NEEGAN BURNSIDE

Whitesand First Nation Cogeneration and Pellet Mill Project

Water Assessment Report

Sagatay Cogeneration LP

October 2014

Whitesand First Nation
Cogeneration and Pellet Mill Project

Water Assessment Report

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Prepared for:

Sagatay Cogeneration LP, with its General Partner, Sagatay Cogeneration Ltd., and Whitesand First Nation as agent

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Record of Revisions

Revision	Date	Description
0	December 18, 2013	Draft Report Submission for Consultation
1	October 17, 2014	Application to the Ministry of the Environment and Climate Change for Renewable Energy Approval

Executive Summary

Sagatay Cogeneration LP, with its General Partner, Sagatay Cogeneration Ltd., and Whitesand First Nation ("Whitesand") as agent is proposing to develop, construct and operate a biomass fueled electric power and heat cogeneration plant, and wood pellet facility (the "Project"). The Project is located in an unorganized territory of the Thunder Bay District near Whitesand First Nation and Armstrong, Ontario. The unorganized territory is administered by the Armstrong Local Service Board and the Project will be located on Crown Land in the traditional territory of Whitesand First Nation, as shown on **Figure A1** of **Appendix A**.

Under Sections 29, 30, 31, 39 and 40 of O.Reg. 359/09, a Water Assessment is a required component of an Application for Renewable Energy Approval (REA) of a Class 1 Thermal Facility. The Water Assessment is to be completed in three stages as follows:

- Stage 1: Water Assessment, Records Review;
- Stage 2: Water Assessment, Site Investigation; and,
- Stage 3: Water Body Report (if required).

Based on the review of existing information, agency records, and a Site Investigation, no water bodies or water features are present within 120 m of the Project Location. A detailed description of the records review and the Site Investigation of local water bodies are discussed in this report.

Five ponds were studied during the Site Investigation. Based on substrate and soil types, and the comparison of regional water well records to the local topography at the Project Location, all of the ponds were interpreted to be groundwater fed though no groundwater seeps were observed during Site reconnaissance. No fish were observed in any of the ponds.

Since no components of the Project will be located within the setback distances established in O.Reg. 359/09, a Water Body Report is not required.

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1.0 Introduction

1.1 Project Overview

Sagatay Cogeneration LP, with its General Partner, Sagatay Cogeneration Ltd., and Whitesand First Nation ("Whitesand") as agent is proposing to develop, construct and operate a biomass fueled electric power and heat cogeneration plant, and wood pellet facility (the "Project"). The Project is located on Crown Land in an unorganized territory of the Thunder Bay District near Whitesand First Nation and Armstrong, Ontario. The unorganized territory is administered by the Armstrong Local Service Board and the Project will be located solely on the traditional territory of Whitesand First Nation.

The general Project components include a biomass fueled electric power and heat cogeneration plant, wood pellet plant, maintenance garage, material storage and handling areas, wastewater management system, water storage pond, wells, pump building, and transformer substation. The only biomass used to fuel the cogeneration plant will be woodwaste, making it a Class 1 Thermal Facility under Ontario Regulation 359/09 (O.Reg. 359/09) of the Environmental Protection Act. The proposed Class 1 Thermal Facility would have a nameplate capacity of up to 3.6 MW, and would displace the energy supply from existing diesel generators servicing the community via a local grid, operated by Hydro One Remote Communities Inc., as well as supply electricity for the Project. The local grid is not connected to the Provincial grid, and there are no such future plans for a transmission connection. The Project Location is presented in **Figure A1** of **Appendix A**.

1.2 Report Requirements

The Water Assessment Report provides a descriptive overview of the local water features around the Project. The Water Assessment Report is required to satisfy the requirements listed in **Table 1**, as defined by O.Reg. 359/09. This report was also prepared according to guidance from the Technical Guide to Renewable Energy Approvals (MOE, 2013).

Table 1 Report Requirements

Item	Requirement Met?	Reference in This Report
A person who proposes to engage in a renewable energy project shall conduct a water assessment, consisting of the following:		
1. A records review conducted in accordance with section 30 of O.Reg. 359/09	Yes	Part I

Item	Requirement Met?	Reference in This Report
2. A site investigation conducted in accordance with section 31 of O.Reg. 359/09	Yes	Part II

1.3 Project Location

The Project is located on Crown land in an unorganized territory of the Thunder Bay District near Whitesand First Nation and Armstrong, Ontario; approximately 210 km north of Thunder Bay, and two km south of Armstrong. The Project will be located on the traditional territory of Whitesand First Nation. This Project context is shown in the key map of **Figure A1** of **Appendix A**.

The "Project Location" is defined in O.Reg. 359/09 as:

> *"a part of land and all or part of any building or structure in, on or over which a person is engaging in or proposes to engage in the project and any air space in which a person is engaging in or proposes to engage in the project".*

The Project Location also includes any temporary work areas required to construct the Project. The cogeneration plant, pellet plant, maintenance garage, wastewater management system, water storage pond, and associated equipment and temporary work areas will be contained within a boundary of approximately 35 ha as shown in **Figure A1** of **Appendix A**. For reference, a Site plan of the Project is shown within the Project Location in **Figure A1** of **Appendix A**.
There is an existing electricity distribution connection owned and operated by Hydro One Remote Communities Inc. that will be used to connect the Project to the local grid. It is within an existing right-of-way extending from the Site to the nearby existing diesel generating station. Any upgrades required to the existing electricity distribution connection will be the responsibility of Hydro One Remote Communities Inc.

Solid waste generated at the facility will be disposed of off-site at an approved disposal facility.

1.4 Report Organization

Under Section 29, 30, 31, 39 and 40 of O.Reg. 359/09, a Water Assessment is a required component of an Application for Renewable Energy Approval (REA) of a Class 1 Thermal Facility. The Water Assessment is to be completed in three stages as follows:

- Part I: Water Assessment, Records Review;

- Part II: Water Assessment, Site Investigation; and,
- Part III: Water Body Report (if required).

This report is organized according to these parts.

Water Assessment
Part I: Records Review

1.0 Records Review

1.1 Purpose of the Records Review Report

This section of the report presents the findings of the Part I Records Review and includes a detailed compilation of available background information from a variety of sources, including:

- government agency files;
- policy documents and mapping;
- online and published resources; and
- aerial photography.

1.2 Records Review Methodology

1.2.1 Study Area

The Water Assessment must identify all lake trout lakes that are at or above capacity within 300 m of the Project Location and all other permanent and intermittent surface water features, including seepage areas that are within 120 m of the Project Location. At the time of the Records Review, there was potential for minor adjustments to the Project Location. As a precaution, an expanded Study Area of approximately 42 ha was considered, as shown in **Figure A2** of **Appendix A** (compared to the 35 ha Project Location shown in **Figures A1** and **A3** of **Appendix A**). Both a 120 m and 300 m setback from the expanded Study Area were also considered in the Records Review, as shown in **Figure A2** of **Appendix A**.

1.2.2 Scope of the Review

A Records Review is required in accordance with Sections 29 and 30 of O.Reg. 359/09 and the Technical Guide to Renewable Energy Approvals (MOE, 2013).

The Records Review must determine whether the Project Location is:

- in a water body;
- within 120 m of the average annual high water mark of a lake, other than a lake trout lake that is at or above development capacity;
- within 300 m of the average annual high water mark of a lake trout lake that is at or above development capacity;
- within 120 m of the average annual high water mark of a permanent or intermittent stream; and
- within 120 m of a seepage area.

The definition of a water body provided in O.Reg. 359/09, is as follows:

> *"…a lake, a permanent stream, an intermittent stream and a seepage area but does not include, a) grassed waterways, b) temporary channels for surface drainage, such as furrows or shallow channels that can be tilled and driven through, c) rock chutes or spillways, d) roadside ditches that do not contain a permanent or intermittent stream, e) temporarily ponded areas that are normally farmed, f) dugout ponds, or g) artificial bodies of water intended for the storage, treatment or recirculation of runoff from farm animal yards, manure storage facilities and sites and outdoor confinement areas".*

Information was collected to determine the potential presence of:

- lakes;
- lake trout lakes;
- permanent or intermittent streams; and
- seepage areas.

1.2.3 Publicly Available Data Sources

A summary of information sources reviewed is provided in **Table 2.**

Table 2 Publicly Available Data Sources Reviewed

Data Source	Information Provided	Reference
Policy Documents		
Crown Land Use Policy Atlas	• Provincial Waterway Parks	http://www.mnr.gov.on.ca/en/Business/LUEPS/2ColumnSubPage/STDU_137972.html
Lake Nipigon Forest Management Plan	• Aquatic features and cool/cold water habitats	http://www.appefmp.mnr.gov.on.ca/eFMP/home.do
Ministry of Natural Resources' Renewable Energy Atlas	• Wetlands	http://www.mnr.gov.on.ca/en/Business/Renewable/2ColumnSubPage/276957.html
Natural Heritage Information Center, Biodiversity Explorer	• Species at Risk records	https://www.biodiversityexplorer.mnr.gov.on.ca/nhicWEB/main.jsp
Land Information Ontario ("LIO") publicly available datasets	• Drain classifications • Water body information	http://www.mnr.gov.on.ca/en/Business/LIO/index.html

1.2.4 Requests for Information and Records

Letters were sent to a number of federal, provincial, local, other agencies and organizations in order to request additional information and records not publicly available through web searches. In addition, several phone calls and follow-up emails were completed. A copy of all correspondence with agencies is provided in **Appendix B** and is summarized in **Table 3.**

Table 3 Summary of Agencies Contacted, Records Requested and Records Received

Source and Contact Information	Records Requested	Agency Response/Records Reviewed
Source: Environment Canada Contact: Rob Dobos, Manager, Environmental Assessment Section Dates Contacted: May 31, 2013	• General records of known natural heritage and water features.	• No response to date.
Source: Ministry of Municipal Affairs and Housing-Northwestern Municipal Services Office Contact: Murray Armstrong, Senior Planner Dates Contacted: May 31, 2013	• General records of known natural heritage and water features.	• No response to date.
Source: Ministry of Natural Resources, Thunder Bay District Contact: Melissa Mauro, District Planner Dates Contacted: May 31, 2013	• General records of known natural heritage features. • LIO/NRVIS data layers including sensitive data.	• Team given access to LIO data and provided with sensitive data records for the area.
Source: Ministry of the Environment, Thunder Bay District Contact: Scott Sheriff, District Supervisor Dates Contacted: May 31, 2013	• General records of known natural heritage and water features.	• No response to date.

Source and Contact Information	Records Requested	Agency Response/Records Reviewed
Source: Ministry of the Environment, Northern Region Contact: Ellen Cramm, Environmental Assessment Coordinator Dates Contacted: May 31, 2013	• General records of known natural heritage and water features.	• No response to date.
Source: Ministry of the Environment, EAAB Contact: Narren Santos, Senior Program Support Coordinator Dates Contacted: May 31, 2013	• General records of known natural heritage and water features.	• No response to date.
Source: Armstrong Local Services Board Contact: Elaine Lawrence, Secretary and Treasurer Dates Contacted: May 31, 2013	• General records of known natural heritage and water features.	• No response to date.
Source: Ministry of Northern Development, Mines and Forestry Contact: Jennifer Lillie-Paetz, Environmental Assessment Coordinator Dates Contacted: May 31, 2013	• General records of known natural heritage features.	• No response to date.
Source: Ministry of Northern Development, Mines and Forestry Contact: Marc Leroux, Manager, Information Services Dates Contacted: May 31, 2013	• General records of known natural heritage features.	• June 20, 2013 letter response from Mark Puumala, Regional Resident Geologist indicating little likelihood of karst hazards, caves or abandoned mines in the area.

2.0 Records Review Results

Based on the review of existing information and agency records, several water bodies were identified within 120 m of the expanded Study Area at the south end. As such, revisions were made to the Study Area along with other facility design changes, which resulted in the Project Location shown in **Figures A1** and **A3** of **Appendix A**. The resulting Project Location indicates several water bodies between the 120 m and 300 m Study Area setbacks from the Project Location, but no water bodies at or within 120 m of the Project Location. A detailed description of these features is presented in the following sections. Reference material and background data sources are provided in **Appendix C**. Features and water body locations are shown on **Figure A3** in **Appendix A**.

2.1.1 Watershed

The Project is located within the Lake Nipigon drainage basin which eventually flows south to Lake Superior and the Great Lakes system.

2.1.2 Lakes and Lake Trout Lakes

There are relatively few surface water features in the vicinity of the Project. Three small ponds are present in the southern corner, just outside the 120 m Study Area boundary around the Project Location. The ponds are unnamed and have been identified as Ponds 1, 2 and 3 for the purposes of this report, as shown on **Figure A3**. Based on aerial photography and base mapping, the ponds appear to be isolated and not connected to any other water body or watercourse. Mapping from the Lake Nipigon Forest Management Plan (LNFMP, 2011), show several cool and cold water surface water features in the broader vicinity around Armstrong. It appears that the ponds have not been studied and their temperature regime has not been identified. Because the ponds are unnamed they do not appear in the MNR's list of Lake Trout Lakes in Ontario (MNR, 2006).

Two additional ponds were also studied and are located east of the Project Location. These are also unnamed and have been identified as Ponds 4 and 5 for the purposes of this report. They are shown on the eastern edge of the 300 m Study Area setback boundary on **Figure A3**. Pond 4 appears to be connected to a small pond or wetland north of its location (outside the 300 m boundary) by an intermittent channel. Based on topographic mapping, the channel appears to flow from south to north. The channel appears to dissipate in the small ponds to the north, thus the ponds are not connected to any larger system. The thermal regime of these ponds is also unknown; however, due to their isolated nature and small size, it is unlikely that they support Lake Trout.

A brief summary of Ponds 1 to 5 as they relate to the Project Location is provided in **Table 4**.

Table 4 Ponds within 300 m of the Project Location

Feature	Approximate Size (ha)	Approximate Distance from Project Location (m)	Characteristics
Pond 1	0.56	125	Isolated, thermal regime unknown.
Pond 2	0.47	214	Isolated, thermal regime unknown.
Pond 3	0.60	167	Isolated, thermal regime unknown.
Pond 4	0.33	226	Appeared to be connected to a small wetland to the north by an intermittent watercourse; watercourse could dissipate in forest prior to reaching small wetland; not connected to any larger surface water system. Thermal regime unknown.
Pond 5	0.90	241	Appeared to be connected to pond located adjacent to the northeast; not connected to any larger surface water system. Thermal regime unknown.

2.1.3 Permanent and Intermittent Watercourses

There are no known watercourses, permanent or intermittent, at or within 120 m of the Project Location. There is one permanent watercourse, Hoodoo Creek, which flows at least 400 m north of the Project Location, as shown on **Figure A2** and **A3**. Portions of this creek have been identified as having cold water characteristics.

An intermittent watercourse is thought to be located flowing north from Pond 4 towards a small wetland located outside of the Study Area. A small watercourse, located at the north end of Pond 5, is thought to be connected to a water body that is outside of the Study Area. The thermal regimes of these watercourses are not known. These watercourses are also well outside 120 m of the Project Location and therefore will not be considered further in this report.

2.1.4 Fish and Fish Habitat

No records with information relating to fish or fish habitat could be found for water bodies in the Project Study Area, including Ponds 1 to 5. With the exception of Ponds 4 and 5, the ponds all appear to be isolated and not connected to any other water body, thus preventing fish migration to and from the ponds. Digital mapping retrieved from Land Information Ontario (“LIO”) did not identify any known fish spawning areas or other aquatic habitat in the vicinity of the Project.

Fish habitat in the ponds will be characterized during the Site Investigation.

2.1.5 Habitat of Endangered and Threatened Species

Based on information provided by the MNR, no endangered or threatened aquatic species are known to inhabit water bodies in the vicinity of the Project.

2.1.6 Groundwater Recharge and Discharge Areas/Seepage Areas

No records of groundwater recharge and discharge/seepage areas were found. The Project processes will require water taking activities from groundwater, as described in detail in the Design and Operations Report under a separate cover.

3.0 Records Review Summary

There are no known water bodies within 120 m of the Project Location. However there are three small ponds to the south and two ponds to the east that are within 300 m of the Project Location. All of the ponds are small and isolated with unknown fish habitat and thermal regime characteristics. None of these ponds are considered to be a Lake Trout Lake.

No known permanent or intermittent watercourses or seepage areas are located within 120 m of the Project Location.

Ponds 1, 2, 3, 4, and 5 were investigated and will be characterized in greater detail through the Site Investigation. The Site Investigation will also determine whether any additional surface water features are present that may not have been recorded to date.

Water Assessment
Part II: Site Investigation

1.0 Site Investigation

1.1 Purpose of the Site Investigation

In accordance with subsections 31(1) and 31(2) of O.Reg. 359/09, a Site Investigation includes an investigation of the land and water within 120 m and 300 m of the Project Location as applicable to determine:

- whether the results of the Records Review are correct or require correction;
- whether any additional water bodies exist, other than those identified in the Records Review;
- the boundaries, located within 120 m of the Project Location, of any water body that was identified in the records review or Site Investigation or the boundaries of any lake trout lake that is at or above development capacity located within 300 m of the Project Location; and,
- the distance from the Project Location to the boundaries determined above.

As described in Section 2.0 of the Records Review in Part I of this report, the Project Location defined for the Site Investigation was refined to the approximately 35 ha area delineated in **Figures A1** and **A3** of **Appendix A**.

1.2 Methodology

The first step in the Site Investigation was to search the Project Location and areas within 300 m of it for any additional water bodies that may not have been identified through the Records Review.

Subsequently, the Site Investigation focused on the three ponds located south and two ponds located east of the Project Location. Information about each of the ponds was collected in accordance with the MTO/DFO/MNR Protocol (MTO, 2006). This protocol involves collecting detailed information about the watercourse including location, channel dimensions, morphology, fish observations, riparian habitat and fish habitat mapping. This protocol is recognized by the MNR and Department of Fisheries and Oceans ("DFO").

The MTO Protocol was used since it is the most accepted method of assessment for documenting existing aquatic conditions. Habitat mapping was also conducted along with visual observations for aquatic life (fish, crayfish, macrophytes, etc.). Fish collections were not part of the Site Investigation since no work is proposed within any water body. Weather conditions, survey times and locations are provided in the MTO Watercourse Field Record Form in **Appendix D** and are summarized in **Table 5**.

A search for seepage areas was conducted as part of the Natural Heritage Assessment during Ecological Land Classification mapping. Seepage areas are locations where groundwater comes to the surface and are typically present at the base of a slope. Searches focused on the presence of indicators such as iron staining and vegetation types including jewelweed, skunk cabbage, and watercress.

Table 5 Summary of Site Investigation Methods

Survey Type	Purpose	Summary of Methods	Date(s), Time(s) (Duration)	Weather Conditions
General Site Reconnaissance	To identify any previously unknown aquatic features.	Wandering transects through the Project Location and 300 m from it to record any relevant observations.	20-Aug-2013 to 21-Aug-2013. Approximately 4 hours.	Approximately 30ºC and clear of cloud cover. Little to no wind. Rain overnight on the 20th.
Aquatic Habitat Mapping	To characterize aquatic habitat and conditions and to delineate the boundaries of the small ponds.	Using MTO/DFO Protocol and/or Burnside's standard Ponds/Lakes Field Collection Record. Perimeter walk of water bodies.	20-Aug-2013 to 21-Aug 2013. Approximately 12 hours.	Approximately 30ºC and clear of cloud cover. Little to no wind. Rain overnight on the 20th.

1.2.1 Qualifications

The Site Investigation was carried out by Devin Soeting, Environmental Technologist, under the direction of Neegan Burnsides' Senior Aquatic Ecologist (Christopher Pfohl, C.E.T, EP). Curriculum Vitae's (CV's) for Mr. Soeting and Mr. Pfohl are provided in **Appendix E**.

1.3 Site Investigation Results

1.3.1 Changes to the Records Review

Based on the Site Investigation, no changes were made to the Records Review. No water bodies or watercourses were identified at or within 120 m of the Project Location. Five ponds were located between the 120 m and 300 m Study Area setback boundaries of the Project Location.

1.3.2 Ponds within 300 m of the Project Location

As previously stated, no ponds were observed within 120 m of the Project Location. Below are descriptions of the ponds that were observed within 300 m of the Project Location. The weather during the Site Investigation was clear and sunny with temperatures at approximately 30ºC. The duration of each pond investigation lasted approximately an hour in length. No fish sampling was performed as the ponds were located outside 120 m of the Project Location and the potential to fish impacts are anticipated to be negligible.

1.3.2.1 Pond 1

Pond 1 is the water body that is closest in proximity to the Project Location (125 m) and is located to the south, adjacent to a gravel logging road. The general dimensions of Pond 1 are approximately 115 m x 85 m and it is generally aligned in a north-south direction. The depth of the pond is unknown, but based on field observations, is not expected to be deeper than 5 m. The water body appears to be a kettle pond and is surrounded by relatively steep (approximately 35% slope), forested slopes on the north and western shores and slightly gentler slopes (<10%) on the east and south shores. No inlets or outlets were observed at this location and the pond appeared to be isolated. The water in the pond was clear and the substrate was comprised mainly of sand, gravel, rubble, and detritus. Some muck and boulders were also noted at some locations in the substrate towards the southern portion of the pond.

The presence of seeps was also investigated and though no seeps were observed, the pond water level is interpreted to be a surficial representation of the groundwater table.

This interpretation is based on pond substrate type, and the comparison of regional water well records to the local topography.

Several species of aquatic vegetation were observed within the pond (no watercress). Approximately 35% of the water body contained vegetation. 70% of the vegetation observed at the pond was categorized as submerged and was comprised predominantly of grasses. The remaining aquatic vegetation was comprised of floating (i.e., Lily pad, arrowhead) and emergent species (grasses). Several logs and downed trees were also observed in the pond, creating underwater cover. A historic beaver lodge was observed along the western shore, in the northern part of the pond. It appeared that the lodge was uninhabited. No fish were observed in the pond during the perimeter walk.

1.3.2.2 Pond 2

Pond 2 was also south of the Site and is located adjacent to the south side of the logging road. It is generally aligned in a north-south direction and, similar to Pond 1, Pond 2 is also classified as a kettle pond and had no inlets or outlets. The general dimensions of the pond were approximately 140 m x 40 m and appeared to be relatively shallow (<3 m deep). The land surrounding the pond was forested and was steeply sloped along the eastern shore (approximately 23%). The slopes along the remaining shoreline are relatively gentle (approximately 5%). The slopes were observed for evidence of groundwater seeps. Though no groundwater seeps were observed, similar to Pond 1, the pond is thought to be groundwater fed.

The water in the pond appeared to be more tannic-coloured than Pond 1. The substrate at Pond 2 was comprised of muck, with some gravel and sand, and a trace amount of boulder-sized stone. Approximately 30% of the surface area of the pond was occupied by vegetation. The majority was comprised of emergent grasses. Some floating vegetation (i.e., Lily pads and water smartweed) and submerged grasses were also observed.

A small fen was connected to the pond directly south of its location and contained emergent grasses throughout its middle. An active beaver lodge was located at the eastern shore. Some logs and trees, and organic debris were noted as providing underwater cover, but most cover was due to macrophyte presence. No fish were observed in Pond 2.

1.3.2.3 Pond 3

Pond 3 was located approximately 18 m west of Pond 2 and was also aligned in a north-south direction. Pond 3 is classified as a kettle pond and did not have any inlets or outlets. The general dimensions of the pond were approximately 130 m x 75 m and

appeared to be relatively shallow in depth (approximately <5 m). Similar to the other ponds, the land around Pond 3 was also sloped steeply. The western and northern near-shore slopes were relatively steep (between 40 to 60%), while the eastern and southern slopes were more gentle (approximately 3%). Although no groundwater seeps were observed, this pond is also interpreted to be groundwater fed.

The water in the pond was relatively clear and was calm to rippled during the Site Investigation. The substrate in Pond 3 was comprised of sand and muck, with some gravel, cobble, and detritus. Trace boulders were also observed.

Pond 3 contained noticeably less aquatic vegetation with only 10% of the surface area of the pond being occupied by aquatic vegetation. The majority of the vegetation were emergent grasses, while the remaining vegetation were comprised of floating Lily pads, arrowhead, and submerged grasses. No fish were observed in Pond 3 during the Site Investigation.

1.3.2.4 Pond 4

Pond 4 was located approximately 226 m east of the Project Location and was generally round in shape. Upon inspection, this pond appeared to be very shallow and was classified as a fen. The general dimensions of this feature were approximately 90 m x 60 m and appeared to be less than a meter deep. Similar to Ponds 1 to 3, the shoreline was characterized by steep slopes to along the eastern shoreline. The northern, western, and southern shorelines were observed to be relatively flat.

Two small, intermittent watercourses (inlet and outlet) were observed at Pond 4, though neither were able to be investigated in detail due to the presence of a black bear during the Site Investigation. The outlet was described as draining to the north and was approximately 5 cm deep at its deepest point and was approximately 60 cm wide. The substrate was noted to be muck and detritus, indicating low flows. As previously mentioned, the outlet is thought to meander from this feature to a small wetland located north of Pond 4 where it is anticipated to dissipate. Based on mapping, this pond is not thought to be connected to a larger system. Though no groundwater seeps were observed, the pond is thought to be groundwater fed. An inactive beaver lodge was also located near the confluence of the pond to the watercourse.

The inlet to Pond 4 was only able to be observed through sound. What appeared to be a small watercourse was heard flowing from the steep slope in the area of the southeast portion of the pond. However, as mentioned the watercourse could not be investigated further due to the presence of a black bear in the area. Based on its sound, the amount of water flowing into the feature was thought to be minimal.

Pond 4 contained a relatively high amount (approximately 80% of the area) of emergent vegetation (grasses) throughout. The water appeared to be tannic-coloured and the predominant substrate appeared to be muck and detritus. Some downed woody debris was also present within the feature. No fish were observed during the Site Investigation.

1.3.2.5 Pond 5

Pond 5 was located approximately 241 m northeast of the Project Location and was generally aligned in a north-south direction. This pond was surrounded by forest and was investigated under calm conditions. Pond 5 was relatively large compared to ponds 1 to 4 (approximately 210 m x 55 m) and was clear to tannic in colour. This pond appeared to be relatively deep and was estimated to be between 5 to 7 m deep at its deepest point based on topographic maps and the observations of the surrounding shorelines. The surrounding shores were generally angled at approximately 20% slopes. This pond was also classified as a kettle pond. Similar to the other ponds, Pond 5 was interpreted to be groundwater fed.

Pond 5 appeared to be clear to tannic in colour and the varying near-shore substrate types. Substrate types ranged between areas comprised of organics and detritus with some muck to areas comprised of sand with some gravel (<5 cm diameter) and gravel. Vegetation was observed across approximately 25% of the surface area of which 70% was classified as emergent grasses, with 30% classified as submerged grasses.

Underwater cover was comprised of downed logs and trees and macrophyte coverage over approximately 40% of the area. A beaver lodge was observed along the northwest bank of the pond and appeared to be active. No fish were observed during the investigation.

A small (approximately 20 m in length x 4 m in width), dammed, although connected channel was observed between Pond 5 and an unnamed water body, upstream. This channel was investigated using the MTO Protocol. The channel appeared to be a permanent feature and had minimal flow (<0.1m/s) that was attributed to the presence of a beaver dam. The channel was classified as a flat that was approximately 2 m deep with a substrate comprised of sand and muck containing some gravel, cobbles, and detritus. The channel contained some large in-stream woody debris and some submerged grasses. No fish were observed in this feature.

The unnamed water body, located upstream of this watercourse was not investigated as it was located over 300 m from the Project Location.

2.0 Project Site Plan

Updated facility Site Plan revisions were made after the Site Investigation, identifying revised locations of the various Project components, including the cogeneration facility, pellet plant, biomass stockpile areas, internal road system, transformer substation, and ancillary equipment. While the location of internal facility components changed, the Project Location remained the same as it was defined for the Site Investigation, as shown in **Figures A1** and **A3** of **Appendix A**.

The proposed Project Site Plan is shown on **Figure A3** in **Appendix A**.

2.1 Location of Water Bodies in Relation to the Project

As previously mentioned, no water bodies are located within 120 m of the Project Location. The minimum distances from each pond to the Project Location are shown on **Figure A3** in **Appendix A**.
Below is a description of the distances from the water bodies to noted Project components.

Table 6 Distance Between Ponds and Project Components

Feature	Approximate Distance to Nearest Biomass Storage Area (m)	Approximate Distance to Transformer Station (m)	Approximate Distance to Nearest Other Project Component (m)
Pond 1	298	519	130
Pond 2	406	619	219
Pond 3	384	590	172
Pond 4	717	1004	680
Pond 5	716	979	582

3.0 Site Investigation Summary

The results of the records review corresponded to the features that were observed during the Site Investigation. No additional water bodies were identified during the investigation, and no components of the Project will be located within 120 m of any of the five ponds that were identified in the records review and investigated in the field. No lake trout lakes at or above capacity were identified during the Site Investigation.

With the exception of Pond 4, the ponds were classified as kettle lakes according to the definition described in Section 4.1 in Chapter 8 (Guidance for Preparing the Water Assessment and Water Body Reports) in the Technical Guide to Renewable Energy Approvals. Based on field observations, it was determined that Pond 4 most resembled a fen.

No seepage areas were observed in any of the ponds though they were all interpreted to be groundwater fed based on the hydrogeological assessment described in the Design and Operations Report under a separate cover. No fish were observed in any of the ponds during the Site reconnaissance, although no invasive techniques were involved in the study.

Since no components of the Project will be located within the setback distances prescribed in O.Reg. 359/09, a Water Body Report is not required.

4.0 Conclusion

The Water Assessment did not identify any lake trout lakes that are at or above capacity within 300 m of the Project Location, and no other permanent or intermittent surface water features, including seepage areas, were found within 120 m of the Project Location. Since the Project Location boundary satisfies the water body setback requirements established in O.Reg. 359/09, a Water Body Report was not required.

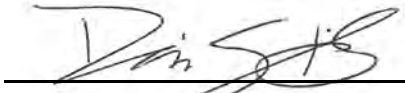
The Project has been sited, and will include additional design features to mitigate impacts on water bodies in the broader vicinity of the Project as much as possible. Further details regarding mitigation are provided in the Design and Operations Report, Surface Water Assessment Report, and Construction Plan Report, under separate covers.

Neegan Burnside Ltd. has prepared this Water Assessment Report for Whitesand First Nation in accordance with O.Reg. 359/09. This report has been prepared by Burnside for the sole benefit of Whitesand First Nation, and may not be re-produced by any third party without the express written consent of Whitesand First Nation.

Respectfully submitted,

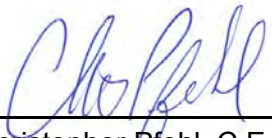
Neegan Burnside Ltd.

Written by:

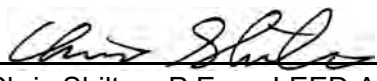
Signature  Date October 2014

Devin Soeting, B.A.
Environmental Technologist
Neegan Burnside Ltd.

Reviewed by:

Signature  Date October 2014

Christopher Pfohl, C.E.T., (EP)
Senior Aquatic Ecologist
Neegan Burnside Ltd.

Signature  Date October 2014

Chris Shilton, P.Eng., LEED AP
Project Manager
Neegan Burnside Ltd.

Approved by:

Signature  Date October 2014

Craig Toset
Project Manager
Whitesand First Nation

5.0 References

Ministry of the Environment, 2013. Technical Guide to Renewable Energy Approvals, Guidance for Preparing the Water Assessment and Water Body Reports, Queens Printer for Ontario

Ministry of Natural Resources, 2006. Inland Ontario Lakes Designated for Lake Trout Management. Retrieved July 26, 2013 from http://www.mnr.gov.on.ca/stdprodconsume/groups/lr/@mnr/@letsfish/documents/document/256676.pdf

Ministry of Natural Resources, 2011. Lake Nipigon Forest Management Plan. Retrieved July 26, 2013 from http://www.appefmp.mnr.gov.on.ca/eFMP/viewFmuPlan.do?fmu=815&fid=100100&type=CURRENT&pid=100100&sid=8806&pn=FP&ppyf=2011&ppyt=2021&ptyf=2011&ptyt=2016&phase=P1

Ministry of Transportation,2006. MNR Protocol for Watercourse Crossings, MTO/DFO/MNR Protocol

Figures

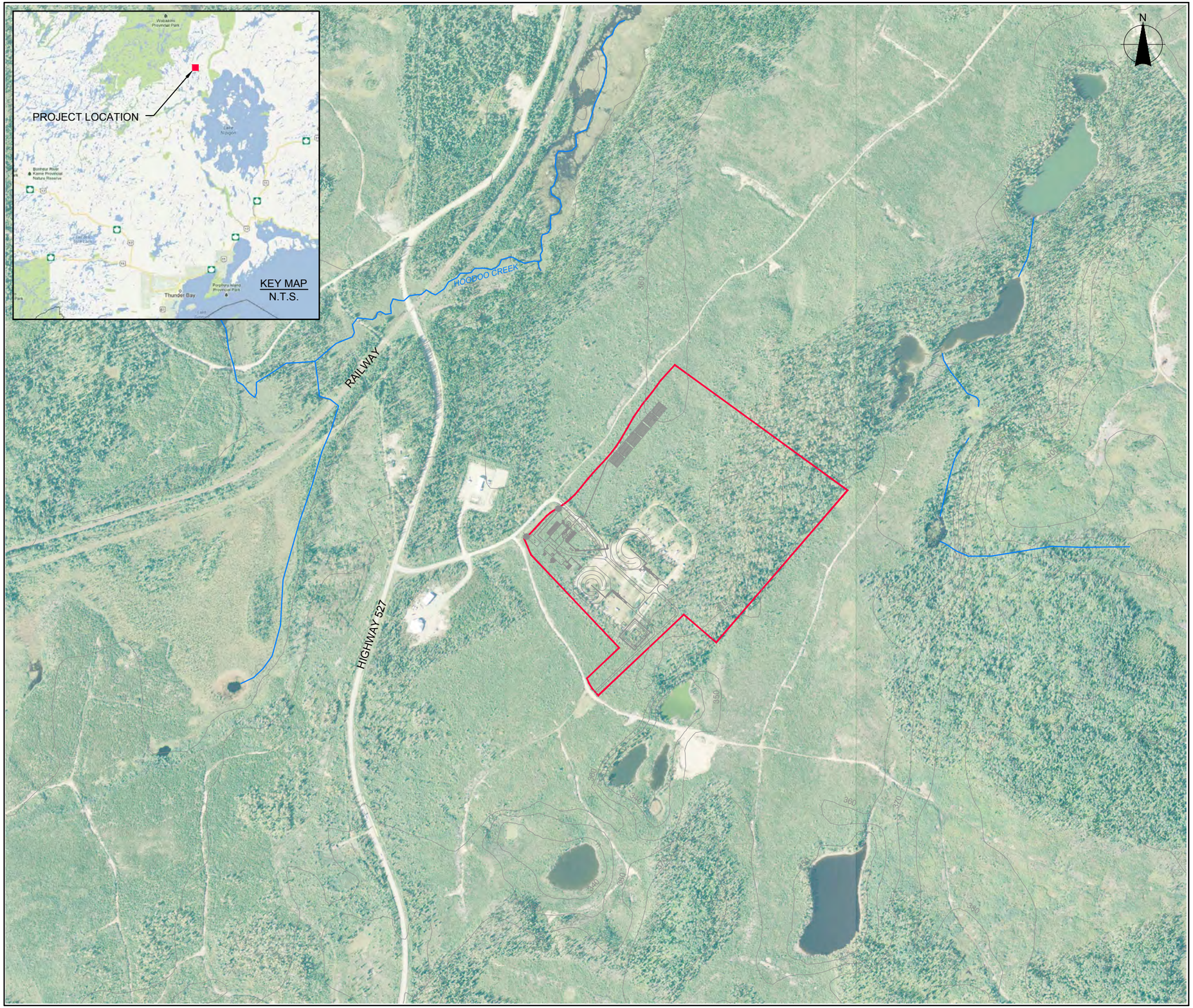


FIGURE A1

WHITESAND FIRST NATION
COGENERATION & PELLET MILL PROJECT
RENEWABLE ENERGY APPROVAL
WATER ASSESSMENT REPORT

PROJECT LOCATION

LEGEND

PROJECT LOCATION

350 EXISTING 10m CONTOURS INTERVAL (m asl)

Air Photo Source:
Background 2008 forest resource inventory air photo reproduced with the permission of Ministry of Natural Resources, © Queen's Printer for Ontario

0 200 400 600 800
Metres

1:10,000
August 2014
Project Number: 300030895

Projection: UTM Zone 16
Datum: NAD83

Prepared by: C. Sheppard

Verified by: C. Shilton

NEEGAN BURNSIDE

030895 PELLET MILL DRAWING SET.DWG

LAYOUT: WATER ASSESSMENT PL

PRINTED: August 19, 2014, 11:31 AM

Air Photo Source:
Background 2008 forest resource inventory air photo reproduced with the permission of Ministry of Natural Resources, © Queen's Printer for Ontario

FIGURE A2

WHITESAND FIRST NATION
COGENERATION & PELLET MILL PROJECT
RENEWABLE ENERGY APPROVAL
WATER ASSESSMENT REPORT

RECORDS REVIEW STUDY AREA

LEGEND

- RECORDS REVIEW EXPANDED PROJECT LOCATION
- STUDY AREA 120m SETBACK
- STUDY AREA 300m SETBACK

0 100 200 400 600
Metres

1:7,500
August 2014
Project Number: 300030895

Projection: UTM Zone 16
Datum: NAD83

Prepared by: C. Sheppard

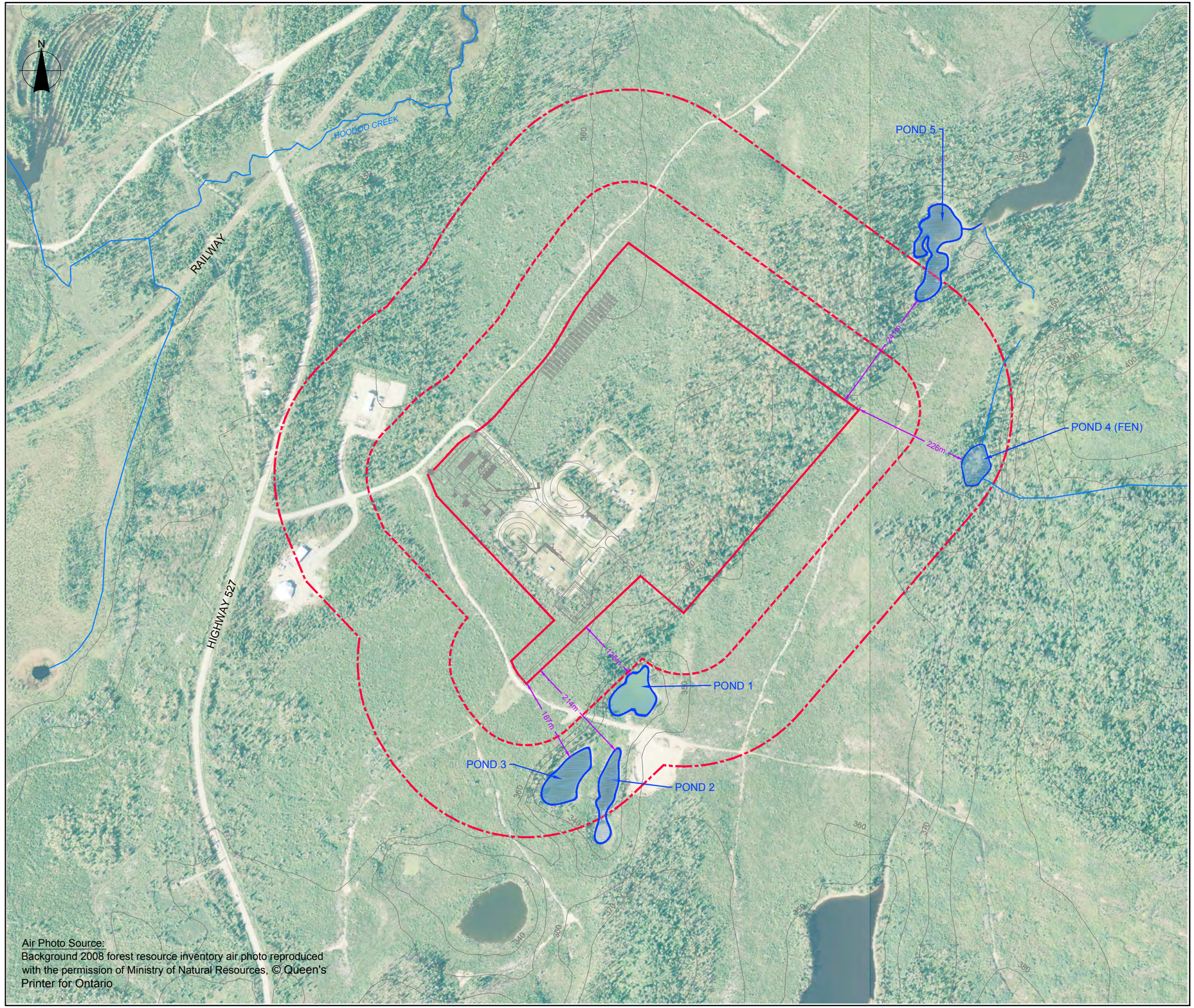
Verified by: T. Radburn

NEEGAN BURNSIDE

030895 PELLET MILL DRAWING SET.DWG

LAYOUT: WATER ASSESSMENT RRSA

PRINTED: August 20, 2014, 3:17 PM



Air Photo Source:
Background 2008 forest resource inventory air photo reproduced with the permission of Ministry of Natural Resources, © Queen's Printer for Ontario

FIGURE A3

WHITESAND FIRST NATION
COGENERATION & PELLET MILL PROJECT
RENEWABLE ENERGY APPROVAL
WATER ASSESSMENT REPORT

STUDY AREA FEATURES

LEGEND

- PROJECT LOCATION
- STUDY AREA 120m SETBACK
- STUDY AREA 300m SETBACK

0 100 200 400 600
Metres

1:7,500
July2014
Project Number: 300030895

Projection: UTM Zone 16
Datum: NAD83

Prepared by: C. Sheppard

Verified by: T. Radburn

NEEGAN BURNSIDE

030895 PELLET MILL DRAWING SET.DWG

LAYOUT: WATER ASSESSMENT SAF

PRINTED: August 19, 2014, 11:33 AM

Correspondence

Appendix B

Neegan Burnside Ltd. 292 Speedvale Avenue West Unit 20 Guelph ON N1H 1C4 Canada
telephone (519) 823-4995 **fax** (519) 836-5477 **web** www.neeganburnside.com

NEEGAN BURNSIDE

May 31, 2013

Via: Mail

«Title» «First_Name» «Last_Name»
«Position»
«AgencyOrganization»
«Address_1»
«Address_2»
«City», «Province» «Postal_Code»

Dear «Title» «Last_Name»:

Re: Whitesand First Nation Pellet Mill & Biomass Project
Request for Information: Records Review
File No.: 300030895

Whitesand First Nation has retained Neegan Burnside Ltd. ("Neegan Burnside") to prepare an application for a Renewable Energy Approval, under Ontario Regulation 359/09 of the *Environmental Protection Act* for a proposed green biomass fueled electrical power and heat cogeneration plant to be located near the Whitesand FN and the community of Armstrong Ontario. The proposed project also consists of a new pellet mill, which would use energy from the cogeneration plant. The cogeneration plant is categorized as a Class 1 Thermal Facility and together with the pellet mill is located within the project study area presented in Figure 1, attached.

At this stage, Neegan Burnside is conducting a Records Review, as required as part of the Natural Heritage Assessment. The Records Review includes a review of existing data sources to confirm the potential presence of significant natural features.

Neegan Burnside is requesting that your agency/organization provide us with any data or records that you may have relating to the natural environment so that we can include these in our assessment of potential impacts.

Burnside is seeking information, including:

- Records of significant natural features, including species at risk, wildlife habitats, aquatic habitat, etc;
- Geological information including the presence of karst topography/caves etc. that could provide bat hibernacula;
- Other background information that is pertinent to the compilation of an environmental inventory of the general area of study; and,
- Any preliminary comments or concerns that your agency has on the proposed project.

It is essential to the success of this project that the concerns of your agency, and other stakeholders, are identified early in the planning process, such that the appropriate environmental protection measures are incorporated into the overall project design. Your input and questions are encouraged.

To provide the study team with your comments or for further information please contact Tricia Radburn, Environmental Planner at 519-823-4995 x479 or by email at tradburn@neeganburnside.com.

Please indicate to us your interest in providing input to this project by responding to this letter. All interested stakeholders will be kept up-to-date on project status by means of future mailings, or inclusion in project meeting, as deemed appropriate.

Your participation in this Renewable Energy Approval process is much appreciated.

Yours truly,

Neegan Burnside Ltd.

Chris Shilton, P.Eng., LEED®AP
Project Manager
CS/sd

Enc.

030895_Records Review Letter.doc
31/05/2013 4:58 PM

Records Review Results

Appendix C

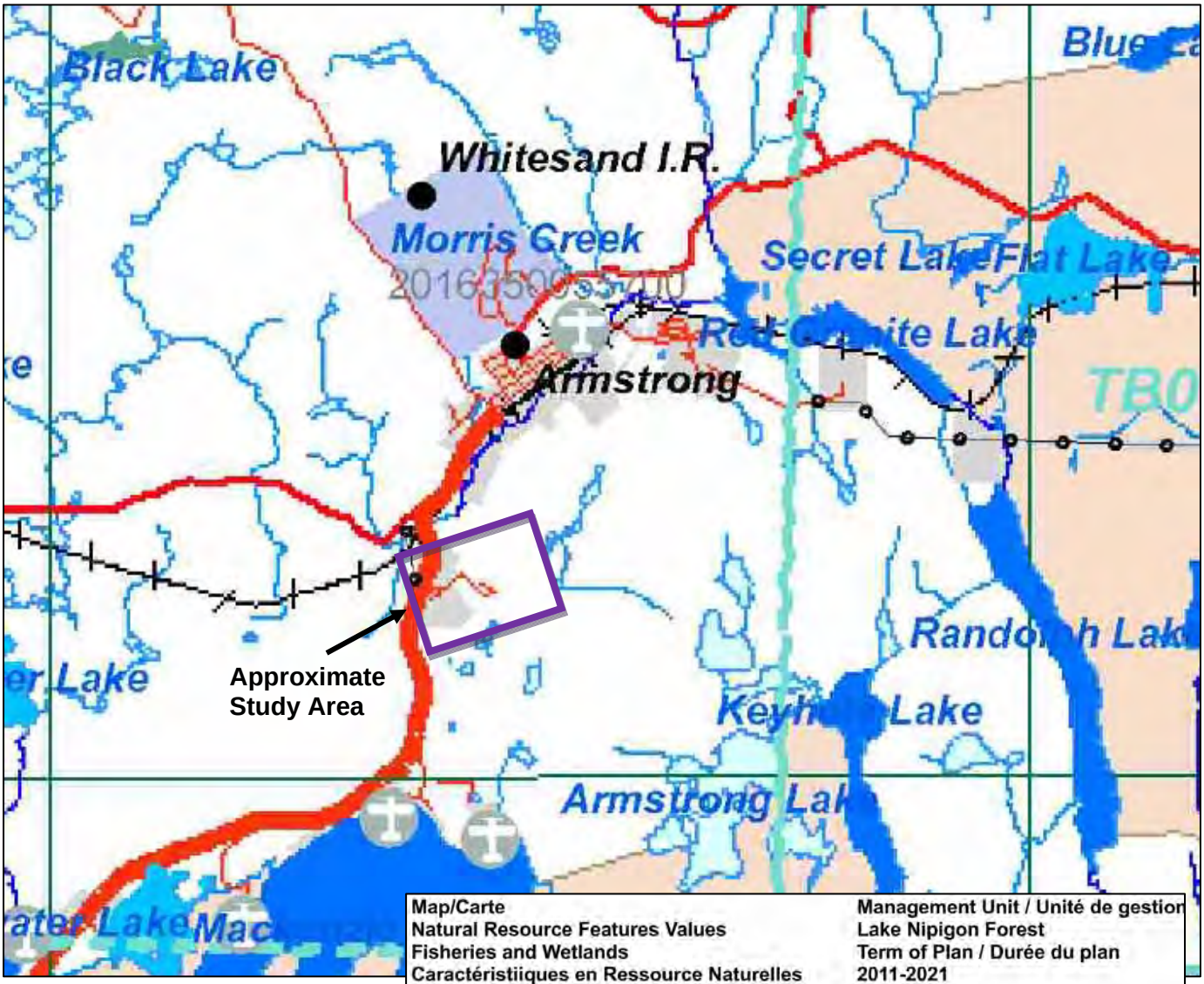


Figure C1: Fisheries and Wetlands
Source: (Lake Nipigon Forest Management Plan, 2011-2021, Lake Nipigon Forest Management Inc., 2011)

NEEGAN BURNSIDE

File No.: 300030895

Date: June 2013

Burnside Field Notes – MTO / DFO / MNR Protocol

Appendix D

20-Aug-2013 WHITESAND FN Aquatic Surveys

PIEZOMETER W.L.

11:10 OUT 20.5"

IN 19.5"

POND #1

10:50 - NO INLET OR OUTLET - very clear water

- no seeps observed, though it appears to be groundwater fed.
- No FISH OBSERVED
- see pictures & FIELD collection record
- sand, cobble, detritus & muck substrate
- many different kinds of aquatic vegetation
- no veg. observed in middle of pond

POND #2

- SEE POND #2 pics & Field collection records

POND #3

- SEE POND #3 PICS & FIELD Collection records

21 AUG 13 WHITESAND F.N. AQUATIC SURVEYS

STATION #4 - POND #4

9:45 - MEADOW MARSH - NOT A POND

- ~60 m wide - round feature
- similar to feature connected to POND #2 - (FEN)
- moat-like around many weeds
- grasses in channel, emergent
- grasses in middle of "pond"

SEE classification pg. for more detail

- Small DRAIN FLOWS FROM NE TO other small marsh outside of 300 m
- mud bottom creek ~2 ft wide, shallow, grasses around it, beaver lodge adjacent to it - NOT ACTIVE

10:10 - BEAR WAS PRESENT, had to abandon observations - HEALTH & SAFETY CONCERN

- WATER HEARD FLOWING IN SE SECTION OF STUDY AREA - INTERPRETED TO FLOW FROM HIGHER ELEVATED SHELF TO POND 4 - COULD NOT OBSERVE DUE TO BEAR PRESENCE

STATION #5 - POND #5

- SEE POND #3 PICS & FIELD Collection records

PONDS / LAKES FIELD COLLECTION RECORD

Project #:	Name of Waterbody:	Day	Month	Year
300030895	POND #1	20	AUG	13

Location of Station: POND LOCATED SOUTH-WEST OF THE SITE, EAST OF ROAD

Station #: 1

Collectors: DS

Weather Conditions: ~30°C CLEAR, NO WIND

Time Started:	Time Finished:	Sampling Duration:
~10:50	11:50	1 hr

Type of Waterbody

☐ Large Lake ☐ Small Lake ☑ Pond

☐ Dug-out ☐ Run-Off ☑ Spring-fed ☐ Connected ☐ By-Pass ☐ In-Stream

Plant Type (% surface area) 35%

Submergent 25 % e.g. ALGAE & GRASSES

Floating 10 % e.g. LILY PADS WATER SMARTWEED

Emergent 5 % e.g. GRASSES

None

Bottom Type (%)

Rock ____ Boulder 5% Rubble 20% Gravel 20% Sand 20% Silt ____

Clay ____ Muck 15% Marl ____ Detritus 20% Other ____

Dimensions:

Length (m) ~115 m Mean ~~Mean~~ Width ~85 m Max. Depth NA

Nearshore Slope (%) ~5% on S. ~70% on N slope

Shoreline Substrate SAND & GRAVEL & COBBLES

WATER CHEMISTRY:

pH	Secchi Depth	Surface Conditions	Conductivity (µS)
NA	NA	☑ calm ☑ rippled ☐ wavy ☐ rough	NA

WATER COLOUR:

☑ Colourless ☐ turbid ☑ clear ☐ Blue/green ☐ yellow/brown ☐ other

D.O. / Temperature Profile: NA **Time:** NA

Depth (m)	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0
Water Temp. (°C)											
D.O. (mg/L)											
Depth (m)	**5.0**	**5.5**	**6.0**	**6.5**	**7.0**	**7.5**	**8.0**	**8.5**	**9.0**	**9.5**	**10.0**
Water Temp. (°C)											
D.O. (mg/L)											

Bank Characteristics (stability, slopes, vegetation etc): STEEP SLOPE IN ~~SOUTH~~, GENTLE IN N, NE & EAST

Surrounding Land Use/Terrain: FOREST, RD ALGONQUIN TO SOUTH

Underwater Cover (% of area): 20%

Undercut Banks 0 Boulders 0 Logs & Trees 80% Organic Debris ____ w/c Macrophytes 20% Combination ____ None ____

Additional Data: (Pollution, Migratory Obstructions, etc.)

NO POLLUTION, NO INLET OR OUTLET ASSOCIATED W THIS POND VERY CLEAR, DEEP, MANY DIFFERENT TYPES OF VEG., NO SEEPS OBSERVED, THOUGH INDICATIONS THAT IT'S GROUNDWATER FED, NO FISH OBSERVED

PONDS / LAKES FIELD COLLECTION RECORD

Project #:	Name of Waterbody:	Day	Month	Year
30003089S	POND #2	20	AUG	13

Location of Station: Pond Southwest of Site
Station #: 2

Collectors: DS - DEVIN SOETING

Weather Conditions: CLEAR, HUMID, 30°C

Time Started: 12:30 **Time Finished:** 14:00 **Sampling Duration:** 1.5 hrs

Type of Waterbody
☐ Large Lake ☐ Small Lake ☑ Pond
☐ Dug-out ☐ Run-Off ☑ Spring-fed ☐ Connected ☐ By-Pass ☐ In-Stream

Plant Type (% surface area) ~30%
Submergent 10 % Floating 30 % Emergent 60 % None
e.g. grasses e.g. grasses & lily pads e.g. grasses

Bottom Type (%)
Rock ____ Boulder ____ Rubble 5% Gravel 10 % Sand 15 % Silt ____
Clay ____ Muck 70% Marl ____ Detritus ____ Other ____

Dimensions: Length (m) ~140 Mean Width ~40m Max. Depth NA.
Nearshore Slope (%) 42% on S side
Shoreline Substrate S side = mostly organic; N side = smaller

WATER CHEMISTRY:

pH	Secchi Depth	Surface Conditions	Conductivity (µS)
NA	NA	☐ calm ☑ rippled ☐ wavy ☐ rough	NA

WATER COLOUR:
☐ Colourless ☐ turbid ☐ clear
☐ Blue/green ☑ yellow/brown (tannic) ☐ other

D.O. / Temperature Profile: NA **Time:** NA

Depth (m)	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0
Water Temp. (°C)											
D.O. (mg/L)											
Depth (m)	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0
Water Temp. (°C)											
D.O. (mg/L)											

Bank Characteristics (stability, slopes, vegetation etc): stable slopes, shrubs & trees ie alder, BL. Spruce

Surrounding Land Use/Terrain: Forest & wetland
RD ADJACENT NORTH

Underwater Cover (% of area): 20%
Undercut Banks 0 Boulders 0 Logs & Trees 20% Organic Debris 20% w/c Macrophytes 60% Combination ____ None ____

Additional Data: (Pollution, Migratory Obstructions, etc.)
Beaver house, shallower, shallower middle vegetation in middle - marshier towards ef west ends, no groundwater seeps observed - BEAVER SLIDES EVIDENT
Connected to smaller ~~wetland~~ FEN w/ moat like open water around grasses to south

PONDS / LAKES FIELD COLLECTION RECORD

Project #:	Name of Waterbody:	Day	Month	Year
30003 0395	Pond #3	20	Aug	13

Location of Station: W of Station 2 - SW of site
Station #: 3

Collectors: Devin Soeting

Weather Conditions: 30°C, clear, slight wind

Time Started: 14:05 **Time Finished:** 15:00 **Sampling Duration:** 55 mins

Type of Waterbody

☐ Large Lake ☐ Small Lake ☑ Pond
☐ Dug-out ☐ Run-Off ☑ Spring-fed ☐ Connected ☐ By-Pass ☐ In-Stream

Plant Type (% surface area) 10%

Submergent 5 % Floating 20 % Emergent 75 % None

e.g. algae & grasses e.g. lily pads & [illegible] e.g. grasses

Bottom Type (%)

Rock ____ Boulder 1% Rubble 10% Gravel 10% Sand 40 Silt ____

Clay ____ Muck 30% Marl ____ Detritus 10% Other ____

Dimensions: Length (m) ~130 Mean Width ~75 m Max. Depth NA

Nearshore Slope (%) S= gentle ~2% N=60% W=40%

Shoreline Substrate organics

WATER CHEMISTRY:

pH	Secchi Depth	Surface Conditions	Conductivity (µS)
NA	NA	☑ calm to ☑ rippled ☐ wavy ☐ rough	NA

WATER COLOUR: ☐ Colourless ☐ turbid ☑ clear to ☐ Blue/green ☐ yellow/brown (circled) ☐ other — tannic [illegible]

D.O. / Temperature Profile: NA **Time:**

Depth (m)	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0
Water Temp. (°C)											
D.O. (mg/L)											
Depth (m)	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0
Water Temp. (°C)											
D.O. (mg/L)											

Bank Characteristics (stability, slopes, vegetation etc): stable banks, marsh/water shores, wetland /bog vegetation, grasses mostly

Surrounding Land Use/Terrain: Forest & wetland; RD adjacent north

Underwater Cover (% of area): 5%

Undercut Banks 5% Boulders ____ Logs & Trees 80% Organic Debris 15% w/c Macrophytes ____ Combination ____ None ____

Additional Data: (Pollution, Migratory Obstructions, etc.) - Beaver slides also evident

Appeared to be part of a large kettle w pond to south, now are 2 distinct ponds
Shallow, no inlet or outlet - pond
No fish observed - deeper than pond 2 - but lily pads observed in middle

PONDS / LAKES FIELD COLLECTION RECORD

Project #:	Name of Waterbody:	Day	Month	Year
300030895	POND 4 STATION 4 - MEADOW MARSH/FEN	21	AUG	13

Location of Station: ~~AREA~~ EAST OF STUDY AREA ~ 300 m EAST OF SITE 4 **Station #:**

Collectors: DEVIN SECTING

Weather Conditions: 30°C - CLEAR

Time Started:	Time Finished:	Sampling Duration:
9:45	10:10	25 mins.

Type of Waterbody

☐ Large Lake ☐ Small Lake ☑ Pond SHORE MARSH/FEN

☐ Dug-out ☐ Run-Off ☐ Spring-fed ☐ Connected ☐ By-Pass ☐ In-Stream

Plant Type (% surface area) 80%

Submergent 20 % e.g. grasses | Floating _____ % e.g. _____ | Emergent 80 % e.g. grasses | None

Bottom Type (%)

Rock _____ Boulder _____ Rubble _____ Gravel _____ Sand _____ Silt _____

Clay _____ Muck 100% Marl _____ Detritus _____ Other _____

Dimensions: Length (m) ~90m Mean Width ~60 m Max. Depth NA

Nearshore Slope (%) 1% to North ~60% to southeast

Shoreline Substrate muck

WATER CHEMISTRY:

pH	Secchi Depth	Surface Conditions	Conductivity (µS)
	NA	☑ calm ☐ rippled ☐ wavy ☐ rough	NA

WATER COLOUR: ☐ Colourless ☐ turbid ☐ clear ☐ Blue/green ☑ yellow/brown ☐ other

D.O. / Temperature Profile: NA **Time:**

Depth (m)	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0
Water Temp. (°C)											
D.O. (mg/L)											
Depth (m)	**5.0**	**5.5**	**6.0**	**6.5**	**7.0**	**7.5**	**8.0**	**8.5**	**9.0**	**9.5**	**10.0**
Water Temp. (°C)											
D.O. (mg/L)											

Bank Characteristics (stability, slopes, vegetation etc): stable, riparian grasses, FOREST

Surrounding Land Use/Terrain: FOREST

Underwater Cover (% of area): 80%

Undercut Banks 5% Boulders _____ Logs & Trees 30% Organic Debris _____ w/c Macrophytes ~grasses 70% Combination _____ None _____

Additional Data: (Pollution, Migratory Obstructions, etc.)

- small intermittent drainage area noted to North - away from marsh - dissipates in forest Adjacent to POND - dry - ~ 20' in length - mud - see photos
- watercourse draining to ~~NORTH~~ NORTH from a wetland channel - Beaver ~~dam~~ LODGE (INACTIVE) - Adjacent to waterway

PONDS / LAKES FIELD COLLECTION RECORD

Project #:	Name of Waterbody:	Day	Month	Year
	POND # 5	21	AUG	13

Location of Station: NE CORNER OF STUDY AREA

Station #: 5

Collectors: DEVIN SOETING

Weather Conditions: 30°C CLEAR

Time Started:	Time Finished:	Sampling Duration:
10:45	12:30	1 hr 45 mins

Type of Waterbody

☐ Large Lake ☐ Small Lake ☑ Pond

☐ Dug-out ☐ Run-Off ☑ Spring-fed ☐ Connected ☐ By-Pass ☐ In-Stream

Plant Type (% surface area) 25%

Submergent 30% % Floating _____ % Emergent 70% % None

e.g. GRASSES e.g. _____ e.g. GRASSES

Bottom Type (%)

Rock _____ Boulder _____ Rubble 5 Gravel 5 Sand 20 Silt _____

Clay _____ Muck ~~65~~ Marl _____ Detritus 15 Other _____

Dimensions:	Nearshore Slope (%)	Shoreline Substrate
Length (m) ~210m Mean Width ~55m Max. Depth NA	~20% all around	ALGAE OF ORGANICS & SAND & DETRITUS, some stones muck

WATER CHEMISTRY:

pH	Secchi Depth	Surface Conditions	Conductivity (µS)
NA	NA	☑ calm ☐ rippled ☐ wavy ☐ rough	NA

WATER COLOUR: ☐ Colourless ☐ turbid ☑ clear ☐ Blue/green ☐ yellow/brown ☐ other — more clear than stream

D.O. / Temperature Profile: NA **Time:** NA

Depth (m)	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0
Water Temp. (°C)											
D.O. (mg/L)											
Depth (m)	**5.0**	**5.5**	**6.0**	**6.5**	**7.0**	**7.5**	**8.0**	**8.5**	**9.0**	**9.5**	**10.0**
Water Temp. (°C)											
D.O. (mg/L)											

Bank Characteristics (stability, slopes, vegetation etc): stable, lots of riparian grasses & shrubs some spruce, poplar & downed woody debris

Surrounding Land Use/Terrain: FOREST

Underwater Cover (% of area): 40%

Undercut Banks _____ Boulders _____ Logs & Trees 50 Organic Debris _____ w/c Macrophytes 50 Combination _____ None _____

Additional Data: (Pollution, Migratory Obstructions, etc.)

- GRASSES THROUGHOUT
- no evidence of GW seeps
- some beaver activity
- BEAVER LODGE ON NW BANK

GENERAL INFORMATION

PROJECT #:	PROJECT DESCRIPTION:	DAY:	MONTH:	YEAR:
300030595	AQUATICS ASSESSMENT	21	AUG	2013

Is STREAM REALIGNMENT required for this section:

Yes (No) Unknown

COLLECTORS:	WEATHER CONDITIONS:	TIME STARTED:	TIME FINISHED:
DEVIN SOTINA	30°C CLEAR	12:30	13:10

PHOTOS NUMBERS AND DESCRIPTIONS:

LOCATION

NAME OF WATERBODY:	DRAINAGE SYSTEM:	CROSSING #:	STATION #:
UNNAMED WATERCOURSE	LAKE NIPIGON	NA	6

LOCATION OF CROSSING:
BTWN POND 5 & UNNAMED WATERBODY NORTH OF STUDY AREA

UTM EASTING & NORTHING:	MTO CHAINAGE:
16U 355194 m E 5572653 m N	NA
TOWNSHIP: ARMSTRONG	**MNR DISTRICT:** THUNDER BAY

LAND USE AND POLLUTION

SURROUNDING LAND USE:	SOURCES OF POLLUTION:
FOREST	NONE

EXISTING STRUCTURE TYPE

Bridge	Box Culvert	Open Foot Culvert	CSP	(N/A)

Other Describe: CHUTE BTWN PONDS W BEAVER DAM | Size (w x h) m2

SECTION TYPE AND MORPHOLOGY

SECTION IDENTIFIER:	SECTION LOCATION: (include on habitat map)

TYPE:	Stream / river	Channelized	Permanent	Intermittent	Ephemeral	ASSOCIATED WETLAND:
			✓			

TOTAL SECTION LENGTH (m):	CURRENT VELOCITY (m/s):
~20m	0.1 m/s

SUB-SECTION(S)	Run	Pool	Riffle	Flats	Inside culvert	Other
Percentage of area	N/A			100%		
mean depth wetted (m)	N/A			~2m		
mean width wetted (m)	N/A			~4m		
Mean bankfull width (m)				~5m		
Mean bankfull depth(m)				~2.6m		
Substrate						

Bedrock Br	Boulder Bo	(Cobble Co)	(Gravel Gr)	(Sand Sa)	Silt Si	Clay Cl	(Muck Mu)	(Detritus D)
		5%	5%	55%			30%	5%

BANK STABILITY

	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Upstream Bank	✓	✓ - sand & gravel		
Right Upstream Bank	✓	✓ on shoals		

HABITAT

IN-STREAM COVER (% surface area):	Undercut banks	Boulders	Cobble	Large Woody Debris ✓	Organic debris	Vascular plants	None
	3%			Instream ✓ 90%		Instream	
				Overhanging ✓ 10%		Overhanging	

SHORE COVER (% stream shaded):	100 – 90 %	90 – 60%	60- 30%	30 – 1%	None
			✓ 30%	✓	

VEGETATION TYPE (%):	Submergent	Floating	Emergent	None
	✓			
Predominant Species	grasses			

MIGRATORY OBSTRUCTIONS:	None	Seasonal	Permanent
			BEAVER DAM

POTENTIAL CRITICAL HABITAT LIMITING:	Spawning	Evidence of Groundwater	Other
		NONE OBSERVED	BEAVER DAM IMPASSIBLE BARRIER

POTENTIAL ENHANCEMENT OPPORTUNITIES:

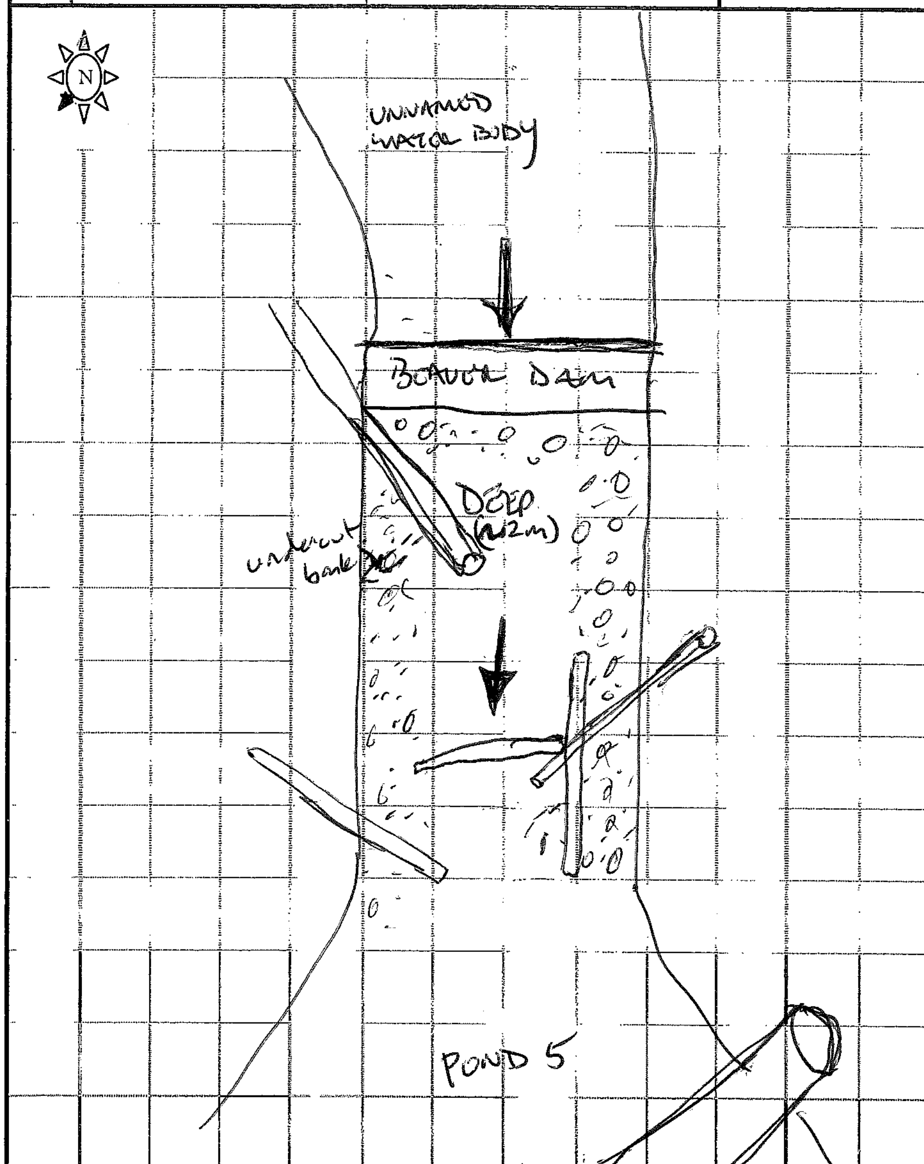
Removal of Dam, more overhanging/riparian species

COMMENTS :

- NO FISH OBSERVED
- ~~NOT THOUGHT TO BE INHABITED BY FISH~~ - NONE IN PONDS
- WATERCOURSE IS OUTSIDE OF 300 m BOUNDARY FOR SITE STUDY AREA
- VERY LOW FLOW DUE TO DAM
- NOT A NOTICEABLE GRADIENT CHANGE FROM POND NORTH OF POND 5 TO POND 5

Additional Notes Appended? No Yes number of pages _____

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
POND 5 WATERCOURSE		20m	



PROJECT #: 3000 30895

MAPPER: DEVIN SOETING

NAME OF WATERBODY: UNNAMED

CROSSING #: N/A

STATION #: 5

DATE: DD-MMM-YY 21-AUG-13

LEGEND

10d depth (cm)
6w width

➡ Riffle
⇨ Run/Glide
⬭ Pool
▩ Island/Bar

░ Fine Substrate
Gravel Substrate

oOooO Cobble /Boulder
*** * *** Debris

CT Cattail
SV/FV Submerg/Float Veg

EV Emergent Vegetation
W Watercress

Fe Iron Staining
////// Eroded Bank

XXX Riprap / Other Stabilization

⊂⊃ Instream Log/Tree
^^^ Dam/Weir/Obstruction

® Riparian Tree

|▶ Seep/Spring
-------- Undercut Bank

— Barrier to Fish Movement
-S- Seasonal Barrier

-x--x- Fence line
└┘ Culvert

PROFILE: **Horz. Scale** **Vert. Scale**

Slow flow - approx 0.1 m/s

Approx. 2 m deep in middle of channel

Curriculum Vitae

Profession

Senior Aquatic Ecologist

Education

Terrain and Water Resources Technologist, Sir Sandford Fleming College, School of Natural Resources, 1996

Certificates

Environmental Professional (EP), ECO Canada, 2013

CISEC-Certified Inspector for Sediment and Erosion Control, 2011

MNR/TRCA Ontario Stream Assessment Protocol (OSAP), 2010

OBBN-Ontario Benthos Biomonitoring Network Certification, 2010

DFO, Ontario Freshwater Mussel Identification Course, 2007

MTO/DFO/MNR Fisheries Protocol, Fisheries Assessment Specialist, Fisheries Contract Specialist (RAQs Certified), 2006

MNR Class 1 Electrofishing Certification and Trainer, 2006 (updated 2010)

ROM, Ontario Freshwater Fishes Identification Course, 2005

Professional Societies

Ontario Association of Certified Engineering Technicians and Technologists (OACETT)

Employment Record

Aquatic Ecologist, R.J. Burnside & Associates Limited (2007-Present)

Aquatic Resources Technologist, AMEC Earth and Environmental (2003-2006)

Environmental Technologist, AMEC Earth and Environmental (1998-2003)

Citizenship

Canadian

Languages

English

Christopher Pfohl, C.E.T., (EP)

Christopher has a broad range of experience in Canada and Internationally, with 15 years of professional experience in environmental assessment, baseline studies, habitat restoration, environmental monitoring and protection, fisheries and fish habitat, Species at Risk, hydrology, hydrogeology and contaminated sites. He has extensive knowledge of the Fisheries Act, Endangered Species Act, and Species at Risk Act, as it pertains to the protection of aquatic and terrestrial species and their habitat. Christopher is responsible for obtaining permits from various government agencies (MNR, DFO, Conservations Authorities), environmental impact assessment, environmental and construction monitoring, developing and conducting sampling programs for fisheries and aquatic habitat inventories, and the preparation of technical reports based on project requirements.

Christopher has undertaken projects for a wide range of clients throughout the energy, transportation, mining and development sectors from local to remote areas of Canada and overseas. This requires the development and coordination of extensive field investigations and includes the management of logistics, field staff and sub-consultants, data analysis, report and proposal preparation. He is responsible for liaison with government agencies, First Nations, large corporations, and stakeholders.

Christopher is a certified Environmental Professional (EP) under the Fish and Wildlife specialization by the Canadian Environmental Certification Approvals Board.

Biological Resources

Municipal Class Environmental Assessment, Brook Trout Spawning Surveys, Credit River, Orangeville Waste Water Treatment Plant Expansion, Town of Orangeville, Ontario (2007-Ongoing)

Aquatic Resources Specialist responsible for conducting Brook trout spawning surveys with the Credit Valley Conservation Authority (CVC) on the upper Credit River. Spawning Surveys were required to determine presence/absence of critical habitat for Brook trout in sections of the Credit River downstream from the Orangeville Waste Water Treatment Plant. Concerns from CVC on the proposed expansion of the plant triggered more intense investigations of the Credit River immediately downstream of the outfall.

Various Wind Energy Projects, Amphibian Monitoring, Confidential Clients, Southern Ontario (2007-Ongoing)

Responsible for developing and conducting Amphibian Monitoring programs for spring breeding surveys. Breeding surveys were developed based on the Marsh Monitoring program for Ontario. Survey results were reported for each study area and included in the Provincial and Federal Environmental Assessment documents.

Siloam Pond Natural Channel Design, Mill Run Golf and Country Club, Uxbridge, Ontario (2010-Ongoing)

Mr. Pfohl provided aquatic resource input into the final design of more than 350m of brook trout habitat in Uxbridge, Ontario. The Siloam Pond was taken off-line to reduce thermal impacts to a cold water fishery and provide a constant water source for the golf club. Christopher provided suitable habitat designs for large woody debris, riffle sections and over-wintering habitat in strategic locations along the channel and as part of the compensation required

for the DFO Authorization. He was also responsible for obtaining the Scientific Collectors Permit from MNR, fish salvage, construction monitoring, and submission of fish collection records as part of the condition of the MNR permit. Mr. Pfohl will be monitoring the new channel for habitat use, substrate movement and naturalization of the riparian corridor as part of the permit conditions provided in the DFO Authorization.

Coves ESA Master Plan and Rehabilitation of the East Pond, City of London, London, Ontario (2011-Ongoing)

Mr. Pfohl was subcontracted by North South Environmental to provide aquatic support for development of the Coves ESA Master Plan located in an urban environment. He was responsible for background review, confirmation of existing conditions and input to rehabilitation of the Coves ponds and watercourses as it pertains to aquatic resources. A rehabilitation matrix was developed by Mr. Pfohl to determine the best options for improvements to the aquatic conditions in the Coves ponds and watercourses. A rehabilitation concept and plan has been provided for funding approval.

Rumble Pond Storm Water Management Facility and Creek Realignment, Town of Richmond Hill, Richmond Hill, Ontario (2013-Ongoing)

Aquatic ecologist responsible for natural channel design and construction for the Rumble Pond SWM facility. The Stormwater pond was taken offline to improve water quality conditions in a reach of the Don River supporting the last remaining stocks of Redside Dace (Endangered Aquatic Species). Mr. Pfohl provided oversight to channel construction and field fit opportunities for future Redside dace habitat. He provided support during the Endangered Species Act permitting process to acquire permits for works within regulated habitat.

Natural Heritage Network, Headwater Drainage Assessment, City of Vaughan, Vaughan, Ontario (2013)

Mr. Pfohl was subcontracted by North South Environmental to manage and conduct the Headwater Drainage Feature Assessment (HDFAs) for the City of Vaughan and future development areas. Through coordination with City of Vaughan, TRCA and MNR he facilitated assessment of over 90 HDFAs and provided input to the City of Vaughan regarding protection of certain features and sensitive habitat for aquatic Species at Risk. He is one of the first to be certified for HDFA by MNR and TRCA.

Bronte Creek Rehabilitation and Natural Channel Design, Trout Unlimited, Lowville, Ontario (2011)

Aquatic Resources Specialist responsible for natural channel design options and prescriptions for areas that have been impacted by erosion, heavy pedestrian use, and areas of channel widening. Christopher conducted spawning surveys for rainbow trout (steelhead) and Chinook salmon to determine critical habitat areas to be protected during construction. Habitat prescriptions included spawning areas, riffle sections, boulder clusters, large woody debris, pool creation, juvenile habitat and retrofit of existing riffle structures. He conducted swim-up counts for steelhead fry and determination of prescription success based on the contractor's rehabilitation works. Trout Unlimited was overwhelmed with the positive feedback on the construction and design.

Stream Realignment, Upper Nottawasaga River, Township of Mono, Ontario (2009-2010)

Project Coordinator responsible for stream realignment of 105 linear metres of coldwater habitat in the Upper Nottawasaga River watershed. Project required coordination of contractors, reporting to the Township of Mono and Nottawasaga Valley Conservation Authority and liaison with landowners. Realignment involved creation of suitable habitat for coldwater species (brook trout and migratory rainbow trout) including riffle structures, large woody debris placement, native substrate loading, vegetative mats for undercuts and riparian plantings. Responsible for salvage efforts and compliance with the Department of Fisheries and Oceans (DFO) authorization for the "Harmful alteration, disruption or destruction" (HADD) of fish habitat and future monitoring requirements.

Fixed Link Project CEAA Screening, Chippewas of Georgina Island First Nation, Sutton West, Ontario (2007-2008)

Responsible for the preparation of an aquatic existing conditions report for the study area and made recommendations on a preferred alternative route based on potential effects to the aquatic environment. Information prepared was included in the Preliminary Evaluation of Engineering and Environmental Alternatives Study and CEAA Screening Report for the proposed Fixed Link. The proposed Fixed Link is to be a reliable all-weather transportation (vehicle and passenger) link from Georgina Island to the mainland.

Environmental Monitoring and Fish Salvage, Stanley Park Seawall Undermining Repair, Vancouver Board of Parks and Recreation, Vancouver, British Columbia (2003)

Environmental monitor required to inspect construction activities including shotcrete applications in a marine environment for the Stanley Park Seawall. Responsible for obtaining specific fish collection permits and approval of work permit extensions from the DFO on behalf of the client. Selected tidal pools were bailed and marine life collected and transported to the Burrard

Inlet for release prior to the preparation of undermined locations. An environmental monitoring report including fish collection details was submitted to the DFO for review.

Environmental Protection Plan, Stanley Park Seawall Undermining Repair, Vancouver Board of Parks and Recreation, Vancouver, British Columbia (2003)

Responsible for the preparation of an Environmental Protection Plan that was reviewed by DFO prior to gaining approval for the repair works along the Stanley Park Seawall.

Transportation

Municipal Class Environmental Assessment (Schedule B) Mono Sideroad #7 culvert replacement, Town of Mono, Orangeville, Ontario (Ongoing)

Assisted with the completion of the environmental, and approvals and permitting processes associated with the design and construction of the Mono Sideroad #7 culvert replacement.

Fish Habitat Assessments, Road Crossings, Various Clients across Ontario (2007-Ongoing)

Responsible for collecting and mapping fish habitat information for over 70 various road crossing and highway twinning projects in Ontario. Habitat Assessments (MTO Protocol 2006) were completed as part of the information requirements based on the Environmental Assessment Act. Information has been presented at Public Information Centers, in Environmental Study Reports and various Environmental Assessment documents for regulatory review.

GO Transit Class Environmental Assessment, Group B for the Proposed Rail Expansion from Toronto to Milton, GO Transit, Ontario (2011-Ongoing)

Aquatic ecologist responsible for coordinating existing conditions surveys for all watercourse crossings from Union west to Milton Station. Efforts included site visits to watercourses to document existing and critical fish habitat and determination for potential Fisheries Act Authorizations. Responsible for reporting information under the requirements for Municipal Class Environmental Assessment Projects for the preparation of the Environmental Study Report (ESR).

Municipal Class Environmental Assessment, (Schedule B) Gore Road Widening (Patterson Sideroad to Highway 9), Region of Peel, Ontario (2011-Ongoing)

Aquatic ecologist responsible for efforts including preparation of public consultation materials, liaison with Region staff and review agencies and coordination of studies by environmental sub consultants. Primary author of the PFR.

Fisheries Contract Specialist, MTO Contracts, Various Locations and Clients in Ontario (2012-Ongoing)

Fisheries Contract Specialist certified by MTO under RAQs responsible for 4 large MTO highway construction projects and related inspection. Mr. Pfohl was responsible for inspection and reporting to the Contract Administrator to ensure protection of fisheries in watercourses crossing the project right of way. Chris provided contractor training on Species at Risk (SAR) and associated mitigation measures along with SAR surveys prior to construction works. He was also responsible for fish/wildlife salvage and obtaining Scientific Collectors Permits from MNR.

Municipal Class Environmental Assessment, (Schedule B) Niska Road and Bridge Improvements, City of Guelph, Ontario (2013-Ongoing)

Aquatic ecologist lead responsible for managing field efforts including review of background documents, coordination of environmental field studies.

Municipal Class Environmental Assessment Addendum (Schedule C) County Road 90 Improvements, County of Simcoe, Midhurst, Ontario (2011-2012)

Aided the Environmental Assessment co-coordinator with the preparation of the EA Addendum report. Ms. Evans completed the Ecological Land Classification for the proposed improvements.

GO Transit Class Environmental Assessment, Group B for the Proposed Rail Expansion from Hamilton to Niagara Falls, GO Transit, Ontario (2010)

Aquatic ecologist responsible for coordinating existing conditions surveys for all watercourse crossings in the Hamilton to Niagara region. Efforts included site visits to watercourses to document existing and critical fish habitat and determination for potential Fisheries Act Authorizations. Responsible for reporting information under the requirements for Municipal Class Environmental Assessment Projects for the preparation of the Environmental Study Report (ESR).

Municipal Class Environmental Assessment, Schedule C for the Dissette Street Widening, Town of Bradford West Gwillimbury, Ontario (2007-2010)

Aquatic Resource Specialist responsible for coordinating the aquatic existing conditions survey to determine potential for fish habitat as defined under the Fisheries Act for future road widening. Consultation with the Lake Simcoe Region Conservation Authority (LSRCA) to develop a program which included sampling of local watercourses, habitat mapping (MTO Protocol 2006) and background review for reporting EA requirements. Submission of a Letter of Intent (LOI) to LSRCA to provide watercourse improvements in conjunction with mitigation and monitoring efforts to avoid a HADD to fish habitat was facilitated.

GO Transit Class Environmental Assessment, Group B for the Proposed Rail Expansion from Georgetown to Kitchener, GO Transit, Ontario (2008-2009)

Aquatic ecologist responsible for coordinating existing conditions surveys for over 50 watercourse crossings in the Credit Valley and Grand River watersheds. Efforts included site visits to watercourses to document existing and critical fish habitat and determination for potential Fisheries Act Authorizations. Responsible for reporting information under the requirements for Municipal Class Environmental Assessment Projects for the preparation of the Environmental Study Report (ESR).

Redhill Creek By-Pass, Environmental Monitor, UMA and Dufferin Construction, City of Hamilton, Ontario (2006)

Environmental Monitor responsible for compliance to the Environmental Protection and Sediment and Erosion Control Plan related to highway construction works. Required to submit daily environmental monitoring reports to determine non-compliance issues related to contractor performance. Protection of significant habitat adjacent to project construction limits. MTO project number.

Goreway Road Expansion, Fisheries Assessment, Brampton, Ontario (2006)

Responsible for collecting field data for fish habitat assessments of approximately 7 water crossings along the proposed ROW using the new MTO/DFO/MNR protocol for future expansion of Goreway Road.

Hwy 410 Extension, Fisheries Assessment, Brampton, Ontario (2005)

Responsible for conducting fish habitat assessments and fish inventories for a section of Etobicoke Creek for the Hwy 410 extension. The aquatic ecosystems inventory and assessment was carried out to meet the established criteria set forth by the Ontario Ministry of Transportation (MTO), “Environmental Reference for Highway Design”, November 2002 (ERD).

Hwy 5 West of Hwy 6 and East of Hwy 8, Preliminary Design, Hamilton, Ontario (2005)

Aquatic ecosystem and existing conditions assessment for watercourses along Hwy 5, West of Hwy 6 and East of Hwy 8. The aquatic ecosystems inventory and assessment was carried out to meet the established criteria set forth by the Ontario Ministry of Transportation (MTO), “Environmental Reference for Highway Design”, November 2002 (ERD).

GO Transit Rail Line Expansion, URS Corporation, Hamilton to Burlington, Ontario (2005)

Responsible for determining all waterway crossings and potential impacts to fish habitat associated with the expansion of an existing rail line from Hamilton to Burlington.

Fish Collection and Sediment Sampling, Translink, Richmond, British Columbia (2000)

Conducted fish collection and sediment sampling to determine and compare Polycyclic Aromatic Hydrocarbons (PAHs) in fish tissue and sediment samples. Analytical results of the sediment were compared to the fish tissue and the consumption levels presented in the “Guide to Eating Sportfish, 2001”, Ministry of Environment, Ontario.

Energy

Water Assessment and Water Body Report, Grand Bend Wind Farm, Northland Wind Limited Partnership, Grand Bend, Ontario (2011-Ongoing)

As part of the Renewable Energy Act application for a proposed wind farm, Mr. Pfohl was responsible for assessment of all water bodies within the study area. He was responsible for agency meetings, Species at Risk, records review, waterbody determination, assessment of watercourses within the 120 m Project Location, determination of impacts and mitigation measures. Mr. Pfohl has submitted the final Water Assessment and Water Body Report to the Ministry of Environment for review.

Natural Gas Pipeline Construction, Senior Environmental Monitor, Union Gas, Strathroy, Ontario (2007)

Lead Environmental Monitor reporting to Union Gas for the construction of an 18 km, 48" Natural Gas pipeline loop from Strathroy to Lobo Station. Responsible for all environmental aspects of the project including; protection of Cultural resource sites, fish and wildlife, sediment and erosion control, spill clean-up, and selection of discharge sites for dewatering applications. Also responsible for maintaining adherence to Water Take Permits (MOE), Protection of Fish and Fish Habitat (DFO), Flood/Fill Regulation for St. Clair Regional Conservation Authority (SCRCA), and the reporting requirements based on the conditions of each permit. A total of 7 watercourse crossings were completed in the dry, following proper mitigation measures required for sediment and erosion control and fish and wildlife salvage. Also responsible for bank stabilization, riparian area planting, and pipeline cover project on the adjacent 28" pipeline, including associated meetings with DFO and SCRCA.

Parry Sound Power Generation, Seguin River Water Management Plan, Fisheries Impacts Associated with Historical Dam Manipulation, Parry Sound, Ontario (2005)

Responsible for determining potential fisheries habitat impacts for the Seguin River System based on historical information on dam manipulation provided by Parry Sound Power Generation.

Walleye Spawning Survey, Parry Sound Power Generation, Parry Sound, Ontario (2005)

Responsible for enumeration of spawning Walleye (Sander vitreus vitreus) in the Seguin River downstream of the Parry Sound Power Generation, Hydroelectric Dam in Parry Sound. Information collected was presented to stakeholders and public interest groups in conjunction with the Ministry of Natural Resources (MNR) and Department of Fisheries and Oceans (DFO).

Site Reconnaissance of the Pembina Pipeline Oil Spill, Pine River, District of Chetwynd, British Columbia (2000-2003)

Field project manager responsible for coordinating and conducting the 2000-2002 site reconnaissance of the Pine River Oil Spill, the largest oil spill to a fresh water environment in North America which occurred on August 1, 2000. Responsible for coordinating and conducting a fingerprinting program with BC Research to determine the original source of hydrocarbons present in the Pine River. Accessed depositional areas along the river using a canoe, and video documented sampling locations for future legal evidence. Reviewed analytical data for report preparation and submission to regulatory agencies. Information regarding observations, sampling techniques, and analytical data were presented to the District council members, residents of Chetwynd, and Government Officials at public information sessions.

Kokanee Stranding Assessment, BC Hydro, Duncan River, Nelson, British Columbia (2003)

Field team member responsible for a Kokanee stranding assessment during a reduction in water flows at a BC Hydro generating dam on the Duncan River in Nelson, BC. Stranded fish were captured using electro-fishing methods for identification and enumeration. Data collected will be used to determine effects on fish during future flow reductions.

Environmental Monitoring, BC Hydro Substation Construction, Alltec Corporation, Langley, British Columbia (2003)

Environmental monitor responsible for environmental and construction monitoring for a BC Hydro Substation adjacent to a Restrictive Covenant zone. Responsible for water quality testing and sampling, client liaison, and reporting any infractions to the provincial regulations. A final monitoring report was sent to the Ministry of Water Land and Air Protection, Habitat Protection Branch for final review.

Fisheries Habitat Overview, Aurora South, Syncrude, Fort MacMurray, Alberta (2003)

Responsible for conducting a reach break analysis for the Regional Study Area (RSA) selected for future Oil Sands mining in north-eastern Alberta. Potential fisheries and wildlife values have been determined and documented using background information and an aerial photography of the RSA. Information gathered was used for the Environmental Impact Assessment (EIA) for future development.

Natural Gas Well Feasibility Study, Rosetta Exploration, Hudson's Hope, British Columbia (2002)

Project manager and coordinator required to determine the feasibility of an exploration well for natural gas. Site investigations were conducted in a remote location in north-eastern BC to determine if previous occupants have impacted an area used for previous oil and gas exploration. Information collected was used to determine future impacts on the local ecology. Information presented to the client was reviewed by the Oil and Gas Commission prior to gaining permits for future exploration.

2000 Follow-up Studies to the Stewart Creek Oil Spill, Confidential Client, Stewart Creek, British Columbia (2000)

Responsible for conducting sediment and benthic invertebrate sampling program at 7 sites in the fall of 2000, 5 years after a crude oil spill in the Stewart Creek watershed. The project involved comparisons of the hydrocarbon and benthic invertebrate data collected in 1995, 1997, and 2000.

Species at Risk

Barrier Mitigation for Redside Dace, Don Head West, Town of Richmond Hill, Ontario (2011-Ongoing)

Aquatic Resource Specialist responsible for collection of Endangered Species (Redside dace) based on the conditions of the Endangered Species Act (ESA) permit. Mr. Pfohl provided support during the application for the ESA permit along with the appropriate animal care protocols. He was required to salvage all aquatic life from a work area planned for barrier mitigation under the conditions set-out in the ESA permit. A "rocky ramp" was constructed to mitigate the impassable barrier for fish movement. A Scientific Collectors Report has been submitted to MNR on behalf of the client and the conditions of the ESA permit. Ongoing monitoring for habitat success is required during 2012.

Endangered Species Act Approval, King Street Reconstruction, Region of Peel, Bolton, Ontario (2011)

Mr. Pfohl was responsible for acquiring approval from MNR for an outlet to Cold Creek, a tributary of the Humber River. Cold Creek is designated as potential Redside dace habitat and a Letter of Advice (LOA) was obtained from MNR for the construction works associated with an outlet structure to the watercourse. The LOA was provided by MNR based using approved Best Management Practices and Mitigation measures associated with the construction works.

Species at Risk Monitor, Water Treatment and Distribution System, Moose Deer Point First Nations Reserve, MacTier, Ontario (2009-2011)

Species at Risk and Environmental monitor for construction of a water treatment and distribution system along the eastern shore of Georgian Bay. Protected Species at Risk include endangered and threatened turtles and snakes. Required to facilitate and conduct Species at Risk training for First Nations and construction workers based on mandatory requirements from the Environment Canada, Species at Risk permit.

Environmental Monitoring, Richmond Hill Community Environmental Center, Region of Peel, Richmond Hill, Ontario (2010-2011)

Environmental Monitor responsible for inspecting erosion and sediment controls required for the construction of the Richmond Hill Community Environmental Center. Receiving waters from the site connect to protect Redside dace habitat that is highly sensitive. Stringent monitoring was required during construction along with weekly reporting.

Species at Risk Biologist, Unexploded Ordnance Clearing, XTEC, Former Camp Ipperwash, Ipperwash, Ontario (2007-2009)

Biologist Team member responsible for adherence to the Environment Canada (EC) Species at Risk Permit required for vegetation clearing on the Former Camp Ipperwash, Military Training Center. EC issued a permit under the Species at Risk Act to protect threatened and endangered species known to exist on site based on previous observations during biological inventories required under the Canadian Environmental Assessment Act. Vegetation clearing was required to conduct electromagnetic (EM) surveys to determine unexploded ordnance locations. The Biologist Team was responsible for identification and avoidance of Federal and Provincial Species at Risk during site operations.

Water Resources

Colgan Well, Determination of Surface Water Impacts, Township of Adjala-Tosorontio, Colgan, Ontario (2011-Ongoing)

Aquatic Resources Specialist responsible for determination of groundwater areas that may be impacted from a production well located in Colgan, Ontario. Groundwater upwelling and seepage areas were documented to determine potential impacts to receiving watercourses from groundwater extraction and potential effects to the fishery.

Erosion and Aquatic Assessment, Upper Rouge River and Beaver Creek, Town of Richmond Hill, Ontario (2010-2011)

Aquatic Resources Specialist responsible for erosion and aquatic conditions assessment for 18 km of the Upper Rouge River, and Beaver Creek, a tributary of the Rouge River, Richmond Hill. Required to identify areas of erosion that may cause impacts to municipal infrastructure, public and private land. Aquatic conditions were assessed in conjunction with erosion areas that may be improved during future works. Collected information was used to determine a level of potential hazard.

Erosion and Aquatic Assessment, German Mills Creek, Town of Richmond Hill, Ontario (2009-2010)

Aquatic Resources Specialist responsible for erosion and aquatic conditions assessment for 10 km of German Mills Creek, a tributary of the East Don River, Richmond Hill. Required to identify areas of erosion that may cause impacts to municipal infrastructure, public and private land. Aquatic conditions were assessed in conjunction with erosion areas that may be improved during future works. Collected information was used to determine a level of potential hazard.

Water Intake Repair, CEAA Screening, Six Nations, Ontario (2007-2008)

Preparation of a Letter of Intent (LOI) to the Department of Fisheries and Oceans (DFO) for work within hazard lands to repair a communal water intake structure. The intake structure, which is built into the bank of the Grand River, is experiencing erosion around the sheet pile facing walls, as well as movement of the sheet pile walls. The repair must alleviate the sheet pile movement, and erosion around the structure.

Lakes and Rivers Improvement Act (LRIA), Permit Application for Dam Construction, Confidential Client, Uxbridge Township, Ontario (2006)

Project coordinator responsible for the submission of a LRIA permit application to construct a dam on a tributary of Duffins creek. Required to coordinate and fulfill the information requirements set out in the LRIA guidelines for MNR permit applications.

Environmental Protection Plan/Environmental Monitoring for a Culvert Removal and Habitat Restoration, Innovative Housing, Surrey, British Columbia (2002)

Responsible for final submission of the Environmental Protection Plan to the Ministry of Water Land and Air Protection, Habitat Protection Section, for review and approval for "Working in and about a stream". Christopher was the on-site Environmental monitor for the construction work related to the removal of a culvert to daylight an existing creek and substrate placement to provide habitat restoration. Responsible for documenting construction activities, water quality monitoring, client liaison and final reporting required by Ministry of Water Land and Air Protection.

International

Ribb Dam Supplemental EA, World Bank, Ethiopia (2008-2009)

Project Coordinator/Aquatic Resource Specialist on a World Bank funded project to undertake a series of studies to update the existing EA in compliance with World Bank guidelines. Assisted in the development of Habitat Suitability Curves for Physical Habitat Simulation (PHABSIM) model to determine potential impacts to habitat for African barbs, Nile tilapia, and African catfish of the Ribb River. Studies focused primarily on aquatic and wetland baseline information, potential hydrological effects, and impacts and mitigation measures related to the construction of a large water supply dam.

Mining

Peer Review of MAQ Quarry Natural Environment Report, Township of Grey Highlands, Ontario (June 2008-Ongoing)

Mr. Pfohl provided a peer review of aquatic existing conditions report to determine if potential impacts to aquatic life was determined and appropriately addressed. He provided a review of the field program for suitable sampling methods and determination of fish habitat. Significant environmental resources were present on, and adjacent to, the proposed below-water table quarry, including a provincially significant wetland, habitat of endangered species and other provincially-rare species. Proponents challenged the identification of Significant Wildlife Habitat and Significant Woodlands on the site. The proposal also created debate over the protection of environmental resources and whether the provision of a supply of aggregate material close to markets should take precedence. Proponents have yet to address outstanding comments.

Peer Review of Aquatic Assessment for Highland Companies Mega Quarry, Opposition Group (CAUSE), Shelburne, Ontario (2011-2012)

Mr. Pfohl was contracted to provide a peer review of the Aquatic Assessment for tributaries of the Pine River within lands proposed for the largest quarry in North America. Recommendations for the opposition group (CAUSE), was provided for future use to ensure proper aquatic assessment of subject lands. Emphasis was put on critical habitat for spawning brook trout and potential impacts to groundwater upwellings.

Victor Diamond EIA/Baseline Study, Annual Fisheries Surveys, DeBeers Canada, Attawapiskat, Ontario (2004-2006)

Field project manager responsible for baseline studies and annual fisheries surveys to quantify Whitefish and Brook trout abundance in potential groundwater drawdown areas for a proposed diamond mine in northern Ontario. Required to obtain Fish and Wildlife Act "Scientific Collection Permits" and Public Lands Act "Work Permits" from Ministry of Natural Resources

(MNR) to conduct annual surveys. Construction of a full span fish fence to determine fall migratory species and abundance in the Nayshkootayow River. Trained First Nations field staff to monitor water quality and fish abundance in potential groundwater drawdown areas. Obtained "Permit to Take Water" from MOE for waterway crossings and provided environmental monitoring during construction. Collection of tissue samples analyzed for the "Sportfish Eating Guide of Ontario" and future reference for Brook trout DNA. Collection of aging structures (otilith and scale) for Lake Whitefish, Lake Ciscoe and Brook trout. Initiated the first round of benthic collections and water sampling for the Environmental Effects Monitoring (EEM) program based on specific discharge locations. Information collected from baseline studies was included in the EIA and the Comprehensive Study Report for Government Agencies, Public, and First Nations review.

Aquatic Baseline Study, Howell's River, Lab Mag Services, Schefferville, Quebec (2006)

Field project manager responsible for baseline aquatic studies pertaining to the construction of an iron ore mine in northern Labrador. Responsible for locating last remaining stocks of Ounaniche (land locked Atlantic salmon) on the Howell's River system for a satellite based telemetry program. Conducted morphometrics, anaesthesia and surgical placement of transmitters in adult Ounaniche. Responsible for field crew logistics, aquatic data collection, health and safety in remote locations, and client liaison.

Environmental/Construction Monitoring, Montcalm Mine, Falcon Bridge, Timmins, Ontario (2005)

Environmental monitor responsible for environmental and construction monitoring for the installation of a pipeline diffuser in the Groundhog river, Timmins, ON. Responsible for contractor supervision, fish and wildlife monitoring, water quality monitoring and the implementation of the Sediment and Erosion Control Plan.

Habitat Suitability for Walleye, Three Nations Lake, Pamour Mine Expansion Project, Porcupine Joint Venture, Timmins, Ontario (2004)

Conducted an extensive literature review of Suitable Habitat for Walleye (Sander vitreus vitreus). The information was used to determine suitable habitat, substrate, depths, and spawning shoal design for a compensation plan for Three Nations Lake. The lake was dyked to provide access to subsurface gold deposits and a new section of the lake was flooded to provide a "no net loss" of fish habitat.

Environmental Effects Monitoring, Equity Mine, Placer Dome, Houston, British Columbia (2002)

Responsible for conducting and coordinating fieldwork and an Environmental Effects Monitoring (EEM) program for Silver mine in northern BC. A release of tailings effluent into the local watershed from previous spring runoff was investigated using biological indicators and water and sediment quality. Installation of periphyton blocks and invertebrate baskets used were used to monitor downstream conditions. A sediment-sampling program in a lake near the mine was also incorporated into the effects monitoring program to determine concentrations and toxicity to invertebrates from possible metals contamination.

Biological Inventory

Christopher has been certified by MNR/TRCA under the Ontario Stream Assessment Protocol (OSAP) with additional certification by the Ontario Benthos Biomonitoring Network (OBBN). He has completed the Ontario Fishes Identification Course presented by the Royal Ontario Museum, and is certified by MNR as a Class 1 Electrofishing Crew Leader and trainer. Christopher has been certified under the MTO/DFO/MNR Fisheries Protocol, Fisheries Assessment Specialist, Fisheries Contract Specialist presented by MTO/DFO/MNR in November 2006, and is RAQS certified by MTO. Christopher has completed the Ontario Freshwater Mussel Identification Workshop (DFO), the Marsh Monitoring protocol for Amphibian Breeding surveys and egg mass surveys for breeding salamanders (Species at Risk). He has conducted numerous aquatic inventories in Ontario, Labrador and British Columbia, in local watersheds to very remote areas in northern climates.

Health and Safety

Christopher has been a Health and Safety Committee member and employee representative and has completed numerous Health and Safety Plans for a variety of local and remote projects.

Profession

Environmental Technologist, B.A.

Education

Environmental Engineering Applications, Conestoga College, 2008

B.A., Geography and Environmental Studies, McMaster University, 2005

Employment Record

Environmental Technologist, R.J. Burnside & Associates Limited (2008-Present)

Labour Foreman, Eagle Terrace Developments (2007)

Research Technician, University of Toronto (2006)

Project Coordinator, Halton Region Conservation Authority (2004)

Citizenship

Canadian

Languages

English

Devin Soeting, B.A.

Devin Soeting is an Environmental Technologist with over 6 years of experience conducting hydrogeological investigations, Phase One and Two Environmental Site Assessments, report preparation, and data processing and analysis. As part of the Hydrogeology Group, Devin has coordinated and supervised well drilling programs, sampled surface and groundwater, monitored stream levels and flow, and conducted exploratory groundwater resource studies. He also has experience coordinating and conducting Phase I and II environmental site assessments and has worked on a number of contaminated sites. Devin has also been involved in issues involving solid waste management including landfill sampling, visual audits, and report preparation.

Relevant Experience

Groundwater Quality Monitoring Program, Region of Waterloo, Ontario (2008-Ongoing)

Development and sampling of over 125 wells for water quality parameters including basic chemistry, 1, 4-Dioxane, VOC's and pesticides. Field parameters are recorded, well inventory forms completed and photos are taken. Semi-annual water quality data reports combined with annual detailed water quality assessments are completed. An annual PTTW summary report and semi-annual drought reports are also prepared for the Region of Waterloo.

Greenbrook Water Quality Sampling, Kitchener, Ontario (2008-Ongoing)

Conducts semi-annual sampling of over 70 wells in the Greenbrook area of Kitchener for 1, 4-Dioxane and VOC's. The purge water is contained and disposed of by a licensed wastewater handler. Semi-annual water quality data reports follow each round of sampling.

Phase II Environmental Site Assessment and Supplemental Investigations, 1755 Steeles Avenue, Toronto, Ontario (2009-Ongoing)

Conducted groundwater and subsurface investigations to assess the extent of TCE and hydrocarbon contamination at the Site. This included monitoring well assessment and groundwater sampling program, collection of water level data, supervising surveyors, and contaminant mapping. Coordinated supplemental test pit and monitoring well program. Supplemental investigations have consisted of 62 test pits and seven monitoring well installations. Summarizing report detailing investigations, findings, and recommendations was completed.

Permit to Take Water Monitoring Reports, Various Clients, Ontario (2010-Ongoing)

Ongoing monitoring of several sites related to Permits to Take Water. Typical work scope is the monitoring of on and off-site wells for signs of influence related to source of water taking. Yearly reports summarizing observations and providing recommendations are completed and submitted to the MOE.

Groundwater Monitoring Program, Church Street Residential Development, Elmira, Ontario (2011-Ongoing)

Supervised the installation of four monitoring wells for the purposes of monitoring the shallow groundwater across the proposed residential development property. As part of this program, a local domestic well and septic survey of surrounding residential and commercial properties was conducted, and monitoring reports were completed on a quarterly and annual

basis. Pressure transducers were installed at a total of 3 local domestic and 8 on-site monitoring wells.

Phase I Environmental Site Assessment, Various Clients, Ontario (2008-2011)

Prepared Phase I ESA reports for several commercial and industrial sites throughout Ontario. Activities included a site inspection to identify potential areas of environmental concern, conducting interviews, reviewing background information and report preparation.

Phase Two Environmental Site Assessment, Church Street Residential Development, Elmira, Ontario (2011-2012)

Conducted a Phase Two ESA related to the known historic soil and groundwater contamination at a property adjacent to the planned residential development. Work included coordinating and supervising subcontractors, conducting test pits, collecting surficial soil and surface water samples, supervising the drilling and installation of monitoring wells and subsequent soil and groundwater sampling. Completed the Phase Two Report in accordance with O.Reg. 511/09.

Groundwater Resource Assessment, Six Nations, Ontario (2011)

Supervised the installation of a production well for the purposes of obtaining a sufficient supply of groundwater to satisfy the needs of a prospective beverage facility. After installation, step and short-term pumping tests were performed and a groundwater sample was collected. A report detailing the field program, well tests, sampling, analysis of the groundwater chemistry, and recommendations was completed.

Phase I and II Environmental Site Assessment, Kipling Avenue, Toronto, Ontario (2011)

Conducted Phase I and II Environmental Site Assessments on a multi-use property in Toronto for the purposes of a potential real estate transaction. A total of 6 boreholes and 4 monitoring wells were completed at the Site in the potential areas of concern. Soil and groundwater samples were collected and submitted for various parameters. Reports detailing the field program, sampling, analysis of the soil and groundwater chemistry, and conclusions were completed.

Schedule B Environmental Assessment, Gore Road, Caledon, Ontario (2011)

Conducted aquatic environment assessments, mapped watercourses and detailed potential fish habitat along a stretch of Gore Road where road improvements were planned. Met with conservation authority representatives and discussed local watercourses and planned road improvements.

Municipal Class Environmental Assessment (Schedule B), Tiny Septage Management, Township of Tiny, Ontario (2011)

Completed background research and written portions relating to the aquatic resources and aquatic environment in Tiny Township for the Schedule B environmental assessment.

Hydrogeologic Review, The Kingsway, Toronto, Ontario (2011)

Completed a hydrogeologic study of a plaza property relating to a change of property use to satisfy the City of Toronto's requirements for a hydrogeologic review. As part of the study, 4 monitoring wells were installed in the overburden to determine water level elevations, quantities, and hydraulic conductivity.

Phase One Environmental Site Assessment, Saunders Road, Barrie, Ontario (2011)

Prepared a Phase One ESA report in accordance with O.Reg. 511/09 at an industrially-zoned property on Saunders Road in Barrie. Activities included a site inspection to identify potential areas of environmental concern, conducting interviews, reviewing background information and report preparation.

Phase One Environmental Site Assessment, Montreal Street, Thunder Bay, Ontario (2011)

Prepared a Phase One ESA report in accordance with O.Reg. 511/09 at a large-scale industrial property. This property was used for various industrial purposes for over 100 years. Activities included a site inspection to identify potential areas of environmental concern, conducting interviews, reviewing background information and report preparation.

Creek Re-alignment, Mill Run Creek, Uxbridge, Ontario (2011)

Conducted field work related to fish management in an offline pond. Fish were moved as the pond was being taken off-line and were cleared out of the stagnant creek and into the new online creek.

Phase Two Environmental Site Assessment, Alpine Road, Kitchener, Ontario (2011)

Supervised the drilling of 2 deep overburden wells using PQ coring drilling techniques at a TCE contaminated site. Samples were obtained for the laboratory analysis of VOCs, pH, and grain size. Borehole logs and site cross-sections were also completed.

Municipal Well Optimization – Groundwater Supply Wells, City of Cambridge, Ontario (2009-2010)

On-site Technologist during existing well optimization (construction upgrades), and drilling and testing of adjacent new supply wells. Work included test well and monitoring well drilling, stratigraphic logging, and long term pumping tests at 3 separate sites in the Cambridge area over a 2 year period. Onsite and surrounding domestic wells were monitored for quantity and quality changes throughout the program with status updates provided to project managers.

Phase II Environmental Site Assessment, Heart Lake Road, Brampton, Ontario (2010)

Conducted Phase II ESA at potentially contaminated site. Work included the drilling and sampling of 4 monitoring wells, completing stratigraphic logs, and completion of written report. Soil and groundwater were sampled and submitted for hydrocarbon contamination.

Phase II Environmental Site Assessment, Caledonia Road, Toronto, Ontario (2010)

Conducted Phase II ESA including drilling and sampling of four monitoring wells. Conducted hydrogeologic investigations including the drilling and sampling of 4 monitoring wells, completing stratigraphic logs, and completion of written report. Soil and groundwater were sampled at the site.

Phase II Environmental Site Assessment, Stratford, Ontario (2010)

Participated in large-scale and intensive Phase II ESA of a contaminated site in Stratford, Ontario. Site investigations included the completion of 26 test pits, and low-flow groundwater sampling of on-site wells. Test pit stratigraphy was catalogued and selected soil was sampled for analysis of various parameters.

Hydrogeological Assessment, East Garafraxa, Ontario, (2010)

Hydrogeological investigations relating to expansion of gravel pit. Scope of work included the completion of 4 monitoring wells to define till horizons and map groundwater flow across the site. Groundwater elevations were also monitored and a technical report was prepared summarizing the work.

Underground Storage Tank (UST) Removal and Supplemental Sampling, Various Clients, Ontario (2010)

Supervised the removal of several USTs for various clients in the Waterloo Region. Tanks were catalogued and soil conditions, including signs of contamination, were recorded. Confirmatory soil samples from excavations were submitted, and in some cases additional soil was removed due to contamination. Samples were taken according to industry standards.

Desktop Study, Various Clients, Ontario (2008-2009)

Completed desktop studies pertaining to PTTW applications for several golf course and country clubs throughout Ontario. Activities included well record review and analysis, analysis of site geology and subsurface conditions, report preparation and recommendations of locations of potential sources of on-site groundwater.

Groundwater Study, Marden Park, Township of Guelph/Eramosa, Ontario (2009)

Supervised the development of 5 monitoring wells across the site and performed hydraulic conductivity testing, groundwater sampling, water level data analysis, site surveying, and groundwater flow mapping. The study was a key part of the construction of the Marden Park Recreation Facilities.

Supplemental Soil Sampling Program, First Street and Huron Street Reconstruction and Infrastructure Improvements, Collingwood, Ontario (2009)

A test-pitting program was initiated to determine the presence of contamination beneath the subject site. Pits were catalogued and representative soil samples were obtained for lab analysis and sieve testing. A letter was prepared outlining the results of the investigations as well as recommendations for future construction activities.

Hydrogeologic Assessment, Six Nations Landfill, Six Nations, Ontario (2009)

Supervised the installation of 16 monitoring wells and 5 gas probes throughout the Site. After installation, groundwater was sampled and water quality parameters were measured. Hydraulic conductivity tests were also performed and a report detailing the field program, sampling, analysis of the groundwater chemistry, and recommendations was completed.

Water Quality Study, Township of Wilmot, Ontario (2009)

Coordinated and completed the groundwater sampling of multiple locations throughout the Township for the analysis of nitrate content. Duties also included the composition of yearly reports summarizing the results of the study, the analysis of trends, and proposing future recommendations.

South Oxford County Groundwater Exploration Study (2009)

Supervised the creation and development of 5 test wells outside of the Town of Tillsonburg. The study was conducted to determine the availability of viable sources of groundwater to support future residential developments in the nearby town.

Continuing Education

First Aid Trained – Recertified in 2012

HAZWOPER Certified (2008) 8 Hour Refresher Training (2011).

Neegan Burnside Ltd.