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May 12, 2022

File: CMSS 22 05

NB Department of Environment and Local Government

Marysville Place, P.O. Box 6000

Fredericton, NB

E3A 5T8

Attention: **Shawn Hamilton, P.Eng. - Project Manager**

**Re: Environmental Impact Assessment Registration for upgrades
of the existing Septic System at Crabbe Mountain**

NATECH Holdings Inc. (NATECH) is pleased to submit this electronic copy of the Environmental Impact Assessment (EIA) registration document for the proposed undertaking on behalf of Crabbe Mountain Investments Inc. This document was prepared in association with GEMTEC.

The proposed project involves the replacement of the existing septic system with a Large-Diameter Matted Pipe (LDMP) disposal field system on property identified by Service New Brunswick as Parcel Identifier (PID) 75513309.

Please do not hesitate to contact the undersigned if you have any questions or concerns about the registration document or about the information presented herein.

Sincerely,

A handwritten signature in blue ink, appearing to read "J. Schroer".

Jochen Schroer, M.Eng., P.Eng.

NATECH

A handwritten signature in blue ink, appearing to read "Paul Vanderlaan".

Paul Vanderlaan, P. Eng.

GEMTEC



Environmental Impact Assessment
Registration Document for the:

**On-site Effluent Disposal System Upgrades at the
Crabbe Mountain Ski Lodge**

Submitted to:

New Brunswick Department of Environment and Local Government
Marysville Place, P.O. Box 6000
Fredericton, NB
E3A 5T8

Date:

2022 05 12

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1.0 INTRODUCTION

NATECH Environmental Services Inc, in association with Gemtec Ltd., have been retained by Crabbe Mountain Investments Inc., to prepare an Environmental Impact Assessment (EIA) document for the proposed septic system upgrades (herein referred to as “the Project”) at Crabbe Mountain Ski Resort in Central Hainesville, New Brunswick. The Project involves the replacement of the existing system with a Large-Diameter Matted Pipe (LDMP) disposal field system on property identified by Service New Brunswick (SNB) as Parcel Identifier (PID) 75513309. The existing infrastructure has reached the end of its useful life. Further, the proposed system will support the increased capacity demand expected during the 2023 Canada Winter Games to be held at Crabbe Mountain.

The proposed Project type is specified as an undertaking outlined in Schedule A of the *New Brunswick Environment Impact Assessment Regulation 87-83* under paragraph:

(n): all sewage disposal or sewage treatment facilities, other than domestic, on-site facilities.

This document is in support of the EIA Registration for the proposed Project. The document details the necessary information as outlined in the NBDELG document “A Guide to Environmental Impact Assessment in New Brunswick” dated January, 2018.

1.1 Name of the Undertaking and Project Proponent

1.1.1 Name of the Undertaking

Crabbe Mountain Septic System Upgrade, Central Hainesville, New Brunswick

1.1.2 Project Proponent

The name and contact information of the Proponent is presented in Table 1.1.

Table 1.1 Proponent Information

Name of Proponent	Crabbe Mountain Investments Inc.
Address of Proponent	50 Crabbe Mountain Road, Central Hainesville, New Brunswick E6E 1E1
Principal Proponent Contact	Mr. George Peppin Vice President, Crabbe Mountain Investments Inc. Telephone: (506) 457-8275 Email: pepping@arrowco.ca
Principal Contact Person for EIA	Jochen Schroer. M.Eng., P.Eng NATECH Environmental Services Inc. 2492 Route 640, Hanwell, New Brunswick, E3E 2C2 Telephone: (506) 447-1085 Email: Jochen.S@natechenv.com
Property Ownership	The property is private land and owned by Crabbe Mountain Investments Inc.

2.0 PROJECT DESCRIPTION

2.1 Project Overview

The Project consists of the upgrading of the on-site septic disposal system servicing the main lodge at Crabbe Mountain Ski Resort (Crabbe Mountain). The lodge houses a full-service licensed restaurant and public washroom facilities. Currently, the main lodge is undergoing an expansion, in part to accommodate the 2023 Winter Games, as the alpine ski and freestyle ski events will be held at Crabbe Mountain. The expanded lodge capacity and attendance of the Winter Games is expected to increase septic effluent during Crabbe Mountain's seasonal commercial operations.

The existing septic system has come to the end of its useful life resulting in increased occurrences of odour complaints and sewer backups requiring repairs. Crabbe Mountain proposes to install a new LDMP disposal field system in the general location of the existing system, located in an area currently used as an overflow gravel parking lot (Figure 1). The new system will consist of five new 9,000 Liter septic tanks, one 6,800 Liter grease interceptor, one pump station, and 250 LDMP pipes. Preliminary design drawings are presented in Appendix A. The new septic system will be designed and installed in accordance with the "New Brunswick Technical Guidelines for On-site Sewage Disposal System" by New Brunswick Health dated April 2020. Project related construction will be carried out in the summer of 2022, if approved.

As part of the Project, one of the existing septic tanks will be removed entirely. When encountered during the installation of the new system, the affected parts of the existing septic field will be removed. Remaining portions of the system will be left in-situ to minimize the disturbance activities.

2.2 Purpose / Rationale / Need for the Undertaking

The purpose of the Project is to continue to provide safe and effective on-site septic disposal services to support the Crabbe Mountain commercial enterprise, and to accommodate the increased demand on the septic system expected during the 2023 Canada Winter Games.

The Project is located within the Crabbe Mountain property, and is proposed to replace aging, existing infrastructure.

2.3 Siting Considerations

The Project location was selected due to its proximity to the main lodge. The location for the proposed Project is within lands currently occupied by a septic field and gravel parking lot; minimal disturbance to adjoining land use is required for the Project.

On-site water wells are located beyond the 15 metres and 23 metres setbacks required by NB Public Health Regulations.

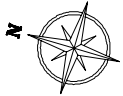
A wetland area (unregulated) is located south of the Project; however, the new system is proposed at a further distance, and higher elevation, from this feature than the existing septic field (Figure 1). A wetland delineation was completed as part of the EIA and associated data is presented in Appendix B.

2.4 Physical Components and Dimensions of the Project

Conceptual design drawings (issued for information) are presented in Appendix A.

2.5 Project Related Documents

There are no known prior EIAs or environmental studies available for the Project.



LOCATION MAP



DRONE PHOTO WAS TAKEN ON:
MAY 13, 2022
(NOT TO SCALE)



CRABBE MOUNTAIN INVESTMENTS INC.

ON-SITE EFFLUENT DISPOSAL REPLACEMENT SYSTEM

2022 05 15

FIGURE 1



3.0 ENVIRONMENTAL IMPACT ASSESSMENT METHODOLOGY

This EIA report has been written to meet the requirements of the *New Brunswick Environmental Impact Assessment Regulation 87-83* (as described in Section 1.0), and in particular:

- Documents the existing conditions of the Site and the Project description;
- Assesses potential environmental effects of the Project (positive or negative);
- Outlines mitigation and impact management measures to minimize anticipated impacts or to reduce anticipated impacts to acceptable levels.

Specific to the EIA document, potential interactions or effects of the Project on the environment have been identified and are discussed herein. Where potential effects are anticipated, the proposed methods for mitigating the potential effects have been presented.

The EIA has been completed for two spatial boundaries:

- The Site is defined as the general location of the proposed Project as depicted in Figure 1; and
- The Assessment Area is generally defined as nearby sensitive receptors on properties adjoining SNB PID 75513309 (*i.e.*, neighbouring residential dwellings, environmentally sensitive areas, *etc.*).

The temporal boundaries of the EIA have been completed for the construction and operation phase of the Project. It is expected that a decommissioning plan will be developed in accordance with the approval provided by Public Health, when applicable.

4.0 DESCRIPTION OF THE EXISTING ENVIRONMENT

4.1 Groundwater Resources

4.1.1 Drainage and Topography

A review of contour mapping indicates that the general gradient of the Site is sloping southeast. Downgradient flow is expected south through the adjoining wetland area, then east towards Central Hainesville Road, located approximately 600 metres southeast of the Site.

Regionally, the peak of Crabbe Mountain (+400 metres) is the highest elevation of the surrounding topography, with steep slopes to the north and west, influencing drainage pattern towards Burt Lake Branch watercourse and wetland complex (Toporama Mapping, Appendix C).

4.1.2 Geology

Surficial geology mapping indicates that the area of study is covered with Late Wisconsinan morainal sediments consisting of hummocky loamy ablation till, lodgement till, minor silt, sand and gravel and boulders: generally greater than 1.5 metres thick (Rampton, V. N., 1984).

As part of the Crabbe Mountain lodge expansion structural project, GEMTEC Consulting Engineers and Scientists Limited (GEMTEC) undertook a geotechnical investigation of exploratory test pits situated within 100 metres of the Site. Generally, the soil conditions encountered consist of a thin layer of fill and / or overburden soils over bedrock. The thickness of the overburden layer ranged from approximately 0.1 to 0.2 metres. Probable bedrock was encountered in all test pits. Excavator refusal was achieved on the bedrock surface in all test pits with the exception of one, where highly weathered bedrock was observed. This weathered bedrock could be excavated with an excavator. Groundwater seepage was not observed during the investigation.

Local bedrock geology mapping indicates bedrock in the area generally comprises greywacke, slate, siltstone, sandstone, conglomerate, and limestone, with minor ferruginous and manganiferous chert and argillite, and minor volcanic rocks.

4.1.3 Groundwater Quality and Quantity

The NBDELG Online Well Log System (OWLS) was accessed to identify groundwater extraction wells located within a 1 kilometre (km) radius of the Site. The OWLS database is maintained by NBDELG and contains information on water wells constructed since 1994. The NBDELG takes no responsibility and makes no guarantee as to the completeness, accuracy or timeliness of the data provided in this database. Available water chemistry data from the NBDELG database were compared to the Canadian Drinking Water Quality Guidelines (CDWQG; Health Canada, June, 2019).

There were 42 groundwater wells, drilled between 1994 and 2021, identified in the NBDELG database that occur within a 1 km radius of the Site. Well driller reports are presented in Appendix C and well construction details for these wells are summarized in Table 4.1.

Table 4.1 Construction Details for Wells Reported Within 1 km of Site

Well Construction Component	Minimum	Maximum	Average
Total Well Depth (m)	31.7	118.87	57.1
Casing Depth (m)	5.49	21.34	8.54
Casing Diameter (cm)	15.24	15.24	15.24

Estimated Safe Yield (L/min)	0	136	24
Water Bearing Fracture Zones (m)	9.14	111.25	38.85
Depth to Bedrock (m)	0	7.32	2.15
Bedrock Type	Granite, Slate, Shale		
Notes: m = metres; cm = centimetres; L/min = litres per minute			

Based on the available data (*i.e.*, 8 groundwater chemistry records), exceedances of the CDWQG were noted in one or more wells for the following: iron, manganese, turbidity, pH, and total dissolved solids. Table 1 in Appendix C summarizes the analytical data from the 8 records.

4.2 Ecological Environment

A two-phased approach was used to determine the existing ecological environment, and any potential interaction with the Project, including:

- A desktop study of all existing information for habitat, flora and fauna species at risk (SAR) and species of conservation concern (SOCC) that may occur within the Site. SAR are considered species that have a protective status under Schedule 1 of the federal *Species at Risk Act* (SARA) or are protected under the provincial *New Brunswick Species at Risk Act* (NBSAR). SOCC include species that are:
 - Considered rare in New Brunswick with an Atlantic Canada Conservation Data Centre (ACCDC) S-rank of S1 (imperiled) to S3 (vulnerable); and/or
 - Ranked At Risk, May Be At Risk or Sensitive by the New Brunswick Department of Energy and Resource Development (NBDERD);
- Field investigation by a GEMTEC biologist to field truth habitat types within the Site on May 3, 2022.

A data request was submitted to the Atlantic Canada Conservation Data Centre (ACCDC) for a 5 km radius of the Site. The ACCDC report provides the location of recorded flora and fauna SAR or SOCC, the presence or absence of any location sensitive species, and the location and information on significant or managed natural areas. The ACCDC report is presented in Appendix C.

4.2.1 Habitat Description

A GEMTEC biologist attended the Site on May 3, 2022 to characterize the habitat and complete a delineation of the wetland on site. The inspection was completed outside of the typical wetland delineation period (June 1 – September 30). However, conditions of the wetland at the time of the inspection and collected Light Detection and Ranging (LiDAR) data were sufficient to provide a. Three

habitats were identified and are discussed below. The results of the investigation are illustrated on Figure 2.

No watercourses were observed on the Site or expected in the Assessment Area; therefore, potential impacts to surface water quality and the aquatic environment are not discussed herein.

4.2.1.1 Cattail Marsh – Wetland

The provincial GeoNB mapping was reviewed prior to the Site visit and showed no mapped wetlands within proximity to the Site. A small wetland (approximately 0.5 hectares) was identified during the Site visit; this wetland is not associated with any watercourse. Aerial imagery and LiDAR was collected by NATECH on-site on May 3, 2022. The LiDAR data (Appendix B) shows clear definition of the wetland on-site which was used in combination with the collected field data to delineate this feature.

Hydrophytic vegetation, hydrology indicators and soil characteristics are all found in the habitat unit. The wetland is largely dominated by Broadleaf cattail (*Typha latifolia*) with associate species including Speckled alder (*Alnus incana*) and Willow sp. (*Salix sp.*). The wetland is located at the bottom of a bowl feature surrounded by a mixed woodland and disturbed area. Surface water (A1) was observed throughout the wetland. The standing water and sediment contained a rusty appearance making a soils assessment difficult; although, a loamy gleyed matrix (F2) was observed to be the dominant matrix in the soil assessment. Wetland delineation data sheets are provided in Appendix B.

4.2.1.2 Mixed Woodland

A mixed woodland was identified east and west of the wetland. This feature is located on the sloped lands of the bowl feature and continues into a larger

woodlot east of the Site. The mixed woodland is dominated by Eastern hemlock (*Tsuga canadensis*), Sugar maple (*Acer sacharum*), Trembling aspen (*Populus tremuloides*), and White spruce (*Picea glauca*). Understorey vegetation is dominated by regenerating tree species. Limited ground vegetation was present at the time of the investigation, although Trout lily (*Erythronium americanum*) and Trillium sp. were observed. The woodland is described as having a closed canopy comprised of mature coniferous and deciduous trees and a relatively open understory.

4.2.1.3 Anthropogenic – Disturbed Lands

The dominant habitat in the Site has been subject to anthropogenic disturbance. Construction activities including grading, staging areas, excavation, and dumping are common in the area. Landscaping material and construction material from the parking lot north of the wetland has been piled immediately north of the wetland. Limited vegetation is present in this area.

Legend

- DISTURBED AREA
- DELINEATED WETLAND
- MIXED WOODLAND AREA
- PROPERTY LINE

Topographic map 21103 source GeoGratis (Government of Canada)

1:100000

Notes

- This drawing is a schematic representation. Sizes, locations and dimensions are approximate.
- Coordinate system: New Brunswick, Stereographic projection, NAD83 (CSRS) Datum.
- Base aerial photograph from May 20, 2021. Source Google Earth.
- Site drone image from May 03, 2022. Provided by the client.

Date	MAY 2022	Draw	CHG	Checked	SG
Project	EIA REGISTRATION CRABBE MOUNTAIN ON-SITE SEPTIC DISPOSAL SYSTEM				
Drawing	WETLAND DELINEATION				

Scale 1:1500

Project No. 101786.001 | Drawing No. FIGURE 1 | Revision No. 0



4.2.2 Ecological Significant Areas (ESAs)

The ACCDC report identified one managed area (MA) within a 5 km radius of the Site (ACCDC, 2022; Appendix C). The Slippery Mitten Nature Preserve is located approximately 1.5 km southeast of the Site. This MA is approximately 36 hectares in size and comprised of mixed-wood forest, wetlands and small streams. A recreational trail system is maintained and utilized by nearby residents and visitors.

No National Wildlife Areas (NWAs), Migratory Bird Sanctuaries (MBSs), Ramsar Sites, or New Brunswick Protected Natural Areas, apart from the Slippery Mitten Nature Preserve, are located within 5 km of the Site (Environment Canada Protected Areas Network, 2021, Ramsar Sites Information Service, 2022, and NBDERD Protected Natural Areas, 2022).

The Project is not expected to interact with any ESAs or MAs and, therefore, is not discussed further in this EIA.

4.2.3 Flora

The ACCDC report identified 5 flora species (vascular plants) as occurring within 5 km of the Site (Appendix C).

A rare vascular flora survey was not completed as part of this assessment as Site conditions are not expected to support such species.

4.2.3.1 Flora Species at Risk and Critical Habitat

The ACCDC had no records of flora SAR occurring within 5 km of the Project Site (ACCDC, 2022).

4.2.3.2 Flora Species of Conservation Concern

The ACCDC lists 5 flora species considered to be SOCC known to occur within 5 km of the Site. One of the SOCC species, Dwarf Ginseng (*Panax trifolius*) is reported to occur less than 1 km from the Site on the upgradient skill hill area (ACCDC, 2022). Dwarf Ginseng is ranked S3 (vulnerable) by the ACCDC. The species generally occurs in rich deciduous woods (Hinds, 2000).

The preferred habitat descriptions for all flora SOCC are presented in Table 4.2.

The Project is not expected to interact with any flora SAR or SOCC and, therefore, is not discussed further in this EIA.

Table 4.2 Flora Species of Conservation Concern Recorded within 5 km of the Project Site

Common Name	Scientific Name	S-Rank	Habitat	Probability of Occurrence in Project Site
Spotted Coralroot	<i>Corallorhiza maculata</i> <i>var. occidentalis</i>	S2S3	Woodlands and forests, generally preferring those with limited herbaceous cover.	Low
Spotted Coralroot	<i>Corallorhiza maculata</i> <i>var. maculata</i>	S2S3	Woodlands and forests, generally preferring those with limited herbaceous cover.	Low
Dwarf Ginseng	<i>Panax trifolius</i>	S3	Rich deciduous woods.	Low
American Beech	<i>Fagus grandifolia</i>	S3S4	Moist or wet, lowland sites	Low
White Ash	<i>Fraxinus americana</i>	S3S4	Rich, upland or lowland woods; well-drained stream banks; pastures	Low

4.2.4 Wildlife Species at Risk (SAR) and Critical Habitat

The ACCDC listed 22 avifauna species as occurring within 5 km of the Project Site. Ten of the 17 species listed are considered SAR under this assessment, and three species have a moderate potential of utilizing the Site based on the habitat units described in Section 4.2.1:

- The Canada Warbler (*Cardellina canadensis*) is listed as Threatened under *SARA* and *NBSAR*. Canada Warbler prefer wet, mixed deciduous-coniferous forest with a well-developed shrub layer, and also stands regenerating after natural or anthropogenic disturbances (*SARA*, 2021). These habitats are found adjoining the Site but not the immediate Project development area;
- The Barn Swallow (*Hirundo rustica*) is listed as Threatened under *SARA* and *NBSAR*. This species nests in and on artificial structures, including barns and other outbuildings, garages, houses, bridges, and road culverts (*SARA*, 2021). These habitats are found adjoining the Site but not the immediate Project development area; and
- The Eastern Wood Pewee (*Contopus virens*) is listed as Special Concern under *SARA* and Secure under *NBSAR*. This species is typically found in mixed and deciduous forests throughout eastern North America. Mixed woodlands are found east of the Site but are not within the immediate Project development area.

ACCDC did not list any other SAR wildlife occurrences, including mammals, reptiles, or amphibians within the Site.

Table F.3 summarizes SAR species and the potential interactions with the Project based on known habitats in the Site.

4.2.5 Wildlife Species of Conservation Concern

The 12 remaining species recorded by ACCDC are considered SOCC; however, none of the SOCC have a high or moderate potential for nesting within the Site.

Table F.4 summarizes SOCC species and the potential interactions with the Project based on known habitats in the Site.

No nests or incidental SAR / SOCC avifauna sightings were identified during targeted nesting and avifauna survey completed by GEMTEC biologist during the field investigation.

Table 4.3 Fauna Species at Risk with 5 km of the Project Site + Potential Use of Project Site

Common Name	Scientific Name	S-Rank	NBDNRED General Status	Nesting Habitat	Probability of Nesting in Project Site
Barn Swallow	<i>Hirundo rustica</i>	S2B	Sensitive	Artificial structures, bridges, barns, and other outbuildings.	Moderate
Bank Swallow	<i>Riparia riparia</i>	S2S3B,S2 S3M	Sensitive	Riverbanks, road cuts, lake and ocean bluffs.	Low
Canada Warbler	<i>Wilsonia canadensis</i>	S3S4B	At Risk	Moist dense thickets near wetlands.	Moderate
Bobolink	<i>Dolichonyx oryzivorus</i>	S3B	Sensitive	Hayfields and pastures.	Low
Common Nighthawk	<i>Chordeiles minor</i>	S3B, S4M	At Risk	Open area habitats, abandoned agriculture areas, disturbed areas, bogs, rock outcrops and gravel roofs.	Low

Wood Thrush	<i>Hylocichla mustelina</i>	S1S2B	At Risk	Trees over 50 feet tall, a moderate understory of saplings and shrubs, an open floor with moist soil and decaying leaf litter, and water nearby.	Low
Eastern Whip-Poor-Will	<i>Antrostomus vociferus</i>	S2B	Sensitive	Purely deciduous and mixed deciduous-pine forests, often in areas with sandy soil.	Low
Chimney Swift	<i>Chaetura pelagica</i>	S2BS3B, S2M	At Risk	Nest in chimneys and on other vertical surfaces in dim, enclosed areas, including air vents, wells, hollow trees, and caves.	Low
Eastern Wood-Pewee	<i>Contopus virens</i>	S3B	Secure	Breed in nearly any type of wooded habitat nest in trees and saplings	Moderate

				such as elms, oaks, maples, birches.	
Olive-sided Flycatcher	<i>Contopus cooperi</i>	S3B	At Risk	Opening or edges of forest along meadows, rivers and streams, recent burns and bogs.	Low

Table 4.4 Fauna Species of Conservation Concern with 5 km of the Project Site + Potential Use of Project Site

Common Name	Scientific Name	S-Rank	NBDNRED General Status	Nesting Habitat	Probability of Nesting in Project Area
Cliff Swallow	<i>Petrochelidon pyrrhonota</i>	S2B	Sensitive	Bridges, farms, cliffs, and river bluffs.	Low
Red Crossbill	<i>Loxia curvirostra</i>	S3	Secure	Mature coniferous forests.	Low
Great Crested Flycatcher	<i>Myiarchus crinitus</i>	S3B	Sensitive	Open broadleaf or mixed woodlands, with nests in cavities in dead trees, abandoned woodpecker holes, nesting boxes, hollow posts.	Low

Table 4.4 Fauna Species of Conservation Concern with 5 km of the Project Site + Potential Use of Project Site

Common Name	Scientific Name	S-Rank	NBDNRED General Status	Nesting Habitat	Probability of Nesting in Project Area
Scarlet Tanager	<i>Piranga olivacea</i>	S3B	Secure	Mature deciduous forests and mixed deciduous-coniferous forests Nesting in oak, pine-oak, oak-hickory, beech, hemlock-hardwood.	Low
Killdeer	<i>Charadrius vociferus</i>	S3B	Sensitive	Open habitat, pastures, plowed fields, large lawns, mudflats, lake shores, coastal estuaries.	Low
Black-Billed Cuckoo	<i>Coccyzus erythrophthalmus</i>	S3B	Secure	Deciduous thickets and shrub thickets on the edges of woodland or marshes. Also along shrubby edges of second	Low

Table 4.4 Fauna Species of Conservation Concern with 5 km of the Project Site + Potential Use of Project Site

Common Name	Scientific Name	S-Rank	NBDNRED General Status	Nesting Habitat	Probability of Nesting in Project Area
				growth of mixed forest.	
Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>	S3B	Secure	Second-growth woods, suburban areas, parks, gardens, and orchards, as well as shrubby forest edges next to streams, ponds, marshes, roads, or pastures.	Low
Indigo Bunting	<i>Passerina cyanea</i>	S3S4	Secure	Edges of woods and fields; along roads, streams, rivers, and powerline cuts.	Low

Table 4.4 Fauna Species of Conservation Concern with 5 km of the Project Site + Potential Use of Project Site

Common Name	Scientific Name	S-Rank	NBDNRED General Status	Nesting Habitat	Probability of Nesting in Project Area
Canada Jay	<i>Perisoreus canadensis</i>	S3S4	Secure	Boreal and subalpine forests where black and white spruce trees are common.	Low
Eastern Kingbird	<i>Tyrannus tyrannus</i>	S3S4B	Sensitive	Open habitats such as yards, fields, pastures, grasslands, or wetlands, and are especially abundant in open places along forest edges or water.	Low
Spotted Sandpiper	<i>Actitis macularius</i>	S3S4B,S 4M	Secure	Shoreline of fresh or coastal waters.	Low

Table 4.4 Fauna Species of Conservation Concern with 5 km of the Project Site + Potential Use of Project Site

Common Name	Scientific Name	S-Rank	NBDNRED General Status	Nesting Habitat	Probability of Nesting in Project Area
Wilson's Snipe	<i>Gallinago delicata</i>	S3S4B,S 5M	Secure	Wet, marshy settings, including bogs, fens, alder and willow swamps, wet meadows, and along rivers and ponds.	Low

4.3 Cultural Features

There are no federally, provincially, or locally recognized heritage areas located within the Site or Assessment Area.

The nearest First Nations community is the Pilick (Kingsclear) First Nation located approximately 25 km southeast of the Site. The Sitansisk (Saint Mary's) First Nations and Wotstak (Woodstock) First Nations communities are located approximately 40 km to the east and west of the Site, respectively. Both the communities reside on designated reserve lands and maintain the right to harvest natural resources to support their cultural, social, and economic wellbeing.

4.4 Existing Land Use

The Site is a portion of an active commercial ski resort that typically operates four months annually. Ancillary buildings near the Site include a main lodge housing a full-service licensed restaurant, a retail shop, and public washroom facilities – the Project is required to support this facility as the existing septic infrastructure has reached the end of its useful life. A rental / repair shop and ticketing / change house are located west of the Site. The main parking area is situated southwest, the Site is an area considered for overflow parking (Figure 1).

The neighbouring residential and recreational properties are generally located to the northeast along Skiers Lane and southwest along Crabbe Mountain Road. Other adjoining land uses are generally timberland. A list of all adjoining property uses per SNB's Registry and Mapping Services (SNB Planet, 2022) is presented in Table 2 in Appendix C.

There are no known federal contaminated sites within the Assessment Area (FCSI, 2018). Based on SNB land gazette records, the Site and all adjoining properties are not known to be contaminated nor do they have records of contamination remediation (SNB, 2022).

IDENTIFICATION OF ENVIRONMENTAL IMPACTS

The proposed Project involves ground disturbing activities required for the construction of a new septic system, and the operation of the upgraded septic system in support of Crabbe Mountain's seasonal commercial operation.

4.5 Groundwater Resources Potential Effects

4.5.1 Drainage and Topography Potential Effects

Potential effects to regional physiography as a result of Project activities are not expected. The overall drainage patterns will remain consistent or similar to existing conditions. The minor changes to drainage patterns are not expected to interact with groundwater resources within the Assessment Area; therefore, physiography and drainage are not discussed further in this EIA.

4.5.2 Geology and Hydrogeology Potential Effects

Potential effects to surficial geology as a result of Project activities include ground disturbance and the release of accumulated biomat or other contaminants during removal of the null system.

Any excavated material will be used as bedding in natural depressions and as fill after grading. No material is expected to be removed from the Site. In the event of a release of biomat build-up or other contaminate during the removal of the null system, the impacted soil will be removed from Site and disposed of at a designated facility.

Imported material will consist of treatment sand and topsoil.

4.5.3 Groundwater Quality and Quantity Potential Effects

Potential effects to groundwater quality as a result of Project activities include the potential for:

- Contaminants through spills of fuels, lubricants, and chemicals from on-site equipment and storage areas; and / or
- The release of septic effluent through a failure of the system into a groundwater resource.

As the groundwater table was not encountered during nearby geotechnical investigations, the potential for effects to groundwater quality is considered low. The proposed infrastructure is designed per the New Brunswick Technical Guidelines for On-Site Sewage Disposal Systems (April 2020), and with the consideration of regular maintenance, any effluent is assumed to be properly treated before entering a nearby aquifer.

Further, the septic pumps will be tied into the emergency power source on the Site. In the event of a power source failure, the water source pump will also be immobilized; thus, effluent quantities will be reduced.

4.6 Ecological Environment Potential Effects

Potential effects to the ecological environment as a result of Project activities include the potential for:

- Impacts to migratory birds:
 - Migratory birds may utilize the habitat in proximity to the Site and these birds and their nests are protected under the federal *Migratory Bird Convention Act (1994) (MBCA)*. Project activities may alter or destroy migratory bird habitat as a result of the vegetation clearing;
 - Noise from Project activities may disrupt bird species within the Site or deter migratory birds from utilizing this area. Sound quality potential effects are limited to active working periods of the

- construction phase with no long-term impacts expected; the Project is not expected to emit significant ambient noise during operation;
- Attraction to cleared or stockpile areas may result in an increase in bird injuries or deaths, and / or destruction of nests; and
 - Accidental contaminant spills may result in bird injury or death and / or destruction of nests, habitat or foraging areas.
- The release of septic effluent into the nearby wetland habitat. However, the existing system is only active in the winter months when the nearby wetland and adjoining habitat are frozen; the same is presumed with the operation of the new infrastructure. Combined with the proposed higher elevation and further distance of the new infrastructure, and the larger bed of treatment sand, the potential influence of biochemical oxygen demand (BOD), nitrates, and other effluent contaminates is considered minimal.

Significant vegetation clearing is not required as the proposed Project is situated within the footprint of an existing overflow parking area. Any impacts to adjoining habitats or wildlife species on a population scale is considered negligible.

4.7 Cultural Features Potential Effects

No First Nations or designated reserve lands adjoin the Site. A high-level project description and invitation for comments and concerns was sent to the Pilick (Kingsclear) First Nation, Sitansisk (Saint Mary's) First Nations and Wotstak (Woodstock) First Nations in accordance with Interim Proponent Guide (Department of Aboriginal Affairs, August 2019) as part of this EIA. Any received correspondence and concerns will be presented to NBDELG under a separate cover detailing public and First Nations consultation.

As the Project is proposed within an existing parking lot historically influenced by disturbance / placed gravel fill, and is situated at a distance from any significant

wetland complex or watercourse, the potential for effects to archaeological resources is considered low.

4.8 Existing Land Use

The Project is expected to have a positive impact to existing land use by replacing aging infrastructure with a safe and effective on-site septic treatment to support the Crabbe Mountain commercial enterprise, and to accommodate the increased demand on the septic system expected during the 2023 Canada Winter Games.

5.0 SUMMARY OF PROPOSED MITIGATION

The potential effects and proposed mitigation measures to minimize the potential adverse effects to the environment during the Project are summarized in Table 6.1.

Table 6.1 Summary of Proposed Mitigation Measures

Project Component	Summary of Potential Interaction	Mitigation Measures
Geology and Land Use	Ground disturbance increases potential for the degradation of adjoining properties via the failure of erosion and sediment control structures.	<p>Erosion and sediment control (ESC) structures will be properly installed around the work area prior to commencement of any on-site activities, as applicable. All structures will be inspected regularly to ensure that they are functioning as intended;</p> <p>At the first evidence that runoff of sediment is starting to occur, Project work will temporarily cease. All siltation prevention devices shall be inspected and monitored. Any necessary repairs will be made such that they accomplish their intended function prior to work commencing;</p> <p>Once the Project work is complete, all exposed, erodible soil will be permanently stabilized against erosion with landfill cover; and</p> <p>Existing vegetation will be retained whenever possible.</p>

Table 6.1 Summary of Proposed Mitigation Measures

Project Component	Summary of Potential Interaction	Mitigation Measures
	Release of accumulated biomat or other contaminants during removal of null system	<p>Removal of the null septic field will be limited to the footprint required for the new infrastructure;</p> <p>The ground will be visually monitored during removal of the null infrastructure for release of accumulated material / sludge;</p> <p>Appropriate spill response equipment will be stored and readily available for the duration of the construction phase of the Project; and</p> <p>Impacted soil will be removed from Site and disposed of at a designated facility.</p>
Groundwater Quality	Potential for contaminants to be released into water resources through spills of fuels, lubricants, and chemicals from on-site equipment and storage	<p>No construction chemical or petroleum storage will occur within 100-metres of a private groundwater well;</p> <p>No construction chemical or petroleum storage will occur within 30-metres of an environmental sensitive area (i.e., wetland, etc.);</p> <p>Inspections of construction equipment and vehicles shall be undertaken;</p>

Table 6.1 Summary of Proposed Mitigation Measures

Project Component	Summary of Potential Interaction	Mitigation Measures
	areas.	<p>Construction vehicles shall be fueled in a designated area; and</p> <p>Construction equipment will be kept in good working order.</p>
	Potential for a release of septic effluent into water resources through a failure of the system infrastructure.	<p>The system shall be designed in accordance with New Brunswick Technical Guidelines for on-Site Sewage Disposal Systems, April 2020;</p> <p>The system meets all separation distances stated in the New Brunswick Technical Guidelines for on-Site Sewage Disposal Systems, April 2020;</p> <p>All design and construction work will be conducted by persons qualified / licensed in their trade;</p> <p>Installation and initiation of the system will be completed during “off-season” when septic load is low to monitor for leaks or ground surface breakout;</p> <p>Vehicle traffic will not be permitted atop the newly installed infrastructure;</p> <p>Infrastructure will be regulatory inspected and maintained for</p>

Table 6.1 Summary of Proposed Mitigation Measures

Project Component	Summary of Potential Interaction	Mitigation Measures
		discrepancies and immediate resolution will be initiated, as required; and pumps will be tied to emergency power on site.
Wildlife and Avifauna	<p>Vegetation clearing will alter / destroy habitat in the Site;</p> <p>Noise from Project activities may disrupt wildlife and birds;</p> <p>Possibility of human interaction as a result of personnel within the Site, possible attraction to waste / garbage stored on site; and</p> <p>Attraction to cleared /</p>	<p>Nearby wildlife will likely be deterred by the noise on the Site during Project activities and more suitable habitat types are not limiting on adjoining properties;</p> <p>Equipment will be maintained in good working order;</p> <p>Equipment will be muffled, if feasible;</p> <p>Although no vegetation removal is expected, no vegetation clearing shall be completed within the Breeding Bird period, April 15 to September 1, without the completion of a nesting survey conducted no more than 5 days prior to clearing activities. If a nesting bird species is encountered, contact with and disturbance of the species and its habitat will be avoided;</p>

Table 6.1 Summary of Proposed Mitigation Measures

Project Component	Summary of Potential Interaction	Mitigation Measures
	<p>stockpile areas may result in an increase in bird injuries and / or deaths or destruction of nests.</p>	<p>An appropriate vegetated buffer will be established around any nests encountered to protect them from disturbance and work in that area will be avoided until after the birds have fledged or vacated; and</p> <p>If any SAR are encountered during construction activities, a qualified biologist shall be contacted for further direction.</p>

6.0 PUBLIC AND FIRST NATIONS INVOLVEMENT

6.1 First Nations Involvement

The Province of New Brunswick has a constitutional Duty to Consult, and accommodate where required, Aboriginal Peoples whenever a decision or activity is being contemplated that could adversely impact Aboriginal or Treaty rights. As per the Interim Proponent Guide published by the Province of New Brunswick, project proponents play a valuable role in the consultation process by engaging Aboriginal Peoples in the development of any project or proposal.

In keeping with the above guidance, a notification containing a high-level project description and invitation for comments and concerns was sent to the Pillick (Kingsclear) First Nation, Sitansisk (Saint Mary's) First Nations and Wotstak (Woodstock) First Nations in accordance with Interim Proponent Guide (Department of Aboriginal Affairs, August 2019).

Any comments and / or questions will be addressed and responded to and summarized in the First Nation Involvement / Public Consultation Summary report to be submitted to NBDELG.

6.2 Public and Stakeholder Involvement

An information letter will be sent to adjoining landowners and a notice detailing the Project will be posted to Crabbe Mountain's website. Any comments and / or questions will be addressed and responded to and summarized in the First Nation Involvement / Public Consultation Summary report to be submitted to NBDELG.

7.0 APPROVAL OF THE PROJECT

Subsequent to the receipt of a Certificate of Determination, any applicable approvals, permits and / or authorizations will be obtained as required.

8.0 FUNDING

The Project is being funded almost entirely by the proponent. Some funding assistance was provided by ACOA and the Canada Winter Games organization.

9.0 REFERENCES

- Department of Aboriginal Affairs (DAA) Interim Proponent Guide, A Guide for Proponents on Engaging with Aboriginal Peoples in New Brunswick. August 2019. Website: <https://www2.gnb.ca/content/dam/gnb/Departments/aas-saa/pdf/ProponentGuide-Excel/InterimProponentGuide.pdf>
- Federal Contaminated Sites Inventory (FCSI). Accessed May 2022. Website: <https://map-carte.tbs-sct.gc.ca/>
- GeoNB Wetland Mapping (GeoNB). Accessed May, 2022. Website: <http://geonb.snb.ca/geonb/>
- GeoNB Protected Wellfields (GeoNB). Accessed May, 2022. Website: http://geonb.snb.ca/geonb/index_wellfield.html
- GeoNB Protected Watersheds (GeoNB). Accessed May 2022. Website: http://geonb.snb.ca/geonb/index_watershed.html
- Guidelines for Canadian Drinking Water Quality. 2019. Health Canada. Accessed May 2022. Website: https://www.canada.ca/content/dam/hc-sc/migration/hc-sc/ewh-semt/alt_formats/pdf/pubs/water-eau/sum_guide-res_recom/summary-table-EN-2020-02-11.pdf
- Hinds, Harold R. (Hinds) Flora of New Brunswick. 2nd Edition (2000). Biology Department, University of New Brunswick
- New Brunswick Department of Environment and Local Government (NBDELG). January 2018. A Guide to Environmental Impact Assessment in New Brunswick.
- New Brunswick Department of Environment and Local Government (NBDELG). Online Well Log System. Accessed May 2022. Website: <http://app.elg-egl.gnb.ca/0375-0001/userType.aspx>

Rampton, V. N., 1984: Generalized surficial geology of New Brunswick. Department of Natural Resources and Energy. Minerals, Policy and Planning Division. Map 1594A; scale 1: 500 000. Reproduced with the permission of the minister of Public Works and Government Services Canada. 2002 and Courtesy of Natural Resources Canada. Geological Survey of Canada

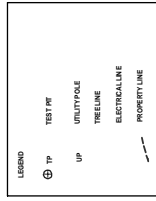
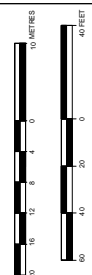
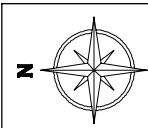
Service New Brunswick (SNB). 2022. Registry and Mapping Services. Accessed May 2022. Website: <https://www.planet.snb.ca/PLANET/index.html>

Species At Risk Public Registry (SARA). 2021. Species Summary Canada Warbler (*Cardellina canadensis*). Accessed May 2022. Website: <https://species-registry.canada.ca/index-en.html#/species/1008-699>

Species At Risk Public Registry (SARA). 2021. Species Summary Barn Swallow (*Hirundo rustica*). Accessed May 2022. Website: <https://species-registry.canada.ca/index-en.html#/species/1147-790>

Appendix A

Preliminary Design Drawings

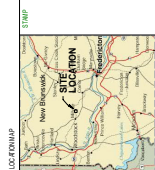


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02			
03			
04			



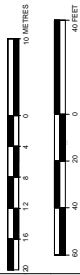
**CRABBE MOUNTAIN SKI RESORT
ON-SITE EFFLUENT TREATMENT
AND DISPOSAL SYSTEM**

BASE MAP



DESIGNED	JS	CDSM/22-01
DRAWN	JS	
CHECKED	FR	POW/10/10
DATE	FEBRUARY 2021	
SCALE	1:300	W-01





NOTE: EXISTING STRUCTURE LOCATIONS ARE APPROXIMATE ONLY.

LEGEND	TEST PIT
UP	UTILITY POLE
---	TREE LINE
---	ELECTRICAL LINE
---	PROPERTY LINE

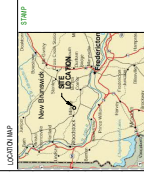
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		BT
		02/02



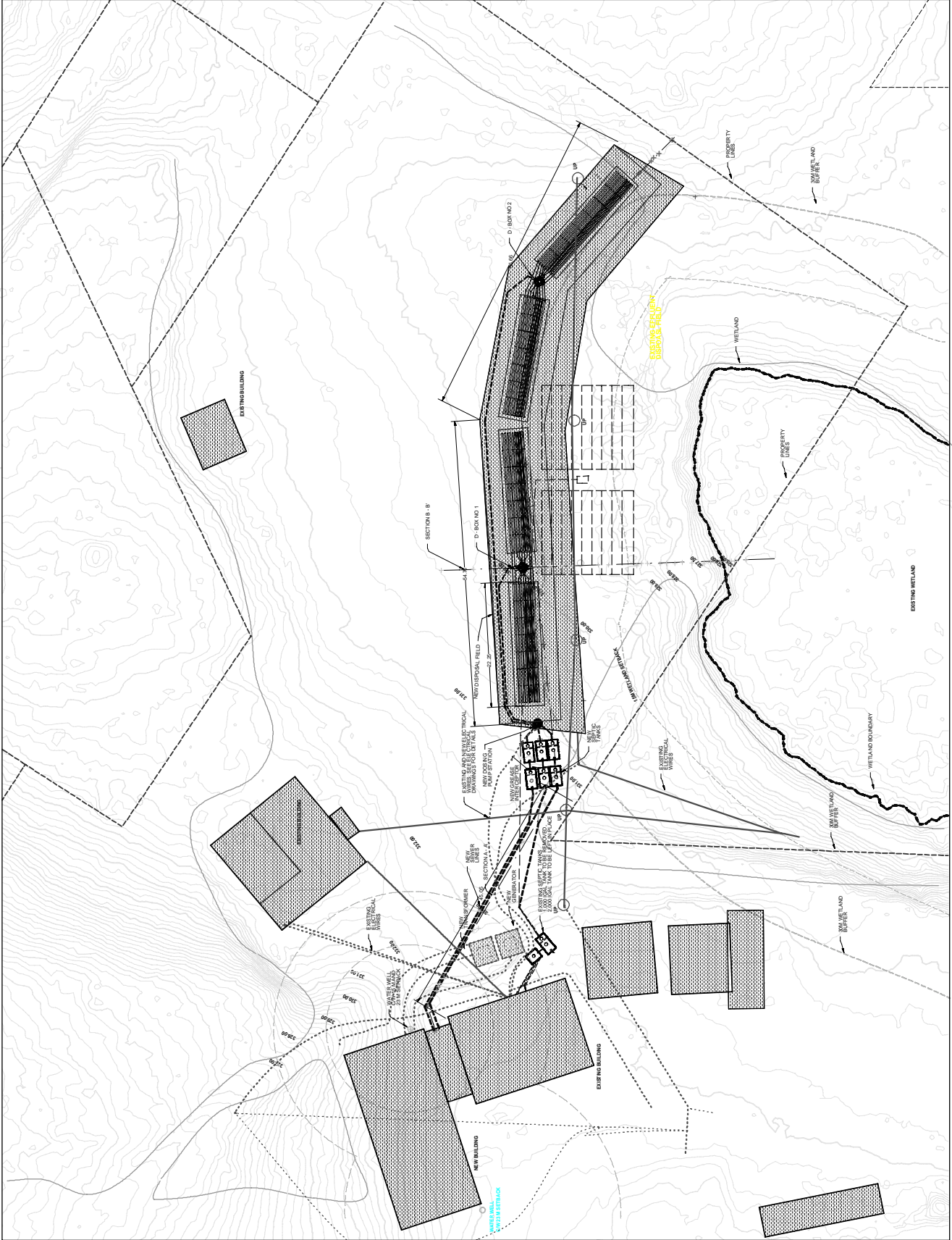
2492 Route 440, Harwell, NB E2C 2C2
ph: (506) 635-0388, fax: (506) 635-1088

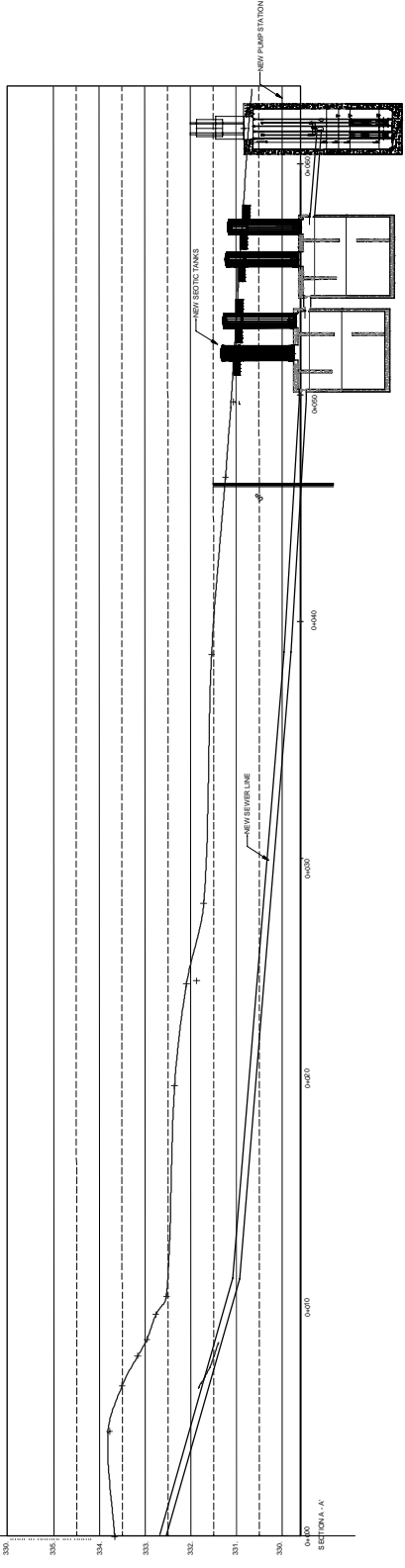
CRABBE MOUNTAIN SKI RESORT
ON-SITE EFFLUENT TREATMENT
AND DISPOSAL SYSTEM

BASE MAP

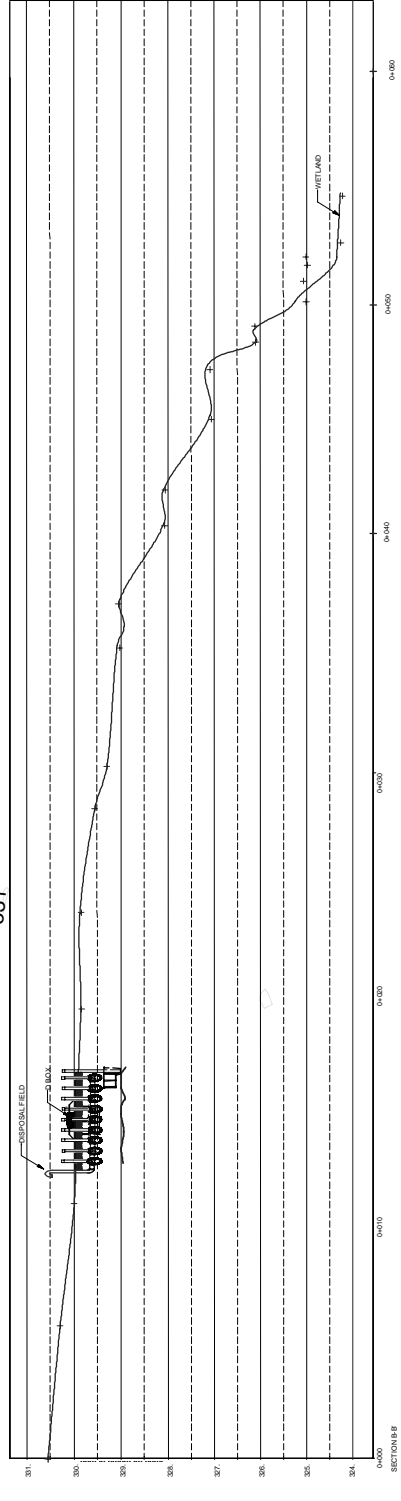


DESIGNED	JR JS	JR N.	CRM 20-01
DRAWN	JR JS		
CHECKED	FR	DATE	20/02/02
SCALE	1:300	DATE	19/02





331



REV	DESCRIPTION	DATE
01	FOR APPROVAL (NOT FOR CONSTRUCTION)	JR 21 10 06



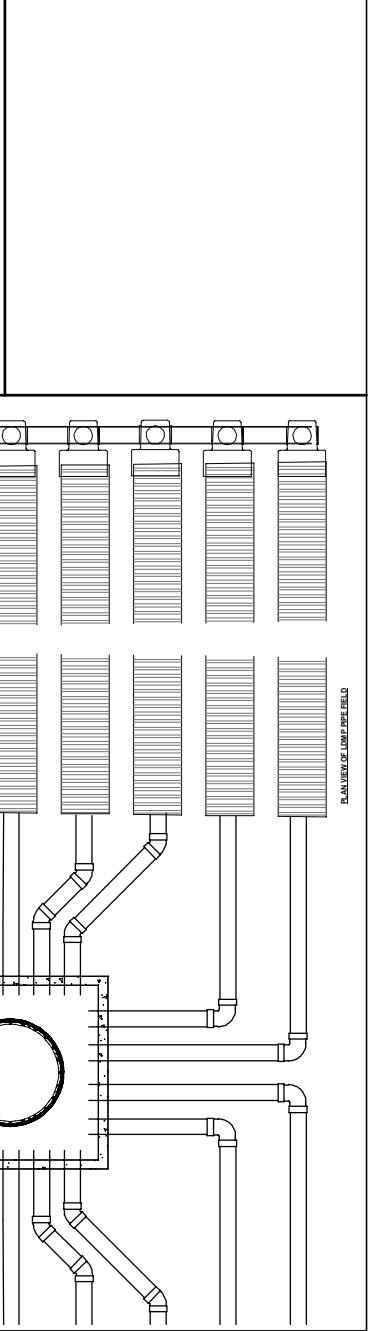
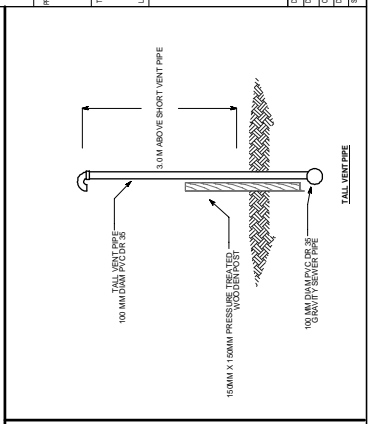
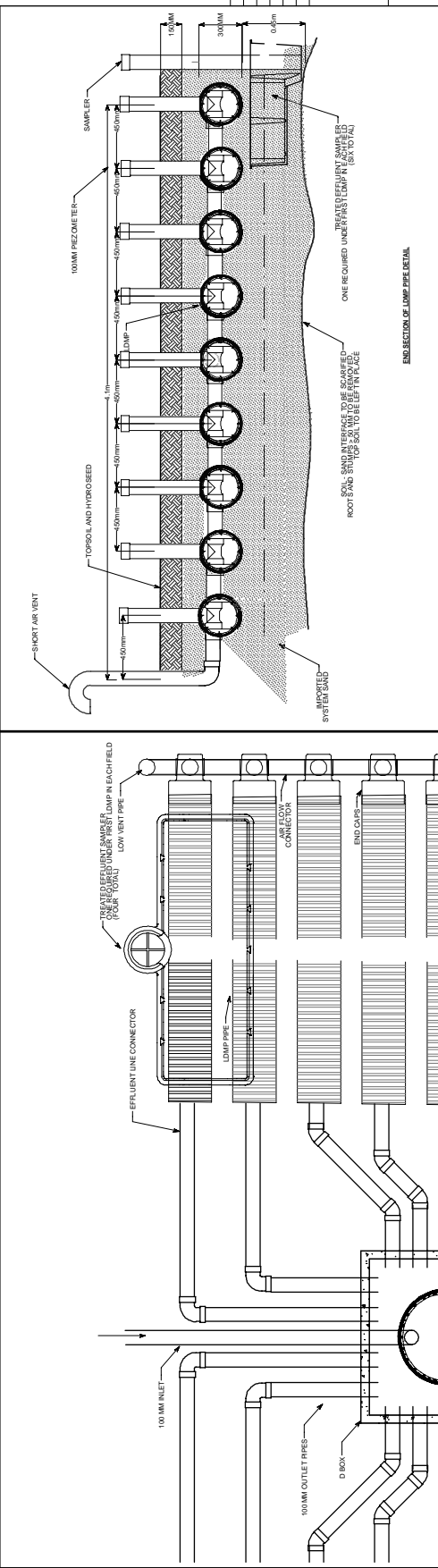
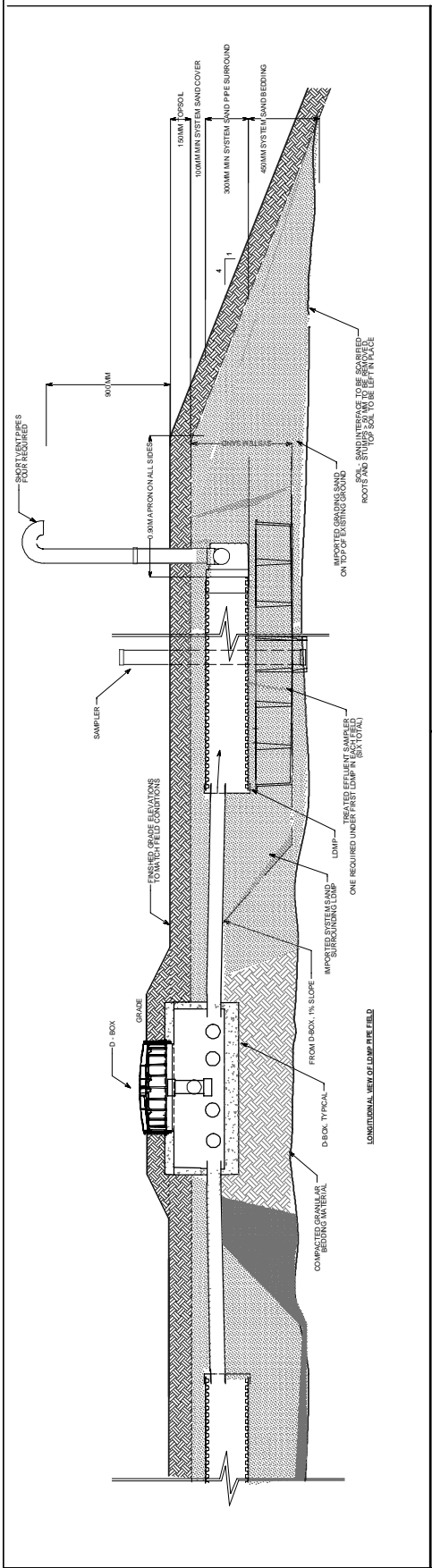
2492 Route 640, Harwell, ME 02842
ph: (207) 535-0342, fax: (207) 535-0349

PROJECT: CRABBE MOUNTAIN SKI RESORT
ON-SITE EFFLUENT TREATMENT AND DISPOSAL SYSTEM

TITLE: PROFILES

LOCATION MAP	TYPE
New Harwell	11/06

DESIGNED	JR	JR N.
DRAWN	JR	CRM 20-01
CHECKED	FR	DW/2/02
DATE	FEBRUARY 2001	
SCALE	AS SHOWN	W-10



REV	DESCRIPTION	DATE
01	FOR APPROVAL (NOT FOR CONSTRUCTION)	21/10/05
		BP
		DBE



NATECH
 Environmental Services Pty Ltd
 2400 Environmental Services Pty Ltd, Suite 202
 1/100-110 Stirling Highway, Perth, WA 6000
 Ph: (08) 9455-1000, Fax: (08) 9455-1009

PROJECT: CRABBE MOUNTAIN SKI RESORT
 ON-SITE EFFLUENT TREATMENT AND DISPOSAL SYSTEM

TITLE: TANK DETAILS
 LOCATION: SWAMP

DESIGNED BY	JS	DRAWN BY	JS
CHECKED BY	JS	DATE	21/10/05
SCALE	AS SHOWN	JOB No.	CRM-02-01
		DRAWN	JS
		DATE	21/10/05
		SCALE	AS SHOWN
		JOB No.	CRM-02-01
		DRAWN	JS
		DATE	21/10/05
		SCALE	AS SHOWN

Appendix B

Wetland Delineation Information

Legend

- DISTURBED AREA
- DELINEATED WETLAND
- MIXED WOODLAND AREA
- PROPERTY LINE

Topographic map 21103 source GeoGratis (Government of Canada)

1:100000

Notes

- This drawing is a schematic representation. Sizes, locations and dimensions are approximate.
- Coordinate system: New Brunswick, Stereographic projection, NAD83 (CSRS) Datum.
- Base aerial photograph from May 20, 2021. Source Google Earth.
- Site drone image from May 03, 2022. Provided by the client.

Date	MAY 2022	Draw	CHG	Checked	SG
Project	EIA REGISTRATION CRABBE MOUNTAIN ON-SITE SEPTIC DISPOSAL SYSTEM				

Drawing

WETLAND DELINEATION

Scale 1:1500

0 30 60 90m

Project No. 101786.001 | Drawing No. FIGURE 1 | Revision No. 0



WETLAND DELINEATION DATA FORM – NEW BRUNSWICK

Project/Site: Crabbe Mountain Municipality/County: Central Highlands Sampling Date: May 3, 2011
 Applicant/Owner: _____ Sampling Point: _____
 Investigator(s): Stewart Gibson Affiliation: GEMTEL
 Landform (hillslope, terrace, etc.): Bowl Fracture Local relief (concave, convex, none): _____
 Slope (%): 0 Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name/Type: _____ Wetland Type: Cattail Marsh
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No _____ (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes _____ No
 Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) - Significant leaching & oxidation in water & soil influencing color determination - Determination is critical @ toe of slope.	

VEGETATION – Use scientific names of plants.

Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A) Total Number of Dominant Species Across All Strata: _____ (B) Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
_____ = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
Sapling/Shrub Stratum (Plot size: _____)				
1. <u>Speckled Alder</u>	<u>25</u>		<u>NE</u>	
2. <u>Bald Willow</u>	<u>05</u>		<u>FACW</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
_____ = Total Cover				Hydrophytic Vegetation Indicators: <input type="checkbox"/> Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
Herb Stratum (Plot size: _____)				
1. <u>Broadleaf Cattail</u>	<u>30</u>		<u>OBL</u>	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
_____ = Total Cover				
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
_____ = Total Cover				
Remarks: (Include photo numbers here or on a separate sheet.) limited veg present - cattail dominant @ toe of slope				

Adapted from U.S. Army Corps of Engineers form for North Central and North East Region (Version 2.0), and Field Indicators for Identifying Hydric Soils in New England (Version 4.0) Supplement for use in New Brunswick (2019)

SOIL

Sampling Point: W940

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (cm)	Matrix		Redox Features		Type ¹	Loc ²	Texture	Remarks
	Color (moist)	%	Color (moist)	%				
0-80	5YR 5C/1W				D		Silty clay	~ 100% soil see below reading

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

- | | | |
|--|---|--|
| <p>Hydric Soil Indicators:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Stratified Layers (A5) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Sandy Redox (S5) | <ul style="list-style-type: none"> <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Dark Surfaces (S7) <input type="checkbox"/> Polyvalue Below Surface (S8) <input type="checkbox"/> Thin Dark Surface (S9) <input checked="" type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8) | <p>Indicators for Problematic Hydric Soils³:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Coast Prairie Redox (A16) <input type="checkbox"/> 5 c Mucky Peat or Peat (S3) <input type="checkbox"/> Iron-Manganese Masses (F12) <input type="checkbox"/> Piedmont Floodplain Soils (F19) <input type="checkbox"/> Red Parent Material (F21) <input type="checkbox"/> Very Shallow Dark Surface (F22) <input type="checkbox"/> Other (Explain in Remarks) |
|--|---|--|

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (cm): _____

Hydric Soil Present? Yes No

Remarks: - 100% soil to determine soil due to reading.

HYDROLOGY

- Wetland Hydrology Indicators:**
- | | | |
|---|---|--|
| <p><u>Primary Indicators (minimum of one is required; check all that apply)</u></p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | <ul style="list-style-type: none"> <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks) | <p><u>Secondary Indicators (minimum of two required)</u></p> <ul style="list-style-type: none"> <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5) |
|---|---|--|

Field Observations:

Surface Water Present? Yes No Depth (cm): 0cm

Water Table Present? Yes No Depth (cm): 0cm

Saturation Present? (includes capillary fringe) Yes No Depth (cm): 0cm

Wetland Hydrology Present? Yes No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Determination is W940-939.

Adapted from U.S. Army Corps of Engineers form for North Central and North East Region (Version 2.0), and Field Indicators for Identifying Hydric Soils in New England (Version 4.0) Supplement for use in New Brunswick (2019)

WETLAND DELINEATION DATA FORM – NEW BRUNSWICK

Project/Site: Crabbe Mountain Municipality/County: Central Hantsville Sampling Date: May 3, 2022

Applicant/Owner: _____ Sampling Point: WP 925

Investigator(s): Stewart Gibson Affiliation: GEMTEL

Landform (hillslope, terrace, etc.): Sloped hill transition to plateau Local relief (concave, convex, none): _____

Slope (%): 25-30 Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name/Type: _____ Wetland Type: ~~Wetland~~ Disturbed meadow (upland)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes _____ No
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/>
Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/>	If yes, optional Wetland Site ID: _____
Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	

Remarks: (Explain alternative procedures here or in a separate report.)
 - Survey completed outside of typical survey wetland limited vegetation present. Delineation clear based on topography.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A) Total Number of Dominant Species Across All Strata: _____ (B) Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)
1. <u>White Birch</u>	<u>5</u>		<u>FAC+</u>	
2. <u>Sweetgum</u>	<u>5</u>		<u>FAC+</u>	
3. <u>White Pine</u>	<u>5</u>		<u>FACU</u>	
4. _____				
5. _____				<u>15 = Total Cover</u>
Sapling/Shrub Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
1. <u>Red Raspberry</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FAC-</u>	
2. _____				
3. _____				
4. _____				
5. _____				<u>20 = Total Cover</u>
Herb Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Indicators: <input type="checkbox"/> Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u>Golden Rod sp. (C. = canadensis)</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FACU</u>	
2. <u>Leafy Ceanothus</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FAC+</u>	
3. <u>Cowbane</u>	<u>10</u>		<u>FACU-</u>	
4. <u>Burdock</u>	<u>15</u>			
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				<u>_____ = Total Cover</u>
Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/>
1. _____				
2. _____				<u>_____ = Total Cover</u>

Remarks: (Include photo numbers here or on a separate sheet.)
 Adjacent upland veg is mix forest with some hemlock, sugar maple, etc. sapling white pine.

Adapted from U.S. Army Corps of Engineers form for North Central and North East Region (Version 2.0), and Field Indicators for Identifying Hydric Soils in New England (Version 4.0) Supplement for use in New Brunswick (2019)

SOIL

Sampling Point: _____

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (cm)	Matrix		Redox Features		Type ¹	Loc ²	Texture	Remarks
	Color (moist)	%	Color (moist)	%				
0-5								orange sand litter & decomposing debris
5-50	2.5 YR 4/3E	100					Sandy loam	Expected fill from adj. P-4 lots of gravel

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)

- Stripped Matrix (S6)
- Dark Surfaces (S7)
- Polyvalue Below Surface (S8)
- Thin Dark Surface (S9)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- Coast Prairie Redox (A16)
- 5 c Mucky Peat or Peat (S3)
- Iron-Manganese Masses (F12)
- Piedmont Floodplain Soils (F19)
- Red Parent Material (F21)
- Very Shallow Dark Surface (F22)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
Depth (cm): _____

Hydric Soil Present? Yes _____ No

Remarks: *no soil in pit*

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)

- Water-Stained Leaves (B9)
- Aquatic Fauna (B13)
- Marl Deposits (B15)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres on Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- Surface Soil Cracks (B6)
- Drainage Patterns (B10)
- Moss Trim Lines (B16)
- Dry-Season Water Table (C2)
- Crayfish Burrows (C8)
- Saturation Visible on Aerial Imagery (C9)
- Stunted or Stressed Plants (D1)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- Microtopographic Relief (D4)
- FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No _____ Depth (cm): _____
Water Table Present? Yes _____ No _____ Depth (cm): _____
Saturation Present? Yes _____ No _____ Depth (cm): _____
(includes capillary fringe)

Wetland Hydrology Present? Yes _____ No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: *No bog in soil pit.*

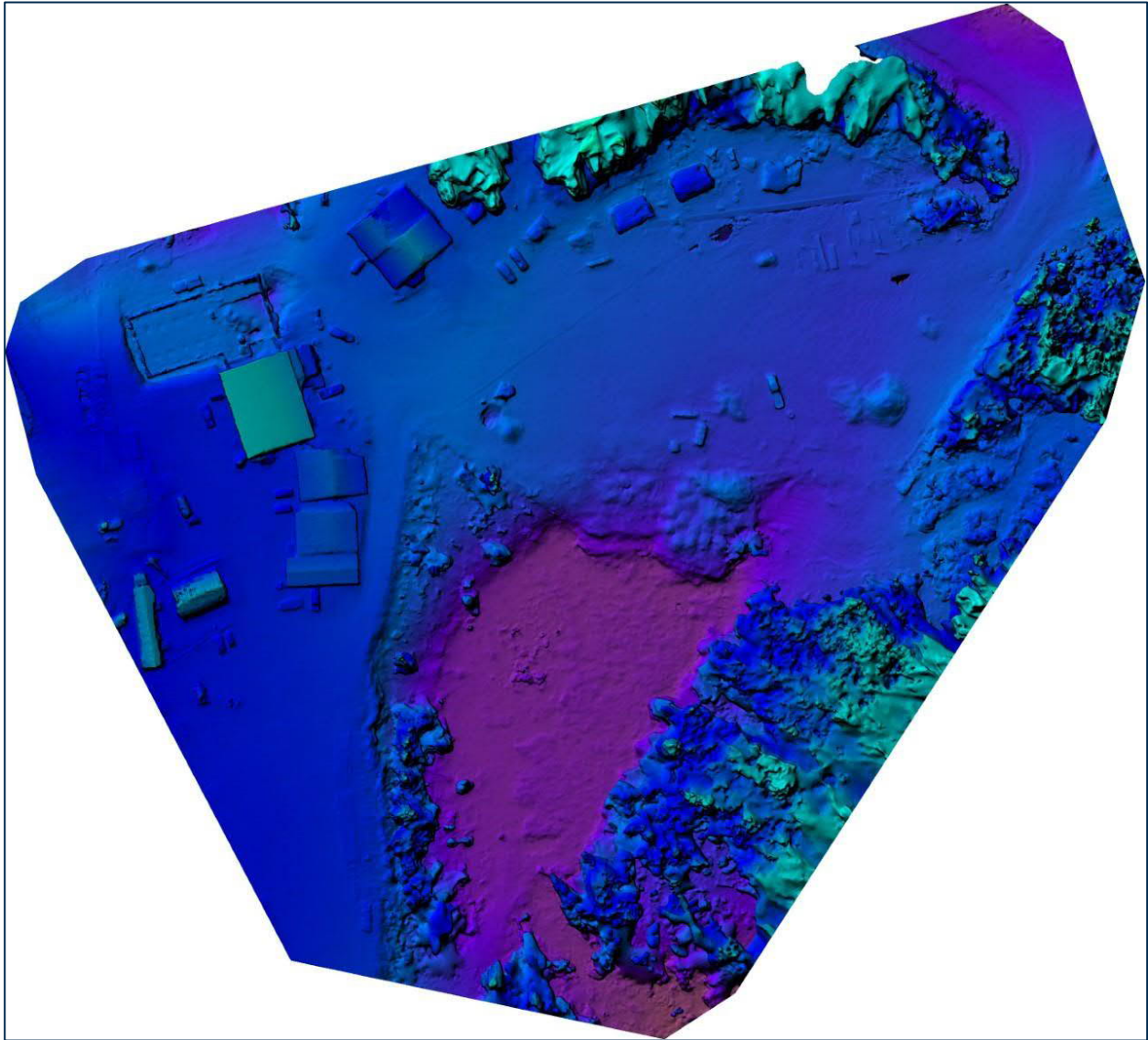


Figure 1 - LiDAR Imagery taken on May 3rd, 2022 by Natech



Figure 2 - Drone imagery captured on My 3rd, 2022 by Natech