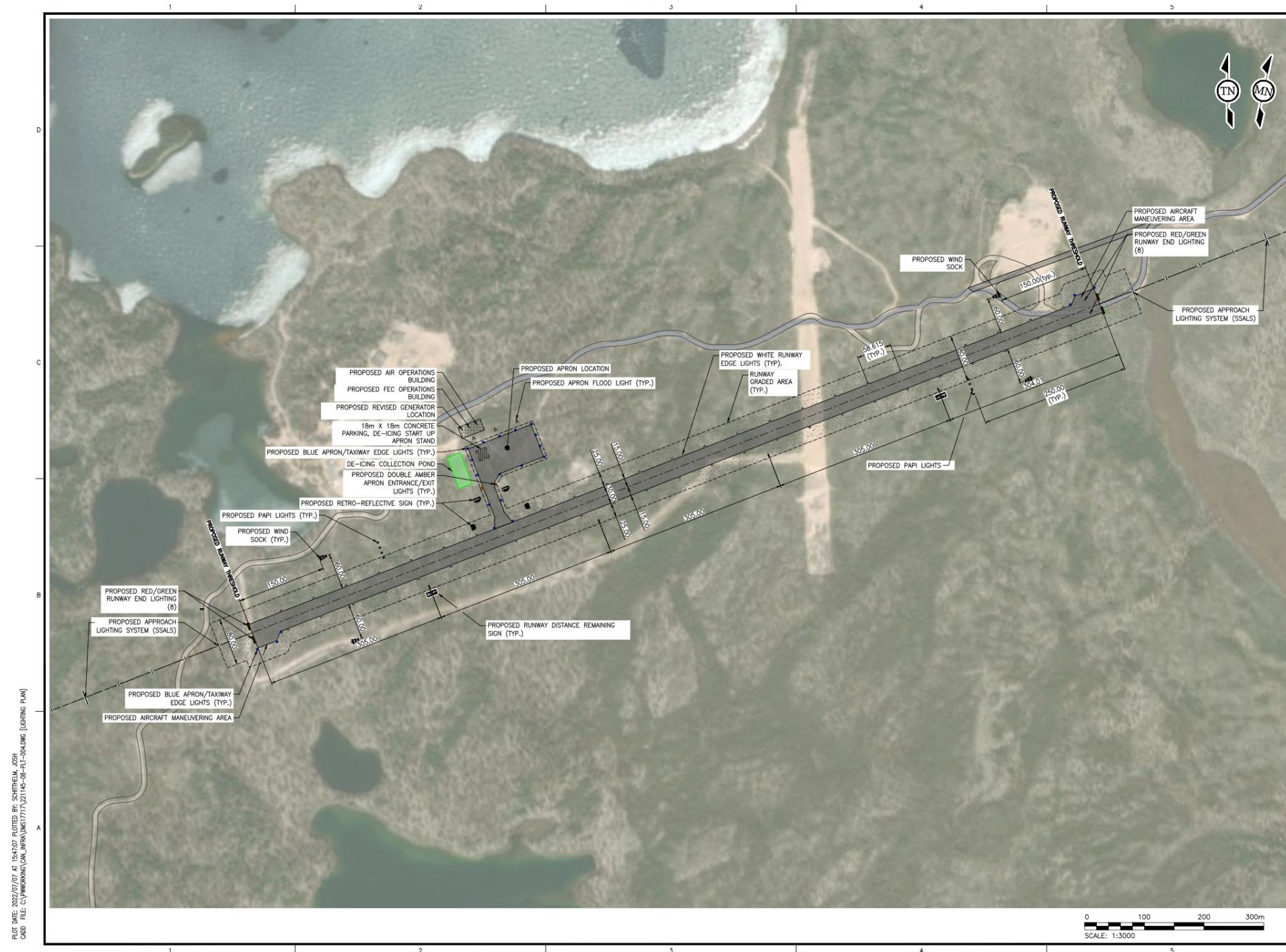


Figure 3.1 – Proposed Site Layout (Tetra Tech, 2022)

The pre-feasibility study drawings including site location, proposed orientation and runway plan and profile are included in Appendix B. The original feasibility study was addressed to Fission Uranium Corporation in error as the work, while paid for by Fission as part of their community support program, was for the sole use of Big Bear Camps and its owners in the CRDN.

The civil works included with the construction of the Project include:

- Mobilization to the Project.
- Construction surveying.
- Tree clearing.
- Stripping.
- Earthworks – cut to fill with grading and compaction.
- Earthworks – cut to haul off-site.
- Install granular subbase. Subbase is expected to be sourced from a gravel pit located nearby which on Big Bear territory.
- Produce and install granular base for runway, taxiway, apron and safety areas.
- Construction of concrete apron hardstand.
- Installation of lined sump for glycol collection on apron.
- Installation of airfield lighting and electrical works.

Operational activities will include site maintenance, storage of hazardous materials including the refueling of storage tanks, grading of the runway, and management and staffing of the aerodrome itself. Locations of storage tanks and infrastructure have not yet been determined and will be completed at the design phase of the Project. Care will be taken to position all infrastructure for the Project as far as possible from sensitive receptors (such as Grygar Lake). Design and construction of the aerodrome will be completed by qualified professionals.

The purpose of decommissioning would be to ensure that any surficial disturbance related to the Project is able to return to as close to pre-disturbance conditions as possible. While the aerodrome is expected to have a long life, once the Project has reached its lifespan, all infrastructure associated with the aerodrome will be removed from the Site. Replacement of any stockpiled subsoil and topsoil will be completed where possible. Natural encroachment of native vegetation will be encouraged at reclaimed areas and where necessary, an approved seed mixture will be applied.

### 3.3.2 Existing Infrastructure

Big Bear Camp is located at the Site and has been in operation since 2005. The company offers a variety of services including maintenance, construction, trucking, seismic line cutting services, aggregate crushing, general field labour, delivery and aviation services, fuel services, and camp services for contractors.

The camp consists of various buildings including four dorm buildings, a kitchen, maintenance sheds, office trailers and a bulk fuel storage area.

There is currently a graveled firebreak near the proposed Project, and all-weather gravel Highway 955 is located approximately 1.6 km east of the Site.

### 3.4 Production Capacity

*An estimate of maximum production capacity of the project and a description of the production processes to be used.*

The final product for the Project will be an aerodrome with a single runway with a compacted gravel top approximately 5,000 feet (1,524 m) in length and up to 197 feet (60 m) in width. The frequency of flights will be highly dependent on the mining support required in the area.

### 3.5 Anticipated Schedule

*The anticipated schedule for the project's construction, operation, decommissioning, and abandonment, including any expansions of the project.*

The anticipated schedule is outlined in Table 3.1 below; however, it is dependent on receipt of the necessary environmental approvals and will be extended if a federal IA is required.

**Table 3.1 – Anticipated Schedule – No Impact Assessment Required**

Task	Schedule
• Preparation of technical proposal, engagement activities and regulatory licensing requirements	Ongoing with submissions in Q2 2024
• Feasibility engineering	Q4 2024
• Design engineering; procurement of equipment, materials and labor	2025
• Construction phase, including: site preparation, construction of airstrip and supporting infrastructure, site access construction, electrical infrastructure, water and sewer facilities, waste management requirements, etc.	2025
• Operation phase	Q2 or Q3 2026

**Table 3.1 – Anticipated Schedule – No Impact Assessment Required**

Task	Schedule
<ul style="list-style-type: none"> <li>Decommissioning phase</li> </ul>	<p>At this time there are no plans to decommission the project and it is expected to operate as long as it is technically and economically feasible.</p>

Should a federal IA be required, the following schedule (Table 3.2) would apply:

**Table 3.2 – Anticipated Schedule – Impact Assessment Required**

Task	Schedule
<ul style="list-style-type: none"> <li>Preparation of technical proposal, engagement activities and regulatory licensing requirements and ongoing with submissions of detailed project description (DPD)*</li> </ul>	<p>Q2 2024</p>
<p><i>*If an impact assessment decision is received, studies and further engineering will be completed</i></p>	
<ul style="list-style-type: none"> <li>Impact Assessment Process</li> </ul>	<p>2025 - 2028</p>
<ul style="list-style-type: none"> <li>Design engineering; procurement of equipment, materials and labor</li> </ul>	<p>2028 - 2029</p>
<ul style="list-style-type: none"> <li>Construction phase, including: site preparation, construction of airstrip and supporting infrastructure, site access construction, electrical infrastructure, water and sewer facilities, waste management requirements, etc.</li> </ul>	<p>2029</p>
<ul style="list-style-type: none"> <li>Operation phase</li> </ul>	<p>2030 onward</p>
<ul style="list-style-type: none"> <li>Decommissioning phase</li> </ul>	<p>At this time there are no plans to decommission the project and it is expected to operate as long as it is technically and economically feasible.</p>

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### 3.6 Potential Alternatives

#### *A list of potential:*

- *Alternative means that the proponent is considering and that are technically and economically feasible, including through the use of best available technologies; and*
- *Alternatives to the project that the proponent is considering and that are technically and economically feasible, and directly related to the project.*

There have been no alternative locations considered for this aerodrome. The location has been chosen based on the pre-feasibility and proximity to the Big Bear Camp site.

Currently the Site is serviced by float and ski planes which severely limits year-round air access and winter operations are becoming more problematic with global warming. While access is available from Highway 955, transportation safety on this highway is a concern especially for travelers and tourists not familiar with the road. Big Bear and CRDN do not see another alternative for the Project and are not considering any other alternatives at this time.

A smaller aerodrome was considered during the feasibility study, but a smaller airstrip would not provide enough variability in aircraft types to make the aerodrome economical.

The proponent will examine the possibility of using renewable energy once the Project is at the design phase to reduce the projects emission footprint.

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## 4.0 Location Information and Context

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### 4.1 Geographic Coordinates

*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.*

The Project is located in northern Saskatchewan, approximately 145 km north of La Loche and 200 km south, south-east of the airstrip at Uranium City (direct distances). The Project is accessible via Highway 155 to La Loche, and then north from La Loche on Highway 955 (old Cluff Lake Mine Road).

The UTM coordinates for the Project are N57.777813, W109.466969. Grygar Lake is present immediately north of the Project. Both the developing NexGen and Fission properties are located approximately 20 km south of the Project in the Patterson Lake area (Figure 4.1).

#### **4.1.1 Site Maps**

*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.*

Figure 4.1 shows the general Project location with surrounding features such as waterbodies and the nearby mine sites. Figure 2.1 and Figure 3.1 also present site maps with additional features.

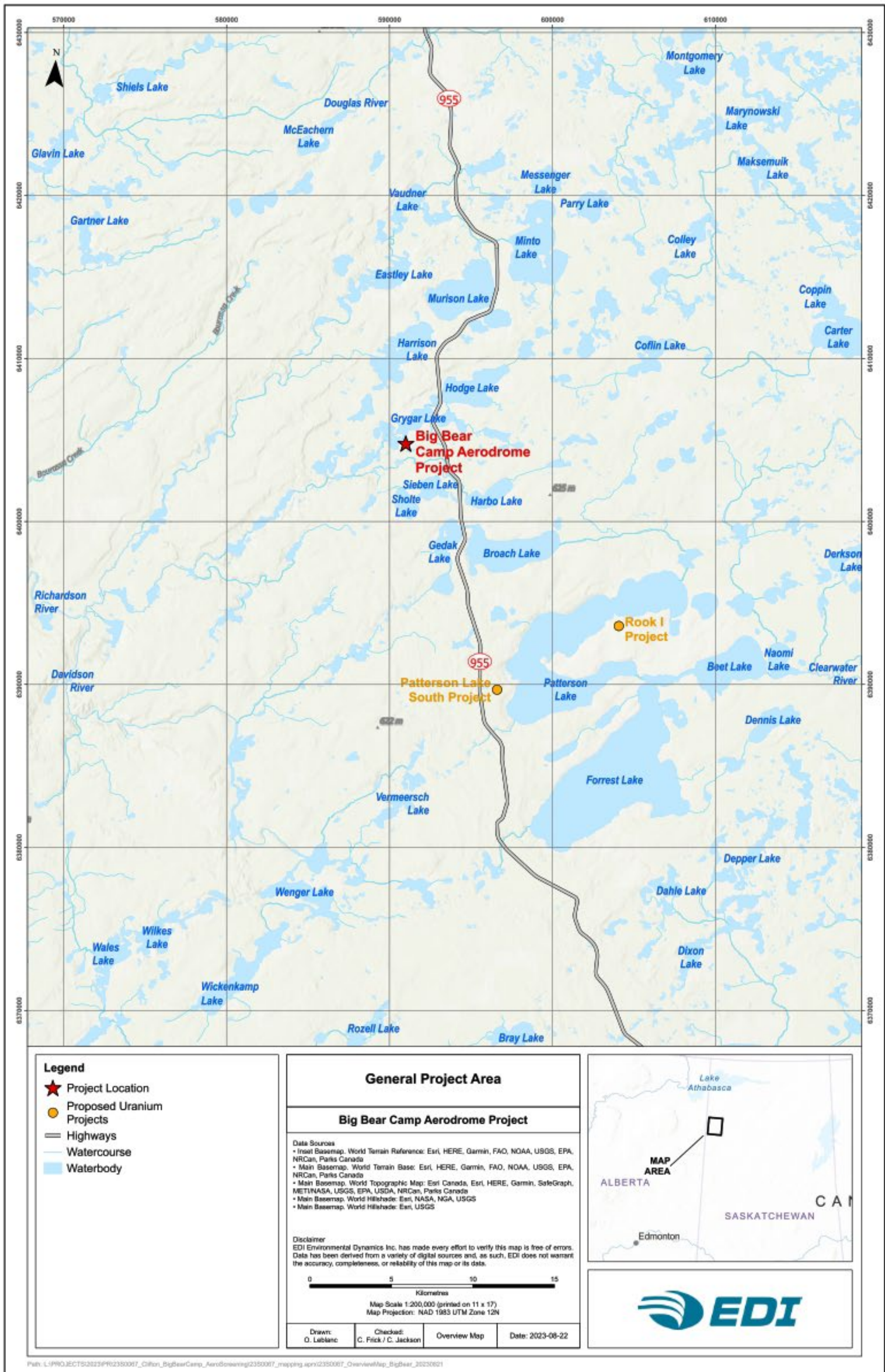


Figure 4.1 – General Project Area (EDI 2023)

#### 4.1.2 Legal Land Descriptions and Landowner Documents

*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.*

The Site is located on LSD 24-101-22 W3M.

The land is an industrial lease issued by the province of Saskatchewan to Big Bear (Lease Numbers 14ML224; CA021; 0064252-00-00 issued on 16 June 2015), which covers the existing Big Bear camp and outfitting cabins. Once the provincial EA process is complete, Big Bear will apply for an amendment to their lease to include the aerodrome location.

#### 4.1.3 Proximity to Residents and Communities

*The project's proximity to any permanent, seasonal or temporary residences and to the nearest affected communities.*

The small settlement of Descharme Lake is the nearest community to the Project. Descharme Lake, located approximately 87 km south of the Project, has a total of 26 residents according to the 2021 Census (Statistics Canada, 2023).

La Loche and CRDN are the closest large communities to the Project, located approximately 145 km south (direct distance), with populations of 2,514 and 831 people, respectively.

In Section 4.1 below there is a figure which illustrates the proximity of the Project to nearby communities.

#### 4.1.4 Project Proximity to Traditional Indigenous Uses

*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.*

The Project is located on Crown lands within Treaty 8 Territory and is owned by Clearwater River Dene Nation. The Clearwater River Dene Traditional Territory boundaries are shown below in Figure 4.2.

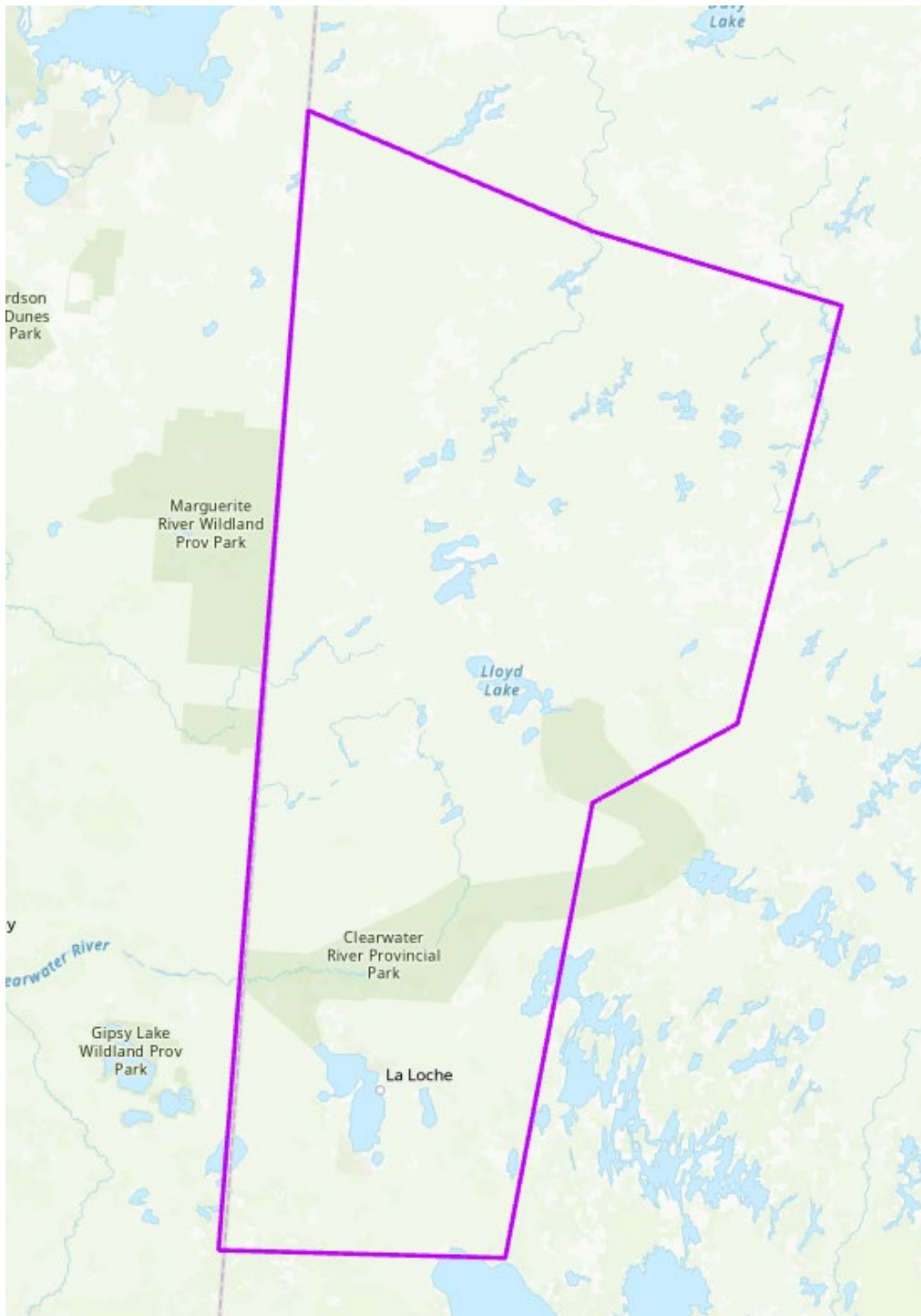


Figure 4.2 – Clearwater River Dene Traditional Territory Boundary (source, CRDN)

Other traditional territories in the area include Buffalo River Dene Nation, Birch Narrows Dene Nation, Black Lake Denesuline First Nation, Fond du Lac Denesuline First Nation, and Athabasca Chipewyan First Nation. Figure 4.3 and Table 4.1 provide information on the traditional Nations surrounding the Project. The closest federal land to the Project is Athabasca Chipewyan First Nation (201A), which is approximately 105 km (direct distance as there is no driveable route from the Project).

Indigenous Knowledge (IK) has the potential to provide valuable information. Big Bear will work with members of Clearwater River Dene Nation who will participate in all phases of the Project to offer historical perspective that cannot be gathered through conventional scientific baseline surveys.

The Project and regional study area are located in within the claim settlement area of CRDN and the homeland of the Métis Nation within the boundaries of the 2019 North West Métis Land Claim area. The Local Study Area (LSA) is defined as a 1 km buffer around the Project component's footprint and the Regional Study Area (RSA) is defined as a 15 km buffer around the Project component's footprint.

**Table 4.1 – Indigenous Nations Surrounding the Project**

Nation	Status	Population In 2021 Census	Distance From The Project Area (km) <sup>1</sup>
Clearwater River Dene	Indian Reserve	831	135
Birch Narrows Dene Nation	Indian Reserve	476	152
Buffalo River Dene Nation	Indian Reserve	842	200
Black Lake Denesuline First Nation	Indian Reserve	2,096	264
Fond du Lac Denesuline First Nation	Indian Reserve	926	172
Athabasca Chipewyan First Nation (Jackfish, AB)	Indian Reserve	1,508	105
Total		2,149	

<sup>1</sup> Distance from the Project area is shown as the approximate direct distance.



Table 4.2 below lists the communities, the 2021 Statistics Canada census population data, and the distance from the Project for communities that are located along and directly adjacent to Highway 955 and Highway 155, beginning at Beauval.

<b>Table 4.2 – Communities Surrounding the Project</b>			
<b>Community Name</b>	<b>Status</b>	<b>Population In 2021 Census</b>	<b>Distance From The Project Area (km)<sup>1</sup></b>
Descharme Lake	Northern settlement	26	80
La Loche	Northern village	2,514	145
Turnor Lake	Northern hamlet	154	155
Black Point	Northern settlement	39	160
Bear Creek	Northern settlement	45	170
Garson Lake	Northern settlement	10	165
Michel Village	Northern hamlet	37	205
Dillon	Unorganized	1,871	210
St. Georges Hill	Northern hamlet	77	220
Buffalo Narrows	Northern village	1,014	225
Ile-a-la-Crosse	Northern village	1,425	280
Beauval	Northern village	840	320
Total		8,052	

<sup>1</sup> Distance from the Project area is shown as the approximate direct distance.

#### 4.1.5 Proximity to Federal Lands

*The project's proximity to any federal lands.*

The Project itself is located on provincially leased land (see Section 4.1.2). The Project will operate as an Indigenous-owned business on the leased land.

The closest federal land to the Project is Athabasca Chipewyan First Nation (201A), which is approximately 105 km (direct distance as there is no driveable route from the Project).

There are no Migratory Bird Sanctuaries (MBS), national wildlife areas or national parks near the Site. The closest sanctuary is the Richardson Lake MBS approximately 110 km northwest in Alberta, and the closest MBS in Saskatchewan is the Murray Lake (over 500 km south). The closest National Park is the Prince Albert National Park, over 450 km southeast.

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#### 4.2 Physical and Biological Environment

*A brief description of the physical and biological environment of the project's location, based on information that is available to the public.*

MCEL retained EDI Environmental Dynamics (EDI) to complete a desktop biophysical assessment. The data presented for the physical and biological environment (Section 4.2) is copied from EDI's *Description of the Environment for Big Bear Aerodrome Technical Proposal, 2024*.

The following sections provide an overview of the existing environment for the LSA and regional study areas RSA surrounding the Project. All information included in this section was obtained from existing, publicly available literature and online data sources as field studies have not been completed. Pre-construction surveys will be conducted as part of the permitting phase of the Project.

This section provides information on the terrestrial environment of the LSA and RSA, including land cover types, vegetation and wildlife communities, as well as species of conservation concern (SOCC). Sources of information herein include publicly available reports for the PLS and Rook I projects in the RSA:

- Fission Project Description – PLS Project (Clifton and CanNorth 2021).
- Vegetation Baseline Report 2 (Inventory, Rare Plants, and Wetlands) for the Rook I Project – Final Report; Annex VII.2 (CanNorth 2021b).
- Wildlife Baseline Report 1 (Mammals, Waterfowl and Raptors) for the Rook I Project; Annex VIII.1. (Omnia 2021a).
- Wildlife Baseline Report 2 (Amphibians, Birds and Bats) for the Rook I Project; Annex VIII.2 (CanNorth 2021c).

#### 4.2.1 Terrain and Soil

The soils that predominate in the Project area are sandy soils typical of the Athabasca Basin area. The soil is predominantly silica sand with a thin A-horizon layer of a few centimetres with some organic content. The soils are not very productive.

##### 4.2.1.1 Land Cover

The Project is within the Boreal Shield Ecozone, specifically the McTaggart Plain at the southwest boundary of the Athabasca Plain Ecoregion (Acton et al. 1998). The Boreal Shield landcover has been influenced by wildfire throughout, which is a determining factor in habitat successional stages throughout the ecozone (CanNorth 2021b).

In general, habitat in the McTaggart Plain is dominated by open jack pine (*Pinus banksiana*) woodlands on sandy glaciofluvial material (Acton et al. 1998). A mix of both black spruce (*Picea mariana*) and jack pine is typically found on the slopes of eskers. Boggy lowlands are often associated with closed stands of stunted black spruce forest. According to the Saskatchewan Conservation Data Centre (SKCDC) Hunting, Angling, and Biodiversity in Saskatchewan (HABISask) database (SKCDC 2023) Saskatchewan Digital Land Cover, the Project will predominantly be situated within the following land cover types:

- closed canopy jack pine (greater than 75% of jack pine by area; greater than 55% crown closure).
- open canopy jack pine (greater than 75% of jack pine by area; 10% to 55% crown closure).
- mixed woods: all softwood/hardwood mixtures; open and closed canopy (i.e., an area of hardwood and softwood combinations in which neither hardwood nor softwood accounts for greater than 75% of species by area, and where the crown closure is greater than 10%).
- revegetating/regeneration burn (an area showing evidence of natural or prescribed burning and where regeneration or revegetation is visible).
- treed rock (areas of exposed bedrock with generally less than 10% tree cover); and
- disturbed (developed lands for industrial land use purposes comprised of exposed areas with little or no vegetation).

##### 4.2.1.2 Potential Impacts and Mitigation

A summary of the potential impacts and mitigations to terrain and soil during construction of the Project are presented in Table 4.3.

**Table 4.3 – Terrain and Soil – Potential Impacts and Mitigations**

Potential Impacts	Mitigation
<ul style="list-style-type: none"> <li>• Direct loss of soil via erosion</li> </ul>	<ul style="list-style-type: none"> <li>• Erosion control practices will be implemented throughout the duration of construction activities. An Erosion and Sediment Control Plan will be developed for the project.</li> </ul>
<ul style="list-style-type: none"> <li>• Removal of soil and grading of terrain in the project footprint. Reduction in soil quality/productivity, changes to terrain stability and alteration of local slope profiles</li> </ul>	<ul style="list-style-type: none"> <li>• Project footprint will be kept to the smallest extent possible to do the work safely and work area boundaries will be maintained for the duration of construction. It is estimated the total Project footprint to be approximately 23 hectares (TetraTech).</li> </ul>
<ul style="list-style-type: none"> <li>• Hazardous waste spills or leaks from equipment/ vehicles can affect soils and vegetation</li> </ul>	<ul style="list-style-type: none"> <li>• Emergency response plans will be included in the Environmental Protection Plan (EPP) per the provincial Environmental Code and spill response requirements to provide quick detection, control, and management of any spill during construction/operation and to ensure proper disposal of hazardous waste.</li> <li>• Development and implementation of a Hazardous Materials Management Plan.</li> <li>• Properly designed and licensed facilities for the storage of hazardous materials and fuel.</li> </ul>

#### 4.2.2 Vegetation

Various plant species are found in the vegetation communities within the Athabasca Plain Ecoregion and the associated McTaggart Plain (Acton et al. 1998).

Open jack pine woodlands on sandy glaciofluvial soil typically have an understory of low-lying shrubs such as blueberry (*Vaccinium angustifolium*) and cranberry (*Vaccinium oxycoccos*) and a ground cover of lichens. Closed jack pine stands, on lower slopes with more moisture, have tall shrubs, such as green alder (*Alnus viridis*) or willow (*Salix* species). Mixedwood stands of trembling aspen (*Populus tremuloides*) and white birch (*Betula papyrifera*) occur occasionally within the jack pine forests, typically on finer textured sands and sandy loam soils, found near the shores of lakes and streams (Acton et al. 1998).

A baseline vegetation survey was completed in 2018 for the Rook I project, located approximately 15 km southeast of the Project (CanNorth 2021b). Results of the survey identified overstory jack pine stands containing shrubs such as Labrador tea (*Rhododendron groenlandicum*), blueberry (*Vaccinium myrtilloides*), mountain cranberry (*Vaccinium vitis-idaea* ssp. *minus*), bearberry (*Arctostaphylos uva-ursi*), and green alder, with an understory of lichens, mosses, and needle litter.

Black spruce-jack pine communities are transitional between drier upland pine woodlands and lowland black spruce stands (Acton et al. 1998). Other common trees in this community include trembling aspen, white birch, and green alder. The understory includes shrubs mixed with intermittent groundcover of lichens and feather mosses (e.g., species in the order *Hypnales*).

Bogs in the Athabasca Plain Ecoregion form upslope from fens, are nutrient poor and receive water via precipitation (Acton et al. 1998). These conditions lead to the growth of acid-loving sphagnum mosses (i.e., *Sphagnum* species), herbs, shrubs and stunted black spruce.

A terrestrial baseline inventory was conducted for the PLS project in 2018/2019 (Clifton and CanNorth 2021), which included a 15 km x 15 km area around the proposed PLS project that extended north toward the Project LSA. Browse surveys identified seven shrub that are highly palatable to moose (*Alces alces*), but many plots had low forage potential as they did not contain any of these preferred browse species. Reindeer lichen (*Cladonia rangiferina*) was found in most plots, which would provide a high forage potential for caribou (*Rangifer tarandus caribou*).

Fire has been shown to play a role in shaping the vegetation community in the RSA (Omnia 2021b). In general, younger forest stands are found in areas that have been burnt in recent years. The most recent fire within the RSA occurred in 2009, less than 5 km east of the Project and south and east of Hodge Lake.

#### **4.2.2.1 Potential Impacts and Mitigations**

A summary of the potential impacts and mitigations to vegetation during construction of the Project are presented in Table 4.4.

**Table 4.4 – Vegetation - Potential Impacts and Mitigations**

Potential Impacts	Mitigation
Removal of vegetation	<ul style="list-style-type: none"> <li>• Project footprint will be kept to the smallest extent possible to do the work safely and work area boundaries will be maintained for the duration of construction.</li> <li>• Construction during sensitive wildlife windows will be avoided. Clearing activities will only be completed during specified timeframes.</li> <li>• Development of an EPP.</li> </ul>
Introduction of prohibited, noxious, nuisance, and/or invasive plants	<ul style="list-style-type: none"> <li>• Prevention of the introduction and spread of prohibited, noxious, nuisance, and invasive plants will be addressed in the environmental management plan.</li> <li>• Disturbed areas will be re-seeded with native vegetation as soon as possible.</li> </ul>

## 4.2.3 Wildlife and Wildlife Habitat

### 4.2.3.1 Mammals

The Athabasca Plain Ecoregion represents the interface between the southern limit of the open boreal forest and the northern extent of the closed boreal forest. The harsh climate, sandy shallow soils, and high fire frequency in this ecoregion result in moderate species richness for mammals (Acton et al. 1998).

Typical mammal species found in this ecoregion include moose, black bear (*Ursus americanus*), woodland caribou, northern flying squirrel (*Glaucomys sabrinus*), beaver (*Castor canadensis*), grey wolf (*Canis lupus*), least weasel (*Mustela nivalis*), North American porcupine (*Erethizon dorsatum*), northern bog lemming (*Synaptomys borealis*), Canada lynx (*Lynx canadensis*), American marten (*Martes americana*), and wolverine (*Gulo gulo*).

Various mammal species were identified in the terrestrial baseline inventory conducted for the PLS project in 2018/2019 (Clifton and CanNorth 2021). Winter track surveys identified 12 mammal species or species groups, including: woodland caribou, moose, grey wolf, wolverine, Canada lynx, American marten, fisher (*Martes pennanti*), American mink (*Mustela vison*), snowshoe hare (*Lepus americanus*), red squirrel (*Tamisciurus hudsonicus*), weasel species (*Mustela species*) and voles or mice. Semi-aquatic mammals identified included beaver, river otter (*Lontra candesis*), muskrat (*Ondatra zibethicus*) and American mink.

Mammal species were identified during several surveys conducted for the Rook I project from 2018 to 2020. Winter track count surveys conducted in 2018 and 2020 identified 13 species or species groups: moose, coyote (*Canis latrans*), snowshoe hare, red squirrel, marten, fisher, ermine (*Mustela erminea*), red

fox (*Vulpes vulpes*), microtine rodent species, mink, Canada lynx, otter, and least weasel (Omnia 2021a). Moose, woodland caribou, and wolf were encountered in March and/or April 2019 during winter backtrailing surveys (Omnia 2021a). The presence of moose, black bear, woodland caribou, mink and otter was determined during surveys for pellets or scats in June 2018 and May 2019 (Omnia 2021a). In September 2018, sign of muskrat, beaver and mink were identified during a semi-aquatic furbearing mammals survey (Omnia 2021a). During a 2018 wildlife field program for the Rook I project, mammal species recorded incidentally included moose, black bear, northern grey wolf (*Canis lupus occidentalis*), beaver, American mink, muskrat, snowshoe hare, least chipmunk (*Tamias minimus*), red squirrel, and woodland caribou (CanNorth 2021c).

Bat surveys completed as part of the baseline surveys for the PLS project in 2018/2019 (Clifton and CanNorth 2021) identified three categories of bats based on recorded vocalizations: 1) high frequency group, including eastern red bats (*Lasiurus borealis*), little brown myotis (*Myotis lucifugus*) and northern myotis (*Myotis septentrionalis*); 2) myotis subset group including little brown myotis and northern myotis; and 3) low-frequency group, including big brown bat (*Eptesicus fuscus*), silver-haired bat (*Lasionycteris noctivagans*) and hoary bat (*Lasiurus cinereus*). These same three bat groupings were detected in surveys conducted for the Rook I project in 2018 (CanNorth 2021c). Results of both surveys indicated that the majority of the bat passes recorded belonged to the high frequency and myotis subset groups.

#### 4.2.3.2 Birds

Resident and abundant bird species, common migrant species, and waterfowl found in the Athabasca Plain Ecoregion are listed in Table 4.5. Approximately 176 avian species occur within this ecoregion, which is identified as having low diversity compared to other regions within the Boreal Shield Ecozone (Acton et al. 1998).

The density in the Athabasca Plain Ecoregion is 140 birds per 100 hectares, dropping to 12 to 37 birds per 100 hectares in the dry upland jack pine forests. Avian abundance is concentrated in riparian areas. Low productivity of the waterbodies within the RSA results in a low diversity of waterfowl.

**Table 4.5 – Resident and Abundant Bird Species, Common Migrant Species and Waterfowl of the Athabasca Plain Ecoregion**

<b>Resident and Abundant Bird Species</b>	<b>Common Migrant Species</b>	<b>Waterfowl</b>
Black-backed Woodpecker ( <i>Picoides arcticus</i> )	American Robin ( <i>Turdus migratorius</i> )	American white pelican ( <i>Pelecanus erythrorhynchos</i> )
Boreal chickadee ( <i>Poecile hudsonicus</i> )	Barn swallow ( <i>Hirundo rustica</i> )	Common merganser ( <i>Mergus merganser</i> )
Common raven ( <i>Corvus corax</i> )	Belted kingfisher ( <i>Megaceryle alcyon</i> )	Common loon ( <i>Gavia immer</i> )
Downy woodpecker ( <i>Dryobates pubescens</i> )	Bohemian waxwing ( <i>Bombycilla garrulus</i> )	Ring-necked duck ( <i>Aythya collaris</i> )
Great gray owl ( <i>Strix nebulosa</i> )	Common nighthawk ( <i>Chordeiles minor</i> )	Lesser scaup ( <i>Aythya affinis</i> )
Gray jay ( <i>Perisoreus canadensis</i> )	Dark-eyed junco ( <i>Junco hyemalis</i> )	Bufflehead ( <i>Bucephala albeola</i> )
Hairy woodpecker ( <i>Leuconotopicus villosus</i> )	Hermit thrush ( <i>Catharus guttatus</i> )	
Red-breasted nuthatch ( <i>Sitta canadensis</i> )	Olive-sided flycatcher ( <i>Contopus cooperi</i> )	
Sharp-tailed grouse ( <i>Tympanuchus phasianellus</i> )	Palm warbler ( <i>Setophaga palmarum</i> )	
Spruce grouse ( <i>Canachites canadensis</i> )	Red-tailed hawk ( <i>Buteo jamaicensis</i> )	
Three-toed woodpecker ( <i>Picoides dorsalis</i> )	Swainson's thrush ( <i>Catharus ustulatus</i> )	
White-winged crossbill ( <i>Loxia leucoptera</i> )	Yellow warbler ( <i>Setophaga petechia</i> )	

The most commonly detected bird species identified in surveys conducted for the PLS project in 2018/2019 (Clifton and CanNorth 2021) included: Yellow-rumped Warbler (*Setophaga coronate*), Chipping Sparrow (*Spizella passerina*), Hermit Thrush and Dark-eyed Junco. The most abundant waterbirds observed included Canada geese (*Branta canadensis*), Mallards (*Anas platyrhynchos*) and Merganser species. Two

raptors, Bald Eagles (*Haliaeetus leucocephalus*) and Northern Goshawks (*Accipiter gentilis*), were identified. Common Nighthawk was detected, while Yellow Rail was not.

Baseline breeding bird surveys were also conducted in 2018 for the Rook I project; 95 bird species were recorded (CanNorth 2021c). Species most commonly detected included Canada Goose, Dark-eyed Junco, Yellow-rumped Warbler, and White-throated Sparrow (*Zonotrichia albicollis*).

Eleven species of birds are SOCC including four species listed under the *Species at Risk Act* (i.e., Common Nighthawk, Olive-sided Flycatcher, Rusty Blackbird [*Euphagus carolinus*] and Barn Swallow [*Hirundo rustica*]) and seven species with provincial activity restriction guidelines (i.e., Bonaparte's Gull [*Chroicocephalus piladelphia*], Common Loon [*Gavia immer*], Bald Eagle, Herring Gull [*Larus argentatus*], Osprey [*Pandion haliaetus*], American White Pelican and Great Gray Owl).

Surveys for Common Nighthawk indicated the species was common and widespread in the area for the Rook I project; no Yellow Rail were detected in wetlands surveyed (CanNorth 2021c).

#### **4.2.3.3 Potential Impacts and Mitigations**

A summary of the potential impacts and mitigations to wildlife during construction of the Project are presented in Table 4.6.

**Table 4.6 – Wildlife - Potential Impacts and Mitigations**

Potential Impacts	Mitigations
Loss of Habitat	<ul style="list-style-type: none"> <li>• Project footprint will be kept to the smallest extent possible to do the work safely and work area boundaries will be maintained for the duration of construction.</li> <li>• Limit the removal of habitat to the areas necessary.</li> <li>• Concentrate construction activities, such as vehicle parking, to areas that have already been disturbed.</li> </ul>
Disturbance	<ul style="list-style-type: none"> <li>• Complete clearing activities outside of the migratory bird nesting period (generally beginning of April to end of August).</li> <li>• Potential impacts to the environment will be assessed in a screening assessment and/or pre-construction survey, and mitigation measures will be developed where necessary along with follow-up monitoring programs.</li> <li>• Minimize dust and noise emissions as much as practicable to avoid stress on wildlife.</li> <li>• Complete daily inspections during construction activities, as detailed in the EPP.</li> </ul>
Human Interference	<ul style="list-style-type: none"> <li>• Include wildlife incidents, such as accidental vehicle collisions, in site-specific protocols as well as the steps to report an incident.</li> <li>• Avoid interactions with wildlife including hunting, chasing, or feeding.</li> </ul>

#### 4.2.4 Water –Surface Water, Wetlands, and Groundwater

##### 4.2.4.1 Surface Water Hydrology

The nearest water body to the Project is Grygar Lake, which is approximately 200 m from the proposed aerodrome. The exact location of infrastructure for the Project have not yet been determined, and will likely be further away from Grygar Lake.

The Hodge Lake watershed in the Project RSA has an area of approximately 53 km<sup>2</sup> (Golder 2022) and Hodge Lake has a surface area of 5.4 km<sup>2</sup> (Angler’s Atlas 2023a; CanNorth 2021a). Grygar Lake, 2.5 km to the southwest of Hodge Lake and about 200 m north of the Project has a surface area of approximately 1.8 km<sup>2</sup> (Angler’s Atlas 2023b). At its deepest point, Hodge Lake has a depth of approximately 46 m (CanNorth 2021a).

Hodge Lake drains west into an unnamed lake and then Grygar Lake (CanNorth 2021a). In 2020, Hodge Creek, downstream of the Hodge Lake outlet, was recorded as having a discharge ranging between

0.568 m<sup>3</sup>/s and 0.817 m<sup>3</sup>/s, based on readings taken monthly between June and September, with the maximum discharge recorded in August 2020 (Golder 2022).

#### 4.2.4.2 Groundwater and Water Quality

Baseline monitoring programs for surface water quality, undertaken for the PLS and Rook I projects, generated data for Hodge Lake and other lakes to the southeast of the Project in 2016/2017 and 2019 for the PLS project and in 2018 to 2020 for Rook I (Clifton and CanNorth 2021; CanNorth 2021a). In general, these lakes were found to have a near neutral pH and dissolved oxygen levels adequate to support fish populations. They had low levels of nutrients, ions, total and dissolved metals, and radionuclides, with concentrations being similar among lakes, seasons, and years. Only concentrations of total and dissolved iron were found to exceed applicable water quality guidelines within many of the lakes, but not Hodge Lake.

According to the Water Security Agency (WSA) Water Wells GIS Site, the closest groundwater well registered with WSA are located at the Fission mine site south of the Project. The wells are registered as domestic use withdrawal wells and ranged in depths of 22 m to 73 m. Groundwater chemistry for these wells was not available on public domain.

#### 4.2.4.3 Potential Impacts and Mitigations

A summary of the potential impacts and mitigations to the surface water and groundwater during construction of the Project are presented in Table 4.7.

**Table 4.7 – Surface Water and Groundwater - Potential Risks and Mitigations**

Potential Impacts	Mitigations
Grygar Lake	<ul style="list-style-type: none"> <li>The project is not expected to directly impact Grygar Lake or any other waterbody (see Sheet 221145-00-PLT-001, Tetra Tech, 2022).</li> <li>A topographical study will be part of the site design process and it will be designed to ensure all potential receptors and drainage requirements are considered.</li> <li>Erosion and sediment control will be developed and implemented as needed.</li> <li>If required, all work near (bank or boundary areas) or in waterbodies will be conducted under an Aquatic Habitat Protection Permit (AHPP) and permit requirements will be followed.</li> <li>Project footprint will be limited to the smallest extent possible, work area boundaries will be maintained for the duration of construction, and</li> </ul>

**Table 4.7 – Surface Water and Groundwater - Potential Risks and Mitigations**

Potential Impacts	Mitigations
	construction during sensitive fish timing windows will be avoided for work in or near water.
Sedimentation	<ul style="list-style-type: none"> <li>• Reduce dust and airborne particles by watering the ground surface (or using other dust prevention amendments) during dry, windy conditions.</li> <li>• If possible, cover or vegetate areas with a high potential for erosion.</li> <li>• Reduce dust generation through speed limits.</li> <li>• Erosion and sediment control will be developed and implemented as needed.</li> </ul>
Accidental Spills	<ul style="list-style-type: none"> <li>• Emergency response plans will be included in the EPP per the provincial Environmental Code and spill response requirements to provide quick detection, control, and management of any spill during construction/operation and to ensure proper disposal of hazardous waste.</li> <li>• Include Hazardous Materials Management in the EPP.</li> <li>• Properly designed and licensed facilities for the storage of hazardous materials and fuel.</li> </ul>

#### 4.2.5 Fish and Fish Habitat and Aquatic Environment

##### 4.2.5.1 Baseline Aquatic Data

The Project is situated within the McTaggart Plain along the south-west boundary of the Athabasca Plain Ecoregion of the Boreal Shield Ecozone in northern Saskatchewan (Acton et al. 1998). Aquatic habitats are abundant within the RSA, with Grygar Lake 200 m north of the Project, Hodge Lake 2.5 km to the northeast, and many smaller unnamed lakes and creeks within the LSA and RSA.

Sources of information include publicly available reports for two proposed uranium projects in the RSA:

- Fission Project Description –PLS Project (Clifton and CanNorth 2021).
- Aquatic Environment Baseline Report for the Rook I Project – Final Report; Annex V.1 (CanNorth 2021a).
- Hydrometric Monitoring Characterization Report for the Rook I Project; Annex V.2 (Golder 2022).

The PLS project is located approximately 1 km west of Patterson Lake, while the Rook I project is situated on the east side of this lake, and about 1 km south of the nearest shore of Patterson Lake. Both of these projects are located approximately 15 km to the southeast of the Project. The three aforementioned documents included information/data collected at Hodge Lake that were used to inform the environmental assessments for those projects. As Hodge Lake is 2.5 km from the Project, it could serve as a potential reference location related to aquatic baseline information.

For the purposes of this assessment, specific water quality and aquatic parameters have been included for Hodge Lake, as little to no site-specific data are available for Grygar Lake. Therefore, characterization of the aquatic environment for Grygar Lake is inferred based on the information collected/analyzed from Hodge Lake, given the proximity of the two lakes and the fact that Hodge Lake and Grygar Lake are hydrologically connected.

#### 4.2.5.2 Plankton

##### Phytoplankton

Baseline sampling programs for phytoplankton took place at Hodge Lake in July 2016 for the PLS project and September/October 2018 for the Rook I project (Clifton and CanNorth 2021; CanNorth 2021a). Phytoplankton density at Hodge Lake was recorded as 11.4 million cells/L in 2018. Most (e.g., over 85%) of the phytoplankton community consisted of *Cyanophycota* (i.e., blue-green algae); the dominant family was *Synechococcaceae*. Biovolume, which can serve as a proxy for biomass, was low in Hodge Lake in 2018 (i.e., 0.12  $\mu\text{L/L}$ ) compared to other lakes to the southeast (range: 0.09 to 1.83  $\mu\text{L/L}$ ), which were sampled as part of the phytoplankton program for the Rook I project.

Simpson's diversity index measures the number of species present against the relative abundance of each species. Simpson's evenness measures how evenly distributed species are within a community. The index, was moderately high for Hodge Lake (0.76), while the Simpson's evenness was low (0.16). The low Simpson's evenness was due to the dominance of a few blue-green algae families.

##### Zooplankton

Baseline sampling programs for zooplankton took place at Hodge Lake in fall 2018 for the Rook I project, in July 2019 for the PLS project, and concurrently with the phytoplankton programs for both projects (CanNorth 2021a; Clifton and CanNorth 2021). The zooplankton density in 2018 was recorded as 33 organisms/L. This community was dominated by *Cyclopoida* crustaceans and *Ploima* rotifers. Other taxa identified in this community included *Cladocera*, *Calanoida*, and *Flosculariaceae*. Biomass at Hodge Lake (i.e., 0.27 mg/L) was relatively high compared to other lakes to the southeast (range: 0.06 mg/L to 0.30 mg/L), which were also sampled as part of the zooplankton program for the Rook I project. Simpson's diversity was moderately low at Hodge Lake (i.e., 0.45), while Simpson's evenness was low (0.23).

### **Sediment Quality**

In September and October 2018, a baseline monitoring program for sediment quality was undertaken at Hodge Lake as part of a larger baseline program for the Rook I project (CanNorth 2021a). Results of this investigation identified that sediment at Hodge Lake was mostly (i.e., almost 75%) composed of fine and coarse sand, with the remaining fractions composed primarily of silt and a small amount of clay. Sediment quality sampling in 2017 and 2019 for the PLS project identified fine and coarse sand as the predominant fraction in the sediment composition for lakes to the southeast of the Project (Clifton and CanNorth 2021). Concentrations of key metals, nutrients and radionuclides were determined in sediment samples collected from Hodge Lake in September 2018. No parameters at Hodge Lake exceeded applicable sediment quality guidelines or reference values (CanNorth 2021a).

### **Benthic Invertebrates**

In general, the invertebrate fauna in the Athabasca Plain Ecoregion is typical of the cold northern waters of Saskatchewan (Acton et al. 1998). A baseline sampling program for benthic invertebrates was undertaken at Hodge Lake in fall 2018, concurrent with plankton sampling for the Rook I project (CanNorth 2021a). A benthic invertebrate sampling program was undertaken for the PLS project in 2017 and 2019 (Clifton and CanNorth 2021).

The majority (i.e., over 80%) of the benthic invertebrate community at Hodge Lake in fall 2018 was comprised of *Chironomidae*, non-biting midge larvae (CanNorth 2021a). *Chironomidae* were identified as the most abundant taxa for lakes sampled in the benthic invertebrate program for the PLS project (Clifton and CanNorth 2021). Density of benthic invertebrates at Hodge Lake in 2018 (i.e., 33,655 organisms/m<sup>2</sup>) was relatively high compared to other lakes to the southeast (range: 297 to 41,168 organisms/m<sup>2</sup>). Both Simpson's diversity (0.24) and evenness (0.15) were relatively low at Hodge Lake, likely due to the dominance of *Chironomidae*.

### **Aquatic Macrophyte Chemistry**

An aquatic macrophyte chemistry program for *Carex* species (i.e., sedges) took place in July 2016 for the PLS project, with some sampling taking place within the RSA for the Project (Clifton and CanNorth 2021). Parameter concentrations in shoots, roots and sediment were generally similar among the waterbodies sampled and frequently measured below the laboratory detection limits. However, uranium concentrations in shoot and root samples collected from Patterson Lake (in the Project RSA) were higher than the other two study areas, which included Broach Lake (in the Project RSA) and Naomi Lake (southeast of the Project RSA; Figure 4.1).

A monitoring program for aquatic macrophyte chemistry took place for the Rook I project in 2018 and 2019 (CanNorth 2021a). While sampling did not take place at Hodge Lake, *Carex* species samples were collected from several other lakes and creeks to the southeast (e.g., Broach Lake; Jed Creek draining into Patterson Lake). Results of the chemical analysis of the shoots and roots collected can be found in CanNorth (2021a, Table 36).

#### 4.2.5.3 Fish Community, Spawning, Habitat and Fish Tissue Chemistry

The sandy substrate and low abundance of aquatic vegetation limits the fish species found within the Athabasca Plain Ecoregion (Acton et al. 1998). Large fish species in this ecoregion include lake trout (*Salvelinus namaycush*), walleye (*Sander vitreus*), Arctic grayling (*Thymallus arcticus*), lake whitefish (*Coregonus clupeaformis*), northern pike (*Esox lucius*), yellow perch (*Perca flavescens*), burbot (*Lota lota*), white sucker (*Catostomus commersonii*) and longnose sucker (*Catostomus catostomus*). Forage fish include cisco (*Coregonus artedii*), lake chub (*Couesius plumbeus*), trout-perch (*Percopsis omiscomaycus*), spottail shiner (*Notropis hudsonius*), ninespine stickleback (*Pungitius pungitius*), slimy sculpin (*Cottus cognatus*) and longnose dace (*Rhinichthys cataractae*).

Baseline fish studies completed in 2016 and 2017 for the PLS project resulted in the capture of 5,022 fish from 17 waterbodies to the southeast of the Project, with the northern most of these lakes located within the Project RSA (e.g., Broach Lake and Patterson Lake; Clifton and CanNorth 2021). Fourteen species were identified, including Arctic grayling, burbot, longnose sucker, lake trout, lake whitefish, northern pike, walleye, white sucker, yellow perch, slimy sculpin, lake chub, ninespine stickleback, spottail shiner, and trout-perch.

Concentrations of parameters in the flesh and bones of lake whitefish and northern pike were generally similar among the waterbodies sampled and were largely near or below reported detection limits. Concentrations of mercury and selenium in fish flesh were below Health Canada safe consumption levels and U.S. Environmental Protection Agency (USEPA) guidelines, respectively.

Fish community surveys were conducted at Hodge Lake in May (spring), August (summer) and September (fall) 2018 for the Rook I project (CanNorth 2021a). Trout-perch samples were collected, frozen and retained for potential chemical analyses in the future. Spawning surveys were not conducted at Hodge Lake.

A total of 217 fish were captured at Hodge Lake in 2018 (CanNorth 2021a). The most common fish species were yellow perch ( $n = 122$ ) and burbot ( $n = 32$ ). Other species included lake trout, lake whitefish, northern pike, white sucker, Johnny darter (*Etheostoma nigrum*), nine-spined stickleback, slimy sculpin, spottail shiner, and trout-perch.

In August 2018, baseline fish habitat surveys were completed for Hodge Lake in association with the Rook I project (CanNorth 2021a). Twenty-five distinct habitat sections were identified in the lake based on physical characteristics (e.g., vegetation present, bank stability, substrate type, water depth). Substrates of the littoral zone for 14 habitat sections consisted mainly of sand or a mixture of sand and gravel, with 4 comprised mainly of cobble and boulder and 2 containing mixtures of fine substrates with some gravel and cobble.

Cover for fish, when present, included sparse amounts of large woody debris and sparse to moderate amounts of overhanging vegetation. Dense rock cover occurred occasionally. Undercut banks and aquatic vegetations were generally absent or sparse.

Aquatic macrophyte species noted within Hodge Lake included *Sparganium* species (bur reed), *Carex* species (sedges) and *Potamogeton* species (pondweed).

#### **4.2.5.4 Potential Impacts and Mitigations**

Potential impacts and mitigations for fish and fish habitat are provided in section 6.1.1.

### **4.2.6 Air Quality and Noise**

#### **4.2.6.1 Noise**

Noise sources in the area are minimal and locally are the sounds associated with Big Bear Camp including the generators and equipment. In addition, aircraft can produce loud noises for a short period of time when taxi-ing, taking off or landing.

#### **4.2.6.2 Air Quality**

With no industrial sources nearby, the air quality in the area is considered quite good. No site-specific air quality assessment was completed and information from nearby projects such as the historical Cluff Lake project or the NexGen Rook I EIA was used. Periodic aircraft use is unlikely to significantly affect air quality.

#### **4.2.6.3 Potential Impacts and Mitigations**

A summary of the potential impacts and mitigations to noise and air quality during construction of the Project are presented in Table 4.8.

**Table 4.8 – Air and Noise – Potential Impacts and Mitigations**

Risk	Mitigation
<b>Fugitive Dust</b>	<ul style="list-style-type: none"> <li>• Limit the area of disturbance as much as practical.</li> <li>• Implement reduced vehicle speed limits or other speed control measures.</li> <li>• Suppress dust as necessary using water trucks.</li> <li>• Conduct visual monitoring of dust to determine when suppression is needed.</li> <li>• Dust suppression and management of soil stockpiles where required.</li> </ul>
<b>Air Emissions</b>	<ul style="list-style-type: none"> <li>• Expected emissions will not be much greater than for the existing Big Bear Camp given the frequency of flights will be dependent on services required from local mining and outfitters.</li> <li>• Increased emissions will occur during construction for a limited time. These will be minimized by using well maintained equipment and limiting idling wherever possible.</li> <li>• Use of best available technology in design of the airstrip and supporting infrastructure to reduce emissions to air, where feasible.</li> <li>• Implement a regular maintenance program of vehicles and equipment to reduce combustion emissions and maximize fuel efficiency.</li> </ul>
<b>Potentially Disturbing Noise</b>	<ul style="list-style-type: none"> <li>• Select equipment that minimizes noise generation and conduct regular maintenance where possible. Since the site is oil generator supported, electric vehicles are not considered an option at this time.</li> </ul>

### 4.3 Health, Social, and Economic Context

*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.*

#### 4.3.1 Health Context

The closest health centre to the Project is the La Loche Health Centre and Hospital which is approximately 176 km south of the Site and is located within the Keewatin Yatthé Regional Health Authority. There are health clinics located in communities south of La Loche including Buffalo Narrows, CRDN, Birch Rivers, and Île-à-la-Crosse. The nearest Royal Canadian Mounted Police (RCMP) detachment, ambulance and fire services to the Project are also located in La Loche.

#### 4.3.2 Social Context

The Project is located within Treaty 8 Territory and the small settlement of Descharme Lake is the nearest community to the Project. Descharme Lake, located approximately 60 km south of the Project, has a total of 26 residents according to the 2021 Census (Statistics Canada 2023). Descharme Lake began as a Dene winter hunting camp and in 1974, approximately 48 residents lived in the village, but since then, most residents have moved to La Loche, located approximately 95 km south of Descharme Lake. Some residents from La Loche currently maintain seasonal cabins in Descharme Lake (Portage La Loche 2019). The residents within Descharme Lake rely on the nearby communities of La Loche and Clearwater River Dene Nation for their services such as healthcare and education.

La Loche and Clearwater River Dene Nation are the closest large communities to the Project, located approximately 176 km to the south, with populations of 2,514 people and 831 people, respectively. Both La Loche and CRDN have predominantly young populations that have the greatest proportions in the age ranges of 0 years - 14 years and 25 years - 29 years of age. The majority of the population is Indigenous, with 94% and 98% of persons identifying as Indigenous in La Loche and CRDN, respectively (Statistics Canada 2021). Recreational activities within the La Loche and CRDN area include ski trails, an indoor and outdoor rink, an outdoor volleyball court, a community hall, school gyms, bike park, ball diamonds, basketball courts, playgrounds, gymnasiums, and a fitness centre (Northern Saskatchewan Business Directory 2013).

The Northern Village of Buffalo Narrows has a population of approximately 1,014 people with a primarily younger population, with the largest age group between 0 years - 14 years of age (Statistics Canada 2021). The population is predominantly Indigenous at approximately 92% (Statistics Canada 2021).

Île-à-la-Crosse has a population of approximately 1,425 people and similar to Buffalo Narrows, has a predominantly younger population with the largest age group between 0 years - 14 years of age. Additionally, the majority of the population is Indigenous at approximately 92% (Statistics Canada 2021).

Section 4.0 (2) lists the communities, the 2021 Statistics Canada census population data, and the distance from the Project for communities and First Nations that are located along and directly adjacent to Highway 955 and Highway 155, beginning at Beauval. These communities have the potential of being affected in both negative and positive ways from a socio-economic and traditional land and resource use perspective through Project development and operations. Figure 4.4 shows the approximate locations of nearby communities to the Project.



Figure 4.4 – Closest Communities to the Proposed Aerodrome

### 4.3.3 Economic Context

According to the National Occupational Classification (2021), the sectors of labor forces in the CRDN include health care, education, the construction industry, mining, retail, transportation and warehousing, public administration and administrative and support. The sector with majority of workers is educational services.

Some of the major employers in the La Loche area include the Province of Saskatchewan, La Loche Community Health Centre, educational centers, Methy Construction, retail, and maintenance. Other businesses in the La Loche area include Canada Post, Clearwater Aviation, one take-out restaurant and bar, motor inn, a gas station, gift store, liquor store, towing, construction and maintenance, pharmacy, and a general merchandise store (Norther Village of La Loche and Shop La Loche 2019). Businesses and services in Clearwater River include the Clearwater Store, Armand Bekkattla Treatment Centre, and Clearwater River Dene School.

Other employment in the area includes exploration activities for mining companies such as Cameco, Orano, NexGen, Denison, and Purepoint, among others, that have mineral claims in the vicinity of the Project.

Services in Buffalo Narrows include airline services, construction and trucking, accommodations, construction and maintenance services, fuel and retail services, a campground, a church, economic development services, restaurants and groceries (Business Directory, Buffalo Narrows 2021).

Local businesses and services within Île-à-la-Crosse include fuel services, elementary and high school, Canada Post, taxi services, Friendship Centre, RCMP detachment, St. Joseph's Hospital, a grocery store, confectionary, restaurant, motel, tavern, pharmacy, radio, and car wash (Shop Île-à-la-Crosse 2019).

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## 5.0 Federal, Provincial, Territorial, Indigenous and Municipal Involvement and Effects

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### 5.1 Federal Financial Support

*A description of any financial support that federal authorities are, or maybe, providing to the project.*

Big Bear Contracting Ltd. is the sole financier of the project.

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## 5.2 Federal Project Lands

*A list of any federal lands that may be used for the purpose of carrying out the project.*

No federal lands will be used for the Project.

The closest federal land to the Project is Athabasca Chipewyan First Nation (201A), which is approximately 105 km (direct distance as there is no driveable route from the Project).

The Project itself is located on provincially leased land (see Section 4.1.2). The Project will operate as an Indigenous-owned business on the leased land.

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## 5.3 Jurisdictions with Powers, Duties, or Functions

*A list of any jurisdictions that have powers, duties, or functions in relation to an assessment of the project's environmental effects.*

Aside from the IAAC, there are permits/approvals that will be required through the provincial and municipal governments. The other agencies requiring approval would be:

- Saskatchewan Ministry of Environment.
- Saskatchewan Ministry of Labour Relations and Workplace Safety (occupational health and safety).
- Saskatchewan Ministry of Environment Resource Management Division – Lands Branch (surface leases).
- Saskatchewan Ministry of Environment – Environmental Protection Branch.
- Saskatchewan Ministry of Agriculture (Forest Product permit for land clearing).
- Saskatchewan Ministry of Highways (highway access).
- Saskatchewan Ministry of Health (camp, hygiene, water and sewage treatment).
- Saskatchewan Ministry of Parks, Culture and Sport – Heritage Conservation Branch.
- Saskatchewan Public Safety Agency.

There are no municipal permits or approvals that will be required for the Project.

Federal and provincial permitting requirements will be completed following the approval to proceed with the Project. Table 5.1 presents some of the Acts and Regulations that may apply.

**Table 5.1 – Acts and Regulations**

Acts	Regulations
PROVINCIAL	
<i>The Environmental Management and Protection Act</i>	Litter Control Regulations Hazardous Substances and Waste Dangerous Goods Regulations Environmental Management and Protection (General) Regulations Environmental Management and Protection (Saskatchewan Environmental Code Adoption) Regulations
<i>The Dangerous Goods Transportation Act</i>	Dangerous Goods Transportation Regulations
<i>The Fisheries (Saskatchewan) Act</i>	The Fisheries Regulations
<i>The Wildfire Act</i>	The Wildfire Regulations Reporting Responsibility
<i>The Fire Safety Act</i>	Fires Safety Regulations
<i>The Forest Resources Management Act</i>	The Forest Resources Management Regulations
<i>The Heritage Property Act</i>	Heritage Property Regulations
<i>The Management and Reduction of Greenhouse Gases Act</i>	The Management and Reduction of Greenhouse Gases (Standards and Compliance) Regulations
<i>The Provincial Lands Act</i>	The Crown Resource Land Regulations
<i>The Public Health Act</i>	The Health Hazard Regulations The Shoreland Pollution Control Regulations
<i>The Sand and Gravel Act</i>	Occupational Health and Safety Regulations
<i>The Saskatchewan Employment Act</i>	The Water Security Agency Regulations Ground Water Regulations
<i>The Water Security Agency Act</i>	Wildlife Habitat Lands Disposition and Alteration Regulations
<i>The Wildlife Habitat Protection Act</i>	The Wild Species at Risk Regulations
<i>The Wildlife Act</i>	

**Table 5.1 – Acts and Regulations**

Acts	Regulations
FEDERAL	
<i>Canada Transportation Act</i>	Air Transportation Regulations
<i>Aeronautics Act</i>	Canadian Aviation Regulations
<i>Migratory Birds Convention Act</i>	Migratory Birds Regulations
<i>Fisheries Act</i>	Critical Habitat of the Woodland Caribou ( <i>Rangifer tarandus caribou</i> ) Boreal Population Order
<i>Species at Risk Act</i>	Transportation of Dangerous Good Regulations
<i>Canadian Environmental Protection Act</i>	Transportation of Dangerous Good Act

## 6.0 Potential Effects of the Project

### 6.1 Relevant Environmental Legislation

*A list of any changes that, as a result of the carrying out of the project, may be caused to the following components of the environment that are within the legislative authority of Parliament:*

- a. fish and fish habitat as defined in subsection 2(1) of the Fisheries Act.*
- b. aquatic species, as defined in subsection 2(1) of the Species at Risk Act (marine plants).*
- c. migratory birds, as defined in subsection 2(1) of the Migratory Birds Convention Act, 1994.*

#### 6.1.1 Fish and Fish Habitat

Due to the proximity of Grygar Lake to the Project, it is important that work area boundaries are properly defined to ensure no impacts. The Project is not expected to directly impact Grygar Lake or any other waterbody (see Sheet 221145-00-PLT-001, Tetra Tech, 2022). If required, all work near (bank or boundary areas) or in waterbodies will be conducted under an Aquatic Habitat Protection Permit (AHPP) and permit requirements will be followed. No in-water work is expected for the Project.

There will be no-refueling activities adjacent to waterbodies and there will be a spill response plan in place for construction activities. Erosion and sediment control will be in place during construction and reclamation

activities. Further mitigations proposed from the protection of species under the *Fisheries Act* are provided in Table 6.1.

**Table 6.1 – Mitigations for Species Under the *Fisheries Act***

Potential Impacts	Mitigations
Grygar Lake	<ul style="list-style-type: none"> <li>• Setback distances from Grygar Lake will be as placed as far as possible.</li> <li>• Erosion and sediment control will be developed and implemented as needed.</li> <li>• The site will be graded to ensure surficial drainage is managed properly.</li> <li>• If required, all work near (bank or boundary areas) or in waterbodies will be conducted under an Aquatic Habitat Protection Permit (AHPP) and permit requirements will be followed.</li> <li>• Project footprint will be limited to the smallest extent possible, work area boundaries will be maintained for the duration of construction, and construction during sensitive fish timing windows will be avoided for work in or near water.</li> </ul>
Sedimentation	<ul style="list-style-type: none"> <li>• Reduce dust and airborne particles by watering the ground surface (or using other dust prevention amendments) during dry, windy conditions.</li> <li>• If possible, cover or vegetate areas with a high potential for erosion. Erosion and sediment control will be developed and implemented as needed.</li> <li>• If required, an AHPP will be secured, and mitigations will be followed during the construction phase of the Project.</li> </ul>
Accidental Spills	<ul style="list-style-type: none"> <li>• Emergency response plans will be included in the EPP per the provincial Environmental Code and spill response requirements to provide quick detection, control, and management of any spill during construction/operation and to ensure proper disposal of hazardous waste.</li> <li>• Include Hazardous Materials Management in the EPP.</li> <li>• Properly designed and licensed facilities for the storage of hazardous materials and fuel. Spill kits will be available at the fuel storage area in case of accidental spills.</li> </ul>

### 6.1.2 Aquatic Species and Marine Plants

The *Species at Risk Act* prohibit the killing, harming, harassing, or capturing of species listed within the Act. According to the SKCDC HABISask database (SKCDC 2023), there are no occurrences of federally listed or provincially tracked species that have been historically documented within the LSA. Big Bear will comply with the prohibitions in the *Species at Risk Act* throughout all stages of the project.

A summary of mitigations measures for aquatic species and marine plants under the *Species at Risk Act* are presented in Table 6.2.

Table 6.2 – Mitigations for Aquatics Species/Marine Plants under <i>Species at Risk Act</i>	
Potential Impacts	Mitigation
Habitat Disturbance	<ul style="list-style-type: none"> <li>Project footprint will be kept to the smallest extent possible to do the work safely and work area boundaries will be maintained for the duration of construction.</li> <li>Erosion and sediment control will be developed and implemented as needed.</li> <li>Construction during sensitive wildlife windows will be avoided.</li> <li>Development of an EPP.</li> </ul>
Introduction of prohibited, noxious, nuisance, and/or invasive plants	<ul style="list-style-type: none"> <li>Prevention of the introduction and spread of prohibited, noxious, nuisance, and invasive plants will be addressed in the environmental management plan.</li> </ul>
Accidental Spills	<ul style="list-style-type: none"> <li>Emergency response plans will be included in the EPP per the provincial Environmental Code and spill response requirements to provide quick detection, control, and management of any spill during construction/operation and to ensure proper disposal of hazardous waste.</li> <li>Include Hazardous Materials Management in the EPP.</li> <li>Properly designed and licensed facilities for the storage of hazardous materials and fuel.</li> </ul>

### 6.1.3 Migratory Birds

The *Migratory Birds Act* prohibits the harming of migratory birds or the disturbance/destruction of their nests and eggs. The general breeding bird window is beginning of April to end of August. There are treed areas and vegetated areas within the footprint of the project which could potentially be used as habitat for breeding bird.

Due to the potential for migratory birds to be present within the project footprint mitigation measures must be considered. Trees within the footprint of the project will be cleared outside of the breeding bird window and grasses will be mowed to prevent ground nesting birds. Additional mitigation measures can be implemented if migratory birds are observed at the time of construction. These include adjusting the construction schedule by postponing activities near occupied nests, implementing a barrier between the occupied nest and the activity, moving equipment daily, relocating nests or wildlife, and/or monitoring the nest to determine if the inhabitant is showing signs of stress. With the primary mitigation measures in place, it is unlikely that an issue to migratory birds would occur during construction/operation.

A summary of mitigations measures for species under the *Migratory Birds Act* is presented in Table 6.3.

Table 6.3 – Mitigations Measures for Species Under the <i>Migratory Birds Act</i>	
Potential Impacts	Mitigations
Loss of Habitat	<ul style="list-style-type: none"> <li>Limit the removal of habitat to the areas necessary.</li> <li>Project footprint will be kept to the smallest extent possible to do the work safely and work area boundaries will be maintained for the duration of construction.</li> <li>Concentrate construction activities to areas that have already been disturbed.</li> </ul>
Disturbance	<ul style="list-style-type: none"> <li>Complete clearing activities outside of the migratory bird nesting period (generally beginning of April to end of August).</li> <li>Potential impacts to the environment will be assessed in a screening assessment and/or pre-construction survey, and mitigation measures will be developed where necessary along with follow-up monitoring programs.</li> <li>Complete daily inspections during construction activities, as detailed in the EPP.</li> </ul>
Human Interference	<ul style="list-style-type: none"> <li>Include wildlife incidents, such as accidental vehicle collisions, in site-specific protocols as well as the steps to report an incident.</li> <li>Avoid interactions with wildlife including hunting, chasing, or feeding.</li> </ul>

## 6.2 Changes to Federal Lands

*A list of any changes to the environment that, as a result of carrying out 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 of Canada.

The project is located on provincially leased land on the traditional territory of CRDN. CRDN is in full support of the Project. Big Bear Camp currently operates as an industrial lease issued by the province of Saskatchewan. Once the provincial EA process is complete, Big Bear will apply for an amendment to their lease to include the aerodrome location.

No changes to federal lands are anticipated. There are no federal lands within the footprint of the project or adjacent to the project's boundaries. The closest Indigenous Nation is approximately 105 km from the Project, which would be the closest federal lands. The Project footprint does not cross provincial or international boundaries.

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### 6.3 Impact to Indigenous Peoples

*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.*
- *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.*

The Big Bear Camp is owned by members of the CRDN who claim this area as their traditional territory. As such, they are best positioned to assess potential cumulative impacts to their territory. While they don't believe there are any that they cannot manage themselves, they will work with other nations should they have concerns related to traditional land use by their respective members.

In discussion with Big Bear Camp and CRDN, they have stated that the land surrounding the Project is not utilized for traditional uses. They are also not aware of any other First Nations that utilize the Project area for traditional uses. The proposed aerodrome takes up a relatively small amount of area within the traditional territory and will not affect the ability to undertake traditional activities; however, it will provide economic opportunities. There will be disturbance to vegetation and trees in the area that is proposed to be cleared, which will not affect gathering, hunting or trapping. In addition, with the exception of incidental occurrences, any potential effects to Grygar Lake and the fish habitat are expected to be managed through the mitigations listed.

Potential effects to the physical and cultural heritage or the socio-economic health of the Indigenous peoples of Canada may be revealed throughout the duration of the Project. If any potential effects are brought forth, Big Bear will work with CRDN to help mitigate any issues. Given the responses received to date following the initial engagement process, no effects to the physical heritage, cultural heritage, or traditional land uses for Indigenous people are anticipated.

The Crown has a legal obligation to consult with First Nations and Métis communities in advance of decisions or actions that may adversely impact Treaty and Aboriginal rights, such as the right to hunt, fish and trap for food, and to carry out traditional uses. The duty to consult (DTC) may be triggered during the EA process for projects that require an EIA. For a project that does not require an EIA, the DTC is assessed by subsequent regulatory agencies. Given that Big Bear Camp is owned by members of CRDN and operates as an Indigenous business on Crownland, engagement letters sent to the surrounding Indigenous communities, including CRDN, should be sufficient for consultation purposes.

Engagement letters have been sent to the following communities: Clearwater River Dene Nation, Birch Narrows Dene Nation, Buffalo River Dene Nation and Athabasca Chipewyan First Nation. A letter was also sent to Ya' Thi Néné Lands and Resources, an organisation representing seven First Nations in the Athabasca basin. A summary of the engagement completed to date has been provided in Section 2.4.

In discussions with CRDN, they have indicated that the Project will provide jobs and business opportunities for their Nation. This is considered a positive outcome of the Project.

In Saskatchewan, heritage resources include pre-contact period and historic period archaeological sites, built heritage sites, structures of historical and/or architectural interest, and paleontological sites. Heritage resources are the property of the Provincial Crown and are protected under *The Heritage Property Act*. A Heritage Sensitivity Screening Report was completed and required the Project area to be submitted to the HCB for further review.

A response was received from the HCB on 18 October 2023 (Appendix C). There are no known archaeological sites located at the Site; however, the Site will affect areas of boreal forest near Grygar Lake including other tributaries and waterbodies. These types of terrain are known to have moderate to high potential to contain intact heritage resources; therefore, a HRIA is required for the Project. Big Bear acknowledges this and will ensure required surveys are completed and heritage clearance obtained from the HCB prior to commencement of construction.

The area is not considered to be of high potential for heritage resources; however, the proximity to Grygar Lake is considered to have some potential. Big Bear camp will conduct an HRIA prior to construction and will have a chance find protocol in place. CRDN will be informed of all findings.

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#### **6.4 Effect to the Health, Social or Economic Conditions of Indigenous Peoples**

*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.*

The Project is expected to have a positive effect on the economic conditions for the surrounding Indigenous communities as it will offer a form of employment and income. CRDN Chief also believes positive socio-economic benefits will come from the Project (referenced in letter of support). According to

CRDN, the footprint of the Project does not encompass land that is currently utilized for traditional land uses by Indigenous Peoples. A positive effect can be expected for the health conditions of the surrounding communities as the Project will allow for easier access to medical and emergency services. Furthermore, the Project will provide a safer and reliable transportation method for all persons needing transportation to and from the area.

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## 6.5 Greenhouse Gas Estimate

*An estimate of any GHG emissions associated with the project. This should be calculated as the net GHG emissions associated with the project and estimated based on the information available to proponents at this stage.*

The following GHG estimate for the Big Bear Airstrip has been developed for both the construction and operation phases. The emission and activity factors used for heavy equipment, vehicles, and land mass changes were derived using the GHG estimates for local mining EIAs, notably the Fission Uranium Project draft EIA (Fission 2024). This GHG assessment evaluates a future project without any available direct GHG emission data, and the GHG emissions quantification was restricted to the use of the appropriate emission factors (EF) and activity factors (AF) identified for the nearby mining project.

The general GHG emissions quantification equation used in (Fission 2024) was:

$$\text{CO}_{2e} \text{ (tonnes/year)} = \text{AF} * \text{EF} * \text{GWP} * \text{CF}$$

Where:

CO<sub>2e</sub> (tonnes/year) – estimated GHG emissions expressed as CO<sub>2e</sub> equivalent in metric tonnes (t) per year.

AF – Activity Factor.

EF – Emission Factor;

GWP – Global Warming Potential for an evaluated GHG gas; and

CF – Units Conversion Factor.

Applied GWP conversion factors per the IPCC 5<sup>th</sup> Protocol are summarized in Table 6.4. This led to emission factors shown in Table 6.5.

**Table 6.4 – Applied GWP Conversion Factors**

GHG Gas	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O
GWP Factor	1	28	265

**Table 6.5 – Emission Calculation Factors Used**

Source	Factor Used
<b>Scope 1 – Direct Emissions</b>	
Construction Equipment – Diesel-powered 5 pieces of heavy equipment (trucks and excavators) + 2 auxiliary equipment.	Heavy - 25 L/hr at 2.7 kg CO <sub>2e</sub> /L Aux. - 15 L/hr at 2.7 kg CO <sub>2e</sub> /L
Operations Equipment – Diesel-powered 2 pieces of auxiliary equipment such as a plow and grader.	Aux. - 15 L/hr at 2.7 kg CO <sub>2e</sub> /L
Construction Equipment – Gas-powered 2 vehicles – full time including construction and operations	11 L/100km at 2.3 kg CO <sub>2e</sub> /L
<b>Land Use Change – Biomass Oxidation</b>	<b>300 t CO<sub>2e</sub>/ha</b>
<b>Scope 2 – Indirect Emission – Acquired Energy</b>	<b>Not applicable</b>
<b>Scope 3 – Indirect Emissions</b>	
Haulage to Project – Diesel-powered	0.0011 t CO <sub>2e</sub> /km
Personnel Vehicles – commute to site, gas-powered	0.0017 t CO <sub>2e</sub> /km
Project related air travel	1,000 t/y CO <sub>2e</sub> all-in
Biogenic Emissions - Land Use Change – Loss of Carbon Sequestration	12.78 t CO <sub>2e</sub> /ha

## 6.5.1 Direct GHG Emissions (Formerly Scope 1 GHG Emissions)

### 6.5.1.1 Stationary Combustion

Site power is currently supplied by a diesel generator. The airstrip once constructed will not create a significant additional demand on the current power generation on site for avionics, runway lights, and the terminal building. There is the potential to have a small back-up generator for the airstrip for safety considerations, but this has not been sized yet, and it would operate rarely.

### 6.5.1.2 Mobile Combustion

Emissions from mobile combustion equipment is expected during construction and operation phases of the project.

During construction, equipment requirements for diesel-powered mining and auxiliary vehicles is five pieces of heavy equipment including one aggregate crusher. Construction equipment would typically include haul trucks, excavators, compactors, and bulldozers, but only four would be operating at a given time on average. The aggregate crusher would be serviced by the same heavy equipment used during Project construction and travel to and from a pit is included in the operating hours.

Construction auxiliary vehicles include a grader, a light crane or fuel/lube truck. Based on a search of operator's sites online (e.g., JS Cole 2024) the fuel consumption for the largest piece of heavy equipment likely to be used is 25 L/hr, and 15 L/hr for auxiliary equipment. It is estimated that the construction equipment will run an average of 12 hours per day (less in winter and longer in summer) for consumptions of 300 L and 180 L per day respectively, for a rounded total of 500 L/day. If diesel produces 2.7 kg CO<sub>2e</sub> per litre (Natural Resources Canada, 2024), then the total CO<sub>2e</sub> produced per day is 1,350 kg CO<sub>2e</sub>/day or 1.35 t CO<sub>2e</sub>/day. This would be a total of 492.75 t CO<sub>2e</sub> for the heavy equipment for the one year of airstrip construction. While more equipment might be used, there would be a commensurate shortening of the construction period, so the annual total are expected to remain the same.

It is estimated that there will be two gasoline powered pickup trucks for construction to move crews and service equipment. Crews will travel short distances and would be unlikely to exceed 100 km/day, so this distance was used to calculate the gas-powered fleet emissions. If large gas-powered pickups on average use 11 L/100 km, then the total fuel usage for these vehicles would be 22 L/day or 50.6 kg CO<sub>2e</sub>/day if gasoline produce 2.3 kg CO<sub>2e</sub>/L (Natural Resources Canada, 2024). The annual emissions from the two gas-powered vehicles would be 18.47 t CO<sub>2e</sub>.

During operation of the aerodrome, it is estimated that two pieces of auxiliary equipment and one gas-powered pickup will be assigned to the airstrip. The auxiliary equipment would be a plow and a grader. It is estimated that they would not operate continually but for maintenance and snow clearing, therefore two hours per day was used as an average usage estimate. If the auxiliary equipment uses 15 L/hr of diesel, then an estimate of 60 L/day is used for operations diesel equipment usage. If diesel produces 2.7 kg CO<sub>2e</sub> per L (Natural Resources Canada, 2024), then the total CO<sub>2e</sub> produced per day is 162 kg, for an annual

total of 59.13 t CO<sub>2e</sub>/year. Add to this one pickup that we will say does a conservative 100 km/day, which would produce 9.23 t CO<sub>2e</sub>/year. The total operational vehicle emissions associated with the airstrip would be 68.36 t CO<sub>2e</sub>/year.

#### **6.5.1.3 Industrial Process Inputs**

There is not expected to be any need for explosives given the lack of bedrock and the sandy nature of the materials to be moved. Solid waste and wastewater are not included in the GHG calculation as they are part of the normal operation of the Big Bear Camp and the construction would not create any unusual loadings over and above the normal range from camp operations.

#### **6.5.1.4 Land Use Change – Biomass Oxidation**

The runway is expected to cover an area of 80 m x 1,524 m for an operational area of 121,920 m<sup>2</sup>, or 12.192 ha). Since the final design has not been done, we would double this area to account for a construction right of way and to include the flight paths, which while not impacting ground cover, will require some trees to be removed. This would mean a cleared area of approximately 23 ha, about half of this will be reclaimed to vegetated, stabilize soils. An emission factor of 300 t CO<sub>2e</sub>/ha for sparse forest was applied. This analysis adopted the terminology and application of emissions factors outlined in the UNIPCC's Good Practice Guidance for Land Use and Land-use Change and Forestry (UNIPCC, 2003) into a modified methodology more typically applied when estimating GHG emissions for future land use change as described in Seabridge Gold Inc. and Rescan Environmental Services Ltd (2013). The proposed land use change related to the project would account for an estimated GHG emissions of 6,900 t CO<sub>2e</sub> as a result of the biomass oxidation. This is a one-time charge to the project, and as such is added to the construction year.

#### **6.5.2 Indirect GHG Emissions (Formerly Scope 2 GHG Emissions)**

Acquired Energy GHG Emissions (Not Applicable to the Project). There are no powerlines to the site.

#### **6.5.3 Indirect GHG Emissions (Formerly Scope 3 GHG Emissions)**

##### *Project-related Commercial Traffic and Project-related Personnel Travel by Road*

Traffic in support of the project is expected to be minimal as the airstrip needs will be blended into the current camp operations. While fuel will be available for aircraft, most flights in the north leaving a large well-established base will carry enough fuel for a round trip and some extra. So, refueling at the Big Bear Camp would be minimal except for aircraft based there, whether permanently or on a temporary basis (e.g. wildfire aircraft). To be conservative, we included one fuel truck per week and one semi-truck with other supplies per week in support of the airstrip. These trucks would come from Edmonton (aviation fuel) and La Loche respectively for a total return mileage of 1,902 km and 350 km respectively, or 2,252 km/week. This average would include trips during construction when fuel would be replaced by other supplies. The estimated GHGs from trucks related to the project would be 2,252 km/week (at 0.0011 t CO<sub>2e</sub>/km) for 2.48 t CO<sub>2e</sub>/week (or 128.81 t CO<sub>2e</sub>/year).

For personnel vehicles, there will not be a large staff involved in construction, say 12 persons. With carpooling and a two-week shift rotation (likely less frequent) we can estimate four vehicles during construction (one year) and one car per rotation during operations. If all employees come from La Loche (likely as the Project will be hiring locally), that would account for 1400 km every two weeks for construction (36,400 km/year), and 350 km every two weeks for operations (9,100 km/year). This works out to 61.88 t CO<sub>2e</sub>/year (0.0017 t CO<sub>2e</sub>/km x 36,400 km/year) during construction, and 15.47 t CO<sub>2e</sub>/year during operations.

#### **6.5.3.1 Project-related Aircraft Traffic**

In the Fission EIA, it was estimated that the GHG emissions from air travel would be 453.12 t/y CO<sub>2e</sub> (Fission draft EIA, submitted March 2024, specifically Clifton 2024). This is considered accurate as Big Bear is one of the potential airstrips that mines would use. As Fission is the closest mine, we used their air transportation GHG estimate (Fission, 2024). If the Big Bear Camp is to truly be a regional airstrip, it is estimated that two mining operations could be going on at the same time, although another potential mine (other than NexGen and Fission) has not yet been announced. There have been a number of high-grade discoveries locally that could portend another mine in the future. The estimate excludes the NexGen uranium project because they are building their own airstrip. So, to be conservative and to incorporate another mine, exploration operations, charters, or wildfire aircraft, we estimate 1,000 t/y CO<sub>2e</sub> for all flight traffic.

#### **6.5.3.2 Biogenic GHG Emissions – Carbon Sequestration Loss**

The runway is expected to cover an area of 80m x 1,524 m for an operational area of 121,920 m<sup>2</sup>, or 12.192 ha). Since the final design has not been completed, we would double this area to account for a construction right of way and to include the flight paths, which while not impacting ground cover, would require some trees to be removed. This would mean a cleared area of approximately 23 ha, about half of this will be reclaimed to stabilize soils. With a factor of 12.78 t CO<sub>2e</sub>/ha/year the proposed land use change related to the project would account for a loss of 293.94 t CO<sub>2e</sub> sequestration/year, although about half this will be reclaimed to ground cover immediately after construction.

#### **6.5.3.3 Total GHG Calculation for the Project**

Table 6.6 summarizes the estimated Project emissions and provides a per year total for the one year of construction and per year of operations. With construction taking about one year or less, it is estimated that the total construction emissions will be approximately 7,473.1 t CO<sub>2e</sub>/year, say, 7,500 t CO<sub>2e</sub> during the construction year. For operations, the estimated tons of GHGs per year will be 1,506.58 CO<sub>2e</sub>, say 1,500 tCO<sub>2e</sub>/year. These levels of emissions are below any emissions reporting criteria either federally or provincially. Emissions associated with project decommissioning are discussed in the next section.

**Table 6.6 – Tonnes CO<sub>2e</sub>/year for Construction and Operations**

Source	GHG Total/Year
<b>Scope 1 – Direct Emissions</b>	
1) Construction Equipment – Diesel 5 pieces of heavy equipment (trucks and excavators) + 2 pieces of auxiliary equipment.	<b>492.75 t CO<sub>2e</sub>/year</b>
2) Operations Equipment – 2 pieces of auxiliary equipment such as a plow and grader + one pickup truck	<b>68.36 CO<sub>2e</sub>/year</b>
3) Construction Equipment – Gas 2 vehicles – full time including construction and operations	<b>18.47 t CO<sub>2e</sub>/year</b>
4) Land Use Change – Biomass Oxidation (one time charge to project (UNIPCC 2003)	<b>6,900 t/CO<sub>2e</sub></b>
<b>Scope 2 – Indirect Emission – Acquired Energy</b>	<b>Not applicable</b>
<b>Scope 3 – Indirect Emissions</b>	
5) Haulage to Project (aviation fuel and supplies)	<b>128.81 t CO<sub>2e</sub>/year</b>
6) Personnel Vehicles – Construction	<b>61.88 t CO<sub>2e</sub>/year</b>
7) Personnel Vehicles – Operations	<b>15.47 t CO<sub>2e</sub>/year</b>
8) Project related air travel	<b>1,000 t CO<sub>2e</sub>/year</b>
<b>Land Use Change – Biogenic Emissions</b>	
9) Land Use Change-Carbon Sequestration Loss	<b>293.94 t CO<sub>2e</sub>/year</b>
<b>TOTAL – Construction (includes 1, 3, 4 and 6)</b>	<b>7,473.1 t CO<sub>2e</sub>/year</b>
<b>TOTAL – Operations (includes 2, 5, 7, 8 and 9)</b>	<b>1,506.58 t CO<sub>2e</sub>/year</b>

#### 6.5.3.4 Decommissioning

The aerodrome is expected to operate so long as it is technically and economically feasible, which is anticipated to be several decades. The GHG contributions at decommissioning are anticipated to be of similar nature and magnitude as the estimates calculated for the construction phase and include the following stages:

- Airstrip and infrastructure will need to be removed.
- Re-grading and recontouring of the site to restore pre-development drainage to the extent practicable.
- Topsoil spreading, grading and revegetation.

Specific plans and estimates would be calculated in a more realistic timeframe for the project's end-of-life and using updated tools and information available at that time. At present, emissions at decommissioning are conservatively estimated to be the equivalent of 1 year of construction emissions and include the emissions and quantities outlined in Table 6.7 below:

<b>Table 6.7 – Tons CO<sub>2</sub>e/year for Decommissioning</b>	
<b>Source</b>	<b>GHG Total/Year</b>
<b>Scope 1 – Direct Emissions</b>	
1) Construction Equipment – Diesel 5 pieces of heavy equipment (trucks and excavators) + 2 pieces of auxiliary equipment.	<b>492.75 t CO<sub>2</sub>e/year</b>
2) Construction Equipment – Gas 2 vehicles – full time including construction and operations	<b>18.47 t CO<sub>2</sub>e/year</b>
<b>Scope 2 – Indirect Emission – Acquired Energy</b>	<b>Not applicable</b>
<b>Scope 3 – Indirect Emissions</b>	
3) Personnel Vehicles – Construction	<b>61.88 t CO<sub>2</sub>e/year</b>
4) Project related air travel	<b>1,000 t CO<sub>2</sub>e/year</b>
<b>TOTAL – Decommissioning</b>	<b>1,573.1 t CO<sub>2</sub>e/year</b>

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## 6.6 Strategic Assessment of Climate Change

Utilizing the net GHG calculations in Section 4.1 of the Government of Canada's *Strategic Assessment of Climate Change* (Revised, October 2020) the following calculations for construction (Table 6.8) and for operations (Table 6.9) were computed.

<b>Table 6.8 – Net GHG Emissions for Construction</b>	
<b>Calculation Element</b>	<b>Project Value for the One Year of Construction (tCO<sub>2e</sub>)</b>
Direct Emissions	511.22
Plus Acquired energy GHG emissions	Not applicable
Minus CO <sub>2</sub> Captured and Stored	0
Minus Avoided Domestic GHG Emissions	0
Minus Offset Credits	0
<b>Net GHG Emissions</b>	<b>511.22</b>

<b>Table 6.9 – Net GHG Emissions for Operations</b>	
<b>Calculation Element</b>	<b>Project Value for the One Year of Construction (tCO<sub>2e</sub>)</b>
Direct Emissions	68.36
Plus Acquired energy GHG emissions	Not applicable
Minus CO <sub>2</sub> Captured and Stored	0
Minus Avoided Domestic GHG Emissions	0
Minus Offset Credits	0
<b>Net GHG Emissions</b>	<b>68.36</b>

Note: It is estimated that while decommissioning would not occur for the foreseeable future, the level of GHG emissions would be similar to construction stage.

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## 6.7 Types of Waste and Emissions

*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.*

### 6.7.1 Air

Per 6.4, expected emissions include: (i) emissions from earthworks and heavy equipment during construction and; (ii) emissions from aircrafts and from use and maintenance of the gravel airstrip during operation. Emissions from vehicles and heavy equipment will be minimized by using best management practices including regular vehicle and equipment maintenance, limiting idling wherever possible, and use of best available technology where possible.

### 6.7.2 Water

The Big Bear Camp currently holds a license from the Water Security Agency (WSA) to pull water from Grygar Lake and treat it at their on-site water treatment plant. If additional water is required over the current allocation, an amendment to the WSA license will be obtained to include the water supply for the aerodrome.

Septic services for the aerodrome terminal building will be in holding tanks (above or underground), which will be emptied by a vac truck and disposed of as required. Big Bear Camp currently has sewage holdings tanks which are permitted by SKENV and are emptied as required.

### 6.7.3 Land

Potential solid waste generated by the project are building materials, construction waste, and garbage/scrap materials. Materials will be sourced to minimize waste at source and then follow the waste management hierarchy: avoid waste, repurpose/reuse, recycle, and as a last resort dispose.

Domestic waste and recyclables will be stored, recycled or disposed in an appropriate manner. Source reduction elimination methods through design resource planning will be utilized. Materials on-Site will be re-used and recycled wherever possible.

Hazardous materials will be handled and stored in compliance with the Hazardous Substances and Waste Dangerous Goods Regulations. All chemicals and hazardous substances will be stored and handled according to Transportation of Dangerous Goods Regulations (TDG) and Workplace Hazardous Material Information System (WHMIS) requirements. Hazardous substance will be setback from waterbodies. Appropriate procedures for spill response will be outlined and readily available.

Aviation fuel(s), diesel and gasoline will be stored in approved double walled storage tanks equipped with secondary containment in accordance with provincial regulations and standards.

Oils, greases and coolant for equipment maintenance will be stored in the truck maintenance shop in appropriate containers. Material recycling such as used oil, oil filters, etc. will be conducted accordingly through the Saskatchewan Association for Resource Recovery Corporation (SARRC) program.

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## References

- Acton, D.F., Padbury, G.A. and Stushnoff, C.T. (eds.) 1998. Ecoregions of Saskatchewan. Regina: Canadian Plains Research Center.
- Angler's Atlas. 2023a. Hodge Lake. <https://www.anglersatlas.com/place/110432/hodge-lake>.
- Angler's Atlas. 2023b. Grygar Lake. <https://www.anglersatlas.com/place/112690/grygar-lake>.
- Canadian Environmental Assessment Act, 2012. *Guide to Preparing a Description of a Designated Project under the Canadian Environmental Assessment Act, July 2012*.
- Canadian Environmental Assessment Act, 2012. *Assessing Cumulative Environmental Effects under the Canadian Environmental Assessment Act, 2012*.
- Canadian Herpetological Society. 2023a. Boreal Chorus Frog.  
[https://canadianherpetology.ca/species/species\\_page.html?cname=Boreal%20Chorus%20Frog](https://canadianherpetology.ca/species/species_page.html?cname=Boreal%20Chorus%20Frog).
- Canadian Herpetological Society. 2023b. Canadian Toad.  
[https://canadianherpetology.ca/species/species\\_page.html?cname=Canadian%20Toad](https://canadianherpetology.ca/species/species_page.html?cname=Canadian%20Toad).
- Canadian Herpetological Society. 2023c. Northern Leopard Frog.  
[https://canadianherpetology.ca/species/species\\_page.html?cname=Northern%20Leopard%20Frog](https://canadianherpetology.ca/species/species_page.html?cname=Northern%20Leopard%20Frog).
- Canadian Herpetological Society. 2023d. Red-sided Gartersnake.  
[https://canadianherpetology.ca/species/species\\_page.html?cname=Red-sided%20Gartersnake](https://canadianherpetology.ca/species/species_page.html?cname=Red-sided%20Gartersnake).
- Canadian Herpetological Society. 2023e. Wood Frog.  
[https://canadianherpetology.ca/species/species\\_page.html?cname=Wood%20Frog](https://canadianherpetology.ca/species/species_page.html?cname=Wood%20Frog).
- Canada North Environmental Services (CanNorth). 2021a. Rook I Project Environmental Impact Statement Annex V.1: Aquatic Environment Baseline Report for the Rook I Project – Final Report. Prepared for NexGen Energy Ltd. Project No. 3008. September 2021.
- Canada North Environmental Services (CanNorth). 2021b. Rook I Project Environmental Impact Statement Annex VII.2: Vegetation Baseline Report 2 (Inventory, Rare Plants, and Wetlands) for the Rook I Project – Final Report. Prepared for NexGen Energy Ltd. Project No. 3008. September 2021.

- Canada North Environmental Services (CanNorth). 2021c. Rook I Project Environmental Impact Statement Annex VIII.2: Wildlife Baseline Report 2 (Amphibians, Birds and Bats). Prepared for NexGen Energy Ltd. Project No. 3008. September 2021.
- Clifton Engineering Group (Clifton) and CanNorth. 2021. Fission Project Description – Patterson Lake South Project. Prepared for Fission Uranium Corporation. 130 pp.  
<https://publications.saskatchewan.ca/#/products/115606>.
- Cornell Lab of Ornithology (Cornell). 2019. All About Birds. Cornell Lab of Ornithology, Ithaca, New York.  
<https://www.allaboutbirds.org>
- COSEWIC. 2009. COSEWIC assessment and updated status report on Northern Leopard Frog *Lithobates pipiens*, Rocky Mountain population, Western Boreal/Prairie populations and Eastern populations, in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 69 pp.  
([www.sasregistry.gc.ca/status/status\\_e.cfm](http://www.sasregistry.gc.ca/status/status_e.cfm)).
- Environment Canada. 2013. Management Plan for the Northern Leopard Frog (*Lithobates pipiens*), Western Boreal/Prairie Populations, in Canada [Proposed]. *Species at Risk Act* Management Plan Series. Environment Canada, Ottawa. iii + 28 pp
- Environmental Dynamics Inc, 2024. *Description of the Environment, Big Bear Camp Aerodrome Technical Proposal*.
- Fission 2024, Fission Uranium Corp. Triple R Deposit Draft Environmental Impact Statement. Currently in review with Saskatchewan Environmental Assessment and Stewardship Branch, Saskatchewan Ministry of Environment. Submitted, March 2024.
- Golder Associates Ltd. (Golder). 2022. Rook I Project Environmental Impact Statement Annex IV.2: Hydrometric Monitoring Characterization Report for the Rook I Project. Prepared for NexGen Energy Ltd. March 2022.
- Government of Canada. 2019a. Impact Assessment Act. Available Online: <https://laws-lois.justice.gc.ca/eng/acts/I-2.75/FullText.html>.
- Government of Canada. 2023. Northern Leopard Frog - Species At Risk Public Registry.  
[http://www.registrelep-sararegistry.gc.ca/sar/index/default\\_e.cfm](http://www.registrelep-sararegistry.gc.ca/sar/index/default_e.cfm).
- Government of Canada. 2012. *Professional Radio Operator Certificates*. <https://ised-isde.canada.ca/site/spectrum-management-telecommunications/en/licences-and-certificates/professional-radio-operator-certificates>

- Government of Canada. *Strategic Assessment of Climate Change* (Revised, October 2020). Available online: <https://www.strategicassessmentclimatechange.ca/>
- Ministry of Environment (ENV), Fish, Wildlife and Lands Branch. 2017. Activity Restriction Guidelines for Sensitive Species. Regina, Saskatchewan. Retrieved from <https://publications.saskatchewan.ca/#/categories/2062>
- Myclimate flight emission calculator. [https://co2.myclimate.org/en/flight\\_calculators/new](https://co2.myclimate.org/en/flight_calculators/new)
- National Wetlands Working Group. 1997. The Canadian Wetland Classification System. Wetlands Research Centre, University of Waterloo, ON.
- Natural Resources Canada. *Greenhouse Gas Equivalencies Calculator*. <https://oee.nrcan.gc.ca/corporate/statistics/neud/dpa/calculator/ghg-calculator.cfm>
- Natural Resources Canada. *2024 Fuel Consumption Guide*. <https://natural-resources.canada.ca/sites/nrcan/files/files/pdf/2024%20Fuel%20Consumption%20Guide.pdf>
- Omnia Ecological Services (Omnia). 2021a. Rook I Project Environmental Impact Statement Annex VIII.1: Wildlife Baseline Report 1 (Mammals, Waterfowl and Raptors). Prepared for NexGen Energy Ltd. December 2021.
- Omnia Ecological Services (Omnia). 2021b. Rook I Project Environmental Impact Statement Annex VII.1: Vegetation Baseline Report 1 (Mapping). Prepared for NexGen Energy Ltd. December 2021.
- Saskatchewan Conservation Data Centre. 2023a. Saskatchewan Non-Vascular Plant Species by Ecoregion Tracked Taxa List. Regina, Saskatchewan. Retrieved from [www.biodiversity.sk.ca/SppList.htm](http://www.biodiversity.sk.ca/SppList.htm).
- Saskatchewan Conservation Data Centre. 2023b. Saskatchewan Non-Vascular Plant Species by Ecoregion Tracked Taxa List. Regina, Saskatchewan. Retrieved from [www.biodiversity.sk.ca/SppList.htm](http://www.biodiversity.sk.ca/SppList.htm).
- Saskatchewan Conservation Data Centre. 2023c. Saskatchewan Vertebrate Tracked Taxa List. Regina, Saskatchewan. Retrieved from [www.biodiversity.sk.ca/SppList.htm](http://www.biodiversity.sk.ca/SppList.htm).
- Saskatchewan Ministry of Environment. *Technical Proposal Guidelines*. June 2014.

Statistics Canada. 2023. (table). *Census Profile*. 2021 Census of Population. Statistics Canada Catalogue no. 98-316-X2021001. Ottawa. Released March 29, 2023.  
<https://www12.statcan.gc.ca/census-recensement/2021/dp-pd/prof/index.cfm?Lang=E>

Transport Canada. *Canadian Aviation Regulations SOR/96-433*. May 2024.

UK Government. CO2 emissions of transport modes– processed by Our World in Data. *Transport emissions per kilometer travelled [dataset]*. <https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2022>

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# Appendix A

## Engagement Documents



T (306) 975-0401  
F (306) 975-1076

[saskatoon@clifton.ca](mailto:saskatoon@clifton.ca)  
[www.mistyventures.ca](http://www.mistyventures.ca)

**Big Bear Contracting Ltd. – Camp Expansion (Notification Letters) / Support Letters**

**Date Sent: 01/29/2024**

Entity: Clearwater River Dene Nation

Sent via : Email / Letter : **Email** Chief / Cam Wheeler

Response: Via phone call: (01/31/2024) No issues indicated or raised by the group.

**Date Sent: 01/29/2024**

Entity: Clearwater Clear Lake Metis Region 2 MN-S

Sent via : Email / Letter : **Email** Leonard Montgrand

Response: (01/31/2024) Via phone call: No issues indicated or raised by the group.

**Date Sent: 03/18/2024**

Entity: Birch Narrows Dene Nation

Sent via : Email / Letter : **Email** Chief Jonathon Sylvestre

Response: Awaiting

**Date Sent: 03/18/2024**

Entity: Buffalo Narrows Dene Nation

Sent via : Email / Letter : **Email** Chief Norma Catarat

Response: Awaiting

**Date Sent: 03/18/2024**

Entity: Athabasca Chipewyan First Nation

Sent via : Email / Letter : **Email** Chief Allan Adam

Response: Awaiting

**Date Sent: 03/18/2024**

Entity: Ya'thi Néné Lands & Resources

Sent via : Email / Letter : **Email** Garrett Schmidt

Response: Awaiting

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29 January 2024

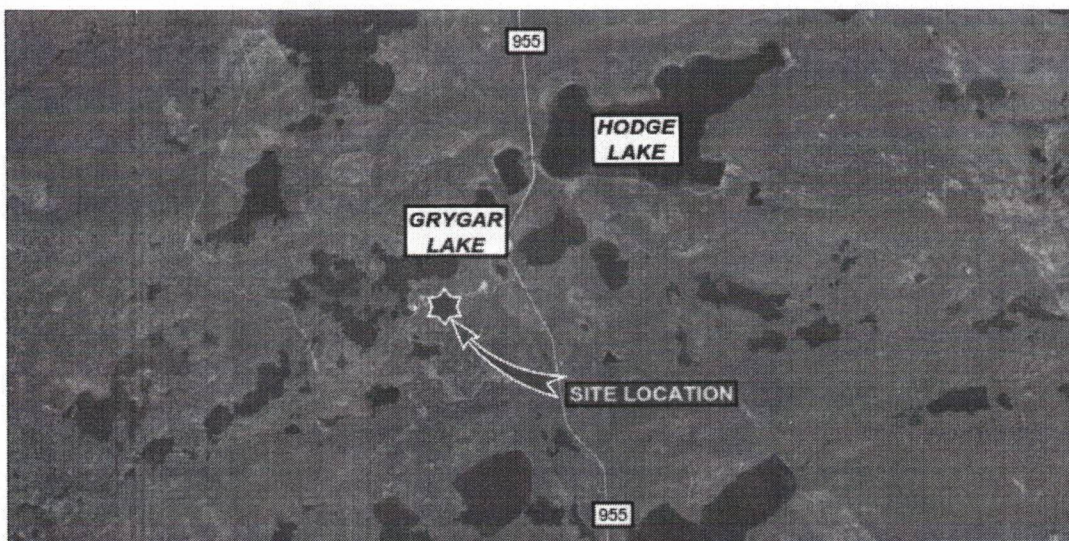
Attention: Chief Teddy Clark  
Company: Clearwater River Dene Nation  
Address: Box 5050, La Loche SK, S0M 3H0

---

Dear Chief Teddy Clark,

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The airstrip is approximately 140 km due north of the airstrip at La Loche, 200 km south, south-east of the airstrip at Uranium City, and 165 km northwest of Fort McMurray International Airport. The airstrip is currently envisioned to be a non-certified airstrip with a graded, compacted gravel top that is approximately 5,000 ft long (1,524 m) and 110 ft wide (33.5 m). It would be like airstrips currently at McArthur River, Key Lake, and formerly, Cluff

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Please send your comments to Dean Balaneski at [bigbeargm@hotmail.com](mailto:bigbeargm@hotmail.com).

Yours truly,

<original signed by>

Dean Balaneski  
General Manager  
Big Bear Contracting Ltd.

---

29 January 2024

Attention: Leonard Montgrand

Company: Clearwater Clear Lake Metis Region 2 MN-S

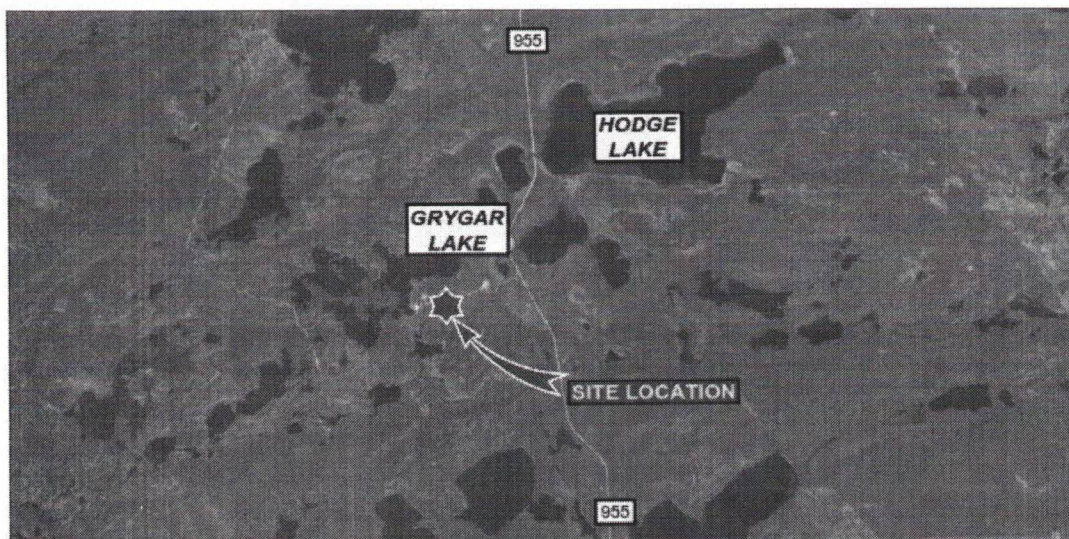
Address: Fontaine Ave, La Loche, SK S0M 1G0

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Please send your comments to Dean Balaneski at [bigbeargm@hotmail.com](mailto:bigbeargm@hotmail.com).

Yours truly,

<original signed by>

Dean Balaneski  
General Manager  
Big Bear Contracting Ltd.

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18 March 2024

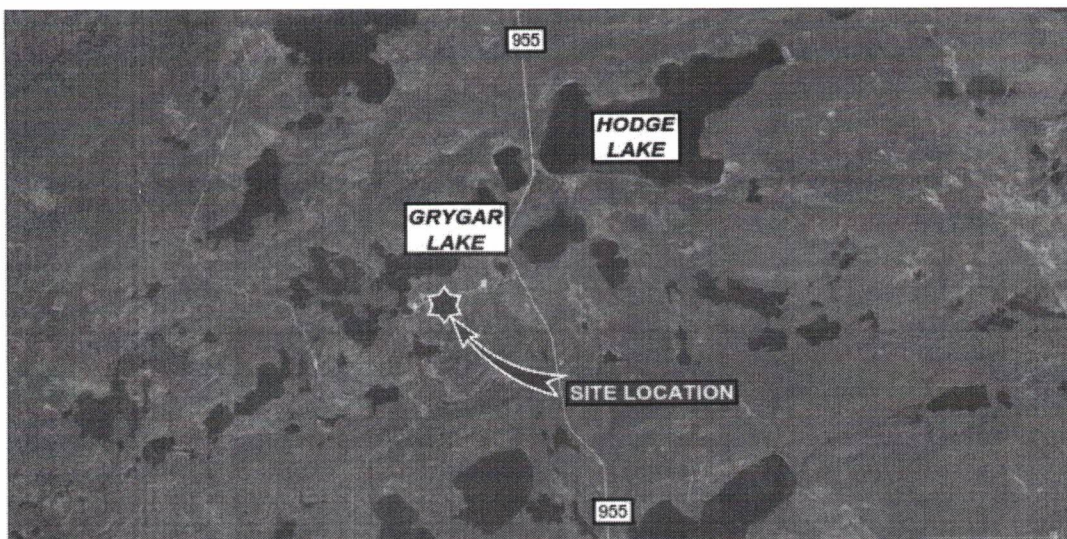
Attention: Chief Norma Catarat  
Company: Buffalo River *Dene* Nation  
Address: Box 40, Dillon SK, S0M 0S0

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Dear Norma Catarat,

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Yours truly,

<original signed by>

Dean Balaneski  
General Manager  
Big Bear Contracting Ltd.

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18 March 2024

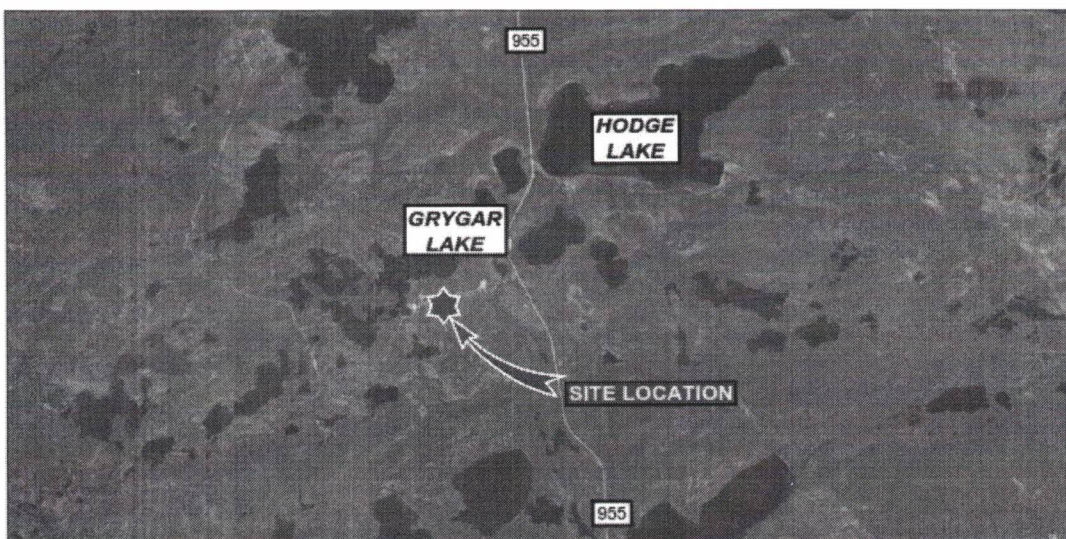
Attention: Jonathon Sylvestre  
Company: Birch Narrows Dene Nation  
Address: Box 40, Turnor Lake SK, S0M 3E0

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Dear Jonathon Sylvestre,

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Yours truly,

<original signed by>

Dean Balaneski  
General Manager  
Big Bear Contracting Ltd.

---

18 March 2024

Attention: Garrett Schmidt

Company: Ya' thi Néné Lands and Resources

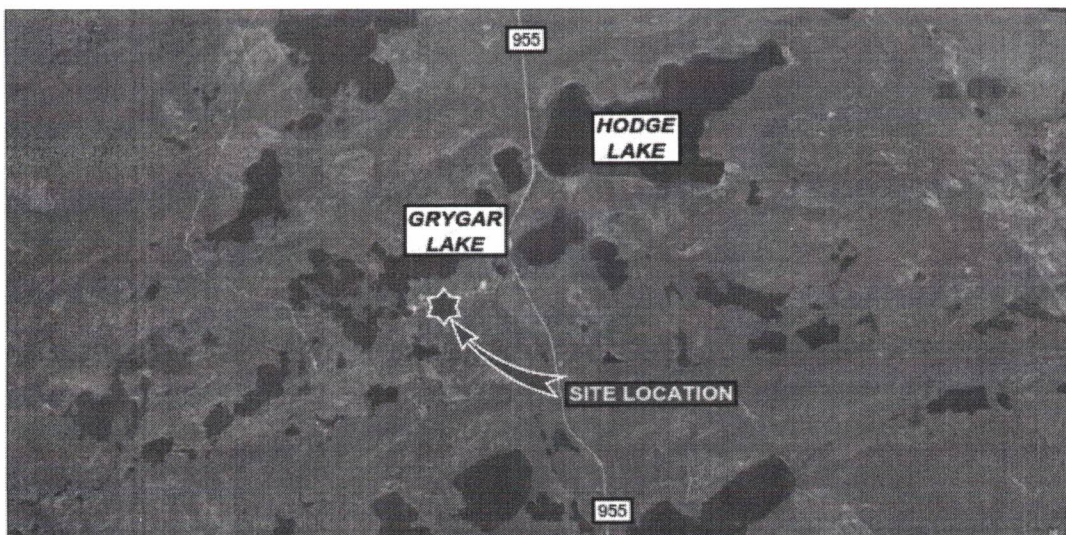
Address: 100 – 335 Packham Avenue Saskatoon, SK S7N 4S1

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18 March 2024

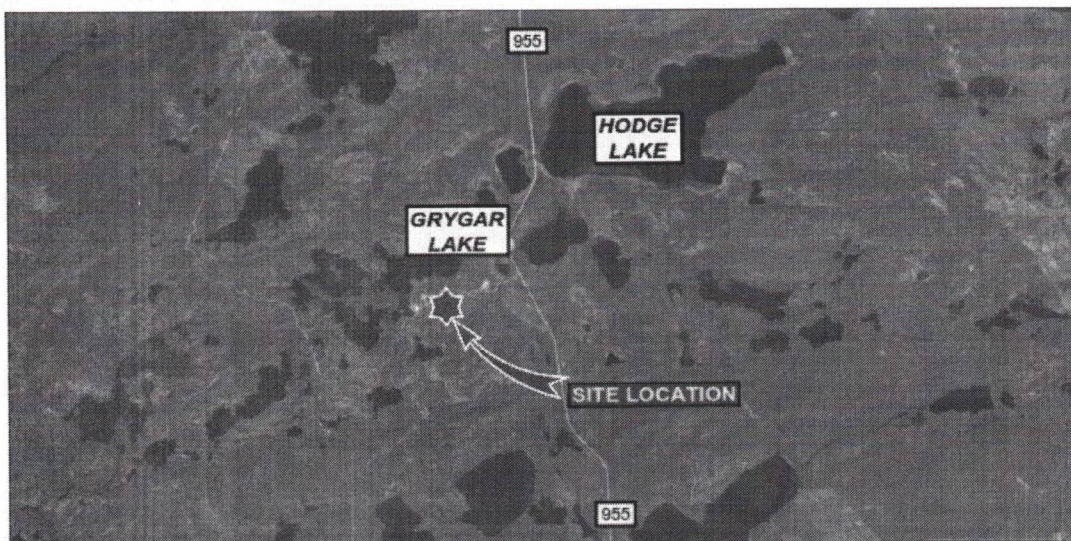
Attention: Chief Allan Adam  
Company: Athabasca Chipewyan First Nation  
Address: Box 366 | Fort Chipewyan, AB | T0P 1B0

---

Dear Allan Adam,

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Yours truly,

<original signed by>

Dean Balaneski  
General Manager  
Big Bear Contracting Ltd.

---

10 April 2024



Dear Mr. Balaneski,

This letter is in response to the notification letter sent by Big Bear Contracting Ltd. (Big Bear) regarding the construction of a new aerodrome at Big Bear Camp located near Grygar Lake, Saskatchewan. The Clearwater River Dene Nation (CRDN) has a great interest in the Project as it is located on our traditional lands. Big Bear Camp is owned by members of CRDN and gets most of its employees from the Nation.

CRDN is proud to provide this support letter with hopes the Project will progress through the regulatory requirements. CRDN has a working relationship with Big Bear and trusts the Project will be completed in a manner that will be protective of CRDN's traditional knowledge and land use of the area. We will assist them in this. It is understood that further studies such as a Heritage Resource Impact Assessment will be completed prior to construction activities starting. CRDN believes these mitigations will be prudent in protection of the environment and CRDN's traditional lands.

CRDN believes that the Project will be beneficial in regard to supporting the transportation and courier needs of northern communities and businesses. Other areas that will benefit from the aerodrome include local tourism, wildfire and emergency services, and the mining and exploration projects. It is also expected that the Project will provide job-opportunities for locals and members of CRDN. Further, if the local mining projects proceed, the aerodrome will provide a safer method of transporting CRDN workers to the area when compared to driving on Highway 955.

CRDN fully supports the Big Bear Aerodrome Project and believe it can be completed in a responsible and sustainable manner that will create growth and economic opportunity for our Nation.

Sincerely,

<original signed by>

Chief Teddy Clarke

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# Appendix B

## Tetra Tech Feasibility Report



T (306) 975-0401  
F (306) 975-1076

[saskatoon@clifton.ca](mailto:saskatoon@clifton.ca)  
[www.mistyventures.ca](http://www.mistyventures.ca)



**TETRA TECH**

**Big Bear Camp Aerodrome Feasibility Design  
Fission Uranium Corp.  
Patterson Lake South Project  
SK, Canada**

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PRESENTED TO

**Fission Uranium Corp.**

JULY 8, 2022

ISSUED FOR REVIEW REV B

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## APPENDICES

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## ACRONYMS & ABBREVIATIONS

Acronyms/Abbreviations	Definition
AB	Alberta
AGN IIIA	Aircraft Group Number IIIA (Dash 8 100/300, ATR 42, TYP.)
ARCAL	Aircraft Radio Control of Aerodrome Lighting
ARP	Aerodrome Reference Point
ART	Airfield Reference Temperature
ATB	Air Terminal Building
AWOS	Automated Weather Observation Station
CARs	Canadian Air Regulations
FEC	Field Electrical Centre
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
IAP	Instrument Approach Procedures
ICAO	International Civil Aviation Organization
IFR	Instrument Flight Rules
LiDAR	Light Detection and Ranging
LUP	Land Use Plan (Aerodrome)
MDA	Minimum Descent Altitude
MTOW	Maximum Take-Off Weight
NI	Non-Instrument
NM	Nautical Miles
OLS	Obstacle Limitation Surfaces
PAPIs	Precision Approach Path Indicators
PPR	Prior Permission Required (For Aircraft Operations at the Aerodrome)
RNAV	Satellite Area Navigation
SK	Saskatchewan
SSALS	Short Simplified Approach Lighting System
TC	Transport Canada
TDZE	Touchdown Zone Elevation

## LIMITATIONS OF REPORT

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## 1.0 INTRODUCTION

### 1.1 GENERAL

Fission Uranium Corp. (Fission) is planning to provide site air access to the Patterson Lake South Project by constructing a new aerodrome at the Big Bear Camp that will be capable of operating AGN IIIA aircraft. The Big Bear Camp is located at Grygar Lake, SK, approximately 300 nautical miles NM (by air) northeast of Edmonton, AB, and approximately 90 NM (by air) northeast of Fort McMurray, AB. There is a gravel, unregistered runway near Big Bear Camp and the new aerodrome will be developed in that general vicinity.

Tetra Tech has been retained by Fission to undertake desktop feasibility engineering services for the planned aerodrome, including design basis development and feasibility-level design. The proposed runway orientation and location has been provided by Fission. Evaluation of prevailing winds is not included in this design. No site visit was included for this study and the analyses were strictly desktop-based. The feasibility design drawings are in Appendix A.

Fission had indicated a requirement for a 1,200 m (approx. 4,000 ft.) long runway located at Big Bear Camp and oriented in an east/west direction. We recommended a 1,524 m (approx. 5,000 ft.) long runway as part of our Rev A submission, and Fission has requested Tetra Tech revise the feasibility study documents to a 5,000 ft. long runway for our Rev B submission.

The aerodrome will be private with Prior Permission Required (PPR) for use.

This feasibility design involved the analyses of a pre-determined aerodrome site (by Fission) in the vicinity of the Big Bear Camp with the proposed runway perpendicular to the current gravel runway location and orientation. This design basis focuses on a feasibility-level analysis of the site for an AGN IIIA aircraft, gravel surfaced aerodrome, including airfield lighting.

Limited topographical data was provided by Fission. This data should be supplemented with new Lidar surveys prior to final design.

No geotechnical information has been provided and the granular runway, taxiway, and apron structures are based on typical soil conditions in the area. A site geotechnical study should be done prior to final design.

Hydrology studies should be undertaken to determine drainage requirements, the suitability of this site, and the risks of flooding and erosion.

### 1.2 AERODROME ASSESSMENT CRITERIA

The aerodrome location was pre-selected by Fission and has been assessed for characteristics and the following design criteria:

- Design Aircraft of De Havilland Dash 8-100, ATR 42, Beechcraft 1900D, and De Havilland Dash 8-300.
- Obstacle Limitation Surfaces (OLS) including the runway strip, approach surface, and transitional surfaces to the latest requirements from Transport Canada (TP312 5<sup>th</sup> Edition) for AGN IIIA aircraft operating in non-instrument conditions. A take-off surface has not been reviewed because TP312 5<sup>th</sup> Edition stipulates that it is established when “(a) the opposite threshold does not coincide with the end of TORA and the instrument departure climb gradient has not been assessed; or (b) a clearway has been established.” At this point, because

there is no displaced threshold or clearway, a take-off surface review is not required. If there is a clearway or displaced threshold in later designs, then a take-off surface analysis could be done.

- The aerodrome will be designated as “Registered”. This designation allows service with approved chartered aircraft without mandatory compliance with all of Transport Canada’s (TC) standards and operational requirements. However, the aerodrome will be designed to allow future “certification” for AGN IIIA turbo prop aircraft should TC regulations change regarding charter flights into registered aerodromes. Upgrading to a “Certified” status may require TC review and approval of the site. Should certification be sought in the future, significant additional administrative, reporting, safety management, wildlife management, and documentation duties will be required on an ongoing basis.

The aerodrome will have a granular surfaced runway, taxiway, and apron, and will be maintained to operate year-round.

### 1.3 AERODROME APPROVALS

Environmental and land use approvals related to mine development are not included here. The following approvals only apply to aerodrome specific approval requirements from Transport Canada and Nav Canada:

1. Since 2017, Transport Canada has introduced Canadian Air Regulation (CAR) 307 which introduces notification requirements for new aerodromes. This regulation was created due to complaints from adjacent landowners after an aerodrome was constructed and operated without input or consultation. Some aerodromes were created in locations that conflicted with existing airport airspace and approach procedures. Prior to this regulation only certified airports were required to provide pre-consultation. CARS 307 is included in Appendix C and generally requires pre-consultation with adjacent landowners, Transport Canada, and Nav Canada.
2. The Instrument Approach Procedure (IAP) designer that Fission retains will provide IAP design and secure aerodrome registration and IAP approvals/publication with Nav Canada and Transport Canada.

### 1.4 BACKGROUND DATA

The following background data was provided by Fission in support of the study:

- Topographical data
- Google Earth Satellite imagery

## 2.0 AERODROME DESIGN BASIS

### 2.1 RUNWAY LENGTH

The feasibility design of the runway location is using a length of 1,524 m (approx. 5,000 ft.) with 60 m (approx. 197 ft.) runway strip allowance at each threshold. The original length provided by Fission was 1,200 m (approx. 4,000 ft.), and the feasibility study has been updated with our recommendation of 1,524 m (5,000 ft.).

The following table was created to provide an approximate overview of the takeoff length required for the proposed site at the respective aircraft’s MTOW. The calculated adjusted field length in Table 2-1 is taken using the method in ICAO 9157 which takes the runway length required for take-off at a level site at sea level in standard atmosphere conditions and corrects for elevation, temperature, and slope. The vertical distance used to determine the approximate gradient was determined by dividing the runway length by the difference between the highest elevation and lowest elevation. For the takeoff length calculation, a gradient of 0.32% was assumed, along with dry runway

conditions and zero wind. An Airfield Reference Temperature (ART) of 22.7°C was used based on the nearest weather station from Environment Canada using 1981-2010 (Cluff Lake, approximately 66 km away). An elevation of 530 m was assumed for the takeoff length calculations.

**Table 2-1: Runway Length Summary**

Aircraft	AGN Runway Environment	Seats	Range (NM)	MTOW (lbs)	Max Payload (lbs)	ICAO - ART 22.7°C Adjusted Field Length (Rounded) – m (ft) Aerodrome Reference Temp., °C (T1) ICAO 9157 Method	Airport Planning Manual - TOW for a Take-off Field Length of 1,524m <sup>1</sup>
Beechcraft Beech-1900D	II	12-19	1,360	17,120	4,375	1,433 m (4,700 ft.)	Not available
DHC-8 Dash 8 - 100	IIIA	37-39	820	34,500	7,800	1,250 m (4,100 ft.)	MTOW at Flap 0 degrees
DHC-8 Dash 8 - 300	IIIA	50-56	920	43,000	13,500	1,494 m (4,900 ft.)	MTOW at Flap 10 degrees
ATR 42 – 600	IIIA	48	716	41,005	11,684	1,463 m (4,800 ft.)	Not available

Notes:

<sup>1</sup>The allowable take-off weights are read off the charts from the airport planning manual for the Q300 Issue 2 PSM 1-83-13 dated July 27, 2001 and for the Q100 PSM 1-81-13 dated May 20, 1993. The inputted values include an outside air temperature of 22.7 degrees Celsius, an airfield altitude of 530 m, and a take-off distance of 1,524 m. Associated conditions include the following:

1. Dry, hard, level runway surface, zero wind;
2. Both engines at normal takeoff power to V1, thereafter max takeoff power on operating engine; and
3. Retardation in acc. stop: anti-skid brakes in the Dash 8-100/300, ground and flight spoilers extended in the Dash 8-100, both props in discing in the Dash 8-100/300.

As another check, the available airport planning manuals were reviewed. The airport planning manuals for Dash 8-100 and Dash 8-300 were available and used in this review. The approximate take-off weight calculated from the charts assuming a 1,524 m runway length and flaps oriented at 0 degrees for the Dash 8-100 and 10 degrees for the Dash 8-300 is shown in Table 2-1. Other flap settings may require weight restrictions for the Dash 8-300. Based on the ICAO runway length calculations, we would recommend a runway length of 5,000 ft. to accommodate the aircraft listed in Table 2-1. However, exact operating conditions, engine types and payload allowances must be confirmed, and the required runway length would need to be confirmed by the air service provider. Tetra Tech recommends that Fission review this data with their air service provider to ensure their agreement with runway length.

## 2.2 PHYSICAL CHARACTERISTICS

The following physical characteristics are standards from TP312 5<sup>th</sup> Edition to meet the AGN IIIA, Non-Instrument (NI) physical environment for aircraft with an outer main gear wheel span between 6.0 m up to but not including 9.0

m. These are the constraints for the development of the aerodrome. A set of feasibility plan and profile has been developed and is included in Appendix A.

The selected design aircraft fit within the AGN IIIA category or lower for the runway environment based on their dimensions and approach speed. With a Global Navigation Satellite System (GNSS) Instrument Approach Procedure (IAP), we anticipate the Big Bear aerodrome would operate as a NI runway. As defined in TP312 5th Edition, an NI runway is intended for the operation of aircraft using visual approach procedures, or an instrument approach procedure down to a height above aerodrome or height above touchdown zone not lower than 500 ft. However, the IAP will be determined by the instrument approach designer retained by Fission.

The following physical requirements are outlined in TP312 5<sup>th</sup> Edition to meet the AGN IIIA-NI physical environment.

### 2.2.1 Runway

- Minimum width of the runway surface is 30 m (45 m recommended).
- Maximum longitudinal slope is 2.0%.
- Maximum change between consecutive slopes is 2.0%, where slope changes cannot be avoided.
- Maximum longitudinal slope rate of change is 0.4% per 30 m.
- Minimum distance between points of intersection of two successive curves is the greater of:
  - The sum of the absolute numerical values of the corresponding slope changes multiplied by 5,000; or
  - 45 m.
- To allow for adequate drainage, maximum transverse slope of the runway surface is 2.5% (recommended for gravel surfaces to facilitate good drainage and reduce standing water).
- Runway strip length is a minimum of 60 m before the threshold and beyond the end of the runway. The total strip length is the runway length plus the strip at each end out to the inner edge of the OLS approach surface.
- Runway strip width is a minimum of 40 m measured out each side of runway centreline and starts at the same elevation as the runway centreline at the start of the transitional surface.
- Runway safety area is a minimum 40 m each side of the runway centreline within the strip. The safety area is the graded area that extends beyond the edge of the runway surface to the minimum distance specified.
- Acceptable longitudinal slope range prior to the threshold and beyond the runway is  $\pm 2.0\%$  with no abrupt changes or sudden reversals within the runway safety area.
- Transverse slopes in the runway safety area must allow for adequate water drainage to prevent pooling and fall within 0 to minus 3% below the horizontal.

### 2.2.2 Taxiway

- Minimum taxiway width required is 15 m; however, we recommend the taxiway at the aerodrome be constructed to a width of 18 m to allow easier snow removal in the winter months and provide safer aircraft taxiing without centreline guidance (no paint markings on gravel).
- Taxiway clearance from the centreline to an object is 26 m.
- Transverse slope of a taxiway is to be sufficient to prevent accumulation of standing water (2.5% maximum).

- Taxiway safety area (graded area) is a minimum of 5 m from the edge of the taxiway or 12.5 m from the taxiway centreline, whichever is greater.
- Taxiway safety area is limited to a maximum transverse slope of plus 2.5% with reference to the transverse slope of the adjacent taxiway surface. The slope below the horizontal plane can be a maximum of 5%.

### 2.2.3 Apron

The apron dimensions will allow for parking and maneuvering of two design aircraft. Apron positioning is flexible along the length of the runway and will be selected to provide the optimal positioning for the site conditions and power supply. The apron will include provisions for a hard stand for aircraft start up and the containment of de-icing fluids.

## 2.3 OBSTACLE LIMITATION SURFACE (OLS)

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The OLS defines the areas that must remain obstacle free including moving vehicles, terrain, towers, and any other obstacles in the vicinity of the aerodrome. An on-site review has not been undertaken to confirm any man-made structures or towers that might penetrate the OLS surfaces. Tree clearing requirements are based on an estimate of average tree height of 10 m above the existing topography.

The existing LIDAR shows a hill on the west end of the runway that would penetrate the OLS. During detailed design, LIDAR should be used to confirm the location/existence of this hill. If it penetrates the OLS, we recommend considering shifting the runway to the east to avoid this obstacle.

When the feasibility study was updated to extend the proposed runway to the east by an additional 1,000 ft., the existing service road connecting into Semchuk Trail Saskatchewan Hwy 955 conflicts with the runway area. We would recommend realigning the road, so it maintains a 4.6 m vertical clearance to the OLS.

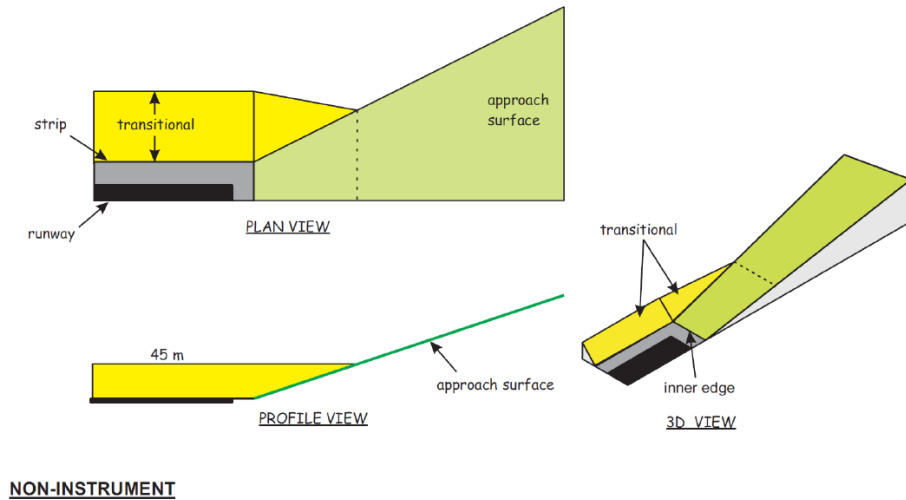
The following requirements are outlined in TP312 5<sup>th</sup> Edition to meet the AGN IIIA – NI, OLS operational levels.

### 2.3.1 Approach Surfaces

- Length of inner edge each side of centerline is 40 m, same as the runway strip width.
- Distance from each threshold is 60 m, same as the runway strip length.
- Divergence of the approach surface as shown in Figure 2-1 is 10%.
- For a NI environment, there is only one slope in the approach surface. The total section is 2,500 m in length at a 4% slope.

### 2.3.2 Transitional Surfaces

The Transitional Surface is an imaginary surface along either side of the runway and Approach Surface that must remain free of obstacles. The Transitional Surface begins at the runway strip (40 m from runway centreline) and extends upwards. The surface begins at the strip or Approach Surface elevation and extends upwards and away from the runway/Approach Surface at a grade of 20% to a point 45 m above the Aerodrome Reference Point (ARP). The ARP at the Big Bear aerodrome will be the centreline elevation at the mid-point of the runway.



**Figure 2-1: Non-Instrument OLS Surface Views**

TP312 5<sup>th</sup> Edition Figure 4-1(a). There is only one slope for each of the transitional and approach surfaces in a Non-Instrument environment for AGN IIIA (20% and 4%, respectively).

## 2.4 INSTRUMENT APPROACH PROCEDURES

The selected design aircraft fits within the AGN IIIA – Non-Instrument (NI) category. With a Global Navigation Satellite System (GNSS) Instrument Approach Procedure (IAP), we anticipate the aerodrome will operate as an NI runway. An NI runway is intended for the operation of aircraft using an IAP to a Minimum Descent Altitude (MDA) not lower than 152 m. (500 ft.) above the runway Touchdown Zone Elevation (TDZE).

A third party IAP designer should be retained early in the aerodrome feasibility process as the assessment, development and approval of IAPs may take up to two years.

## 3.0 PAVEMENT STRUCTURE

### 3.1 SUBGRADE

Based on discussions with Fission, it is understood that the existing material on site is a silty, sandy, gravel. A geotechnical investigation would be required to confirm the subgrade bearing strength. It is recommended that California Bearing Ratio (CBR) tests be completed as part of the geotechnical investigation.

Since a geotechnical report is not available, the Advisory Circular 302-011 Airport Pavement Bearing Strength Reporting dated 2016-01-04 provides guidance on typical subgrade bearing strengths for different subgrade types. For example, a sand with silty fines has a typical design value of 65kN and a gravel with silty fines has a design

value of 135kN. If the water table is within 1 m of the pavement surface, then the typical design value would reduce by an additional 10%. For the purposes of the feasibility study, a subgrade bearing strength of 135 kN is used. This will need to be confirmed with a geotechnical investigation.

Table 3-1 shows the tire pressures and Aircraft Load Ratings (ALRs) of the different design aircraft. The ALR is expressed as a number between 1 and 13 and represents the load imposed by the aircraft on a pavement.

**Table 3-1: Runway Length Summary**

Aircraft	Aircraft Load Rating (ALR)	Tire Pressure (MPa)
Beechcraft Beech-1900D	2.9	0.67
DHC-8 Dash 8 - 100	4.7	0.90
DHC-8 Dash 8 - 300	4.8	0.67
ATR 42	4.9	0.72

Pavement Load Ratings (PLR) are numbers expressing the strength and load carrying capacities of airport pavement structures. They are a function of subgrade bearing strengths, and type and thickness of pavement structures. PLRs are expressed as a number between 1 and 13 with 1 being the weakest and 13 the strongest. In general, an aircraft whose load rating is equal or lower than the PLR can operate from that surface without restrictions. However, the tire pressure should not exceed any tire pressure restrictions assigned to the pavement. A minimum design PLR of 5 is selected, which is more than the ALRs shown for the design aircraft in Table 3-1.

As best practice, a minimum gravel structure of 300 mm is selected for the design. Assuming a subgrade bearing strength of 135 kN, this would provide a PLR of 8. As a comparison, if the subgrade bearing strength was 65 kN, then a gravel structure of 420 mm is required to achieve a PLR of 5. For a tire pressure restriction of 145 psi (or 1.0 MPa), then the measured CBR of the compacted gravel material will require a minimum of 29 as per Advisory Circular 300-004 Unpaved Runway Surfaces.

The PLR strength reporting codes are not well understood by the aviation community outside of Canada. To facilitate reporting of airport pavement bearing strength information on an international basis, the Pavement Classification Number (PCN) system was adopted by Transport Canada. The PLR value can be converted to a PCN value once the subgrade bearing strength is known. For example, a pavement structure with a PLR of 8, a subgrade strength of 135kN, and a tire pressure restriction of 1.0 would have a PCN of “23/F/B/1.0MPa/T Note: Gravel Surface Construction”.

If the subgrade material is determined to be frost susceptible, then a sufficient depth of non-frost susceptible material should be provided.

## 4.0 AERODROME CONCEPTUAL PLAN AND PROFILE

A plan and profile for the runway is presented in Appendix A. Standard sections with side slopes for the runway and taxiway are provided on a separate drawing. The physical characteristics of the runway and taxiway meet the AGN IIIA - NI conditions.

The taxiway length from the runway to the apron is minimized to meet the clearance requirements for any aircraft or equipment parked on the apron without impacting runway operations or the OLS.

## 5.0 RUNWAY ORIENTATION

Ideally, the runway will be aligned with the prevailing winds to minimize crosswinds and the potential for service disruption. Wind data specific to the Big Bear site was not provided; however, the Patterson Lake South report indicates a prevailing wind direction generally aligned northwest by southeast. The runway orientation chosen by Fission is east/west and approximately 45 degrees from the approximate prevailing wind direction.

Prior to final design, an AWOS should be established on site and a wind study should be undertaken to determine runway reliability based on wind conditions and the service provider's aircraft cross wind component capability. Limitations for aircraft include potential impacts to level of service for the aerodrome when runway crosswinds are greater than the acceptable limits of the air service provider's aircraft.

## 6.0 ADDITIONAL AERODROME REQUIREMENTS

Several additional items are required when developing, operating, and maintaining an aerodrome, as discussed in the below subsections.

### 6.1 INSTRUMENT APPROACH PROCEDURES

Tetra Tech recommends engaging an IAP designer to provide an assessment of potential procedures for the aerodrome and provide IAPs for the final aerodrome configuration. The aerodrome should be supported by RNAV – GPS (Global Positioning System) IAPs allowing Instrument Flight Rules (IFR) approaches and departures under suitable meteorological conditions. It is anticipated that IAPs down to NI limits (no lower than 152 m or 500 ft.) may be possible. This process should be undertaken as soon as the aerodrome runway threshold locations and elevations have been determined, as the design and approval process can take years to complete.

An AWOS with wind strength, wind direction, ceilings, altimeter settings, and visibility should be established at the site to provide pilots with up to date weather information and allow Minimum Descent Altitudes during aircraft approach.

### 6.2 LIGHTING

The aerodrome will include runway, taxiway, and apron edge lighting. These facilities have been included in the cost estimate (Appendix B). Illuminated signage and windsocks will provide pilots with clear directional cues. Where space, topography, and budgets allow, approach lighting (e.g., Short Simplified Approach Lighting System (SSALS)) and/or Runway Threshold Identification Lights (RTILs) are recommended (these have been included in the cost estimate in Appendix B). Precision Approach Path Indicators (PAPIs) should be installed along the edge for both runway approaches to provide the aircraft with visual vertical guidance. The PAPI's distance from the threshold can be determined once the runway grading design is finalized.

The lighting controls should be set up to allow pilots to automatically engage the system using Aircraft Radio Control of Aerodrome Lighting (ARCAL) as well as direct control by ground personnel.

We recommended the installation of illuminated Runway Distance Remaining signs to provide pilots with better situational awareness on take-off and landing. This is especially important on granular surfaced runways where there are no pavement markings to provide runway distance remaining cues.

The existing LIDAR survey has a hill located on the west end of the runway that would protrude the plane of approach lights on this end. As per TP312, the plane of approach lights an object cannot protrude is defined as

60 m from the centreline of the approach lighting system or the runway strip width (40 m), whichever is less. During detailed design, once more detailed LIDAR is available, moving the runway further east to avoid this obstacle should be considered.

### 6.3 BUILDING INFRASTRUCTURE

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A prefabricated modular Air Terminal Building (ATB) should be located adjacent to the apron. The building will be sized by Fission to their requirements. The ATB should be equipped with sufficient windows to view the aerodrome and surrounding area. The ATB should contain radio equipment, ground to air communication, and dual altimeter setting equipment for the ground personnel to relay information to the pilots. An Automated Weather Observation Station (AWOS) should be provided to give altimeter settings, current conditions and ceilings to the incoming and outgoing pilots. The ATB should be heated and contain washroom facilities. It is expected that all passengers will be loaded from the aircraft directly to a bus and that the ATB will not be sized to contain the passengers. The ATB is outside the scope of this feasibility design and pricing for the ATB is not included in Appendix B.

A prefabricated modular Field Electrical Centre (FEC) will be located adjacent to the ATB. The FEC will contain all the regulators and controls for the aerodrome lighting option and ATB electrical service. We also recommend a stand-alone emergency power generator in a self-contained prefabricated modular station adjacent the FEC.

De-icing equipment, application and pollution control is normally attributed to the air service provider. A concrete de-icing area draining to a sump would be designed as part of the apron works. This will allow the collection of glycols into a sump that could be collected by a tank truck and hauled to a suitable disposal site.

Fuel facilities have not been included; however, any fuelling of aircraft should be done in an area where a spill can be contained (the de-icing area).

### 6.4 PERSONNEL AND MAINTENANCE EQUIPMENT

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- An all-weather road must be constructed from the aerodrome to the mine site.
- Mine equipment can be used for much of the aerodrome surface maintenance.
- A grader, dump trucks, and loaders from the mine or the mine road maintenance crews can be used for aerodrome snow removal and surface re-grading. A self-propelled compaction roller should be available on-site.
- Dust control can be managed using dust suppressants, such as EK35. A water tanker/distributor and operator should be available if dust suppressors are deemed to be too expensive.
- Provide a service pick-up truck for runway inspections which should include runway surface friction index equipment. The aerodrome operator will relay the friction index data to pilots.
- Mine trucks and a loader equipped with a baggage box can be used to load and transfer passenger baggage and air freight.
- A trained radio operator should be at site prior to the flight leaving its originating airport and remaining until the flight has landed and departed. This will allow the operator to relay weather and altimeter information to the pilots prior to, during, and after departure (in case an emergency return is required).

## 7.0 ESTIMATED QUANTITIES AND COSTS

We have estimated the project quantities based on the available information. The following information presents the summary of estimated project costs based on the components listed above. The detailed quantity/unit cost estimates are included in Appendix B.

**Table 7-1: Construction of the Big Bear Aerodrome - Estimated Costs**

Project Item	Estimated Cost
Civil Works	\$ 7,402,000
Airfield Lighting and Electrical Works	\$ 2,401,000
<b>TOTAL ESTIMATED COST WITH 35% CONTINGENCIES EXCLUDING TAXES</b>	<b>\$ 9,803,000</b>

The above are conceptual estimates of probable costs in CAD and are based on drawings and limited information available. The estimated cost is provided for budgetary purposes only. It is not to be interpreted as a guarantee by Tetra Tech of the actual project costs. The actual project costs shall be determined based on the final design as well as the procurement and construction process. Additional assumptions are listed in Appendix B.

## 8.0 NEXT STEPS AND PROJECT PRIORITIZATION

Following are our recommendations for aerodrome project prioritization and next steps:

1. New aerodrome consultation process with adjoining landowners in accordance with Transport Canada’s AC 307-001.
2. Retain an IAP designer to register the aerodrome and provide the design and approvals for the Instrument Approach Procedures with Nav Canada and Transport Canada.
3. Establish an AWOS on site. Collection of wind data at the site. Assess service interruptions due to excessive crosswinds.
4. LiDAR survey of the site and the approaches 3,000 m beyond the runway ends. The survey should be tied to at least two ground-based monuments on the aerodrome site to ensure accuracy and compliance for ground-based survey. The LiDAR survey should be processed into 3D Digital Terrain Models (DTM) with accompanying air photo information tied to the LiDAR data.
5. Hydrology/Hydraulic study to determine pipe sizing as well as the risks and mitigations to control drainage.
6. Site visit and runway assessment including a geotechnical investigation to confirm pavement structure design details to allow year-round operation of the runway.
7. Obstacle assessment and production of OLS obstruction charts to define obstacle free air space and any operational restrictions.
8. Discussions with Air Operators.

9. Develop a simple Land Use Plan (LUP) defining the development areas on the aerodrome including the Air Terminal Building (ATB), runway turn pads, drainage infrastructure, future hangar locations, and proposed perimeter and security fence line if required.
10. Preliminary and detailed design drawings, specifications, and procurement documents for the airfield upgrades including construction, electrical, and lighting but not including buildings.

## 9.0 CLOSURE

We trust this document meets your present requirements. If you have any questions or comments, please contact the undersigned.

Respectfully submitted,  
Tetra Tech Canada Inc.

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FILE: 221145-08-RPT-001  
FILE: 221145-08-RPT-001

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/tad

## REFERENCES

Transport Canada, 2015. *Aerodrome Standards and Recommended Practices – TP312 (5<sup>th</sup> Edition)*. Canadian Aviation Regulations standard published by Transport Canada. September 15<sup>th</sup>, 2015 (Updated 01/15/2020).

Transport Canada, 2017-11-10, AC\_307-001 - Canadian Aviation Regulation 307 – Aerodromes - Consultations

## APPENDIX A

### SITE PLAN, PROFILES AND AERODROME LIGHTING LAYOUT



CONSULTANTS

# AERODROME FEASIBILITY STUDY BIG BEAR CAMP

**PATTERSON LAKE SOUTH PROJECT, SASKATCHEWAN**  
**TRN.AIRP03677-01**

SEALS / STATUS



**AERODROME  
FEASIBILITY STUDY  
BIG BEAR CAMP**

**PATTERSON LAKE SOUTH PROJECT  
SASKATCHEWAN**


B	ISSUED FOR REVIEW	2022/07/07	L.M.
A	ISSUED FOR REVIEW	2022/05/20	L.M.

MARK	DESCRIPTION	DATE	APP'D
PROJECT NO : TRN.AIRP03677-01			
CONTRACT NO :			
DRAFTING BY : T.CLENDENING			
DESIGN BY : T.CLENDENING			
CHECKED BY : J.WILLMS/L.M.A			

**COVER SHEET**

SHEET ID  
**221145-00-CST-001**

**ISSUED FOR REVIEW**  
**JULY 7, 2022**

GENERAL

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- 221145-00-PLT-001 - OVERALL SITE PLAN

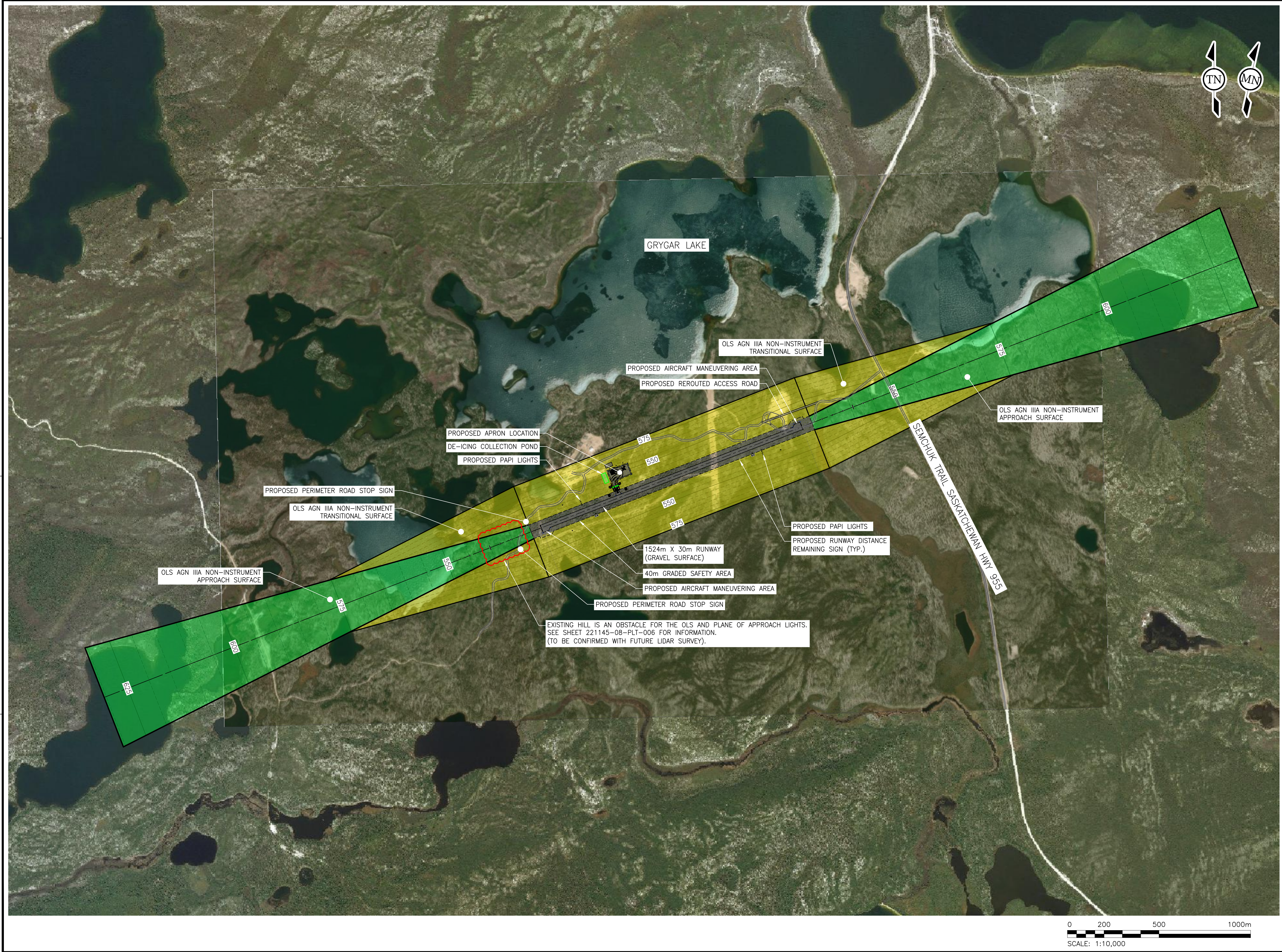
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- 221145-08-PLT-001 - RUNWAY GRADING PLAN
- 221145-08-PLT-002 - RUNWAY PLAN AND PROFILE
- 221145-08-PLT-003 - KEY PLAN CROSS SECTION
- 221145-08-PLT-004 - LIGHTING PLAN
- 221145-08-PLT-005 - TREE CLEARING
- 221145-08-PLT-006 - OLS WEST APPROACH MOUNTAIN CLEARING PLAN
- 221145-08-DET-001 - RUNWAY AND APRON CROSS SECTIONS
- 221145-08-DET-002 - TYPICAL DETAILS AND CROSS SECTIONS

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ISSUED FOR REVIEW

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CONSULTANTS

SEALS / STATUS

FOR DISCUSSION  
 PURPOSES ONLY  
**DRAFT**



**AERODROME  
 FEASIBILITY STUDY  
 BIG BEAR CAMP**

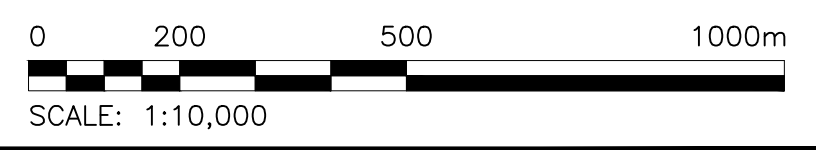
**PATTERSON LAKE SOUTH PROJECT  
 SASKATCHEWAN**


B	ISSUED FOR REVIEW	2022/07/07	L.M.
A	ISSUED FOR REVIEW	2022/05/20	L.M.

MARK	DESCRIPTION	DATE	APP'D
PROJECT NO : TRN.AIRP03677-01			
CONTRACT NO :			
DRAFTING BY : T.CLENDENING			
DESIGN BY : T.CLENDENING			
CHECKED BY : J.WILLMS/L.M.A			

**OVERALL SITE  
 PLAN**

SHEET ID  
**221145-00-PLT-001**



ISSUED FOR REVIEW

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CONSULTANTS

SEALS / STATUS



**AERODROME  
 FEASIBILITY STUDY  
 BIG BEAR CAMP**

**PATTERSON LAKE SOUTH PROJECT  
 SASKATCHEWAN**


B	ISSUED FOR REVIEW	2022/07/07	L.M.
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A	ISSUED FOR REVIEW	2022/05/20	L.M.
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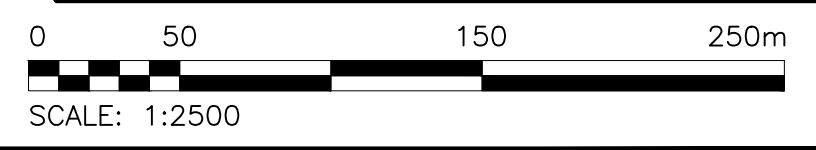
DRAFTING BY : T.CLENDENING

DESIGN BY : T.CLENDENING

CHECKED BY : J.WILLMS/LMA

**LEGEND**

- PROP. NEW RUNWAY/APRON
- PROP. MAJOR CONTOUR (1.0m INTERVAL)
- PROP. MINOR CONTOUR (0.2m INTERVAL)
- EX. MAJOR CONTOUR (1.0m INTERVAL)
- EX. MINOR CONTOUR (0.2m INTERVAL)



**RUNWAY  
 GRADING PLAN**

SHEET ID  
**221145-08-PLT-001**

50 mm

ISSUED FOR REVIEW

CONSULTANTS

SEALS / STATUS



**AERODROME  
FEASIBILITY STUDY  
BIG BEAR CAMP**

**PATTERSON LAKE SOUTH PROJECT  
SASKATCHEWAN**


MARK	DESCRIPTION	DATE	APP'D
B	ISSUED FOR REVIEW	2022/07/07	L.M.
A	ISSUED FOR REVIEW	2022/05/20	L.M.

PROJECT NO : TRN.AIRP03677-01

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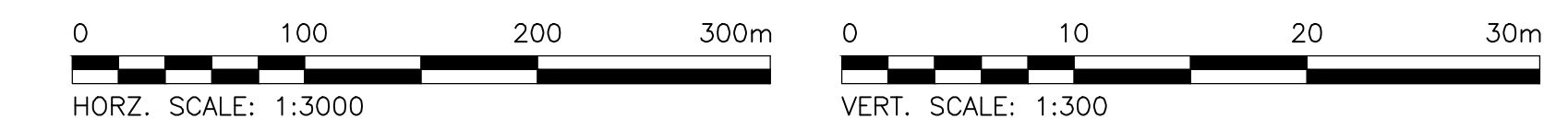
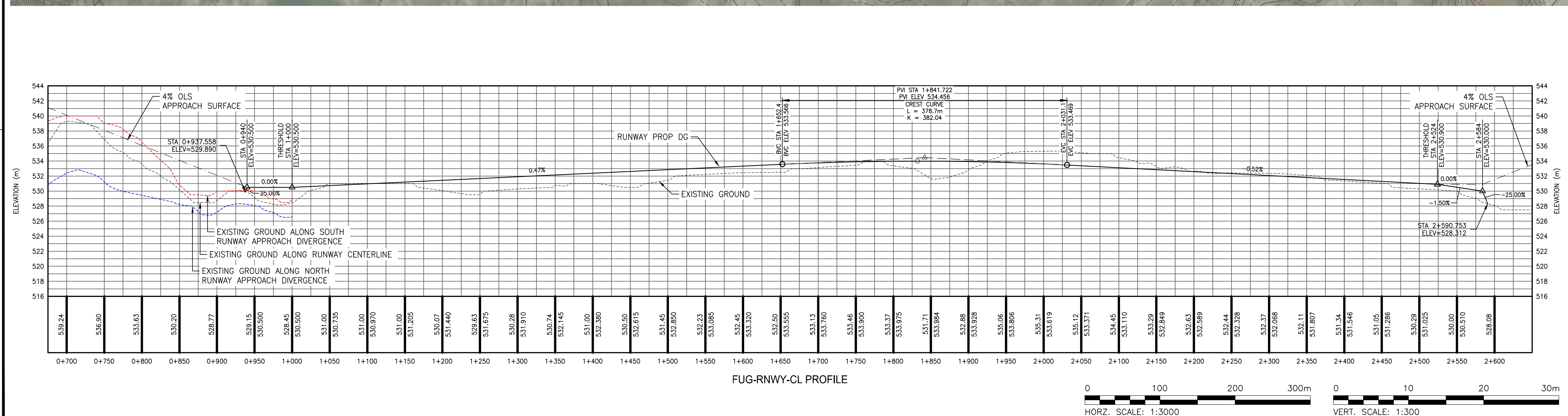
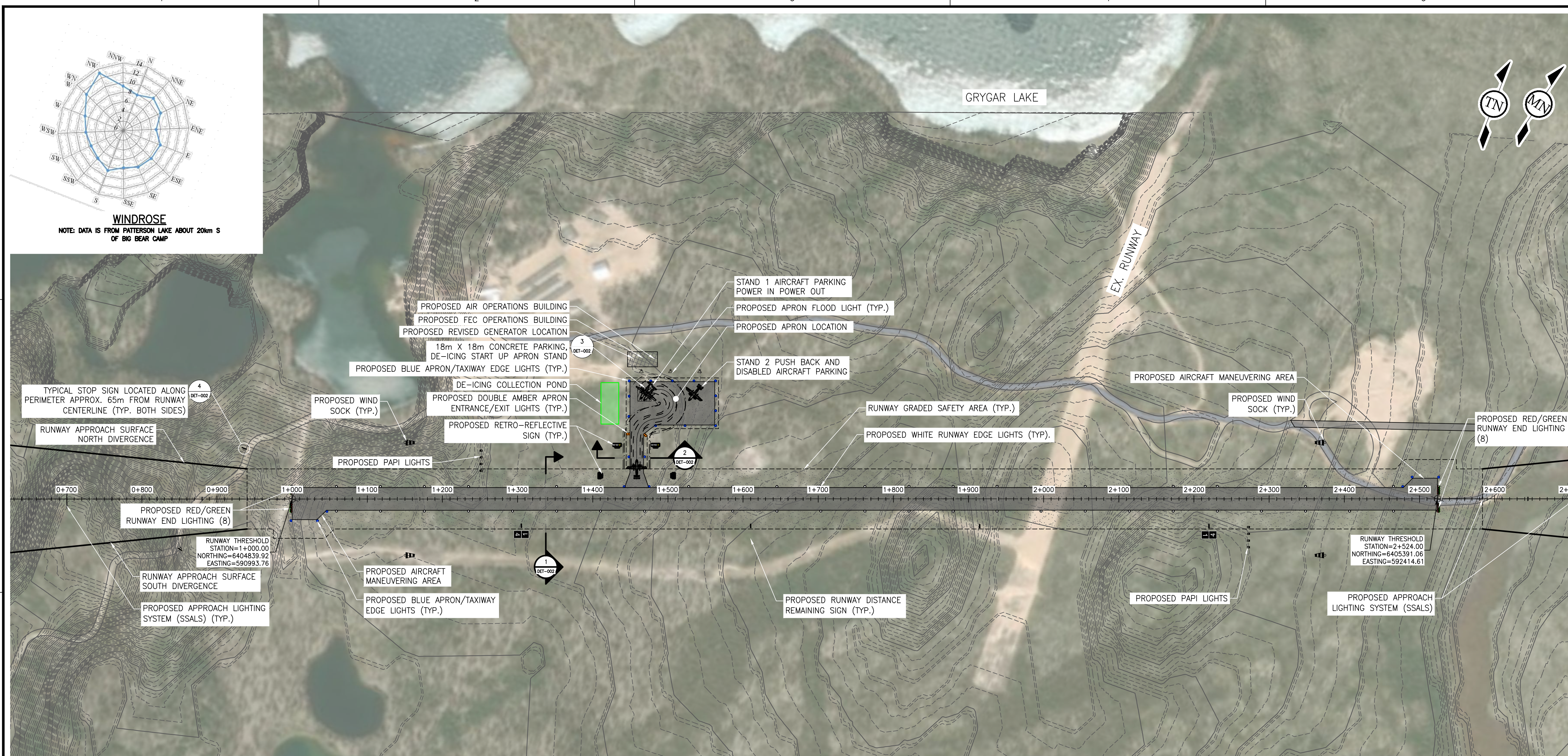
CHECKED BY : J.WILLMS/L.M.A

**RUNWAY  
PLAN AND PROFILE**

SHEET ID  
**221145-08-PLT-002**

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ISSUED FOR REVIEW



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1 2 3 4 5

GRYGAR LAKE



CONSULTANTS

SEALS / STATUS



### AERODROME FEASIBILITY STUDY BIG BEAR CAMP

PATTERSON LAKE SOUTH PROJECT  
SASKATCHEWAN


B	ISSUED FOR REVIEW	2022/07/07	L.M.
A	ISSUED FOR REVIEW	2022/05/20	L.M.

MARK	DESCRIPTION	DATE	APP'D

PROJECT NO : TRN.AIRP03677-01

CONTRACT NO :

DRAFTING BY : T.CLENDENING

DESIGN BY : T.CLENDENING

CHECKED BY : J.WILLMS/L.M.A

### KEY PLAN FOR RUNWAY AND APRON CROSS SECTIONS

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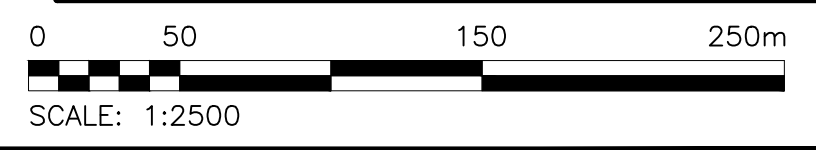
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ISSUED FOR REVIEW



**LEGEND**

- PROP. NEW RUNWAY/APRON
- PROP. MAJOR CONTOUR (1.0m INTERVAL)
- PROP. MINOR CONTOUR (0.2m INTERVAL)
- EX. MAJOR CONTOUR (1.0m INTERVAL)
- EX. MINOR CONTOUR (0.2m INTERVAL)



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CONSULTANTS

SEALS / STATUS



**AERODROME  
FEASIBILITY STUDY  
BIG BEAR CAMP**

**PATTERSON LAKE SOUTH PROJECT  
SASKATCHEWAN**

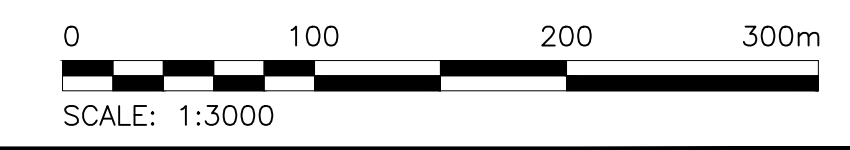

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MARK	DESCRIPTION	DATE	APP'D
PROJECT NO : TRN.AIRP03677-01			
CONTRACT NO :			
DRAFTING BY : T.CLENDENING			
DESIGN BY : T.CLENDENING			
CHECKED BY : J.WILLMS/L.M.A			

**RUNWAY  
LIGHTING PLAN**

SHEET ID  
**221145-08-PLT-004**

ISSUED FOR REVIEW



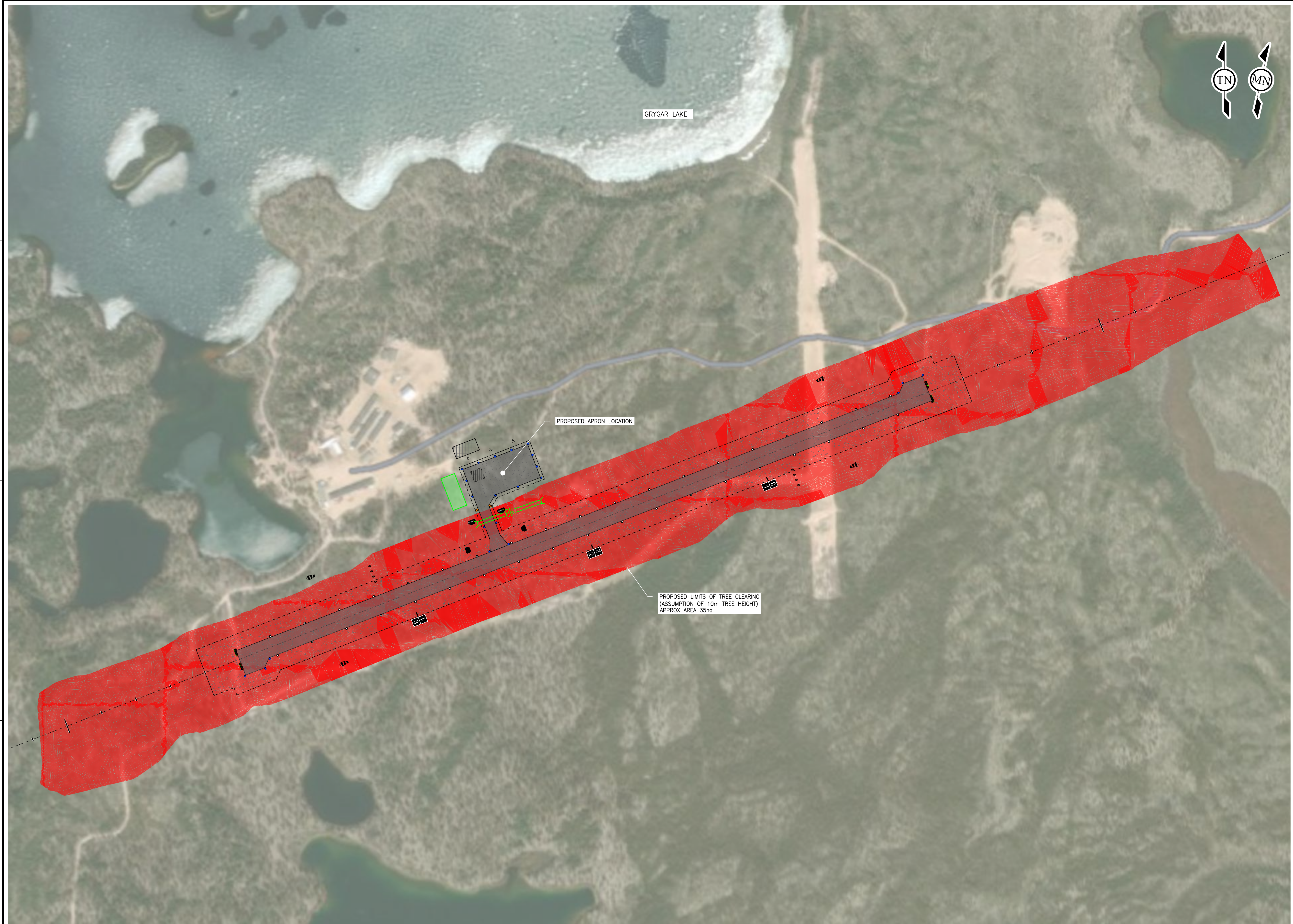
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1 2 3 4 5

1 2 3 4 5

50 mm

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CONSULTANTS

SEALS / STATUS

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 PURPOSES ONLY



**AERODROME  
 FEASIBILITY STUDY  
 BIG BEAR CAMP**

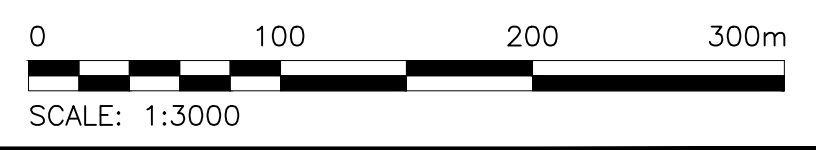
**PATTERSON LAKE SOUTH PROJECT  
 SASKATCHEWAN**


B	ISSUED FOR REVIEW	2022/07/07	L.M.
A	ISSUED FOR REVIEW	2022/05/20	L.M.

MARK	DESCRIPTION	DATE	APP'D
PROJECT NO : TRN.AIRP03677-01			
CONTRACT NO :			
DRAFTING BY : T.CLENDENING			
DESIGN BY : T.CLENDENING			
CHECKED BY : J.WILLMS/L.M.A			

**TREE CLEARING  
 PLAN**

SHEET ID  
**221145-08-PLT-005**



ISSUED FOR REVIEW

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SSALS APPROACH LIGHTING CLEARING AREA  
 APPROX. AREA: 10,500m<sup>2</sup>  
 APPROX. VOLUME: 10,300m<sup>3</sup>

OLS APPROACH CLEARING AREA  
 APPROX. AREA: 2,400m<sup>2</sup>  
 APPROX. VOLUME: 600m<sup>3</sup>



CONSULTANTS

SEALS / STATUS

FOR DISCUSSION  
 DRAFT  
 PURPOSES ONLY



**AERODROME  
 FEASIBILITY STUDY  
 BIG BEAR CAMP**

**PATTERSON LAKE SOUTH PROJECT  
 SASKATCHEWAN**


A	ISSUED FOR REVIEW	2022/07/07	L.M.
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MARK DESCRIPTION DATE APP'D

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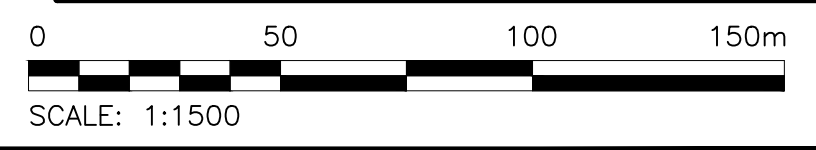
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**OLS WEST APPROACH  
 MOUNTAIN CLEARING PLAN**

SHEET ID  
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**LEGEND**

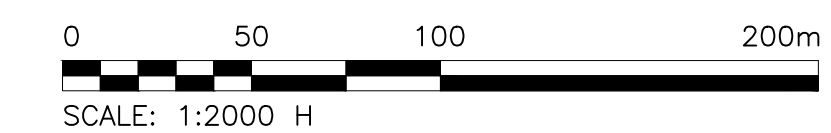
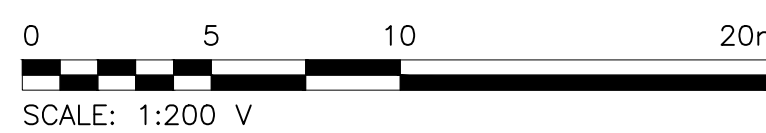
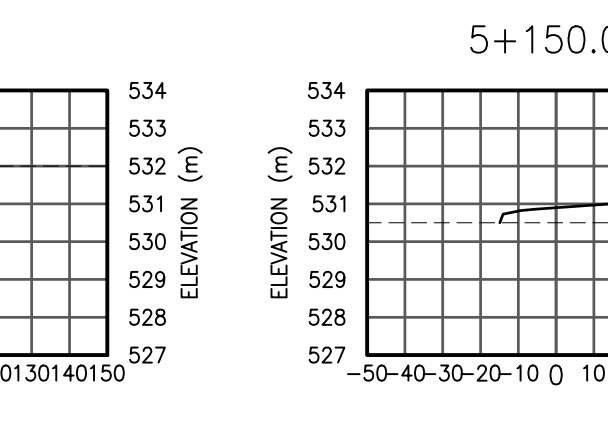
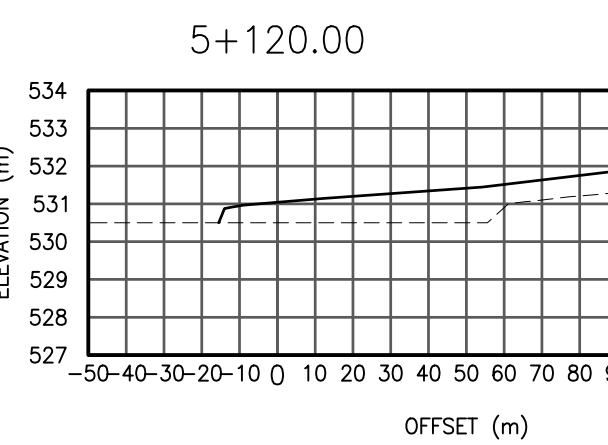
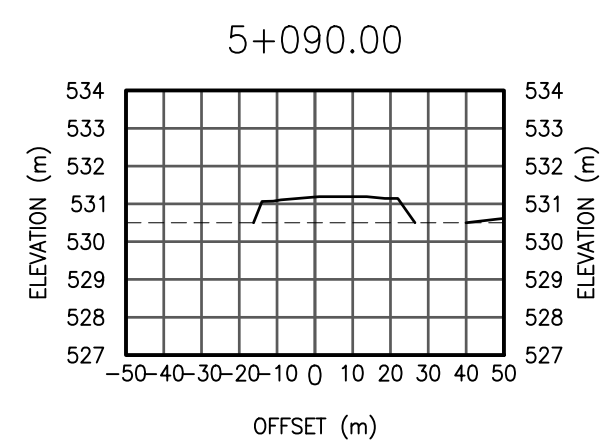
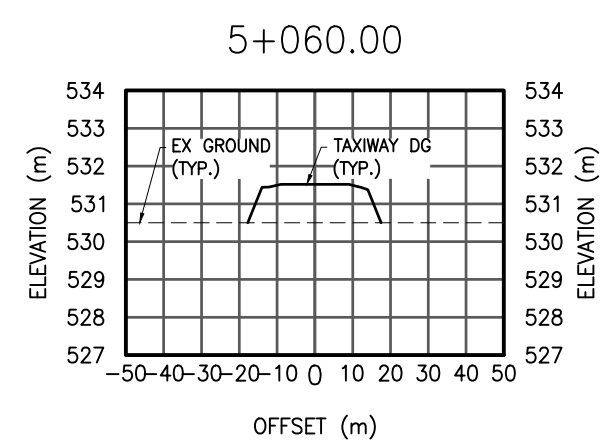
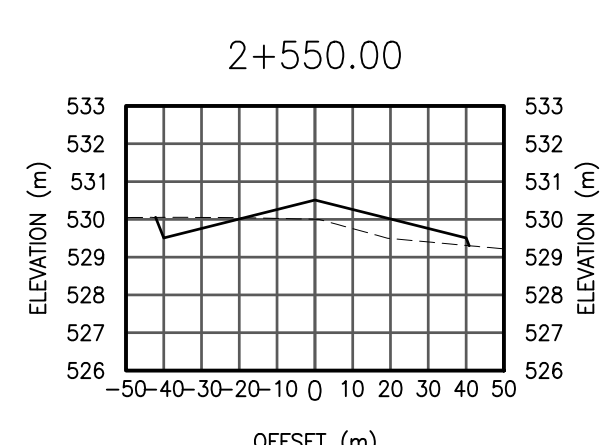
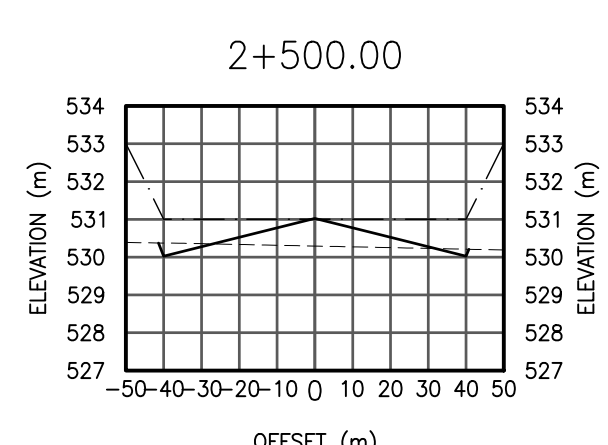
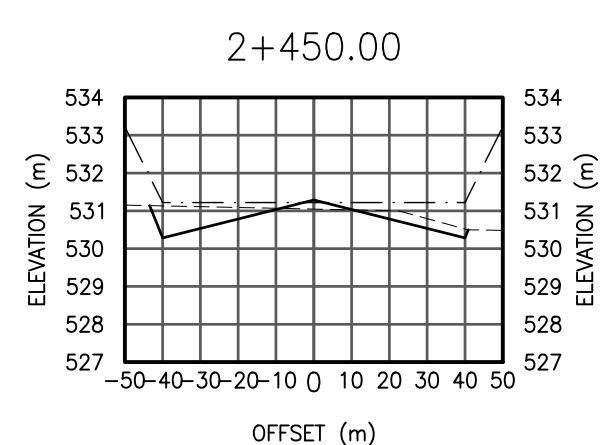
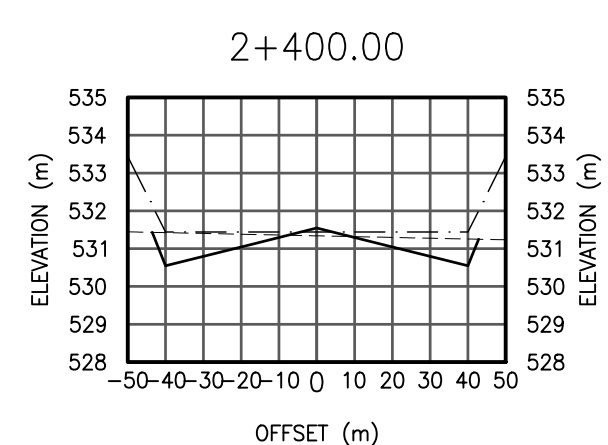
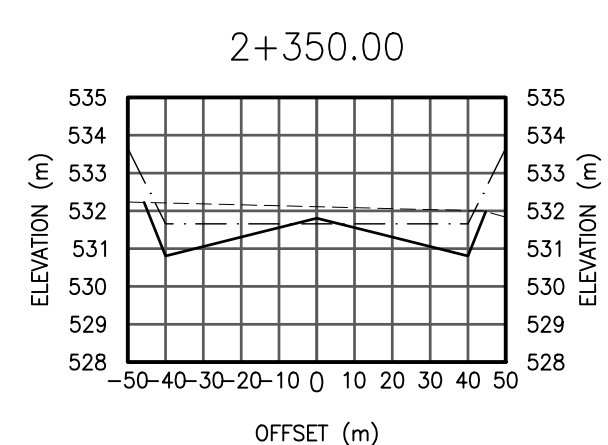
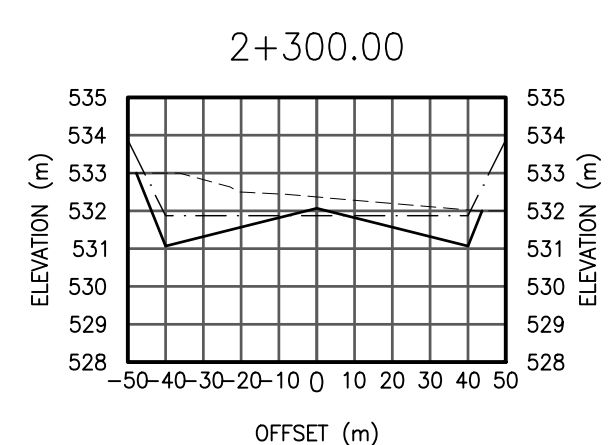
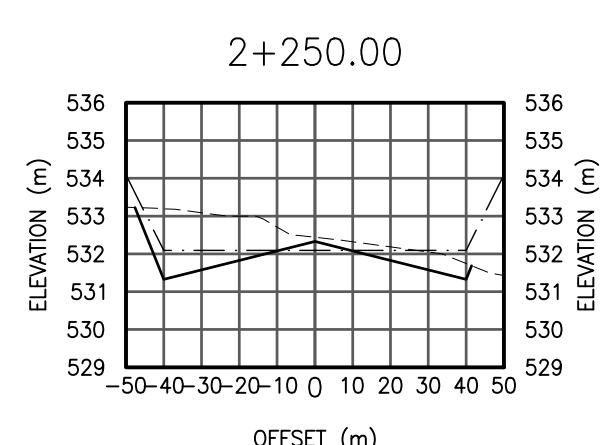
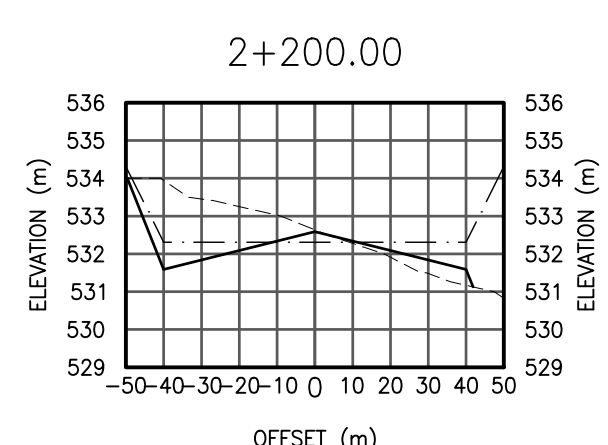
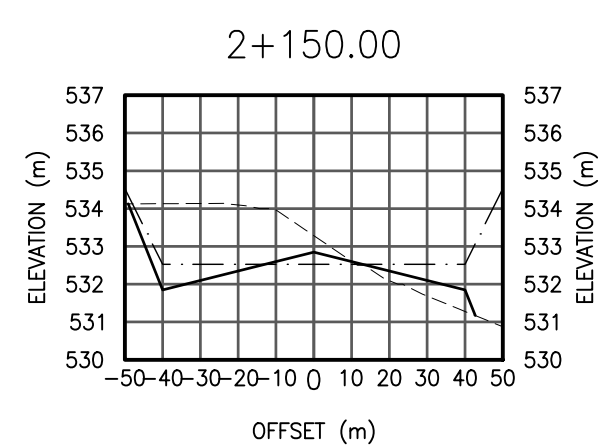
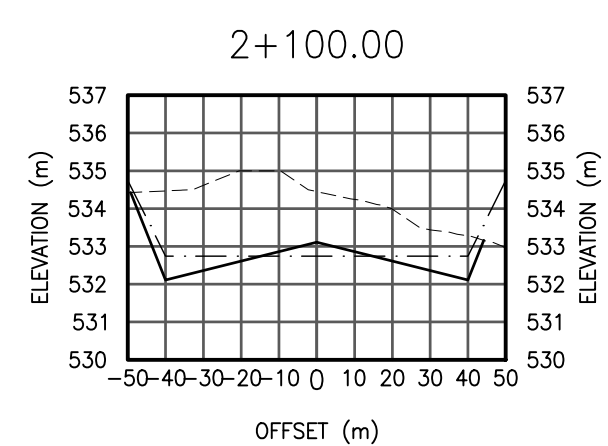
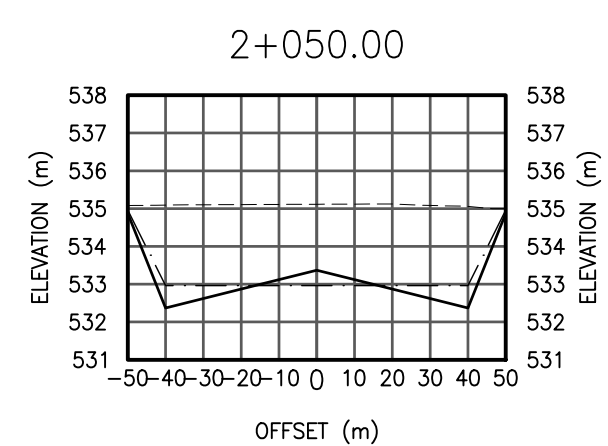
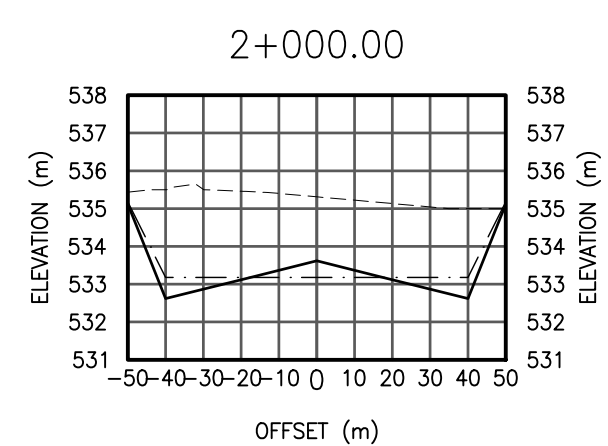
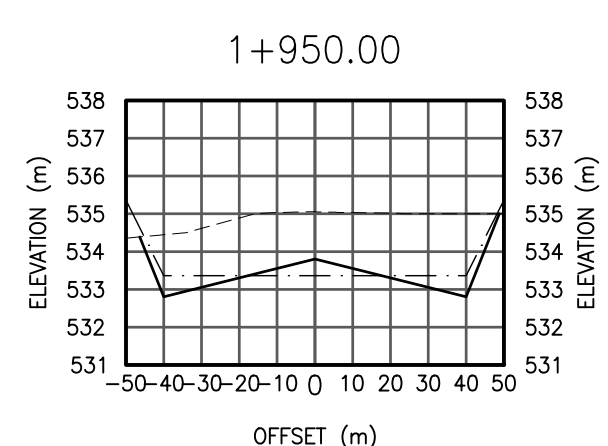
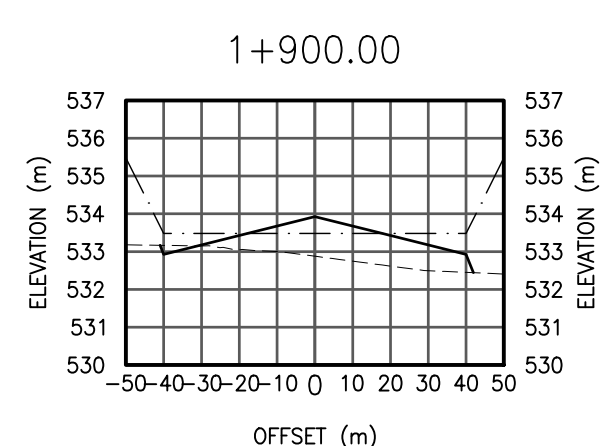
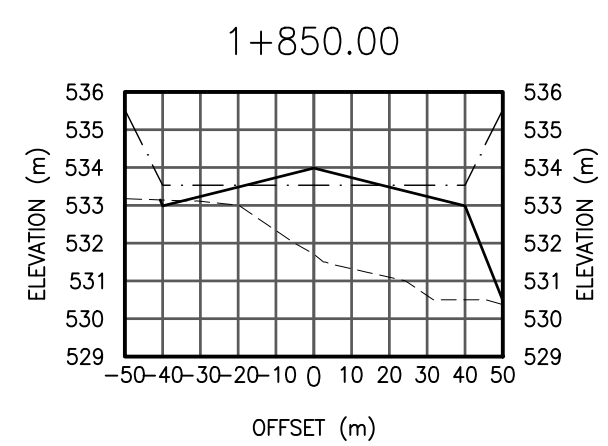
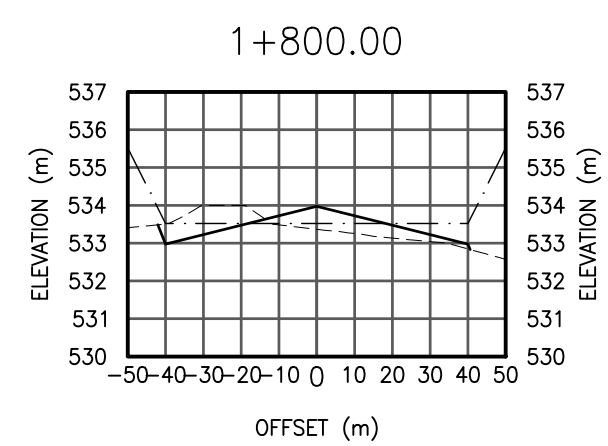
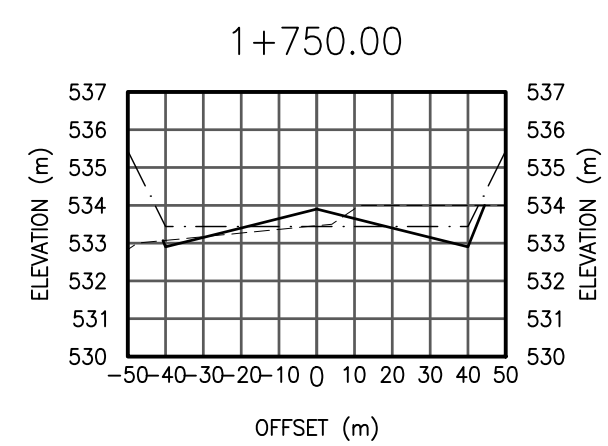
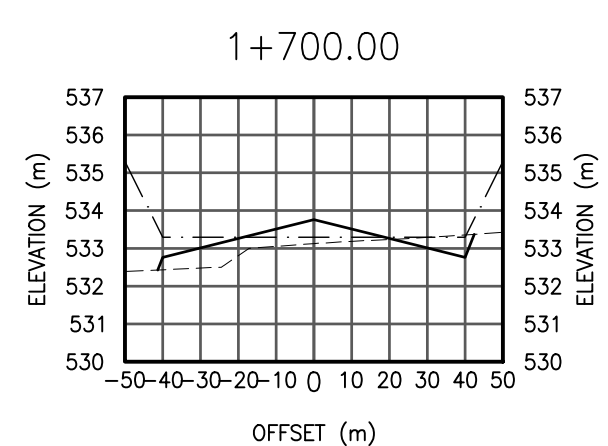
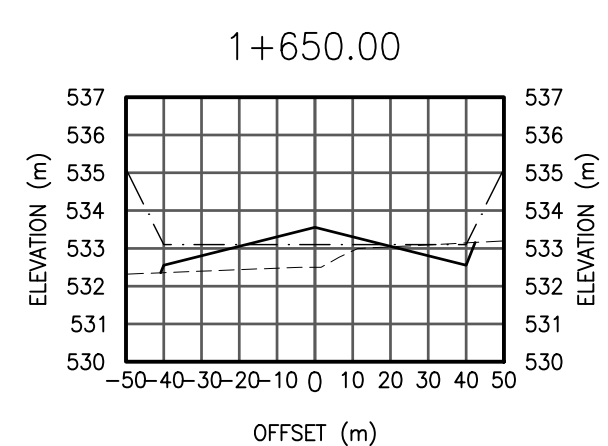
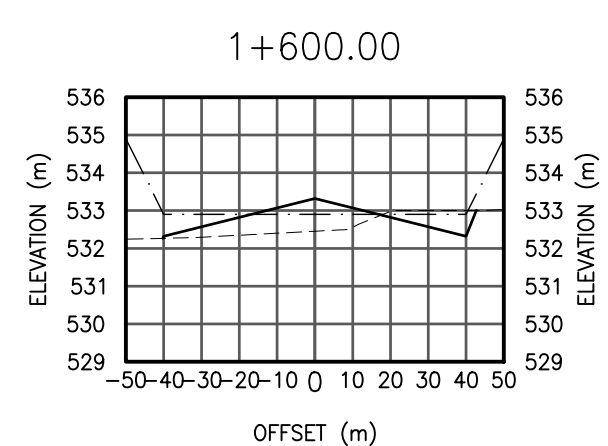
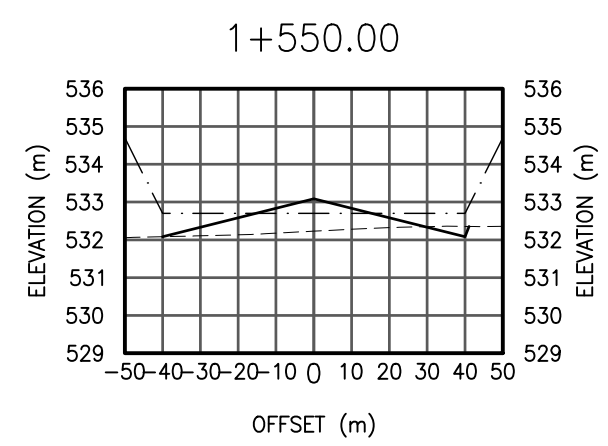
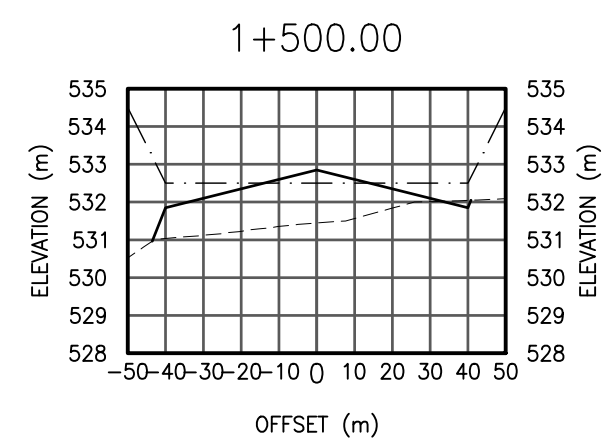
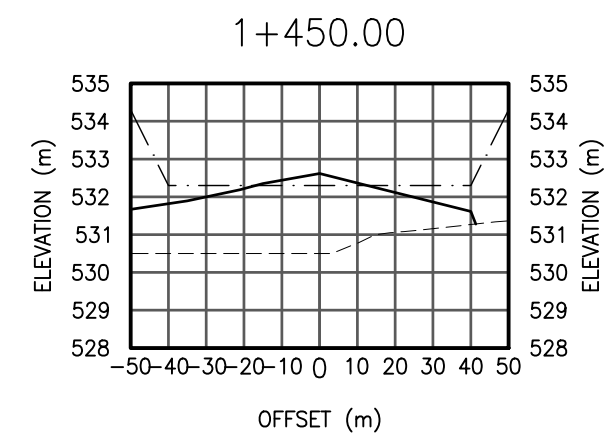
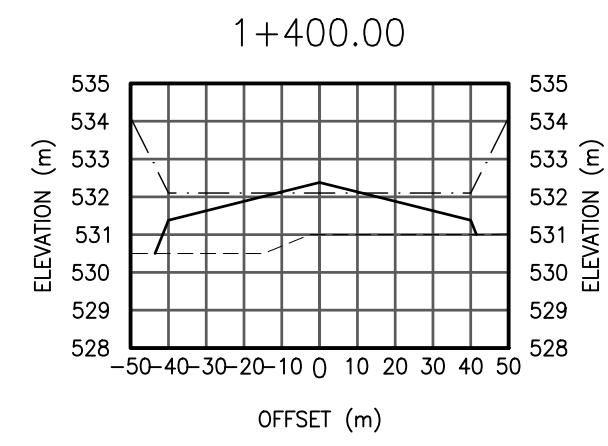
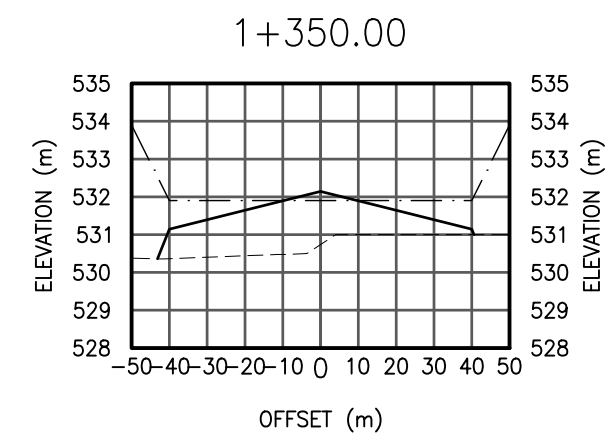
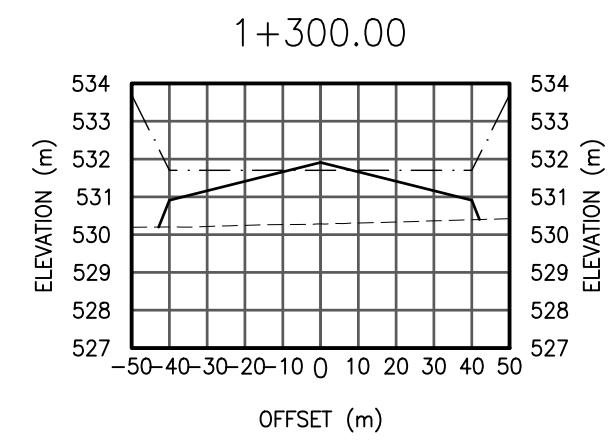
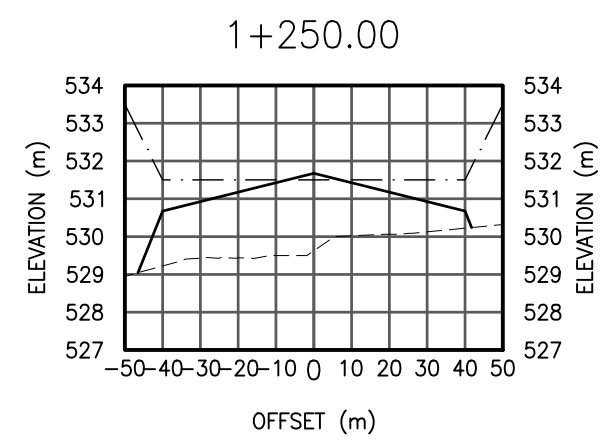
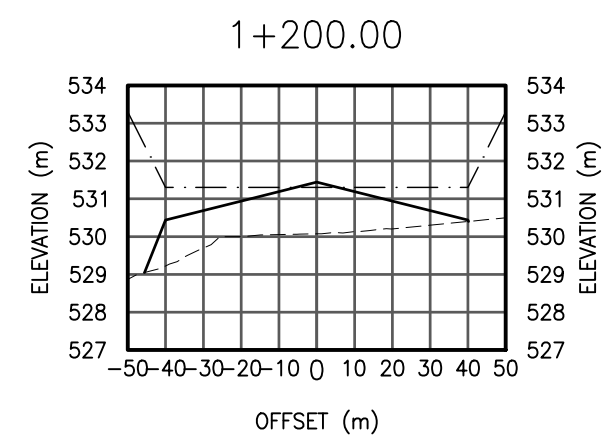
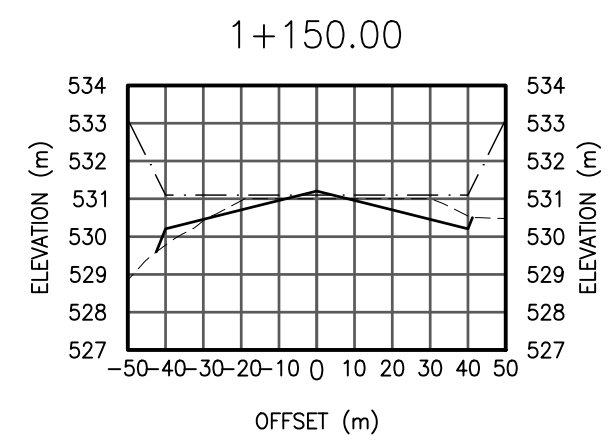
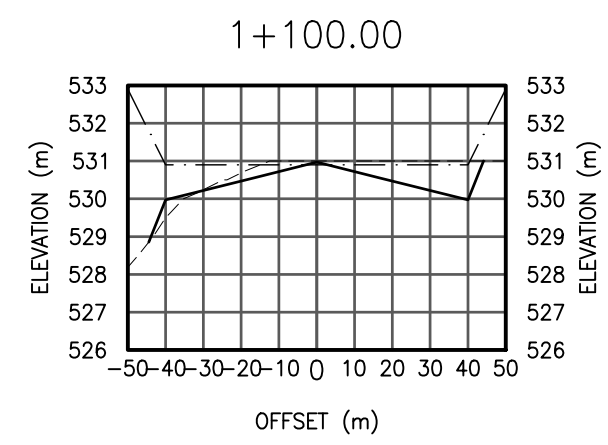
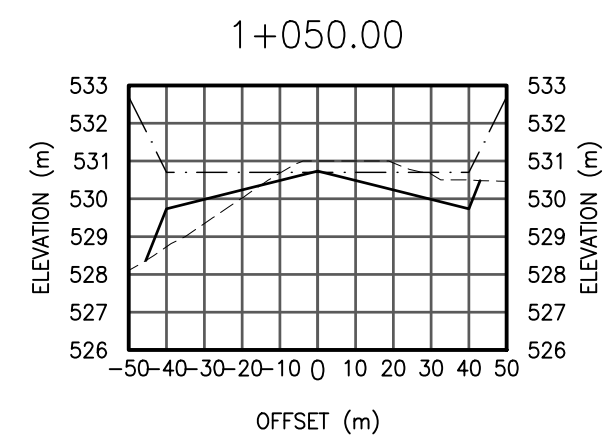
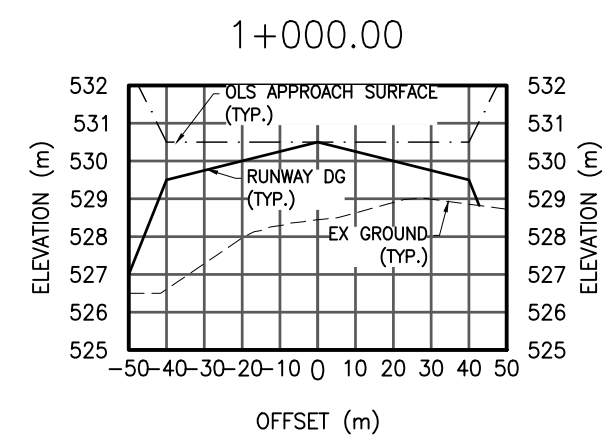
- PROP. NEW RUNWAY/APRON
- SSALS APPROACH LIGHT CLEARING AREA
- OLS APPROACH CLEARING AREA
- PROP. OLS MAJOR CONTOUR (25m INTERVAL)
- PROP. OLS MINOR CONTOUR (5m INTERVAL)
- EX. MAJOR CONTOUR (1.0m INTERVAL)
- EX. MINOR CONTOUR (0.2m INTERVAL)



50 mm

ISSUED FOR REVIEW

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CONSULTANTS

SEALS / STATUS



**AERODROME  
 FEASIBILITY STUDY  
 BIG BEAR CAMP**

**PATTERSON LAKE SOUTH PROJECT  
 SASKATCHEWAN**


B	ISSUED FOR REVIEW	2022/07/07	L.M.
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A	ISSUED FOR REVIEW	2022/05/20	L.M.
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MARK	DESCRIPTION	DATE	APP'D
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PROJECT NO : TRN.AIRP03677-01

CONTRACT NO :

DRAFTING BY : T.CLENDENING

DESIGN BY : T.CLENDENING

CHECKED BY : J.WILLMS/LMA

**RUNWAY AND APRON  
 CROSS SECTIONS**

SHEET ID  
**221145-08-DET-001**

50 mm

ISSUED FOR REVIEW

CONSULTANTS

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FOR DISCUSSION  
DRAFT  
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**AERODROME  
FEASIBILITY STUDY  
BIG BEAR CAMP**

**PATTERSON LAKE SOUTH PROJECT  
SASKATCHEWAN**

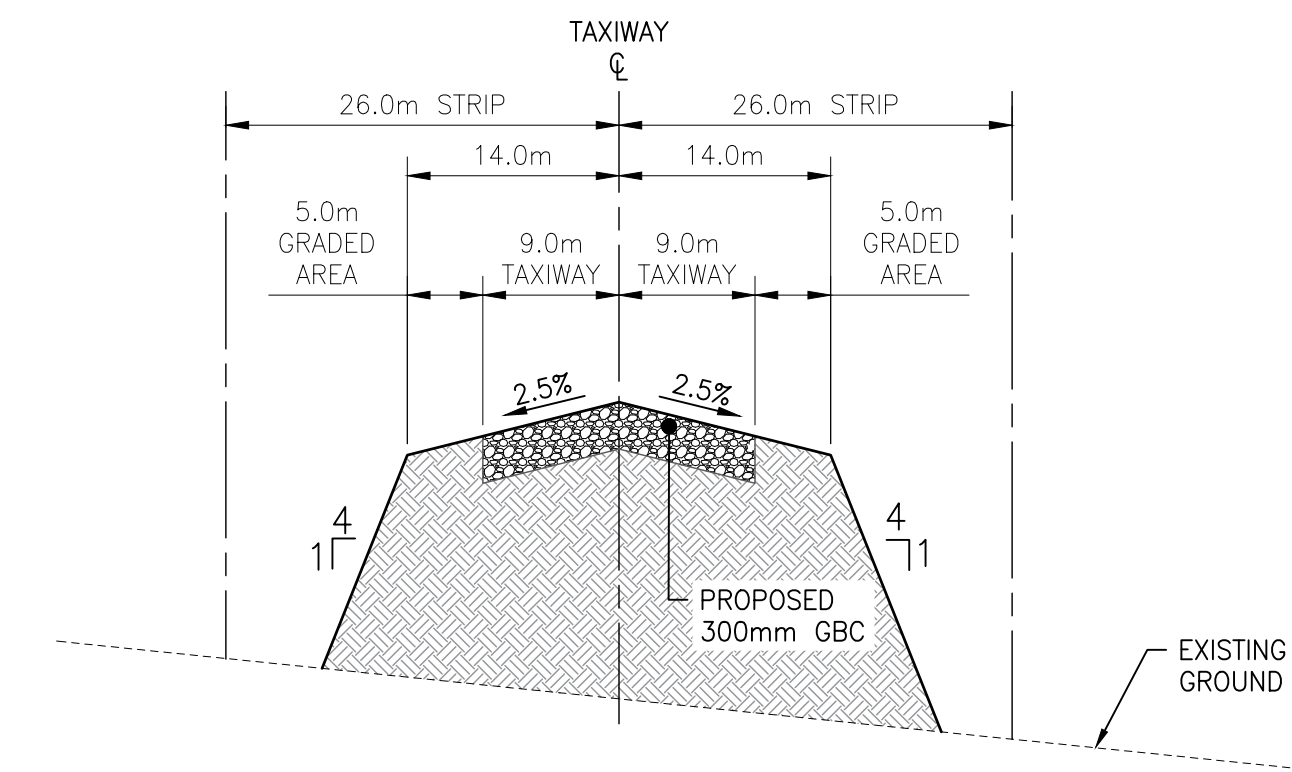

B	ISSUED FOR REVIEW	2022/07/07	L.M.
A	ISSUED FOR REVIEW	2022/05/20	L.M.

MARK	DESCRIPTION	DATE	APP'D
PROJECT NO : TRN.AIRP03677-01			
CONTRACT NO :			
DRAFTING BY : T.CLENDENING			
DESIGN BY : T.CLENDENING			
CHECKED BY : J.WILLMS/L.M.A			

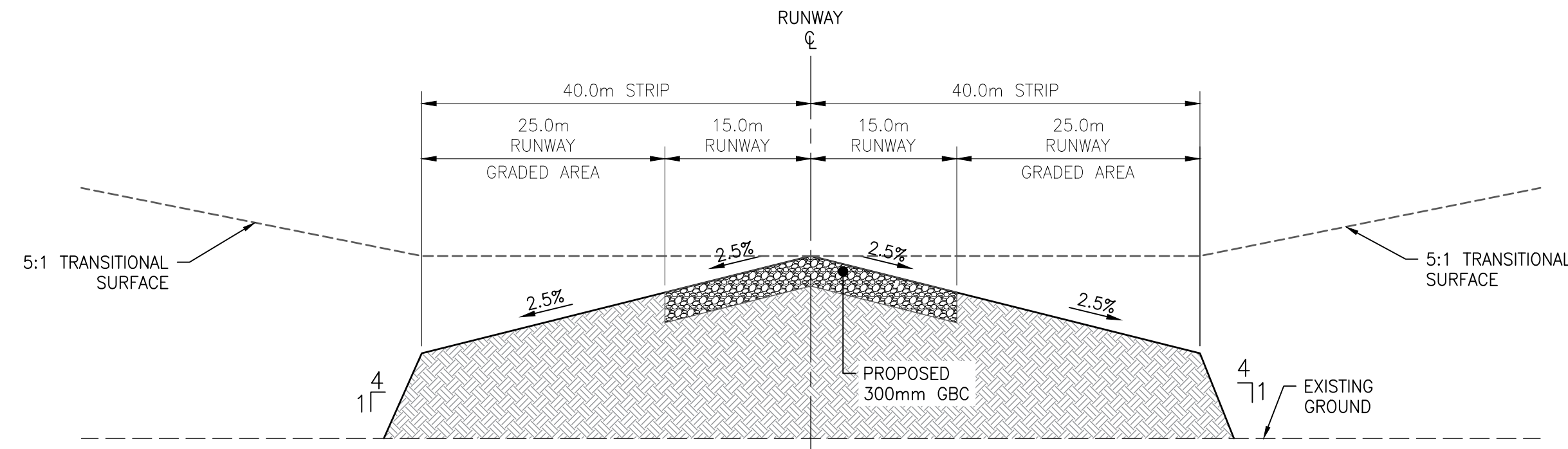
**TYPICAL DETAILS  
AND CROSS SECTIONS**

SHEET ID  
**221145-08-DET-002**

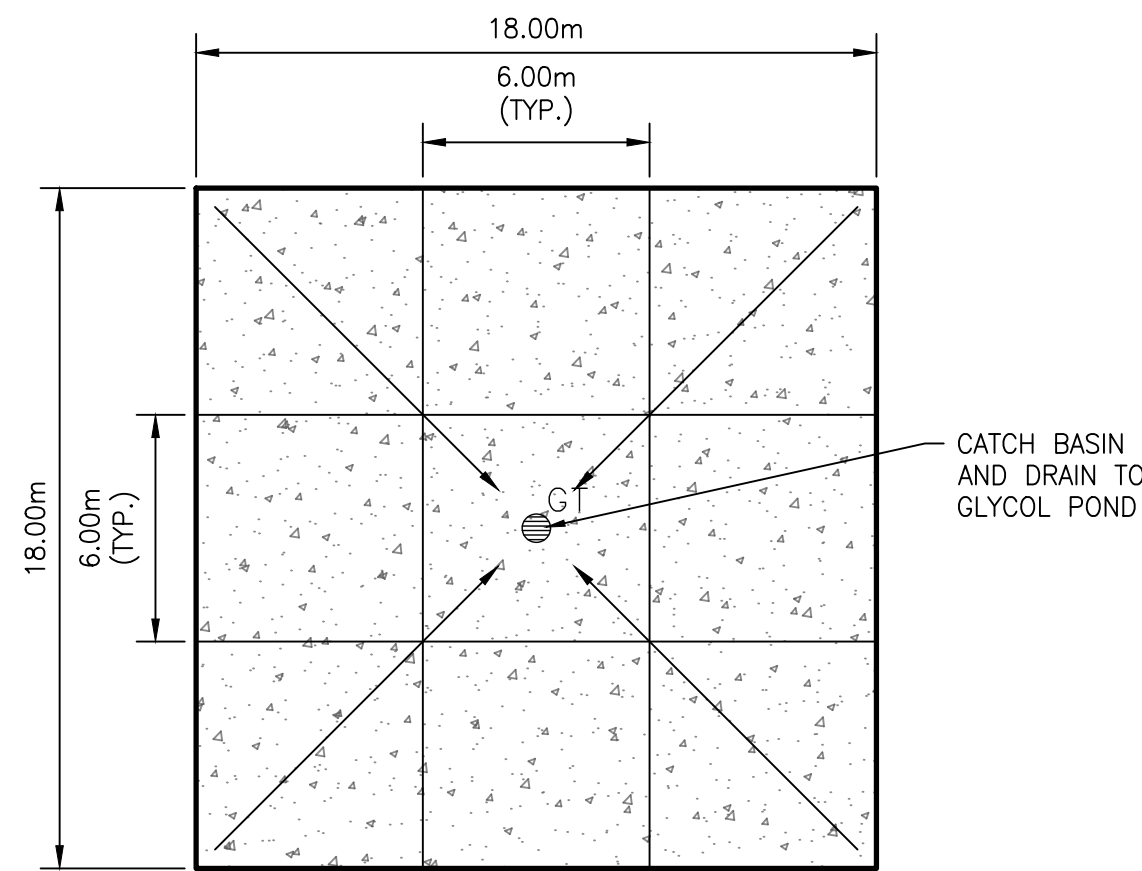
ISSUED FOR REVIEW



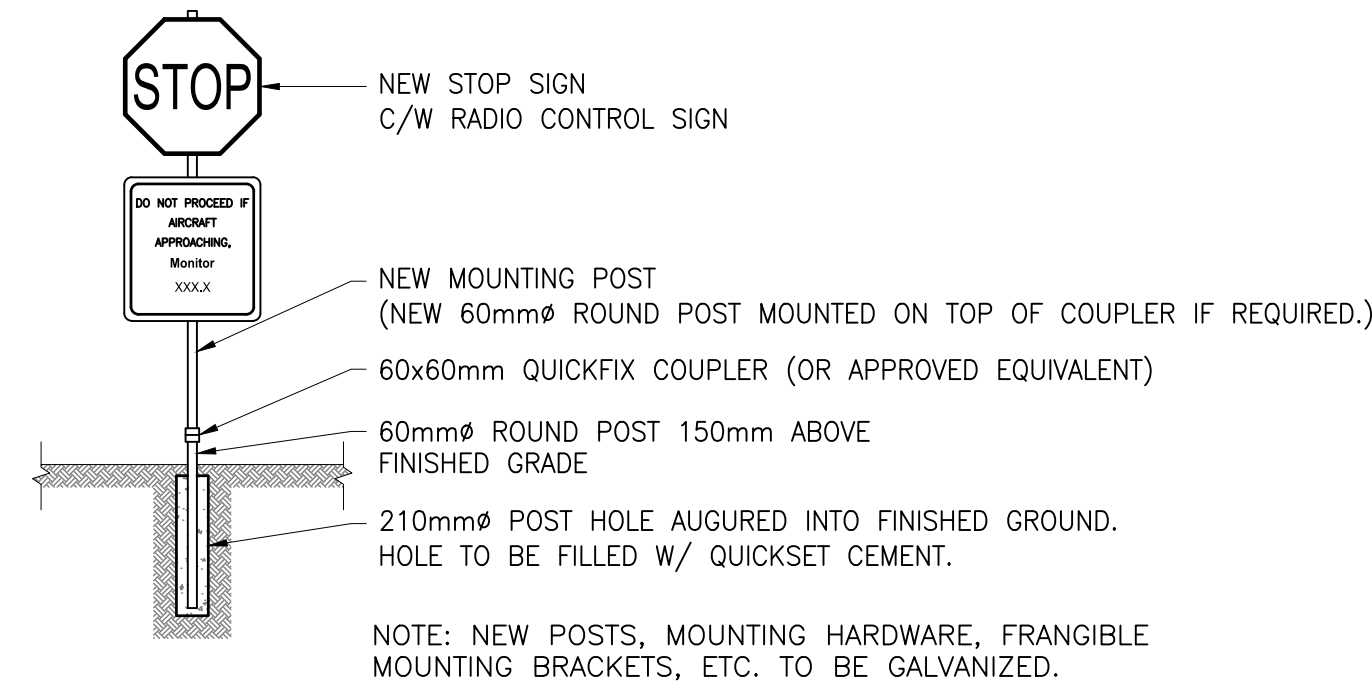
**2 TAXIWAY TYPICAL SECTION DETAIL**  
PLT-002 SCALE: 1:500



**1 RUNWAY TYPICAL SECTION DETAIL**  
PLT-002 SCALE: 1:500



**3 CONCRETE PAD DETAIL**  
PLT-002 SCALE: 1:200



**4 TYPICAL STOP SIGN DETAIL**  
PLT-002 SCALE: 1:50

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## APPENDIX B

### COST ESTIMATE DETAILS



Date: 2022/5/20 Issued for Review Document No. 221145-08-RPT-001 REV B	<b>ENGINEER'S ESTIMATE</b>
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Item				TOTAL
1	Civil Works			\$ 5,483,100.00
2	Airfield Lighting & Electrical Works			\$ 1,778,700.00
	<b>Sub Total</b>			\$ 7,261,800.00
	<b>Contingencies (35%)</b>			\$ 2,541,630.00
	<b>Total Estimate</b>			\$ <b>9,803,430.00</b>

1	Civil Works	Unit	Quantity	Unit Price	Total
1.1	Mobilization / Demobilization / Quality Control (Assume 10%)	LS	1	\$500,000.00	\$ 500,000.00
1.2	Construction/As-built survey	LS	1	\$50,000.00	\$ 50,000.00
1.3	Tree Clearing	Ha	35	\$25,000.00	\$ 875,000.00
1.4	Stripping	M2	65500	\$4.00	\$ 262,000.00
1.5	Earthworks, Cut to Fill with Grading and Compaction	M3	35900	\$12.00	\$ 430,800.00
1.6	Earthworks, Cut to Haul off site	M3	29800	\$12.00	\$ 357,600.00
1.7	Install Granular Subbase (material from ex. Borrow); Use as structural fill for Runway, Taxiway, Apron	M3	26400	\$40.00	\$ 1,056,000.00
1.8	Produce and Install 19mm Granular Base for Runway, Taxiway, Apron, Safety Areas	M3	19600	\$90.00	\$ 1,764,000.00
1.9	Concrete Apron Hardstand (18m x 18m)	M2	324	\$425.00	\$ 137,700.00
1.10	Lined Sump for Glycol Collection on Apron	LS	1	\$50,000.00	\$ 50,000.00
<b>Total Section 1.0</b>					<b>\$ 5,483,100.00</b>

2	Airfield Lighting & Electrical Works	Unit	Quantity	Unit Price	Total
2.1	Electrical Mobilization / Demobilization / General Conditions / Etc. (Assume 10%)	LS	1	\$150,000.00	\$ 150,000.00
2.2	Testing and Commissioning, O&M Manuals	LS	1	\$6,500.00	\$ 6,500.00
2.3	Spare Parts	LS	1	\$5,000.00	\$ 5,000.00
2.4	Trenching c/w 1-50mm RPVC Duct (0.6 m Deep)	LM	1,400	\$65.00	\$ 91,000.00
2.5	Trenching c/w 2-50mm RPVC Duct (0.6 m. Deep)	LM	2,600	\$80.00	\$ 208,000.00
2.6	Trenching, c/w 4-50mm RPVC Concrete Encased (0.9 m. Deep)	LM	75	\$300.00	\$ 22,500.00
2.7	Supply, install, and connect pullpit	EA	70	\$900.00	\$ 63,000.00
2.8	Supply, install, and connect 1-1/C, #8 5kV ASLC in Duct	LM	8,000	\$5.00	\$ 40,000.00
2.9	Supply, install, and connect Runway Edge Light (Clear)	EA	22	\$1,500.00	\$ 33,000.00
2.10	Supply, install, and connect Runway Edge Light (Clear/Yellow)	EA	18	\$1,500.00	\$ 27,000.00
2.11	Supply, install, and connect Runway Threshold/End Light (Green/Red)	EA	24	\$1,800.00	\$ 43,200.00
2.12	Supply, install, and connect Taxiway/Apron Edge Light (Blue)	EA	14	\$1,500.00	\$ 21,000.00
2.13	Supply, install, and connect Taxiway/Apron Edge Light (Yellow)	EA	4	\$1,500.00	\$ 6,000.00
2.14	Supply, install, and connect Illuminated Windcone	EA	2	\$15,000.00	\$ 30,000.00
2.15	Supply, install, and connect Distance-To-Go (DTG) Sign	EA	3	\$6,500.00	\$ 19,500.00
2.16	Supply, install, and connect Airfield Sign (Hold, Directional)	EA	4	\$7,500	\$ 30,000.00
2.17	Supply, install, and connect 4-Unit PAPI System	SYSTEM	2	\$35,000.00	\$ 70,000.00
2.18	Supply, install, and connect SSALS Approach Lighting	SYSTEM	2	\$225,000.00	\$ 450,000.00
2.19	Supply, install, and connect FEC c/w CCRs, Beacon, ARCAL	LS	1	\$250,000.00	\$ 250,000.00
2.20	Supply, install, and connect Diesel Generator, Fuel Tanks, and Transfer Switch	LS	1	\$175,000.00	\$ 175,000.00
2.21	Supply, install, and connect apron floodlight pole c/w fixtures.	EA	2	\$18,000.00	\$ 36,000.00
2.22	Supply install and connect FEC feeder cabling in duct to ATB and Generator	LS	1	\$2,000.00	\$ 2,000.00
<b>Total Section 2.0</b>					<b>\$ 1,778,700.00</b>

**Assumptions**

- ATB Not Included
- Based on 2022 Estimated Costs
- Does not include an AWOS
- Based on drawings included in Appendix A
- Does not include engineering fees or allowances for design/tender/construction management
- Does not include taxes.
- Does not include contingencies for safety/security/fencing/regulatory requirements/environmental requirements, project management, property acquisition (if require)
- Based on limited survey provided by Fission
- Does not include living costs/accommodations for the contractor
- Assumes work will be done by mine equipment already on site including crushers at the nearby pit.
- Does not include road relocation

## APPENDIX C

### TRANSPORT CANADA AC\_307-001



# Advisory Circular

**Subject: Canadian Aviation Regulation 307 – Aerodromes – Consultations**

Issuing Office:	Civil Aviation, Policy and Regulatory Services	Document No.:	AC 307-001
File Classification No.:	Z 5000-34	Issue No.:	01
RDIMS No.:	13058113-v5	Effective Date:	2017-11-10

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## 1.0 INTRODUCTION

- (1) This Advisory Circular (AC) is provided for information and guidance purposes to support Section 307 of the *Canadian Aviation Regulations*, Aerodromes – Consultations.

### 1.1 Purpose

- (1) The purpose of this document is to provide context and explanation of certain elements of CAR 307, *Aerodromes – Consultations* (the Regulation).

### 1.2 Applicability

- (1) This document applies anyone seeking to undertake an aerodrome work, as defined in the Regulation.

### 1.3 Description of Changes

- (1) Not applicable.

## 2.0 REFERENCES AND REQUIREMENTS

### 2.1 Reference Documents

- (1) It is intended that the following reference materials be used in conjunction with this document:  
(a) *Canadian Aviation Regulation* - Subpart III - Section 307 - Aerodromes – Consultations.

### 2.2 Cancelled Documents

- (1) Not applicable.

### 2.3 Definitions and Abbreviations

- (1) The following **definitions** are used in this document:
- (a) **aerodrome work** means work, other than work necessary to comply with a new requirement imposed by or under the *Aeronautics Act*, carried out for any of the following purposes:
    - (i) building a new aerodrome; or
    - (ii) at an existing aerodrome,
      - (A) building a new runway for aeroplanes, or
      - (B) increasing the length of an existing runway for aeroplanes by 100 m or by 10%, whichever is greater.
  - (b) **proponent** means a person who proposes to carry out aerodrome work.
  - (c) **protected area** means a natural area or habitat that is protected by or under federal legislation.
- (2) The following **abbreviations** are used in this document:
- (a) **CAR**: *Canadian Aviation Regulation*
  - (b) **PRS**: Policy and Regulatory Services at TCCA
  - (c) **TC**: Transport Canada
  - (d) **TCCA**: Transport Canada Civil Aviation

### 3.0 BACKGROUND

- (1) The Aerodrome Work Consultations Regulation - CAR 307 - was born out of the concerns raised by interested parties adversely affected by aerodrome developments, by proponents frustrated by costly administrative and legal delay, and by the general aviation community concerned for their future in Canada. The nature of the concerns centred on improved communication in advance of construction between proponents of aerodrome developments and those most likely to be affected by such development. Requiring consultation in advance of commencing construction will allow for concerns to be proactively raised and mitigated.
- (2) Prior to the coming into force of CAR 307, the regulatory requirement to consult was limited to those seeking certification and, even then, they were only required to consult with local land use authorities [as per paragraphs 302.03(1)(a) and 305.08(1)(d)]. The CARs did not define what constituted meaningful consultation, which lead to inconsistent approaches and uncertainty around whether the requirement has been met.
- (3) CAR 307 broadens the requirement to consult to include anyone seeking to undertake a prescribed aerodrome work at a certified or non-certified aerodrome. Aerodrome work is defined in the Regulation as work, other than work necessary to comply with a new requirement imposed by or under the *Aeronautics Act*, carried out for any of the following purposes:
  - (a) building a new aerodrome; or
  - (b) at an existing aerodrome,
    - (i) building a new runway for aeroplanes, or
    - (ii) increasing the length of an existing runway for aeroplanes by 100 m or by 10%, whichever is greater.

The Regulation also provides minimum expectations for how the consultation should be conducted, including timelines, who to notify and under what circumstances.
- (4) The intent of the Regulation is to compel consultation in advance of an aerodrome work that will result in sustained and regular impact on interested parties as identified in the Regulation.
- (5) The following exclusions are outlined in the Regulation:
  - (a) Heliports and aerodromes primarily used for helicopter operations;
  - (b) Temporary aerodromes for the provision of emergency services such as forest fire suppression, medical necessity, law enforcement activities and search and rescue;
  - (c) Aerodromes used primarily for agricultural operations;
  - (d) Military aerodromes; and
  - (e) Water aerodromes.
- (6) A graphic organizer of the consultation process can be found in Appendix A of this document.

### 4.0 POINTS OF CONTACT FOR PROPONENTS AND STAKEHOLDERS

- (1) Whether it is the local municipality, a nearby airport, a piece of land under federal protection, the neighbors or the Crown, the proponent is responsible to correctly identify the specific individual or office that should receive the notification. It is recommended the proponent identify the points of contact during the planning or pre-consultation stage to ensure that all interested parties have the benefit of the full consultation period.

#### 4.1 Transport Canada

- (1) Proponents are required to contact TC to ensure there are no safety or other concerns with respect to the proposed aerodrome work.
- (2) Contact details for the Regional Offices of Transport Canada are as follows:

**Pacific Region**  
**Transport Canada, Civil Aviation**  
820-800 Burrard Street  
Vancouver BC V6Z 2J8  
Tel.: (604) 666-5575  
Fax: (604) 666-4839

**Prairie and Northern Region**  
**Transport Canada, Civil Aviation**  
**Street Address:**  
344 Edmonton Street, 1st Floor,  
Winnipeg MB R3B 2L4  
**Mailing Address:**  
P.O. Box 8550  
Winnipeg, MB R3C 0P6  
Tel.: (204) 983-4341  
Fax: (204) 984-2069

**Ontario Region**  
**Transport Canada, Civil Aviation**  
300-4900 Yonge Street  
Toronto ON M2N 6A5  
Tel.: (416) 952-0215  
Fax: (416) 952-0196

**Atlantic Region**  
**Transport Canada, Civil Aviation**  
**Street Address:**  
Heritage Court, 6th Floor,  
95 Foundry Street  
Moncton NB E1C 5H7  
**Mailing Address:**  
P.O. Box 42  
Moncton NB E1C 8K6  
Tel.: 1-800-305-2059  
Fax: 1-855-726-7495

**Quebec Region**  
**Transport Canada, Civil Aviation**  
700 Leigh Capr  ol, 2nd Fl.  
Dorval PQ H4Y 1G7  
Tel.: (514) 633-3580  
Fax: (514) 633-3585

#### 4.2 Air Navigation Service Provider

- (1) Proponents are required to consult with the appropriate air navigation service provider. The contact details for NAV CANADA are as follows:

AIS Data Collection Unit and Land Use Office  
NAV CANADA  
1601 Tom Roberts Road  
P.O. Box 9824, Station T  
Ottawa, ON K1G 6R2

**Tel:** (866) 577-0247  
**Fax:** (613) 248-4094

Landuse@navcanada.ca

#### 4.3 Local Land Use Authority

- (1) Because municipalities have the responsibility for managing the broader planning and development of their communities, proponents are required to consult with the local land use authority. Proponents should make efforts to work with the land use authority to resolve conflicts that may arise over aerodrome work.

#### 5.0 PRE-CONSULTATION CONTACT WITH INTERESTED PARTIES

- (1) Although not required in the Regulation, an industry best practice is to pre-consult with key stakeholders during the planning and development stage and is highly recommended. It permits the proponent to ascertain the feasibility of a project and establish proof of concept that can be presented during the actual consultation period. Proponents who go forward without proof of

concept will do so at their own peril and may experience consequential delays if safety or navigation related issues arise.

- (2) It is recommended that Transport Canada, the air navigation service provider and the local land use authority be engaged at the pre-consultation stage. Pre-consultation is not the same as consultation. Interested parties contacted during the pre-consultation must still receive the notice during the actual consultation period.
- (3) If the aerodrome work may affect a change in the level of service or safety of air operations that requires an aeronautical study as per Canadian Aviation Regulations - Part VIII - Section 806, pre-consultation with the air navigation service provider is highly recommended because it may not be able to conduct the aeronautical study in the minimum consultation time requirement as defined in the Regulation. If a proposal requires an aeronautical study, such as for establishing an instrument approach procedure or if the aerodrome work is being undertaken in a controlled zone, the contact information for NAV CANADA is the same as in 4.2(1).

## **6.0 PROHIBITION ON THE GROUNDS OF SAFETY OR PUBLIC INTEREST**

- (1) Section 4.31(1) of the *Aeronautics Act* grants the Minister the power to prohibit an aerodrome activity or development if it is deemed to be unsafe or in the public interest to do so.
- (2) For the purpose of CAR 307, factors including but not limited to economic, social, and environmental are taken into consideration as long as it relates to aviation and does not fall into the responsibility of another federal department or a province, territory or municipality to regulate.

## **7.0 BUILT-UP AREA**

- (1) Since more people are affected by an aerodrome work in areas that are more populated, the Regulation requires more interested parties be consulted if the proposed aerodrome work falls in the built-up area of a city or town.
- (2) For the purpose of CAR 307, please refer to Appendix B to see how Transport Canada will make a determination on whether an area is built-up.

## **8.0 ITINERANT AIRCRAFT MOVEMENTS**

- (1) The intent of the Regulation is to compel consultation in advance of an aerodrome work that will establish a permanent facility resulting in sustained and regular material impact on affected stakeholders.
- (2) In addition to the exceptions outlined in 3.0(5), it is also not the policy intent of the Regulation to capture occasional or one-off landings on the tundra or in private fields, or temporary landing sites for mining and resource exploration in northern and remote areas for seasonal hunting and fishing operations. Aviation refers to this kind of activity as "itinerant aircraft movements." However, once the activity stops being itinerant and becomes regular and sustained, it may likely be subject to the Regulation. It is the responsibility of the proponent to ascertain if they must comply with the Regulation.

## **9.0 SUMMARY REPORT**

- (1) The purpose of the Regulation is to compel meaningful consultation in advance of construction with the goal of soliciting and mitigating concerns from affected stakeholders (interested parties). The Regulation provides a process by which this can be achieved and all proponents of an

aerodrome work must follow the process and document their compliance in the form of a Summary Report.

- (2) In the Summary Report, proponents should clearly identify the objections they have received and what steps they have taken to mitigate the concerns. The proponent is also required to clearly identify any objections they have not addressed and provide a rationale for not doing so.
- (3) The Summary Report must be sent to Transport Canada where it will be reviewed to ensure the consultation has been conducted in accordance with the Regulation. The Summary Report will also serve as a record of the commitments made by the proponent regarding both the aerodrome work and any mitigation strategies.
- (4) The proponent must make the Summary Report available to any interested party for a duration of five years.

#### **10.0 INFORMATION MANAGEMENT**

- (1) Not applicable.

#### **11.0 DOCUMENT HISTORY**

- (1) Not applicable.

#### **12.0 CONTACT OFFICE**

For more information, please contact:

Michel Béland  
Director,  
Policy and Regulatory Services  
Transport Canada  
Phone: 613-949-2385  
E-mail: [michel.beland@tc.gc.ca](mailto:michel.beland@tc.gc.ca)

Suggestions for amendment to this document are invited, and should be submitted via the following e-mail address:

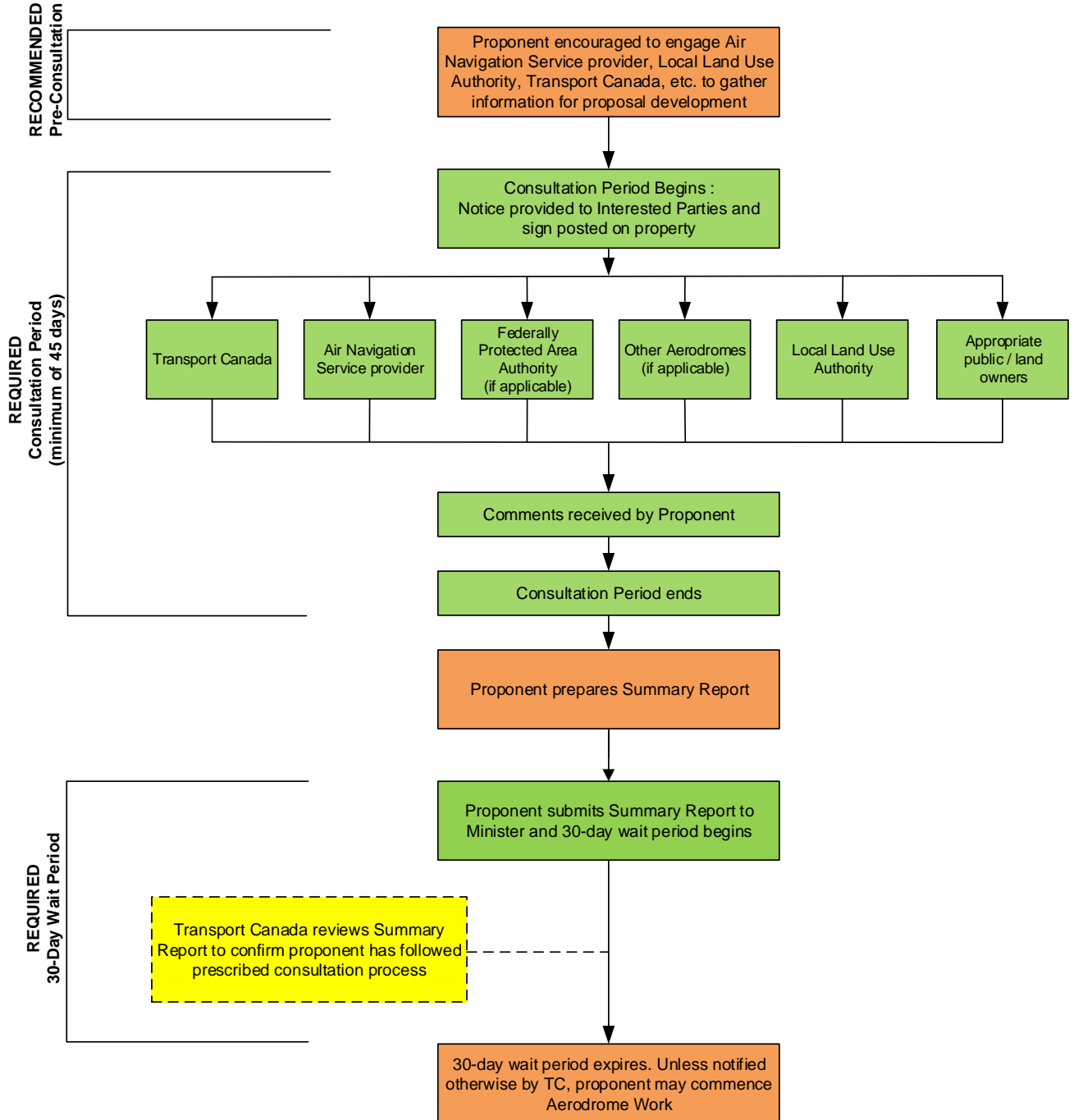
AART Documentation Services/ AART Services de documentation [AARTinfoDoc@tc.gc.ca](mailto:AARTinfoDoc@tc.gc.ca)

***Original signed by Pierre Ruel for***

Robert Sincennes  
Director, Standards Branch  
Civil Aviation

APPENDIX A — GRAPHIC OVERVIEW FOR PUBLIC CONSULTATION PROCESS

# Transport Canada Aerodrome Work Public Consultation Process



## APPENDIX B — ASSESSING IF AN AREA IS BUILT UP

**BUILT-UP AREA ASSESSMENT TOOL FOR CAR 307**

The following series of questions will be used by Transport Canada to assess if an area is built-up as per CAR 307.04. Except for questions 1 and 2, the responses are purposefully not definitive as each situation is unique.

1	Is the area marked in yellow on an aeronautical chart, such as a VNC or VFR Terminal Area Chart?	Yes No	Area is built-up Possibly not built-up
2	Is the area marked in pink on a 1:50,000 National Topographic Society map?	Yes No	Area is built-up Possibly not built-up
3	Does the area have a largely residential population?	Yes No	Probably built-up Probably not built-up
4	Are the lots similar in size to city lots, as distinct from larger semi-rural lots?	Yes No	Probably built-up Probably not built-up
5	Would a pilot easily see the structures and recognize the area as populated?	Yes No	Probably built-up Probably not built-up
6	Is there an empty area adjacent to the runway that can be used for emergency landings?	Yes No	Probably not built-up Probably built-up
7	Is there a pattern of at least three streets?	Yes No	Possibly built-up Possibly not built-up
8	Is there a group of man-made structures?	Yes No	Possibly built-up Possibly not built-up
9	Are the structures mainly along a single road (ribbon development)?	Yes No	Possibly not built-up Possibly built-up
10	Is the area incorporated as a town or city (not as a rural municipality)?	Yes No	Possibly built-up Possibly not built-up
11	Is the area within a designated practice area as shown on an aeronautical chart?	Yes No	Possibly not built-up Possibly built-up

---

# Appendix C

## Heritage Conservation Branch



T (306) 975-0401  
F (306) 975-1076

saskatoon@clifton.ca  
www.mistyventures.ca

October 18, 2023

Our file: 23-901

Lindsay Larre  
Clifton  
*Agent for: Big Bear Contracting Ltd.*  
#4 1925 1<sup>st</sup> Avenue N  
SASKATOON, SK S7K 6W1  
Phone: 306.975.0401  
Email: [lindsay\\_larre@clifton.ca](mailto:lindsay_larre@clifton.ca)

Dear Lindsay Larre:

**RE: Big Bear Camp Aerodrome in Sections 19 and 24-101-22 W3M (Your file: MC0094):  
HERITAGE RESOURCE REVIEW**

Thank you for referring this development for heritage resource review.

In determining the need for, and scope of, Heritage Resource Impact Assessment (HRIA) pursuant to s.63 of *The Heritage Property Act*, the following factors were considered: the presence of previously recorded heritage sites, the area's overall heritage resource potential, the extent of previous land disturbance, and the scope of new proposed land development.

No known archaeological sites are located in potential conflict with the proposed project. However, the aerodrome and ancillary components will impact areas of intact boreal forest in the vicinity of Grygar Lake, several eskers, and the uplands overlooking tributaries of several major waterbodies. This is a terrain type known to have moderate to high potential to contain intact heritage resources. As the project may damage or disturb heritage sites, an HRIA is required for the entire project, this includes any access upgrades, aggregate sources, utility upgrades, the aerodrome (i.e. runway, operations buildings, runway graded safety area, cleared areas for runway lighting, aprons, etc.), and any other ancillary components required for the operation of the aerodrome.

The required HRIA, including systematic surface survey and sub-surface test exploration, is a proponent responsibility. The study will first establish the presence of heritage sites within the project area and where suitable site avoidance measures (including relocation of development components) may be implemented. If heritage sites are located in unavoidable conflict with the development, the study must also establish the content, structure and significance of those sites, and, on that basis, recommend both the need for and scope of any further study (including archaeological salvage excavation or other heritage management action).

The required HRIA, including systematic surface survey and sub-surface test exploration, is a proponent responsibility. The study will first establish the presence of heritage sites within the

project area and where suitable site avoidance and protection measures (including relocation of development components and flagging of site boundaries prior to construction activity) may be implemented. If heritage site locations are in unavoidable conflict with the development, the study must also establish the content, structure and significance of those sites, and, on that basis, recommend both the need for and scope of any further study (including archaeological salvage excavation or other heritage management action).

The HRIA must be carried out by qualified personnel under an approved investigation permit issued through this office. A minimum of two business days are required to process a permit application for an archaeological HRIA. The HRIA must be conducted under snow-free and frost-free conditions.

If you have any questions regarding these heritage regulatory requirements, please contact Brent Kevinsen at [brent.kevinsen@gov.sk.ca](mailto:brent.kevinsen@gov.sk.ca) or by calling 306.787.5774. Thank you for referring the proposed development and for your cooperation in protecting the province's cultural heritage.

Sincerely,

<original signed by>

Kim Cloutier  
Assistant Director, Archaeology and Heritage Management



---

**Misty Clifton Engineering Ltd.**

#4 – 1925 1st Avenue N  
Saskatoon, SK S7K 6W1

T (306) 975-0401

F (306) 975-1076

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