Registration Document

Construction of Austere Landing Strip For the 5 Wing Practice Target Area

REGISTRATION PURSUANT TO SECTION 7 OF THE ENVIRONMENTAL ASSESSMENT ACT, 2000

INVOLVING

CONSTRUCTION OF AUSTERE LANDING STRIP AT 5 WING GOOSE BAY PRACTICE TARGET AREA

DEPARTMENT OF NATIONAL DEFENCE

4 June 2010

REGISTRATION FORM

NAME OF UNDERTAKING: Construction of Austere Landing Strip at the 5 Wing Goose Bay Practice Target Area.

PROPONENT:

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Department of National Defence (DND)

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GLOSSARY AND
LIST OF ABBREVIATIONS

1 CAD	1 Canadian Air Division
DND	Department of National Defence
GBO	Goose Bay Office
GP	General Purpose
ITAF	Italian Air Force
Lease Agreement	Transfer of Administration and Control of Crown Land to Her Majesty the Queen in Right of Canada (Province of Newfoundland and Labrador
LGB	Laser Guided Bomb
LLTA	Low Level Training Area
MCC	Military Coordination Center
MOU	Memorandum of Understanding
PGM	Precision Guided Munitions
PTA	Practice Target Area
RAF	Royal Air Force

1.0 INTRODUCTION

1.1 Identification of the Proponent

The Department of National Defence (DND) is the responsible authority for all military training including foreign military training activities conducted at 5 Wing Goose Bay. Forces from foreign nations, as signatories to agreements with the Government of Canada, authorizing them to conduct training in Canada are international participants in the training activity.

DND considers the enclosed undertaking an essential element to ensure that 5 Wing facilities remain viable to the training requirements of the participating air forces.

1.2 Nature of the Undertaking

1.2.1 Background

Low-level flight training involves activity below 1000 feet and as low as 100 feet above all obstacles and is confined to a designated training area over the interior of the Quebec-Labrador peninsula. Figure 1.1 illustrates the lower portion of the training area, the entirety of which measures 130,000 square kilometres (the size of England). There is only one community (Churchill Falls, population 800) within the training area and it is protected from disturbance by a 10-nautical mile radius exclusion zone. A dozen small communities are situated some forty kilometres or more from the training area perimeter; members of these communities practice traditional hunter/gatherer harvesting activities within the training area during different periods of the year.

Aircrew have the opportunity to conduct weapons training through the release of inert (non explosive) weapons onto defined targets within the confines of a four nautical mile (nm) radius area within a larger 16 nautical mile tactical air weapons range, commonly referred to as the Practice Target Area. This PTA is covered under a Transfer of Administration and Control (TAC) from the Province of Newfoundland and Labrador (No. 106234). Inside the 4 nm area of the PTA, DND has outlined a simulated airfield, complete with mock runways, infrastructures and weapon systems for visual reference (see Figure 1.2).

The Practice Target Area (PTA) is located approximately 65NM SSW of Goose Bay and is used for various types of military ground and air training. As there are no roads to the area, all transport of personnel and equipment must be done by helicopter or by small fixed wing aircraft. Future range development, clean-up operations and growth in ground/joint force training is restricted due to the limited transport capabilities and high transport costs to/from the PTA.

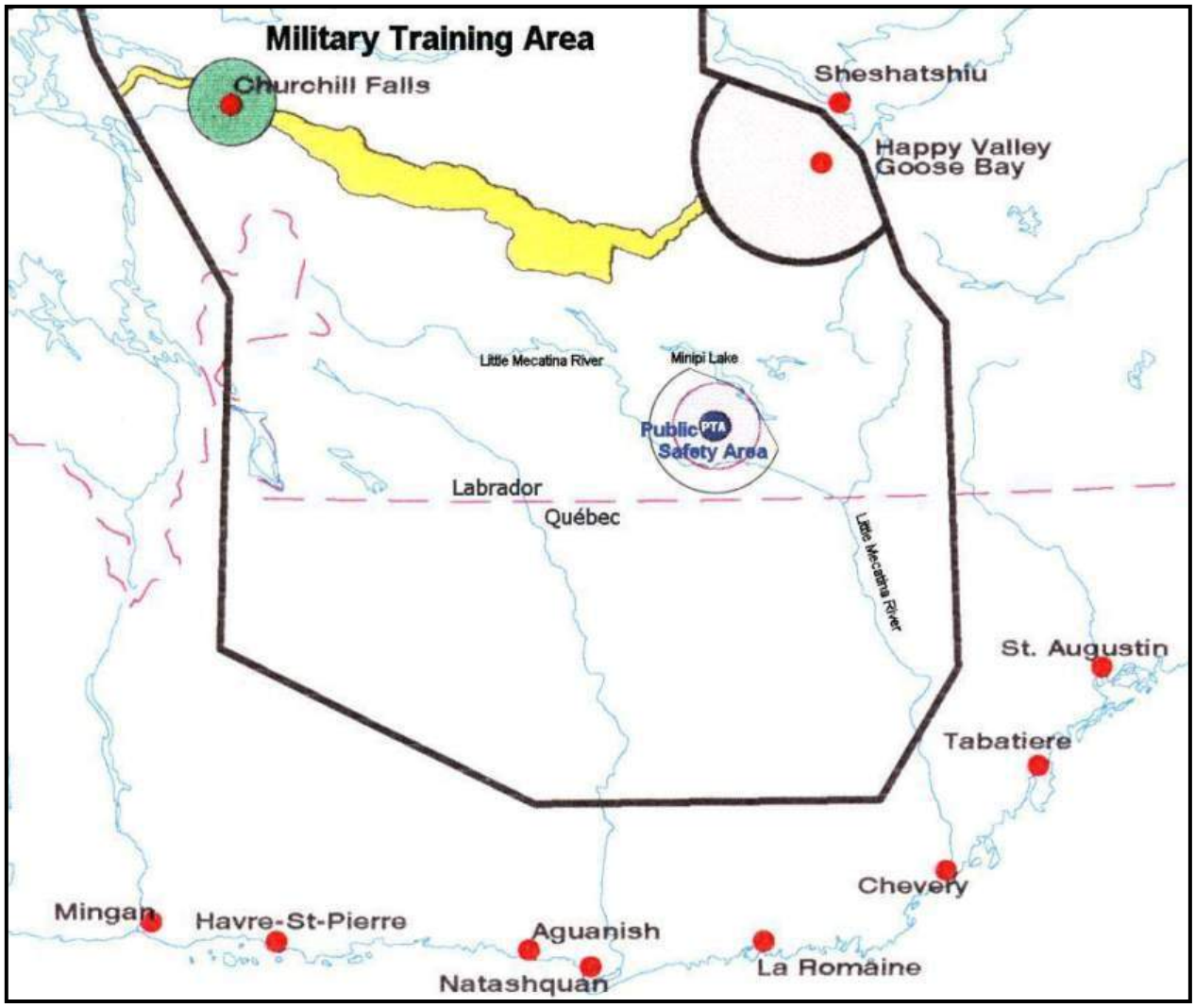


Figure 1.1 Lower portion of Military Training Area, including Public Safety Area

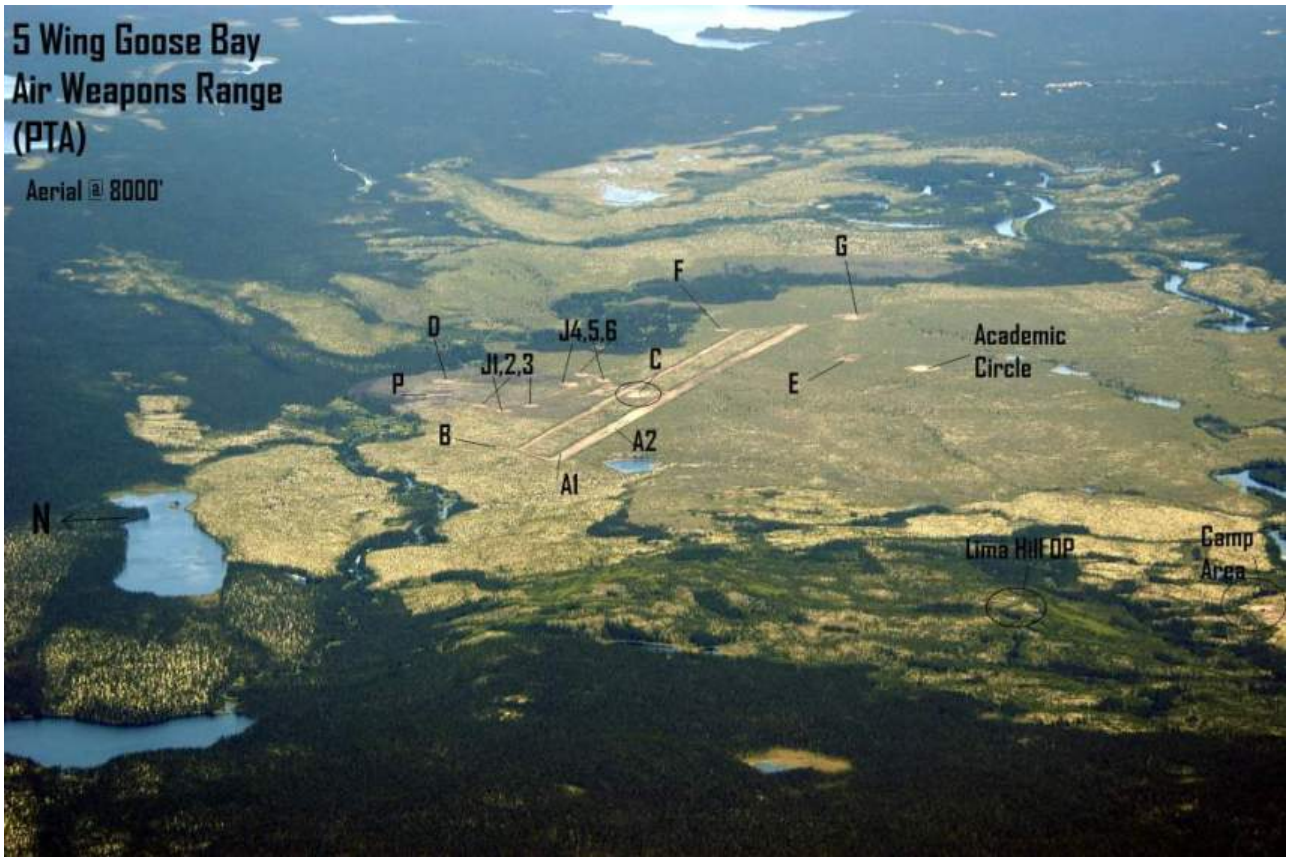


Figure 1.2: Practice Target Area (PTA) Simulated Airfield

1.2.2 Previous Environmental and Administrative Processes

Training activity at the PTA was referred to an independent environmental assessment panel for a public review under the federal Environmental Assessment and Review Process Orders guidelines. The Department of National Defence published an **Environmental Impact Statement (EIS) on Military Training Activities in Labrador and Quebec** (DND 1994), which provided the basis for subsequent technical and public hearings throughout the affected region. In 1995, the Government of Canada accepted the principal findings and recommendations of the panel, thus authorizing the continuation and controlled expansion of the activity.

Also in 1995, a **Transfer of Administration and Control of Crown Land to Her Majesty the Queen in Right of Canada** (Province of Newfoundland and Labrador Document No. 106234) formalized the establishment of the PTA lands as a "tactical air weapons range" under the administration and control of DND. This document, hereinafter referred to as the TAC, sets out the terms and conditions that apply to the use of those lands. The TAC was amended in 2002 to provide for a safety template for use of precision guided munitions and amended in 2005 to allow ground force training activities and facilities.

1.3 Alternatives to the Undertaking

The viability of the training program conducted at Goose Bay is entirely dependent on DND's ability to offer facilities and services that continue to satisfy the evolving requirements of participating air forces. Due to continuing fiscal constraints and the competitive marketplace, it is also important that their training goals be met in a cost-effective and comprehensive manner. The inability of a particular air force to train in a crucial aspect of their operation could compromise the overall training value of their program in Goose Bay, and thus lead to an investigation of alternative training venues elsewhere in the world.

The employment and socio-economic benefits accruing from the allied training have been well documented in the 1994 EIS, and more recently, in a study sponsored by the Institute for Environmental Monitoring and Research. Over the past several decades, and for the foreseeable future, the military activity at Goose Bay represents an economic mainstay for the region.

1.4 Schedule for the Undertaking

The construction of this soft surface austere landing strip is scheduled for Summer/Fall 2010.

2.0 DESCRIPTION OF THE UNDERTAKING

2.1 Construction of Austere Landing Strip

The project will require constructing an operational gravel/sand austere landing strip at the PTA, approx 4,500 ft in length and 75 -100 ft wide to allow medium transport aircraft to land and take off at the PTA. The surface of the assault landing strip should be firm enough to enable aircraft to land, while remaining soft enough to allow soft surface operation training. In addition, the landing strip must include a turn around area for loading/off-loading transport aircraft, while simultaneously allowing another aircraft to land or take-off.

Obstacles (such as trees or brush) within 100 feet on either side of the edge of the runway must be lower than 2 feet. Obstacles from 100 ft to 300 ft from the edge of the runway shall be lower than 4 feet (or as directed by 1 Cdn Air Div A4 AE if more stringent). Any high obstacles in the approach and departure sectors must also be cut as per 1 Cdn Air Div A4 AE direction so they do not interfere with a safe takeoff and landing

The runway will have to be maintained and must be leveled and compacted after 40-50 landings. As such, the equipment to maintain the landing strip must remain at the PTA to ensure the maintenance can be completed within 36 hours. As well, the runway should be able to be snow cleared within a reasonable time when required. The detailed designed drawing is located in Appendix A.

During construction, a level one range clearance as per B-GL-304-003/TS-003 is required. In addition, after the initial grubbing and before compacting begins, the W Arm O must inspect the construction site for any inert bomb remains.

2.2 Future Cleanup of the PTA.

The austere landing strip will permit medium size transport aircraft to move bombs and ammunition back to Goose Bay much more economically than helicopter or small fixed wing aircraft. As there are thousands of bombs at the PTA, this reduction in clean-up costs alone could pay for the costs of constructing the runway. In addition, Allied nations presently require a soft surface landing area for training with tactical medium transport aircraft. We could offer them the austere landing strip to conduct their training, and in return they could transport the bomb scrap from the PTA. Using this initiative, cleanup costs would be minimized even further.

2.3 Further Development of the PTA.

The PTA can be developed and maintained quicker and cheaper by providing medium size transport with an operating surface at the PTA. We must develop a variety of training facilities if we are to offer better

opportunities for joint operations training at the PTA and to satisfy the growing requirements for both air and ground training. These improvements require intensive material and equipment transport to the PTA. Medium transport aircraft with their larger volume and weight capabilities will enable us to deliver the required material faster and more economically to the PTA.

2.4 Enabling Growth of Ground Force Training

The present transport capabilities at the PTA limit the scope of ground force training to small group training only. Special Forces and Specialized Force Groups (Paratroopers) must train with large troop sizes using their own equipment. However, with only the capability to land small aircraft at the PTA, deployments are limited to small groups without vehicles and large weapons as it is too time consuming and expensive to transport this equipment by helicopter.

An austere landing strip at the PTA will allow larger ground forces and their equipment access to the PTA through para jumps, para drops or landings at the PTA. In Jan 05, the RAF conducted Exercise Frozen Star at the PTA as part of their winter training. The extraction of the Paratroopers using small civilian fixed wing aircraft was very expensive and exceeded their exercise budget. If training units could access the PTA with their own air transport, the PTA would be elevated to an excellent, usable training location.

2.5 Practice Soft Surface Take-off/Landing Operations

Tactical fixed wing transport aircraft (C130, C160, C27, A 400M) have a significant need to practice soft surface operations from short soft surface (dirt, sand) landing strips in preparation for their missions in remote areas such as Afghanistan or Africa or even our North. Over the last few years, tactical transport aircraft aircrews from Great Britain, Germany, France, Italy and Israel have inquired about the ability to practice soft surface landing/take-off techniques on 3500 – 4500 ft long sand/gravel strips within two hours flying time from Goose Bay. There is no known usable soft surface landing strip in this area. The landing strips in Labrador and Quebec are either only 1500 - 2500 ft long or they have a hard surface and are, therefore, unusable for this purpose. Also with the future CF procurement of new tactical lift transport and SAR fixed wing aircraft plus the renewed interest in northern operations, 5 Wing Goose Bay could play a significant role in their operations. In addition, to being a possible operating location for this type of aircraft, having an austere soft surface runway in close proximity to the base could be a major asset for their type of training.

Offering a usable, but relatively short soft surface landing strip at the PTA will add considerably to the training opportunities for transport aircraft in Goose Bay. Flying units could better justify why they want to train in Goose Bay as they will be able to expand their training program to include soft surface operation in addition to day and night tactical low level operation, para drops of personnel and heavy loads, and joint operations with ground forces.

2.6 Environmental Protection Procedures

The undertaking will not require any significant changes to existing mitigation, communications or coordination procedures. DND maintains a comprehensive mitigation program to safeguard the environment throughout the training area. In particular, an active monitoring program is in place to identify sensitive locations on the ground arising from human or wildlife activities. Information is gathered from ongoing surveys, tracking of wildlife based on satellite and radio collars, community liaison programs and the publication of contact information to advise 5 Wing officials of activity within the training area.

2.7 Geographic Considerations

The PTA is located on a sandy plateau approximately sixty nautical miles (120 kilometres) south, southwest of Goose Bay. The center of the PTA is at surveyed monument point N 5217.4 and W 6057.3 and is bounded by a circle of four nautical mile radius, representing an area of 175 square kilometres. The complete site description and survey is attached as Schedule A to the 1995 Lease Arrangement. The range also consists of an area of restricted airspace known as CYR 727 that extends out to 10 nautical miles from the centre monument. Access to this area is governed by transport Canada rules outlined in the TP 1820 E Designated Airspace Handbook and is controlled by the Military Coordination Centre (MCC) at 5 Wing Goose Bay.

The PTA and Exclusion Zone surrounding it is an uninhabited area and is not accessible by road or rail. It is accessible by air (with authorization), and to a limited extent (due to the long distances from communities) by river and snowmobile.

2.8 Timeframe for Operational Activity

This soft surface assault landing strip will be able to be used all year long with a focus on summer and fall.

2.9 Access

Due to the nature of the training activities, DND is obligated to exercise control access to the Safety Exclusion Zone. Requests for civil access to designated danger areas are considered only for those activities which are judged essential to the common good and where the associated risk can be accepted. As a first principle, DND attempts to accommodate controlled public access if it is safe and if the defence requirement can still be met. This may allow for joint, but not necessarily concurrent use. Special consideration may be made, notably in the areas of energy development, which represents a national interest of a high order. The same can be said of traditional aboriginal land use. Possible access arrangements are discussed further is section 5, as a mitigation measure.

2.9.1 Communicating with Civil Aviation

Access to the PTA area is controlled for DND by the 5 Wing Military Control Centre (MCC). The PTA is defined as restricted airspace in the Transport Canada Designated Airspace Handbook, DAH TP 1820, for areas CYR 727 and CYR 750. The PTA has a buffer zone, identified as CYR 726 from ground level to 1000 feet AGL, with a radius of 30 nm from the centre.

All military flights into the PTA are booked with the MCC prior to take-off and are conducted in accordance with visual flight rules. All non-military air carriers are required to first request access to these areas through MCC. As such, MCC coordinates the military flying activity and also acts as a liaison with locally-based civilian air carriers. Since it controls all PTA time slot “bookings”, MCC is aware of all military activity and can relay this information to non-military air carriers as required.

Operations staff at 5 Wing conducts a mass briefing for locally-based air carriers annually in March, at which time all new activities relating to the military flying program and training areas are thoroughly described.

3.0 ENVIRONMENTAL ASSESSMENT

The PTA is located on provincial land about 65 nautical miles or 120.5 km south west of the 5 Wing Goose Bay. Approximately 175 km^2 of the area is primarily used for military flight training. The area of interest, proposed location of Austere Landing Airstrip, covers the south-central portion of the 1:250k NTS sheet 13C, and is comprised of the south western portion of the 1:50k NTS sheet 13C7. The proposed location of the airstrip currently contains a mock runway and is approximately 17 km southwest of Minipi Lake.

The geomorphic and geological information has been derived from topographic maps and the elevation information has been obtained from the Natural Resources Canada's (NRCAN) Atlas of Canada. Additional information about the types of vegetation, as well as wildlife, were obtained from the Environmental Impact Statement (DND, 1994) and the Habitat Mapping and Potential Species at Risk investigation (Minaskuat, 2006). Previous environmental registration documents (DND, 2009), Environmental Site Assessment (ESA) and Preliminary Qualitative Risk Assessments (PQRA) (Minaskuat, 2006 and 2007) were also reviewed.

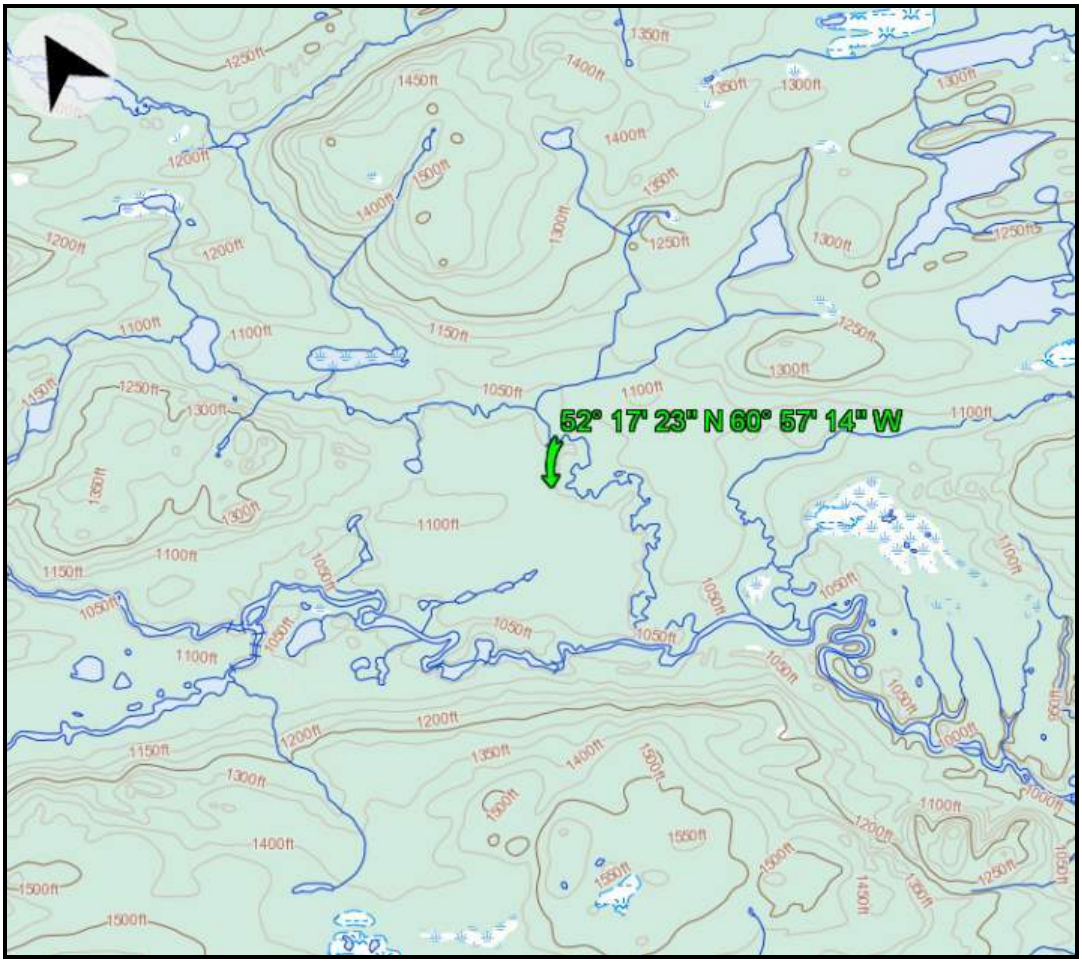


Figure 3.1: The 1:40k map taken from the NRCAN Atlas of Canada showing the general geomorphic features.

3.1 Geomorphology

The topography in the general area of the PTA is undulating to hilly with relatively large flat areas and sparsely forested over sandy, lichen-covered soil. The area of interest is relatively flat. Bedrock in the area, exposed only on hill tops, is mostly granitic gneiss. The till and glaciofluvial soils dominate the remaining areas. Figure 3.1 shows the general nature of the geomorphic features in the area. Digital Elevation Image Data (CDED) has been provided by NRCAN and shows the general nature of the land features in the area of interest (Figure 3.2). The total relief for the area of interest is less than 305 metres. In general the geomorphic features are oriented in NW-SE direction, and most of the steams also flow to the southeast. The general PTA is punctuated by a number of small lakes and steams flowing to and from these lakes. The PTA is located within the Low Subarctic Forest-Little Mecatina River Ecoregion. This ecoregion area is characterized by broad river valleys and rolling hills covered by shallow till, drumlins and eskers. The main water bodies in the area consist of a meandering Little Mecatina River, and a portion of the Minipi Lake. The Little Mecatina River is located in the southern portion of the PTA, and drains to the southwest into the Fourmont Lake (outside the PTA).

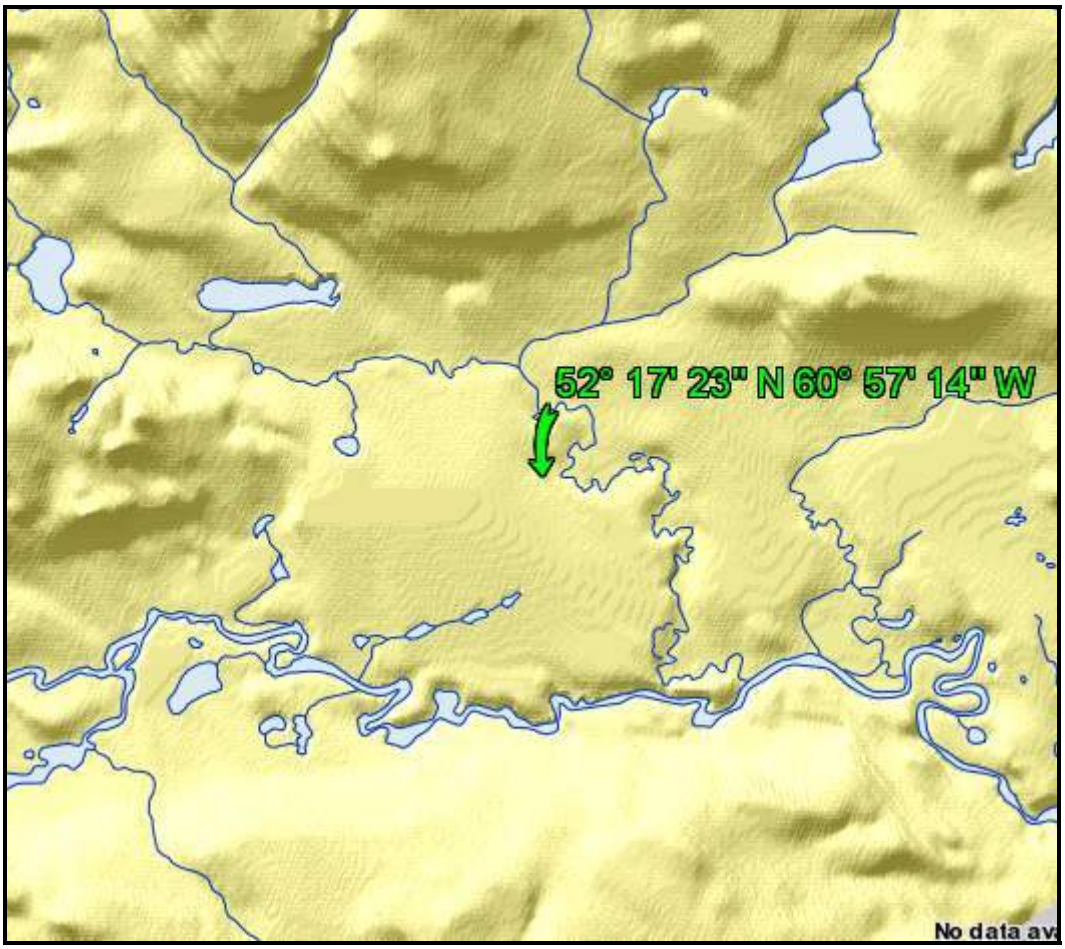


Figure 3.2 The 1:20k elevation image diagram taken from NRCAN showing the general nature of the land feature.

According to NRCAN digital maps, the nearest water bodies to the area of interest are as follows: an unnamed small stream located approximately 150 m east of the proposed location of the airstrip and 30 m east of the proposed vegetation clearing, a pond located approximately 500 m northwest, a string of ponds

located approximately 500 m west and a larger stream located approximately 1000 m (1 km). The NRCAN Atlas of Canada indicated two (2) wetlands approximately 2 km and 2.5 km south and southeast of the proposed site (Figure 3.1). According to the Habitat Mapping and Potential Species at Risk Investigation (Minaskuat,2006) there were three (3) wetlands located to the west, south and southeast approximately to 2 km, 1 km and 2 km, respectively of the site

3.2 Water Bodies/Fisheries Resources

Based on the Habitat Mapping and Potential Species at Risk investigation (Minaskuat, 2006), the pond located approximately 500 m northwest of the area of interest was not a suitable fish habitat. Additional investigations (Minaskuat, 2006 and 2007) to include fish sampling were conducted at the pond and various streams in the area of interest. Figure 3.3 shows location of fish sampling in the pond.

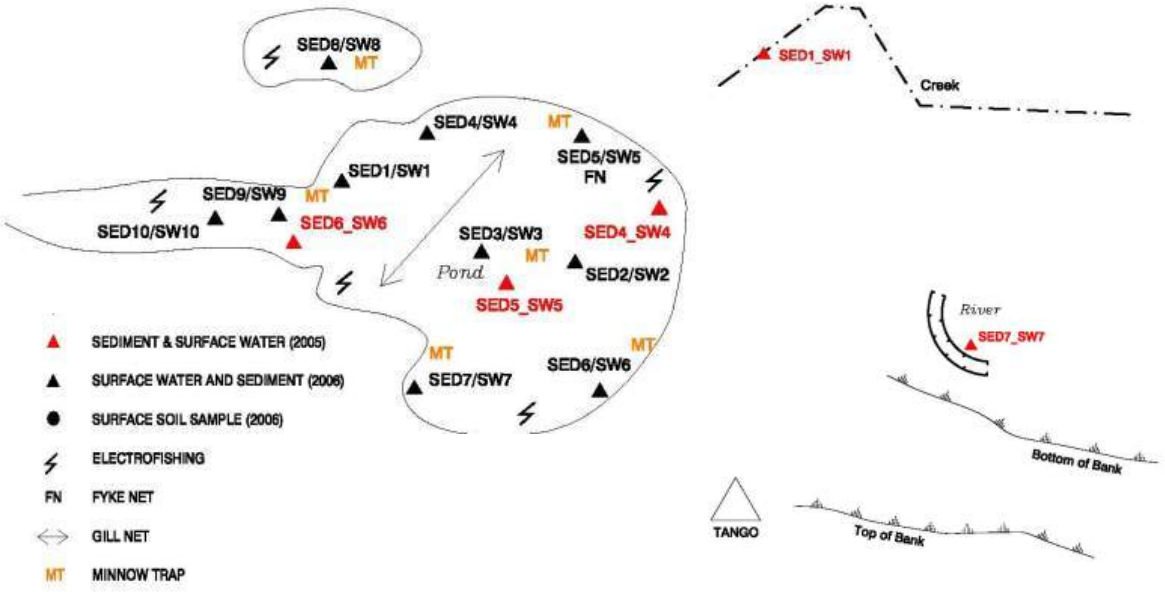


Figure 3.3 Diagram taken from Minaskuat, 2006 showing sample locations at pond and adjacent streams to area of interest.

Attempts were made to catch fish during the investigation by electrofishing, gill netting, fyke netting and minnow traps were all used within the Pond adjacent to the area of interest. Electrofishing was used on 5 stream crossings between the main campsite and target areas. Angling was used on the main river flowing along the northern portion of the site. No fish were collected at any of the sites sampled. A habitat assessment was also completed for each area sampled and included a review of substrate type, in stream cover and vegetation cover. Habitat classification was conducted in accordance with Department of Fisheries and Oceans (DFO) standard methods (Sooley et al. 1998) and summarized in the Table 3.1 below.

Table 3.1 Biological Habitat Assessments

Site	Substrate Composition	Average Water Depth (m)	Average Bank Width (m)	Average Wetted Width (m)	Primary Habitat Units [1]	Flow (m/s)	Cover (%)	Salmonid Habitat
Pond	100% fines and mud	2.0	90	40 - 90	Flat	<0.15	10% to 20% - primarily	Type IV

Site	Substrate Composition	Average Water Depth (m)	Average Bank Width (m)	Average Wetted Width (m)	Primary Habitat Units [1]	Flow (m/s)	Cover (%)	Salmonid Habitat
							shrubs and grasses lining the shoreline.	
Stream 1	100% fines and mud	0.1	1.0	0.2 to 0.3	Flat	<0.15	50% - in stream vegetation.	Type IV
Stream 2	100% fines and mud	0.1	1.0	0.4 – 0.5	Flat	<0.15	50% to 75% - alders, grasses and small plants covering stream.	Type IV
Stream 3	100% fines and mud	N/A	1.0	N/A	Flat	N/A	50% - 75% - spruce trees and small plants	Type IV
Stream 4	100% fines and sand	0.1	2.0	1.0 – 2.0	Flat	<0.15	20% to 30% - grass and small plants	Type IV
Stream 5	90% gravel and cobble, 10% fines	1.0	2.0	1.0 – 2.0	90% Flat 10% Riffle	<0.15 to 0.3	50% to 75% stream cover, alders, spruce and small plants	Type II
Main River	100% fines and mud	> 2.0	10	8 – 10	Flat	<0.15	5% to 10% in stream vegetation	Type IV

The pond adjacent to the area of interest, 4 streams located between the main campsite and target areas and the Main River flowing through the northern portion of the property were all classified as type IV habitat which is poor juvenile salmonid rearing habitat and corresponds with no fish caught during the fish sampling survey. Stream 5 located adjacent to the main accommodations complex was classified as a type II habitat which is good salmonid rearing habitat with limited spawning.

3.3 Wetlands

The PTA contains hundreds of wetlands, five (5) of -which were evaluated during the habitat mapping investigation (Minaskuat, 2006). The wetland surveys collected a variety of information including the type of wetland and a description of its hydrology, a description of the wetland habitat types present in the wetland, inventories of vascular plants, birds, mammals, reptiles and amphibians present in the wetland, any evidence of anthropogenic use of the wetland, and any evidence of damage to the wetland caused by anthropogenic activities. There were three wetlands within 1 km to 2.5 km from the area of interest. A brief summery of the three wetlands is provided below and Figure 3.4:

Wetland No. 1 was identified as a shallow basin marsh type wetland (uncommon for the PTA) approximately two (2) hectares in size and located approximately 1 km northwest of the project site. The wetland is expected to be inundated in the spring and early summer and retains water throughout the year. The marsh contains three distinct plant communities that are arranged in concentric zones around a shallow pond that occupies approximately half the wetland and is discussed in further detail in Section 5.7. According to the report, the wetland is located in a well defined basin at the foot of a long slope that is filled by a combination of surface water and groundwater. There is no water inflow to the wetland and excess water decants through a small channel located on the northern side of the wetland which flows into a small river. The wetland may function as a groundwater recharge site and may help to regulate stream flow by detaining surface water and slowly releasing it to streams as shallow groundwater. The report concluded that the wetland is unlikely to play a major role in the regulation of surface flow in the watershed and would have relatively little socio-economic value.

Wetland No. 2 was identified as a basin bog and channel fen elements and is located approximately 2 km south of the proposed project site. The wetland developed in an old ox bow lake and does not appear on NTS mapping or satellite imagery available for the area. The wetland is estimated to be approximately five (5) hectares in size. The wetland supports three distinct bog plant communities and one fen plant community, discussed in greater detail in Section 5.7. The wetland was indicated to receive a combination of both groundwater and surface water inputs. The wetland decants through a small overflow channel that enters the river that the ox bow lake is associated with and the wetland can be expected to help to regulate flow in the river by intercepting water during precipitation events and slowly releasing it into the river. Given the relatively small size of the wetland, the contribution of this wetland to flow regulation in the river is not expected to be great. The wetland may also contribute to flood control by providing a temporary reservoir for flood waters but would be limited due to the relatively small size of the wetland. The wetland is expected to have little if any socio-economic value. It is located within a restricted area so use of the wetland by the general public is not permitted for safety reasons. The wetland is not part of any protected area such as a national or provincial park, national wildlife area, federal migratory bird sanctuary, ecological reserve, provincial wildlife management area, wildlife refuge, or game sanctuary (Minaskuat, 2006).

Wetland 3 is a wetland complex located approximately 2 km east of the proposed project site and is composed of coniferous treed slope bog and Atlantic ribbed fen. The slope bog is located on the upper half of the wetland. This wetland is somewhat nutrient enriched and is relatively dry and the rooting zone is largely elevated above the level of the groundwater entering the wetland. The vegetation of the wetland is discussed in Section 5.7. The wetland occupies a small sloped basin approximately 2 ha in size. The wetland appears to be a groundwater discharge site since there is no apparent inflow into the wetland but a small exit stream. The wetland may help to regulate stream flow by storing water and slowly releasing it into the stream. It is not expected to play any significant role in flood control since the wetland has limited storage capacity. The wetland is located within a restricted area and as such would have little socio-economic value. The wetland is not part of any protected area such as a national or provincial park, national wildlife area, federal migratory bird sanctuary, ecological reserve, provincial wildlife

management area, wildlife refuge, or game sanctuary. There is no evidence of anthropogenic disturbance of the wetland associated with training activities.

3.4 Vegetation

The predominant land cover type for the PTA is spruce forest cover with varying degree of density. Within the PTA, the central portion (general location of proposed landing airstrip) is covered by recent burn and barren soil, whereas the forest cover is mostly confined to the southwestern portion. There are few bogs and small water bodies present in the PTA. In general, there is a greater diversity of land cover types in the river valleys, particularly the Little Mectina River. This includes, patches of mixed-wood and deciduous forest, along with large areas of recent burn and barren soil. Since, the Little Mecatina River is shallow and meandering in nature, depending upon the amount of precipitation received in the area, various parts of the stream bed are likely to be exposed and/ or covered with sand. Based on the amount of precipitation, these sand bodies (including sand bars) contain varying degree of moisture and are likely to be shifting, and thus providing a variety of land cover types.

Vegetation information was obtained from the Habitat Mapping and Potential Species at Risk investigation conducted by Minaskuat in 2006. The investigation identified twenty-five (25) habitat types within the PTA. A brief description of the habitat types are provided below and shown on Figure 3.4.

- Dry Black Spruce/Moss Forest: The tree canopy is mainly back spruce (*Picea mariana*) and to a lesser degree, balsam fir (*Abies balsamea*), heart-leaved paper birch (*Betula cordifolia*) and American larch (*Larix laricina*). The forest understory is mainly Labrador tea (*Ledum groenlandicum*), speckled alder (*Alnus incana*) and late-lowbush blueberry (*Vaccinium angustifolium*) with a ground layer composed of Schreber's moss (*Pleurozium schreberi*), knight's plume moss (*Ptilium cristacastrensis*) and creeping snowberry (*Gaultheria hispidula*).
- Wet Black Spruce/Moss Forest: The tree canopy is similar to that of the black spruce canopy. The shrub layer is composed of a mixture of Labrador tea, leatherleaf (*Chamaedaphne calyculata*) and late lowbush blueberry with the ground layer consisting of sphagnum moss (*Sphagnum* sp.) and Schreber's moss as well as small quantities of cloudberry (*Rubus chamaemorus*), three-seed sedge (*Carex trisperma*), and three-leaf Solomon's-plume (*Smilacina trifolia*).
- Black Spruce/American Larch Forest: The tree canopy is similar in composition as the above forest with the main difference being the large numbers of the Spruce and Larch. The shrub understory is sweet bayberry (*Myrica gale*) and leatherleaf, while the ground layer is mostly a mixture of sphagnum moss, cloudberry and three-seed sedge.
- Black Spruce/Lichen/Moss Forest: The tree canopy is exclusively black spruce and is open. The shrub layer consists of stunted black spruce and Labrador tea with the ground vegetation consisting of Schreber's moss and reindeer lichen (*Cladonia alspestris* and *Cladonia rangiferina*).
- Mature Black Spruce/Lichen Woodland: The tree canopy is characterized by carpet of reindeer lichen with scattered black spruce and American larch. Shrub cover consists mainly of dwarf birch (*Betula glandulosa*), Labrador tea and northern blueberry (*Vaccinium boreale*).
- Immature Black Spruce/Lichen Woodland: The only difference from the Mature Black Spruce/Lichen Woodland is the small size and low cover of black spruce and the presence of more vascular plants (Alaskan clubmoss (*Diphasiastrum sitchense*), fireweed (*Epilobium angustifolium*) and crinkled hairgrass (*Deschampsia flexuosa*)) in the ground vegetation layer.
- Riparian White Spruce/Fir Forest: This type of forest is uncommon in the area and is only found on fluvial deposits along larger rivers (i.e. Little Mecatina River). The dominant tree species are balsam fir, white spruce (*Picea glauca*) and heart-leaved paper birch. The shrub understory is

balsam fir saplings and speckled alder with Schreber's moss, dwarf dogwood (*Cornus canadensis*), twin flower (*Linnaea borealis*) and northern starflower (*Trientalis borealis*) covering the ground layer.

- Mature Mixedwood Forest: This type of forest is also uncommon in the area and is associated with the rich well drained slopes located near the southern end of the PTA. The forest canopy is a dense growth of balsam fir and heart-leaved paper birch. The shrub understory consists of scattered saplings of balsam fir and the ground vegetation layer is mostly mosses (Schreber's moss and broom moss (*Dicranum* sp.)) with the following speices; creeping snowberry, dwarf dogwood, Clinton lily (*Clintonia borealis*) and tree clubmoss (*Lycopodium obscurum*).
- Mature Hardwood Forest: This forest is also found on rich sites with steep well drained slopes located mostly in the southern portion of the PTA. Heart-leaved paper birch is the dominant species of the tree layer but also including the black spruce and balsam fir. The shrub understory is mainly speckled alder, saplings of heart-leaved paper and black spruce as well as squashberry (*Viburnum edule*) and northern mountain-ash (*Sorbus decora*). The ground layer includes the dwarf dogwood, large-leaf goldenrod (*Solidago macrophylla*), wild lily-of-the-valley (*Maianthemum canadense*), Schreber's moss, mountain wood-fern (*Dryopteris campyloptera*), stiff clubmoss (*Lycopodium annotinum*), and northern oak fern (*Gymnocarpium dryopteris*).
- Immature Hardwood Forest: These are found on burned over slopes and hill tops and is also uncommon for the PTA area. There were two types of immature hardwood forest noted in the area. One type of immature hardwood was found on dry, rocky hill tops dominated by trembling aspen (*Populus tremuloides*) with an understory of young black spruce, dwarf birch, willow (*Salix discolor*), and late lowbush blueberry (*Vaccinium angustifolium*) with the ground layer consisting of Schreber's moss, reindeer lichen (*Cladonia alpestris*) and trailing clubmoss (*Diphasiastrum complanatum*). The other type of immature hardwood was found on slopes receiving internal drainage and dominated by heart-leaved paper birch with a tall shrub layer of green alder (*Alnus viridis*), red raspberry *Rubus idaeus*), squashberry, skunk currant (*Ribes glandulosum*), and pin cherry (*Prunus pensylvanica*) and a ground layer of dwarf dogwood, Clinton lily, mountain wood-fern, blue-joint reedgrass (*Calamagrostis canadensis*), and tree clubmoss.
- Recent Burn: These are abundant in the southern half of the PTA and are characterized by little plant cover in all three (tree, shrub and ground) layers. The amount of plant cover depends on the elapsed time since the fire.
- Dwarf Birch/Soil: This type of area represents an early stage of secondary plant growth following a fire. There is no tree cover but the shrub cover consists of dwarf birch, northern blueberry and sheep laurel (*Kalmia angustifolia*) along with scattered willow and the ground cover consists of open soil covered with a layer of crustose lichen and reindeer lichen (*Cladonia alpestris*) and Alaskan clubmoss.
- Dwarf Birch/Lichen: This area represents the next stage following fire. It is similar in species composition to the above except that the lichen cover is replaced by reindeer lichen (*Cladonia alpestris* and *Cladonia rangiferina*), blueberry and dwarf birch cover is limited and black spruce cover is higher. The shrub layer has dwarf birch, sheep laurel, northern blueberry, Labrador tea, pussy willow and saplings of black spruce. The ground vegetation layer consists of reindeer lichen along with a few Alaskan clubmoss.
- Sand Barrens: This habitat is rare for the PTA. The vegetation is sparse, consisting of various foliose and crustose lichen species as well as the moss (*Rhacomitrium lanuginosum*). Vascular plant cover consists of scattered black spruce seedlings and ground juniper (*Juniperus communis*).
- Sand Bar: The habitat is found on the shores of the larger rivers in the PTA. They support relatively little vegetation and have no tree cover with the shrub cover consisting of small patches of sweet bayberry and willow. The ground vegetation layer consists of small clumps of

grasses and forbs including river beauty (*Epilobium latifolium*), blue-joint reedgrass (*Calamagrostis canadensis*), New Belgium American aster (*Aster novi-belgii*), and common yarrow (*Achillea millefolium*).

- Riparian Alder Thicket: These are found on the floodplains of rivers and streams. On smaller rivers, thickets are dominated by a dense canopy of speckled alder (*Alnus incana*) with some low shrub cover of red raspberry and skunk currant. The ground vegetation layer is mainly of a few-seeded sedge (*Carex oligosperma*), mountain woodfern (*Dryopteris campyloptera*), wild lily-of-the-valley, and blue-joint reedgrass. On large rivers, thickets are dominated by green alder with the shrub layer consisting of bog willow, red raspberry and silky dogwood (*Cornus sericea*). The ground vegetation layer is sparse, consisting of dwarf red raspberry (*Rubus pubescens*), blue-joint reed grass, northern starflower, and large-leaf goldenrod.
- Basin and Slope Bogs: Bogs are the most abundant wetland type in the PTA. Common types of bogs found include basin bogs and slope bogs. The vegetation of a basin bogs and slope bogs can be broken down into three distinct plant communities (low shrub dominated bog, treed bog and treed/lichen bog). Low shrub dominated bogs consists of a sphagnum moss carpet with patches of low shrubs, stunted trees and graminoids. Tree cover consists of scattered stunted black spruce and American larch. The shrub layer is low and dominated by leatherleaf along with smaller amounts of Labrador tea, pale laurel (*Kalmia polifolia*), bog rosemary (*Andromeda glaucophylla*), and small cranberry (*Vaccinium oxycoccos*). Treed bogs have black spruce as the tree cover with some American larch. Shrub cover consists of leatherleaf, alpine blueberry (*Vaccinium uliginosum*), black crowberry (*Empetrum nigrum*), and Labrador tea. Sphagnum moss, few-seeded sedge, fewflowered sedge, cloudberry, and three-leaf Solomon's-plume are the ground vegetation species. In the treed bog/lichen the cover of black spruce is relatively high; however, shrub cover is rather low and consists of Labrador tea, alpine blueberry, pale laurel, and late low bush blueberry. The ground vegetation layer is characterized by little cover of sphagnum moss and high cover of reindeer moss (*Cladonia alpestris* and *Cladonia rangiferina*) with other species to include cloudberry, tufted leafless-bulrush (*Scirpus caespitosus*), alpine cotton-grass (*Scirpus hudsonianus*), and water sedge (*Carex aquatilis*).
- Shore Bog: These are non-floating bogs that form on the shores of ponds or lakes. Tree cover is sparse consisting of scattered stunted black spruce and American Larch. The shrub layer is dominated by leatherleaf and sweet bayberry with Labrador tea, pale laurel, bog rosemary, and small cranberry. The dominant ground vegetation species are sphagnum moss and few-seeded sedge.
- String Bog: This type of habitat is found on gradual slopes and characterized by the presence of a series of parallel peat ridges. Tree cover is extremely sparse and consists mainly of stunted American larch. The shrub layer is not as well developed and has an abundance of leatherleaf, bog rosemary, and pale laurel. The ground vegetation layer is dominated by sphagnum moss and few-seeded sedge along with lesser quantities of mud sedge (*Carex limosa*), and three-leaf Solomon's-plume.
- Fen: Fens are peatlands and are uncommon in the PTA. The vegetation of fens is characterized by the presence of sedges, grasses, reeds, and brown mosses. A sparse cover of shrubs and some trees may also be present. Two fen types were encountered in the PTA, Atlantic ribbed fen and channel fen. Atlantic ribbed fens are dominated by a mixture of coast sedge (*Carex exilis*) and alpine cotton-grass as well as some sphagnum moss and rough-leaved aster (*Aster radula*). The shrub layer consists largely of leatherleaf, sweet bayberry, and stunted American larch and black spruce. Channel fens vary depending on the amount of groundwater inputs. In areas where nutrient enriched groundwater inputs are high, the plant community is dominated by a mixture of inflated sedge (*Carex vesicaria*), sphagnum moss, marsh cinquefoil (*Potentilla palustris*), and blue-joint reedgrass. The shrub layer of this plant community consists almost entirely of leatherleaf. In instances where nutrient enriched groundwater inputs are low, the ground

vegetation layer contains rough cotton-grass (*Eriophorum tenellum*), inflated sedge, sphagnum moss, bog sedge, mud sedge, water horsetail (*Equisetum fluviatile*), bog buckbean (*Menyanthes trifoliata*), and three-leaf Solomon'splume. Shrub cover is sparse and largely restricted to the landward edges of the plant community. The most abundant shrub species are leatherleaf and bog willow.

- Marsh: Marshes are mineral wetlands or occasionally peatlands and are uncommon for the PTA. The vegetation of the marsh is characterized by distinct zonation and the dominant species are often tall emergent graminoid species. The most abundant plant species were shore sedge (*Carex lenticularis*), inflated sedge and thread rush (*Juncus filiformis*).
- Rock Outcrop: Found in areas of high relief where bedrock is not covered by glacial till. These areas are scattered throughout the PTA but are not common. The vegetation associated are similar in species to the black spruce lichen/moss plant community except that black spruce cover is reduced. Shrub cover consists mainly of Labrador tea, leatherleaf and black crowberry. The ground vegetation layer is of reindeer lichen (*Cladonia alpestris*) and Schreber's moss.

Habitat Mapping and Potential Species at Risk Investigation conducted by Minaskuat in 2006 identified the PTA has having hundreds of wetlands. Five of the wetlands were surveyed and three wetlands are located in the vicinity (approximately 1-2.5km) of the proposed project site and are briefly described below.

- Wetland No. 1, Marsh - The survey identified fifteen (15) species of vascular plants, with the narrow-leaf burreed (*Sparganium angustifolium*) and water starwort (*Callitriche* sp.) being the most abundant. None of the vascular plant species encountered were considered to be rare nationally (COSEWIC 2005) or provincially (ACCDC 2005) and no non-native plant species were found. The wetland was determined to be of moderate value due the habitat type being uncommon for the PTA.
- Wetland No. 2, Basin Bog/Basin Fen - The survey revealed the presence of thirty (30) species of vascular plant. None of the species encountered were considered to be rare nationally (COSEWIC 2005), however, one species, water horsetail (S1S3), was found and is considered to be rare in Labrador (ACCDC 2005). The wetland was determined to be of moderate value due to the role of flood control and habitat for water horsetail.
- Wetland No. 3, Atlantic Ribbed Fen - The survey revealed the presence of 50 species of vascular plant species. None of the species encountered is considered to be rare nationally (COSEWIC 2005), however, one species (Bod Clubmoss, *Lycopodiella inundata*) is considered to be uncommon to rare (S2S3; ACCDC 2005) in Labrador. This wetland is considered moderate value as a result of the presence of an uncommon to rare plant species.

Within the PTA, the central portion (in the general location of the proposed landing strip) is covered by recent burn and barren soil, whereas the forest cover is mostly confined to the south western portion. Land cover types are more diverse in the river valleys including the Little Mectina River. The cover includes, patches of mixed-wood and deciduous forest, along with large areas of recent burn and barren soil. Vegetation information for the PTA was obtained from the Habitat Mapping and Potential Species at Risk investigation conducted by Minaskuat in 2006. The investigation identified twenty-five (25) habitat types within the PTA. According to the survey the habitat surrounding the proposed project site is classified as "recent burn" characterized by little plant cover, depending on the elapsed time since the fire, with no trees and consisting of various lichens, moss and blueberry bushes. The site also consists of the dwarf birch/soil habitat that has a plant community representing an early stage of secondary plant succession following fire. There is no tree cover but seedlings of black spruce are present in the shrub layer. Shrub cover consists largely of dwarf birch, northern blueberry and sheep laurel (*Kalmia angustifolia*) along with scattered willow. The ground vegetation layer consists mainly of open soil covered with a layer of crustose lichen. A small amount of reindeer lichen (*Cladonia alpestris*) is also

present. Vascular plant ground vegetation cover is very sparse and consists mainly of Alaskan clubmoss. Some areas of the site are considered to be of the dwarf birch/lichen habitat, which the plant community appears to represent the next stage in forest secondary succession following fire. It is similar in species composition to the dwarf birch/soil plant community except that the crustose lichen cover has been replaced by reindeer lichen (*Cladonia alpestris* and *Cladonia rangiferina*), blueberry and dwarf birch cover is reduced and black spruce cover is higher. A few tree sized black spruce are present in the tree canopy. The shrub layer is composed of dwarf birch, sheep laurel, northern blueberry, Labrador tea, pussy willow and saplings of black spruce. The ground vegetation layer is composed almost entirely of reindeer lichen along with a few Alaskan clubmoss (Minaskuat, 2006).

3.5 Wildlife

The PTA area has been thoroughly surveyed each season between 1993 and 1998. No endangered species are found and wildlife populations across the study area are quite low for all species. Extensive surveys were carried out in the region to determine the presence of wildlife. It was concluded that the area in general provides poor quality habitat and thus is not capable of supporting large populations of wildlife (EIS, DND, 1994). Since then, the Goose Bay Office and its partners have conducted numerous wildlife surveys in the area for different species and have found nothing of significance in the proposed safety zone. The most current survey (Minaskuat, 2006) indicated that the PTA may provide habitat – either permanent, seasonal or infrequent – for at least four species of listed on COSEWIC and/or the Newfoundland and Labrador's Endangered Species Act (Woodland Caribou, Harlequin Duck, Barrow's Goldeneye, and Short-eared Owl). The following summarizes the extent of surveying and monitoring carried out for various species. Inferences have been drawn from past or current studies.

Caribou - The study area encompasses the major portion of the range for the Dominion Lake herd. This herd was estimated at less than 200 animals in 1979 (Folinsbee1979). Institute for Environmental Monitoring and Research (IEMR) transect surveys during the winter 2000 found no evidence of this herd. DND monitoring surveys throughout the study area during summer months (1993-98) did not locate caribou within the study area, the closest being a solitary animal near Dominion Lake, well to the north-west of the study area. Satellite monitoring of Caribou by DND and the Provincial Wildlife Division has been ongoing in the Study Area since 2002. While occasional solitary animals may wander into the study area, most recent survey information suggests the herd no longer exists.

Moose - The area around the PTA provides poor quality browse, with some high and moderate quality habitat along the Little Mecatina River Valley. This area lies within the proposed safety zone but it is outside the PTA. IEMR transect survey in 2000 and DND surveys from 1995-1997 and 2001 located few Moose in the study area. Moose sensitivity period is during late winter (1 March through 15 May).

During the evaluation of the 5 wetlands as part of the Habitat Mapping and Potential Species at Risk investigation (Minaskuat, 2006) the moose (*Alces alces*) was observed in Wetland No. 2, Basin Bog/Basin.

Carnivores and Fur Bearing Animals - The PTA area and the safety zone provide few water bodies for suitable habitat. During surveys for other wildlife in the area, these fur-bearing animals have not been observed in significant numbers. Due to lack of large game and fur bearing animals in the region, the population of the carnivores is almost non-existent.
During the evaluation of the 5 wetlands as part of the Habitat Mapping and Potential Species at Risk investigation (Minaskuat, 2006) the following was observed with respect to mammals.

- Wetland No. 1, Marsh - Small mammals were recorded in the vicinity of the wetland but none are considered to be rare or sensitive.

- Wetland No. 2, Basin Bog/Basin Fen - The American Black Bear (*Ursus americanus*) and Meadow Vole were observed.

None of the above species are considered to be rare or sensitive nationally (COSEWIC 2005) or provincially (ACCDC 2005).

Raptorial Birds – Osprey habitat throughout the study area is low to moderate quality. Based on monitoring studies conducted by DND as part of its mitigation program, between 1995 and 1998, 2 active osprey nests are anticipated within the study area. The habitat is suitable for bald eagle throughout the Minipi Lake system along the northern boundary of study area and the Anne-Marie Lake system to the North. Lac Fourmont to the south-east of the study area is also suitable. One bald eagle nest site has been located through DND's monitoring program outside the study area, north-east of Minipi Lake.

The Peregrine Falcon (*anatum* and *tundrius* subspecies) listed as Special Concern and Threatened under COSEWIC and NL's Endangered Species Act, respectively has been surveyed since 1987. It was noted that thousands of hours were flown in search of the Falcon. Neither the Falcon nor any nesting habitat was encountered.

Minaskuat has conducted aerial surveys for raptor nests of the Short-eared Owl in the general low-level training area (LLTA) and adjacent areas since 1987. Results from the surveys indicate that the owl inhabits the LLTA area during the spring season.

Waterfowl and Loons - Harlequin Duck habitat is marginally suitable along Little Mecatina River which bisects the southern portion of the study area. The DND monitoring program has revealed no known nesting areas or populations within study area. Waterfowl spring staging typically occurs form mid-April through end-May. Low numbers / densities have been found. The sensitive areas, in order of importance, are:

- Lac Fourmont - outside study area to the south-east
- Minipi lake – along northern boundary of study area
- Anne- Marie lake – north of study area
- Little Minipi Lake – north of study area

Nesting activity may occur in low density along the Minipi Lake system (June-August) north of the study area. No nesting populations have been identified through the DND monitoring program, and no significant nesting population is expected within study area. A large black duck moulting area is located at Lac Formont, outside the study area to the south-east. A less-important moulting area may also occur at Anne-Marie Lake, also outside the study area

Fall Migration typically occurs in September and October. No late-fall monitoring has been conducted. Potential resting/ feeding areas are along the Minipi Lake system along the northern boundary of the study area, Anne-Marie Lake to the north and Lac Fourmont to the southeast.

During the recent investigation (Minaskuat, 2006) pairs and individuals of the Harlequin Duck have been documented within the PTA along the Little Mecatina River, as indicated above. The duck was also observed in adjacent habitats (*e.g.* Guines Lake, Minipi River). Pairs and individuals of the Barrows Goldeneye have also been documented within the area of the PTA.

During the evaluation of the 5 wetlands as part of the Habitat Mapping and Potential Species at Risk investigation the Canada Goose (*Branta Canadensis)* was observed in Wetland No. 1, Marsh. The Canada Goose is not rare or sensitive nationally (COSEWIC 2005) or provincially (ACCDC 2005).

Song Bird –During the evaluation of the 5 wetlands as part of the Habitat Mapping and Potential Species at Risk investigation the following was observed with respect to Song Birds.
None of the above species are considered to be rare or sensitive nationally (COSEWIC 2005) or provincially (ACCDC 2005).

Fish –Supplemental Environmental Work was conducted by Minaskuat in March 2007 involving fish surveys. No fish were collected at any of the sites sampled. The sites consisted of the pond adjacent to the area of interest and five stream crossings located between the main campsite and target areas (Figure 3.3). The following areas were classified as type IV habitat (poor juvenile salmonid rearing habitat); pond adjacent to area of interest, 4 streams located between the main campsite and target areas and the Main River flowing through the northern portion of the property. Stream 5 located adjacent to the main accommodations complex was classified as a type II habitat (good salmonid rearing habitat with limited spawning).

3.6 Environmental Site Assessment and Preliminary Qualitative Risk Assessment

An Environmental Site Assessment (ESA) and Preliminary Qualitative Risk Assessment (PQRA) were completed in 2006 by Minaskuat. The ESA consisted of forty-five (45) shallow test pits, twenty-six (26) shallow boreholes, and the collection of eight (8) sediment samples and eight (8) surface water samples from various streams and water bodies present within the PTA. The findings and conclusions as per the report are summarized below.

- No free phase petroleum hydrocarbon product was found during the investigation.
- Low levels of total petroleum hydrocarbons (TPH) and benzene, toluene, ethylbenzene and xylene (BTEX) were detected in two soil samples collected from the test pits and boreholes at the camp site (approximately 2.8km northwest of the proposed site); however none of the concentrations exceeded the applicable Tier I Risk Based Screening Level (RBSL) for a residential/parkland site with non-potable groundwater and coarse soil.
- Concentrations of various metals were detected in soil samples from all the test pits and boreholes; however, none of the detected concentrations of metals exceeded the applicable criteria for metals in soil on a residential/parkland site, where such criteria exist.
- Low levels of VOCs were detected in soil samples from some of the test pits and boreholes; however none of the detected VOCs levels exceeded the applicable criteria for VOCs in soil on a residential/parkland site.
- There were no detectable semi-VOCs or energetics in soil samples tested.
- Concentrations of various metals were detected in all sediment samples analysed. The detected concentrations of cadmium in two samples (SED4 and SED5), taken from the pond located approximately 500 m northwest of the site, exceeded the applicable Canadian Council of Ministers of the Environment (CCME) interim sediment quality guidelines (ISQGs). The detected concentration of cadmium in one sample (SED5) also exceeded the applicable CCME probable effects levels (PELs).
- There were no detectable TPH and BTEX concentrations in any of the surface water samples.
- Concentrations of various metals were detected in all surface water samples analysed. The detected concentrations of aluminum and copper in seven samples (SW1, SW2, SW4, SW5, SW6, SW7, SW8 of which three were taken from the pond) and iron concentrations in five samples (SW1, SW2, SW5, SW7 and SW8 of which one was taken from the pond) exceeded the applicable Canadian Water Quality Guidelines (CWQG) for the protection of Freshwater Aquatic Life. Furthermore, cadmium concentrations in three samples (SW4, SW5, SW6) taken from the pond and lead and zinc concentrations in one sample (SW5) taken from the pond exceeded the applicable guidelines.

The report concluded that soil contamination from TPH/BTEX, metals, volatile organic compounds (VOCs) as well as semi-VOCs, and energetics did not appear to be an environmental concern in the investigated portions of the subject site. TPH/BTEX concentrations for surface water samples did not appear to be an environmental concern for the PTA site. Cadmium in the two sediment samples, taken from the pond located adjacent to the proposed project site, is believed to be associated with the historic operations of the site and a result of non-explosive practice ordinance missing their intended targets, as cadmium is often used in electronic components. Based on elevated concentrations of aluminum, copper and iron present in the background surface water sample, it is likely that the elevated concentrations in other surface water samples are associated with naturally occurring background levels. However, elevated concentrations of cadmium, zinc and lead in the pond are believed to be associated with the historic bombing of the site.

The PQRA completed in 2006 identified the following chemicals as potential chemicals of concern (COC) at the site:

- Cadmium in sediment; and,
- Cadmium, lead and zinc in surface water.

The following human and ecological receptors were identified; occasional commercial receptors (i.e., military personnel and SERCO personnel) with limited exposure and potential for aboriginal groups; terrestrial ecological receptors and aquatic and semi-aquatic ecological receptors. The PQRA concluded that a low risk potential was estimated for human and terrestrial receptors based on current land use and a medium to high risk potential was estimated for aquatic and semi-aquatic ecological receptors because of potential exposure to cadmium in sediment and cadmium, lead and zinc in surface water at the site.

The PTA site was given a National Classification System (NCS) score of 60 and a Federal Contaminated Sites Action Plan (FCSAP) score of 67. These scores classify the site as a Class 2 site. Based on the classification descriptions; "*The available information indicates that there is high potential for adverse off-site impacts, although the threat to human health and the environment is generally not imminent. There is probably no indication of off-site contamination; however, the potential was rated high and therefore some action is likely required*." The report recommended that the presence or absence of ecological receptors in the pond be confirmed and if no ecological receptors are found to be present then no further work would be required; however, if ecological receptors were found the report recommended further assessment.

As recommended by the above report, additional environmental work was carried out at the PTA by Minaskuat in 2007. The supplemental investigation consisted of the collection of twenty-two (22) soil samples, twelve (12) sediment samples and twelve (12) surface water samples from various locations as well as a fish survey. The findings and conclusions as per the report are summarized below.

- No fish were collected at any of the sites sampled. The sites consisted of the pond adjacent to Alpha 1 (location of existing simulated airstrip) and five (5) stream crossings located between the camp and target areas. The following areas were classified as type IV habitat (poor juvenile salmonid rearing habitat); pond adjacent to Alpha 1, 4 streams located between the main campsite and target areas. Stream 5 located adjacent to the main accommodations complex was classified as a type II habitat (good salmonid rearing habitat with limited spawning).
- No free phase petroleum hydrocarbon product was found on the site during the investigation.
- Low levels of TPH were detected in one soil sample collected at the camp. All the TPH concentrations were within the applicable Tier I RBSL for a residential/parkland site with non-potable groundwater and coarse soil. No BTEX parameters were detected in any of the soil samples.
- Concentrations of various metals were detected in all soil samples; however, they were below applicable criteria for metals in soil on a residential/parkland site.

- TPH were detected in six sediment samples taken from the pond, but were below the Ontario Ministry of Environment and Energy (OMOEE) guideline for TPH in freshwater sediment and no BTEX parameters were detected.
- Concentrations of various metals were detected in each of the sediment samples analysed. However the detected concentrations of cadmium in three samples taken from the pond were the only metal that exceeded the applicable CCME probable effects levels (PELs).
- There were no detectable TPH and BTEX concentrations in any of the surface water samples tested during this investigation.
- Concentrations of various metals were detected in all surface water samples analysed. The detected concentrations of aluminium in all samples including the reference sample exceeded the applicable Canadian Water Quality Guidelines (CWQG) for the protection of Freshwater Aquatic Life. Cadmium and copper concentrations in all samples with the exception of the reference site exceeded the applicable CWQG. Iron concentrations in all samples with the exception of one sample exceeded the applicable CWQG. Chromium concentrations in samples five samples and lead concentrations in two samples taken from the pond exceeded the applicable CWQG. No other detectable concentrations exceeded the applicable CWQG for the protection of Freshwater Aquatic Life.

In conclusion; soil contamination from TPH/BTEX and metals does not appear to be an environmental concern in the investigated portions of the subject site. TPH/BTEX in sediment does not appear to be a concern for the sediment sampled and analysed during the investigation. Cadmium was the only metal exceedance in three sediment samples taken from the pond located adjacent to the proposed project site and is believed to be associated with the historic operations of the site and a result of non-explosive practice ordinance missing their intended targets, as cadmium is often used in electronic components. The elevated concentration of aluminum, copper and iron in surface water is believed to be naturally occurring since the background levels present at the site were also high in aluminum and the elevated concentrations of cadmium, chromium, lead and zinc in the pond are believed to be associated with the historic operations of the site.

Another PQRA was conducted during the investigation as contaminants were identified at the site at concentrations exceeding the applicable guidelines. Based on the PQRA, the following chemicals were considered potential chemicals of concern (COC) at the site:

- Cadmium in sediment; and,
- Cadmium, chromium, lead and zinc in surface water.

For the PQRA the following human and ecological receptors were identified for the PTA site; occasional commercial receptors (i.e., military personnel and SERCO personnel) with limited exposure as well as the potential for aboriginal groups and terrestrial ecological receptors. The PQRA concluded that a low risk potential was estimated for human, terrestrial and semi-aquatic ecological receptors at the site based on current land use and the pond not being a suitable fish habitat.

The PTA site was given a NCS score of 36 and a FCSAP score of 36, which classify the site as Class N site. Based on the classification descriptions; "*The available information indicates there is probably no significant environmental impact or human health threats. There is likely no need for action unless new information becomes available indicating greater concerns, in which case the site should be re-examined*" and the report concluded that no further investigation or remediation work is required at the site.

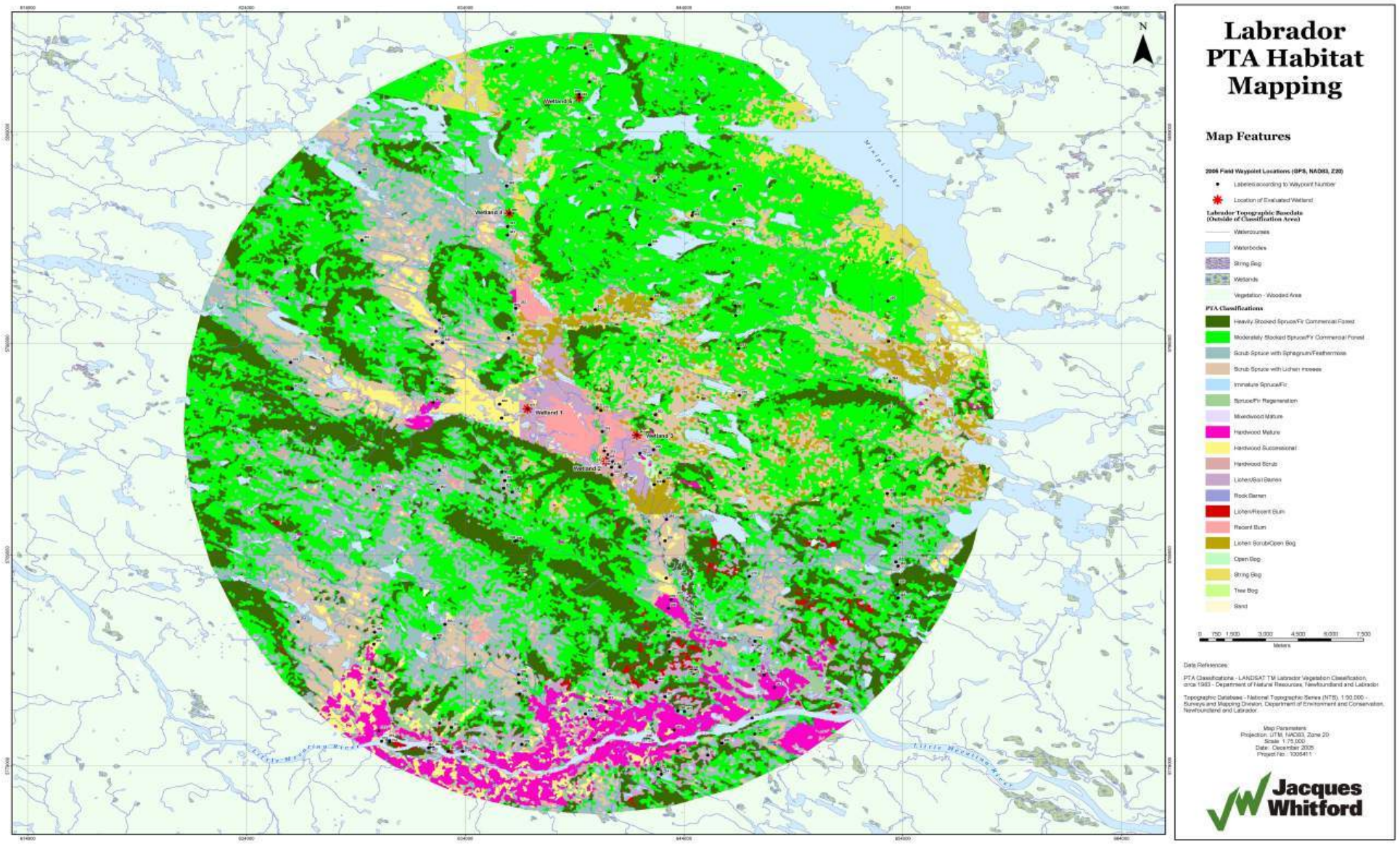


Figure 3.4 Diagram taken from Minaskuat 2006 report, showing habitat mapping for the PTA. Note: Area of interest is located in the recent burn area at the centre of the PTA.

3.7 Recreation/Aesthetic

A dozen small communities are situated some forty kilometres or more from the training area perimeter; members of these communities practice traditional hunter/gatherer harvesting activities within the training area during different periods of the year. An Innu Nation report indicated that the main potential for overlap with Labrador Innu activity is centred on the south shore of Minipi Lake during the spring ice breakup. This represents a relatively small spatial and temporal overlap within the Safety Exclusion Zone. While information from the Quebec Innu communities has yet to arrive, DND data from studies related to the Environmental Impact Statement (DND, 1994) and information since gathered within the ongoing mitigation program suggest that only relatively minor overlaps may also occur. The primary inland activity for Quebec Innu appears to be related more to late fall ventures within the northern border regions (DND, 2009). While these results may be subject to revision, it appears very likely that whatever overlap exists is minor and may be addressed in the context of further discussion and appropriate arrangements.

Regulations for Canadian Forces Air Weapons Ranges provide direction for safe operations and training, including the safety of the public. These procedures, which are in place at the PTA, include appropriate measures for marking ranges and warning the public of danger. The two standard physical activities in marking a range include:

- a clear-cut warning track consisting of an 8-metre wide slash mark, and
- metal signs around the perimeter to identify range boundary – 2,000 ft spacing.

Human ingress into the area during the summer is light and mostly limited to Minipi Lake activity to the north and east, primarily involving outfitter camp operations. Access from the other quadrants during this period is even more limited and would be confined to the Little Mecatina or Minipi River systems. The closest community is 100 kilometres south of the Safety Exclusion Zone (DND, 2009).

Measures with Transport Canada and 1 Canadian Air Division to have an airspace restriction equivalent to the Safety Exclusion Zone designated and published in advance of the start of training is in place and working. Requests by civil aviation to fly through the zone will be granted unless there is a conflict between PTA use and the civil request. Control of this airspace will continue to be exercised by the Military Coordination Centre at 5 Wing (DND, 2009).

3.8 Archaeological/Cultural

Given the historical use of the land at the PTA by aboriginal groups, archaeological or cultural artifacts may be encountered during project activities. It should be noted that intrusive activities (i.e. excavation) are not expected and will be limited to grubbing and removal of topsoil. A stage 1 level archaeological study was conducted at the PTA by DND as part of the original Lease Agreement in 1995; however, the report was not available for review at the time of the EA.

3.9 Assessment of Valued Ecosystem Components

Valued Ecolsystem Components (VECs) are the environmental attributes or elements that are identified as having scientific, social, cultural, economic, historical, biological, archaeological or aesthetic significance. The potential interactions between the project components identified and the VECs are listed in Table 3.2: Environmental Effects Matrix.

Because of the project footprint; vegetation (i.e. tree/bush clearing and trimming), effects on terrestrial habitat, a small loss of habitat for terrestrial birds and animals may be unavoidable. Mitigation measures

to minimize these impacts will be implemented for the duration of the project activities. Impacts to wetlands, fish habitat and invertebrates may occur due to project activities from sediment, silt or contamination (i.e. petroleum products) entering the receiving water bodies. However, impacts are not expected to affect wetland function or fish/invertebrate populations locally or regionally, if the proper mitigation measures are implemented. A stage 1 level archaeological study was conducted by DND as part of the original Lease Agreement in 1995; however, it was not available to review during the time of the assessment. There is a possibility that artifacts may be encountered considering the area has been historically associated with traditional aboriginal activities. Mitigation measures have been identified in case artifacts are uncovered during project activities.

Based on the research conducted, there is the potential for the proposed facility to interact with various VECs including the following; atmosphere, surface water, groundwater, soils, ambient noise, terrestrial animals, terrestrial habitat, aquatic animals, aquatic habitat, vegetation, archaeological/cultural, recreation/aesthetic, human health and safety, economy and services. However implementation of the mitigation measures presented in Table 3.3 will reduce or eliminate the potential impacts on the environment and identified VECs.

Table 3.2 Environmental Effects Matrix

PROJECT COMPONENT	VALUED ECOSYSTEM COMPONENTS																		
	PHYSICAL						BIOLOGICAL					SOCIAL							
	Atmosphere	Surface Water	Groundwater	Soils	Terrain	Ambient Noise	Terrestrial Animals	Terrestrial Habitat	Aquatic Animals	Aquatic Habitat	Vegetation	Archaeological/Cultural	Heritage	Recreation/Aesthetic	Human Health and Safety	Economy	Services	Land Use
Site Preparation and Construction of the Austere Landing Airstrip	**X**	**X**	**X**	**X**		**X**	**X**	**X**	**X**	**X**	**X**	**X**		**X**	**X**		**X**	
Site Operation of the Austere Landing Airstrip	**X**	**X**	**X**	**X**		**X**	**X**	**X**	**X**	**X**	**X**			**X**	**X**			

Potential effects shown with an "**X**"

It should be noted that the following table is assessing both project components together in Table 3.3, as such impacts and mitigation measures apply to all project components.

Table 3.3 Scope Rationale for Each Identified VEC and Mitigation Measures			
VEC/SCOPED IN/OUT		**RATIONALE**	**MITIGATION MEASURES**
Atmosphere	In	Greenhouse gas emissions will be produced on site as a result of vehicle (i.e. dozer, ATVs) and equipment (i.e. chainsaw) used during the site preparation and construction as well as operation (i.e. fixed wing aircraft). Dust/particulates will become airborne as a result of clearing and soil handling activities during site preparation, and construction. Dust may also be generated from maintenance activities (i.e. moving vehicles, clearing) during the operation of the airstrip. Fixed wing aircraft landing on the airstrip will also generate dust.	Impacts to atmosphere and air quality from vehicles/equipment and aircraft must be mitigated with the following measures: • Equipment must be maintained in good working condition by the Contractor to reduce emissions and maintain emissions levels within provincial guidelines; • Mechanical systems such as ventilation systems and air discharge equipment must be routinely inspected, cleaned and maintained at designated areas; • Equipment and mechanical systems, when not in use, must be turned off; and • Aircraft is routinely checked and maintained before and after flights. Impacts to atmosphere and air quality from dust must be mitigated with the following measures: • Appropriate covers (i.e. tarps) on soil stockpiles are to be used; • Manage dust and airborne particulates using covering measures and wetting techniques should machinery traffic or exposed soil generate dust; • Spray water to minimize the release of dust and particulates from exposed soils; • Minimize the time between clearing and backfill/compaction; • Restore disturbed areas as soon as possible to minimize the duration of soil exposure; • Where possible leave rooting system from vegetation clearing; and • Maintain runway (i.e. compaction, wetting) during times of heavy traffic.
Surface Water	In	Water runoff from the proposed project sites is expected to be directed to the nearest water body via the natural drainage system. The receiving bodies could potentially receive a pulse of sediment during project activities (i.e. clearing, vehicle movement, etc.)	Sedimentation runoff from project activities (i.e. clearing) into nearby water pathways (i.e. natural drainage) must be controlled. The following mitigative measures are directed towards controlling sediment: • The exposure of soil at the site should not occur any sooner than necessary to minimize the time the soil is exposed; • Exposed soil must be stabilized as soon as possible with erosion control measures (i.e. compaction, spreading hay, tarps, etc.);

Table 3.3 Scope Rationale for Each Identified VEC and Mitigation Measures			
VEC/SCOPED IN/OUT		**RATIONALE**	**MITIGATION MEASURES**
		Spills and leaks from equipment may introduce deleterious substances into the receiving body during site preparation and construction (i.e. heavy equipment) as well as operation (i.e. fixed wing aircraft).	• Stockpiles must be protected from erosion to contain materials from leaving the area (i.e. cover with tarp, hay bails, berm, etc.); • Avoid working during periods of high precipitation; • A **30 metre** buffer zone from the high water mark of any water body, including wetlands, will be established; • Where possible maintain rooting system during clearing; • Contractor will develop a site specific **Erosion and Sediment Control Plan** to be reviewed and approved by DND/DCC prior to beginning work; and • Remove erosion structure only after the area is stabilized. Deleterious substances must not enter the receiving water body during the project activities; the following measures must be implemented: • Store and handle hazardous materials and wastes in accordance with applicable federal and provincial laws, regulations, codes, and guidelines; • The Contractor will develop and implement a **Spill Control/Response Plan** to be reviewed and approved by DND/DCC prior to beginning work. The Plan will outline the procedures to follow for any accidental spills, such as reporting requirements and responsibilities of personnel; • In developing the plan, Environment Canada recommends the Canadian Standards Association publication Emergency Planning for Industry (CAN/CSA-Z731-95), be consulted as a useful reference; • A vegetated buffer zone should be maintained, as appropriate, to protect surface waters; • Proper procedures for refuelling, equipment, generator and aircraft must be followed; • Personnel must be made aware of spill response procedures; • Do not discharge contaminated water to water bodies; and • Equipment maintenance activities must be undertaken on level terrain, at a suitable distance (i.e. 30 m) from environmentally sensitive areas including watercourses, and on a prepared impermeable surface.

Table 3.3 Scope Rationale for Each Identified VEC and Mitigation Measures			
VEC/SCOPED IN/OUT		**RATIONALE**	**MITIGATION MEASURES**
Groundwater	In	Accidental spills and leaks from equipment and/or storage of hazardous materials (i.e. oils, fuels) during project activities may permeate the soil and enter the groundwater Improper re-fuelling techniques and storage of hazardous materials for all project components may also result in spills.	To prevent deleterious substances from entering the groundwater as a result of accidental spills and leaks operation; the following measures must be implemented • All workers will be trained in spill control and response procedures, including, spill prevention techniques, spill response measures, and spill reporting protocols; • Spill response procedures will be posted and made aware to the workers on site and an emergency contact list on-site will be placed in a noticeable location; and • The Contractor shall include in the **Spill Control/Response Plan**, description of spill kits (i.e. absorbent materials, plastic lining, containment booms); storage, handling, usage and disposal of products; location of staging areas (i.e. drawing) and develop procedures to handle spills. In order to prevent accidental spills during refueling activities and storage, the following measures must be implemented • Proper procedures for refuelling, equipment, generator and aircraft must be followed; • Refuelling and maintenance activities should be undertaken on level terrain, at least **30m** from any surface water (including shorelines and wetlands); • Personnel must be made aware of spill response procedures; • Drums of petroleum products should be tightly sealed against corrosion and rust and protected against collision with moving vehicles. Drums should be surrounded by an impermeable barrier in a dry, water-tight structure.
Soils	In	During the project activities (i.e. refueling equipment) the risk of spills and accidental releases could impair soil quality. The project site has not been identified as a contaminated site; however precautions should be in place incase contaminated soil is encountered.	To prevent deleterious substances from contaminating the soil as a result of accidental spills and leaks operation; the following measures must be implemented; • Clean up any spills and leaks immediately and report spills, as required, to the DND Project Manager and Wing Environment Office; • Procedures for handling spills will be described in the Contractors **Spill Control/Response Plan**; and • Ensure proper fuelling procedures are followed.

Table 3.3 Scope Rationale for Each Identified VEC and Mitigation Measures			
VEC/SCOPED IN/OUT		**RATIONALE**	**MITIGATION MEASURES**
			If during excavation activities, unknown subsurface issues are encountered, the DND Project Manager must be contacted immediately and appropriate measures (i.e. containment/cleanup) should be evaluated to determine the appropriate course of action. This may include soil and groundwater sampling, excavation and disposal of impacted soil, barrier separation of remaining impacts, etc.
Terrain	Out	Significant changes to the existing, predominantly flat, terrain are not anticipated as a result of the project.	• No mitigation required.
Ambient Noise	In	Site activities, primarily those related to the operation of heavy equipment will likely increase the level of noise in the immediate area of the physical works. The presence of workers, vehicle and equipment traffic and unloading of equipment will contribute to the level of ambient noise and vibrations. The proposed site is remote; therefore the noise from the project is expected to be a nuisance to the natural environment by alarming wildlife habitat as well as personnel within the area. During operation, noise will be associated with the aircraft and typical vehicle movement for maintenance. During training exercise the noise levels associated with the activities (i.e. aircraft, explosives) would be considered Consider mentioning existing noise levels associated with training exercises (i.e. explosives)?	To address the potential for noise impacts associated with the project activities, the following should be implemented; • Personnel should wear proper protective equipment (i.e. ear protectors); • Power generating equipment should be positioned to reduce exposure; • Shield loud power equipment; and turn off equipment when not in use; • Area should be monitored for wildlife during project activities; and • Aircraft is maintained before and after flights.
Terrestrial Animals and Habitat	In	Terrestrial wildlife includes all common species of mammals (including birds) and herpetiles (reptiles and amphibians) within the proposed project sites.	To limit injury to wildlife that may be within or adjacent to the project sites, the following should be considered. • Contractors and personnel should use caution when traveling and watch for wildlife;

Table 3.3 Scope Rationale for Each Identified VEC and Mitigation Measures			
VEC/SCOPED IN/OUT		**RATIONALE**	**MITIGATION MEASURES**
		Project activities have the potential to impact terrestrial animals that may periodically roam and forage in the existing area. Onsite activities may affect the day to day routine of terrestrial animals. Potential environmental effects of the project may result in a change in wildlife habitat type, quantity and/or quality. Project activities, such as vegetation clearing or equipment movement, could potentially result in the destruction of migratory birds or their nests.	• Equipment and material storage sites should be observed to ensure no wildlife residences exist within the designated storage areas; • Garbage generated by all personnel should be disposed of properly in a secured container at the end of each working day; • Minimize disturbance to wildlife by scheduling work to avoid sensitive periods (i.e., staging, hibernation or nursing) and areas (i.e. residence, wildlife movement corridors). The following measures should be implemented to ensure birds are not impacted by the project activities. • Contractor is to comply with the *Migratory Birds Convention Act* and *Regulations* during all project phases; • Contractors will be made aware that under the *Migratory Birds Regulations*, "no person shall deposit or permit to be deposited oil, oil wastes or any other substance harmful to migratory birds in any waters or any area frequented by migratory birds"; • No one shall disturb, move or destroy migratory bird nests. If a nest or young birds are encountered, the Contractor shall cease work in the immediate area of the nest and contact the DND Project Manager and Wing Environment Office; • Measures will be in place to deter birds away from the area during activities, if required; • Clearing of vegetation will cause disturbance to migratory birds and their habitat. Many species use trees, as well as brush, deadfalls and other low-lying vegetation for nesting, feeding, shelter and cover. This would apply to songbirds throughout the region, as well as waterfowl in wetland areas. Disturbance of this nature would be most critical during the nesting period; from May to around mid-July in this region and should be avoided; and • If a nest is located during the clearing/grubbing activity; the nest and neighbouring vegetation should be left undisturbed and activities in the area should be minimized until nesting is complete.

Table 3.3 Scope Rationale for Each Identified VEC and Mitigation Measures			
VEC/SCOPED IN/OUT		**RATIONALE**	**MITIGATION MEASURES**
			Minimize the project footprint – no unnecessary vegetation clearing or disturbance will occur. Existing natural vegetation outside the immediate footprint of project site shall be maintained. Where possible, other vegetation could be used to create or restore lost habitat (i.e. piling brush to create ruffed grouse habitat).
Aquatic Animals and Habitat	In	Hazardous materials (i.e. oil, fuels) used during site preparation, installation or during site operation have the potential to impact aquatic animals and habitat through an accidental discharge into the environment and possibly entering the nearby water bodies. Sediments can introduce nutrients, salts, metals, pesticides and other persistent organic compounds sorbed to soil particles to the aquatic environment.	The following mitigative measures relating to aquatic animals and habitat must be considered and must be included in the Contractors Specifications and implemented at the project site: • Deleterious substances (i.e. lubricating fluids, fuels) cannot be deposited into water frequented by fish; • No person shall deposit or permit to be deposited oil, oily wastes or any other substance harmful to migratory birds in any waters or any area frequented by migratory birds; • Personnel working on the project must be knowledgeable about response procedures, as per the **Spill Control/Response Plan**; • Any accidental release of contaminants must be addressed immediately to the satisfaction of the DND Project Manager and Wing Environment Office; • Ensure hazardous materials and site equipment (i.e. excavators, trucks) are stored away from sensitive receptors; • Maintenance of equipment must only occur at designated areas on level, hard surface areas, and away from sensitive receptors; and • Contractor shall make the DND Project Manager and Wing Environment Office aware of hazardous materials to be stored on site and the DND Project Manager and Wing Environment Office will inform the Wing Fire Chief of all hazardous materials on site. Sedimentation runoff must be controlled with the following mitigative measures; • Drainage from construction and operation drainage must not be harmful to fish; • Install and maintain all sediment/erosion control structures, as per the Contractor's **Erosion and Sediment Control Plan**; and • Remove control structures only after site restoration.

Table 3.3 Scope Rationale for Each Identified VEC and Mitigation Measures			
VEC/SCOPED IN/OUT		**RATIONALE**	**MITIGATION MEASURES**
Vegetation	In	Native vegetation will be damaged if equipment and materials are placed on undeveloped, natural areas. Some native shrubs and trees will require removal and vegetation that is to remain may be damaged by equipment. Vegetation could become contaminated from equipment leaks or spills.	Vegetation impacts must be controlled with the following mitigative measures; • Equipment and materials shall be placed on hardstands to limit the amount of destruction to native vegetation by the weight of the equipment and materials; • Where possible maintain the rooting system; • Care should be taken to limit the amount of damage to vegetation in the surrounding area and designate routes should be established; and • The area to be disturbed should be minimized by not clearing beyond the footprint required. Equipment should be in good mechanical condition, checked for leaks and malfunctions regularly and stored and refuelled .3on hardstands with containment.
Archaeological/Cultural	In	There may be a chance that artifacts are uncovered during project activities as aboriginal groups have historically used the area.	• If artifacts or other heritage articles are encountered during the project, the Contractor is to stop work immediately and the DND Project Manager and Wing Environment Office should be notified. The DND Project Manager shall contact the Provincial Archaeology Office for further direction.
Heritage	Out	The proposed project will not interact with any buildings with Federal Heritage status.	• No mitigation required.
Recreation/ Aesthetic	In	Aboriginal and non-aboriginal groups are known to use the land for traditional hunter/gatherer harvesting activities.	DND continues to have an ongoing dialogue, through public meetings and gatherings with both the aboriginal and non-aboriginal stakeholders. Access to the training areas is controlled for DND by the 5 Wing Military Control Centre (MCC).
Human Health and Safety	In	Accidents may occur during the handling hazardous materials such as fuels (i.e. diesel), oils or lubricants. Accidents from the use of heavy machinery and equipment may occur during project activities, if personnel are not qualified or trained to complete the work. Increases in the amount of airborne dust	When dealing with hazardous materials, the Contractor, as a minimum, shall: • Ensure workers have been trained in accordance with Workplace Hazardous Materials Information System (WHMIS) requirements; • Where contact with hazardous materials is expected, workers shall be instructed in handling procedures, safety precautions, use of safety equipment and applicable legislation and regulations; and • Emergency contact numbers and Material Safety Data Sheets

Table 3.3 Scope Rationale for Each Identified VEC and Mitigation Measures			
VEC/SCOPED IN/OUT		**RATIONALE**	**MITIGATION MEASURES**
		and particulates and vehicle/aircraft exhaust emissions at the site may pose a potential adverse health effect to individuals	(MSDS) for hazardous products must be made easily accessible to all workers on the site. To ensure accidents are avoided during project activities the following mitigation measures must be followed; • A **Site Specific Health and Safety Plan** must be prepared by the Contractor prior to site activities to provide workers with the knowledge of appropriate training and safety equipment required to help prevent harmful situations. The plan must be reviewed and approved by DND/DCC prior to beginning work; • Prior to the commencement of work, a health and safety meeting will be held and regular safety meetings will be conducted daily to identify safety concerns and potentially avoid hazardous incidents; • All work shall be conducted in compliance with the Newfoundland and Labrador Occupational Health and Safety Act; and • All workers must utilize personal protective equipment appropriate to the jobs performed; and • Locate and maintain emergency and first-aid equipment in an appropriate location on site including but not limited to a first-aid kit to accommodate number of site workers, portable emergency eye wash station and the appropriate number and type of fire extinguishers. To address the adverse health effects that may be caused by air emissions, refer to mitigation measures outlined in the VEC "Atmosphere"
Economy	Out	Due to the nature and scale of the project there is not expected to be a significant influence on the local economy.	• No mitigation required.
Services	In	The PTA has been used as training purposes since the 1990's. The construction of the austere landing airstrip will increase the training exercised for DND and provide better service to the PTA in general.	• No mitigation required.

Table 3.3 Scope Rationale for Each Identified VEC and Mitigation Measures			
VEC/SCOPED IN/OUT		**RATIONALE**	**MITIGATION MEASURES**
Land use	Out	The PTA has been used as training purposes since the 1990's, therefore, no interaction with land use is anticipated	• No mitigation required.

3.9 Malfunctions and/or Accidents

Accidents and upset events are considered a component of the project. Environmental impacts resulting from accidents and upset events, such as spills of hazardous products and incidental leaks from equipment and machinery may occur during the project. During operation, accidents may occur from leaks/spills from fixed wing aircraft as well as a crash.

In the case of this proposed project and the area of occurrence, the plausible "accidents and/or malfunctions" that will be considered are petroleum, oil, lubricants (POL), diesel and or jet fuel leaks and spills related to vehicle/aircraft and equipment operation and/or maintenance as well as erosion of on-site material (including soil).

The following is a list of best management practices commonly used for spill management:

- All materials and equipment that could spill or cause a spill will be used and stored in a manner that prevents material from entering water bodies;
- All personnel responsible for fuel handling/product transfer will possess the appropriate training and experience;
- Store fuel and refuel vehicles away from sensitive areas (i.e. water bodies) and in a manner which minimizes the potential for accidental release;
- All contractors will be required to abide by Wing Safety Orders and Fire Safety Orders, prior to work commencing;
- Hazardous material storage and work areas will be designed to provide secondary containment in the event of a spill or leak; and
- The construction contractor's Spill Control/Response Plan, training and equipment will be verified prior to work commencing.

Mitigation to respond to incidents will involve prompt response by initiating the Spill Control/Response plan and contacting the proper authorities to report the incident. Direction will be provided as to how to properly manage the incident. The following is a list of best management practices commonly used for response:

- Ensure that site staff are familiar with, and post, the Spill Control/Response Plan procedures and emergency contact list on-site in a noticeable location;
- Ensure that a suitable supply of absorbent materials is readily accessible; and
- Capture, contain and clean up any spills and leaks and immediately report all spills to the contracting authority and Wing Environment Office.

3.10 Conclusion

Based on the research conducted, there is the potential that the proposed project could affect atmosphere, surface water, groundwater, soils, ambient noise, terrestrial animals, terrestrial habitat, aquatic animals, aquatic habitat, vegetation, archaeological/cultural, recreation/aesthetic and human health and safety; however with proper and full implementation of the mitigation measures presented in Table 3.3, the impact on the environment is expected to be significantly reduce or eliminated.

Based on this assessment it has been concluded that potential significant environmental impacts as a result of this project can be eliminated for planned activities, and minimized for unplanned accidental releases through adherence to the mitigation measures.

A review of the physical works and associated activities for the project indicates that the impacts of the project are expected to be short-term, confined mainly to the area of interest and can be mitigated. It is believed that the undertaking will not pose adverse or likely environmental effects.

4.0 ENVIRONMENTAL MANAGEMENT

4.1 General

DND maintains a high standard of environmental management associated with the training activities in Goose Bay. It has a guaranteed source of funding for its mitigation programs and benefits from its association with the provincial wildlife agencies of both Quebec and Newfoundland and Labrador, the Institute for Environmental Monitoring and Research and other partnerships it has developed over the years. 5 Wing Goose Bay maintains ISO 14001 certification of its Environmental Management System.

National Defence will continue its monitoring program of the entire training area for as long as the allied forces train in Goose Bay. Particular emphasis will be placed on communication and consultation arrangements with individuals and organizations whose activities are close to or within the Safety Exclusion Zone.

4.2 Project Related Options

Should it be determined that the undertaking cannot proceed, DND would be not be able to offer participating nations the opportunity to conduct soft surface operations from short soft surface (dirt, sand) landing strips in addition to limiting the scope of ground force training at the PTA to small group training only.

4.3 Project Related Documents

The following documents provide project information relevant to the training activity, National Defence Regulations, Orders and Procedures and previous associated environmental assessments:

- An Environmental Impact Statement on Military Flying Activities in Labrador and Eastern Quebec (DND, 1994)
- Transfer Administration and Control of Crown Land To Her Majesty The Queen in Right of Canada, 01 June 1995 (Lease Agreement) between DND and the Province of Newfoundland
- Wing Flying Orders – 5 Wing
- Mitigation Orders for Foreign Military Training in Goose Bay
- Access and Co-operation Agreement Between DND, Canoe Lake Cree Nation and Saskatchewan (1997)
- Canadian Forces Technical Order C-02-040-002/TS-001 Laser Safety
- Canadian Forces Technical Order C-02-040-002/AA-000 ANSI Z136.1-1993 Safe Use of Lasers
- Canadian Forces Publication B-GL-304-003/TS-0A1 Training Safety

- Canadian Forces Publication C-07-010-011/TP-000 CF Air Weapons Ranges (DND 1997)

5.0 CONCLUSION

The foreign military training presence at Goose Bay has long been a "way of life" and a primary source of economic activity for the region. With time and advancing technology, training requirements keep evolving to meet changing operational demands.

Based on this assessment it has been concluded that potential significant environmental impacts as a result of this project can be eliminated for planned activities, and minimized for unplanned accidental releases through adherence to the mitigation measures.

A review of the physical works and associated activities for the project indicates that the impacts of the project are expected to be short-term, confined mainly to the area of interest and can be mitigated. It is believed that the undertaking will not pose adverse or likely environmental effects.

6.0 APPROVAL OF THE UNDERTAKING

The following permits and approvals may be required to construct the Austere Landing Strip at the 5 Wing Practice Target Area:

Table 6.1 Permits, Approvals and Authorizations

Permit, Approval or Authorization	Agency
Federal	
Release from the Canadian Environmental Assessment Act	CEAA
Air Weapons Range clearance	Department of National Defence, 1 CAD
Provincial	
Release from Newfoundland Environmental Assessment Act	Department of Environment
Transfer of Administration and Control of Crown Land amendment	Government Services and Lands

7.0 FUNDING

The Department of National Defence will assume funding for this Undertaking.

8.0 SIGNATURE

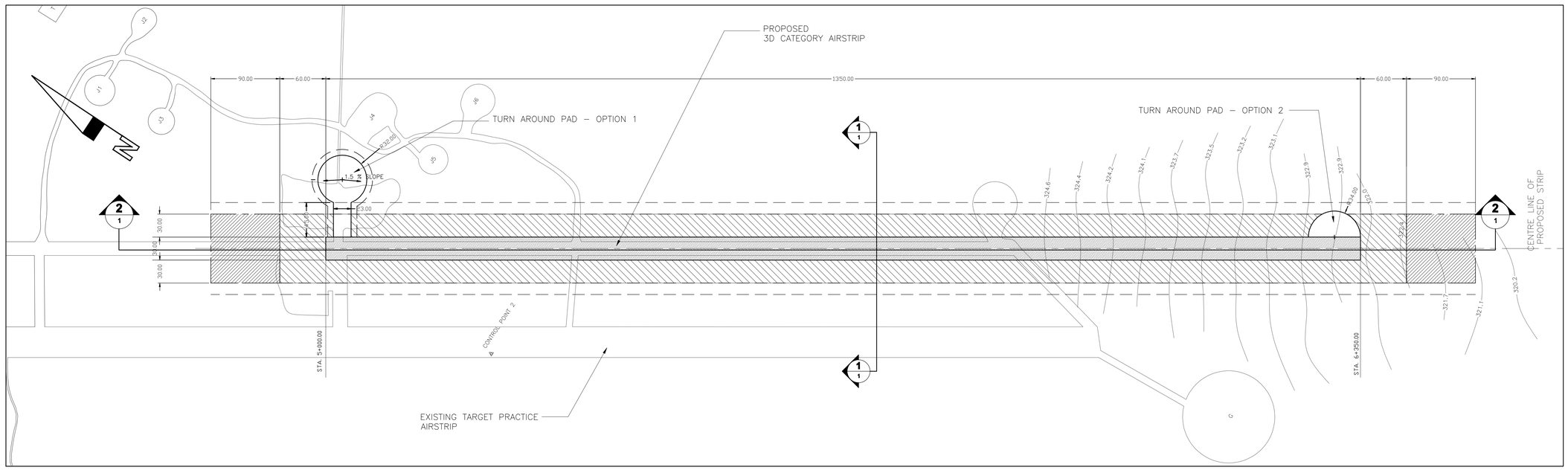
04 JUN 2010
Dated

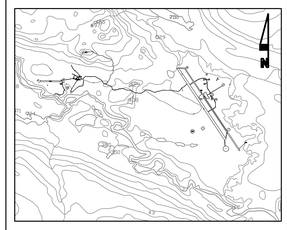
LCol B.L. Bowerman
Commander
5 Wing Goose Bay

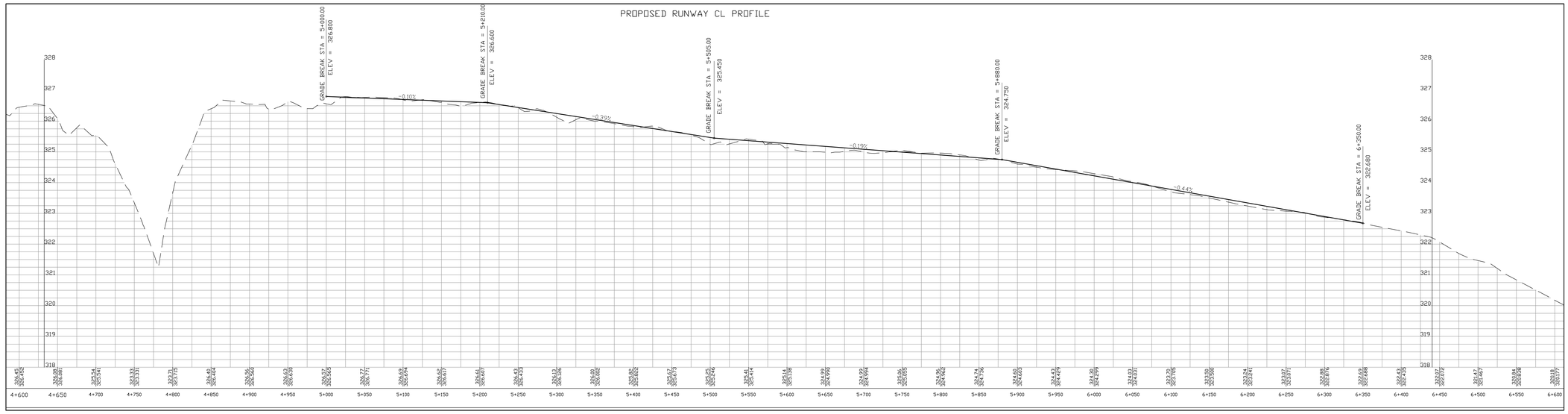
Enclosures: 1

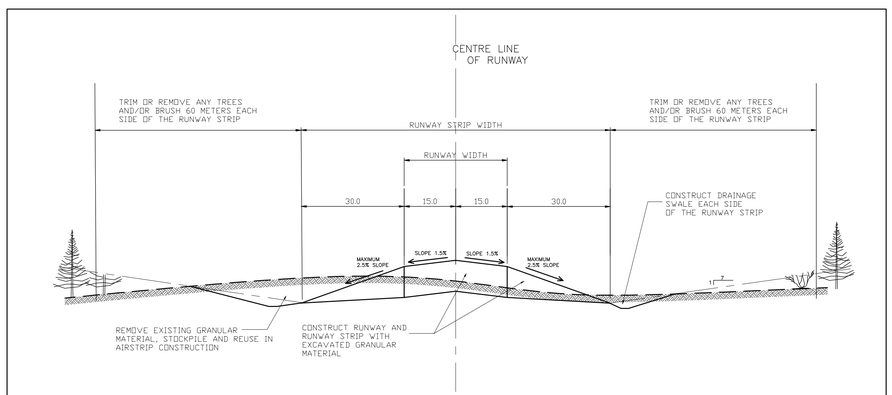
Appendix A

Site Drawing

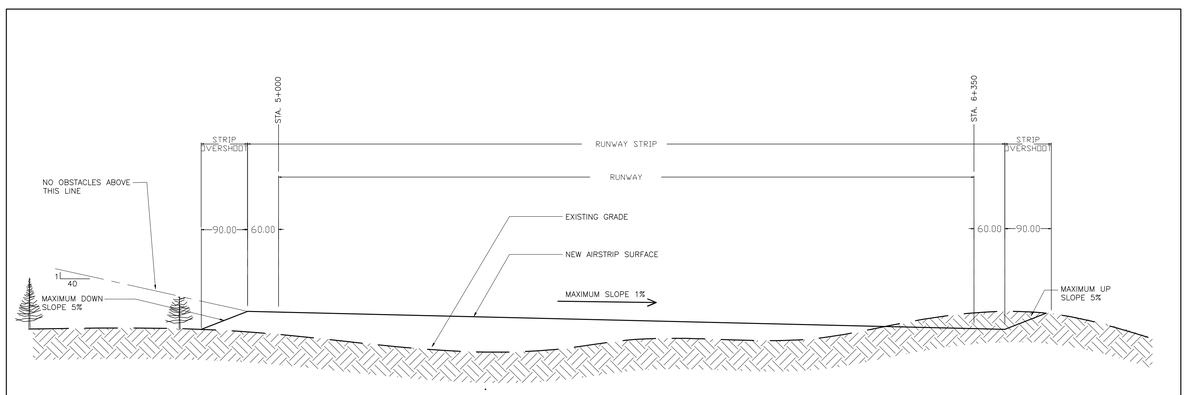








1 / 1 **CROSS SECTION**
N.T.S.



2 / 1 **LONGITUDINAL SECTION**
N.T.S.

Public Works and Government Services Canada
Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region

PRELIMINARY
NOT FOR CONSTRUCTION

DO NOT SCALE DRAWINGS

5		
4		
3		
2		
1		
0	Design Completion	
revisions	description	date

Client

project title
**5 WING GOOSE BAY,
NEWFOUNDLAND, CANADA**

PTA SITE

approved by

designed by
Sirinder S. BRAR, P. Eng.

drawn by
Misha GOGELA

PWGSC Project Manager

PWGSC, Architectural and Engineering Resources Manager
Surinder J. Singh, P. Eng.

Client

drawing title
PROPOSED NEW AIRSTRIP

project no.	sheet	revision no.
	CI OF XX	**0**

B1 1000 x 707

0 10 20 30 40 50 60 70 80 90 100mm

A000