


Appendix A

Nova Scotia Joint Stocks Record

Profile [Printer Version](#)[Profile Info](#) [People Info](#) [Activites Info](#) [Related Reg's Info](#)**PROFILE** - OSCO AGGREGATES LIMITED - as of: 2017-04-02 06:06 PM

Business/Organization Name:	OSCO AGGREGATES LIMITED
Registry ID:	1818288
Type:	N.S. Limited Company
Nature of Business:	
Status:	Active
Jurisdiction:	Nova Scotia
Registered Office:	17 ESTATES DRIVE LOWER SACKVILLE NS Canada B4C 3Z2
Mailing Address:	17 ESTATES DRIVE LOWER SACKVILLE NS Canada B4C 3Z2
Previous Name:	M.S.D. ENTERPRISES LIMITED

PEOPLE

Name	Position	Civic Address	Mailing Address
HANS O. KLOHN	Director	400 CHESLEY DRIVE SAINT JOHN NB E2K 5L6	
JOHN K.F. IRVING	Director	55 UNION ST., SUITE 710 SAINT JOHN NB E2L 5B7	
Nolan P. Walsh	Assistant Treasurer	400 Chesley Drive Saint John NB E2K 5L6	
DON ISNOR	VICE PRESIDENT	400 CHESLEY DRIVE SAINT JOHN NB E2K 5L6	
C. PAUL SMITH	SECRETARY	44 CHIPMAN HILL, SUITE 1000 SAINT JOHN NB E2L 2A9	
JOHN K.F. IRVING	Chairman & CEO	55 UNION ST., SUITE 710 SAINT JOHN NB E2L 5B7	
JAMES A. ISNOR	TREASURER	400 CHESLEY DRIVE SAINT JOHN NB E2K 5L6	
HANS O. KLOHN	PRESIDENT	400 CHESLEY DRIVE SAINT JOHN NB E2K 5L6	

GREG G, HARDING	ASSISTANT SECRETARY	44 CHIPMAN HILL, SUITE 1000 SAINT JOHN NB E2L 2A9	
DEANNE MACLEOD	Recognized Agent	1959 UPPER WATER STREET HALIFAX NS B3J 3N2	P.O. BOX 997 HALIFAX NS B3J 2X2

ACTIVITIES

Activity	Date
Annual Renewal	2016-10-28
Annual Statement Filed	2016-10-28
Annual Renewal	2015-10-29
Annual Statement Filed	2015-10-29
Annual Renewal	2014-10-14
Annual Statement Filed	2014-10-14
Effective Date of Name Change	2014-01-01
Filed Name Change	2013-12-30
Annual Renewal	2013-10-15
Annual Statement Filed	2013-10-15
Annual Statement Filed	2012-11-22
Annual Renewal	2012-11-22
Annual Statement Filed	2011-11-30
Appoint an Agent	2011-11-30
Annual Renewal	2011-11-30
Annual Statement Filed	2010-09-13
Annual Renewal	2010-09-13
Annual Renewal	2009-12-02
Change of Directors	2009-01-30
Appoint an Agent	2009-01-05
Change of Directors	2009-01-05
Filed Document	2008-12-19
Annual Renewal	2008-09-22
Annual Renewal	2007-09-11
Annual Renewal	2006-10-13
Annual Statement Filed	2006-10-13

Annual Statement Filed	2006-10-13
Special Resolution	2006-01-27
Address Change	2006-01-25
Appoint an Agent	2006-01-25
Change of Directors	2006-01-25
Filed Document	2006-01-18
Annual Statement Filed	2005-12-15
Annual Statement Filed	2005-12-15
Annual Renewal	2005-11-30
Change of Directors	2005-08-10
Annual Renewal	2004-10-29
Annual Statement Filed	2004-10-29
Annual Renewal	2003-10-30
Annual Statement Filed	2003-10-30
Annual Statement Filed	2003-10-30
Annual Renewal	2002-09-12
Annual Renewal	2001-10-16
Annual Statement Filed	2001-10-16
Address Change	2001-02-13
Appoint an Agent	2001-02-13
Annual Statement Filed	2001-01-30
Annual Renewal	2000-10-16
Annual Renewal	1999-09-16
Annual Statement Filed	1999-09-16
Annual Statement Filed	1999-09-15
Annual Renewal	1998-09-16
Annual Statement Filed	1998-09-16
Annual Statement Filed	1998-09-16
Annual Renewal	1997-10-28
Annual Statement Filed	1997-10-28
Appoint an Agent	1997-10-20
Change of Directors	1997-10-20
Annual Renewal	1996-10-18
Annual Statement Filed	1996-10-18
Annual Report Filed	1995-10-04

Agent Filed	1991-10-15
Special Resolution	1988-07-19
Change of Directors	1987-11-27
Registered Office Change	1987-11-27
Incorporated	1987-10-29
Registered	1987-10-29

Show All [Collapse](#)

RELATED REGISTRATIONS

This Company ...	
GLENHOLME READY MIX & CONTRACTING	Registered

Appendix B

Summary of Contacts and Information Provided

Summary of Contacts/Information Provided for Proposed OSCO Glenholme Pit No. 4 Project

Contact	Date	Regarding
H. Yeh Nova Scotia Environment Environmental Assessment Branch	August 9, 2016	Submission requirements
H. Yeh and M. Elderkin (Nova Scotia Department of Natural Resources Species at Risk)	August 18, 2016	Wildlife related submission requirements
D. Mitchell Office of Aboriginal Affairs contacted by Dillon	November 4&7, 2016	Recommended aboriginal contacts
K. MacLean, Kwilmu'kw Maw-klusuaqn Mi'kmaq Rights Initiative (KMKNO)	November 16, 2016	Heritage Research Permit notice of project and request for information
Information sheet delivered to residents along Little Dyke Road and Hwy 2 leading to Little Dyke Road, and posted at General Store. S. Putnam spoke with seven individuals.	November 10 2016	Introduction to the project – no concerns expressed at that time
S. Putnam (Glenholme facility manager) provided introduction to the project to local residents – approximately 20 attended meeting	November 25, 2016	Project introduction
Information sheet provided to First Nations Twila Gaudet, Consultation Liaison Officer cc: Michael Cox, Consultation Researcher; Kwilmu'kw Maw-klusuaqn Mi'kmaq Rights Initiative (KMKNO); Chief Robert Gloade, Millbrook First Nation; and Chief and Council, Sipeknekatik (Shubenacadie) First Nation	January 6, 2016	Introduction to project and request for comments
Preliminary draft Nov. 25 2016 meeting minutes expressing concerns provided by community contact to OSCO.	December 6, 2016	Comments from residents on meeting
Communication between S. Putnam and contact person for the local residents group regarding finalizing the Nov. 25 meeting minutes.	December 12, 2017	The residents group contact identified that draft was very preliminary and additional comments will be provided
Site visit with Ducks Unlimited Canada – R. Fraser, and OSCO - D. Bancroft	January 9, 2017	Introduction to project and identification of DU requirements
S. Putnam clarification of meeting comments and request for final minutes to residents group contact.	February 10, 2017	
Update information sheet emailed to contact for local residents group and forwarded to interested individuals, and posted at the General Store.	February 12, 2017	Update on measures to mitigate public concern
Initial and Update information sheets provided and offer to provide additional information sent to District Councillors, MP and MLA – K. Casey, T. Taggart, D. MacInnes, B. Casey	February 15, 2017	Introduction to project
Further request for local residents input by S. Putnam to residents group contact.	February 16, 2017	Residents group contact indicated residents letter will be finalized within a couple weeks
Sipeknekatik First Nation correspondence that information sheet received and they will review the EA prior to providing comments.	February 17, 2017	OSCO request for comments
OSCO letter to Ducks Unlimited	February 27, 2017	Summary of site visit
Residents group contact email to S. Putnam providing information that a meeting with Karen Casey had been held and that the local residents intend to hold a couple more internal meetings prior to responding to OSCO.	March 21, 2017	For information
Residents Information Session – Hosted by K. Casey MLA	April 21, 2017	Further project information and opportunity for questions and comment

OSCO Aggregates Limited
Glenholme Pit No. 4 Aggregate Extraction Project
Project Information Sheet

Project Overview

OSCO Aggregates Limited (OSCO) is undertaking an environmental assessment for a proposed aggregate extraction project 'Pit No. 4' (the Project) near the community of Glenholme, Colchester County, Nova Scotia (see Figure on reverse). The Project will be operated by OSCO Aggregates personnel who have been operating pits in the area for approximately 30 years and live in the community.

The Project would primarily result in a continued supply of high quality aggregate (stone) for concrete plants in the northern Nova Scotia corridor and Halifax areas. Aggregate (sand and gravel, as well as clean stone) would also be available for various local markets and road building. The Project will also extend the life of the OSCO Aggregates Wash Plant facility for up to 20 years, providing employment in the area.

Project Site

The proposed Pit No. 4 site is located on private lands (PID #: 20134177 and 20134243) along Little Dyke Road approximately 3 kilometers south of Exit 11 Highway 104. An existing gravel pit on the site (known locally as the Lafarge Pit), operated by others, has been in sporadic use for approximately 25 years, and the currently inactive pit and aggregate stockpiles occupy the northern portion of the study area. Most of the Project study area was also historically cut-over. OSCO intends to extract available aggregates on up to approximately 35 hectares (86 acres) of the study area. Approximately 4 hectares (10 acres) of the study area are occupied by the existing pit and stockpiles excavated by previous operators.

Project Activities

The scope of the Project activities will include pit development/aggregate extraction, screening, mobile crushing, stockpiling of aggregate, and transport to the existing OSCO Aggregates Wash Plant facility (approximately 700 meters northward along Little Dyke Road). Details of the Project operation include:

- No blasting and no washing will occur at the Pit No. 4 site.
- The scheduling of aggregate extraction and mobile crushing operations will vary depending on market conditions but are generally expected to occur 12-14 hours/day, 6 days/week. There is the potential for short periods of increased operations to 7 days/week, 24 hours/day.
- Annual aggregate extraction from Pit No. 4 will vary with market conditions but is expected to be between 50,000 and 250,000 metric tonnes.

- Activities related to the OSCO Aggregates Wash Plant facility (under existing approval), including transportation rates to market, will not change due to the new aggregate source.
- Progressive reclamation will occur in stages as aggregate removal is completed from sections of the site.
- Final reclamation will be completed following regulatory requirements.

Environmental Assessment Process and Other Regulatory Requirements

The project will be registered as a Class I Undertaking pursuant to the Nova Scotia Environment Act and Environmental Assessment Regulations. This legislation requires the proponent to undertake an environmental assessment (EA) of the proposed development and activities. The EA is currently being prepared on behalf of OSCO by environmental consultants Dillon Consulting Limited (Dillon). Once registered with Nova Scotia Environment (NSE), the EA will be available for public review.

Pit development activities will be undertaken in accordance with the Nova Scotia Pit and Quarry Guidelines (NSE 1999). Other relevant provincial regulations include the Activities Designation Regulations, which requires an Industrial Approval from the Nova Scotia Department of Environment for the pit operation. OSCO will submit an application for the Industrial Approval and other regulatory requirements on approval of the EA.

The EA will evaluate potential environmental effects of the project and identify mitigation and monitoring measures to minimize adverse effects. Environmental components being assessed include: potential for rare plants and animals, migratory birds, wetlands, groundwater resources, surface water resources, fish and fish habitat, archaeological and heritage resources, air quality/noise, and associated socio-economic conditions.

Contact

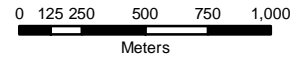
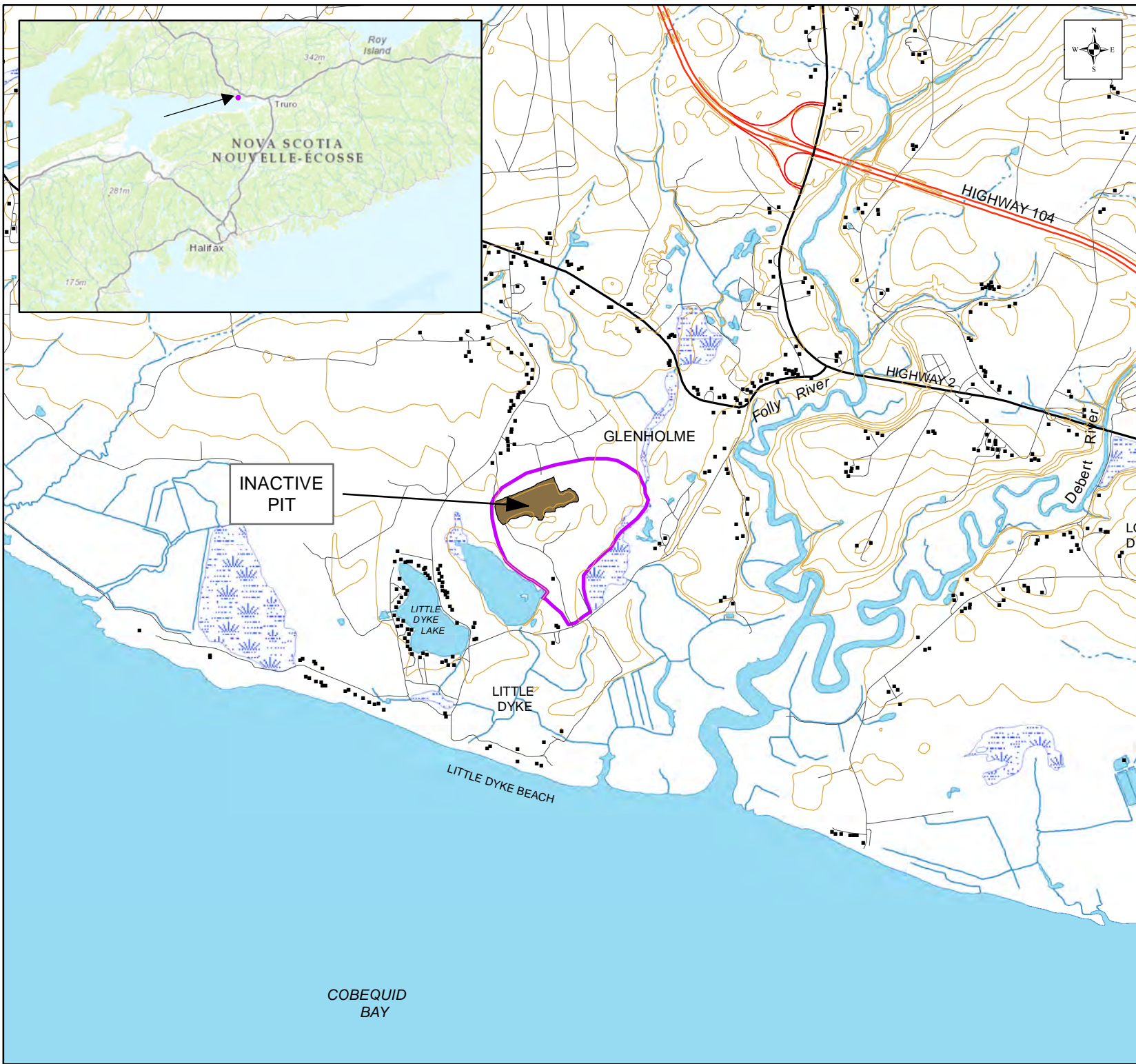
If you have any questions or concerns about this project please contact:

Shawn Putnam, Operations Manager, Glenholme
OSCO Aggregates Limited
749 Little Dyke Rd, Great Village, NS B0M 1L0
Telephone: (902) 899-5201

OSCO Aggregates Limited
 Glenholme Pit No. 4
 Extraction Project
 Environmental Assessment

Project Location

- Building/Structure
- Road
- Highway
- Watercourse
- Contour Interval
- Approximate Study Area
- Open Water
- Wetland



COBEQUID
 BAY

MAP CREATED BY: SCM
 MAP CHECKED BY: KLM
 MAP PROJECTION: NAD 1983 CSRS UTM Zone 20N
 Projection: Transverse Mercator
 Source: GeoNova, OSCO Aggregates Limited
 Date: 11/2/2016



January 6, 2017

Twila Gaudet, Consultation Liaison Officer
Kwilmu'kw Maw-klusuaqn
Mi'kmaq Rights Initiative (KMKNO)
75 Treaty Trail, Truro, NS
B2N 6N8

Dear Ms. Gaudet,

***OSCO Aggregates Limited, Glenholme Pit No. 4 Aggregate Extraction Project, NS –
Environmental Registration Document for a Class 1 Undertaking Under Section 9 (1) of the NS
Environment Assessment Regulations***

OSCO Aggregates Limited (OSCO), utilizing consultant Dillon Consulting Limited, is in the process of preparing an Environmental Assessment (EA) Registration document for a proposed aggregate extraction project near Glenholme, Colchester County, Nova Scotia (see map and information sheet attached).

The Project is the development of an aggregate (sand/gravel) pit (Pit No. 4) on private property. The approximate center of the study area is at Universal Transverse Mercator (UTM) 20 T 456950 5026479. The study area is accessed from Little Dyke Road, approximately 3 kilometers (km) south of Exit 11 on Highway 104.

The attached Information Sheet provides a Project summary. As noted, the majority of the proposed Project area has been disturbed historically. As part of the assessment an Archeological Screening was undertaken and the KMKNO was advised in November 2016 of the Heritage Permit application.

It is anticipated that the EA Registration document will be submitted to Nova Scotia Environment (NSE) in winter of 2017, and would appreciate comments prior to the end of January.

As a Class 1 project, the registration document will be publically available on NSE's website for Environmental Assessments and the NSE review will follow the typical timeline of approximately 50 calendar days.

We extend the offer to provide the EA Registration document directly at your request.



OSCO Concrete is a
member of the OSCO
Construction Group

- **Corporate Head Office:** 400 Chesley Drive • Saint John, NB • E2K 5L6 • **Tel: (506) 632-2600** • Fax: (506) 632-7689
- **NS Regional Office:** 17 Estate Drive • Lower Sackville, NS • B4C 3Z2 • **Tel: (902) 864-3230** • Fax: (902) 865-3033
- **PE Regional Office:** 412 Mount Edward Road • Charlottetown • PE • C1E 2A1 • **Tel: (902) 628-0127** • Fax: (902) 566-1169



If you have any questions or comments during the interim, or wish to meet to discuss the project, please contact either:

Annamarie Burgess, P.Eng., MCIP
Dillon Consulting Limited
137 Chain Lake Drive, Suite 100
Halifax, NS, B3S 1B3
T - 902.450.5015 ext. 5050

David Bancroft, P.Eng., GSC, General Manager;
Glenholme Pit No. 4 Project Manager
OSCO Aggregates Limited
17 Estate Drive, Lower Sackville, NS, B4C 3Z2
T - 902.864.3230

Sincerely,

OSCO AGGREGATES LIMITED

David Bancroft, P.Eng., GSC, General Manager

KLM:jes

Attachment(s): Information Sheet and Map

cc: Office of Aboriginal Affairs
Michael Cox, Consultation Researcher

Our file: 16-4517-1000



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January 6, 2017

Chief Robert Gloade
Millbrook First Nation
P. O. Box 634
Truro, Nova Scotia
B2N 5E5

Dear Chief Goade,

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137 Chain Lake Drive, Suite 100
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T - 902.450.5015 ext. 5050

David Bancroft, P.Eng., GSC, General Manager;
Glenholme Pit No. 4 Project Manager
OSCO Aggregates Limited
17 Estate Drive, Lower Sackville, NS, B4C 3Z2
T - 902.864.3230

Sincerely,

OSCO AGGREGATES LIMITED

David Bancroft, P.Eng., GSC, General Manager

KLM:jes
Attachment(s): Information Sheet and Map
cc: Office of Aboriginal Affairs

Our file: 16-4517-1000



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January 6, 2017

Chief and Council
Sipeknekatik (Shubenacadie) First Nation
522 Church Street
Indian Brook, Nova Scotia
B0N 1W0

Dear Chief and Council,

***OSCO Aggregates Limited, Glenholme Pit No. 4 Aggregate Extraction Project, NS –
Environmental Registration Document for a Class 1 Undertaking Under Section 9 (1) of the NS
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As a Class 1 project, the registration document will be publically available on NSE's website for Environmental Assessments and the NSE review will follow the typical timeline of approximately 50 calendar days.

We extend the offer to provide the EA Registration document directly at your request.



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David Bancroft, P.Eng., GSC, General Manager;
Glenholme Pit No. 4 Project Manager
OSCO Aggregates Limited
17 Estate Drive, Lower Sackville, NS, B4C 3Z2
T - 902.864.3230

Sincerely,

OSCO AGGREGATES LIMITED

David Bancroft, P.Eng., GSC, General Manager

KLM:jes
Attachment(s): Information Sheet and Map
cc: Office of Aboriginal Affairs

Our file: 16-4517-1000



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OSCO Aggregates Limited
David Brancroft, General Manager
17 Estate Drive
Lower Sackville, NS B4C 3Z2

February 17th, 2017

Dear Mr. Brancroft,

Re: OSCO Aggregates Limited, Glenholme Pit No. 4 Aggregate Extraction Project, NS – Environmental Registration Document for a Class 1 Undertaking Under Section 9 (1) of the NS Environment Assessment Regulations

This letter is in reply to your letter dated January 6, 2017 where you gave notice that OSCO Aggregates Limited (OSCO) is in the process of preparing an Environmental Assessment (EA) Registration document for a proposed aggregate extraction project near Glenholme in Colchester County, Nova Scotia.

As offered, please provide a copy of the EA Registration document (including the archeological screening report(s)) once complete. Please mail to:

*Consultation Coordinator
Sipekne'katik
522 Church Street
Indian Brook, NS B0N 1W0*

Comments can be provided after a review of the EA Registration documents.

Sincerely yours,


Chief Michael P. Sack

cc. David Mitchell, Consultation Advisor, Nova Scotia Office of Aboriginal Affairs
Jennifer Copage, Consultation Coordinator, Sipekne'katik

Little Dyke Residents' Meeting with Shawn Putnam of Osco Aggregates.

Nov 25, 2016

Shawn Putnam presented plans for an 86-acre expansion of the Osco Gravel Pit on Little Dyke Road at the home of [REDACTED] [REDACTED] of Little Dyke.

The 90-minute presentation included many questions from about 20 residents gathered for the event.

Mr. Putnam estimates the life span of the project to be about 20 years.

Summary of Concerns

The residents' concerns are typically waterfowl habitat, noise and unsightliness.

Osco Aggregates plans to purchase the land in question, and its environmental assessment findings will determine the setback distance the company is permitted to develop the gravel pit from the current Ducks Unlimited Pond.

Residents' major concerns are that the minimum 30 meter setback from the pond to the gravel excavation, will deprive waterfowl of a clean and safe habitat, especially loon and heron habitat in the pond as run-off and noise will be prominent, and

will echo across the pond into the back yards and front yards of most, if not all, lakeside dwellers.

The groundwater was also discussed, as residents are aware of a local family adjacent to the current Osco facility on Little Dyke Road whose well could no longer be used for drinking water because of a high nitrate level. Mr Putnam stated that the department of environment concluded it wasn't contaminated by the operation of the gravel pit as the problem is nitrogen. Drinking water can contain up to a level of 10 and the well was at 12. The department of environment felt the high nitrogen level was from a mobile chicken pen used to raise meat chickens by the residents or the properties own septic system. This has not yet been investigated. The home has been purchased by Osco at the asking price, it was the only option that worked for both parties.

████████████████████ voiced concerns about the 20-year lifespan of the project. He and ██████████, along with ██████████ ██████████ and ██████████ are concerned about what might happen to the waterfowl habitat and groundwater if there is a change of management at Osco. That change could possibly remove local resident Shawn Putnam from his current position at Osco. It's hoped that NEVER happens, but there is always that concern that we would lose our local connection to this project.

Personal assurances were made by Mr. Putnam in an effort to effect a compromise. But if a management shake-up were to

occur, it should be noted that there is a general mistrust of large corporations whose decision-making ability lies outside the province. Put simply, if Shawn Putnam were to leave the company, the local contact would be lost. The general feeling of residents is that as an Irving-funded company, Osco will have to go above and beyond to prove their good will in order to reach a suitable compromise with Little Dyke residents.

Summary of Requests by Residents to the NS Government and Osco Aggregates.

- Little Dyke Residents are asking that the gravel supplies viewable from the duck be left un-touched. Failing that, at the very least, they would like to see all gravel excavation moved back to not less than 300 feet from the edge of the pond and its marshes.
- Residents are asking that Osco put up a monetary bond in case of water contamination or a disturbance of the underground springs that supply Little Dyke Lake, which could destroy property values, if the lake and/or the pond were to disappear. This could also be used to cover the costs incurred in the event that the underground source for lakeside residents' well-water was disturbed.

- Residents are requesting that a “berm” built to block noise from the Osco Operations and want to hold meetings each year with Osco management and the Department of Environment to monitor concerns and pollution-related issues.
- Residents want the roadway that is currently used by Osco Triple-Axle trucks to be upgraded to facilitate a greatly-expanded traffic count from heavy equipment and trucks.
- Residents ask that operational permits for the Osco expansion be limited to 6 days a week, and that operations begin no earlier than 7am - with operations concluding no later than 6pm, with NO SUNDAY operations permitted.

Respectfully Submitted by

[REDACTED] on behalf of Little Dyke Residents

This DRAFT ONLY COPY has been circulated to those named below, and feedback is ongoing.

Cc/ [REDACTED], [REDACTED], [REDACTED] and [REDACTED]
[REDACTED], [REDACTED], [REDACTED] and [REDACTED]
[REDACTED], [REDACTED], [REDACTED], [REDACTED] and [REDACTED]

[REDACTED] and [REDACTED], [REDACTED] and [REDACTED]

[REDACTED] [REDACTED] and [REDACTED], [REDACTED] and [REDACTED]

[REDACTED] and [REDACTED] [REDACTED]

OSCO Aggregates Limited
Glenholme Pit No. 4 Aggregate Extraction Project
Project Update - February 2017

Project Overview

OSCO Aggregates Limited (OSCO) is undertaking an environmental assessment (EA) for a proposed aggregate extraction project 'Pit No. 4' (the Project) located near the community of Glenholme, Colchester County. The Project will be registered as a Class I Undertaking pursuant to the Nova Scotia Environment Act and Environmental Assessment Regulations. The EA is currently being prepared on behalf of OSCO by Dillon Consulting Limited (Dillon). Once registered with Nova Scotia Environment (NSE), the EA will be available for public review and comment.

The proposed Pit No. 4 will occur on private lands along Little Dyke Road approximately 3 kilometers south of Exit 11 Highway 104. Currently an inactive pit and aggregate stockpiles (known locally as the Lafarge pit) occupy approximately 4 ha (10 acres) of the northern portion of the Project area. The Project would extract available aggregates on up to 35 hectares (86 acres) of the study area. A wetland managed by Ducks Unlimited Canada borders on the west side of the Project.

This document is provided as an update on the Project since the project information notice was provided to local area residents on November 10, 2016.

Addressing Comments Received to Date

Representatives from OSCO have met with members of the local community at a Community Meeting in November 2016 and with biologists from Ducks Unlimited Canada in January 2017 to discuss the project and identify concerns and proposed mitigation measures.

To address comments received from the public to date, OSCO proposes that:

- In addition to regulatory setbacks, a berm will be constructed near the western Project property limit to provide additional buffer to the Ducks Unlimited Canada pond, and limit noise trespass. A berm is already in place and will be maintained on the northern property boundary.
- Existing tree cover will be maintained in a buffer along the western property boundary.
- Project operations will be limited to six days a week (no work on Sundays).
- OSCO will continue to meet with area residents over the operation of the Project.

Biologists from Ducks Unlimited Canada met with OSCO personnel onsite to review the proposed plan for the Project. Ducks Unlimited Canada personnel did not anticipate negative impact to the managed wetland based on the Project description, and will review the EA document when it is registered. OSCO is committed to continuing to work with Duck Unlimited Canada to mitigate potential impacts to the existing managed wetland.

Project Activities

The scope of the Project activities will include pit development/aggregate extraction, screening, mobile crushing, stockpiling of aggregate, and transport to the existing OSCO Aggregates Wash Plant facility (approximately 700 meters northward along Little Dyke Road).

No blasting and no washing will occur at the Project site.

OSCO Aggregates Limited
Glenholme Pit No. 4 Aggregate Extraction Project
Project Update - February 2017

The operations at the Project site will vary depending on market conditions but are generally expected to occur 12-14 hours per day, 6 days per week. It is estimated that no more than 9 trucks per hour will run from Pit No. 4 to the Wash Plant facility. Activities related to the Wash Plant facility (under existing approval), including the existing trucking rates to surrounding markets, will not change due to the new aggregate source.

Progressive reclamation of Pit No. 4 will occur in stages as aggregate removal is completed from sections of the site. Final reclamation will be completed following regulatory requirements.

Summary of Environmental Findings and Mitigations

As part of the EA preparation, Dillon staff completed field investigations to assess the potential impacts to the environment. The following mitigation measures will be included in the Project:

- 30 m setbacks will be maintained from wetlands and streams. Any infringement on the wetland setback, if required at an access road location, would be designed to meet Environment Act approval requirements.
- Groundwater impacts are not anticipated. The pit will remain 0.5 m above the groundwater table elevation, and NSE Handbook for Erosion and Sediment Control will be followed.
- Species At Risk (SAR) plants and animals (other than birds) are not anticipated to be present within the Project footprint based on habitat identified. None were observed during field investigations.
- A wide variety of bird species may nest in the general Project area, including SAR birds. No clearing activities will occur during the bird nesting season.
- Noise conditions will not be altered by the Project from existing conditions at potential receptors and are expected to be typical of levels in a rural/resource development area.

Next Steps

The EA is currently being prepared on behalf of OSCO by Dillon. Once registered with Nova Scotia Environment (NSE), the EA will be available for public review for 30 days. Notification of the registration will be provided through two newspaper advertisements.

Contact

OSCO is committed to continue to work with the community and local stakeholders. If you have questions or comments on the Project please contact:

Shawn Putnam
Operations Manager, Glenholme
OSCO Aggregates Limited
749 Little Dyke Rd, Great Village, NS B0M 1L0
Telephone: (902) 899-5201



February 27, 2017

Ducks Unlimited Canada
P.O. Box 430, 64 Hwy 6
Amherst, NS
B4H 3Z5

Attention: Rob Fraser

Re: Site Visit Glenholme, Nova Scotia January 2017

I appreciated the opportunity to explain OSCO's vision for the possible expansion of our aggregate operation in Glenholme.

I would like to recap the salient points from the meeting to ensure I have understood everything correctly and to provide a record for the future.

I stated that it would be OSCO's intention to perform only extraction and crushing/screening on the old Lafarge property to extend the life of the existing operation, not increase annual production. This raw material would then be trucked to the current wash/screening facilities operating at Pit #2 off Little Dyke Road. Reclamation would take place in a phased manner ensuring that only the minimum amount of land would be disturbed at any one time.

We took a short drive around the site so that you could assess the topography and vegetation particularly in the area bordering the wetland that you manage. You were able to view such features as the old pit and the fact that there is a field, currently being farmed, extending to the edge of the DU Managed property.

The two questions that I presented on behalf of the company were site related. Firstly, was there anything that we needed to know or do to ensure that our operations would not negatively impact the property that DU currently manages. Secondly, would there be an appetite for, or any benefit in, OSCO donating property after the project completion.

You stated that DU engages with the EA review process and has confidence in the NSE officials that if an Approval was granted, the requirements of the Approval would be sufficient. Based on our review of the project and site, you had no specific requirements for the property bordering the DU managed site at this time. Secondly, regarding the expansion of the existing wetland, you



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member of the OSCO
Construction Group

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- **NS Regional Office:** 17 Estate Drive • Lower Sackville, NS • B4C 3Z2 • Tel: (902) 864-3230 • Fax: (902) 865-3033
- **PE Regional Office:** 412 Mount Edward Road • Charlottetown • PE • C1E 2A1 • Tel: (902) 628-0127 • Fax: (902) 566-1169



commented that you would not likely consider this, as the existing DU wetland works well in its existing configuration. The suggestion that the expansion of one of the existing wetlands on the Lafarge property could be considered in the future and may work into the pit reclamation plan was of course the most prudent suggestion. We anticipate that the later approach will be pursued with Ducks Unlimited.

We look forward to the opportunity to work on a rehabilitation plan together in the future.

Thanks again for the time,

Best regards,

David Bancroft, P.Eng.
General Manager of OSCO Concrete and Aggregates



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Proposed Glenholme Pit No. 4 Project
Summary of Residents Information Session
Friday April 21, 2017, 6:30 pm Erskine United Church Glenholme

Karen Casey, MLA for Colchester North hosted an information session between property owners at Little Dyke and staff from OSCO as an opportunity for property owners to ask questions and get information regarding the proposed expansion of the OSCO operations.

Presenters providing information on OSCO, the existing Glenholme facility operations and the proposed Pit No. 4 project (see attached powerpoint from the session):

OSCO Aggregates Limited Glenholme Facility Operations Manager - Shawn Putnam;
OSCO Aggregates General Manager – David Bancroft P.Eng. GSC

Attendees: Over 20 residents from the Little Dyke Road area (a sign-in sheet was compiled by OSCO and was sent to the MLA's office).

Following the presentation, OSCO personnel were available to answer questions. The following is OSCO's summary of key concerns identified:

- 1) A truck (not belonging to OSCO) leaving the Glenholme pit about 6 months ago blew a hydraulic hose and spilled hydraulic oil on the Little Dyke road. When it happened Glenholme staff put some concrete sand on it to contain it and the operations manager phoned the area manager for DOT and told him about the spill. DOT had not responded, so OSCO indicated they would check into it again. Contact with DOT was made again subsequent to the meeting and DOT indicated they would investigate.
- 2) The residents raised a concern about OSCO loaders and trucks crossing the Little Dyke road from Pit #1 to Pit #2 and asked for stop signs to be installed at each exit. OSCO agreed to put a stop sign at the exit of Pit #1 and a yield sign at the exit of Pit #2. OSCO also will speak to our employees to stop before crossing from either side.
- 3) Another concern was that the existing gravel pits in the Glenholme area were having a negative effect on the wetlands and McCurdy creek.
- 4) The condition of Little Dyke road due to truck traffic and no spring weight restriction was a concern in relation to DOT repair priorities along the road with OSCO truck traffic. Karen Casey agreed to check into this.
- 5) Residents are concerned about the crusher running past the hour of 4 o'clock pm in fear of the noise affecting their ability to enjoy their decks after work. OSCO indicated that restrictions on evening work cannot be guaranteed, but would be willing to consider crushing a years supply at one time to minimize the impact. Fall was a consideration.
- 6) It was suggested that the residents would elect someone to represent them and to attend quarterly meetings with management to have opportunity to raise any new concerns and share advice. OSCO would be agreeable to this.



Residents Meeting

Structure of the Irving Companies

- * Irving Oil – Arthur Irving
 - * Refineries
 - * Gas Stations
- * JDI – Jim Irving
 - * Kent Stores
 - * Irving Equipment
 - * Irving Shipyards
 - * Etc.

- 
- * OCI – John Irving
 - * OSCO Construction Group
 - * Radio Stations
 - * Real Estate

OSCO Construction Group

- * Corporate Leadership
 - * John Irving, Chairman of the Board
 - * Hans Klohn, President

- * Local Leadership
 - * David Bancroft, General Manager
 - * Shawn Putnam, Operations Manager

David Bancroft – General Manager

- * Structural Engineer with 35+ years of construction experience
 - * Concrete
 - * Road Building
 - * Paving
- * Partner in Pennecon
 - * 46 Companies in 4 Provinces
 - * Managed Nova Scotia Division (10 Companies)

Purchase of MSD Enterprises

- * Pennecon purchased MSD in 2006
- * MSD was a family owned and run business
- * Consolidation in the industry made it difficult for family run businesses to remain competitive
- * First meeting with Shawn led to a friendship and ongoing business relationship

Shawn Putnam – Operations Manager

- * M.S.D. Enterprises – Merle, Shawn, Dennis
- * Merle started the business with his 17 year old son Shawn in 1987
- * Seven years later Shawn took over the business as his fathers health was failing
- * It was a successful family run gravel and concrete operation until the sale in 2006 to Pennecon.

OSCO Expands in Nova Scotia

- * 2008 OSCO acquired the Nova Scotia branch of Pennecon
- * I sold my shares in Pennecon and remained as the General Manager for Nova Scotia under the new OSCO management
- * In 2010 I became responsible for concrete and aggregate operations in the Maritimes

Current Process

- * Push topsoil to one side
- * Remove material from bank with a loader and feed it into a crusher
- * Crush material to $\frac{3}{4}$ minus
- * Stockpile this material as feed stock for the washplant

Current Process





Product Quality

- * Alkali Silica Reaction
 - * Portland Cement is high in PH (alkalis)
 - * Silica in the stone reacts with the alkalis in the cement in the presence of water
 - * Crystals are formed in the hardened concrete
 - * These expanding crystals cause the concrete to crack and fall apart
- * MSD stone is non-reactive

Alkali Silica Reactivity



Product Availability

Construction Aggregates

★ Glenholme



Product Use

- * Concrete coarse aggregate
- * Concrete fine aggregate
- * Miscellaneous products
- * Not roadbase

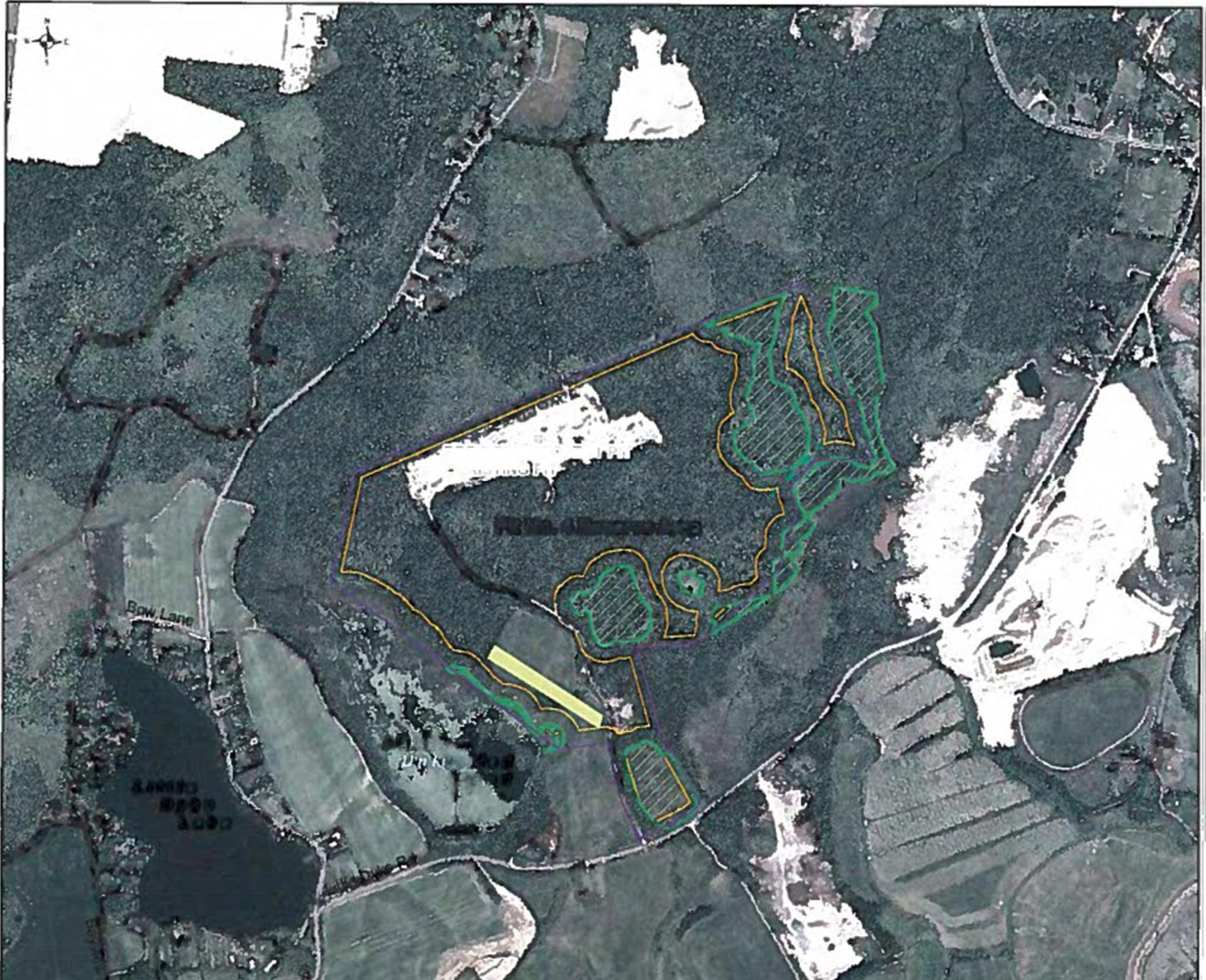
Reserves

- * Three to four years in the current location
- * To continue the business we need additional reserves not sales
- * Current washplant represents an investment in excess of \$1,000,000
- * Additional reserves would therefore be trucked to the current washplant

Socio Economic Impact

- * OSCO employs 16 people
- * OSCO has paid out in excess of 2.5 million dollars in wages, fees, royalties and taxes in the last five years alone







Future Extraction Plan

- * Clear cut a portion of the area
- * Move root mat and topsoil to remediate previously disturbed area
- * Feed bank material through the crusher and stockpile
- * Always stay above watertable
- * Truck stockpile to washplant
- * Possible better route to washplant

Impacts on Residents

- * Visual
- * Noise
- * Dust
- * Traffic
- * Hours of Operation



Appendix C

Noise Data, November 2016

Glenholme Noise Collector Locations

Waypoint	Sample Collection Location	Unit	GPS Coordinates	
			Easting (m)	Northing (m)
	370 East Location	DCL-01	457726	5026734
	371 South-West Location	DCL-02	456422	5025855
	372 North Location	DCL-03	456545	5026818

NOTE: Locations are approximate

Appendix C
Background Noise Measurement at DCL-01

Record #	Time	Measurement Time	LAeq	LAmx	L Amin	LA05	LA10	LA50	LA90	LA95	Lppeak
1	11/5/2016 15:13	1:00:00	47.2	84	30.2	49.6	46.8	40.1	35.6	34.4	108.9
2	11/5/2016 16:13	1:00:00	42.4	63.3	31.2	47.6	45.1	38.3	35.2	34.4	97.3
3	11/5/2016 17:13	1:00:00	40.8	59.3	30.5	46	45.2	36.9	34	33.4	96
4	11/5/2016 18:13	1:00:00	37.7	53.1	30.2	41.5	39.7	35.9	33.6	32.9	87.1
5	11/5/2016 19:13	1:00:00	36.6	51.9	31.5	40.1	38	35	33.4	33	85.9
6	11/5/2016 20:13	1:00:00	34.7	54	21.6	39.2	36.6	29.8	25.3	24.5	77.4
7	11/5/2016 21:13	1:00:00	33.8	54.6	23.5	37.8	35.2	29.7	26.9	26.3	73.5
8	11/5/2016 22:13	1:00:00	32.6	57.8	22.3	35.4	33.3	27.8	24.6	24.2	79.7
9	11/5/2016 23:13	1:00:00	31.9	56.2	20.9	35.8	32.8	26.4	23.6	23.2	90.6
10	11/6/2016 0:13	1:00:00	27.8	49.6	20.2	31	29	24.3	22.4	22	70
11	11/6/2016 1:13	1:00:00	30	49.9	20.4	35.2	32.6	25.4	23.1	22.6	69.1
12	11/6/2016 2:13	1:00:00	28.9	52	22	33	28.6	24.9	23.6	23.5	72.9
13	11/6/2016 3:13	1:00:00	26	43.5	21.5	29.3	27.6	24.5	23.2	22.9	68.6
14	11/6/2016 4:13	1:00:00	24.5	43.2	19.5	27.3	25.9	23.2	20.9	20.6	68.8
15	11/6/2016 5:13	1:00:00	27.5	51.6	19.3	30.1	28.3	23.9	20.9	20.2	67.1
16	11/6/2016 6:13	1:00:00	28.6	49.2	18.7	32.7	30.4	24.9	20.4	19.7	69.9
17	11/6/2016 7:13	1:00:00	33.8	56.9	19.9	36.3	33.5	28	23.6	22.8	73.6
18	11/6/2016 8:13	1:00:00	38.8	68.8	25.5	41.8	39.9	34.1	29.9	29.2	79
19	11/6/2016 9:13	1:00:00	44.4	63.2	29.3	51.4	45.4	36.8	33.6	32.9	92.8
20	11/6/2016 10:13	1:00:00	45.1	74	27.3	47.7	43.6	35.1	31.5	30.7	89.8
21	11/6/2016 11:13	1:00:00	38	57.1	27.1	43.1	38.9	33.1	29.9	29.3	84.4
22	11/6/2016 12:13	1:00:00	39.3	60.6	28.3	45	40.6	34.4	32	31.5	89.3
23	11/6/2016 13:13	1:00:00	42.9	70.9	26.9	46.1	44.7	35	31.1	30	92.3
24	11/6/2016 14:13	1:00:00	43.9	67.5	28.8	47.8	44.3	36.4	33.1	32.2	88.3
25	11/6/2016 15:13	1:00:00	46.8	66	30.5	54.9	53	39.8	34.2	33.5	93.5
26	11/6/2016 16:13	1:00:00	42.7	74.2	30.6	47.3	44	37.8	34	33.3	101.1
27	11/6/2016 17:13	1:00:00	41.1	65.6	33.5	44.4	42.1	38.7	36.7	36.2	90.6
28	11/6/2016 18:13	1:00:00	40	56.4	32.9	43.2	41.1	38.3	36.7	36.2	83
29	11/6/2016 19:13	1:00:00	41.9	55.5	35.8	44.1	43.3	41.5	39.3	38.6	91.3
30	11/6/2016 20:13	1:00:00	38.5	58.1	30.6	41.1	40.1	37.1	34.4	33.8	87.7
31	11/6/2016 21:13	1:00:00	37.3	54.3	29.9	40.7	39.7	36.5	33.5	32.8	95.2
32	11/6/2016 22:13	1:00:00	37.6	56.9	25.4	41.1	39.8	35.4	31.7	30.7	88.3
33	11/6/2016 23:13	1:00:00	35.4	56.8	25.1	39	37.4	33.1	29.1	28.2	86.9
34	11/7/2016 0:13	1:00:00	33.8	55	22.4	37.5	36.2	32	27.3	25.5	76
35	11/7/2016 1:13	1:00:00	35.4	53.4	25.7	39.8	38.3	33.2	29.8	29	72.9
36	11/7/2016 2:13	1:00:00	32.4	47.2	24.1	36.7	35.5	31	27.3	26.5	77.1
37	11/7/2016 3:13	1:00:00	32.2	58.7	21.3	36.1	34.1	29.4	25.4	24.6	74.8
38	11/7/2016 4:13	1:00:00	32.2	49.7	21.6	37.3	35.5	30	25.1	24.5	76.4
39	11/7/2016 5:13	1:00:00	35.3	55.5	22.9	38.7	37	32.5	28.4	27	74.9
40	11/7/2016 6:13	1:00:00	38.4	58.8	29.2	42.1	40.6	36.7	33	32.1	79.2
41	11/7/2016 7:13	1:00:00	43	68	32.1	46.8	45	40.9	37.1	35.8	80.7
42	11/7/2016 8:13	1:00:00	48.8	69.5	36.8	53.2	50.2	45.3	42	41.1	91.1
43	11/7/2016 9:13	1:00:00	46.2	76.5	34.8	50	46.7	40.8	38	37.4	91.5
44	11/7/2016 10:13	1:00:00	45.2	69.6	30.7	47.4	44.6	39	34.4	33.6	94.9
45	11/7/2016 11:13	1:00:00	43.3	63.8	30.9	47.3	45.4	39.3	35	34.1	92.3
46	11/7/2016 12:13	1:00:00	43.9	68	30.4	48.9	46.1	37.3	33.8	33.3	93.7
47	11/7/2016 13:13	1:00:00	45.1	67	31.8	49.9	47.9	37.4	34.6	34	94
48	11/7/2016 14:13	1:00:00	43.7	69.6	29.2	48.1	45.9	38	33.6	32.8	92.7
49	11/7/2016 15:13	1:00:00	50.3	75.4	30.1	49.5	42.6	35.2	32.8	32.2	96.1
50	11/7/2016 16:13	1:00:00	40.1	66.5	30.6	42.6	39.6	35.8	33.6	33	83.6
51	11/7/2016 17:13	1:00:00	45.4	65.5	30.4	49.7	47.4	38.9	35.7	35	87.6
52	11/7/2016 18:13	1:00:00	42.6	61.5	30.3	46.7	43.9	38.1	34.7	33.9	89.8
53	11/7/2016 19:13	1:00:00	45.4	67	26.4	49.2	45.4	38.1	32.6	31.4	88.4
54	11/7/2016 20:13	1:00:00	38.3	56.3	24.6	43.4	41.6	35.2	29.9	28.9	86.7
55	11/7/2016 21:13	1:00:00	37.3	52.3	24.1	42.7	40.7	34.3	28.5	27.4	80.6
56	11/7/2016 22:13	1:00:00	34.9	55.5	23.5	38.7	36.9	31.8	27.4	26.4	71.9
57	11/7/2016 23:13	1:00:00	33.7	55.3	23.8	37.3	35.3	29.9	26.9	26	76.5
58	11/8/2016 0:13	1:00:00	28.7	44.2	21.8	33.5	31.4	26.9	24.5	23.9	82.8
59	11/8/2016 1:13	1:00:00	29.5	48.2	22.1	34.8	32	26	24.3	24.1	75.1
60	11/8/2016 2:13	1:00:00	32.2	53.4	21.1	37.7	34.6	26.5	24.2	23.6	82
61	11/8/2016 3:13	1:00:00	28.4	43.9	21.3	32.7	31.1	27	23.6	23.1	75
62	11/8/2016 4:13	1:00:00	32	50.3	20.4	36.9	35	28.8	23.8	22.8	75.7
63	11/8/2016 5:13	1:00:00	43.1	58.2	24.1	47.7	46.2	41.4	32.7	28.3	81.8
64	11/8/2016 6:13	1:00:00	40.2	59	30.1	42.6	40.3	35.9	33.1	32.5	84.3
65	11/8/2016 7:13	1:00:00	42.7	61.1	29.5	47.2	44.6	38.9	33.9	32.7	87.5
66	11/8/2016 8:13	1:00:00	45.5	65	35	49.8	47.7	41.8	38.4	37.6	88
67	11/8/2016 9:13	1:00:00	45.2	66.4	32.9	51	46.8	39.7	35.9	35.1	87
68	11/8/2016 10:13	1:00:00	45.5	66.3	30.7	51	46.5	36.4	33.7	33.2	86.7
69	11/8/2016 11:13	1:00:00	45.5	64.8	33.2	51.3	48.3	39.9	36.4	35.6	92.7
70	11/8/2016 12:13	1:00:00	46.1	68.4	31.6	51.5	49.5	38.6	35.4	34.9	94
71	11/8/2016 13:13	0:04:21	48.8	74.6	30.9	54	48.8	36.2	32.8	32.4	96.7

Time Period	Max:	Min:	Geo Mean	Lp90
Daytime (7am - 7pm)	50	34	43	34
Evening (7pm - 11pm)	45	33	37	30
Nighttime (11pm - 7am)	43	25	32	25

Appendix C
Background Noise Measurements at DCL-02

Record #	Time	Measurement Time	LAeq	LAmx	LAmn	LA05	LA10	LA50	LA90	LA95	Lppeak
1	11/5/2016 15:41	1:00:00	39.1	69.8	23.8	43	40.8	35.4	29.4	28	99.4
2	11/5/2016 16:41	1:00:00	44.5	75.1	29.7	45	42	35.9	33.4	32.9	102.6
3	11/5/2016 17:41	1:00:00	39.1	75.9	30	41.3	39.5	35.2	32.5	31.9	90.1
4	11/5/2016 18:41	1:00:00	35.8	49.5	30.9	39.5	37.6	34.9	32.8	32.5	80.8
5	11/5/2016 19:41	1:00:00	34.6	54.7	26.6	38.9	36.7	32.7	29.3	28.6	80.3
6	11/5/2016 20:41	1:00:00	34.6	51.8	26.3	39.3	36	31.6	29.1	28.3	72
7	11/5/2016 21:41	1:00:00	33.8	52.6	21.1	39.7	36.2	26.6	23.8	23.2	74.4
8	11/5/2016 22:41	1:00:00	29.7	50.7	19.4	35.1	31.3	23.9	21.3	20.6	75.3
9	11/5/2016 23:41	1:00:00	31.6	54.9	18.6	36.2	31.8	21.1	19.6	19.4	73.3
10	11/6/2016 0:41	1:00:00	29	51.9	19	32.4	28.9	21.6	19.8	19.6	71.5
11	11/6/2016 1:41	1:00:00	30.9	50.7	22.1	36.2	33	27.3	24.9	24.2	74.4
12	11/6/2016 2:41	1:00:00	29.9	52.6	23.5	34.6	30.3	26.6	25.5	25.1	77.1
13	11/6/2016 3:41	1:00:00	26.1	41.1	21.6	28.3	27.4	25.4	23.6	23.3	72.6
14	11/6/2016 4:41	1:00:00	24.6	44.1	19.8	27.3	25.3	22.9	21.5	21.1	77.8
15	11/6/2016 5:41	1:00:00	27.6	46.5	19.3	31.5	28.8	23.8	21.3	20.9	71.9
16	11/6/2016 6:41	1:00:00	27.6	47.2	19.2	31.1	29.3	25	21.8	20.9	74.1
17	11/6/2016 7:41	1:00:00	34.2	57.1	20.6	39.1	36.1	30.2	24.2	23.1	72.6
18	11/6/2016 8:41	1:00:00	44.7	66.2	28.4	45.5	42	37	33.1	32	84
19	11/6/2016 9:41	1:00:00	42.6	68.4	32	46.5	44.4	39.9	36.6	35.9	87.3
20	11/6/2016 10:41	1:00:00	45.5	75.9	34.2	46.3	44.6	41	38.1	37.4	98.2
21	11/6/2016 11:41	1:00:00	39.7	53.4	31.5	43.1	42.2	38.8	35.8	35	80.3
22	11/6/2016 12:41	1:00:00	36.4	59.3	26	41.2	38.1	33.4	29.9	29.2	82.3
23	11/6/2016 13:41	1:00:00	52.4	82.2	25.3	44.8	41	32.8	29.7	28.9	105.1
24	11/6/2016 14:41	1:00:00	43.3	73.5	27.7	44.5	41.4	35.2	31.9	31.1	93.4
25	11/6/2016 15:41	1:00:00	38.7	66.6	27.6	42.9	40.6	35.5	32.4	31.6	90.4
26	11/6/2016 16:41	1:00:00	41.8	62.7	29.9	46.4	44.1	38.2	34.1	33.3	95
27	11/6/2016 17:41	1:00:00	39.3	65.2	31.8	43.1	41	37.3	35.1	34.6	90.6
28	11/6/2016 18:41	1:00:00	38.8	54.8	31	42.6	41.7	37.5	33.7	33.3	90.8
29	11/6/2016 19:41	1:00:00	40.3	59.6	32.9	44.5	42.9	38.9	36	35.4	96.6
30	11/6/2016 20:41	1:00:00	37.6	53	30.4	41.8	40.3	35.8	33.2	32.6	98.3
31	11/6/2016 21:41	1:00:00	38.2	51.3	30	42.1	40.9	37.2	34	33.1	95.2
32	11/6/2016 22:41	1:00:00	38.7	55.7	27.5	44.1	41.9	36	32	31.2	95.8
33	11/6/2016 23:41	1:00:00	35	52.8	23.5	38.4	36.6	33.1	30.1	29.2	87.8
34	11/7/2016 0:41	1:00:00	33.9	55.6	21.5	36.8	35.1	31.4	27.5	25.7	83.6
35	11/7/2016 1:41	1:00:00	33.9	50.2	25.8	37.3	36.3	32.9	29.9	29.1	90.9
36	11/7/2016 2:41	1:00:00	31.6	53.8	21.1	33.5	32.1	28.5	24.2	23.2	75.6
37	11/7/2016 3:41	1:00:00	30.9	53.4	21.1	34.7	33.3	29.2	25.5	24.3	82.1
38	11/7/2016 4:41	1:00:00	30.5	49.4	21.8	34.6	33.1	29	25.9	25.1	88.5
39	11/7/2016 5:41	1:00:00	37.9	54	24.5	44	42.2	32.4	29.2	28.2	88.7
40	11/7/2016 6:41	1:00:00	46.2	60.1	32.4	52.5	50.4	41.1	36.4	35.6	78.5
41	11/7/2016 7:41	1:00:00	51.8	62.1	41.8	55.9	54.8	50.8	46.6	45.7	85
42	11/7/2016 8:41	1:00:00	50.3	62.4	37.9	55.4	53	47.9	43.2	42.4	85.3
43	11/7/2016 9:41	1:00:00	46.9	75.9	33.3	45.3	43.3	39.6	36.8	36.2	95.6
44	11/7/2016 10:41	1:00:00	39.1	54.9	30	43.4	41.9	37.6	34.4	33.7	91.7
45	11/7/2016 11:41	1:00:00	39.1	56	30.2	42.8	41.6	38	34.9	34.1	94
46	11/7/2016 12:41	1:00:00	40.2	60.4	28.5	44.2	42.6	38.2	34.6	33.4	91.6
47	11/7/2016 13:41	1:00:00	42.2	60.5	30.3	46.6	44.9	40.4	35.6	33.6	94.7
48	11/7/2016 14:41	1:00:00	43.9	66.5	33.5	47.7	45.8	40.9	37.1	36.3	91.8
49	11/7/2016 15:41	1:00:00	46.7	70.6	31.9	46.8	44.9	40	36.4	35.6	94.2
50	11/7/2016 16:41	1:00:00	43.4	59.4	33.4	48	46.6	41.7	37.5	36.7	94.7
51	11/7/2016 17:41	1:00:00	43.9	65.6	19.7	47.8	46.6	42.7	27.5	24.2	77.9
52	11/7/2016 18:41	1:00:00	35.4	61.6	20.7	41.9	38.2	28.2	25	24.5	82.7
53	11/7/2016 19:41	1:00:00	34	56.2	18.8	39.7	33.6	24.7	20.9	20.2	73.1
54	11/7/2016 20:41	1:00:00	34	53.9	18.6	41.7	37.5	22.8	19.6	19.3	78.9
55	11/7/2016 21:41	1:00:00	28.5	56.1	18.5	32.6	29	21.3	19.4	19.3	77.2
56	11/7/2016 22:41	1:00:00	34.6	52.9	21.5	41	35.9	27.6	24.1	23.5	81
57	11/7/2016 23:41	1:00:00	27.1	45.9	20.9	31.4	30.1	25.1	23.1	22.8	80.1
58	11/8/2016 0:41	1:00:00	23.1	40.6	20.4	24.6	23.9	22.8	21.8	21.6	77.2
59	11/8/2016 1:41	1:00:00	24	45.6	19.8	25.5	24.5	22.9	21.6	21.3	78
60	11/8/2016 2:41	1:00:00	30.3	51.8	20.9	33.9	29.7	24.3	22.6	22.3	75.8
61	11/8/2016 3:41	1:00:00	27.2	56.8	19.2	28.6	27	23.5	21.1	20.4	74.9
62	11/8/2016 4:41	1:00:00	35.7	65	20.7	40.7	38.9	32	24.5	23.2	93.5
63	11/8/2016 5:41	1:00:00	41.7	67	32.5	45.6	43.5	39.9	36.7	36	96.2
64	11/8/2016 6:41	1:00:00	47.4	59	34.9	52	50.7	46	40.3	38.4	80.3
65	11/8/2016 7:41	1:00:00	48.5	57.9	35.2	52.8	51.8	47.6	41.2	39.8	84.8
66	11/8/2016 8:41	1:00:00	52.6	63.1	37.3	58.7	57.2	48.6	43.3	40.6	84
67	11/8/2016 9:41	1:00:00	43.3	64.3	33	44.7	42.9	39.5	36.5	35.7	83.2
68	11/8/2016 10:41	1:00:00	40	55.4	31.2	44.9	42.4	37	34.4	33.8	91.8
69	11/8/2016 11:41	1:00:00	43.1	67.7	25.8	41.3	38.3	33.8	30.6	30	94.3
70	11/8/2016 12:41	0:54:02	35.2	72.2	25.4	36.4	33.7	29.3	27.5	27.1	98.4

Appendix C
Background Noise Measurements at DCL-02

Time Period	Max	Min	Geo Mean	Lp90
Daytime (7am - 7pm)	53	34	42	34
Evening (7pm - 11am)	40	29	35	26
Nighttime (11pm - 7am)	47	23	31	25

Appendix C
Background Noise Measurement at Location DCL-03

Record #	Time	Measurement Time	LAeq	LAmaz	LAmín	LA05	LA10	LA50	LA90	LA95	Lpeak
1	11/5/2016 16:09	1:00:00	44.6	70	30.3	49.9	47.2	40.2	35.5	34.3	94.9
2	11/5/2016 17:09	1:00:00	44.9	76.6	32	50	47.6	40.7	36.3	35.4	100.9
3	11/5/2016 18:09	1:00:00	39.3	60.4	28.1	45.2	42.7	33.3	30.4	30	80.8
4	11/5/2016 19:09	1:00:00	34.2	54.7	26.5	38.7	34.6	30.5	28.8	28.4	79.7
5	11/5/2016 20:09	1:00:00	42.8	68.1	22.1	48.7	44.6	30.1	25.8	24.7	88.2
6	11/5/2016 21:09	1:00:00	41.5	67.6	21.1	48	41.7	29.1	25	24.2	89.4
7	11/5/2016 22:09	1:00:00	32.9	61.6	20.7	37.6	34	27.5	24.5	23.8	80.5
8	11/5/2016 23:09	1:00:00	29.2	53.6	19	33.9	31.7	26.2	21.1	20	78.4
9	11/6/2016 0:09	1:00:00	27.5	49.5	18.5	32	28.6	22.1	19.6	19.4	70.2
10	11/6/2016 1:09	1:00:00	29	51.2	18.8	33.3	30.6	21.6	19.6	19.5	70.5
11	11/6/2016 2:09	1:00:00	26.7	50.7	19.6	30.3	26.6	22.4	20.7	20.6	72.9
12	11/6/2016 3:09	1:00:00	25.4	41.7	20.2	29.2	27.1	23.6	22	21.6	62.9
13	11/6/2016 4:09	1:00:00	23.1	39.2	18.8	26.5	25.1	22	19.8	19.6	63.6
14	11/6/2016 5:09	1:00:00	26.5	46.4	18.9	30.9	29.3	24.7	20.2	19.7	64.6
15	11/6/2016 6:09	1:00:00	27.6	44.9	18.5	32	30.5	25.3	19.9	19.5	64
16	11/6/2016 7:09	1:00:00	30.4	50.2	19	34.8	32.9	28.2	22.9	21.6	71.5
17	11/6/2016 8:09	1:00:00	36.8	61.2	23.6	41.9	40.4	33.7	28.9	27.7	74.2
18	11/6/2016 9:09	1:00:00	41.2	57.9	28.8	45.5	43.2	38.1	34.4	33.3	80.8
19	11/6/2016 10:09	1:00:00	43.9	68.7	31.4	47.5	44.5	38.8	35.5	34.6	79.9
20	11/6/2016 11:09	1:00:00	41.9	62.8	31.1	46.5	44	38.9	35.3	34.4	84.1
21	11/6/2016 12:09	1:00:00	48.1	68.4	28.9	47.3	44.8	38.6	33.3	32.4	83.5
22	11/6/2016 13:09	1:00:00	55.7	82.9	27.4	58.1	45.7	36.7	32.7	31.5	98.1
23	11/6/2016 14:09	1:00:00	44.6	66	29.9	48.3	45.7	39.6	35.3	34.3	88.2
24	11/6/2016 15:09	1:00:00	45.3	68.2	30	50.5	48	41.9	37.1	35.5	91.7
25	11/6/2016 16:09	1:00:00	45.6	70.1	32.8	48.9	46.7	41	36.8	36	92.5
26	11/6/2016 17:09	1:00:00	42.1	64.7	33.1	46.1	44.4	40.1	37.5	36.7	92.7
27	11/6/2016 18:09	1:00:00	39.3	61.5	32	43.7	41.7	37	34.9	34.3	81.7
28	11/6/2016 19:09	1:00:00	40.6	54.1	33.3	43.4	42.4	40.2	37.3	36.3	98.6
29	11/6/2016 20:09	1:00:00	38.4	55.7	29.5	42.5	40.6	36.5	33.8	33.3	98.2
30	11/6/2016 21:09	1:00:00	38	55	29.5	42.1	40.3	36.5	33.4	32.7	95
31	11/6/2016 22:09	1:00:00	37.7	59.7	28.2	41.8	39.9	35.3	32.2	31.4	101.8
32	11/6/2016 23:09	1:00:00	35.3	51	25.1	39.3	37.7	33.3	29.9	29.1	94.4
33	11/7/2016 0:09	1:00:00	32.4	46.9	19.6	36.4	35.3	31.3	25.3	23.5	77.1
34	11/7/2016 1:09	1:00:00	34.1	57	23.9	38.3	36.9	31.8	28.8	27.8	89.1
35	11/7/2016 2:09	1:00:00	32	46.8	22.6	36.2	34.9	30.5	26.6	25.8	71.4
36	11/7/2016 3:09	1:00:00	29	47.3	19.2	33.1	31.8	27.1	22.1	21.1	70.5
37	11/7/2016 4:09	1:00:00	31.5	49.3	19.9	35.9	34	28.6	23.6	22.9	78.4
38	11/7/2016 5:09	1:00:00	32.6	48	20.9	36.8	35.2	30.9	26.4	24.7	81
39	11/7/2016 6:09	1:00:00	34.1	51.5	26.6	37.5	36.4	33.2	30.5	29.7	86.3
40	11/7/2016 7:09	1:00:00	38	54.5	30.3	41.3	40.2	36.9	34.4	33.7	83
41	11/7/2016 8:09	1:00:00	42.4	58.1	33.4	46.2	45.2	41.3	37.9	36.8	83.5
42	11/7/2016 9:09	1:00:00	39.8	55.8	31.6	43.4	42.4	38.4	34.8	34.2	92.8
43	11/7/2016 10:09	1:00:00	37.7	56.5	30.4	41.5	39.9	36.3	33.8	33.2	94
44	11/7/2016 11:09	1:00:00	37.5	52.4	29.9	41.7	40.1	35.7	32.7	32.1	98.6
45	11/7/2016 12:09	1:00:00	37.6	55.4	28.6	43	40.3	34.8	31.7	31.1	99.1
46	11/7/2016 13:09	1:00:00	37.7	53.9	29.9	42	40.2	35.4	32.8	32.2	99.1
47	11/7/2016 14:09	1:00:00	38.5	57.6	28.5	43.1	40.7	35.4	32.4	31.7	98.9
48	11/7/2016 15:09	1:00:00	51.9	78.7	28.9	44	40.3	35	32.5	31.9	100.3
49	11/7/2016 16:09	1:00:00	38.3	53.7	28.8	42.1	40.7	36.9	33.7	33	79.6
50	11/7/2016 17:09	1:00:00	40.3	61.8	31.5	44.4	42.1	38.1	35.4	34.7	85.9
51	11/7/2016 18:09	1:00:00	36.7	55.9	21.5	41.1	39.1	32.8	28.2	27.1	81.1
52	11/7/2016 19:09	1:00:00	37.2	58.2	19.5	42.5	38.9	31.9	27	25.4	79.2
53	11/7/2016 20:09	1:00:00	30.9	50.2	19.5	35.9	33.5	27	22.8	21.8	81
54	11/7/2016 21:09	1:00:00	33.5	63.1	19	37.4	32.8	26	21.8	20.9	83.6
55	11/7/2016 22:09	1:00:00	28.4	41.3	19.7	33	31.4	26.8	23.1	22.3	66.8
56	11/7/2016 23:09	1:00:00	30.4	46.9	19.7	34.9	33.3	28.1	22.9	22.1	77.3
57	11/8/2016 0:09	1:00:00	25.2	45.8	19.2	28.8	27.6	23.2	20.7	20.4	67.5
58	11/8/2016 1:09	1:00:00	24.1	41.1	19.4	27.7	26.2	22.6	20.7	20.4	67.5
59	11/8/2016 2:09	1:00:00	27.1	45.8	19.5	30.5	28.4	23.2	20.7	20.4	68.6
60	11/8/2016 3:09	1:00:00	25.4	39.8	19.3	29.1	28.1	24.1	21.1	20.6	70
61	11/8/2016 4:09	1:00:00	31	50.6	19	37.1	34.2	25.3	20.6	19.8	67.6
62	11/8/2016 5:09	1:00:00	38.1	50.7	23.5	42.4	41.3	36.6	29.3	26.9	73
63	11/8/2016 6:09	1:00:00	49.1	62.1	34.2	53.3	52.2	47.9	41	39.3	76.1

Appendix C
Background Noise Measurement at Location DCL-03

64	11/8/2016 7:09	1:00:00	50.7	60.1	37	55.4	54.4	49.2	42.6	41.5	82
65	11/8/2016 8:09	1:00:00	51	59.3	39.5	54.5	53.8	50.5	44.6	42.6	86.4
66	11/8/2016 9:09	1:00:00	49.4	62.2	34.3	55.3	54.2	42.2	37.4	36.8	84
67	11/8/2016 10:09	1:00:00	38.8	57.9	28.8	44.9	40.6	34.1	31.4	31.1	75
68	11/8/2016 11:09	1:00:00	45.7	71.5	31	45.6	43.4	37.4	34	33.4	88
69	11/8/2016 12:09	1:00:00	40.2	59.8	26.5	45.4	42.6	34.3	30.4	29.3	82.8
70	11/8/2016 13:09	0:33:49	36.9	68.7	23.2	37.4	34.1	28.4	26	25.7	94.4

Time Period	Max	Min	Geo Mean	Lp90
Daytime (7am - 7pm)	56	30	42	34
Evening (7pm - 11am)	43	28	36	28
Nighttime (11pm - 7am)	49	23	30	23

Appendix C
November 5, 2016 Weather for Debert, Nova Scotia

Date/Time	Temp (°C)	Dew Point Temp (°C)	Rel Hum (%)	Wind Dir (10s deg)	Wind Spd (km/h)	Stn Press (kPa)
11/5/2016 0:00	2.1	-0.5	83	30	11	101.05
11/5/2016 1:00	1.5	-1.2	82	30	9	101.11
11/5/2016 2:00	0.7	-2.2	81	30	12	101.12
11/5/2016 3:00	0.7	-2.7	78	31	7	101.14
11/5/2016 4:00	0.7	-2.9	77	31	15	101.16
11/5/2016 5:00	0.3	-3.2	77	32	12	101.21
11/5/2016 6:00	-0.5	-3.5	80	32	12	101.25
11/5/2016 7:00	-0.8	-3.9	79	32	11	101.3
11/5/2016 8:00	-0.7	-3.2	83	29	3	101.35
11/5/2016 9:00	0.9	-3.1	75	31	7	101.34
11/5/2016 10:00	2.4	-3.3	66	31	10	101.33
11/5/2016 11:00	3.4	-2.1	67	28	7	101.31
11/5/2016 12:00	3.1	-3.4	63	29	10	101.26
11/5/2016 13:00	4.4	-3.6	56	22	11	101.2
11/5/2016 14:00	4.3	-3	59	23	15	101.17
11/5/2016 15:00	4	-2.3	63	23	15	101.21
11/5/2016 16:00	4.1	-0.9	70	24	9	101.22
11/5/2016 17:00	2.9	-1.6	72	26	9	101.23
11/5/2016 18:00	2.2	-1.7	75	29	9	101.24
11/5/2016 19:00	1.5	-2.2	76	33	3	101.23
11/5/2016 20:00	0.6	-2	83	16	6	101.24
11/5/2016 21:00	0.3	-1.9	86	6	4	101.27
11/5/2016 22:00	-1.3	-2.7	90	4	4	101.26
11/5/2016 23:00	-1	-2.3	91	0	1	101.24

Source: Environment Canada

Appendix C
November 6, 2016 Weather for Debert, Nova Scotia

Date/Time	Temp (°C)	Dew Point Temp (°C)	Rel Hum (%)	Wind Dir (10s deg)	Wind Spd (km/h)	Stn Press (kPa)
11/6/2016 0:00	-0.2	-1.7	89	6	4	101.23
11/6/2016 1:00	-0.3	-1.9	89	4	5	101.23
11/6/2016 2:00	-0.6	-1.9	91	7	7	101.24
11/6/2016 3:00	0.3	-1.4	88	8	3	101.25
11/6/2016 4:00	0.4	-1.3	88	5	4	101.23
11/6/2016 5:00	0.8	-1.2	86	6	7	101.25
11/6/2016 6:00	0.9	-1	87	5	6	101.28
11/6/2016 7:00	1.3	-0.8	86	6	6	101.31
11/6/2016 8:00	1.5	-0.3	88		0	101.37
11/6/2016 9:00	2	-0.3	84	16	3	101.44
11/6/2016 10:00	2.9	0.4	83	16	2	101.46
11/6/2016 11:00	3.8	1.2	83	11	5	101.52
11/6/2016 12:00	5.5	1.3	75	3	10	101.51
11/6/2016 13:00	6.1	1.4	72	2	11	101.51
11/6/2016 14:00	6.3	1.7	72	3	11	101.55
11/6/2016 15:00	5.6	2.1	78	1	11	101.63
11/6/2016 16:00	5.2	2.5	83	3	12	101.7
11/6/2016 17:00	4.6	2.7	88	3	6	101.79
11/6/2016 18:00	4.4	2.8	90	1	8	101.89
11/6/2016 19:00	4.2	2.2	87	3	18	101.98
11/6/2016 20:00	4	1.6	85	4	17	102.08
11/6/2016 21:00	3.9	1.6	85	3	16	102.16
11/6/2016 22:00	3.8	1.6	86	2	12	102.2
11/6/2016 23:00	3.2	1	85	3	13	102.2

Source: Environment Canada

Appendix C
November 7, 2016 Weather for Debert, Nova Scotia

Date/Time	Temp (°C)	Dew Point Temp (°C)	Rel Hum (%)	Wind Dir (10s deg)	Wind Spd (km/h)	Stn Press (kPa)
11/7/2016 0:00	2.2	0.3	87	4	9	102.2
11/7/2016 1:00	2	0.2	88	36	7	102.24
11/7/2016 2:00	2.8	0.7	86	1	8	102.3
11/7/2016 3:00	3.4	1	84	3	10	102.33
11/7/2016 4:00	2.9	0.1	82	2	11	102.4
11/7/2016 5:00	2.8	-0.1	81	3	7	102.44
11/7/2016 6:00	1.5	-0.8	85	35	16	102.43
11/7/2016 7:00	0.4	-1.5	87	2	9	102.52
11/7/2016 8:00	1.3	-1.2	84	2	4	102.53
11/7/2016 9:00	3.8	-0.5	73	3	12	102.55
11/7/2016 10:00	4.7	-0.8	67	3	12	102.54
11/7/2016 11:00	5.4	0	68	1	17	102.51
11/7/2016 12:00	5.6	-0.7	64	1	15	102.43
11/7/2016 13:00	6.1	-1.4	59	2	15	102.34
11/7/2016 14:00	5.9	-1.3	60	2	15	102.31
11/7/2016 15:00	5.9	-1.7	58	7	11	102.28
11/7/2016 16:00	5.7	-1.7	59	9	7	102.27
11/7/2016 17:00	3.3	-1.9	69	2	6	102.24
11/7/2016 18:00	0.1	-2.3	84	2	5	102.25
11/7/2016 19:00	-0.2	-2.2	87	0	1	102.21
11/7/2016 20:00	-1.3	-2.6	91	1	3	102.15
11/7/2016 21:00	-2.3	-3.7	90	0	1	102.11
11/7/2016 22:00	-2.6	-3.8	92	8	3	102.07
11/7/2016 23:00	-2.9	-3.9	93	11	6	102.07

Source: Environment Canada

Appendix C
November 8, 2016 Weather for Debert, Nova Scotia

Date/Time	Temp (°C)	Dew Point Temp (°C)	Rel Hum (%)	Wind Dir (10s deg)	Wind Spd (km/h)	Stn Press (kPa)
11/8/2016 0:00	-3.1	-4.3	92	7	1	101.98
11/8/2016 1:00	-4.3	-5.1	94	7	7	101.94
11/8/2016 2:00	-3.8	-4.6	94	36	1	101.82
11/8/2016 3:00	-4.1	-5	93	11	4	101.79
11/8/2016 4:00	-4.3	-5.2	93	13	6	101.73
11/8/2016 5:00	-4.3	-5.1	94	4	9	101.75
11/8/2016 6:00	-5	-6.1	92	4	3	101.76
11/8/2016 7:00	-4.8	-5.7	94	36	1	101.7
11/8/2016 8:00	-3.1	-4.4	91	6	3	101.69
11/8/2016 9:00	1	-1.4	84	34	1	101.64
11/8/2016 10:00	3.5	-0.5	75	0	1	101.56
11/8/2016 11:00	6.1	0	65	21	4	101.54
11/8/2016 12:00	8.5	-1.2	51	23	5	101.4
11/8/2016 13:00	9.4	-2.3	44	24	5	101.29
11/8/2016 14:00	10.4	-0.5	47	25	7	101.16
11/8/2016 15:00	10.3	0.2	50	21	8	101.13
11/8/2016 16:00	9.9	0.6	52	25	5	101.09
11/8/2016 17:00	5.7	0.4	69	28	1	101.04
11/8/2016 18:00	3	0	81	32	1	100.96
11/8/2016 19:00	2.6	-0.2	82	36	3	100.91
11/8/2016 20:00	1	-0.9	87	3	4	100.86
11/8/2016 21:00	-0.1	-1.7	89	0	1	100.76
11/8/2016 22:00	-1.6	-3	90	2	5	100.71
11/8/2016 23:00	-2	-3.3	91	1	2	100.72

Source: Environment Canada

Appendix D

Water Chemistry Fall 2016, Maxxam Analytics

Your Project #: 16-4517
Site Location: GLENHOLME
Your C.O.C. #: D07615

Dillon Consulting Limited
137 Chain Lake Dr
Suite 100
Halifax, NS
B3S 1B3

Report Date: 2016/10/25
Report #: R4222930
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B6M3119
Received: 2016/10/17, 15:56

Sample Matrix: Water
Samples Received: 3

Analyses	Quantity	Date	Date	Laboratory Method	Reference
		Extracted	Analyzed		
Carbonate, Bicarbonate and Hydroxide	3	N/A	2016/10/21	N/A	SM 22 4500-CO2 D
Alkalinity	3	N/A	2016/10/24	ATL SOP 00013	EPA 310.2 R1974 m
Chloride	3	N/A	2016/10/24	ATL SOP 00014	SM 22 4500-Cl- E m
Colour	3	N/A	2016/10/24	ATL SOP 00020	SM 22 2120C m
Conductance - water	3	N/A	2016/10/20	ATL SOP 00004	SM 22 2510B m
Hardness (calculated as CaCO3)	3	N/A	2016/10/21	ATL SOP 00048	SM 22 2340 B
Metals Water Total MS	3	2016/10/19	2016/10/20	ATL SOP 00058	EPA 6020A R1 m
Ion Balance (% Difference)	3	N/A	2016/10/25		Auto Calc.
Anion and Cation Sum	3	N/A	2016/10/25		Auto Calc.
Nitrogen Ammonia - water	3	N/A	2016/10/24	ATL SOP 00015	EPA 350.1 R2 m
Nitrogen - Nitrate + Nitrite	3	N/A	2016/10/25	ATL SOP 00016	USGS SOPINCF0452.2 m
Nitrogen - Nitrite	3	N/A	2016/10/25	ATL SOP 00017	SM 22 4500-NO2- B m
Nitrogen - Nitrate (as N)	3	N/A	2016/10/25	ATL SOP 00018	ASTM D3867-16
pH (1)	3	N/A	2016/10/20	ATL SOP 00003	SM 22 4500-H+ B m
Phosphorus - ortho	3	N/A	2016/10/24	ATL SOP 00021	EPA 365.2 m
Sat. pH and Langelier Index (@ 20C)	3	N/A	2016/10/25	ATL SOP 00049	Auto Calc.
Sat. pH and Langelier Index (@ 4C)	3	N/A	2016/10/25	ATL SOP 00049	Auto Calc.
Reactive Silica	3	N/A	2016/10/25	ATL SOP 00022	EPA 366.0 m
Sulphate	3	N/A	2016/10/24	ATL SOP 00023	ASTMD516-11 m
Total Dissolved Solids (TDS calc)	3	N/A	2016/10/25		Auto Calc.
Organic carbon - Total (TOC) (2)	3	N/A	2016/10/24	ATL SOP 00037	SM 22 5310C m
Total Suspended Solids	3	2016/10/19	2016/10/21	ATL SOP 00007	SM 22 2540D m
Turbidity	2	N/A	2016/10/21	ATL SOP 00011	EPA 180.1 R2 m
Turbidity	1	N/A	2016/10/24	ATL SOP 00011	EPA 180.1 R2 m

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) The APHA Standard Method require pH to be analyzed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the APHA Standard Method holding time.

(2) TOC / DOC present in the sample should be considered as non-purgeable TOC / DOC.

Your Project #: 16-4517
Site Location: GLENHOLME
Your C.O.C. #: D07615

Dillon Consulting Limited
137 Chain Lake Dr
Suite 100
Halifax, NS
B3S 1B3

Report Date: 2016/10/25
Report #: R4222930
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B6M3119
Received: 2016/10/17, 15:56

Encryption Key



Sara Mason
Project Manager Assistant
25 Oct 2016 17:20:04 -03:00

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Heather Macumber, Project Manager
Email: HMacumber@maxxam.ca
Phone# (902)420-0203 Ext:226

=====
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Job #: B6M3119
Report Date: 2016/10/25

Dillon Consulting Limited
Client Project #: 16-4517
Site Location: GLENHOLME

RESULTS OF ANALYSES OF WATER

Maxxam ID		DGI745	DGI745			DGI746	DGI747		
Sampling Date		2016/10/14	2016/10/14			2016/10/14	2016/10/14		
COC Number		D07615	D07615			D07615	D07615		
	UNITS	DU POND	DU POND Lab-Dup	RDL	QC Batch	UPSTREAM BROOK	DOWNSTREAM BROOK	RDL	QC Batch

Calculated Parameters									
Anion Sum	me/L	0.760		N/A	4703893	1.87	1.95	N/A	4703893
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	19		1.0	4703888	55	54	1.0	4703888
Calculated TDS	mg/L	44		1.0	4703898	110	110	1.0	4703898
Carb. Alkalinity (calc. as CaCO3)	mg/L	ND		1.0	4703888	ND	ND	1.0	4703888
Cation Sum	me/L	0.780		N/A	4703893	1.83	1.92	N/A	4703893
Hardness (CaCO3)	mg/L	19		1.0	4703891	58	62	1.0	4703891
Ion Balance (% Difference)	%	1.30		N/A	4703892	1.08	0.780	N/A	4703892
Langelier Index (@ 20C)	N/A	-2.25			4703896	-0.791	-0.697		4703896
Langelier Index (@ 4C)	N/A	-2.50			4703897	-1.04	-0.948		4703897
Nitrate (N)	mg/L	ND		0.050	4704716	0.21	0.19	0.050	4704716
Saturation pH (@ 20C)	N/A	9.35			4703896	8.30	8.28		4703896
Saturation pH (@ 4C)	N/A	9.60			4703897	8.55	8.53		4703897

Inorganics									
Total Alkalinity (Total as CaCO3)	mg/L	19		5.0	4712298	55	54	5.0	4712298
Dissolved Chloride (Cl)	mg/L	14		1.0	4712302	24	27	1.0	4712302
Colour	TCU	50		10	4712316	70	100	25	4712316
Nitrate + Nitrite (N)	mg/L	ND		0.050	4712320	0.21	0.19	0.050	4712320
Nitrite (N)	mg/L	ND		0.010	4712321	ND	ND	0.010	4712321
Nitrogen (Ammonia Nitrogen)	mg/L	0.072		0.050	4714822	0.29	0.17	0.050	4714822
Total Organic Carbon (C)	mg/L	6.7		0.50	4714771	7.9	10	0.50	4714771
Orthophosphate (P)	mg/L	ND		0.010	4712318	0.013	0.012	0.010	4712318
pH	pH	7.10	7.14	N/A	4710397	7.51	7.58	N/A	4710397
Reactive Silica (SiO2)	mg/L	3.3		0.50	4712315	10	8.6	0.50	4712315
Total Suspended Solids	mg/L	1.4		1.0	4707589	ND	5.6	1.0	4707589
Dissolved Sulphate (SO4)	mg/L	ND		2.0	4712303	3.5	3.5	2.0	4712303
Turbidity	NTU	1.1	1.2	0.10	4714674	0.58	2.9	0.10	4712453
Conductivity	uS/cm	79	78	1.0	4710401	180	190	1.0	4710401

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable
ND = Not detected

Maxxam Job #: B6M3119
Report Date: 2016/10/25

Dillon Consulting Limited
Client Project #: 16-4517
Site Location: GLENHOLME

ELEMENTS BY ICP/MS (WATER)

Maxxam ID		DGI745	DGI746	DGI747		
Sampling Date		2016/10/14	2016/10/14	2016/10/14		
COC Number		D07615	D07615	D07615		
	UNITS	DU POND	UPSTREAM BROOK	DOWNSTREAM BROOK	RDL	QC Batch
Metals						
Total Aluminum (Al)	ug/L	18	42	120	5.0	4707388
Total Antimony (Sb)	ug/L	ND	ND	ND	1.0	4707388
Total Arsenic (As)	ug/L	ND	ND	ND	1.0	4707388
Total Barium (Ba)	ug/L	5.9	57	62	1.0	4707388
Total Beryllium (Be)	ug/L	ND	ND	ND	1.0	4707388
Total Bismuth (Bi)	ug/L	ND	ND	ND	2.0	4707388
Total Boron (B)	ug/L	ND	ND	ND	50	4707388
Total Cadmium (Cd)	ug/L	ND	ND	ND	0.010	4707388
Total Calcium (Ca)	ug/L	4900	20000	22000	100	4707388
Total Chromium (Cr)	ug/L	ND	ND	ND	1.0	4707388
Total Cobalt (Co)	ug/L	ND	ND	ND	0.40	4707388
Total Copper (Cu)	ug/L	ND	ND	ND	2.0	4707388
Total Iron (Fe)	ug/L	340	120	200	50	4707388
Total Lead (Pb)	ug/L	ND	ND	ND	0.50	4707388
Total Magnesium (Mg)	ug/L	1700	1900	1900	100	4707388
Total Manganese (Mn)	ug/L	11	16	10	2.0	4707388
Total Molybdenum (Mo)	ug/L	ND	ND	ND	2.0	4707388
Total Nickel (Ni)	ug/L	ND	ND	ND	2.0	4707388
Total Phosphorus (P)	ug/L	ND	ND	ND	100	4707388
Total Potassium (K)	ug/L	790	1300	1400	100	4707388
Total Selenium (Se)	ug/L	ND	ND	ND	1.0	4707388
Total Silver (Ag)	ug/L	ND	ND	ND	0.10	4707388
Total Sodium (Na)	ug/L	8200	14000	15000	100	4707388
Total Strontium (Sr)	ug/L	20	64	69	2.0	4707388
Total Thallium (Tl)	ug/L	ND	ND	ND	0.10	4707388
Total Tin (Sn)	ug/L	ND	ND	ND	2.0	4707388
Total Titanium (Ti)	ug/L	ND	ND	3.5	2.0	4707388
Total Uranium (U)	ug/L	ND	0.28	0.28	0.10	4707388
Total Vanadium (V)	ug/L	ND	ND	ND	2.0	4707388
Total Zinc (Zn)	ug/L	ND	ND	ND	5.0	4707388
RDL = Reportable Detection Limit QC Batch = Quality Control Batch ND = Not detected						

Maxxam Job #: B6M3119
Report Date: 2016/10/25

Dillon Consulting Limited
Client Project #: 16-4517
Site Location: GLENHOLME

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	7.0°C
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Results relate only to the items tested.

Maxxam Job #: B6M3119
Report Date: 2016/10/25

Dillon Consulting Limited
Client Project #: 16-4517
Site Location: GLENHOLME

QUALITY ASSURANCE REPORT

QA/QC			Parameter	Date	Value	Recovery	UNITS	QC Limits
Batch	Init	QC Type		Analyzed				
4707388	MLB	Matrix Spike	Total Aluminum (Al)	2016/10/20		107	%	80 - 120
			Total Antimony (Sb)	2016/10/20		101	%	80 - 120
			Total Arsenic (As)	2016/10/20		95	%	80 - 120
			Total Barium (Ba)	2016/10/20		NC	%	80 - 120
			Total Beryllium (Be)	2016/10/20		105	%	80 - 120
			Total Bismuth (Bi)	2016/10/20		96	%	80 - 120
			Total Boron (B)	2016/10/20		106	%	80 - 120
			Total Cadmium (Cd)	2016/10/20		96	%	80 - 120
			Total Calcium (Ca)	2016/10/20		NC	%	80 - 120
			Total Chromium (Cr)	2016/10/20		95	%	80 - 120
			Total Cobalt (Co)	2016/10/20		96	%	80 - 120
			Total Copper (Cu)	2016/10/20		93	%	80 - 120
			Total Iron (Fe)	2016/10/20		NC	%	80 - 120
			Total Lead (Pb)	2016/10/20		95	%	80 - 120
			Total Magnesium (Mg)	2016/10/20		98	%	80 - 120
			Total Manganese (Mn)	2016/10/20		NC	%	80 - 120
			Total Molybdenum (Mo)	2016/10/20		103	%	80 - 120
			Total Nickel (Ni)	2016/10/20		95	%	80 - 120
			Total Phosphorus (P)	2016/10/20		101	%	80 - 120
			Total Potassium (K)	2016/10/20		100	%	80 - 120
			Total Selenium (Se)	2016/10/20		97	%	80 - 120
			Total Silver (Ag)	2016/10/20		95	%	80 - 120
			Total Sodium (Na)	2016/10/20		NC	%	80 - 120
			Total Strontium (Sr)	2016/10/20		NC	%	80 - 120
			Total Thallium (Tl)	2016/10/20		98	%	80 - 120
			Total Tin (Sn)	2016/10/20		103	%	80 - 120
			Total Titanium (Ti)	2016/10/20		96	%	80 - 120
			Total Uranium (U)	2016/10/20		101	%	80 - 120
			Total Vanadium (V)	2016/10/20		100	%	80 - 120
			Total Zinc (Zn)	2016/10/20		95	%	80 - 120
4707388	MLB	Spiked Blank	Total Aluminum (Al)	2016/10/20		102	%	80 - 120
			Total Antimony (Sb)	2016/10/20		99	%	80 - 120
			Total Arsenic (As)	2016/10/20		95	%	80 - 120
			Total Barium (Ba)	2016/10/20		97	%	80 - 120
			Total Beryllium (Be)	2016/10/20		101	%	80 - 120
			Total Bismuth (Bi)	2016/10/20		100	%	80 - 120
			Total Boron (B)	2016/10/20		105	%	80 - 120
			Total Cadmium (Cd)	2016/10/20		97	%	80 - 120
			Total Calcium (Ca)	2016/10/20		99	%	80 - 120
			Total Chromium (Cr)	2016/10/20		96	%	80 - 120
			Total Cobalt (Co)	2016/10/20		98	%	80 - 120
			Total Copper (Cu)	2016/10/20		96	%	80 - 120
			Total Iron (Fe)	2016/10/20		97	%	80 - 120
			Total Lead (Pb)	2016/10/20		98	%	80 - 120
			Total Magnesium (Mg)	2016/10/20		100	%	80 - 120
			Total Manganese (Mn)	2016/10/20		98	%	80 - 120
			Total Molybdenum (Mo)	2016/10/20		102	%	80 - 120
			Total Nickel (Ni)	2016/10/20		99	%	80 - 120
			Total Phosphorus (P)	2016/10/20		100	%	80 - 120
			Total Potassium (K)	2016/10/20		102	%	80 - 120
			Total Selenium (Se)	2016/10/20		96	%	80 - 120
			Total Silver (Ag)	2016/10/20		98	%	80 - 120
			Total Sodium (Na)	2016/10/20		97	%	80 - 120

Maxxam Job #: B6M3119
Report Date: 2016/10/25

Dillon Consulting Limited
Client Project #: 16-4517
Site Location: GLENHOLME

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Strontium (Sr)	2016/10/20		99	%	80 - 120
			Total Thallium (Tl)	2016/10/20		99	%	80 - 120
			Total Tin (Sn)	2016/10/20		102	%	80 - 120
			Total Titanium (Ti)	2016/10/20		100	%	80 - 120
			Total Uranium (U)	2016/10/20		100	%	80 - 120
			Total Vanadium (V)	2016/10/20		99	%	80 - 120
			Total Zinc (Zn)	2016/10/20		96	%	80 - 120
4707388	MLB	Method Blank	Total Aluminum (Al)	2016/10/20	ND, RDL=5.0		ug/L	
			Total Antimony (Sb)	2016/10/20	ND, RDL=1.0		ug/L	
			Total Arsenic (As)	2016/10/20	ND, RDL=1.0		ug/L	
			Total Barium (Ba)	2016/10/20	ND, RDL=1.0		ug/L	
			Total Beryllium (Be)	2016/10/20	ND, RDL=1.0		ug/L	
			Total Bismuth (Bi)	2016/10/20	ND, RDL=2.0		ug/L	
			Total Boron (B)	2016/10/20	ND, RDL=50		ug/L	
			Total Cadmium (Cd)	2016/10/20	ND, RDL=0.010		ug/L	
			Total Calcium (Ca)	2016/10/20	ND, RDL=100		ug/L	
			Total Chromium (Cr)	2016/10/20	ND, RDL=1.0		ug/L	
			Total Cobalt (Co)	2016/10/20	ND, RDL=0.40		ug/L	
			Total Copper (Cu)	2016/10/20	ND, RDL=2.0		ug/L	
			Total Iron (Fe)	2016/10/20	ND, RDL=50		ug/L	
			Total Lead (Pb)	2016/10/20	0.90, RDL=0.50		ug/L	
			Total Magnesium (Mg)	2016/10/20	ND, RDL=100		ug/L	
			Total Manganese (Mn)	2016/10/20	ND, RDL=2.0		ug/L	
			Total Molybdenum (Mo)	2016/10/20	ND, RDL=2.0		ug/L	
			Total Nickel (Ni)	2016/10/20	ND, RDL=2.0		ug/L	
			Total Phosphorus (P)	2016/10/20	ND, RDL=100		ug/L	
			Total Potassium (K)	2016/10/20	ND, RDL=100		ug/L	
			Total Selenium (Se)	2016/10/20	ND, RDL=1.0		ug/L	

Maxxam Job #: B6M3119
Report Date: 2016/10/25

Dillon Consulting Limited
Client Project #: 16-4517
Site Location: GLENHOLME

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Silver (Ag)	2016/10/20	ND, RDL=0.10		ug/L	
			Total Sodium (Na)	2016/10/20	ND, RDL=100		ug/L	
			Total Strontium (Sr)	2016/10/20	ND, RDL=2.0		ug/L	
			Total Thallium (Tl)	2016/10/20	ND, RDL=0.10		ug/L	
			Total Tin (Sn)	2016/10/20	ND, RDL=2.0		ug/L	
			Total Titanium (Ti)	2016/10/20	ND, RDL=2.0		ug/L	
			Total Uranium (U)	2016/10/20	ND, RDL=0.10		ug/L	
			Total Vanadium (V)	2016/10/20	ND, RDL=2.0		ug/L	
			Total Zinc (Zn)	2016/10/20	ND, RDL=5.0		ug/L	
4707388	MLB	RPD	Total Aluminum (Al)	2016/10/20	1.3		%	20
			Total Boron (B)	2016/10/20	2.7		%	20
			Total Copper (Cu)	2016/10/20	NC		%	20
			Total Iron (Fe)	2016/10/20	NC		%	20
			Total Phosphorus (P)	2016/10/20	NC		%	20
			Total Zinc (Zn)	2016/10/20	0.33		%	20
4707589	MM9	QC Standard	Total Suspended Solids	2016/10/21		96	%	80 - 120
4707589	MM9	Method Blank	Total Suspended Solids	2016/10/21	ND, RDL=1.0		mg/L	
4707589	MM9	RPD	Total Suspended Solids	2016/10/21	NC		%	25
4710397	JMV	QC Standard	pH	2016/10/20		100	%	N/A
4710397	JMV	RPD [DGI745-02]	pH	2016/10/20	0.59		%	N/A
4710401	JMV	Spiked Blank	Conductivity	2016/10/20		102	%	80 - 120
4710401	JMV	Method Blank	Conductivity	2016/10/20	1.5, RDL=1.0		uS/cm	
4710401	JMV	RPD [DGI745-02]	Conductivity	2016/10/20	0.99		%	25
4712298	MCN	Matrix Spike	Total Alkalinity (Total as CaCO3)	2016/10/25		NC	%	80 - 120
4712298	MCN	Spiked Blank	Total Alkalinity (Total as CaCO3)	2016/10/24		103	%	80 - 120
4712298	MCN	Method Blank	Total Alkalinity (Total as CaCO3)	2016/10/24	ND, RDL=5.0		mg/L	
4712298	MCN	RPD	Total Alkalinity (Total as CaCO3)	2016/10/25	NC		%	25
4712302	MCN	Matrix Spike	Dissolved Chloride (Cl)	2016/10/24		NC	%	80 - 120
4712302	MCN	QC Standard	Dissolved Chloride (Cl)	2016/10/24		110	%	80 - 120
4712302	MCN	Spiked Blank	Dissolved Chloride (Cl)	2016/10/24		105	%	80 - 120
4712302	MCN	Method Blank	Dissolved Chloride (Cl)	2016/10/24	1.1, RDL=1.0		mg/L	
4712302	MCN	RPD	Dissolved Chloride (Cl)	2016/10/24	3.5		%	25
4712303	KBT	Matrix Spike	Dissolved Sulphate (SO4)	2016/10/24		NC	%	80 - 120
4712303	KBT	Spiked Blank	Dissolved Sulphate (SO4)	2016/10/24		104	%	80 - 120
4712303	KBT	Method Blank	Dissolved Sulphate (SO4)	2016/10/24	ND, RDL=2.0		mg/L	
4712303	KBT	RPD	Dissolved Sulphate (SO4)	2016/10/24	3.8		%	25
4712315	MCN	Matrix Spike	Reactive Silica (SiO2)	2016/10/24		101	%	80 - 120

Maxxam Job #: B6M3119
Report Date: 2016/10/25

Dillon Consulting Limited
Client Project #: 16-4517
Site Location: GLENHOLME

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
4712315	MCN	Spiked Blank	Reactive Silica (SiO ₂)	2016/10/25		101	%	80 - 120
4712315	MCN	Method Blank	Reactive Silica (SiO ₂)	2016/10/25	ND, RDL=0.50		mg/L	
4712315	MCN	RPD	Reactive Silica (SiO ₂)	2016/10/24	NC		%	25
4712316	MCN	Spiked Blank	Colour	2016/10/24		97	%	80 - 120
4712316	MCN	Method Blank	Colour	2016/10/24	ND, RDL=5.0		TCU	
4712316	MCN	RPD	Colour	2016/10/24	NC		%	20
4712318	MCN	Matrix Spike	Orthophosphate (P)	2016/10/24		51 (1)	%	80 - 120
4712318	MCN	Spiked Blank	Orthophosphate (P)	2016/10/24		99	%	80 - 120
4712318	MCN	Method Blank	Orthophosphate (P)	2016/10/24	ND, RDL=0.010		mg/L	
4712318	MCN	RPD	Orthophosphate (P)	2016/10/24	7.4		%	25
4712320	KBT	Matrix Spike	Nitrate + Nitrite (N)	2016/10/25		NC	%	80 - 120
4712320	KBT	Spiked Blank	Nitrate + Nitrite (N)	2016/10/25		95	%	80 - 120
4712320	KBT	Method Blank	Nitrate + Nitrite (N)	2016/10/25	ND, RDL=0.050		mg/L	
4712320	KBT	RPD	Nitrate + Nitrite (N)	2016/10/25	2.3		%	25
4712321	KBT	Matrix Spike	Nitrite (N)	2016/10/25		NC	%	80 - 120
4712321	KBT	Spiked Blank	Nitrite (N)	2016/10/25		98	%	80 - 120
4712321	KBT	Method Blank	Nitrite (N)	2016/10/25	ND, RDL=0.010		mg/L	
4712321	KBT	RPD	Nitrite (N)	2016/10/25	1.6		%	25
4712453	JMV	QC Standard	Turbidity	2016/10/21		101	%	80 - 120
4712453	JMV	Spiked Blank	Turbidity	2016/10/21		96	%	80 - 120
4712453	JMV	Method Blank	Turbidity	2016/10/21	ND, RDL=0.10		NTU	
4712453	JMV	RPD	Turbidity	2016/10/21	NC		%	20
4714674	JMV	QC Standard	Turbidity	2016/10/24		100	%	80 - 120
4714674	JMV	Spiked Blank	Turbidity	2016/10/24		97	%	80 - 120
4714674	JMV	Method Blank	Turbidity	2016/10/24	ND, RDL=0.10		NTU	
4714674	JMV	RPD [DGI745-02]	Turbidity	2016/10/24	8.8		%	20
4714771	SMT	Matrix Spike	Total Organic Carbon (C)	2016/10/24		105	%	80 - 120
4714771	SMT	Spiked Blank	Total Organic Carbon (C)	2016/10/24		106	%	80 - 120
4714771	SMT	Method Blank	Total Organic Carbon (C)	2016/10/24	ND, RDL=0.50		mg/L	
4714771	SMT	RPD	Total Organic Carbon (C)	2016/10/24	NC		%	20
4714822	NRG	Matrix Spike	Nitrogen (Ammonia Nitrogen)	2016/10/24		99	%	80 - 120
4714822	NRG	Spiked Blank	Nitrogen (Ammonia Nitrogen)	2016/10/24		104	%	80 - 120
4714822	NRG	Method Blank	Nitrogen (Ammonia Nitrogen)	2016/10/24	ND, RDL=0.050		mg/L	

Maxxam Job #: B6M3119
Report Date: 2016/10/25

Dillon Consulting Limited
Client Project #: 16-4517
Site Location: GLENHOLME

QUALITY ASSURANCE REPORT(CONT'D)

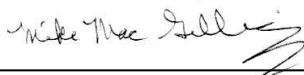
QA/QC				Date				
Batch	Init	QC Type	Parameter	Analyzed	Value	Recovery	UNITS	QC Limits
4714822	NRG	RPD	Nitrogen (Ammonia Nitrogen)	2016/10/24	NC		%	20
<p>N/A = Not Applicable</p> <p>Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.</p> <p>Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.</p> <p>QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.</p> <p>Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.</p> <p>Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.</p> <p>NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).</p> <p>NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).</p> <p>(1) Poor spike recovery due to sample matrix, recovery confirmed with repeat analysis.</p>								

Maxxam Job #: B6M3119
Report Date: 2016/10/25

Dillon Consulting Limited
Client Project #: 16-4517
Site Location: GLENHOLME

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Mike MacGillivray, Scientific Specialist (Inorganics)

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Your Project #: PENDING
 Site Location: GLENHOLME
 Your C.O.C. #: D 07616

Dillon Consulting Limited
 137 Chain Lake Dr
 Suite 100
 Halifax, NS
 B3S 1B3

Report Date: 2016/10/04
 Report #: R4189897
 Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B6K7621
Received: 2016/09/27, 11:55

Sample Matrix: Water
 # Samples Received: 1

Analyses	Date		Laboratory Method	Reference
	Quantity	Extracted		
Carbonate, Bicarbonate and Hydroxide	1	N/A	2016/09/29 N/A	SM 22 4500-CO2 D
Alkalinity	1	N/A	2016/10/03 ATL SOP 00013	EPA 310.2 R1974 m
Chloride	1	N/A	2016/10/04 ATL SOP 00014	SM 22 4500-Cl- E m
Colour	1	N/A	2016/10/04 ATL SOP 00020	SM 22 2120C m
Conductance - water	1	N/A	2016/09/29 ATL SOP 00004	SM 22 2510B m
Hardness (calculated as CaCO3)	1	N/A	2016/09/29 ATL SOP 00048	SM 22 2340 B
Metals Water Total MS	1	2016/09/28	2016/09/28 ATL SOP 00058	EPA 6020A R1 m
Ion Balance (% Difference)	1	N/A	2016/10/04	Auto Calc.
Anion and Cation Sum	1	N/A	2016/10/04	Auto Calc.
Nitrogen Ammonia - water	1	N/A	2016/10/03 ATL SOP 00015	EPA 350.1 R2 m
Nitrogen - Nitrate + Nitrite	1	N/A	2016/10/04 ATL SOP 00016	USGS SOPINCF0452.2 m
Nitrogen - Nitrite	1	N/A	2016/10/03 ATL SOP 00017	SM 22 4500-NO2- B m
Nitrogen - Nitrate (as N)	1	N/A	2016/10/04 ATL SOP 00018	ASTM D3867-16
pH (3)	1	N/A	2016/09/29 ATL SOP 00003	SM 22 4500-H+ B m
Phosphorus - ortho	1	N/A	2016/10/04 ATL SOP 00021	EPA 365.2 m
Sat. pH and Langelier Index (@ 20C)	1	N/A	2016/10/04 ATL SOP 00049	Auto Calc.
Sat. pH and Langelier Index (@ 4C)	1	N/A	2016/10/04 ATL SOP 00049	Auto Calc.

Your Project #: PENDING
Site Location: GLENHOLME
Your C.O.C. #: D 07616

Dillon Consulting Limited
137 Chain Lake Dr
Suite 100
Halifax, NS
B3S 1B3

Report Date: 2016/10/04
Report #: R4189897
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B6K7621
Received: 2016/09/27, 11:55

Sample Matrix: Water
Samples Received: 1

Analyses	Date		Laboratory Method	Reference
	Quantity	Extracted		
Reactive Silica	1	N/A	2016/10/04 ATL SOP 00022	EPA 366.0 m
Sulphate	1	N/A	2016/10/04 ATL SOP 00023	ASTMD516-11 m
Total Dissolved Solids (TDS calc)	1	N/A	2016/10/04	Auto Calc.
Organic carbon - Total (TOC) (4)	1	N/A	2016/10/04 ATL SOP 00037	SM 22 5310C m
Turbidity	1	N/A	2016/09/29 ATL SOP 00011	EPA 180.1 R2 m

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

- (1) Soils are reported on a dry weight basis unless otherwise specified.
- (2) Sample(s) were not field preserved for VPH when received at the laboratory. Analytical results for VPH parameters should be regarded as minimum values.
- (3) The APHA Standard Method require pH to be analyzed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the APHA Standard Method holding time.
- (4) TOC / DOC present in the sample should be considered as non-purgeable TOC / DOC.

Encryption Key



Maxxam
04 Oct 2016 16:38:32 -03:00

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Heather Macumber, Project Manager

Email: HMacumber@maxxam.ca

Phone# (902)420-0203 Ext:226

=====

This report has been generated and distributed using a secure automated process.

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Maxxam Job #: B6K7621
Report Date: 2016/10/04

Dillon Consulting Limited
Client Project #: PENDING
Site Location: GLENHOLME
Sampler Initials: KSR

RESULTS OF ANALYSES OF WATER

Maxxam ID		DDK545	DDK545		
Sampling Date		2016/09/26 11:40	2016/09/26 11:40		
COC Number		D 07616	D 07616		
	UNITS	16SW01	16SW01 Lab-Dup	RDL	QC Batch
Calculated Parameters					
Anion Sum	me/L	0.330		N/A	4678492
Bicarb. Alkalinity (calc. as CaCO ₃)	mg/L	9.4		1.0	4677395
Calculated TDS	mg/L	21		1.0	4678494
Carb. Alkalinity (calc. as CaCO ₃)	mg/L	<1.0		1.0	4677395
Cation Sum	me/L	0.380		N/A	4678492
Hardness (CaCO ₃)	mg/L	8.5		1.0	4678490
Ion Balance (% Difference)	%	7.04		N/A	4678491
Langelier Index (@ 20C)	N/A	-3.21			4677403
Langelier Index (@ 4C)	N/A	-3.46			4677404
Nitrate (N)	mg/L	<0.050		0.050	4678493
Saturation pH (@ 20C)	N/A	9.96			4677403
Saturation pH (@ 4C)	N/A	10.2			4677404
Inorganics					
Total Alkalinity (Total as CaCO ₃)	mg/L	9.4		5.0	4685431
Dissolved Chloride (Cl)	mg/L	4.9		1.0	4685433
Colour	TCU	45		10	4685436
Nitrate + Nitrite (N)	mg/L	<0.050		0.050	4685440
Nitrite (N)	mg/L	<0.010		0.010	4685442
Nitrogen (Ammonia Nitrogen)	mg/L	0.059		0.050	4685665
Total Organic Carbon (C)	mg/L	4.8		0.50	4686115
Orthophosphate (P)	mg/L	<0.010		0.010	4685438
pH	pH	6.75		N/A	4681159
Reactive Silica (SiO ₂)	mg/L	2.1		0.50	4685435
Dissolved Sulphate (SO ₄)	mg/L	<2.0		2.0	4685434
Turbidity	NTU	1.7	1.7	0.10	4681174
Conductivity	uS/cm	34		1.0	4681160
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate					

Maxxam Job #: B6K7621
Report Date: 2016/10/04

Dillon Consulting Limited
Client Project #: PENDING
Site Location: GLENHOLME
Sampler Initials: KSR

ELEMENTS BY ICP/MS (WATER)

Maxxam ID		DDK545		
Sampling Date		2016/09/26 11:40		
COC Number		D 07616		
	UNITS	16SW01	RDL	QC Batch
Metals				
Total Aluminum (Al)	ug/L	20	5.0	4679343
Total Antimony (Sb)	ug/L	<1.0	1.0	4679343
Total Arsenic (As)	ug/L	<1.0	1.0	4679343
Total Barium (Ba)	ug/L	15	1.0	4679343
Total Beryllium (Be)	ug/L	<1.0	1.0	4679343
Total Bismuth (Bi)	ug/L	<2.0	2.0	4679343
Total Boron (B)	ug/L	<50	50	4679343
Total Cadmium (Cd)	ug/L	0.011	0.010	4679343
Total Calcium (Ca)	ug/L	2200	100	4679343
Total Chromium (Cr)	ug/L	<1.0	1.0	4679343
Total Cobalt (Co)	ug/L	<0.40	0.40	4679343
Total Copper (Cu)	ug/L	<2.0	2.0	4679343
Total Iron (Fe)	ug/L	990	50	4679343
Total Lead (Pb)	ug/L	<0.50	0.50	4679343
Total Magnesium (Mg)	ug/L	740	100	4679343
Total Manganese (Mn)	ug/L	28	2.0	4679343
Total Molybdenum (Mo)	ug/L	<2.0	2.0	4679343
Total Nickel (Ni)	ug/L	<2.0	2.0	4679343
Total Phosphorus (P)	ug/L	<100	100	4679343
Total Potassium (K)	ug/L	1000	100	4679343
Total Selenium (Se)	ug/L	<1.0	1.0	4679343
Total Silver (Ag)	ug/L	<0.10	0.10	4679343
Total Sodium (Na)	ug/L	3300	100	4679343
Total Strontium (Sr)	ug/L	11	2.0	4679343
Total Thallium (Tl)	ug/L	<0.10	0.10	4679343
Total Tin (Sn)	ug/L	<2.0	2.0	4679343
Total Titanium (Ti)	ug/L	<2.0	2.0	4679343
Total Uranium (U)	ug/L	<0.10	0.10	4679343
Total Vanadium (V)	ug/L	<2.0	2.0	4679343
Total Zinc (Zn)	ug/L	<5.0	5.0	4679343
RDL = Reportable Detection Limit				
QC Batch = Quality Control Batch				

Maxxam Job #: B6K7621
Report Date: 2016/10/04

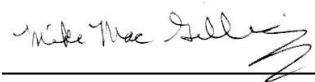
Dillon Consulting Limited
Client Project #: PENDING
Site Location: GLENHOLME
Sampler Initials: KSR

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Kevin MacDonald, Inorganics Supervisor



Mike MacGillivray, Scientific Specialist (Inorganics)



Rosemarie MacDonald, Scientific Specialist (Organics)

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Appendix E

*E1 Atlantic Canada Conservation Data Center
Data
E2 Priority Species Short List*

DATA REPORT 5692: Glenholme Quarry, NS

Prepared 11 October 2016
by J. Churchill, Data Manager

CONTENTS OF REPORT

1.0 Preface

- 1.1 Data List
- 1.2 Restrictions
- 1.3 Additional Information
- Map 1: Buffered Study Area

2.0 Rare and Endangered Species

- 2.1 Flora
- 2.2 Fauna
- Map 2: Flora and Fauna

3.0 Special Areas

- 3.1 Managed Areas
- 3.2 Significant Areas
- Map 3: Special Areas

4.0 Rare Species Lists

- 4.1 Fauna
- 4.2 Flora
- 4.3 Location Sensitive Species
- 4.4 Source Bibliography

5.0 Rare Species within 100 km

- 5.1 Source Bibliography



Map 1. A 100 km buffer around the study area

1.0 PREFACE

The Atlantic Canada Conservation Data Centre (ACCDC) is part of a network of NatureServe data centres and heritage programs serving 50 states in the U.S.A, 10 provinces and 1 territory in Canada, plus several Central and South American countries. The NatureServe network is more than 30 years old and shares a common conservation data methodology. The ACCDC was founded in 1997, and maintains data for the jurisdictions of New Brunswick, Nova Scotia, Prince Edward Island, and Newfoundland and Labrador. Although a non-governmental agency, the ACCDC is supported by 6 federal agencies and 4 provincial governments, as well as through outside grants and data processing fees. URL: www.ACCDC.com.

Upon request and for a fee, the ACCDC queries its database and produces customized reports of the rare and endangered flora and fauna known to occur in or near a specified study area. As a supplement to that data, the ACCDC includes locations of managed areas with some level of protection, and known sites of ecological interest or sensitivity.

1.1 DATA LIST

Included datasets:

Filename	Contents
GlenholmeQuaNS_5692ob.xls	All Rare and legally protected <i>Flora and Fauna</i> within 5 km of your study area
GlenholmeQuaNS_5692ob100km.xls	A list of Rare and legally protected <i>Flora and Fauna</i> within 100 km of your study area
GlenholmeQuaNS_5692ma.xls	All <i>Managed Areas</i> in your study area
GlenholmeQuaNS_5692sa.xls	All <i>Significant Natural Areas</i> in your study area
GlenholmeQuaNS_5692ff.xls	Rare and common <i>Freshwater Fish</i> in your study area (DFO database)

1.2 RESTRICTIONS

The ACCDC makes a strong effort to verify the accuracy of all the data that it manages, but it shall not be held responsible for any inaccuracies in data that it provides. By accepting ACCDC data, recipients assent to the following limits of use:

- a) Data is restricted to use by trained personnel who are sensitive to landowner interests and to potential threats to rare and/or endangered flora and fauna posed by the information provided.
- b) Data is restricted to use by the specified Data User; any third party requiring data must make its own data request.
- c) The ACCDC requires Data Users to cease using and delete data 12 months after receipt, and to make a new request for updated data if necessary at that time.
- d) ACCDC data responses are restricted to the data in our Data System at the time of the data request.
- e) Each record has an estimate of locational uncertainty, which must be referenced in order to understand the record's relevance to a particular location. Please see attached Data Dictionary for details.
- f) ACCDC data responses are not to be construed as exhaustive inventories of taxa in an area.
- g) The absence of a taxon cannot be inferred by its absence in an ACCDC data response.

1.3 ADDITIONAL INFORMATION

The attached file DataDictionary 2.1.pdf provides metadata for the data provided.

Please direct any additional questions about ACCDC data to the following individuals:

Plants, Lichens, Ranking Methods, All other Inquiries

Sean Blaney, Senior Scientist, Executive Director

Tel: (506) 364-2658

sblaney@mta.ca

Animals (Fauna)

John Klymko, Zoologist

Tel: (506) 364-2660

jklymko@mta.ca

Plant Communities

Sarah Robinson, Community Ecologist

Tel: (506) 364-2664

srobinson@mta.ca

Data Management, GIS

James Churchill, Data Manager

Tel: (902) 679-6146

jlchurchill@mta.ca

Billing

Jean Breau

Tel: (506) 364-2657

jrbreau@mta.ca

Questions on the biology of Federal Species at Risk can be directed to ACCDC: (506) 364-2658, with questions on Species at Risk regulations to: Samara Eaton, Canadian Wildlife Service (NB and PE): (506) 364-5060 or Julie McKnight, Canadian Wildlife Service (NS): (902) 426-4196.

For provincial information about rare taxa and protected areas, or information about game animals, deer yards, old growth forests, archeological sites, fish habitat etc., in New Brunswick, please contact Stewart Lusk, Natural Resources: (506) 453-7110.

For provincial information about rare taxa and protected areas, or information about game animals, deer yards, old growth forests, archeological sites, fish habitat etc., in Nova Scotia, please contact Sherman Boates, NSDNR: (902) 679-6146. To determine if location-sensitive species (section 4.3) occur near your study site please contact a NSDNR Regional Biologist:

Western: Duncan Bayne
(902) 648-3536

Duncan.Bayne@novascotia.ca

Western: Donald Sam
(902) 634-7525

Donald.Sam@novascotia.ca

Central: Shavonne Meyer
(902) 893-6353

Shavonne.Meyer@novascotia.ca

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(902) 893-5630

Kimberly.George@novascotia.ca

Eastern: Mark Pulsifer
(902) 863-7523

Mark.Pulsifer@novascotia.ca

Eastern: Donald Anderson
(902) 295-3949

Donald.Anderson@novascotia.ca

Eastern: Terry Power
(902) 563-3370

Terrance.Power@novascotia.ca

For provincial information about rare taxa and protected areas, or information about game animals, fish habitat etc., in Prince Edward Island, please contact Garry Gregory, PEI Dept. of Communities, Land and Environment: (902) 569-7595.

2.0 RARE AND ENDANGERED SPECIES

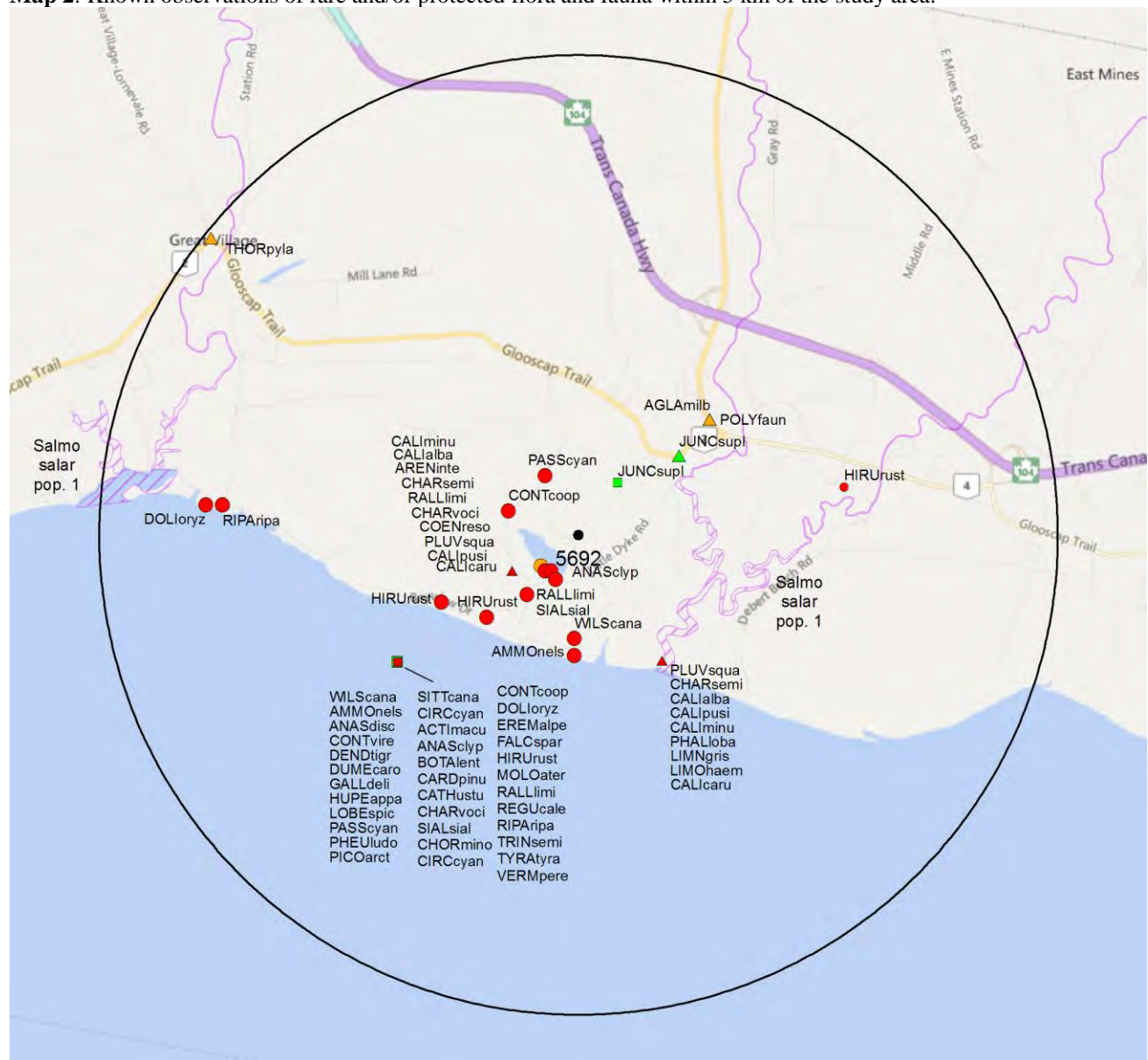
2.1 FLORA

A 5 km buffer around the study area contains 4 records of 3 vascular, no records of nonvascular flora (Map 2 and attached: *ob.xls).

2.2 FAUNA

A 5 km buffer around the study area contains 186 records of 42 vertebrate, 8 records of 4 invertebrate fauna (Map 2 and attached data files - see 1.1 Data List). Please see section 4.3 to determine if 'location-sensitive' species occur near your study site.

Map 2: Known observations of rare and/or protected flora and fauna within 5 km of the study area.



- RESOLUTION**
- 4.7 within 50s of kilometers
 - 4.0 within 10s of kilometers
 - 3.7 within 5s of kilometers
 - △ 3.0 within kilometers
 - △ 2.7 within 500s of meters
 - ◇ 2.0 within 100s of meters
 - ◇ 1.7 within 10s of meters

- HIGHER TAXON**
- vertebrate fauna
 - invertebrate fauna
 - vascular flora
 - nonvascular flora

3.0 SPECIAL AREAS

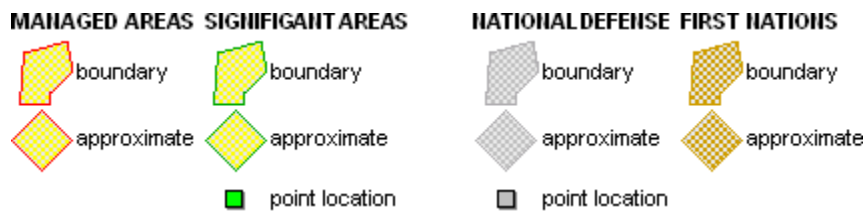
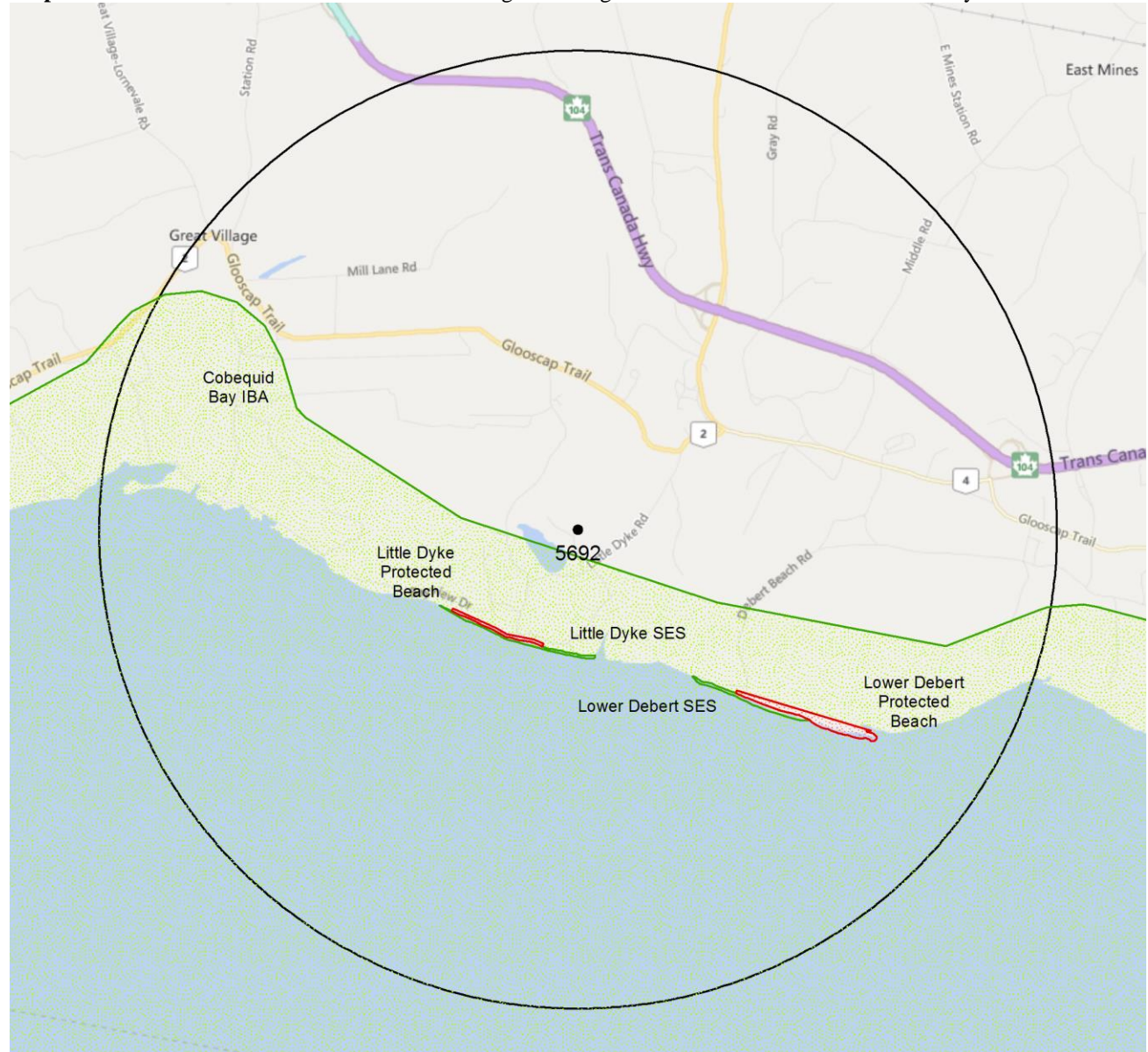
3.1 MANAGED AREAS

The GIS scan identified 2 managed areas in the vicinity of the study area (Map 3 and attached file: *ma*.xls)

3.2 SIGNIFICANT AREAS

The GIS scan identified 3 biologically significant sites in the vicinity of the study area (Map 3 and attached file: *sa*.xls)

Map 3: Boundaries and/or locations of known Managed and Significant Areas within 5 km of the study area.



4.0 RARE SPECIES LISTS

Rare and/or endangered taxa (excluding “location-sensitive” species, section 4.3) within the 5 km-buffered area listed in order of concern, beginning with legally listed taxa, with the number of observations per taxon and the distance in kilometers from study area centroid to the closest observation (\pm the precision, in km, of the record). [P] = vascular plant, [N] = nonvascular plant, [A] = vertebrate animal, [I] = invertebrate animal, [C] = community. Note: records are from attached files *ob.xls/*ob.shp only.

4.1 FLORA

	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)
P	<i>Lobelia spicata</i>	Pale-Spiked Lobelia				S1	2 May Be At Risk	1	2.3 \pm 7.0
P	<i>Juncus subcaudatus</i> var. <i>planisepalus</i>	Woods-Rush				S3	3 Sensitive	2	0.7 \pm 5.0
P	<i>Huperzia appalachiana</i>	Appalachian Fir-Clubmoss				S3	3 Sensitive	1	2.3 \pm 7.0

4.2 FAUNA

	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)
A	<i>Calidris canutus rufa</i>	Red Knot rufa ssp	Endangered		Endangered	S2M	1 At Risk	3	0.8 \pm 0.0
A	<i>Chordeiles minor</i>	Common Nighthawk	Threatened	Threatened	Threatened	S2S3B	1 At Risk	1	2.3 \pm 7.0
A	<i>Riparia riparia</i>	Bank Swallow	Threatened			S2S3B	2 May Be At Risk	7	2.3 \pm 7.0
A	<i>Hirundo rustica</i>	Barn Swallow	Threatened		Endangered	S3B	1 At Risk	8	1.3 \pm 0.0
A	<i>Contopus cooperi</i>	Olive-sided Flycatcher	Threatened	Threatened	Threatened	S3B	1 At Risk	4	0.8 \pm 0.0
A	<i>Wilsonia canadensis</i>	Canada Warbler	Threatened	Threatened	Endangered	S3S4B	1 At Risk	3	1.1 \pm 0.0
A	<i>Dolichonyx oryzivorus</i>	Bobolink	Threatened		Vulnerable	S3S4B	3 Sensitive	3	2.3 \pm 7.0
A	<i>Phalaropus lobatus</i>	Red-necked Phalarope	Special Concern			S2S3M	3 Sensitive	1	1.6 \pm 0.0
A	<i>Contopus virens</i>	Eastern Wood-Pewee	Special Concern		Vulnerable	S3S4B	3 Sensitive	1	2.3 \pm 7.0
A	<i>Sialia sialis</i>	Eastern Bluebird	Not At Risk			S3B	3 Sensitive	2	0.8 \pm 0.0
A	<i>Circus cyaneus</i>	Northern Harrier	Not At Risk			S3S4B	4 Secure	3	2.3 \pm 7.0
A	<i>Ammodramus nelsoni</i>	Nelson's Sparrow	Not At Risk			S3S4B	4 Secure	5	1.3 \pm 0.0
A	<i>Passerina cyanea</i>	Indigo Bunting				S1?B	5 Undetermined	3	0.7 \pm 0.0
A	<i>Calidris minutilla</i>	Least Sandpiper				S1B,S3M	4 Secure	10	0.8 \pm 0.0
A	<i>Charadrius semipalmatus</i>	Semipalmated Plover				S1B,S3S4M	4 Secure	27	0.8 \pm 0.0
A	<i>Limosa haemastica</i>	Hudsonian Godwit				S1S2M	3 Sensitive	1	1.6 \pm 0.0
A	<i>Anas clypeata</i>	Northern Shoveler				S2B	2 May Be At Risk	2	0.5 \pm 0.0
A	<i>Dendroica tigrina</i>	Cape May Warbler				S2B	3 Sensitive	1	2.3 \pm 7.0
A	<i>Molothrus ater</i>	Brown-headed Cowbird				S2B	4 Secure	2	2.3 \pm 7.0
A	<i>Carduelis pinus</i>	Pine Siskin				S2S3	3 Sensitive	1	2.3 \pm 7.0
A	<i>Rallus limicola</i>	Virginia Rail				S2S3B	5 Undetermined	5	0.5 \pm 0.0
A	<i>Tringa semipalmata</i>	Willet				S2S3B	2 May Be At Risk	2	2.3 \pm 7.0
A	<i>Pheucticus ludovicianus</i>	Rose-breasted Grosbeak				S2S3B	3 Sensitive	1	2.3 \pm 7.0
A	<i>Sitta canadensis</i>	Red-breasted Nuthatch				S3	4 Secure	2	2.3 \pm 7.0
A	<i>Falco sparverius</i>	American Kestrel				S3B	4 Secure	1	2.3 \pm 7.0
A	<i>Charadrius vociferus</i>	Killdeer				S3B	3 Sensitive	6	0.8 \pm 0.0
A	<i>Gallinago delicata</i>	Wilson's Snipe				S3B	3 Sensitive	2	2.3 \pm 7.0
A	<i>Tyrannus tyrannus</i>	Eastern Kingbird				S3B	3 Sensitive	3	2.3 \pm 7.0
A	<i>Dumetella carolinensis</i>	Gray Catbird				S3B	2 May Be At Risk	2	2.3 \pm 7.0
A	<i>Pluvialis squatarola</i>	Black-bellied Plover				S3M	4 Secure	5	0.8 \pm 0.0
A	<i>Arenaria interpres</i>	Ruddy Turnstone				S3M	4 Secure	1	0.8 \pm 0.0
A	<i>Calidris pusilla</i>	Semipalmated Sandpiper				S3M	3 Sensitive	28	0.8 \pm 0.0
A	<i>Limnodromus griseus</i>	Short-billed Dowitcher				S3M	4 Secure	3	1.6 \pm 0.0
A	<i>Calidris alba</i>	Sanderling				S3M,S2N	4 Secure	21	0.8 \pm 0.0
A	<i>Picoides arcticus</i>	Black-backed Woodpecker				S3S4	3 Sensitive	1	2.3 \pm 7.0
A	<i>Botaurus lentiginosus</i>	American Bittern				S3S4B	3 Sensitive	2	2.3 \pm 7.0
A	<i>Anas discors</i>	Blue-winged Teal				S3S4B	2 May Be At Risk	1	2.3 \pm 7.0
A	<i>Actitis macularius</i>	Spotted Sandpiper				S3S4B	3 Sensitive	3	2.3 \pm 7.0

	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)
A	<i>Regulus calendula</i>	Ruby-crowned Kinglet				S3S4B	3 Sensitive	3	2.3 ± 7.0
A	<i>Catharus ustulatus</i>	Swainson's Thrush				S3S4B	4 Secure	3	2.3 ± 7.0
A	<i>Vermivora peregrina</i>	Tennessee Warbler				S3S4B	3 Sensitive	2	2.3 ± 7.0
A	<i>Eremophila alpestris</i>	Horned Lark				SHB,S4S5N	4 Secure	1	2.3 ± 7.0
I	<i>Coenagrion resolutum</i>	Taiga Bluet				S1S2	2 May Be At Risk	1	0.5 ± 0.0
I	<i>Aglais milberti</i>	Milbert's Tortoiseshell				S2	4 Secure	5	1.8 ± 1.0
I	<i>Thorybes pylades</i>	Northern Cloudywing				S2S3	3 Sensitive	1	4.9 ± 1.0
I	<i>Polygona faunus</i>	Green Comma				S3	4 Secure	1	1.8 ± 1.0

4.3 LOCATION SENSITIVE SPECIES

The Department of Natural Resources in each Maritimes province considers a number of species “location sensitive”. Concern about exploitation of location-sensitive species precludes inclusion of precise coordinates in this report. Those intersecting a 5 km buffer of your study area are indicated below with “YES”.

Nova Scotia

Scientific Name	Common Name	SARA	Prov Legal Prot	Known within 5 km of Study Site?
<i>Fraxinus nigra</i>	Black Ash		Threatened	No
<i>Emydoidea blandingii</i>	Blanding's Turtle - Nova Scotia pop.	Endangered	Vulnerable	No
<i>Glyptemys insculpta</i>	Wood Turtle	Threatened	Threatened	No
<i>Falco peregrinus pop. 1</i>	Peregrine Falcon - anatum/tundrius pop.	Special Concern	Vulnerable	No
<i>Bat Hibemaculum</i>		[Endangered] ¹	[Endangered] ¹	No

¹ *Myotis lucifugus* (Little Brown Myotis), *Myotis septentrionalis* (Long-eared Myotis), and *Perimyotis subflavus* (Tri-colored Bat or Eastern Pipistrelle) are all Endangered under the Federal Species at Risk Act and the NS Endangered Species Act.

4.4 SOURCE BIBLIOGRAPHY

The recipient of these data shall acknowledge the ACCDC and the data sources listed below in any documents, reports, publications or presentations, in which this dataset makes a significant contribution.

# recs	CITATION
101	Morrison, Guy. 2011. Maritime Shorebird Survey (MSS) database. Canadian Wildlife Service, Ottawa, 15939 surveys. 86171 recs.
53	Lepage, D. 2014. Maritime Breeding Bird Atlas Database. Bird Studies Canada, Sackville NB, 407,838 recs.
31	Erskine, A.J. 1992. Maritime Breeding Bird Atlas Database. NS Museum & Nimbus Publ., Halifax, 82,125 recs.
7	Layberry, R.A. & Hall, P.W., LaFontaine, J.D. 1998. The Butterflies of Canada. University of Toronto Press. 280 pp+plates.
6	Amiro, P.G. 1998. Atlantic Salmon Inner Bay of Fundy SFA 22 & part of 23. DFO Sci. SSR D3-12.
2	Benjamin, L.K. (compiler) 2012. Significant Habitat & Species Database. NS Dept of Natural Resources.
2	Staff, DNR 2007. Restricted & Limited Use Land Database (RLUL).
2	Zinck, M. & Roland, A.E. 1998. Roland's Flora of Nova Scotia. Nova Scotia Museum, 3rd ed., rev. M. Zinck; 2 Vol., 1297 pp.
1	Bird Studies Canada & Nature Canada. 2004-10. Important Bird Areas of Canada Database. Bird Studies Canada, Port Rowan ON, 62 objects.
1	Brunelle, P.-M. (compiler). 2009. ADIP/MDDS Odonata Database: data to 2006 inclusive. Atlantic Dragonfly Inventory Program (ADIP), 24200 recs.
1	Hill, N.M. 1994. Status report on the Long's bulrush <i>Scirpus longii</i> in Canada. Committee on the Status of Endangered Wildlife in Canada, 7 recs.
1	Newell, R.E. 2005. E.C. Smith Digital Herbarium. E.C. Smith Herbarium, Irving Biodiversity Collection, Acadia University, Web site: http://luxor.acadiau.ca/library/Herbarium/project/ . 582 recs.
1	Porter, C.J.M. 2014. Field work data 2007-2014. Nova Scotia Nature Trust, 96 recs.

5.0 RARE SPECIES WITHIN 100 KM

A 100 km buffer around the study area contains 40509 records of 146 vertebrate and 1168 records of 64 invertebrate fauna; 6289 records of 306 vascular, 702 records of 94 nonvascular flora (attached: *ob100km.xls).

Taxa within 100 km of the study site that are rare and/or endangered in the province in which the study site occurs. All ranks correspond to the province in which the study site falls, even for out-of-province records. Taxa are listed in order of concern, beginning with legally listed taxa, with the number of observations per taxon and the distance in kilometers from study area centroid to the closest observation (\pm the precision, in km, of the record).

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
A	<i>Myotis lucifugus</i>	Little Brown Myotis	Endangered	Endangered	Endangered	S1	1 At Risk	44	13.1 \pm 0.0	NS
A	<i>Myotis septentrionalis</i>	Northern Long-eared Myotis	Endangered	Endangered	Endangered	S1	1 At Risk	18	13.1 \pm 0.0	NS
A	<i>Perimyotis subflavus</i>	Eastern Pipistrelle	Endangered	Endangered	Endangered	S1	1 At Risk	7	13.7 \pm 1.0	NS
A	<i>Salmo salar pop. 1</i>	Atlantic Salmon - Inner Bay of Fundy pop.	Endangered	Endangered		S1	2 May Be At Risk	35	5.6 \pm 0.0	NS
A	<i>Charadrius melodus melodus</i>	Piping Plover melodus ssp	Endangered	Endangered	Endangered	S1B	1 At Risk	706	28.6 \pm 0.0	NS
A	<i>Sterna dougallii</i>	Roseate Tern	Endangered	Endangered	Endangered	S1B	1 At Risk	25	83.3 \pm 0.0	NS
A	<i>Morone saxatilis pop. 2</i>	Striped Bass- Bay of Fundy pop.	Endangered			S1B	2 May Be At Risk	4	44.0 \pm 0.0	NS
A	<i>Dermodochelys coriacea (Atlantic pop.)</i>	Leatherback Sea Turtle - Atlantic pop.	Endangered	Endangered		S1S2N		3	81.8 \pm 1.0	NB
A	<i>Calidris canutus rufa</i>	Red Knot rufa ssp	Endangered		Endangered	S2M	1 At Risk	547	0.8 \pm 0.0	NS
A	<i>Caprimulgus vociferus</i>	Whip-Poor-Will	Threatened	Threatened	Threatened	S1?B	1 At Risk	15	44.4 \pm 7.0	NS
A	<i>Catharus bicknelli</i>	Bicknell's Thrush	Threatened	Special Concern	Endangered	S1S2B	1 At Risk	1	62.6 \pm 7.0	NS
A	<i>Glyptemys insculpta</i>	Wood Turtle	Threatened	Threatened	Threatened	S2	3 Sensitive	212	8.9 \pm 5.0	NS
A	<i>Acipenser oxyrinchus</i>	Atlantic Sturgeon	Threatened			S2	2 May Be At Risk	5	31.4 \pm 0.0	NS
A	<i>Anguilla rostrata</i>	American Eel	Threatened			S2	4 Secure	9	6.3 \pm 0.0	NS
A	<i>Chaetura pelagica</i>	Chimney Swift	Threatened	Threatened	Endangered	S2B,S1M	1 At Risk	197	17.8 \pm 0.0	NS
A	<i>Chordeiles minor</i>	Common Nighthawk	Threatened	Threatened	Threatened	S2S3B	1 At Risk	408	2.3 \pm 7.0	NS
A	<i>Riparia riparia</i>	Bank Swallow	Threatened			S2S3B	2 May Be At Risk	607	2.3 \pm 7.0	NS
A	<i>Hirundo rustica</i>	Barn Swallow	Threatened		Endangered	S3B	1 At Risk	1200	1.3 \pm 0.0	NS
A	<i>Contopus cooperi</i>	Olive-sided Flycatcher	Threatened	Threatened	Threatened	S3B	1 At Risk	834	0.8 \pm 0.0	NS
A	<i>Wilsonia canadensis</i>	Canada Warbler	Threatened	Threatened	Endangered	S3S4B	1 At Risk	768	1.1 \pm 0.0	NS
A	<i>Dolichonyx oryzivorus</i>	Bobolink	Threatened		Vulnerable	S3S4B	3 Sensitive	937	2.3 \pm 7.0	NS
A	<i>Sturnella magna</i>	Eastern Meadowlark	Threatened			SHB	3 Sensitive	4	60.6 \pm 7.0	NS
A	<i>Ixobrychus exilis</i>	Least Bittern	Threatened	Threatened		SUB	5 Undetermined	9	71.1 \pm 7.0	NS
A	<i>Hylocichla mustelina</i>	Wood Thrush	Threatened			SUB	5 Undetermined	39	18.2 \pm 7.0	NS
A	<i>Passerculus sandwichensis princeps</i>	Savannah Sparrow princeps ssp	Special Concern	Special Concern		S1B	3 Sensitive	1	83.7 \pm 0.0	NS
A	<i>Falco peregrinus pop. 1</i>	Peregrine Falcon - anatum/tundrius	Special Concern	Special Concern	Vulnerable	S1B,SNAM	3 Sensitive	210	41.9 \pm 0.0	NS
A	<i>Bucephala islandica (Eastern pop.)</i>	Barrow's Goldeneye - Eastern pop.	Special Concern	Special Concern		S1N	1 At Risk	8	54.5 \pm 1.0	NS
A	<i>Asio flammeus</i>	Short-eared Owl	Special Concern	Special Concern		S1S2B	2 May Be At Risk	43	49.3 \pm 7.0	NS
A	<i>Euphagus carolinus</i>	Rusty Blackbird	Special Concern	Special Concern	Endangered	S2B	2 May Be At Risk	215	19.7 \pm 0.0	NS
A	<i>Histrionicus histrionicus pop. 1</i>	Harlequin Duck - Eastern pop.	Special Concern	Special Concern	Endangered	S2N	1 At Risk	6	93.3 \pm 0.0	NS
A	<i>Phalaropus lobatus</i>	Red-necked Phalarope	Special Concern			S2S3M	3 Sensitive	11	1.6 \pm 0.0	NS
A	<i>Chelydra serpentina</i>	Snapping Turtle	Special Concern	Special Concern	Vulnerable	S3	3 Sensitive	76	12.6 \pm 0.0	NS
A	<i>Contopus virens</i>	Eastern Wood-Pewee	Special Concern		Vulnerable	S3S4B	3 Sensitive	769	2.3 \pm 7.0	NS
A	<i>Phocoena phocoena (NW Atlantic pop.)</i>	Harbour Porpoise - Northwest Atlantic pop.	Special Concern	Threatened		S4		1	97.9 \pm 1.0	NS
A	<i>Podiceps auritus</i>	Horned Grebe	Special Concern			S4N	4 Secure	14	84.3 \pm 0.0	NB
A	<i>Tryngites subruficollis</i>	Buff-breasted Sandpiper	Special Concern			SNA	8 Accidental	7	85.2 \pm 0.0	NS
A	<i>Lynx canadensis</i>	Canadian Lynx	Not At Risk		Endangered	S1	1 At Risk	2	95.2 \pm 1.0	NB

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
A	<i>Accipiter cooperii</i>	Cooper's Hawk	Not At Risk			S1?B	5 Undetermined	4	61.0 ± 7.0	NS
A	<i>Fulica americana</i>	American Coot	Not At Risk			S1B	5 Undetermined	44	17.4 ± 0.0	NS
A	<i>Chlidonias niger</i>	Black Tern	Not At Risk			S1B	2 May Be At Risk	35	71.1 ± 7.0	NS
A	<i>Sorex dispar</i>	Long-tailed Shrew	Not At Risk	Special Concern		S2	3 Sensitive	3	16.8 ± 5.0	NS
A	<i>Aegolius funereus</i>	Boreal Owl	Not At Risk			S2?B	5 Undetermined	9	11.9 ± 7.0	NS
A	<i>Glaucomys volans</i>	Southern Flying Squirrel	Not At Risk	Special Concern		S2S3	3 Sensitive	6	69.3 ± 10.0	NS
A	<i>Globicephala melas</i>	Long-finned Pilot Whale	Not At Risk			S2S3		1	61.2 ± 100.0	NS
A	<i>Hemidactylium scutatum</i>	Four-toed Salamander	Not At Risk			S3	4 Secure	27	36.7 ± 0.0	NS
A	<i>Sterna hirundo</i>	Common Tern	Not At Risk			S3B	3 Sensitive	323	40.1 ± 0.0	NS
A	<i>Sialia sialis</i>	Eastern Bluebird	Not At Risk			S3B	3 Sensitive	124	0.8 ± 0.0	NS
A	<i>Buteo lagopus</i>	Rough-legged Hawk	Not At Risk			S3N	4 Secure	4	82.6 ± 1.0	NB
A	<i>Accipiter gentilis</i>	Northern Goshawk	Not At Risk			S3S4	4 Secure	137	13.9 ± 7.0	NS
A	<i>Lagenorhynchus acutus</i>	Atlantic White-sided Dolphin	Not At Risk			S3S4		2	92.1 ± 1.0	PE
A	<i>Circus cyaneus</i>	Northern Harrier	Not At Risk			S3S4B	4 Secure	455	2.3 ± 7.0	NS
A	<i>Ammodramus nelsoni</i>	Nelson's Sparrow	Not At Risk			S3S4B	4 Secure	226	1.3 ± 0.0	NS
A	<i>Alces americanus</i>	Moose			Endangered	S1	1 At Risk	77	10.3 ± 3.0	NS
A	<i>Salmo salar</i>	Atlantic Salmon				S1	2 May Be At Risk	54	31.6 ± 50.0	NS
A	<i>Picoides dorsalis</i>	American Three-toed Woodpecker				S1?	5 Undetermined	2	56.7 ± 0.0	NS
A	<i>Passerina cyanea</i>	Indigo Bunting				S1?B	5 Undetermined	20	0.7 ± 0.0	NS
A	<i>Nycticorax nycticorax</i>	Black-crowned Night-heron				S1B	2 May Be At Risk	2	85.0 ± 1.0	NB
A	<i>Anas acuta</i>	Northern Pintail				S1B	2 May Be At Risk	86	8.2 ± 7.0	NS
A	<i>Oxyura jamaicensis</i>	Ruddy Duck				S1B	4 Secure	53	71.1 ± 7.0	NS
A	<i>Gallinula chloropus</i>	Common Moorhen				S1B	5 Undetermined	26	41.0 ± 7.0	NS
A	<i>Myiarchus crinitus</i>	Great Crested Flycatcher				S1B	2 May Be At Risk	34	22.8 ± 7.0	NS
A	<i>Cistothorus palustris</i>	Marsh Wren				S1B	5 Undetermined	24	71.1 ± 7.0	NS
A	<i>Mimus polyglottos</i>	Northern Mockingbird				S1B	4 Secure	88	31.9 ± 7.0	NS
A	<i>Toxostoma rufum</i>	Brown Thrasher				S1B	5 Undetermined	17	13.5 ± 0.0	NS
A	<i>Vireo gilvus</i>	Warbling Vireo				S1B	5 Undetermined	31	33.9 ± 7.0	NS
A	<i>Dendroica pinus</i>	Pine Warbler				S1B	5 Undetermined	44	8.2 ± 7.0	NS
A	<i>Calidris minutilla</i>	Least Sandpiper				S1B,S3M	4 Secure	1083	0.8 ± 0.0	NS
A	<i>Charadrius semipalmatus</i>	Semipalmated Plover				S1B,S3S4M	4 Secure	1561	0.8 ± 0.0	NS
A	<i>Pluvialis dominica</i>	American Golden-Plover				S1S2M	3 Sensitive	160	7.4 ± 0.0	NS
A	<i>Limosa haemastica</i>	Hudsonian Godwit				S1S2M	3 Sensitive	178	1.6 ± 0.0	NS
A	<i>Vireo philadelphicus</i>	Philadelphia Vireo				S2?B	5 Undetermined	37	20.1 ± 7.0	NS
A	<i>Anas clypeata</i>	Northern Shoveler				S2B	2 May Be At Risk	122	0.5 ± 0.0	NS
A	<i>Anas strepera</i>	Gadwall				S2B	2 May Be At Risk	158	21.4 ± 7.0	NS
A	<i>Empidonax traillii</i>	Willow Flycatcher				S2B	3 Sensitive	43	12.9 ± 0.0	NS
A	<i>Dendroica tigrina</i>	Cape May Warbler				S2B	3 Sensitive	220	2.3 ± 7.0	NS
A	<i>Piranga olivacea</i>	Scarlet Tanager				S2B	5 Undetermined	29	18.8 ± 7.0	NS
A	<i>Pooecetes gramineus</i>	Vesper Sparrow				S2B	2 May Be At Risk	74	18.8 ± 7.0	NS
A	<i>Molothrus ater</i>	Brown-headed Cowbird				S2B	4 Secure	182	2.3 ± 7.0	NS
A	<i>Bucephala clangula</i>	Common Goldeneye				S2B,S5N	4 Secure	115	11.0 ± 5.0	NS
A	<i>Branta bernicla</i>	Brant				S2M	3 Sensitive	21	59.5 ± 0.0	NS
A	<i>Phalacrocorax carbo</i>	Great Cormorant				S2S3	3 Sensitive	70	80.9 ± 7.0	NS
A	<i>Asio otus</i>	Long-eared Owl				S2S3	2 May Be At Risk	28	29.8 ± 7.0	NS
A	<i>Carduelis pinus</i>	Pine Siskin				S2S3	3 Sensitive	422	2.3 ± 7.0	NS
A	<i>Cathartes aura</i>	Turkey Vulture				S2S3B	3 Sensitive	87	44.3 ± 0.0	NS
A	<i>Rallus limicola</i>	Virginia Rail				S2S3B	5 Undetermined	75	0.5 ± 0.0	NS
A	<i>Tringa semipalmata</i>	Willet				S2S3B	2 May Be At Risk	760	2.3 ± 7.0	NS
A	<i>Petrochelidon pyrrhonota</i>	Cliff Swallow				S2S3B	2 May Be At Risk	411	12.0 ± 7.0	NS
A	<i>Pheucticus ludovicianus</i>	Rose-breasted Grosbeak				S2S3B	3 Sensitive	486	2.3 ± 7.0	NS
A	<i>Icterus galbula</i>	Baltimore Oriole				S2S3B	2 May Be At Risk	73	8.2 ± 7.0	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
A	<i>Pinicola enucleator</i>	Pine Grosbeak				S2S3B,S5N	2 May Be At Risk	120	11.9 ± 7.0	NS
A	<i>Numenius phaeopus hudsonicus</i>	Hudsonian Whimbrel				S2S3M	3 Sensitive	182	18.2 ± 0.0	NS
A	<i>Calidris melanotos</i>	Pectoral Sandpiper				S2S3M	4 Secure	303	7.4 ± 0.0	NS
A	<i>Phalaropus fulicarius</i>	Red Phalarope				S2S3M	3 Sensitive	2	89.2 ± 0.0	NS
A	<i>Perisoreus canadensis</i>	Gray Jay				S3	3 Sensitive	546	8.2 ± 7.0	NS
A	<i>Poecile hudsonica</i>	Boreal Chickadee				S3	3 Sensitive	593	8.2 ± 7.0	NS
A	<i>Sitta canadensis</i>	Red-breasted Nuthatch				S3	4 Secure	1016	2.3 ± 7.0	NS
A	<i>Alosa pseudoharengus</i>	Alewife				S3	3 Sensitive	24	16.4 ± 0.0	NS
A	<i>Salvelinus fontinalis</i>	Brook Trout				S3	3 Sensitive	23	47.3 ± 0.0	NS
A	<i>Sorex maritimensis</i>	Maritime Shrew				S3	4 Secure	105	82.7 ± 1.0	NB
A	<i>Synaptomys cooperi</i>	Southern Bog Lemming				S3	4 Secure	1	67.9 ± 0.0	NS
A	<i>Pekania pennanti</i>	Fisher				S3	3 Sensitive	2	71.0 ± 0.0	NS
A	<i>Calidris maritima</i>	Purple Sandpiper				S3?N	3 Sensitive	64	50.5 ± 15.0	NS
A	<i>Calcarius lapponicus</i>	Lapland Longspur				S3?N	4 Secure	33	83.2 ± 2.0	NB
A	<i>Falco sparverius</i>	American Kestrel				S3B	4 Secure	499	2.3 ± 7.0	NS
A	<i>Charadrius vociferus</i>	Killdeer				S3B	3 Sensitive	775	0.8 ± 0.0	NS
A	<i>Gallinago delicata</i>	Wilson's Snipe				S3B	3 Sensitive	725	2.3 ± 7.0	NS
A	<i>Sterna paradisaea</i>	Arctic Tern				S3B	2 May Be At Risk	27	82.7 ± 0.0	NB
A	<i>Coccyzus erythrophthalmus</i>	Black-billed Cuckoo				S3B	2 May Be At Risk	105	8.2 ± 7.0	NS
A	<i>Tyrannus tyrannus</i>	Eastern Kingbird				S3B	3 Sensitive	374	2.3 ± 7.0	NS
A	<i>Dumetella carolinensis</i>	Gray Catbird				S3B	2 May Be At Risk	514	2.3 ± 7.0	NS
A	<i>Wilsonia pusilla</i>	Wilson's Warbler				S3B	3 Sensitive	101	8.2 ± 7.0	NS
A	<i>Tringa melanoleuca</i>	Greater Yellowlegs				S3B,S3S4M	3 Sensitive	1684	7.4 ± 0.0	NS
A	<i>Oceanodroma leucorhoa</i>	Leach's Storm-Petrel				S3B,S5M	4 Secure	9	83.9 ± 0.0	NS
A	<i>Rissa tridactyla</i>	Black-legged Kittiwake				S3B,S5N	3 Sensitive	1	28.0 ± 0.0	NS
A	<i>Fratercula arctica</i>	Atlantic Puffin				S3B,S5N	3 Sensitive	1	85.4 ± 0.0	NB
A	<i>Pluvialis squatarola</i>	Black-bellied Plover				S3M	4 Secure	1515	0.8 ± 0.0	NS
A	<i>Tringa flavipes</i>	Lesser Yellowlegs				S3M	4 Secure	1058	7.4 ± 0.0	NS
A	<i>Arenaria interpres</i>	Ruddy Turnstone				S3M	4 Secure	609	0.8 ± 0.0	NS
A	<i>Calidris pusilla</i>	Semipalmated Sandpiper				S3M	3 Sensitive	1965	0.8 ± 0.0	NS
A	<i>Calidris fuscicollis</i>	White-rumped Sandpiper				S3M	4 Secure	983	10.2 ± 0.0	NS
A	<i>Limnodromus griseus</i>	Short-billed Dowitcher				S3M	4 Secure	1206	1.6 ± 0.0	NS
A	<i>Calidris alba</i>	Sanderling				S3M,S2N	4 Secure	1318	0.8 ± 0.0	NS
A	<i>Chroicocephalus ridibundus</i>	Black-headed Gull				S3N	4 Secure	4	76.7 ± 7.0	NS
A	<i>Somateria mollissima</i>	Common Eider				S3S4	4 Secure	211	41.9 ± 7.0	NS
A	<i>Picoides arcticus</i>	Black-backed Woodpecker				S3S4	3 Sensitive	173	2.3 ± 7.0	NS
A	<i>Loxia curvirostra</i>	Red Crossbill				S3S4	4 Secure	174	8.2 ± 7.0	NS
A	<i>Sorex palustris</i>	American Water Shrew				S3S4	4 Secure	1	82.7 ± 1.0	NB
A	<i>Botaurus lentiginosus</i>	American Bittern				S3S4B	3 Sensitive	325	2.3 ± 7.0	NS
A	<i>Anas discors</i>	Blue-winged Teal				S3S4B	2 May Be At Risk	246	2.3 ± 7.0	NS
A	<i>Actitis macularia</i>	Spotted Sandpiper				S3S4B	3 Sensitive	741	2.3 ± 7.0	NS
A	<i>Empidonax flaviventris</i>	Yellow-bellied Flycatcher				S3S4B	3 Sensitive	620	8.2 ± 7.0	NS
A	<i>Regulus calendula</i>	Ruby-crowned Kinglet				S3S4B	3 Sensitive	1482	2.3 ± 7.0	NS
A	<i>Catharus fuscescens</i>	Veery				S3S4B	4 Secure	480	8.2 ± 7.0	NS
A	<i>Catharus ustulatus</i>	Swainson's Thrush				S3S4B	4 Secure	1420	2.3 ± 7.0	NS
A	<i>Vermivora peregrina</i>	Tennessee Warbler				S3S4B	3 Sensitive	413	2.3 ± 7.0	NS
A	<i>Dendroica castanea</i>	Bay-breasted Warbler				S3S4B	3 Sensitive	513	8.2 ± 7.0	NS
A	<i>Dendroica striata</i>	Blackpoll Warbler				S3S4B	3 Sensitive	101	11.9 ± 7.0	NS
A	<i>Passerella iliaca</i>	Fox Sparrow				S3S4B	4 Secure	42	12.0 ± 7.0	NS
A	<i>Coccothraustes vespertinus</i>	Evening Grosbeak				S3S4B,S3N	4 Secure	448	8.2 ± 7.0	NS
A	<i>Mergus serrator</i>	Red-breasted Merganser				S3S4B,S5N	4 Secure	131	21.4 ± 7.0	NS
A	<i>Bucephala albeola</i>	Bufflehead				S3S4N	4 Secure	42	43.7 ± 11.0	NS

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A	<i>Leucophaeus atricilla</i>	Laughing Gull				SHB	4 Secure	6	80.7 ± 0.0	NB
A	<i>Progne subis</i>	Purple Martin				SHB	2 May Be At Risk	22	37.0 ± 7.0	NS
A	<i>Eremophila alpestris</i>	Horned Lark				SHB,S4S5N	4 Secure	18	2.3 ± 7.0	NS
A	<i>Morus bassanus</i>	Northern Gannet				SHB,S5M	4 Secure	58	79.5 ± 0.0	NB
A	<i>Aythya americana</i>	Redhead				SHB,SNAM	4 Secure	5	71.1 ± 7.0	NS
I	<i>Gomphus ventricosus</i>	Skillet Clubtail	Endangered			S1	2 May Be At Risk	2	50.8 ± 0.0	NS
I	<i>Barnea truncata</i>	Atlantic Mud-piddock	Threatened			S1	1 At Risk	1	18.2 ± 1.0	NS
I	<i>Alasmidonta varicosa</i>	Brook Floater	Special Concern		Threatened	S1S2	3 Sensitive	11	30.1 ± 0.0	NS
I	<i>Danaus plexippus</i>	Monarch	Special Concern	Special Concern		S2B	3 Sensitive	111	18.0 ± 0.0	NS
I	<i>Bombus terricola</i>	Yellow-banded Bumblebee	Special Concern			S3	3 Sensitive	4	41.4 ± 0.0	NS
I	<i>Cicindela formosa</i>	Big Sand Tiger Beetle				S1	2 May Be At Risk	1	81.1 ± 1.0	NS
I	<i>Satyrrium acadica</i>	Acadian Hairstreak				S1	5 Undetermined	8	8.9 ± 0.0	NS
I	<i>Erora laeta</i>	Early Hairstreak				S1	2 May Be At Risk	1	92.9 ± 0.0	PE
I	<i>Neurocordulia michaeli</i>	Broadtailed Shadowdragon				S1		9	76.6 ± 0.0	NS
I	<i>Somatochlora brevicincta</i>	Quebec Emerald				S1	2 May Be At Risk	2	67.3 ± 1.0	NS
I	<i>Leptodea ochracea</i>	Tidewater Mucket				S1	3 Sensitive	22	56.9 ± 0.0	NS
I	<i>Strophitus undulatus</i>	Creeper				S1	2 May Be At Risk	6	45.3 ± 0.0	NS
I	<i>Polygonia comma</i>	Eastern Comma				S1?	1 At Risk	9	64.2 ± 1.0	NS
I	<i>Polygonia satyrus</i>	Satyr Comma				S1?	3 Sensitive	2	84.2 ± 1.0	NS
I	<i>Nymphalis l-album</i>	Compton Tortoiseshell				S1S2	4 Secure	9	8.2 ± 1.0	NS
I	<i>Somatochlora kennedyi</i>	Kennedy's Emerald				S1S2	2 May Be At Risk	7	59.7 ± 1.0	NS
I	<i>Coenagrion resolutum</i>	Taiga Bluet				S1S2	2 May Be At Risk	11	0.5 ± 0.0	NS
I	<i>Stylurus scudderii</i>	Zebra Clubtail				S1S2	2 May Be At Risk	6	46.7 ± 1.0	NS
I	<i>Lycaena hyllus</i>	Bronze Copper				S2	4 Secure	40	43.5 ± 0.0	NS
I	<i>Lycaena dospassosi</i>	Salt Marsh Copper				S2	1 At Risk	58	43.2 ± 0.0	NS
I	<i>Satyrrium calanus</i>	Banded Hairstreak				S2	5 Undetermined	10	8.2 ± 1.0	NS
I	<i>Satyrrium calanus falacer</i>	Banded Hairstreak				S2	1 At Risk	2	84.9 ± 0.0	NS
I	<i>Boloria chariclea</i>	Arctic Fritillary				S2	3 Sensitive	13	8.2 ± 1.0	NS
I	<i>Aglais milberti</i>	Milbert's Tortoiseshell				S2	4 Secure	15	1.8 ± 1.0	NS
I	<i>Epithea princeps</i>	Prince Baskettail				S2	3 Sensitive	16	33.6 ± 1.0	NS
I	<i>Somatochlora williamsoni</i>	Williamson's Emerald				S2	2 May Be At Risk	5	78.2 ± 0.0	NS
I	<i>Williamsonia fletcheri</i>	Ebony Boghaunter				S2	2 May Be At Risk	8	38.3 ± 0.0	NS
I	<i>Enallagma signatum</i>	Orange Bluet				S2	2 May Be At Risk	3	58.3 ± 0.0	NS
I	<i>Margaritifera margaritifera</i>	Eastern Pearlshell				S2	3 Sensitive	129	11.3 ± 0.0	NS
I	<i>Pantala hymenaea</i>	Spot-Winged Glider				S2?B	3 Sensitive	7	67.3 ± 1.0	NS
I	<i>Thorybes pylades</i>	Northern Cloudywing				S2S3	3 Sensitive	9	4.9 ± 1.0	NS
I	<i>Amblyscirtes hegon</i>	Pepper and Salt Skipper				S2S3	4 Secure	21	48.8 ± 1.0	NS
I	<i>Satyrrium liparops</i>	Striped Hairstreak				S2S3	5 Undetermined	9	49.7 ± 1.0	NS
I	<i>Satyrrium liparops strigosum</i>	Striped Hairstreak				S2S3	3 Sensitive	3	84.9 ± 0.0	NS
I	<i>Euphydryas phaeton</i>	Baltimore Checkerspot				S2S3	4 Secure	20	10.5 ± 1.0	NS
I	<i>Gomphus descriptus</i>	Harpoon Clubtail				S2S3	3 Sensitive	2	33.6 ± 1.0	NS
I	<i>Ophiogomphus aspersus</i>	Brook Snaketail				S2S3	2 May Be At Risk	6	44.0 ± 0.0	NS
I	<i>Ophiogomphus mainensis</i>	Maine Snaketail				S2S3	2 May Be At Risk	15	66.8 ± 0.0	NS
I	<i>Ophiogomphus rupinsulensis</i>	Rusty Snaketail				S2S3	2 May Be At Risk	27	50.7 ± 0.0	NS
I	<i>Somatochlora forcipata</i>	Forcipate Emerald				S2S3	2 May Be At Risk	3	82.2 ± 1.0	NS
I	<i>Somatochlora franklini</i>	Delicate Emerald				S2S3	3 Sensitive	3	35.6 ± 1.0	NS
I	<i>Alasmidonta undulata</i>	Triangle Floater				S2S3	4 Secure	33	34.2 ± 0.0	NS
I	<i>Naemia seriata</i>	a Ladybird beetle				S3	3 Sensitive	1	64.0 ± 1.0	NS

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I	<i>Callophrys henrici</i>	Henry's Elfin				S3	4 Secure	15	52.3 ± 0.0	NS
I	<i>Callophrys lanoraieensis</i>	Bog Elfin				S3	2 May Be At Risk	11	50.6 ± 0.0	NS
I	<i>Speyeria aphrodite</i>	Aphrodite Fritillary				S3	4 Secure	18	11.2 ± 1.0	NS
I	<i>Polygonia faunus</i>	Green Comma				S3	4 Secure	15	1.8 ± 1.0	NS
I	<i>Megisto cymela</i>	Little Wood-satyr				S3	4 Secure	12	45.4 ± 0.0	NS
I	<i>Oeneis jutta</i>	Jutta Arctic				S3	2 May Be At Risk	20	40.8 ± 1.0	NS
I	<i>Aeshna clepsydra</i>	Mottled Darner				S3	4 Secure	10	47.0 ± 0.0	NS
I	<i>Aeshna constricta</i>	Lance-Tipped Darner				S3	4 Secure	23	19.7 ± 1.0	NS
I	<i>Boyeria grafiana</i>	Ocellated Darner				S3	3 Sensitive	4	32.1 ± 0.0	NS
I	<i>Gomphaeschna furcillata</i>	Harlequin Darner				S3	3 Sensitive	5	40.8 ± 1.0	NS
I	<i>Somatochlora tenebrosa</i>	Clamp-Tipped Emerald				S3	4 Secure	14	40.6 ± 1.0	NS
I	<i>Nannothemis bella</i>	Elfin Skimmer				S3	4 Secure	29	40.8 ± 1.0	NS
I	<i>Sympetrum danae</i>	Black Meadowhawk				S3	3 Sensitive	1	99.0 ± 1.0	PE
I	<i>Enallagma vernale</i>	Vernal Bluet				S3	5 Undetermined	6	16.0 ± 1.0	NS
I	<i>Amphiagrion saucium</i>	Eastern Red Damsel				S3	4 Secure	2	19.7 ± 1.0	NS
I	<i>Polygonia interrogatilis</i>	Question Mark				S3B	4 Secure	157	8.2 ± 1.0	NS
I	<i>Erynnis juvenalis</i>	Juvenal's Duskywing				S3S4	4 Secure	35	8.2 ± 1.0	NS
I	<i>Amblyscirtes vialis</i>	Common Roadside-Skipper				S3S4	4 Secure	17	48.7 ± 1.0	NS
I	<i>Polygonia progne</i>	Grey Comma				S3S4	4 Secure	25	8.2 ± 1.0	NS
I	<i>Lanthus parvulus</i>	Northern Pygmy Clubtail				S3S4	4 Secure	11	20.1 ± 0.0	NS
I	<i>Lampsilis radiata</i>	Eastern Lampmussel				S3S4	3 Sensitive	58	33.9 ± 0.0	NS
N	<i>Erioderma pedicellatum</i> (Atlantic pop.)	Boreal Felt Lichen - Atlantic pop.	Endangered	Endangered	Endangered	S1	1 At Risk	272	63.9 ± 0.0	NS
N	<i>Erioderma mollissimum</i>	Graceful Felt Lichen	Endangered		Endangered	S1S2	2 May Be At Risk	5	64.2 ± 0.0	NS
N	<i>Peltigera hydrothyrta</i>	Eastern Waterfan	Threatened			S1	2 May Be At Risk	3	15.5 ± 1.0	NS
N	<i>Anzia colpodes</i>	Black-foam Lichen	Threatened			S3	3 Sensitive	2	64.3 ± 0.0	NS
N	<i>Sclerophora peronella</i> (Nova Scotia pop.)	Frosted Glass-whiskers Lichen - Nova Scotia pop.	Special Concern	Special Concern		S1?		8	41.9 ± 0.0	NS
N	<i>Degelia plumbea</i>	Blue Felt Lichen	Special Concern	Special Concern	Vulnerable	S3	4 Secure	30	56.0 ± 0.0	NS
N	<i>Fissidens exilis</i>	Pygmy Pocket Moss	Not At Risk			S1S2	1 At Risk	3	50.6 ± 1.0	NS
N	<i>Pseudevernia cladonia</i>	Ghost Antler Lichen	Not At Risk			S2S3	3 Sensitive	6	70.1 ± 0.0	NS
N	<i>Aloina brevisrostris</i>	Short-Beaked Rigid Screw Moss				S1		1	60.7 ± 2.0	NS
N	<i>Collema cristatum</i>	Fingered Tarpaper Lichen				S1	5 Undetermined	3	58.0 ± 0.0	NS
N	<i>Peltigera lepidophora</i>	Scaly Pelt Lichen				S1	2 May Be At Risk	1	57.0 ± 0.0	NS
N	<i>Aloina rigida</i>	Aloe-Like Rigid Screw Moss				S1?	2 May Be At Risk	4	27.1 ± 0.0	NS
N	<i>Campylostelium saxicola</i>	a Moss				S1?	3 Sensitive	1	92.6 ± 0.0	PE
N	<i>Tortula obtusifolia</i>	a Moss				S1?	5 Undetermined	2	21.0 ± 1.0	NS
N	<i>Paludella squarrosa</i>	Tufted Fen Moss				S1?	3 Sensitive	2	53.1 ± 0.0	NS
N	<i>Trichodon cylindricus</i>	Cylindric Hairy-teeth Moss				S1?		1	98.1 ± 3.0	NS
N	<i>Lichina confinis</i>	Marine Seaweed Lichen				S1?	6 Not Assessed	1	97.8 ± 2.0	NS
N	<i>Aulacomnium heterostichum</i>	One-sided Groove Moss				S1S2	3 Sensitive	2	38.2 ± 1.0	NS
N	<i>Brachythecium turgidum</i>	Thick Ragged Moss				S1S2	3 Sensitive	3	96.5 ± 0.0	NS
N	<i>Ctenidium molluscum</i>	Mollusc Ctenidium moss				S1S2		1	96.9 ± 2.0	NS
N	<i>Hypnum pratense</i>	Meadow Plait Moss				S1S2	3 Sensitive	1	92.7 ± 3.0	NS
N	<i>Mnium thomsonii</i>	Thomson's Leafy Moss				S1S2	3 Sensitive	1	61.7 ± 2.0	NS
N	<i>Plagiothecium latebricola</i>	Alder Silk Moss				S1S2	3 Sensitive	1	44.0 ± 3.0	NS
N	<i>Sematophyllum demissum</i>	a Moss				S1S2	3 Sensitive	1	63.6 ± 2.0	NS

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N	<i>Timmia megapolitana</i>	Metropolitan Timmia Moss				S1S2	3 Sensitive	3	20.3 ± 0.0	NS
N	<i>Tortula mucronifolia</i>	Mucronate Screw Moss				S1S2	3 Sensitive	1	62.0 ± 3.0	NS
N	<i>Cyrtio-hypnum minutulum</i>	Tiny Cedar Moss				S1S2	3 Sensitive	1	77.6 ± 0.0	NS
N	<i>Bryohaplocladium microphyllum</i>	Tiny-leaved Haplocladium Moss				S1S2		1	8.9 ± 5.0	NS
N	<i>Anacamptodon splachnoides</i>	a Moss				S2?	3 Sensitive	2	44.0 ± 3.0	NS
N	<i>Anomodon viticulosus</i>	a Moss				S2?	3 Sensitive	1	31.0 ± 5.0	NS
N	<i>Weissia muhlenbergiana</i>	a Moss				S2?	3 Sensitive	5	61.7 ± 1.0	NS
N	<i>Atrichum angustatum</i>	Lesser Smoothcap Moss				S2?	3 Sensitive	2	19.1 ± 5.0	NS
N	<i>Bryum algovicum</i>	a Moss				S2?	3 Sensitive	1	60.7 ± 2.0	NS
N	<i>Campylium polygamum</i>	a Moss				S2?	5 Undetermined	1	63.6 ± 2.0	NS
N	<i>Campylium radicale</i>	Long-stalked Fine Wet Moss				S2?	5 Undetermined	1	92.7 ± 3.0	NS
N	<i>Dicranum condensatum</i>	Condensed Broom Moss				S2?	5 Undetermined	1	92.7 ± 3.0	NS
N	<i>Ditrichum rhynchostegium</i>	a Moss				S2?	3 Sensitive	2	78.0 ± 1.0	NS
N	<i>Fissidens taxifolius</i>	Yew-leaved Pocket Moss				S2?	3 Sensitive	2	60.7 ± 2.0	NS
N	<i>Kiaeria starkei</i>	Starke's Fork Moss				S2?	3 Sensitive	1	77.7 ± 10.0	NS
N	<i>Orthotrichum anomalum</i>	Anomalous Bristle Moss				S2?	3 Sensitive	1	67.8 ± 2.0	NS
N	<i>Philonotis marchica</i>	a Moss				S2?	5 Undetermined	2	30.2 ± 0.0	NS
N	<i>Physcomitrium collenchymatum</i>	a Moss				S2?	3 Sensitive	1	98.1 ± 0.0	NS
N	<i>Racomitrium affine</i>	a Moss				S2?	5 Undetermined	1	62.1 ± 2.0	NS
N	<i>Saelania glaucescens</i>	Blue Dew Moss				S2?	3 Sensitive	1	36.1 ± 0.0	NS
N	<i>Seligeria donniana</i>	Donian Beardless Moss				S2?	3 Sensitive	1	64.3 ± 3.0	NS
N	<i>Sematophyllum marylandicum</i>	a Moss				S2?	3 Sensitive	2	52.2 ± 6.0	NS
N	<i>Sphagnum subnitens</i>	Lustrous Peat Moss				S2?	3 Sensitive	1	87.5 ± 2.0	NS
N	<i>Tetraplodon angustatus</i>	Toothed-leaved Nitrogen Moss				S2?	3 Sensitive	1	87.5 ± 2.0	NS
N	<i>Plagiommium rostratum</i>	Long-beaked Leafy Moss				S2?	5 Undetermined	1	96.9 ± 2.0	NS
N	<i>Pseudotaxiphyllum distichaceum</i>	a Moss				S2?	3 Sensitive	1	99.7 ± 1.0	NB
N	<i>Cyrtomnium hymenophylloides</i>	Short-pointed Lantern Moss				S2?	3 Sensitive	2	36.1 ± 0.0	NS
N	<i>Platylomella lescurii</i>	a Moss				S2?	3 Sensitive	3	92.5 ± 0.0	NS
N	<i>Leptogium teretiusculum</i>	Beaded Jellyskin Lichen				S2?	3 Sensitive	3	56.8 ± 0.0	NS
N	<i>Peltigera collina</i>	Tree Pelt Lichen				S2?	3 Sensitive	2	58.3 ± 2.0	NS
N	<i>Ephemerum serratum</i>	a Moss				S2S3	3 Sensitive	5	63.6 ± 5.0	NS
N	<i>Eurhynchium hians</i>	Light Beaked Moss				S2S3	3 Sensitive	3	50.1 ± 25.0	NS
N	<i>Platydictya subtilis</i>	Bark Willow Moss				S2S3	3 Sensitive	3	44.0 ± 3.0	NS
N	<i>Tortula truncata</i>	a Moss				S2S3	3 Sensitive	3	37.3 ± 300.0	NS
N	<i>Limprichtia revolvens</i>	a Moss				S2S3	3 Sensitive	1	53.1 ± 0.0	NS
N	<i>Solorina saccata</i>	Woodland Owl Lichen				S2S3	2 May Be At Risk	4	58.0 ± 0.0	NS
N	<i>Fuscopannaria leucosticta</i>	Rimmed Shingles Lichen				S2S3	2 May Be At Risk	4	63.9 ± 0.0	NS
N	<i>Leptogium milligranum</i>	Stretched Jellyskin Lichen				S2S3	3 Sensitive	1	62.2 ± 0.0	NS
N	<i>Parmeliopsis ambigua</i>	Green Starburst Lichen				S2S3	3 Sensitive	1	77.3 ± 2.0	NS
N	<i>Umbilicaria polyphylla</i>	Petalled Rocktripe Lichen				S2S3	3 Sensitive	1	77.3 ± 2.0	NS
N	<i>Collema nigrescens</i>	Blistered Tarpaper Lichen				S3	3 Sensitive	4	35.4 ± 0.0	NS
N	<i>Sticta fuliginosa</i>	Peppered Moon Lichen				S3	3 Sensitive	14	39.8 ± 0.0	NS
N	<i>Leptogium subtile</i>	Appressed Jellyskin Lichen				S3	3 Sensitive	2	94.4 ± 0.0	NS

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N	<i>Fuscopannaria ahlneri</i>	Corrugated Shingles Lichen				S3	4 Secure	26	20.9 ± 0.0	NS
N	<i>Heterodermia speciosa</i>	Powdered Fringe Lichen				S3	4 Secure	1	56.0 ± 0.0	NS
N	<i>Leptogium corticola</i>	Blistered Jellyskin Lichen				S3	3 Sensitive	13	58.8 ± 0.0	NS
N	<i>Leptogium lichenoides</i>	Tattered Jellyskin Lichen				S3	2 May Be At Risk	5	57.3 ± 0.0	NS
N	<i>Nephroma bellum</i>	Naked Kidney Lichen				S3	3 Sensitive	1	52.1 ± 0.0	NS
N	<i>Moelleropsis nebulosa</i>	Blue-gray Moss Shingle Lichen				S3	4 Secure	24	58.8 ± 0.0	NS
N	<i>Calliergon giganteum</i>	Giant Spear Moss				S3?	3 Sensitive	2	57.7 ± 3.0	NS
N	<i>Drummondia prorepens</i>	a Moss				S3?	3 Sensitive	1	71.7 ± 5.0	NS
N	<i>Anomodon tristis</i>	a Moss				S3?	3 Sensitive	8	64.7 ± 0.0	NS
N	<i>Helodium blandowii</i>	Wetland-plume Moss				S3?	4 Secure	5	51.7 ± 3.0	NS
N	<i>Mnium stellare</i>	Star Leafy Moss				S3?	5 Undetermined	2	38.2 ± 1.0	NS
N	<i>Sphagnum riparium</i>	Streamside Peat Moss				S3?	3 Sensitive	1	96.5 ± 1.0	NS
N	<i>Cladina stygia</i>	Black-footed Reindeer Lichen				S3?	3 Sensitive	4	67.3 ± 0.0	NS
N	<i>Anomodon rugelii</i>	Rugel's Anomodon Moss				S3S4	3 Sensitive	2	64.7 ± 0.0	NS
N	<i>Dichelyma capillaceum</i>	Hairlike Dichelyma Moss				S3S4	4 Secure	1	67.2 ± 3.0	NS
N	<i>Dicranella varia</i>	a Moss				S3S4	5 Undetermined	1	98.1 ± 3.0	NS
N	<i>Encalypta procera</i>	Slender Extinguisher Moss				S3S4	4 Secure	1	64.3 ± 3.0	NS
N	<i>Myurella julacea</i>	Small Mouse-tail Moss				S3S4	3 Sensitive	1	36.1 ± 0.0	NS
N	<i>Thamnobryum alleghaniense</i>	a Moss				S3S4	3 Sensitive	3	43.8 ± 4.0	NS
N	<i>Hylocomiastrum pyrenaicum</i>	a Feather Moss				S3S4	3 Sensitive	2	64.3 ± 3.0	NS
N	<i>Leptogium saturninum</i>	Bearded Jellyskin Lichen				S3S4	5 Undetermined	1	71.4 ± 0.0	NS
N	<i>Parmeliopsis hyperopta</i>	Gray Starburst Lichen				S3S4	5 Undetermined	1	54.4 ± 1.0	NS
N	<i>Physconia detersa</i>	Bottlebrush Frost Lichen				S3S4	3 Sensitive	1	71.4 ± 0.0	NS
N	<i>Coccocarpia palmicola</i>	Salted Shell Lichen				S3S4	4 Secure	134	58.6 ± 0.0	NS
N	<i>Anaptychia palmulata</i>	Shaggy Fringed Lichen				S3S4	4 Secure	2	71.4 ± 0.0	NS
N	<i>Evernia prunastri</i>	Valley Oakmoss Lichen				S3S4	3 Sensitive	1	62.8 ± 2.0	NS
N	<i>Heterodermia neglecta</i>	Fringe Lichen				S3S4	4 Secure	9	60.2 ± 0.0	NS
P	<i>Bartonia paniculata ssp. paniculata</i>	Branched Bartonia	Threatened	Threatened		SNA		1	61.9 ± 10.0	NS
P	<i>Clethra alnifolia</i>	Coast Pepper-Bush	Special Concern	Special Concern	Vulnerable	S1	1 At Risk	2	86.2 ± 0.0	NS
P	<i>Lilaeopsis chinensis</i>	Eastern Lilaeopsis	Special Concern	Special Concern	Vulnerable	S2	3 Sensitive	16	46.1 ± 1.0	NS
P	<i>Isoetes prototypus</i>	Prototype Quillwort	Special Concern	Special Concern	Vulnerable	S2	3 Sensitive	13	17.1 ± 0.0	NS
P	<i>Floerkea proserpinacoides</i>	False Mermaidweed	Not At Risk			S2	3 Sensitive	22	28.1 ± 7.0	NS
P	<i>Helianthemum canadense</i>	Long-branched Frostweed			Endangered	S1	1 At Risk	2	82.8 ± 1.0	NS
P	<i>Cypripedium arietinum</i>	Ram's-Head Lady's-Slipper			Endangered	S1	1 At Risk	159	39.1 ± 0.0	NS
P	<i>Thuja occidentalis</i>	Eastern White Cedar			Vulnerable	S1	1 At Risk	39	22.7 ± 0.0	NS
P	<i>Acer saccharinum</i>	Silver Maple				S1	5 Undetermined	12	66.8 ± 2.0	NS
P	<i>Osmorhiza depauperata</i>	Blunt Sweet Cicely				S1	2 May Be At Risk	1	72.2 ± 5.0	NS
P	<i>Sanicula odorata</i>	Clustered Sanicle				S1	2 May Be At Risk	14	16.1 ± 10.0	NS
P	<i>Zizia aurea</i>	Golden Alexanders				S1	2 May Be At Risk	35	28.1 ± 1.0	NS
P	<i>Antennaria rosea ssp. arida</i>	Rosy Pussytoes				S1	2 May Be At Risk	1	96.5 ± 0.0	NS
P	<i>Antennaria parlinii</i>	a Pussytoes				S1	2 May Be At Risk	13	33.5 ± 7.0	NS
P	<i>Bidens hyperborea</i>	Estuary Beggarticks				S1	2 May Be At Risk	2	46.8 ± 0.0	NS
P	<i>Ageratina altissima</i>	White Snakeroot				S1	2 May Be At Risk	2	91.9 ± 10.0	NS
P	<i>Cynoglossum virginianum var. boreale</i>	Wild Comfrey				S1	2 May Be At Risk	5	58.9 ± 1.0	NS
P	<i>Draba glabella</i>	Rock Whitlow-Grass				S1	2 May Be At Risk	4	62.1 ± 0.0	NS
P	<i>Lobelia spicata</i>	Pale-Spiked Lobelia				S1	2 May Be At Risk	13	2.3 ± 7.0	NS

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P	<i>Hudsonia tomentosa</i>	Woolly Beach-heath				S1	2 May Be At Risk	9	83.2 ± 7.0	NS
P	<i>Elatine americana</i>	American Waterwort				S1	2 May Be At Risk	2	56.5 ± 0.0	NS
P	<i>Astragalus robbinsii</i> var. <i>minor</i>	Robbins' Milkvetch				S1	2 May Be At Risk	13	96.4 ± 0.0	NS
P	<i>Desmodium canadense</i>	Canada Tick-trefoil				S1	2 May Be At Risk	22	21.8 ± 5.0	NS
P	<i>Desmodium glutinosum</i>	Large Tick-Trefoil				S1	2 May Be At Risk	17	49.6 ± 0.0	NS
P	<i>Ribes americanum</i>	Wild Black Currant				S1	5 Undetermined	4	16.5 ± 1.0	NS
P	<i>Fraxinus americana</i>	White Ash				S1	2 May Be At Risk	113	8.3 ± 1.0	NS
P	<i>Fraxinus pennsylvanica</i>	Red Ash				S1	2 May Be At Risk	7	58.3 ± 2.0	NS
P	<i>Polygala polygama</i>	Racemed Milkwort				S1	5 Undetermined	1	82.4 ± 1.0	NS
P	<i>Polygonum achoreum</i>	Leathery Knotweed				S1	5 Undetermined	1	84.0 ± 0.0	NB
P	<i>Polygonum careyi</i>	Carey's Smartweed				S1	5 Undetermined	1	34.9 ± 3.0	NS
P	<i>Montia fontana</i>	Water Blinks				S1	2 May Be At Risk	3	84.4 ± 1.0	NS
P	<i>Lysimachia quadrifolia</i>	Whorled Yellow Loosestrife				S1	5 Undetermined	1	80.5 ± 0.0	NS
P	<i>Clematis occidentalis</i>	Purple Clematis				S1	2 May Be At Risk	3	70.2 ± 0.0	NS
P	<i>Ranunculus pensylvanicus</i>	Pennsylvania Buttercup				S1	2 May Be At Risk	25	30.4 ± 0.0	NS
P	<i>Amelanchier nantucketensis</i>	Nantucket Serviceberry				S1	2 May Be At Risk	1	59.1 ± 1.0	NS
P	<i>Salix myrtillifolia</i>	Blueberry Willow				S1	2 May Be At Risk	1	51.8 ± 0.0	NS
P	<i>Salix serissima</i>	Autumn Willow				S1	2 May Be At Risk	2	51.8 ± 0.0	NS
P	<i>Agalinis paupercula</i> var. <i>borealis</i>	Small-flowered Agalinis				S1		9	68.5 ± 0.0	NS
P	<i>Dirca palustris</i>	Eastern Leatherwood				S1	2 May Be At Risk	47	31.4 ± 7.0	NS
P	<i>Boehmeria cylindrica</i>	Small-spike False-nettle				S1	2 May Be At Risk	2	44.0 ± 0.0	NS
P	<i>Pilea pumila</i>	Dwarf Clearweed				S1	2 May Be At Risk	4	23.1 ± 0.0	NS
P	<i>Carex chordorrhiza</i>	Creeping Sedge				S1	2 May Be At Risk	50	73.0 ± 1.0	NS
P	<i>Carex garberi</i>	Garber's Sedge				S1	2 May Be At Risk	4	32.0 ± 0.0	NS
P	<i>Carex granularis</i>	Limestone Meadow Sedge				S1	2 May Be At Risk	1	78.2 ± 0.0	NS
P	<i>Carex gynocrates</i>	Northern Bog Sedge				S1	2 May Be At Risk	2	51.8 ± 0.0	NS
P	<i>Carex haydenii</i>	Hayden's Sedge				S1	2 May Be At Risk	3	20.1 ± 1.0	NS
P	<i>Carex pellita</i>	Woolly Sedge				S1	2 May Be At Risk	12	30.8 ± 0.0	NS
P	<i>Carex laxiflora</i>	Loose-Flowered Sedge				S1	2 May Be At Risk	1	67.5 ± 1.0	NS
P	<i>Carex ormostachya</i>	Necklace Spike Sedge				S1	2 May Be At Risk	2	87.7 ± 1.0	NB
P	<i>Carex plantaginea</i>	Plantain-Leaved Sedge				S1	2 May Be At Risk	3	24.1 ± 0.0	NS
P	<i>Carex prairea</i>	Prairie Sedge				S1	2 May Be At Risk	2	82.2 ± 1.0	NS
P	<i>Carex tenuiflora</i>	Sparse-Flowered Sedge				S1	2 May Be At Risk	2	76.4 ± 0.0	NS
P	<i>Carex viridula</i> var. <i>saxillitoralis</i>	Greenish Sedge				S1	2 May Be At Risk	4	95.8 ± 2.0	NS
P	<i>Cyperus lupulinus</i> ssp. <i>macilentus</i>	Hop Flatsedge				S1	2 May Be At Risk	2	76.8 ± 0.0	NS
P	<i>Iris prismatica</i>	Slender Blue Flag				S1	2 May Be At Risk	1	92.9 ± 100.0	NS
P	<i>Juncus secundus</i>	Secund Rush				S1	2 May Be At Risk	1	91.9 ± 0.0	NS
P	<i>Juncus vaseyi</i>	Vasey Rush				S1	2 May Be At Risk	3	34.2 ± 0.0	NS
P	<i>Allium tricoccum</i>	Wild Leek				S1	2 May Be At Risk	20	38.2 ± 0.0	NS
P	<i>Trillium grandiflorum</i>	White Trillium				S1	5 Undetermined	3	82.2 ± 1.0	NS
P	<i>Malaxis brachypoda</i>	White Adder's-Mouth				S1	2 May Be At Risk	4	38.3 ± 1.0	NS
P	<i>Spiranthes casei</i> var. <i>casei</i>	Case's Ladies'-Tresses				S1	2 May Be At Risk	1	87.4 ± 0.0	NS
P	<i>Bromus latiglumis</i>	Broad-Glumed Brome				S1	2 May Be At Risk	31	38.3 ± 0.0	NS
P	<i>Calamagrostis stricta</i> ssp. <i>inexpansa</i>	Slim-stemmed Reed Grass				S1	3 Sensitive	1	83.7 ± 1.0	NB
P	<i>Elymus wiegandii</i>	Wiegand's Wild Rye				S1	2 May Be At Risk	22	32.0 ± 0.0	NS
P	<i>Elymus hystrix</i> var.	Spreading Wild Rye				S1	2 May Be At Risk	12	16.0 ± 1.0	NS

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P	<i>bigeloviana</i>									
P	<i>Puccinellia fasciculata</i>	Saltmarsh Alkali Grass				S1	5 Undetermined	2	65.9 ± 1.0	NS
P	<i>Adiantum pedatum</i>	Northern Maidenhair Fern				S1	2 May Be At Risk	11	19.2 ± 1.0	NS
P	<i>Equisetum palustre</i>	Marsh Horsetail				S1	2 May Be At Risk	1	82.4 ± 5.0	NS
P	<i>Botrychium lunaria</i>	Common Moonwort				S1	2 May Be At Risk	3	84.4 ± 2.0	NS
P	<i>Selaginella rupestris</i>	Rock Spikemoss				S1	2 May Be At Risk	1	58.8 ± 0.0	NS
P	<i>Solidago hispida</i>	Hairy Goldenrod				S1?	2 May Be At Risk	2	81.0 ± 7.0	NS
P	<i>Suaeda rolandii</i>	Roland's Sea-Blite				S1?	2 May Be At Risk	6	28.3 ± 2.0	NS
P	<i>Crataegus robinsonii</i>	Robinson's Hawthorn				S1?	5 Undetermined	3	21.0 ± 5.0	NS
P	<i>Carex pensylvanica</i>	Pennsylvania Sedge				S1?	2 May Be At Risk	2	42.8 ± 0.0	NS
P	<i>Schoenoplectus robustus</i>	Sturdy Bulrush				S1?	5 Undetermined	2	47.7 ± 5.0	NS
P	<i>Dichanthelium acuminatum</i> var. <i>lindheimeri</i>	Woolly Panic Grass				S1?	5 Undetermined	1	76.5 ± 0.0	NS
P	<i>Fraxinus nigra</i>	Black Ash			Threatened	S1S2	1 At Risk	228	8.3 ± 1.0	NS
P	<i>Rudbeckia laciniata</i>	Cut-Leaved Coneflower				S1S2	2 May Be At Risk	25	36.8 ± 0.0	NS
P	<i>Rudbeckia laciniata</i> var. <i>gaspereauensis</i>	Cut-Leaved Coneflower				S1S2	2 May Be At Risk	7	72.5 ± 0.0	NS
P	<i>Arabis hirsuta</i> var. <i>pyncocarpa</i>	Western Hairy Rockcress				S1S2	2 May Be At Risk	1	41.9 ± 0.0	NS
P	<i>Cardamine maxima</i>	Large Toothwort				S1S2	2 May Be At Risk	2	71.0 ± 0.0	NS
P	<i>Proserpinaca intermedia</i>	Intermediate Mermaidweed				S1S2	2 May Be At Risk	2	47.8 ± 0.0	NS
P	<i>Conopholis americana</i>	American Cancer-root				S1S2	2 May Be At Risk	3	79.1 ± 0.0	NS
P	<i>Anemone virginiana</i> var. <i>alba</i>	Virginia Anemone				S1S2	3 Sensitive	5	18.2 ± 7.0	NS
P	<i>Hepatica nobilis</i> var. <i>obtusata</i>	Round-lobed Hepatica				S1S2	2 May Be At Risk	46	24.4 ± 7.0	NS
P	<i>Ranunculus sceleratus</i>	Cursed Buttercup				S1S2	2 May Be At Risk	20	71.1 ± 0.0	NS
P	<i>Gratiola neglecta</i>	Clammy Hedge-Hyssop				S1S2	3 Sensitive	11	21.4 ± 7.0	NS
P	<i>Carex livida</i> var. <i>radicaulis</i>	Livid Sedge				S1S2	2 May Be At Risk	20	55.3 ± 0.0	NS
P	<i>Juncus greenei</i>	Greene's Rush				S1S2	2 May Be At Risk	11	16.6 ± 1.0	NS
P	<i>Platanthera huronensis</i>	Fragrant Green Orchid				S1S2	5 Undetermined	1	52.2 ± 10.0	NS
P	<i>Calamagrostis stricta</i> ssp. <i>stricta</i>	Slim-stemmed Reed Grass				S1S2	3 Sensitive	6	55.1 ± 7.0	NS
P	<i>Cinna arundinacea</i>	Sweet Wood Reed Grass				S1S2	2 May Be At Risk	20	38.5 ± 0.0	NS
P	<i>Festuca subverticillata</i>	Nodding Fescue				S1S2	2 May Be At Risk	12	18.8 ± 1.0	NS
P	<i>Cryptogramma stelleri</i>	Steller's Rockbrake				S1S2	2 May Be At Risk	3	28.2 ± 0.0	NS
P	<i>Carex vacillans</i>	Estuarine Sedge				S1S3	5 Undetermined	2	76.5 ± 0.0	NB
P	<i>Conioselinum chinense</i>	Chinese Hemlock-parsley				S2	3 Sensitive	7	29.1 ± 0.0	NS
P	<i>Osmorhiza longistylis</i>	Smooth Sweet Cicely				S2	2 May Be At Risk	31	22.1 ± 5.0	NS
P	<i>Erigeron philadelphicus</i>	Philadelphia Fleabane				S2	3 Sensitive	5	55.1 ± 1.0	NS
P	<i>Lactuca hirsuta</i> var. <i>sanguinea</i>	Hairy Lettuce				S2	3 Sensitive	5	69.4 ± 7.0	NS
P	<i>Symphotrichum undulatum</i>	Wavy-leaved Aster				S2	3 Sensitive	7	58.8 ± 0.0	NS
P	<i>Symphotrichum ciliolatum</i>	Fringed Blue Aster				S2	3 Sensitive	20	16.2 ± 0.0	NS
P	<i>Impatiens pallida</i>	Pale Jewelweed				S2	3 Sensitive	2	62.1 ± 1.0	NS
P	<i>Caulophyllum thalictroides</i>	Blue Cohosh				S2	2 May Be At Risk	62	11.5 ± 7.0	NS
P	<i>Arabis drummondii</i>	Drummond's Rockcress				S2	3 Sensitive	11	28.5 ± 0.0	NS
P	<i>Cardamine parviflora</i> var. <i>arenicola</i>	Small-flowered Bittercress				S2	3 Sensitive	11	62.0 ± 0.0	NS

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P	<i>Draba arabisans</i>	Rock Whitlow-Grass				S2	3 Sensitive	14	56.6 ± 0.0	NS
P	<i>Stellaria humifusa</i>	Saltmarsh Starwort				S2	3 Sensitive	11	39.0 ± 1.0	NS
P	<i>Stellaria longifolia</i>	Long-leaved Starwort				S2	3 Sensitive	17	20.1 ± 0.0	NS
P	<i>Chenopodium rubrum</i>	Red Pigweed				S2	2 May Be At Risk	4	73.4 ± 0.0	NS
P	<i>Hudsonia ericoides</i>	Pinebarren Golden Heather				S2	3 Sensitive	16	81.3 ± 7.0	NS
P	<i>Hypericum majus</i>	Large St John's-wort				S2	3 Sensitive	6	39.9 ± 0.0	NS
P	<i>Oxytropis campestris</i> <i>var. johannensis</i>	Field Locoweed				S2	2 May Be At Risk	12	96.2 ± 1.0	NS
P	<i>Myriophyllum farwellii</i>	Farwell's Water Milfoil				S2	3 Sensitive	13	33.6 ± 1.0	NS
P	<i>Myriophyllum verticillatum</i>	Whorled Water Milfoil				S2	3 Sensitive	13	38.2 ± 7.0	NS
P	<i>Oenothera fruticosa</i> <i>ssp. glauca</i>	Narrow-leaved Evening Primrose				S2	5 Undetermined	7	18.2 ± 7.0	NS
P	<i>Polygonum arifolium</i>	Halberd-leaved Tearthumb				S2	3 Sensitive	40	39.3 ± 0.0	NS
P	<i>Rumex salicifolius</i> <i>var. mexicanus</i>	Triangular-valve Dock				S2	3 Sensitive	12	54.3 ± 0.0	NS
P	<i>Primula mistassinica</i>	Mistassini Primrose				S2	3 Sensitive	16	18.2 ± 7.0	NS
P	<i>Anemone canadensis</i>	Canada Anemone				S2	2 May Be At Risk	3	60.4 ± 7.0	NS
P	<i>Anemone quinquefolia</i>	Wood Anemone				S2	3 Sensitive	17	31.1 ± 0.0	NS
P	<i>Anemone virginiana</i>	Virginia Anemone				S2	3 Sensitive	17	13.9 ± 7.0	NS
P	<i>Anemone virginiana</i> <i>var. virginiana</i>	Virginia Anemone				S2	3 Sensitive	2	21.4 ± 7.0	NS
P	<i>Caltha palustris</i>	Yellow Marsh Marigold				S2	3 Sensitive	7	73.0 ± 5.0	NS
P	<i>Galium boreale</i>	Northern Bedstraw				S2	2 May Be At Risk	10	23.6 ± 5.0	NS
P	<i>Galium labradoricum</i>	Labrador Bedstraw				S2	3 Sensitive	82	41.6 ± 0.0	NS
P	<i>Salix pedicellaris</i>	Bog Willow				S2	3 Sensitive	60	43.7 ± 0.0	NS
P	<i>Salix sericea</i>	Silky Willow				S2	2 May Be At Risk	1	51.4 ± 1.0	NS
P	<i>Comandra umbellata</i>	Bastard's Toadflax				S2	2 May Be At Risk	1	97.9 ± 1.0	NB
P	<i>Saxifraga paniculata</i> <i>ssp. neogaea</i>	White Mountain Saxifrage				S2	3 Sensitive	8	62.1 ± 1.0	NS
P	<i>Tiarella cordifolia</i>	Heart-leaved Foamflower				S2	3 Sensitive	222	19.2 ± 1.0	NS
P	<i>Agalinis maritima</i>	Saltmarsh Agalinis				S2	3 Sensitive	1	84.0 ± 0.0	NS
P	<i>Viola nephrophylla</i>	Northern Bog Violet				S2	3 Sensitive	9	21.4 ± 7.0	NS
P	<i>Carex atratiformis</i>	Scabrous Black Sedge				S2	3 Sensitive	3	55.1 ± 0.0	NS
P	<i>Carex bebbii</i>	Bebb's Sedge				S2	3 Sensitive	19	30.5 ± 0.0	NS
P	<i>Carex capillaris</i>	Hairlike Sedge				S2	3 Sensitive	7	65.4 ± 0.0	NS
P	<i>Carex castanea</i>	Chestnut Sedge				S2	2 May Be At Risk	23	40.0 ± 0.0	NS
P	<i>Carex comosa</i>	Bearded Sedge				S2	3 Sensitive	11	9.6 ± 0.0	NS
P	<i>Carex hystericina</i>	Porcupine Sedge				S2	2 May Be At Risk	9	29.8 ± 1.0	NS
P	<i>Carex tenera</i>	Tender Sedge				S2	3 Sensitive	8	14.4 ± 0.0	NS
P	<i>Carex tuckermanii</i>	Tuckerman's Sedge				S2	3 Sensitive	38	29.7 ± 2.0	NS
P	<i>Vallisneria americana</i>	Wild Celery				S2	2 May Be At Risk	7	26.3 ± 1.0	NS
P	<i>Juncus stygius</i> <i>ssp. americanus</i>	Moor Rush				S2	3 Sensitive	13	75.4 ± 0.0	NS
P	<i>Allium schoenoprasum</i>	Wild Chives				S2	2 May Be At Risk	1	86.6 ± 1.0	NB
P	<i>Allium schoenoprasum</i> <i>var. sibiricum</i>	Wild Chives				S2	2 May Be At Risk	1	18.2 ± 7.0	NS
P	<i>Lilium canadense</i>	Canada Lily				S2	2 May Be At Risk	102	8.2 ± 7.0	NS
P	<i>Najas gracillima</i>	Thread-Like Naiad				S2	3 Sensitive	2	58.2 ± 0.0	NS
P	<i>Cypripedium parviflorum</i> <i>var. pubescens</i>	Yellow Lady's-slipper				S2	3 Sensitive	10	37.3 ± 1.0	NS
P	<i>Cypripedium parviflorum</i> <i>var. makasin</i>	Small Yellow Lady's-Slipper				S2	3 Sensitive	13	57.9 ± 0.0	NS
P	<i>Cypripedium reginae</i>	Showy Lady's-Slipper				S2	2 May Be At Risk	33	28.8 ± 7.0	NS
P	<i>Goodyera pubescens</i>	Downy Rattlesnake-Plantain				S2	3 Sensitive	9	44.5 ± 1.0	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
P	<i>Platanthera flava</i> var. <i>flava</i>	Southern Rein Orchid				S2	3 Sensitive	1	69.4 ± 7.0	NS
P	<i>Platanthera flava</i> var. <i>herbiola</i>	Pale Green Orchid				S2	5 Undetermined	11	37.8 ± 1.0	NS
P	<i>Platanthera macrophylla</i>	Large Round-Leaved Orchid				S2	3 Sensitive	14	10.1 ± 1.0	NS
P	<i>Spiranthes lucida</i>	Shining Ladies'-Tresses				S2	2 May Be At Risk	28	30.4 ± 0.0	NS
P	<i>Calamagrostis stricta</i>	Slim-stemmed Reed Grass				S2	3 Sensitive	5	74.6 ± 0.0	NS
P	<i>Dichanthelium linearifolium</i>	Narrow-leaved Panic Grass				S2	3 Sensitive	7	30.7 ± 0.0	NS
P	<i>Piptatherum canadense</i>	Canada Rice Grass				S2	3 Sensitive	8	8.8 ± 0.0	NS
P	<i>Potamogeton friesii</i>	Fries' Pondweed				S2	2 May Be At Risk	14	24.2 ± 5.0	NS
P	<i>Potamogeton richardsonii</i>	Richardson's Pondweed				S2	2 May Be At Risk	9	29.3 ± 0.0	NS
P	<i>Dryopteris fragrans</i> var. <i>remotiuscula</i>	Fragrant Wood Fern				S2	3 Sensitive	11	12.8 ± 1.0	NS
P	<i>Woodsia glabella</i>	Smooth Cliff Fern				S2	3 Sensitive	2	12.7 ± 1.0	NS
P	<i>Symphotrichum boreale</i>	Boreal Aster				S2?	3 Sensitive	6	18.2 ± 7.0	NS
P	<i>Cuscuta cephalanthi</i>	Buttonbush Dodder				S2?	5 Undetermined	3	69.1 ± 1.0	NS
P	<i>Epilobium coloratum</i>	Purple-veined Willowherb				S2?	3 Sensitive	7	43.3 ± 0.0	NS
P	<i>Rumex maritimus</i> var. <i>persicarioides</i>	Peach-leaved Dock				S2?	2 May Be At Risk	1	96.7 ± 5.0	PE
P	<i>Crataegus submollis</i>	Quebec Hawthorn				S2?	5 Undetermined	5	23.5 ± 7.0	NS
P	<i>Carex peckii</i>	White-Tinged Sedge				S2?	2 May Be At Risk	4	16.2 ± 0.0	NS
P	<i>Eleocharis ovata</i>	Ovate Spikerush				S2?	3 Sensitive	14	24.8 ± 0.0	NS
P	<i>Scirpus pedicellatus</i>	Stalked Bulrush				S2?	3 Sensitive	8	39.1 ± 1.0	NS
P	<i>Potamogeton pulcher</i>	Spotted Pondweed			Vulnerable	S2S3	3 Sensitive	3	54.8 ± 2.0	NS
P	<i>Hieracium robinsonii</i>	Robinson's Hawkweed				S2S3	3 Sensitive	3	22.5 ± 1.0	NS
P	<i>Iva frutescens</i> ssp. <i>oraria</i>	Big-leaved Marsh-elder				S2S3	3 Sensitive	17	57.9 ± 1.0	NS
P	<i>Senecio pseudoarnica</i>	Seabeach Ragwort				S2S3	3 Sensitive	15	18.2 ± 7.0	NS
P	<i>Betula michauxii</i>	Michaux's Dwarf Birch				S2S3	3 Sensitive	13	53.7 ± 0.0	NS
P	<i>Sagina nodosa</i>	Knotted Pearlwort				S2S3	4 Secure	11	82.2 ± 1.0	NS
P	<i>Sagina nodosa</i> ssp. <i>borealis</i>	Knotted Pearlwort				S2S3	4 Secure	7	95.7 ± 0.0	NS
P	<i>Ceratophyllum echinatum</i>	Prickly Hornwort				S2S3	3 Sensitive	26	42.0 ± 0.0	NS
P	<i>Hypericum dissimulatum</i>	Disguised St John's-wort				S2S3	3 Sensitive	4	21.4 ± 1.0	NS
P	<i>Triosteum aurantiacum</i>	Orange-fruited Tinker's Weed				S2S3	3 Sensitive	49	22.4 ± 0.0	NS
P	<i>Shepherdia canadensis</i>	Soapberry				S2S3	3 Sensitive	73	55.7 ± 0.0	NS
P	<i>Empetrum eamesii</i> ssp. <i>atropurpureum</i>	Pink Crowberry				S2S3	3 Sensitive	4	81.1 ± 7.0	NS
P	<i>Empetrum eamesii</i> ssp. <i>eamesii</i>	Pink Crowberry				S2S3	3 Sensitive	5	81.1 ± 7.0	NS
P	<i>Chamaesyce polygonifolia</i>	Seaside Spurge				S2S3	3 Sensitive	4	79.8 ± 0.0	NB
P	<i>Hedeoma pulegioides</i>	American False Pennyroyal				S2S3	3 Sensitive	17	41.4 ± 1.0	NS
P	<i>Polygonum buxiforme</i>	Small's Knotweed				S2S3	5 Undetermined	7	12.6 ± 0.0	NS
P	<i>Amelanchier fernaldii</i>	Fernald's Serviceberry				S2S3	5 Undetermined	1	55.8 ± 5.0	NS
P	<i>Potentilla canadensis</i>	Canada Cinquefoil				S2S3	3 Sensitive	1	16.6 ± 5.0	NS
P	<i>Galium aparine</i>	Common Bedstraw				S2S3	3 Sensitive	26	20.5 ± 0.0	NS
P	<i>Galium obtusum</i>	Blunt-leaved Bedstraw				S2S3	3 Sensitive	1	87.7 ± 1.0	NB
P	<i>Salix pellita</i>	Satiny Willow				S2S3	3 Sensitive	8	33.5 ± 4.0	NS

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P	<i>Veronica serpyllifolia</i> <i>ssp. humifusa</i>	Thyme-Leaved Speedwell				S2S3	3 Sensitive	1	95.9 ± 0.0	NS
P	<i>Carex adusta</i>	Lesser Brown Sedge				S2S3	3 Sensitive	8	11.9 ± 7.0	NS
P	<i>Carex hirtifolia</i>	Pubescent Sedge				S2S3	3 Sensitive	46	13.0 ± 0.0	NS
P	<i>Carex houghtoniana</i>	Houghton's Sedge				S2S3	3 Sensitive	4	29.4 ± 1.0	NS
P	<i>Eleocharis olivacea</i>	Yellow Spikerush				S2S3	3 Sensitive	5	32.9 ± 0.0	NS
P	<i>Eriophorum gracile</i>	Slender Cottongrass				S2S3	3 Sensitive	51	21.9 ± 10.0	NS
P	<i>Coeloglossum viride</i> <i>var. virescens</i>	Long-bracted Frog Orchid				S2S3	2 May Be At Risk	2	15.8 ± 0.0	NS
P	<i>Cypripedium</i> <i>parviflorum</i>	Yellow Lady's-slipper				S2S3	3 Sensitive	518	49.6 ± 0.0	NS
P	<i>Poa glauca</i>	Glaucous Blue Grass				S2S3	3 Sensitive	5	49.6 ± 1.0	NS
P	<i>Botrychium</i> <i>lanceolatum</i> var. <i>angustisegmentum</i>	Lance-Leaf Grape-Fern				S2S3	3 Sensitive	11	29.5 ± 0.0	NS
P	<i>Botrychium simplex</i>	Least Moonwort				S2S3	3 Sensitive	6	29.5 ± 0.0	NS
P	<i>Ophioglossum pusillum</i>	Northern Adder's-tongue				S2S3	3 Sensitive	9	45.2 ± 0.0	NS
P	<i>Angelica atropurpurea</i>	Purple-stemmed Angelica				S3	4 Secure	3	41.6 ± 0.0	NS
P	<i>Erigeron hyssopifolius</i>	Hyssop-leaved Fleabane				S3	3 Sensitive	16	7.4 ± 0.0	NS
P	<i>Hieracium paniculatum</i>	Panicled Hawkweed				S3	4 Secure	17	43.2 ± 0.0	NS
P	<i>Megalodonta beckii</i>	Water Beggarticks				S3	4 Secure	25	16.5 ± 0.0	NS
P	<i>Packera paupercula</i>	Balsam Groundsel				S3	4 Secure	43	15.8 ± 0.0	NS
P	<i>Betula pumila</i>	Bog Birch				S3	3 Sensitive	3	52.3 ± 0.0	NS
P	<i>Betula pumila</i> var. <i>pumila</i>	Bog Birch				S3	3 Sensitive	1	68.5 ± 1.0	NS
P	<i>Campanula</i> <i>aparinoides</i>	Marsh Bellflower				S3	3 Sensitive	37	18.5 ± 5.0	NS
P	<i>Minuartia groenlandica</i>	Greenland Stitchwort				S3	3 Sensitive	20	60.5 ± 0.0	NS
P	<i>Viburnum edule</i>	Squashberry				S3	3 Sensitive	2	49.8 ± 0.0	NS
P	<i>Empetrum eamesii</i>	Pink Crowberry				S3	3 Sensitive	7	81.3 ± 7.0	NS
P	<i>Vaccinium boreale</i>	Northern Blueberry				S3	3 Sensitive	4	54.9 ± 1.0	NS
P	<i>Vaccinium</i> <i>caespitosum</i>	Dwarf Bilberry				S3	4 Secure	58	29.3 ± 0.0	NS
P	<i>Vaccinium uliginosum</i>	Alpine Bilberry				S3	3 Sensitive	1	97.1 ± 1.0	NS
P	<i>Bartonia virginica</i>	Yellow Bartonia				S3	4 Secure	1	51.4 ± 7.0	NS
P	<i>Geranium bicknellii</i>	Bicknell's Crane's-bill				S3	4 Secure	13	39.5 ± 2.0	NS
P	<i>Proserpinaca palustris</i>	Marsh Mermaidweed				S3	4 Secure	16	39.0 ± 1.0	NS
P	<i>Proserpinaca palustris</i> <i>var. crebra</i>	Marsh Mermaidweed				S3	4 Secure	28	39.4 ± 0.0	NS
P	<i>Proserpinaca pectinata</i>	Comb-leaved Mermaidweed				S3	4 Secure	5	61.0 ± 5.0	NS
P	<i>Teucrium canadense</i>	Canada Germander				S3	3 Sensitive	15	73.4 ± 5.0	NS
P	<i>Epilobium strictum</i>	Downy Willowherb				S3	3 Sensitive	15	21.8 ± 5.0	NS
P	<i>Polygala sanguinea</i>	Blood Milkwort				S3	3 Sensitive	24	23.8 ± 5.0	NS
P	<i>Polygonum</i> <i>pensylvanicum</i>	Pennsylvania Smartweed				S3	4 Secure	31	18.2 ± 7.0	NS
P	<i>Polygonum scandens</i>	Climbing False Buckwheat				S3	3 Sensitive	31	18.2 ± 7.0	NS
P	<i>Plantago rugelii</i>	Rugel's Plantain				S3	4 Secure	8	16.2 ± 0.0	NS
P	<i>Primula laurentiana</i>	Laurentian Primrose				S3	4 Secure	14	76.2 ± 1.0	NS
P	<i>Samolus valerandi</i> ssp. <i>parviflorus</i>	Seaside Brookweed				S3	3 Sensitive	14	42.6 ± 0.0	NS
P	<i>Pyrola asarifolia</i>	Pink Pyrola				S3	4 Secure	11	19.2 ± 1.0	NS
P	<i>Pyrola minor</i>	Lesser Pyrola				S3	3 Sensitive	3	45.5 ± 0.0	NS
P	<i>Ranunculus gmelinii</i>	Gmelin's Water Buttercup				S3	4 Secure	68	14.6 ± 5.0	NS
P	<i>Rhamnus alnifolia</i>	Alder-leaved Buckthorn				S3	4 Secure	149	25.1 ± 1.0	NS
P	<i>Agrimonia gryposepala</i>	Hooked Agrimony				S3	4 Secure	102	17.0 ± 0.0	NS
P	<i>Amelanchier</i> <i>stolonifera</i>	Running Serviceberry				S3	4 Secure	16	37.6 ± 5.0	NS

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P	<i>Geocaulon lividum</i>	Northern Comandra				S3	4 Secure	6	45.5 ± 0.0	NS
P	<i>Limosella australis</i>	Southern Mudwort				S3	4 Secure	24	43.7 ± 0.0	NS
P	<i>Lindernia dubia</i>	Yellow-seeded False Pimperel				S3	4 Secure	35	30.9 ± 0.0	NS
P	<i>Laportea canadensis</i>	Canada Wood Nettle				S3	3 Sensitive	50	12.3 ± 0.0	NS
P	<i>Verbena hastata</i>	Blue Vervain				S3	4 Secure	128	16.1 ± 0.0	NS
P	<i>Carex cryptolepis</i>	Hidden-scaled Sedge				S3	4 Secure	15	19.8 ± 1.0	NS
P	<i>Carex eburnea</i>	Bristle-leaved Sedge				S3	3 Sensitive	5	16.2 ± 0.0	NS
P	<i>Carex lupulina</i>	Hop Sedge				S3	4 Secure	44	19.8 ± 1.0	NS
P	<i>Carex rosea</i>	Rosy Sedge				S3	4 Secure	33	16.4 ± 0.0	NS
P	<i>Carex swanii</i>	Swan's Sedge				S3	3 Sensitive	2	79.4 ± 0.0	NS
P	<i>Carex tribuloides</i>	Blunt Broom Sedge				S3	4 Secure	15	18.4 ± 0.0	NS
P	<i>Carex wiegandii</i>	Wiegand's Sedge				S3	3 Sensitive	11	19.6 ± 0.0	NS
P	<i>Carex foenea</i>	Fernald's Hay Sedge				S3	4 Secure	18	8.9 ± 0.0	NS
P	<i>Eleocharis nitida</i>	Quill Spikerush				S3	4 Secure	15	33.0 ± 7.0	NS
P	<i>Elodea canadensis</i>	Canada Waterweed				S3	4 Secure	23	8.4 ± 0.0	NS
P	<i>Juncus subcaudatus</i> var. <i>planisepalus</i>	Woods-Rush				S3	3 Sensitive	16	0.7 ± 5.0	NS
P	<i>Juncus dudleyi</i>	Dudley's Rush				S3	4 Secure	31	14.5 ± 0.0	NS
P	<i>Goodyera repens</i>	Lesser Rattlesnake-plantain				S3	3 Sensitive	17	41.8 ± 0.0	NS
P	<i>Listera australis</i>	Southern Twayblade				S3	4 Secure	92	29.0 ± 0.0	NS
P	<i>Platanthera grandiflora</i>	Large Purple Fringed Orchid				S3	4 Secure	97	15.2 ± 0.0	NS
P	<i>Platanthera hookeri</i>	Hooker's Orchid				S3	4 Secure	18	39.3 ± 0.0	NS
P	<i>Platanthera orbiculata</i>	Small Round-leaved Orchid				S3	4 Secure	28	11.9 ± 7.0	NS
P	<i>Spiranthes ochroleuca</i>	Yellow Ladies'-tresses				S3	4 Secure	16	31.6 ± 0.0	NS
P	<i>Alopecurus aequalis</i>	Short-awned Foxtail				S3	4 Secure	25	22.8 ± 0.0	NS
P	<i>Dichanthelium clandestinum</i>	Deer-tongue Panic Grass				S3	4 Secure	89	34.5 ± 0.0	NS
P	<i>Potamogeton obtusifolius</i>	Blunt-leaved Pondweed				S3	4 Secure	22	39.8 ± 0.0	NS
P	<i>Potamogeton praelongus</i>	White-stemmed Pondweed				S3	3 Sensitive	10	11.3 ± 5.0	NS
P	<i>Potamogeton zosteriformis</i>	Flat-stemmed Pondweed				S3	3 Sensitive	26	26.3 ± 2.0	NS
P	<i>Sparganium natans</i>	Small Burreed				S3	4 Secure	22	16.6 ± 0.0	NS
P	<i>Asplenium trichomanes</i>	Maidenhair Spleenwort				S3	4 Secure	12	60.6 ± 1.0	NS
P	<i>Asplenium trichomanes-ramosum</i>	Green Spleenwort				S3	3 Sensitive	8	22.1 ± 7.0	NS
P	<i>Equisetum pratense</i>	Meadow Horsetail				S3	3 Sensitive	15	6.7 ± 0.0	NS
P	<i>Equisetum variegatum</i>	Variiegated Horsetail				S3	4 Secure	53	27.9 ± 0.0	NS
P	<i>Isoetes acadiensis</i>	Acadian Quillwort				S3	3 Sensitive	6	16.8 ± 1.0	NS
P	<i>Lycopodium sitchense</i>	Sitka Clubmoss				S3	4 Secure	6	24.6 ± 5.0	NS
P	<i>Huperzia appalachiana</i>	Appalachian Fir-Clubmoss				S3	3 Sensitive	16	2.3 ± 7.0	NS
P	<i>Botrychium dissectum</i>	Cut-leaved Moonwort				S3	4 Secure	8	29.5 ± 0.0	NS
P	<i>Polypodium appalachianum</i>	Appalachian Polypody				S3	5 Undetermined	14	15.9 ± 0.0	NS
P	<i>Asclepias incarnata</i> ssp. <i>pulchra</i>	Swamp Milkweed				S3?	5 Undetermined	50	43.0 ± 0.0	NS
P	<i>Polygonum amphibium</i> var. <i>emersum</i>	Water Smartweed				S3?	5 Undetermined	1	44.1 ± 0.0	NS
P	<i>Lycopodium sabinifolium</i>	Ground-Fir				S3?	4 Secure	6	9.1 ± 0.0	NS
P	<i>Atriplex franktonii</i>	Frankton's Saltbush				S3S4	4 Secure	4	54.1 ± 5.0	NS
P	<i>Suaeda calceoliformis</i>	Horned Sea-blite				S3S4	4 Secure	17	46.9 ± 0.0	NS
P	<i>Vaccinium corymbosum</i>	Highbush Blueberry				S3S4	4 Secure	2	71.0 ± 0.0	NS
P	<i>Myriophyllum sibiricum</i>	Siberian Water Milfoil				S3S4	4 Secure	6	44.3 ± 0.0	NS
P	<i>Nuphar lutea</i> ssp.	Small Yellow Pond-lily				S3S4	4 Secure	7	31.5 ± 1.0	NS

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P	<i>pumila</i> <i>Sanguinaria canadensis</i>	Bloodroot				S3S4	4 Secure	92	12.3 ± 0.0	NS
P	<i>Polygonum fowleri</i>	Fowler's Knotweed				S3S4	4 Secure	3	11.7 ± 1.0	NS
P	<i>Rumex maritimus</i>	Sea-Side Dock				S3S4		33	70.9 ± 2.0	NS
P	<i>Rumex maritimus</i> var. <i>fueginus</i>	Tierra del Fuego Dock				S3S4	4 Secure	11	91.2 ± 0.0	NS
P	<i>Crataegus succulenta</i>	Fleshy Hawthorn				S3S4	5 Undetermined	1	71.8 ± 0.0	NS
P	<i>Fragaria vesca</i> ssp. <i>americana</i>	Woodland Strawberry				S3S4	4 Secure	63	18.0 ± 0.0	NS
P	<i>Salix petiolaris</i>	Meadow Willow				S3S4	4 Secure	50	15.4 ± 1.0	NS
P	<i>Agalinis neoscotica</i>	Nova Scotia Agalinis				S3S4	4 Secure	9	32.5 ± 0.0	NS
P	<i>Viola sagittata</i> var. <i>ovata</i>	Arrow-Leaved Violet				S3S4	4 Secure	14	54.7 ± 0.0	NS
P	<i>Symplocarpus foetidus</i>	Eastern Skunk Cabbage				S3S4	4 Secure	114	72.3 ± 0.0	NS
P	<i>Carex argyrantha</i>	Silvery-flowered Sedge				S3S4	4 Secure	8	62.0 ± 2.0	NS
P	<i>Eriophorum russeolum</i>	Russet Cottongrass				S3S4	4 Secure	138	63.2 ± 0.0	NS
P	<i>Triglochin gaspensis</i>	Gasp Arrowgrass				S3S4	5 Undetermined	19	82.0 ± 1.0	NB
P	<i>Juncus acuminatus</i>	Sharp-Fruit Rush				S3S4	4 Secure	6	44.5 ± 0.0	NS
P	<i>Luzula parviflora</i>	Small-flowered Woodrush				S3S4	4 Secure	4	27.1 ± 0.0	NS
P	<i>Liparis loeselii</i>	Loesel's Twayblade				S3S4	4 Secure	15	16.9 ± 1.0	NS
P	<i>Panicum tuckermanii</i>	Tuckerman's Panic Grass				S3S4	4 Secure	15	30.7 ± 0.0	NS
P	<i>Trisetum spicatum</i>	Narrow False Oats				S3S4	4 Secure	16	22.7 ± 0.0	NS
P	<i>Cystopteris bulbifera</i>	Bulblet Bladder Fern				S3S4	4 Secure	74	16.1 ± 1.0	NS
P	<i>Equisetum hyemale</i>	Common Scouring-rush				S3S4	4 Secure	4	52.4 ± 0.0	NS
P	<i>Equisetum hyemale</i> var. <i>affine</i>	Common Scouring-rush				S3S4	4 Secure	52	16.5 ± 1.0	NS
P	<i>Equisetum scirpoides</i>	Dwarf Scouring-Rush				S3S4	4 Secure	61	7.9 ± 0.0	NS
P	<i>Lycopodium complanatum</i>	Northern Clubmoss				S3S4	4 Secure	16	29.0 ± 5.0	NS
P	<i>Schizaea pusilla</i>	Little Curlygrass Fern				S3S4	4 Secure	4	75.7 ± 1.0	NS
P	<i>Viola canadensis</i>	Canada Violet				SH	0.1 Extirpated	2	28.1 ± 7.0	NS

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The recipient of these data shall acknowledge the ACCDC and the data sources listed below in any documents, reports, publications or presentations, in which this dataset makes a significant contribution.

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Appendix E-2a

Potential Priority Plant / Lichen / Moss Species for Study Area based on Previous Studies; (AMEC 2007); 2016 ACCDC (5 km buffer, plus potentials within 100 km); and 2016 SARA/NSESA/COSEWIC Listings and Potential Habitat Present

Species	Name	SARA (or COSEWIC*) Status and Sched. and NSESA Status and ACCDC Rank / General Status ¹	Habitat ² (reference locations)	Flowers ²
<i>Asplenium trichomanes-ramosum</i>	Green Spleenwort	S3 / Sensitive	Shaded cliff along stream on basic rocks/limestone. Identified in AMEC 2007. Not anticipated based on habitat at study area.	-
<i>Atrichium angustatum</i>	Lesser Smoothcap Moss	S2? / Sensitive	Mounds of subsoil thrown up by the roots of fallen trees. Observed within 20 km of study area (ACCDC 2016).	-
<i>Bidens connata</i>	Purple-stem Swamp Beggar-ticks	S4 / Secure	Boggy swale, border of pond/ditch, thicket, swale, behind brackish swale. Identified in AMEC 2007. Status now secure.	Aug.-Sept.
<i>Carex comosa</i>	Bearded Sedge	S2 / Sensitive	Swamps and shallow water. Observed within 20 km of study area (ACCDC).	Jun.-Aug.
<i>Carex haydenii</i>	Hayden's Sedge	S1 / May be at Risk	Seasonally saturated soils in open habitats. Observed within 20 km of study area (ACCDC 2016).	June-Aug.
<i>Carex tenera</i>	Tender Sedge	S2 / Sensitive	Meadow, woodland, opening. Observed within 20 km of study area (ACCDC 2016).	late May-Aug.
<i>Dryopteris fragans</i>	Fragrant Fern	S2 / Sensitive	Dry cliff, cliff along streams. Identified in AMEC 2007. Unlikely based on habitat at study area.	-
<i>Equisetum pratense</i>	Meadow Horsetail	S3 / Sensitive	Rich wooded bank, mossy slope, typically alkaline soil. Observed within 20 km of study area (ACCDC 2016). Identified in AMEC 2007.	-
<i>Fraxinus nigra</i>	Black Ash	NSESA Threatened S1S2 / At Risk	Low ground, damp wood, swamp. Observed within 20 km of study area (ACCDC 2016). identified by ACCDC as location sensitive	May-Jun. – identifiable year round.
<i>Huperzia appalachiana</i>	Appalachian Fir-Clubmoss	S3 / Sensitive	Cliff faces, summits, and other exposed, harsh environments. Observed within 5 km of study area (ACCDC 2016). Unlikely based on habitat at study area.	N/A – identifiable year round.
<i>Isoetes prototypus</i>	Prototype Quillwort	Special Concern Sched. 1 NSESA Vulnerable S2 / Sensitive	Bordering lake, pond occasionally river, up to 1 m deep. Observed within 20 km of study area (ACCDC 2016).	Spring - summer
<i>Juncus subcaudatus</i> var. <i>planispealus</i>	Woods-rush	S3 / Sensitive	Wooded bogs, spruce swamps, lakeshores and streamside wetlands. Observed within 5 km of study area (ACCDC 2016).	July - October
<i>Laportea canadensis</i>	Canada Wood Nettle	S3 / Sensitive	Alluvial woods mixed or deciduous trees, fertile areas. Identified in AMEC 2007.	Jul.-Sept.
<i>Lilium canadense</i>	Canada Lily	S2 / May be at Risk	Meadows and stream banks. Identified in AMEC 2007. Observed within 20 km of study area (ACCDC 2016).	July
<i>Lobelia spicata</i>	Pale-spiked Lobelia	S1 / May be at Risk	Glades, open woods, bluffs, wet meadows. Observed within 5 km of study area (ACCDC 2016).	May-Aug.
<i>Megalodonta (Bidens) beckii</i>	Water Beggarticks	S3 / Secure	Shallow, quiet water, slow stream/pond. Observed within 20 km of study area (ACCDC 2016).	Aug-Sept.

Species	Name	SARA (or COSEWIC*) Status and Sched. and NSESA Status and ACCDC Rank / General Status¹	Habitat² (reference locations)	Flowers²
<i>Polygonum arifolium</i>	Halberd-leaved Tearthumb	S2 / Sensitive	Rich alluvial soil, marshy thicket, alder. Identified in AMEC 2007.	-
<i>Polygonum scandens</i>	Climbing False Buckwheat	S3 / Sensitive	Low thicket, river interval. Identified in AMEC 2007. Observed within 20 km of study area (ACCDC 2016).	Mid Aug.-Sept.
<i>Stellaria longifolia</i>	Long-leaved Starwort	S2 / Sensitive	Damp, wet grass. Identified in AMEC 2007. Observed within 20 km of study area (ACCDC 2016).	May to July
<i>Tiarella cordifolia</i>	Heart-leaved Foam Flower	S2 / Sensitive	Deciduous forest, interval. Identified in AMEC 2007. Unlikely based on habitat at study area.	Mid May-mid June

1. Status as of September 2016

2. Zinck 1998

Appendix E-2b

Potential Priority Animal Species for Study Area based on Previous Studies (AMEC 2007); 2016 ACCDC (5 km, plus potentials within 100 km); Nova Scotia Breeding Bird Surveys, and 2016 SARA/NSESA/COSEWIC Listings and Potential Habitat Present

Common Name	Scientific Name	SARA (or COSEWIC*) Status and Sched. and NSESA Status, S Rank and General Status ¹	Habitat Preference and Observations in Vicinity	Timing for Investigation
INVERTEBRATES				
Milbert's Tortoiseshell	<i>Aglais milberti</i>	S2 / Secure	Wet areas near woods. Observed within 5 km of study area (ACCDC 2016).	Mid-April – mid May, mid-August - October (http://novascotiabutterflies.ca/ss.cgi?s=mito)
Acadian Hairstreak	<i>Satyrium acadica</i>	S1 / Undetermined	Observed within 10 km of study area (ACCDC 2016).	summer
Banded Hairstreak	<i>Satyrium calanus</i>	S2 / Undetermined	Woodlands or roadside, with flowers like milkweed and clover. Observed within 10 km of study area (ACCDC 2016).	Late June - Aug.
Common Whitetail (syn. White Tailed Skimmer)	<i>Plathemis (syn. Libellula) lydia</i>	S5 / Secure (Potential identified in 2007 EA – currently not at risk)	Slow moving or still waters	Late May – mid October (http://birdingnewbrunswick.ca/group/nbononatagroup/forum/topics/species-account-common-whitetail-la-lydienne-plathemis-lydia)
Emerald Spreadwing	<i>Lestes dryas</i>	S5 / Secure (Potential identified in 2007 EA – currently not at risk)	Ponds in wooded and peatland areas.	June - August (http://www.insectsofalberta.com/emerald-spreadwing.htm)
Green Comma	<i>Polygonia faunus</i>	S3 / Secure	Boreal forest. Observed within 5 km of study area (ACCDC 2016).	Early April – mid-June Early August – Late September (http://novascotiabutterflies.ca/ss.cgi?s=grco)
Monarch (Butterfly)	<i>Danaus plexippus</i>	Special Concern Sched. 1 S2B / Sensitive	Migrates through area, feeds on milkweed or similar wildflower; Canadian habitat not vulnerable.	Late summer
Northern Cloudywing	<i>Thorybes pylades</i>	S2S3 / Sensitive	Partially wooded areas. Observed within 5 km of study area (ACCDC 2016).	Mid-June – early July (http://novascotiabutterflies.ca/ss.cgi?s=nocl)
Taiga Bluet	<i>Coenagrion resolutum</i>	S1S2 / May be at risk	Sedge marshes. Observed within 5 km of study area (ACCDC 2016).	Late summer

Common Name	Scientific Name	SARA (or COSEWIC*) Status and Sched. and NSESA Status, S Rank and General Status ¹	Habitat Preference and Observations in Vicinity	Timing for Investigation
BIRDS				
American Bittern	<i>Botaurus lentiginosus</i>	S3S4B / Sensitive	Nests in freshwater marshes and occasionally salt marshes. Observed within 5 km of study area (ACCDC 2016).	Nest mid. May – mid Aug.
American Kestrel	<i>Falco sparverius</i>	S3B / Secure	Tree or structure. Observed within 5 km of study area (ACCDC 2016).	Nest May-July
Bank Swallow	<i>Riparia riparia</i>	COSEWIC Threatened S2S3B / May be at Risk	Nest banks, cliffs. Observed within 5 km of study area (ACCDC 2016).	Nest May-July
Baltimore Oriole	<i>Icterus galbula</i>	S2S3B / May be at risk	Nest deciduous trees often suburban or water side. Identified as potential AMEC 2007.	Nest late May - June
Barn Swallow	<i>Hirundo rustica</i>	COSEWIC Threatened, NSESA Endangered S3B / At Risk	Nest on structures. Observed within 5 km of study area (ACCDC 2016).	Nest summer
Bay-breasted Warbler	<i>Dendroica castanea</i>	S3S4B / Sensitive	Breeds in mature coniferous forest, particularly in areas with high spruce budworm concentrations. Observed within 10 km of study area (ACCDC 2016).	Nest mid. June-July
Black-backed Woodpecker	<i>Picoides arcticus</i>	S3S4 / Sensitive	Nest in cavities. Observed within 5 km of study area (ACCDC 2016).	Nest May-June
Black-bellied Plover	<i>Pluvialis squatarola</i>	S3M / Secure	Arctic lowlands on dry tundra. Observed within 5 km of study area (ACCDC 2016).	Not applicable
Black-billed Cuckoo	<i>Coccyzus erythrophthalmus</i>	S3?B / May be at Risk	Nests in forest edges and tall shrub thickets. Identified as potential AMEC 2007.	Nest early June – mid. Aug.
Blue-winged Teal	<i>Anas discors</i>	S3S4B / May be at risk	Nest in fertile marshes. Observed within 5 km of study area (ACCDC 2016).	Nest mid. May-July
Bobolink	<i>Dolichonyx oryzivorus</i>	COSEWIC Threatened, NSESA Vulnerable S3S4B / Sensitive	Nest in lush meadows, open grasslands, hayfields. Observed within 5 km of study area (ACCDC 2016).	Nests June to July
Boreal Chickadee	<i>Poecile hudsonica</i>	S3 / Sensitive	Nest cavities in rotted tree stumps. Observed within 10 km of study area (ACCDC 2016).	Nest mid. May – mid Aug.
Brown-headed Cowbird	<i>Molothrus ater</i>	S2B / Secure	Brood parasite, lays eggs in nests of other bird species. Observed within 5 km of study area (ACCDC 2016).	Nest mid June – late July

Common Name	Scientific Name	SARA (or COSEWIC*) Status and Sched. and NSESA Status, S Rank and General Status ¹	Habitat Preference and Observations in Vicinity	Timing for Investigation
Canada Warbler	<i>Wilsonia Canadensis</i>	COSEWIC/SARA Threatened Sched. 1, NSESA Endangered S3S4B / At Risk	Nest - mid aged mixed forest. Observed within 5 km of study area (ACCDC 2016).	Nest June
Cape May Warbler	<i>Dendroica tigrina</i>	S2B / Sensitive	Nests in conifers. Observed within 5 km of study area (ACCDC 2016).	Nest June
Common Loon	<i>Gavia immer</i>	S3B,S4N / May be at risk	May nest in around adjacent lakes.	Nest summer
Common Nighthawk	<i>Chordeiles minor</i>	COSEWIC/SARA Threatened Sched. 1 NSESA Threatened S2S3B / At risk	Nest -sparsely vegetated or bare ground (cutover/burns, building roof). Observed within 5 km of study area (ACCDC 2016).	Nest June-July
Eastern Bluebird	<i>Sialia sialis</i>	S3B / Sensitive	Woodpecker holes forage low vegetation with scattered trees clear-cut near forest, favour broad-leaf. Observed within 5 km of study area (ACCDC 2016).	Nest May-July
Eastern Kingbird	<i>Tyrannus tyrannus</i>	S3B/ Sensitive	Observed within 5 km of study area (ACCDC 2016).	Nest late June-late Aug.
Eastern Wood-pewee	<i>Conopus virens</i>	COSEWIC Special Concern, NSESA Vulnerable S3S4B / Sensitive	Nest open forest. Observed within 5 km of study area (ACCDC 2016).	Nest early June-early Sept.
Golden-crowned Kinglet	<i>Regulus satrapa</i>	S4 / Sensitive	Anticipated based on habitat.	Nest mid-May-late July
Gray Catbird	<i>Dumetella carolinensis</i>	S3B / May be at Risk	Nest shrubbery. Observed within 5 km of study area (ACCDC 2016).	Nest late May – early Aug.
Gray Jay	<i>Perisoreus canadensis</i>	S3S4 / Sensitive	Nests in forest. Observed in 2016.	Nest late Mar. – early July
Horned Lark	<i>Eremophila alpestris</i>	SHB,S4S5N / Secure	Farmlands, airfields. Observed within 5 km of study area (ACCDC 2016).	Nest mid Apr.- July
Hudsonian Godwit	<i>Limosa haemastica</i>	S1S2M / Sensitive	Nest near the treeline were tundra, open woods and ponds are mixed. Observed within 5 km of study area (ACCDC 2016).	Migratory – spring and fall
Indigo Bunting	<i>Passerina cyanea</i>	S1?B / Undetermined	Nest in fields, edges of woods, roadsides, railroad rights-of-way Observed within 5 km of study area (ACCDC 2016).	Rare migrant to NS.
Killdeer	<i>Charadrius vociferus</i>	S3B / Sensitive	Nest open areas. Observed within 5 km of study area (ACCDC 2016).	Nest mid. April- early July
Least Sandpiper	<i>Calidris minutilla</i>	S1B,S3M / Secure	Tundra and boreal forests. Observed within 5 km of study area	Nest May-June

Common Name	Scientific Name	SARA (or COSEWIC*) Status and Sched. and NSESA Status, S Rank and General Status ¹	Habitat Preference and Observations in Vicinity	Timing for Investigation
			(ACCDC 2016).	
Nelson's Sparrow	<i>Ammodramus nelson</i>	S3S4B / Secure	Nest on the ground of marshes and wet meadows. Observed within 5 km of study area (ACCDC 2016).	Nest June-July
Northern Goshawk	<i>Accipiter gentilis</i>	S3S4 / Secure	Woodland species.	Nest Apr.-May
Northern Harrier	<i>Circus cyaneus</i>	S3S4B / Secure	Open marshes, meadows. Observed within 5 km of study area (ACCDC 2016).	Nest May-July
Northern Pintail	<i>Anas acuta</i>	S2B / May Be At Risk	Nest in open areas with seasonal wetlands and low vegetation. Identified as potential AMEC 2007.	Nest late May-late July
Northern Shoveler	<i>Anas clypeata</i>	S2B / May Be At Risk	Nest in short vegetation near water. Observed within 5 km of study area (ACCDC 2016).	Nest early July – mid Aug.
Olive-sided Flycatcher	<i>Contopus cooperi</i>	Threatened Sched. 1, NSESA Threatened S3B / At Risk	Nest open forest – conifers or mixed. Observed within 5 km of study area (ACCDC 2016).	Nest June-Aug.
Peregrine Falcon – anatum/tundrius pop.	<i>Falco peregrinus pop. 1</i>	SARA Special Concern NSESA Vulnerable	Nesting cliffs, northwestern NS. Not recorded within 5 km but potential location sensitive (ACCDC 2016).	Nest June
Pine Siskin	<i>Carduelis pinus</i>	S2S3 / Sensitive	Breeds in mature coniferous forest. Observed within 5 km of study area (ACCDC 2016).	Nest Late May-early Aug.
Red-breasted Nuthatch	<i>Sitta canadensis</i>	S3 / Secure	Nests excavated from dead trees. Observed within 5 km of study area (ACCDC 2016).	Nest Mid May-late July
Red Knot rufa ssp.	<i>Calidris canutus rufa</i>	COSEWIC Endangered, NSESA Endangered S2M / At Risk	Nest in the Arctic in barren habitats. Observed within 5 km of study area (ACCDC 2016).	Nest mid. June – late July
Red-necked Phalarope	<i>Phalaropus lobatus</i>	COSEWIC Special Concern S2S3M / Sensitive	Nest in Arctic and Sub-Arctic coastal areas. Observed within 5 km of study area (ACCDC 2016).	Not applicable
Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>	S2S3B / Sensitive	Observed within 5 km of study area (ACCDC 2016).	Nest early June-late July
Ruby-crowned Kinglet	<i>Regulus calendula</i>	S3S4B / Sensitive	Nest in conifers. Observed within 5 km of study area (ACCDC 2016).	Nest Mid May-early July
Ruddy Turnstone	<i>Arenaria interpres</i>	S3M / Secure	Nest on open ground in the Arctic. Observed within 5 km of study area (ACCDC 2016).	Not applicable
Sanderling	<i>Calidris alba</i>	S3M,S2N / Secure	Nest in rocky tundra close to water. Observed within 5 km of study	Not applicable

Common Name	Scientific Name	SARA (or COSEWIC*) Status and Sched. and NSESA Status, S Rank and General Status ¹	Habitat Preference and Observations in Vicinity	Timing for Investigation
			area (ACCDC 2016).	
Semipalmated Plover	<i>Charadrius semipalmatus</i>	S1B,S3S4M / Secure	Nest gravel beaches. Observed within 5 km of study area (ACCDC 2016).	Nest June-July
Semipalmated Sandpiper	<i>Calidris pusilla</i>	S3M / Sensitive	Nest open tundra. Observed within 5 km of study area (ACCDC 2016).	Not applicable
Short-billed Dowitcher	<i>Limnodromus griseus</i>	S3M / Secure	Nest on ground in bog, forest clearing, or edge tundra near water. Observed within 5 km of study area (ACCDC 2016).	Not applicable
Spotted Sandpiper	<i>Actitis macularius</i>	S3S4B / Sensitive	Nest open areas. Observed within 5 km of study area (ACCDC 2016).	Nest mid April to mid July
Swainson's Thrush	<i>Catharus ustulatus</i>	S3S4B / Secure	Nest in trees. Observed within 5 km of study area (ACCDC 2016).	Nest Late May-late July
Tennessee Warbler	<i>Vermivora peregrina</i>	S3S4B / Sensitive	Forest. Observed within 5 km of study area (ACCDC 2016).	Nest June-July
Virginia Rail	<i>Rallus limicola</i>	S2S3B / Undetermined	Nest in freshwater and brackish marshes. Observed within 5 km of study area (ACCDC 2016).	Nest early to mid June
Willet	<i>Tringa semipalmata</i>	S2S3B / May be at Risk	Nest coastal near marsh. Observed within 5 km of study area (ACCDC 2016).	Nest mid May-July
Wilson's Snipe	<i>Gallinago delicata</i>	S3B / Sensitive	Nest shallow marsh, bog. Observed within 5 km of study area (ACCDC 2016).	Nest May-July
FISH				
Atlantic salmon iBoF population.	<i>Salmo salar</i>	COSEWIC/SARA Endangered S1 / May be at risk	Gravel bottomed streams, rivers.	Late summer/fall
American eel	<i>Anguilla rostrata</i>	COSEWIC Threatened S5 / Secure	Fresh water streams for adults. Migrate to sea to spawn.	Non-winter
Brook trout	<i>Salvelinus fontinalis</i>	S4 / Sensitive	Streams, brooks.	Late summer/fall
Gaspereau	<i>Alosa pseudoharengus</i>	S4 / Sensitive	Spawn above head of tide in rivers, stillwater, lake.	Spring-summer
Herptiles				
Blandings turtle	<i>Emydoidea blandingii</i>	SARA Endangered NSESA Vulnerable	Freshwater wetlands – shallow vegetated coves, Stillwater brooks, marshes, wet meadows and bogs. Not recorded within 5 km but potential location sensitive (ACCDC 2016).	Early June – Early July
Snapping turtle	<i>Chelydra serpentina</i>	Special Concern Sched. 1 NSESA Vulnerable S5 / Sensitive	Vegetated lakes and streams, nest on sand / gravel.	Non-winter

Common Name	Scientific Name	SARA (or COSEWIC*) Status and Sched. and NSESA Status, S Rank and General Status ¹	Habitat Preference and Observations in Vicinity	Timing for Investigation
Wood turtle	<i>Glyptemys insculpta</i>	Threatened Sched. 1 NSESA Threatened S2 / Sensitive	Nest on gravel bank near river, overwinter in pools, clear streams. Not recorded within 5 km but potential location sensitive (ACCDC 2016).	Late spring
MAMMALS				
Mainland Moose	<i>Alces alces american</i>	NSESA Endangered S1 / At risk	Forest and wetland, large range.	Track or scat visible
Little Brown Myotis	<i>Myotis lucifugus</i>	Endangered Sched. 1 NSESA Endangered S1 / At risk	Hibernate in caves, may feed in area. Not recorded within 5 km but potential location sensitive (ACCDC 2016).	Summer - fall
Northern Myotis	<i>Myotis septentrionalis</i>	Endangered Sched. 1 NSESA Endangered S1 / At risk	Hibernate dense forest and caves, may feed in area. Not recorded within 5 km but potential location sensitive (ACCDC 2016).	Summer - fall
Tri-coloured Bat / Eastern Pipistrelle	<i>Pipistrellus subflavus</i>	Endangered Sched. 1 NSESA Endangered S1 / At risk	Hibernate in caves, may feed in area. Not recorded within 5 km but potential location sensitive (ACCDC 2016).	Summer - fall

1. Status as of September 2016

Appendix F

F1 Plant Species Survey - August 2016
F2 Potential Animal Species

August 31, 2016 Glenholme Pit No. 4 Study Area - Botany Survey (Tom Neily)

		Status	Black Spruce Treed	Alder Thicket	Open Wetland	Urban Disturbed	Upland Regeneration	Small Wetland	Pond Edge
<i>Abies balsamea</i>	Balsam Fir	S5		x					
<i>Acer rubrum</i>	Red Maple	S5		x	x	x	x		
<i>Achillea millefolium</i>	Common Yarrow	S5				x			
<i>Alnus incana</i>	Speckled Alder	S5			x	x			x
<i>Anaphalis margaritacea</i>	Pearly Everlasting	S5				x			
<i>Aralia nudicaulis</i>	Wild Sarsaparilla	S5					x		
<i>Betula alleghaniensis</i>	Yellow Birch	S5		x			x		
<i>Betula papyrifera</i>	Paper Birch	S5					x		
<i>Betula populifolia</i>	Gray Birch	S5				x	x		
<i>Calamagrostis canadensis</i>	Blue-Joint Reedgrass	S5		x	x			x	
<i>Calystegia sepium</i>	Hedge Bindweed	S5							x
<i>Carex canescens</i>	Hoary Sedge	S5						x	
<i>Carex magellanica</i>	A Sedge	S5						x	
<i>Carex stipata</i>	Stalk-Grain Sedge	S5		x					
<i>Carex stricta</i>	Tussock Sedge	S5		x	x				
<i>Carex trisperma</i>	Three-Seed Sedge	S5	x						
<i>Carex trisperma</i>	Three-Seed Sedge	S5						x	
<i>Chamaedaphne calyculata</i>	Leatherleaf	S5		x	x			x	
<i>Cicuta maculata</i>	Spotted Water-Hemlock	S5							x
<i>Comarum palustre</i>	Marsh Cinquefoil	S5			x				x
<i>Comptonia peregrina</i>	Sweet Fern	S5				x	x		
<i>Cornus canadensis</i>	Dwarf Dogwood	S5	x	x			x		
<i>Diervilla lonicera</i>	Northern Bush-Honeysuckle	S5				x	x		
<i>Doellingeria umbellata</i>	Parasol White-Top	S5		x	x				
<i>Drosera rotundifolia</i>	Roundleaf Sundew	S5			x				
<i>Dryopteris cristata</i>	Crested Shield-Fern	S5		x					
<i>Dulichium arundinaceum</i>	Three-Way Sedge	S5							x
<i>Epilobium palustre</i>	Marsh Willow-Herb	S5			x				
<i>Eriophorum virginicum</i>	Tawny Cotton-Grass	S5			x			x	
<i>Euthamia graminifolia</i>	Flat-Top Fragrant-Golden-Rod	S5		x		x			

August 31, 2016 Glenholme Pit No. 4 Study Area - Botany Survey (Tom Neily)

		Status	Black Spruce Treed	Alder Thicket	Open Wetland	Urban Disturbed	Upland Regeneration	Small Wetland	Pond Edge
<i>Fragaria virginiana</i>	Virginia Strawberry	S5				x			
<i>Gaylussacia baccata</i>	Black Huckleberry	S5	x						
<i>Glyceria canadensis</i>	Canada Manna-Grass	S5			x				x
<i>Glyceria striata</i>	Fowl Manna-Grass	S5		x					
<i>Hypericum perforatum</i>	A St. John's-Wort	SNA				x			
<i>Ilex verticillata</i>	Black Holly	S5		x	x			x	
<i>Impatiens capensis</i>	Spotted Jewel-Weed	S5		x					
<i>Iris versicolor</i>	Blueflag	S5			x			x	x
<i>Juncus pelocarpus</i>	Brown-Fruited Rush	S5						x	x
<i>Kalmia angustifolia</i>	Sheep-Laurel	S5	x				x		
<i>Larix laricina</i>	American Larch	S5	x		x		x		
<i>Ledum groenlandicum</i>	Common Labrador Tea	S5	x						
<i>Linnaea borealis</i>	Twinflower	S5					x		
<i>Lycopus americanus</i>	American Bugleweed	S5							x
<i>Lysimachia terrestris</i>	Swamp Loosestrife	S5		x	x			x	x
<i>Maianthemum canadense</i>	Wild Lily-of-The-Valley	S5					x		
<i>Maianthemum trifolium</i>	Three-Leaf Solomon's-Plume	S5	x		x			x	
<i>Myrica gale</i>	Sweet Bayberry	S5		x	x				x
<i>Myrica pensylvanica</i>	Northern Bayberry	S5				x			
<i>Nemopanthus mucronatus</i>	Mountain Holly	S5	x					x	
<i>Onoclea sensibilis</i>	Sensitive Fern	S5		x					
<i>Osmunda cinnamomea</i>	Cinnamon Fern	S5	x		x			x	
<i>Phleum pratense</i>	Meadow Timothy	SNA				x			
<i>Photinia melanocarpa</i>	Black Chokeberry	S5			x				
<i>Picea glauca</i>	White Spruce	S5		x		x			
<i>Picea mariana</i>	Black Spruce	S5	x	x	x		x		
<i>Pinus strobus</i>	Eastern White Pine	S5					x		
<i>Plantago major</i>	Nipple-Seed Plantain	SNA				x			
<i>Polygonum sagittatum</i>	Arrow-Leaved Tearthumb	S5		x					x
<i>Pontederia cordata</i>	Pickereel Weed	S5							x

August 31, 2016 Glenholme Pit No. 4 Study Area - Botany Survey (Tom Neily)

		Status	Black Spruce Treed	Alder Thicket	Open Wetland	Urban Disturbed	Upland Regeneration	Small Wetland	Pond Edge
<i>Populus grandidentata</i>	Large-Tooth Aspen	S5					X		
<i>Populus tremuloides</i>	Quaking Aspen	S5			X	X			
<i>Potentilla simplex</i>	Old-Field Cinquefoil	S5				X			
<i>Prunus serotina</i>	Wild Black Cherry	S5					X		
<i>Pteridium aquilinum</i>	Bracken Fern	S5					X		
<i>Quercus rubra</i>	Northern Red Oak	S5					X		
<i>Ranunculus acris</i>	Tall Butter-Cup	SNA		X					
<i>Rhododendron canadense</i>	Rhodora	S5		X	X				X
<i>Rosa sp</i>	Rose	n/a		X		X			
<i>Rubus sp</i>	Bramble	not a sp at risk		X			X		
<i>Salix sp</i>	Willow	not a sp at risk			X				
<i>Sarracenia purpurea</i>	Northern Pitcher-Plant	S5	X						
<i>Scirpus cyperinus</i>	Cottongrass Bulrush	S5		X					
<i>Solidago canadensis</i>	Canada Goldenrod	S5		X	X				
<i>Solidago puberula</i>	Downy Goldenrod	S5				X			
<i>Solidago rugosa</i>	Rough-Leaf Goldenrod	S5		X	X	X			
<i>Sorbus americana</i>	American Mountain-Ash	S5				X			
<i>Sparganium americanum</i>	American Bur-Reed	S5							X
<i>Spartina pectinata</i>	Fresh Water Cordgrass	S5		X	X				
<i>Spiraea alba</i>	Narrow-Leaved Meadow-Sweet	S5		X	X				X
<i>Spiraea tomentosa</i>	Hardhack Spiraea	S5			X				X
<i>Symphotrichum novi-belgii</i>	New Belgium American-Aster	S5			X				
<i>Thelypteris palustris</i>	Marsh Fern	S5		X	X				X
<i>Triadenum fraseri</i>	Marsh St. John's-Wort	S5			X				
<i>Trientalis borealis</i>	Northern Starflower	S5					X		
<i>Typha latifolia</i>	Broad-Leaf Cattail	S5		X	X				X
<i>Vaccinium angustifolium</i>	Late Lowbush Blueberry	S5					X		
<i>Vaccinium macrocarpon</i>	Large Cranberry	S5		X	X			X	
<i>Vaccinium myrtilloides</i>	Velvetleaf Blueberry	S5					X		
<i>Viburnum nudum</i>	Possum-Haw Viburnum	S5		X		X	X		

August 31, 2016 Glenholme Pit No. 4 Study Area - Botany Survey (Tom Neily)

	Status	Black Spruce Treed	Alder Thicket	Open Wetland	Urban Disturbed	Upland Regeneration	Small Wetland	Pond Edge
<i>Vicia cracca</i>	Tufted Vetch	SNA						x

Potential Animal Species in General Area
(vertebrates excluding birds - see Table 6-9 in Main Report)

Common Name	Scientific Name	S* Rank	Status*	Habitat	Distribution	Observation ¹
Deer mouse	<i>Peromyscus maniculatus</i>	S5	Secure	forests, fields	common in NS, locally	-
Woodland jumping mouse	<i>Napaeozapus insignis</i>	S5	Secure	forest, edge	common throughout NS	-
Meadow jumping mouse	<i>Zapus hudsonius</i>	S5	Secure	wet field, bog, forest	locally throughout NS	-
Meadow vole	<i>Microtus pennsylvanicus</i>	S5	Secure	fields	throughout NS in habitat	-
Cinereus shrew	<i>Sorex cinereus</i>	S5	Secure	forests, field barrens - near water	abundant throughout NS	-
Smoky shrew	<i>Sorex fumeus</i>	S5	Secure	mixed and deciduous forest	uncommon mainland NS	-
Star-nosed mole	<i>Condylura cristata</i>	S5	Secure	low, wet, soft soil near watercourse	locally throughout NS	-
Southern red-backed vole	<i>Myodes gapperi</i>	S5	Secure	forests, edge	abundant throughout NS	-
American water shrew	<i>Sorex palustris</i>	S3S4	Secure	river, stream bank in forest, floodplain	locally throughout NS	-
Short-tailed shrew	<i>Blarina brevicauda</i>	S5	Secure	forests, most areas	abundant throughout NS	-
Eastern chipmunk	<i>Tamias striatus</i>	S5	Secure	forests or edges or gardens	throughout NS	-
Red squirrel	<i>Tamiasciurus hudsonicus</i>	S5	Secure	softwood/ mixed wood forests edges	common throughout NS	Yes
Snowshoe hare	<i>Lepus americanus</i>	S5	Secure	conifer thickets or alder swamps	common throughout NS	-
Beaver	<i>Castor canadensis</i>	S5	Secure	slow-flowing streams, lakes, wetlands	throughout NS	-
Muskrat	<i>Ondatra zibethicus</i>	S5	Secure	marshes, lakes, rivers	throughout NS	-
Red fox	<i>Vulpes vulpes</i>	S5	Secure	agricultural intermixed with woods	throughout NS	-
Eastern coyote	<i>Canis latrans</i>	S5	Secure	wooded areas to farmland	throughout NS	Scat
Black bear	<i>Ursus americanus</i>	S5	Secure	forest, wooded areas, swamps	scattered throughout NS	-
Raccoon	<i>Procyon lotor</i>	S5	Secure	edges of streams, marshes; urban areas	throughout NS	-
Bobcat	<i>Felis rufus</i>		Green	coniferous stands	throughout NS	-
Porcupine	<i>Erethizon dorsatum</i>	S5	Secure	all forest types	common on mainland	-
Striped skunk	<i>Mephitis mephitis</i>	S5	Secure	semi-opened forest, agricultural lands	uncommon in western	-
White-tailed deer	<i>Odocoileus virginianus</i>	S5	Secure	forest edges, fields & cutovers	common throughout NS	Yes
Moose – Federal SAR	<i>Alces americanus</i>	S1	At Risk	young forest/wet sites near lakes/swamps	Cobequid population	-
Mink	<i>Neovison vison</i>	S5	Secure	wetland habitats	throughout NS	-
Short-tailed weasel	<i>Mustela erminea</i>	S5	Secure	forest	common throughout NS.	-
Woodchuck	<i>Marmota monax</i>	S5	Secure	fields, wood edge, rocky slopes	mainland NS	-
Northern flying squirrel	<i>Glaucomys sabrinus</i>	S5	Secure	mature softwood and mixed wood	common throughout NS	-
Little brown myotis (bat) – Federal SAR	<i>Myotis lucifugus</i>	S1	At Risk	forage over water fields and roads, forest roosts	throughout NS - summer	-
Northern myotis (bat) – Federal SAR	<i>Myotis septentrionalis</i>	S1	At Risk	forage over water fields and roads, forest roosts	throughout NS - summer	-
Spotted salamander	<i>Ambystoma maculatum</i>	S5	Secure	woods near breeding sites, bogs/ponds	common throughout NS.	-
Eastern redback salamander	<i>Plethodon cinereus</i>	S5	Secure	moist forest floors	common throughout NS	-
Blue-spotted salamander	<i>Ambystoma laterale</i>	S5	Secure	woods near breeding sites, swamps, ponds, slow streams	occasional Northern NS	-
Red-spotted newt	<i>Notophthalmus viridescens</i>	S5	Secure	woods near aquatic sites	common NS	-
Eastern American Toad	<i>Anaxyrus americanus americanus</i>	S5	Secure	shores of ponds, lakes, streams adjacent woods	scattered throughout NS	-
Northern spring peeper	<i>Pseudacris crucifer</i>	S5	Secure	woods, breeding ponds, marshes	common throughout NS	-
Bullfrog	<i>Lithobates catesbeianus</i>	S5	Secure	vegetated pond/ lake, boggy stream	scattered	-
Green frog	<i>Lithobates clamitans</i>	S5	Secure	lakes, ponds, streams	common throughout NS	-
Northern leopard frog	<i>Lithobates pipiens</i>	S5	Secure	grassy wet areas	common throughout NS	-
Pickering frog	<i>Lithobates palustris</i>	S5	Secure	stream, lakeshore	common throughout NS	-
Mink frog	<i>Lithobates septentrionalis</i>	S5	Secure	near pond, cove of lake or quiet stream	scattered throughout NS	-
Wood frog	<i>Lithobates sylvatica</i>	S5	Secure	damp woods	common through NS	-
Northern redbelly snake	<i>Storeria occipitomaculata</i>	S5	Secure	grassy, heath areas	scattered throughout NS	-
Maritime garter snake	<i>Thamnophis sirtalis pallidulus</i>	S5	Secure	edges of fields, shores or woods	common throughout NS	-
Eastern smooth green snake	<i>Ophedrys vernalis</i>	S4	Secure	grassy shrubby areas, near aquatic	common throughout NS	-
Common snapping turtle – Federal COSEWIC/SAR	<i>Chelydra serpentina</i>	S3	Sensitive	near watercourse, nest on gravel	throughout NS	-
Wood turtle – Federal SAR	<i>Clemmys insculpta</i>	S1	At Risk	river, nest on gravel	throughout NS	-

NOTES *Status as of April 2017 from ACCDC 1. Observed based on animal or animal sign (incidental to 2016 field surveys).

Appendix G

Wetland Data

WETLAND DETERMINATION DATA FORM - MARITIMES

Project/Site: Glenholme Pit 4 Municipality/County: Colchester Sampling Date: 14-Oct-16
 Applicant/Owner: OSCO Aggregates Sampling Point: WL1
 Investigator(s): T.Neily,K.March,K.Regan Affiliation: Dillon Consulting
 Landform (hillslope, terrace, etc.): Basin Local relief (concave, convex, none): concave
 Slope: 2.0% 1.1 ° Lat.: 20T 0457204 Long.: 5026866 Datum: NAD83
 Soil Map Unit Name/Type: Wolfville Formation - glacial fluvial aggregates Wetland Type Bog

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

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

Hydrophytic Vegetation Present? Yes <input checked="" type="radio"/> No <input type="radio"/> Hydric Soil Present? Yes <input checked="" type="radio"/> No <input type="radio"/> Wetland Hydrology Present? Yes <input checked="" type="radio"/> No <input type="radio"/>	Is the Sampled Area within a Wetland? Yes <input type="radio"/> No <input checked="" type="radio"/>
Remarks:	

VEGETATION - Use scientific names of plants.

Stratum (Plot size: _____)	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status	Dominance Test worksheet:
1. <u>Picea mariana</u>	20	<input checked="" type="checkbox"/> 80.0%	FACW	Number of Dominant Species That are OBL, FACW, or FAC: <u>5</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of dominant Species That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B)
2. <u>Larix laricina</u>	5	<input checked="" type="checkbox"/> 20.0%	FACW	
3. _____	0	<input type="checkbox"/> 0.0%	_____	
4. _____	0	<input type="checkbox"/> 0.0%	_____	
5. _____	0	<input type="checkbox"/> 0.0%	_____	
25 = Total Cover				Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species <u>50</u> x 1 = <u>50</u> FACW species <u>11</u> x 2 = <u>22</u> FAC species <u>35</u> x 3 = <u>05</u> FACU species <u>0</u> x 4 = <u>0</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>195</u> (A) <u>375</u> (B) Prevalence Index = B/A = <u>1.9</u>
Sapling/Shrub Stratum (Plot size: <u>5</u>)				
1. <u>Kalmia angustifolia</u>	30	<input checked="" type="checkbox"/> 75.0%	FAC	
2. <u>Viburnum nudum</u>	5	<input type="checkbox"/> 12.5%	FACW	
3. <u>Rhododendron canadense</u>	5	<input type="checkbox"/> 12.5%	FACW	
4. _____	0	<input type="checkbox"/> 0.0%	_____	
5. _____	0	<input type="checkbox"/> 0.0%	_____	
40 = Total Cover				
Herb Stratum (Plot size: <u>1</u>)				
1. <u>Ledum groenlandicum</u>	80	<input checked="" type="checkbox"/> 61.5%	OBL	
2. <u>Maianthemum trifolium</u>	50	<input checked="" type="checkbox"/> 38.5%	OBL	
3. _____	0	<input type="checkbox"/> 0.0%	_____	
4. _____	0	<input type="checkbox"/> 0.0%	_____	
5. _____	0	<input type="checkbox"/> 0.0%	_____	
6. _____	0	<input type="checkbox"/> 0.0%	_____	
7. _____	0	<input type="checkbox"/> 0.0%	_____	
8. _____	0	<input type="checkbox"/> 0.0%	_____	
9. _____	0	<input type="checkbox"/> 0.0%	_____	
10. _____	0	<input type="checkbox"/> 0.0%	_____	
130 = Total Cover				
Woody Vine Stratum (Plot size: _____)				
1. _____	0	<input type="checkbox"/> 0.0%	_____	
2. _____	0	<input type="checkbox"/> 0.0%	_____	
0 = Total Cover				
Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is > 50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤ 3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.				
Hydrophytic Vegetation Present? Yes <input checked="" type="radio"/> No <input type="radio"/>				

Remarks: (Include photo numbers here or on a separate sheet.)
 Black spruce basin bog; Amelanchier sp. Also present

SOIL

Sampling Point: WL1

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-12	N						Peat	

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

Hydric Soil Indicators:

<input checked="" type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Gleyed Matrix (S4)	Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	
<input type="checkbox"/> 2 cm Muck (A10)	<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Muck Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)	
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)		

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)		Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> Dry Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)	
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations:

Surface Water Present? Yes No Depth (inches): _____

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

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

Wetland Hydrology Present? Yes No

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

Remarks:

No rare plant potential habitat

Adapted from U.S. Corps of Engineers form for Northeast-North Central Supplement for use in Maritimes.

WETLAND DETERMINATION DATA FORM - MARITIMES

Project/Site: Glenholme Pit 4 Municipality/County: Colchester Sampling Date: 14-Oct-16
 Applicant/Owner: OSCO Aggregates Sampling Point: WL1U
 Investigator(s): T.Neily,K.March,K.Regan Affiliation: Dillon Consulting
 Landform (hillslope, terrace, etc.): Hillside Local relief (concave, convex, none): convex
 Slope: 5.0% 2.9 ° Lat.: 20T 0457211 Long.: 5026869 Datum: NAD83
 Soil Map Unit Name/Type: Wolfville Formation - glacial fluvial aggregates Wetland Type UPLAND

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

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

Hydrophytic Vegetation Present? Yes <input checked="" type="radio"/> No <input type="radio"/> Hydric Soil Present? Yes <input type="radio"/> No <input checked="" type="radio"/> Wetland Hydrology Present? Yes <input type="radio"/> No <input checked="" type="radio"/>	Is the Sampled Area within a Wetland? Yes <input type="radio"/> No <input checked="" type="radio"/>
Remarks:	

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: <u>10</u>)	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status	Dominance Test worksheet:
1. <u>Picea mariana</u>	50	<input checked="" type="checkbox"/> 55.6%	FACW	Number of Dominant Species That are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of dominant Species That Are OBL, FACW, or FAC: <u>66.7%</u> (A/B)
2. <u>Pinus strobus</u>	40	<input checked="" type="checkbox"/> 44.4%	FACU	
3. _____	0	<input type="checkbox"/> 0.0%	_____	
4. _____	0	<input type="checkbox"/> 0.0%	_____	
5. _____	0	<input type="checkbox"/> 0.0%	_____	
90 = Total Cover				Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>55</u> x 2 = <u>11</u> FAC species <u>65</u> x 3 = <u>195</u> FACU species <u>50</u> x 4 = <u>200</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>170</u> (A) <u>500</u> (B) Prevalence Index = B/A = <u>2.941</u>
Sapling/Shrub Stratum (Plot size: <u>5</u>)				
1. _____	0	<input type="checkbox"/> 0.0%	_____	
2. _____	0	<input type="checkbox"/> 0.0%	_____	
3. _____	0	<input type="checkbox"/> 0.0%	_____	
4. _____	0	<input type="checkbox"/> 0.0%	_____	
5. _____	0	<input type="checkbox"/> 0.0%	_____	
0 = Total Cover				
Herb Stratum (Plot size: <u>1</u>)				
1. <u>Ledum groenlandicum</u>	5	<input type="checkbox"/> 6.3%	OBL	
2. <u>Kalmia angustifolia</u>	5	<input type="checkbox"/> 6.3%	FAC	
3. <u>Cornus canadensis</u>	60	<input checked="" type="checkbox"/> 75.0%	FAC	
4. <u>Pteridium aquilinum</u>	10	<input type="checkbox"/> 12.5%	FACU	
5. _____	0	<input type="checkbox"/> 0.0%	_____	
6. _____	0	<input type="checkbox"/> 0.0%	_____	
7. _____	0	<input type="checkbox"/> 0.0%	_____	
8. _____	0	<input type="checkbox"/> 0.0%	_____	
9. _____	0	<input type="checkbox"/> 0.0%	_____	
10. _____	0	<input type="checkbox"/> 0.0%	_____	
80 = Total Cover				
Woody Vine Stratum (Plot size: _____)				
1. _____	0	<input type="checkbox"/> 0.0%	_____	
2. _____	0	<input type="checkbox"/> 0.0%	_____	
0 = Total Cover				
Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is > 50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)				
¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.				
Hydrophytic Vegetation Present? Yes <input checked="" type="radio"/> No <input type="radio"/>				

Remarks: (Include photo numbers here or on a separate sheet.)
 Amelachier sp. Also present

SOIL

Sampling Point: **WL1U**

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-1		100						Soil duff
1-3	10YR	3/2	100				Sandy silt	
3-12	7.5YR	3/4	100				Silty sand	refusal at 12"

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

Hydric Soil Indicators:

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Gleyed Matrix (S4)	Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	
<input type="checkbox"/> 2 cm Muck (A10)	<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Muck Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)	
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)		

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

Restrictive Layer (if observed):
 Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

<u>Primary Indicators (minimum of one is required; check all that apply)</u>		<u>Secondary Indicators (minimum of two required)</u>
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> Dry Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)	
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations:

Surface Water Present?	Yes <input type="radio"/> No <input checked="" type="radio"/>	Depth (inches): _____	Wetland Hydrology Present? Yes <input type="radio"/> No <input checked="" type="radio"/>
Water Table Present?	Yes <input type="radio"/> No <input checked="" type="radio"/>	Depth (inches): _____	
Saturation Present? (includes capillary fringe)	Yes <input type="radio"/> No <input checked="" type="radio"/>	Depth (inches): _____	

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

Remarks:

Adapted from U.S. Corps of Engineers form for Northeast-North Central Supplement for use in Maritimes.

WETLAND DETERMINATION DATA FORM - MARITIMES

Project/Site: Glenholme Pit 4 Municipality/County: Colchester Sampling Date: 14-Oct-16
 Applicant/Owner: OSCO Aggregates Sampling Point: WL2
 Investigator(s): T.Neily,K.March,K.Regan Affiliation: Dillon Consulting
 Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): concave
 Slope: 0.5% 0.3 ° Lat.: 20T 0457299 Long.: 5026871 Datum: NAD83
 Soil Map Unit Name/Type: Wolfville Formation - glacial fluvial aggregates Wetland Type Swamp

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

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

Hydrophytic Vegetation Present? Yes <input checked="" type="radio"/> No <input type="radio"/> Hydric Soil Present? Yes <input checked="" type="radio"/> No <input type="radio"/> Wetland Hydrology Present? Yes <input checked="" type="radio"/> No <input type="radio"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="radio"/> No <input type="radio"/>
Remarks:	

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: <u>10</u>)	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status	Dominance Test worksheet:
1. <u>Abies balsamea</u>	20	<input checked="" type="checkbox"/> 33.3%	FAC	Number of Dominant Species That are OBL, FACW, or FAC: <u>8</u> (A) Total Number of Dominant Species Across All Strata: <u>8</u> (B) Percent of dominant Species That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B)
2. <u>Picea mariana</u>	30	<input checked="" type="checkbox"/> 50.0%	FACW	
3. <u>Acer rubrum</u>	5	<input type="checkbox"/> 8.3%	FAC	
4. <u>Betula papyrifera</u>	5	<input type="checkbox"/> 8.3%	FACU	
5. _____	0	<input type="checkbox"/> 0.0%		
60 = Total Cover				Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species <u>40</u> x 1 = <u>40</u> FACW species <u>85</u> x 2 = <u>170</u> FAC species <u>70</u> x 3 = <u>210</u> FACU species <u>5</u> x 4 = <u>20</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>230</u> (A) <u>44</u> (B) Prevalence Index = B/A = <u>1.9</u>
Sapling/Shrub Stratum (Plot size: <u>5</u>)				
1. <u>Nemopanthus mucronatus</u>	20	<input checked="" type="checkbox"/> 33.3%	OBL	
2. <u>Myrica gale</u>	10	<input type="checkbox"/> 16.7%	OBL	
3. <u>Alnus incana</u>	20	<input checked="" type="checkbox"/> 33.3%	FACW	
4. <u>Viburnum nudum</u>	10	<input type="checkbox"/> 16.7%	FACW	
5. _____	0	<input type="checkbox"/> 0.0%		
60 = Total Cover				
Herb Stratum (Plot size: <u>1</u>)				
1. <u>Kalmia angustifolia</u>	20	<input checked="" type="checkbox"/> 18.2%	FAC	
2. <u>Osmunda cinnamomea</u>	20	<input checked="" type="checkbox"/> 18.2%	FACW	
3. <u>Ledum groenlandicum</u>	20	<input checked="" type="checkbox"/> 18.2%	OBL	
4. <u>Dryopteris cristata</u>	5	<input type="checkbox"/> 4.5%	OBL	
5. <u>Spiraea alba</u>	5	<input type="checkbox"/> 4.5%	FACW	
6. <u>Carex stricta</u>	40	<input checked="" type="checkbox"/> 36.4%	OBL	
7. _____	0	<input type="checkbox"/> 0.0%		
8. _____	0	<input type="checkbox"/> 0.0%		
9. _____	0	<input type="checkbox"/> 0.0%		
10. _____	0	<input type="checkbox"/> 0.0%		
110 = Total Cover				
Woody Vine Stratum (Plot size: _____)				
1. _____	0	<input type="checkbox"/> 0.0%		
2. _____	0	<input type="checkbox"/> 0.0%		
0 = Total Cover				

Hydrophytic Vegetation Indicators:
 1 - Rapid Test for Hydrophytic Vegetation
 2 - Dominance Test is > 50%
 3 - Prevalence Index is ≤ 3.0¹
 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 Problematic Hydrophytic Vegetation¹ (Explain)
¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes No

Remarks: (Include photo numbers here or on a separate sheet.)
 Complex - Sample at outer edge treed swamp - grades towards stream to meadow/fen; also bog areas.

SOIL

Sampling Point: WL2

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-4	N	100					Peat	
4-6	10R	100					Black organic	some silt/roots
6-12	10YR	5/2	100				Sandy Loam	

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

Hydric Soil Indicators:

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Gleyed Matrix (S4)	Indicators for Problematic Hydric Soils ³ :	
<input checked="" type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)		<input type="checkbox"/> Coast Prairie Redox (A16)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)		<input type="checkbox"/> Dark Surface (S7)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Mucky Mineral (F1)		<input type="checkbox"/> Iron Manganese Masses (F12)
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)		<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> 2 cm Muck (A10)	<input type="checkbox"/> Depleted Matrix (F3)		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)		
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)		
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)		
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)			

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:
Possibly also S1

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)		Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/>	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/>	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/>	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/>	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)	<input type="checkbox"/>
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations:

Surface Water Present? Yes No Depth (inches): _____

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

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

Wetland Hydrology Present? Yes No

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

Remarks:

Adapted from U.S. Corps of Engineers form for Northeast-North Central Supplement for use in Maritimes.

WETLAND DETERMINATION DATA FORM - MARITIMES

Project/Site: Glenholme Pit 4 Municipality/County: Colchester Sampling Date: 14-Oct-16
 Applicant/Owner: OSCO Aggregates Sampling Point: WL2U
 Investigator(s): T.Neily,K.March,K.Regan Affiliation: Dillon Consulting
 Landform (hillslope, terrace, etc.): Hillside Local relief (concave, convex, none): convex
 Slope: 2.0% 1.1 ° Lat.: 20T 0457294 Long.: 5026878 Datum: NAD83
 Soil Map Unit Name/Type: Wolfville Formation - glacial fluvial aggregates Wetland Type UPLAND

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

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

Hydrophytic Vegetation Present? Yes <input checked="" type="radio"/> No <input type="radio"/> Hydric Soil Present? Yes <input type="radio"/> No <input checked="" type="radio"/> Wetland Hydrology Present? Yes <input type="radio"/> No <input checked="" type="radio"/>	Is the Sampled Area within a Wetland? Yes <input type="radio"/> No <input checked="" type="radio"/>
Remarks:	

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: <u>10</u>)	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status	Dominance Test worksheet:
1. <u>Abies balsamea</u>	20	<input checked="" type="checkbox"/> 57.1%	FAC	Number of Dominant Species That are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of dominant Species That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B)
2. <u>Betula populifolia</u>	5	<input type="checkbox"/> 14.3%	FAC	
3. <u>Acer rubrum</u>	5	<input type="checkbox"/> 14.3%	FAC	
4. <u>Picea mariana</u>	5	<input type="checkbox"/> 14.3%	FACW	
5. _____	0	<input type="checkbox"/> 0.0%		
35 = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>5</u>)				Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>10</u> x 2 = <u>20</u> FAC species <u>10</u> x 3 = <u>300</u> FACU species <u>0</u> x 4 = <u>0</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>110</u> (A) <u>30</u> (B) Prevalence Index = B/A = <u>2.7</u>
1. <u>Viburnum nudum</u>	5	<input checked="" type="checkbox"/> 100.0%	FACW	
2. _____	0	<input type="checkbox"/> 0.0%		
3. _____	0	<input type="checkbox"/> 0.0%		
4. _____	0	<input type="checkbox"/> 0.0%		
5. _____	0	<input type="checkbox"/> 0.0%		
5 = Total Cover				
Herb Stratum (Plot size: <u>1</u>)				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is > 50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u>Cornus canadensis</u>	50	<input checked="" type="checkbox"/> 71.4%	FAC	
2. <u>Kalmia angustifolia</u>	10	<input type="checkbox"/> 14.3%	FAC	
3. <u>Linnaea borealis</u>	5	<input type="checkbox"/> 7.1%	FAC	
4. <u>Vaccinium myrtilloides</u>	5	<input type="checkbox"/> 7.1%	FACW	
5. _____	0	<input type="checkbox"/> 0.0%		
6. _____	0	<input type="checkbox"/> 0.0%		
7. _____	0	<input type="checkbox"/> 0.0%		
8. _____	0	<input type="checkbox"/> 0.0%		
9. _____	0	<input type="checkbox"/> 0.0%		
10. _____	0	<input type="checkbox"/> 0.0%		
70 = Total Cover				
Woody Vine Stratum (Plot size: _____)				Hydrophytic Vegetation Present? Yes <input checked="" type="radio"/> No <input type="radio"/>
1. _____	0	<input type="checkbox"/> 0.0%		
2. _____	0	<input type="checkbox"/> 0.0%		
0 = Total Cover				

Remarks: (Include photo numbers here or on a separate sheet.)
 Rubus sp. Also present

SOIL

Sampling Point: WL2U

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-1		100						soil duff
1-3	10YR	3/2	100					Sandy silt
3-12	7.5YR	3/4	100					Silty sand

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

Hydric Soil Indicators:

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Gleyed Matrix (S4)	Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)		<input type="checkbox"/> Coast Prairie Redox (A16)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)		<input type="checkbox"/> Dark Surface (S7)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Mucky Mineral (F1)		<input type="checkbox"/> Iron Manganese Masses (F12)
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)		<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> 2 cm Muck (A10)	<input type="checkbox"/> Depleted Matrix (F3)		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)		
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)		
<input type="checkbox"/> Sandy Muck Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)		
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)			

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

Restrictive Layer (if observed):
 Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:
 Gray Jay and Blue Jay observed

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)		Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> Dry Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)	
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations:

Surface Water Present?	Yes <input type="radio"/> No <input checked="" type="radio"/>	Depth (inches): _____	Wetland Hydrology Present? Yes <input type="radio"/> No <input checked="" type="radio"/>
Water Table Present?	Yes <input type="radio"/> No <input checked="" type="radio"/>	Depth (inches): _____	
Saturation Present? (includes capillary fringe)	Yes <input type="radio"/> No <input checked="" type="radio"/>	Depth (inches): _____	

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

Remarks:

Adapted from U.S. Corps of Engineers form for Northeast-North Central Supplement for use in Maritimes.

WETLAND DETERMINATION DATA FORM - MARITIMES

Project/Site: Glenholme Pit 4 Municipality/County: Colchester Sampling Date: 14-Oct-16
 Applicant/Owner: OSCO Aggregates Sampling Point: WL3
 Investigator(s): T.Neily,K.March,K.Regan Affiliation: Dillon Consulting
 Landform (hillslope, terrace, etc.): Basin Local relief (concave, convex, none): concave
 Slope: 0.0% 0.0 ° Lat.: 20T 0457042 Long.: 5026366 Datum: NAD83
 Soil Map Unit Name/Type: Wolfville Formation - glacial fluvial aggregates Wetland Type Bog

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

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

Hydrophytic Vegetation Present? Yes <input checked="" type="radio"/> No <input type="radio"/> Hydric Soil Present? Yes <input checked="" type="radio"/> No <input type="radio"/> Wetland Hydrology Present? Yes <input type="radio"/> No <input checked="" type="radio"/>	Is the Sampled Area within a Wetland? Yes <input type="radio"/> No <input checked="" type="radio"/>
Remarks:	

VEGETATION - Use scientific names of plants.

Stratum (Plot size: _____)	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status	Dominance Test worksheet:
Tree Stratum (Plot size: 10 _____)				Number of Dominant Species That are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of dominant Species That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B)
1. _____	0	<input type="checkbox"/> 0.0%	_____	
2. _____	0	<input type="checkbox"/> 0.0%	_____	
3. _____	0	<input type="checkbox"/> 0.0%	_____	
4. _____	0	<input type="checkbox"/> 0.0%	_____	
5. _____	0	<input type="checkbox"/> 0.0%	_____	
	0	= Total Cover		Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species <u>60</u> x 1 = <u>60</u> FACW species <u>39</u> x 2 = <u>78</u> FAC species <u>1</u> x 3 = <u>3</u> FACU species <u>0</u> x 4 = <u>0</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>109</u> (A) <u>68</u> (B) Prevalence Index = B/A = <u>1.5</u>
Sapling/Shrub Stratum (Plot size: 5 _____)				
1. <i>Ilex verticillata</i>	15	<input checked="" type="checkbox"/> 100.0%	FACW	
2. _____	0	<input type="checkbox"/> 0.0%	_____	
3. _____	0	<input type="checkbox"/> 0.0%	_____	
4. _____	0	<input type="checkbox"/> 0.0%	_____	
5. _____	0	<input type="checkbox"/> 0.0%	_____	
	15	= Total Cover		
Herb Stratum (Plot size: 1 _____)				Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is > 50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤ 3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <i>Iris versicolor</i>	2	<input type="checkbox"/> 2.1%	OBL	
2. <i>Eriophorum virginicum</i>	20	<input checked="" type="checkbox"/> 21.3%	OBL	
3. <i>Chamaedaphne calyculata</i>	30	<input checked="" type="checkbox"/> 31.9%	OBL	
4. <i>Gaylussacia baccata</i>	10	<input type="checkbox"/> 10.6%	FACU	
5. <i>Ledum groenlandicum</i>	20	<input checked="" type="checkbox"/> 21.3%	OBL	
6. <i>Drosera rotundifolia</i>	2	<input type="checkbox"/> 2.1%	OBL	
7. <i>Sarracenia purpurea</i>	10	<input type="checkbox"/> 10.6%	OBL	
8. _____	0	<input type="checkbox"/> 0.0%	_____	
9. _____	0	<input type="checkbox"/> 0.0%	_____	
10. _____	0	<input type="checkbox"/> 0.0%	_____	
	94	= Total Cover		
Woody Vine Stratum (Plot size: _____)				Hydrophytic Vegetation Present? Yes <input checked="" type="radio"/> No <input type="radio"/>
1. _____	0	<input type="checkbox"/> 0.0%	_____	
2. _____	0	<input type="checkbox"/> 0.0%	_____	
	0	= Total Cover		

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: **WL3**

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-12							Peat	

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

Hydric Soil Indicators:

<input checked="" type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Gleyed Matrix (S4)	Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	
<input type="checkbox"/> 2 cm Muck (A10)	<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Muck Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)	
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)		

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)		Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> Dry Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		

Field Observations:

Surface Water Present? Yes No Depth (inches): _____

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

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

Wetland Hydrology Present? Yes No

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

Remarks:

Adapted from U.S. Corps of Engineers form for Northeast-North Central Supplement for use in Maritimes.

WETLAND DETERMINATION DATA FORM - MARITIMES

Project/Site: Glenholme Pit 4 Municipality/County: Colchester Sampling Date: 14-Oct-16
 Applicant/Owner: OSCO Aggregates Sampling Point: WL3U
 Investigator(s): T.Neily,K.March,K.Regan Affiliation: Dillon Consulting
 Landform (hillslope, terrace, etc.): Hillside Local relief (concave, convex, none): convex
 Slope: 0.0% 0.0 ° Lat.: 20T 0457044 Long.: 5026375 Datum: NAD83
 Soil Map Unit Name/Type: Wolfville Formation - glacial fluvial aggregates Wetland Type UPLAND

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

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

Hydrophytic Vegetation Present? Yes <input type="radio"/> No <input checked="" type="radio"/> Hydric Soil Present? Yes <input type="radio"/> No <input checked="" type="radio"/> Wetland Hydrology Present? Yes <input type="radio"/> No <input checked="" type="radio"/>	Is the Sampled Area within a Wetland? Yes <input type="radio"/> No <input checked="" type="radio"/>
Remarks:	

VEGETATION - Use scientific names of plants.

Stratum (Plot size: _____)	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status	Dominance Test worksheet:
<u>Tree Stratum (Plot size: 10)</u>				Number of Dominant Species That are OBL, FACW, or FAC: <u>3</u> (A)
1. <u>Populus grandidentata</u>	10	<input checked="" type="checkbox"/> 25.0%	FACU-	Total Number of Dominant Species Across All Strata: <u>6</u> (B)
2. <u>Abies balsamea</u>	15	<input checked="" type="checkbox"/> 37.5%	FAC	Percent of dominant Species That Are OBL, FACW, or FAC: <u>50.0%</u> (A/B)
3. <u>Betula populifolia</u>	10	<input checked="" type="checkbox"/> 25.0%	FAC	
4. <u>Betula papyrifera</u>	5	<input type="checkbox"/> 12.5%	FACU	
5. _____	0	<input type="checkbox"/> 0.0%		
	40	= Total Cover		
<u>Sapling/Shrub Stratum (Plot size: 5)</u>				Prevalence Index worksheet:
1. _____	0	<input type="checkbox"/> 0.0%		Total % Cover of: Multiply by:
2. _____	0	<input type="checkbox"/> 0.0%		OBL species <u>0</u> x 1 = <u>0</u>
3. _____	0	<input type="checkbox"/> 0.0%		FACW species <u>0</u> x 2 = <u>0</u>
4. _____	0	<input type="checkbox"/> 0.0%		FAC species <u>45</u> x 3 = <u>135</u>
5. _____	0	<input type="checkbox"/> 0.0%		FACU species <u>25</u> x 4 = <u>100</u>
	0	= Total Cover		UPL species <u>25</u> x 5 = <u>125</u>
<u>Herb Stratum (Plot size: 1)</u>				Column Totals: <u>95</u> (A) <u>60</u> (B)
1. <u>Myrica aspleniifolia</u>	25	<input checked="" type="checkbox"/> 45.5%	UPL	Prevalence Index = B/A = <u>6.3</u>
2. <u>Vaccinium angustifolium</u>	5	<input type="checkbox"/> 9.1%	FACU	
3. <u>Pteridium aquilinum</u>	10	<input checked="" type="checkbox"/> 18.2%	FACU	
4. <u>Dennstaedtia punctilobula</u>	5	<input type="checkbox"/> 9.1%	FAC	
5. <u>Kalmia angustifolia</u>	10	<input checked="" type="checkbox"/> 18.2%	FAC	
6. _____	0	<input type="checkbox"/> 0.0%		
7. _____	0	<input type="checkbox"/> 0.0%		
8. _____	0	<input type="checkbox"/> 0.0%		
9. _____	0	<input type="checkbox"/> 0.0%		
10. _____	0	<input type="checkbox"/> 0.0%		
	55	= Total Cover		
<u>Woody Vine Stratum (Plot size: _____)</u>				
1. _____	0	<input type="checkbox"/> 0.0%		
2. _____	0	<input type="checkbox"/> 0.0%		
	0	= Total Cover		

Hydrophytic Vegetation Indicators:
 1 - Rapid Test for Hydrophytic Vegetation
 2 - Dominance Test is > 50%
 3 - Prevalence Index is ≤ 3.0 ¹
 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 Problematic Hydrophytic Vegetation¹ (Explain)
¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes No

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WL3U

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-1		100						Duff organic root mat
1-10	7.5YR	3/4					Sandy Loam	refusal at 10"

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

Hydric Soil Indicators:

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Gleyed Matrix (S4)	Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	
<input type="checkbox"/> 2 cm Muck (A10)	<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Muck Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)	
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)		

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)		Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> Dry Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)	
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations:

Surface Water Present? Yes No Depth (inches): _____

Water Table Present? Yes No Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes No Depth (inches): _____

Wetland Hydrology Present? Yes No

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

Remarks:

Adapted from U.S. Corps of Engineers form for Northeast-North Central Supplement for use in Maritimes.

WETLAND DETERMINATION DATA FORM - MARITIMES

Project/Site: Glenholme Pit 4 Municipality/County: Colchester Sampling Date: 14-Oct-16
 Applicant/Owner: OSCO Aggregates Sampling Point: WL4
 Investigator(s): T.Neily,K.March,K.Regan Affiliation: Dillon Consulting
 Landform (hillslope, terrace, etc.): Basin Local relief (concave, convex, none): convex
 Slope: 0.0% 0.0 ° Lat.: 20T 0456934 Long.: 5026372 Datum: NAD83
 Soil Map Unit Name/Type: Wolfville Formation - glacial fluvial aggregates Wetland Type Bog

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

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

Hydrophytic Vegetation Present? Yes <input checked="" type="radio"/> No <input type="radio"/> Hydric Soil Present? Yes <input checked="" type="radio"/> No <input type="radio"/> Wetland Hydrology Present? Yes <input checked="" type="radio"/> No <input type="radio"/>	Is the Sampled Area within a Wetland? Yes <input type="radio"/> No <input checked="" type="radio"/>
Remarks:	

VEGETATION - Use scientific names of plants.

Stratum (Plot size: _____)	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status	Dominance Test worksheet:
<u>Tree Stratum (Plot size: 10)</u>				
1. <u>Abies balsamea</u>	30	<input checked="" type="checkbox"/> 50.0%	FAC	Number of Dominant Species That are OBL, FACW, or FAC: <u>8</u> (A) Total Number of Dominant Species Across All Strata: <u>8</u> (B) Percent of dominant Species That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B)
2. <u>Picea mariana</u>	30	<input checked="" type="checkbox"/> 50.0%	FACW	
3. _____	0	<input type="checkbox"/> 0.0%		
4. _____	0	<input type="checkbox"/> 0.0%		
5. _____	0	<input type="checkbox"/> 0.0%		
	60	= Total Cover		
<u>Sapling/Shrub Stratum (Plot size: 5)</u>				Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species <u>30</u> x 1 = <u>30</u> FACW species <u>60</u> x 2 = <u>60</u> FAC species <u>11</u> x 3 = <u>330</u> FACU species <u>0</u> x 4 = <u>0</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>190</u> (A) <u>42</u> (B) Prevalence Index = B/A = <u>2.2</u>
1. <u>Nemopanthus mucronatus</u>	30	<input checked="" type="checkbox"/> 75.0%	FAC	
2. <u>Viburnum nudum</u>	10	<input checked="" type="checkbox"/> 25.0%	FAC	
3. _____	0	<input type="checkbox"/> 0.0%		
4. _____	0	<input type="checkbox"/> 0.0%		
5. _____	0	<input type="checkbox"/> 0.0%		
	40	= Total Cover		
<u>Herb Stratum (Plot size: 1)</u>				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is > 50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u>Kalmia angustifolia</u>	20	<input checked="" type="checkbox"/> 22.2%	FAC	
2. <u>Ledum groenlandicum</u>	20	<input checked="" type="checkbox"/> 22.2%	FW+	
3. <u>Cornus canadensis</u>	20	<input checked="" type="checkbox"/> 22.2%	FAC	
4. <u>Maianthemum trifolium</u>	30	<input checked="" type="checkbox"/> 33.3%	OBL	
5. _____	0	<input type="checkbox"/> 0.0%		
6. _____	0	<input type="checkbox"/> 0.0%		
7. _____	0	<input type="checkbox"/> 0.0%		
8. _____	0	<input type="checkbox"/> 0.0%		
9. _____	0	<input type="checkbox"/> 0.0%		
10. _____	0	<input type="checkbox"/> 0.0%		
	90	= Total Cover		
<u>Woody Vine Stratum (Plot size: _____)</u>				Hydrophytic Vegetation Present? Yes <input checked="" type="radio"/> No <input type="radio"/>
1. _____	0	<input type="checkbox"/> 0.0%		
2. _____	0	<input type="checkbox"/> 0.0%		
	0	= Total Cover		

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WL4

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-10							Peat	Refusal at 10"

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

Hydric Soil Indicators:

<input checked="" type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Gleyed Matrix (S4)	Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	
<input type="checkbox"/> 2 cm Muck (A10)	<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Muck Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)	
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)		

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)		Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> Dry Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)	
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations:

Surface Water Present? Yes No Depth (inches): _____

Water Table Present? Yes No Depth (inches): 3

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

Wetland Hydrology Present? Yes No

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

Remarks:

Habitat unlikely to support rare plants.

Adapted from U.S. Corps of Engineers form for Northeast-North Central Supplement for use in Maritimes.

WETLAND DETERMINATION DATA FORM - MARITIMES

Project/Site: Glenholme Pit 4 Municipality/County: Colchester Sampling Date: 14-Oct-16
 Applicant/Owner: OSCO Aggregates Sampling Point: WL4U
 Investigator(s): T.Neily,K.March,K.Regan Affiliation: Dillon Consulting
 Landform (hillslope, terrace, etc.): Hillside Local relief (concave, convex, none): convex
 Slope: 2.0% 1.1 ° Lat.: 20T 0456930 Long.: 5026374 Datum: NAD83
 Soil Map Unit Name/Type: Wolfville Formation - glacial fluvial aggregates Wetland Type UPLAND

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

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

Hydrophytic Vegetation Present? Yes <input checked="" type="radio"/> No <input type="radio"/> Hydric Soil Present? Yes <input type="radio"/> No <input checked="" type="radio"/> Wetland Hydrology Present? Yes <input type="radio"/> No <input checked="" type="radio"/>	Is the Sampled Area within a Wetland? Yes <input type="radio"/> No <input checked="" type="radio"/>
Remarks:	

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: <u>10</u>)	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status	Dominance Test worksheet:
1. <u>Picea mariana</u>	60	<input checked="" type="checkbox"/> 80.0%	FACW	Number of Dominant Species That are OBL, FACW, or FAC: <u>6</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of dominant Species That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B)
2. <u>Abies balsamea</u>	15	<input checked="" type="checkbox"/> 20.0%	FAC	
3. _____	0	<input type="checkbox"/> 0.0%	_____	
4. _____	0	<input type="checkbox"/> 0.0%	_____	
5. _____	0	<input type="checkbox"/> 0.0%	_____	
75 = Total Cover				Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species <u> </u> x 1 = <u>0</u> FACW species <u>60</u> x 2 = <u>120</u> FAC species <u>10</u> x 3 = <u>300</u> FACU species <u>0</u> x 4 = <u>0</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>160</u> (A) <u>420</u> (B) Prevalence Index = B/A = <u>2.6</u>
Sapling/Shrub Stratum (Plot size: <u>5</u>)				
1. <u>Nemopanthus mucronatus</u>	5	<input checked="" type="checkbox"/> 33.3%	FAC	
2. <u>Viburnum nudum</u>	10	<input checked="" type="checkbox"/> 66.7%	FAC	
3. _____	0	<input type="checkbox"/> 0.0%	_____	
4. _____	0	<input type="checkbox"/> 0.0%	_____	
5. _____	0	<input type="checkbox"/> 0.0%	_____	
15 = Total Cover				
Herb Stratum (Plot size: <u>1</u>)				
1. <u>Osmunda cinnamomea</u>	10	<input type="checkbox"/> 14.3%	FAC	
2. <u>Cornus canadensis</u>	40	<input checked="" type="checkbox"/> 57.1%	FAC	
3. <u>Vaccinium myrtilloides</u>	5	<input type="checkbox"/> 7.1%	FAC	
4. <u>Kalmia angustifolia</u>	15	<input checked="" type="checkbox"/> 21.4%	FAC	
5. _____	0	<input type="checkbox"/> 0.0%	_____	
6. _____	0	<input type="checkbox"/> 0.0%	_____	
7. _____	0	<input type="checkbox"/> 0.0%	_____	
8. _____	0	<input type="checkbox"/> 0.0%	_____	
9. _____	0	<input type="checkbox"/> 0.0%	_____	
10. _____	0	<input type="checkbox"/> 0.0%	_____	
70 = Total Cover				
Woody Vine Stratum (Plot size: _____)				
1. _____	0	<input type="checkbox"/> 0.0%	_____	
2. _____	0	<input type="checkbox"/> 0.0%	_____	
0 = Total Cover				
Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is > 50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)				
¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.				
Hydrophytic Vegetation Present? Yes <input checked="" type="radio"/> No <input type="radio"/>				

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: **WL4U**

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-2								duff
2-5	7.5YR	3/1					Sandy Loam	Trace organics, Refusal at 5"

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

Hydric Soil Indicators:

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Gleyed Matrix (S4)	Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)		<input type="checkbox"/> Coast Prairie Redox (A16)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)		<input type="checkbox"/> Dark Surface (S7)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Mucky Mineral (F1)		<input type="checkbox"/> Iron Manganese Masses (F12)
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)		<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> 2 cm Muck (A10)	<input type="checkbox"/> Depleted Matrix (F3)		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)		
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)		
<input type="checkbox"/> Sandy Muck Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)		
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)			

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)		Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> Dry Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)	
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations:

Surface Water Present? Yes No Depth (inches): _____

Water Table Present? Yes No Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes No Depth (inches): _____

Wetland Hydrology Present? Yes No

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

Remarks:

Adapted from U.S. Corps of Engineers form for Northeast-North Central Supplement for use in Maritimes.

WETLAND DETERMINATION DATA FORM - MARITIMES

Project/Site: Glenholme Pit 4 Municipality/County: Colchester Sampling Date: 14-Oct-16
 Applicant/Owner: OSCO Aggregates Sampling Point: WL5
 Investigator(s): T.Neily,K.March,K.Regan Affiliation: Dillon Consulting
 Landform (hillslope, terrace, etc.): basin Local relief (concave, convex, none): concave
 Slope: 0.0% 0.0 ° Lat.: 20T 0456931 Long.: 5026045 Datum: NAD83
 Soil Map Unit Name/Type: Wolfville Formation - glacial fluvial aggregates Wetland Type Swamp

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

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

Hydrophytic Vegetation Present? Yes <input checked="" type="radio"/> No <input type="radio"/> Hydric Soil Present? Yes <input checked="" type="radio"/> No <input type="radio"/> Wetland Hydrology Present? Yes <input checked="" type="radio"/> No <input type="radio"/>	Is the Sampled Area within a Wetland? Yes <input type="radio"/> No <input checked="" type="radio"/>
Remarks:	

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status	Dominance Test worksheet:
1. _____	0	<input type="checkbox"/> 0.0%	_____	Number of Dominant Species That are OBL, FACW, or FAC: <u>5</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of dominant Species That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B)
2. _____	0	<input type="checkbox"/> 0.0%	_____	
3. _____	0	<input type="checkbox"/> 0.0%	_____	
4. _____	0	<input type="checkbox"/> 0.0%	_____	
5. _____	0	<input type="checkbox"/> 0.0%	_____	
0 = Total Cover				Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species <u>40</u> x 1 = <u>40</u> FACW species <u>85</u> x 2 = <u>170</u> FAC species <u>30</u> x 3 = <u>90</u> FACU species <u>0</u> x 4 = <u>0</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>155</u> (A) <u>30</u> (B) Prevalence Index = B/A = <u>1.9</u>
Sapling/Shrub Stratum (Plot size: <u>5</u>)				
1. <u>Viburnum nudum</u>	10	<input checked="" type="checkbox"/> 40.0%	FAC	
2. <u>Aronia melanocarpa</u>	5	<input checked="" type="checkbox"/> 20.0%	FW	
3. <u>Ilex verticillata</u>	10	<input checked="" type="checkbox"/> 40.0%	FW+	
4. _____	0	<input type="checkbox"/> 0.0%	_____	
5. _____	0	<input type="checkbox"/> 0.0%	_____	
25 = Total Cover				
Herb Stratum (Plot size: <u>1</u>)				
1. <u>Calamagrostis canadensis</u>	70	<input checked="" type="checkbox"/> 53.8%	FCW	
2. <u>Thelypteris palustris</u>	5	<input type="checkbox"/> 3.8%	OBL	
3. <u>Myrica gale</u>	30	<input checked="" type="checkbox"/> 23.1%	OBL	
4. <u>Kalmia angustifolia</u>	20	<input type="checkbox"/> 15.4%	FAC	
5. <u>Spartina alterniflora</u>	5	<input type="checkbox"/> 3.8%	OBL	
6. _____	0	<input type="checkbox"/> 0.0%	_____	
7. _____	0	<input type="checkbox"/> 0.0%	_____	
8. _____	0	<input type="checkbox"/> 0.0%	_____	
9. _____	0	<input type="checkbox"/> 0.0%	_____	
10. _____	0	<input type="checkbox"/> 0.0%	_____	
130 = Total Cover				
Woody Vine Stratum (Plot size: _____)				
1. _____	0	<input type="checkbox"/> 0.0%	_____	
2. _____	0	<input type="checkbox"/> 0.0%	_____	
0 = Total Cover				

Hydrophytic Vegetation Indicators:

1 - Rapid Test for Hydrophytic Vegetation

2 - Dominance Test is > 50%

3 - Prevalence Index is ≤ 3.0¹

4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation¹ (Explain)

¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes No

Remarks: (Include photo numbers here or on a separate sheet.)
 Rosa sp also present

Adapted from U.S. Corps of Engineers form for Northeast-North Central Supplement for use in Maritimes.

SOIL

Sampling Point: **WL5**

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-16							Peat	

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

Hydric Soil Indicators:

<input checked="" type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Gleyed Matrix (S4)	Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	
<input type="checkbox"/> 2 cm Muck (A10)	<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Muck Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)	
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)		

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)		Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> Dry Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)	
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations:

Surface Water Present? Yes No Depth (inches): _____

Water Table Present? Yes No Depth (inches): 1

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

Wetland Hydrology Present? Yes No

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

Remarks:

Adapted from U.S. Corps of Engineers form for Northeast-North Central Supplement for use in Maritimes.

WETLAND DETERMINATION DATA FORM - MARITIMES

Project/Site: Glenholme Pit 4 Municipality/County: Colchester Sampling Date: 14-Oct-16
 Applicant/Owner: OSCO Aggregates Sampling Point: WL5U
 Investigator(s): T.Neily,K.March,K.Regan Affiliation: Dillon Consulting
 Landform (hillslope, terrace, etc.): Hillside Local relief (concave, convex, none): convex
 Slope: 2.0% 1.1 ° Lat.: 20T 0456928 Long.: 5026047 Datum: NAD83
 Soil Map Unit Name/Type: Wolfville Formation - glacial fluvial aggregates Wetland Type UPLAND

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

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

Hydrophytic Vegetation Present? Yes <input checked="" type="radio"/> No <input type="radio"/> Hydric Soil Present? Yes <input type="radio"/> No <input checked="" type="radio"/> Wetland Hydrology Present? Yes <input type="radio"/> No <input checked="" type="radio"/>	Is the Sampled Area within a Wetland? Yes <input type="radio"/> No <input checked="" type="radio"/>
Remarks:	

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status	Dominance Test worksheet:
1. _____	0	<input type="checkbox"/> 0.0%		Number of Dominant Species That are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
2. _____	0	<input type="checkbox"/> 0.0%		
3. _____	0	<input type="checkbox"/> 0.0%		
4. _____	0	<input type="checkbox"/> 0.0%		
5. _____	0	<input type="checkbox"/> 0.0%		
	0	= Total Cover		
Sapling/Shrub Stratum (Plot size: <u>5</u> _____)				Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>10</u> x 2 = <u>10</u> FAC species <u>14</u> x 3 = <u>420</u> FACU species <u>20</u> x 4 = <u>80</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>170</u> (A) <u>51</u> (B) Prevalence Index = B/A = <u>3</u>
1. <i>Prunus virginiana</i>	30	<input checked="" type="checkbox"/> 66.7%	FAC	
2. <i>Acer rubrum</i>	15	<input checked="" type="checkbox"/> 33.3%	FAC	
3. _____	0	<input type="checkbox"/> 0.0%		
4. _____	0	<input type="checkbox"/> 0.0%		
5. _____	0	<input type="checkbox"/> 0.0%		
	45	= Total Cover		
Herb Stratum (Plot size: <u>1</u> _____)				
1. <i>Solidago rugosa</i>	80	<input checked="" type="checkbox"/> 64.0%	FAC	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is > 50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <i>Spiraea alba</i>	15	<input type="checkbox"/> 12.0%	FAC	
3. <i>Calamagrostis canadensis</i>	10	<input type="checkbox"/> 8.0%	FACW+	
4. <i>Rosa multiflora</i>	20	<input type="checkbox"/> 16.0%	FACU	
5. _____	0	<input type="checkbox"/> 0.0%		
6. _____	0	<input type="checkbox"/> 0.0%		
7. _____	0	<input type="checkbox"/> 0.0%		
8. _____	0	<input type="checkbox"/> 0.0%		
9. _____	0	<input type="checkbox"/> 0.0%		
10. _____	0	<input type="checkbox"/> 0.0%		
	125	= Total Cover		
Woody Vine Stratum (Plot size: _____)				
1. _____	0	<input type="checkbox"/> 0.0%		Hydrophytic Vegetation Present? Yes <input checked="" type="radio"/> No <input type="radio"/>
2. _____	0	<input type="checkbox"/> 0.0%		
	0	= Total Cover		

Remarks: (Include photo numbers here or on a separate sheet.)
 Rosa sp and Rubus sp also present, sp not confirmed.

SOIL

Sampling Point: **WL5U**

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-6	10YR	4/2	100				Silty Clay Loam	refusal at 6"

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

Hydric Soil Indicators:

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Gleyed Matrix (S4)	Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)		<input type="checkbox"/> Coast Prairie Redox (A16)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)		<input type="checkbox"/> Dark Surface (S7)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Mucky Mineral (F1)		<input type="checkbox"/> Iron Manganese Masses (F12)
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)		<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> 2 cm Muck (A10)	<input type="checkbox"/> Depleted Matrix (F3)		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)		
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)		
<input type="checkbox"/> Sandy Muck Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)		
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)			

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)		Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> Dry Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)	
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations:

Surface Water Present? Yes No Depth (inches): _____

Water Table Present? Yes No Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes No Depth (inches): _____

Wetland Hydrology Present? Yes No

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

Remarks:

Adapted from U.S. Corps of Engineers form for Northeast-North Central Supplement for use in Maritimes.

WETLAND DETERMINATION DATA FORM - MARITIMES

Project/Site: Glenholme Pit 4 Municipality/County: Colchester Sampling Date: 14-Oct-16
 Applicant/Owner: OSCO Aggregates Sampling Point: WL6
 Investigator(s): T.Neily,K.March,K.Regan Affiliation: Dillon Consulting
 Landform (hillslope, terrace, etc.): Pond Local relief (concave, convex, none): concave
 Slope: 0.0% 0.0 ° Lat.: 20T 0456802 Long.: 5026048 Datum: NAD83
 Soil Map Unit Name/Type: Wolfville Formation - glacial fluvial aggregates Wetland Type Marsh

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

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

Hydrophytic Vegetation Present? Yes <input checked="" type="radio"/> No <input type="radio"/> Hydric Soil Present? Yes <input checked="" type="radio"/> No <input type="radio"/> Wetland Hydrology Present? Yes <input type="radio"/> No <input checked="" type="radio"/>	Is the Sampled Area within a Wetland? Yes <input type="radio"/> No <input checked="" type="radio"/>
Remarks:	

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status	Dominance Test worksheet:
1. _____	0	<input type="checkbox"/> 0.0%	_____	Number of Dominant Species That are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of dominant Species That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B)
2. _____	0	<input type="checkbox"/> 0.0%	_____	
3. _____	0	<input type="checkbox"/> 0.0%	_____	
4. _____	0	<input type="checkbox"/> 0.0%	_____	
5. _____	0	<input type="checkbox"/> 0.0%	_____	
0 = Total Cover				Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species <u>95</u> x 1 = <u>95</u> FACW species <u>50</u> x 2 = <u>10</u> FAC species <u>25</u> x 3 = <u>5</u> FACU species <u>0</u> x 4 = <u>0</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>170</u> (A) <u>27</u> (B) Prevalence Index = B/A = <u>1.6</u>
Sapling/Shrub Stratum (Plot size: <u>5</u>)				
1. <i>Alnus incana</i>	15	<input checked="" type="checkbox"/> 100.0%	FACW	
2. _____	0	<input type="checkbox"/> 0.0%	_____	
3. _____	0	<input type="checkbox"/> 0.0%	_____	
4. _____	0	<input type="checkbox"/> 0.0%	_____	
5. _____	0	<input type="checkbox"/> 0.0%	_____	
15 = Total Cover				
Herb Stratum (Plot size: <u>1</u>)				
1. <i>Myrica gale</i>	15	<input type="checkbox"/> 9.7%	OBL	
2. <i>Spiraea tomentosa</i>	15	<input type="checkbox"/> 9.7%	FAC	
3. <i>Carex lasiocarpa</i>	80	<input checked="" type="checkbox"/> 51.6%	OBL	
4. <i>Lysimachia terrestris</i>	20	<input type="checkbox"/> 12.9%	W+	
5. <i>Iris versicolor</i>	5	<input type="checkbox"/> 3.2%	FW+	
6. <i>Spiraea alba</i>	10	<input type="checkbox"/> 6.5%	FAC	
7. <i>Scirpus cyperinus</i>	10	<input type="checkbox"/> 6.5%	FACW	
8. _____	0	<input type="checkbox"/> 0.0%	_____	
9. _____	0	<input type="checkbox"/> 0.0%	_____	
10. _____	0	<input type="checkbox"/> 0.0%	_____	
155 = Total Cover				
Woody Vine Stratum (Plot size: _____)				
1. _____	0	<input type="checkbox"/> 0.0%	_____	
2. _____	0	<input type="checkbox"/> 0.0%	_____	
0 = Total Cover				

Hydrophytic Vegetation Indicators:
 1 - Rapid Test for Hydrophytic Vegetation
 2 - Dominance Test is > 50%
 3 - Prevalence Index is ≤ 3.0¹
 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 Problematic Hydrophytic Vegetation¹ (Explain)

¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes No

Remarks: (Include photo numbers here or on a separate sheet.)
 Rosa sp also present

SOIL

Sampling Point: **WL6**

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-16							Peat	

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

Hydric Soil Indicators:

<input checked="" type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Gleyed Matrix (S4)	Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	
<input type="checkbox"/> 2 cm Muck (A10)	<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Muck Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)	
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)		

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

Hairy woodpecker flew by.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)		Secondary Indicators (minimum of two required)
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> Dry Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		

Field Observations:

Surface Water Present? Yes No Depth (inches): 1

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

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

Wetland Hydrology Present? Yes No

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

Remarks:

Adapted from U.S. Corps of Engineers form for Northeast-North Central Supplement for use in Maritimes.

WETLAND DETERMINATION DATA FORM - MARITIMES

Project/Site: Glenholme Pit 4 Municipality/County: Colchester Sampling Date: 14-Oct-16
 Applicant/Owner: OSCO Aggregates Sampling Point: WL6U
 Investigator(s): T.Neily,K.March,K.Regan Affiliation: Dillon Consulting
 Landform (hillslope, terrace, etc.): Hillside Local relief (concave, convex, none): convex
 Slope: 2.0% 1.1 ° Lat.: 20T 0456808 Long.: 5026043 Datum: NAD83
 Soil Map Unit Name/Type: Wolfville Formation - glacial fluvial aggregates Wetland Type UPLAND

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

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

Hydrophytic Vegetation Present? Yes <input checked="" type="radio"/> No <input type="radio"/> Hydric Soil Present? Yes <input type="radio"/> No <input checked="" type="radio"/> Wetland Hydrology Present? Yes <input type="radio"/> No <input checked="" type="radio"/>	Is the Sampled Area within a Wetland? Yes <input type="radio"/> No <input checked="" type="radio"/>
Remarks:	

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: <u>10</u>)	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status	Dominance Test worksheet:
1. <u>Picea glauca</u>	15	<input checked="" type="checkbox"/> 100.0%	FAC	Number of Dominant Species That are OBL, FACW, or FAC: <u>6</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
2. _____	0	<input type="checkbox"/> 0.0%	_____	
3. _____	0	<input type="checkbox"/> 0.0%	_____	
4. _____	0	<input type="checkbox"/> 0.0%	_____	
5. _____	0	<input type="checkbox"/> 0.0%	_____	
15 = Total Cover				Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>10</u> x 2 = <u>10</u> FAC species <u>90</u> x 3 = <u>27</u> FACU species <u>0</u> x 4 = <u>00</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>100</u> (A) <u>28</u> (B) Prevalence Index = B/A = <u>2.800</u>
Sapling/Shrub Stratum (Plot size: <u>5</u>)				
1. <u>Alnus incana</u>	10	<input checked="" type="checkbox"/> 100.0%	FACW	
2. _____	0	<input type="checkbox"/> 0.0%	_____	
3. _____	0	<input type="checkbox"/> 0.0%	_____	
4. _____	0	<input type="checkbox"/> 0.0%	_____	
5. _____	0	<input type="checkbox"/> 0.0%	_____	
10 = Total Cover				
Herb Stratum (Plot size: <u>1</u>)				
1. <u>Solidago rugosa</u>	20	<input checked="" type="checkbox"/> 26.7%	FAC	
2. <u>Solidago canadensis</u>	20	<input checked="" type="checkbox"/> 26.7%	FAC	
3. <u>Spiraea alba</u>	20	<input checked="" type="checkbox"/> 26.7%	FAC	
4. <u>Doellingeria umbellata</u>	15	<input checked="" type="checkbox"/> 20.0%	FAC	
5. _____	0	<input type="checkbox"/> 0.0%	_____	
6. _____	0	<input type="checkbox"/> 0.0%	_____	
7. _____	0	<input type="checkbox"/> 0.0%	_____	
8. _____	0	<input type="checkbox"/> 0.0%	_____	
9. _____	0	<input type="checkbox"/> 0.0%	_____	
10. _____	0	<input type="checkbox"/> 0.0%	_____	
75 = Total Cover				
Woody Vine Stratum (Plot size: _____)				
1. _____	0	<input type="checkbox"/> 0.0%	_____	
2. _____	0	<input type="checkbox"/> 0.0%	_____	
0 = Total Cover				
Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is > 50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)				
¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.				
Hydrophytic Vegetation Present? Yes <input checked="" type="radio"/> No <input type="radio"/>				

Remarks: (Include photo numbers here or on a separate sheet.)
 Hairy woodpecker observed

SOIL

Sampling Point: **WL6U**

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-1								root mass, organics
1-16	10YR	3/6					Sandy Clay	

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

<p>Hydric Soil Indicators:</p> <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Stratified Layers (A5) <input type="checkbox"/> 2 cm Muck (A10) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Muck Mineral (S1) <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)	<input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Loamy Mucky Mineral (F1) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8)	<p>Indicators for Problematic Hydric Soils³:</p> <input type="checkbox"/> Coast Prairie Redox (A16) <input type="checkbox"/> Dark Surface (S7) <input type="checkbox"/> Iron Manganese Masses (F12) <input type="checkbox"/> Very Shallow Dark Surface (TF12) <input type="checkbox"/> Other (Explain in Remarks)
--	--	---

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

<p>Restrictive Layer (if observed):</p> Type: _____ Depth (inches): _____	Hydric Soil Present? Yes <input type="radio"/> No <input checked="" type="radio"/>
--	---

Remarks:

HYDROLOGY

<p>Wetland Hydrology Indicators:</p>		
<p><u>Primary Indicators (minimum of one is required; check all that apply)</u></p> <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> True Aquatic Plants (B14) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Gauge or Well Data (D9) <input type="checkbox"/> Other (Explain in Remarks)	<p><u>Secondary Indicators (minimum of two required)</u></p> <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Dry Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)

<p>Field Observations:</p> Surface Water Present? Yes <input type="radio"/> No <input checked="" type="radio"/> Depth (inches): _____ Water Table Present? Yes <input type="radio"/> No <input checked="" type="radio"/> Depth (inches): _____ Saturation Present? Yes <input type="radio"/> No <input checked="" type="radio"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input type="radio"/> No <input checked="" type="radio"/>
---	---

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

Remarks:

Adapted from U.S. Corps of Engineers form for Northeast-North Central Supplement for use in Maritimes.

Appendix H

Archaeological Screening Report (CRM Group)

OSCO AGGREGATES LIMITED

**GLENHOLME PIT NO. 4 AGGREGATE EXTRACTION PROJECT
ARCHAEOLOGICAL SCREENING & RECONNAISSANCE 2016
COLCHESTER COUNTY, NOVA SCOTIA**

FINAL REPORT

Submitted to:
OSCO Aggregates Limited
and the
**Special Places Program of the
Nova Scotia Department of Communities, Culture & Heritage**

Prepared by:
Cultural Resource Management Group Limited
6040 Almon Street
Halifax, Nova Scotia
B3K 1T8

Consulting Archaeologist: Kathryn J. Stewart
Report Preparation: Kathryn J. Stewart and Kyle G. Cigolotti

Heritage Research Permit Number: A2016NS082

CRM Group Project Number: 2016-0016-01

FEBRUARY 2017



*The following report may contain sensitive archaeological site data.
Consequently, the report must not be published or made public without
the written consent of Nova Scotia's Coordinator of Special Places Program,
Department of Communities, Culture and Heritage.*

TABLE OF CONTENTS

	Page
1.0 INTRODUCTION.....	1
2.0 STUDY AREA.....	2
3.0 METHODOLOGY	5
3.1 Background Study.....	5
3.2 Mi'kmaw Engagement.....	5
3.3 Field Reconnaissance.....	5
4.0 RESULTS	6
4.1 Background Study	6
4.2 Field Reconnaissance	13
5.0 CONCLUSIONS AND RECOMMENDATIONS.....	20
6.0 REFERENCES CITED	21

LIST OF FIGURES

Figure 1: Approximate Study Area	3
Figure 2: Detailed Site Plan	4
Figure 3: Church 1874	10
Figure 4: Fletcher 1905.....	11
Figure 5: Aerial Photograph, 1954.....	12
Figure 6: Tracklog	19

LIST OF PLATES

Plate 1: Little Dyke Pit study area.....	2
Plate 2: Acadia Mines, 1882.....	9
Plate 3: Acadia Iron Mines, Nova Scotia, 1889	9
Plate 4: The existing quarry.....	14
Plate 5: Marsh and pond along the northwest site of the study area.....	14
Plate 6: Marsh area at the southeast portion of the study area	15
Plate 7: McCurdy's Brook	15
Plate 8: Inspecting the concrete foundation of a demolished house.....	16
Plate 9: Field adjacent to the foundation	16
Plate 10: Paved path adjacent to the pit access road.....	17
Plate 11: Disturbance close to McCurdy's Brook.....	17

**GLENHOLME PIT NO. 4 AGGREGATE EXTRACTION PROJECT
ARCHAEOLOGICAL SCREENING & RECONNAISSANCE 2016
COLCHESTER COUNTY, NOVA SCOTIA**

1.0 INTRODUCTION

OSCO Aggregates Limited is proposing an expansion of its aggregate pit near Glenholme, Colchester County. In order to investigate the potential for encountering archaeological resources during any expansion of the facility, Cultural Resource Management (CRM) Group has been retained by Dillon Consulting Limited (Dillon) on behalf of OSCO Aggregates to undertake archaeological screening and reconnaissance of the proposed pit expansion area.

The archaeological screening and reconnaissance was directed by CRM Group Archaeologist Kathryn J. Stewart. Stewart was assisted during the field reconnaissance by Archaeological Technician Haiti Tynes. Technical input on the project was provided by CRM Group President and Senior Technical Advisor W. Bruce Stewart.

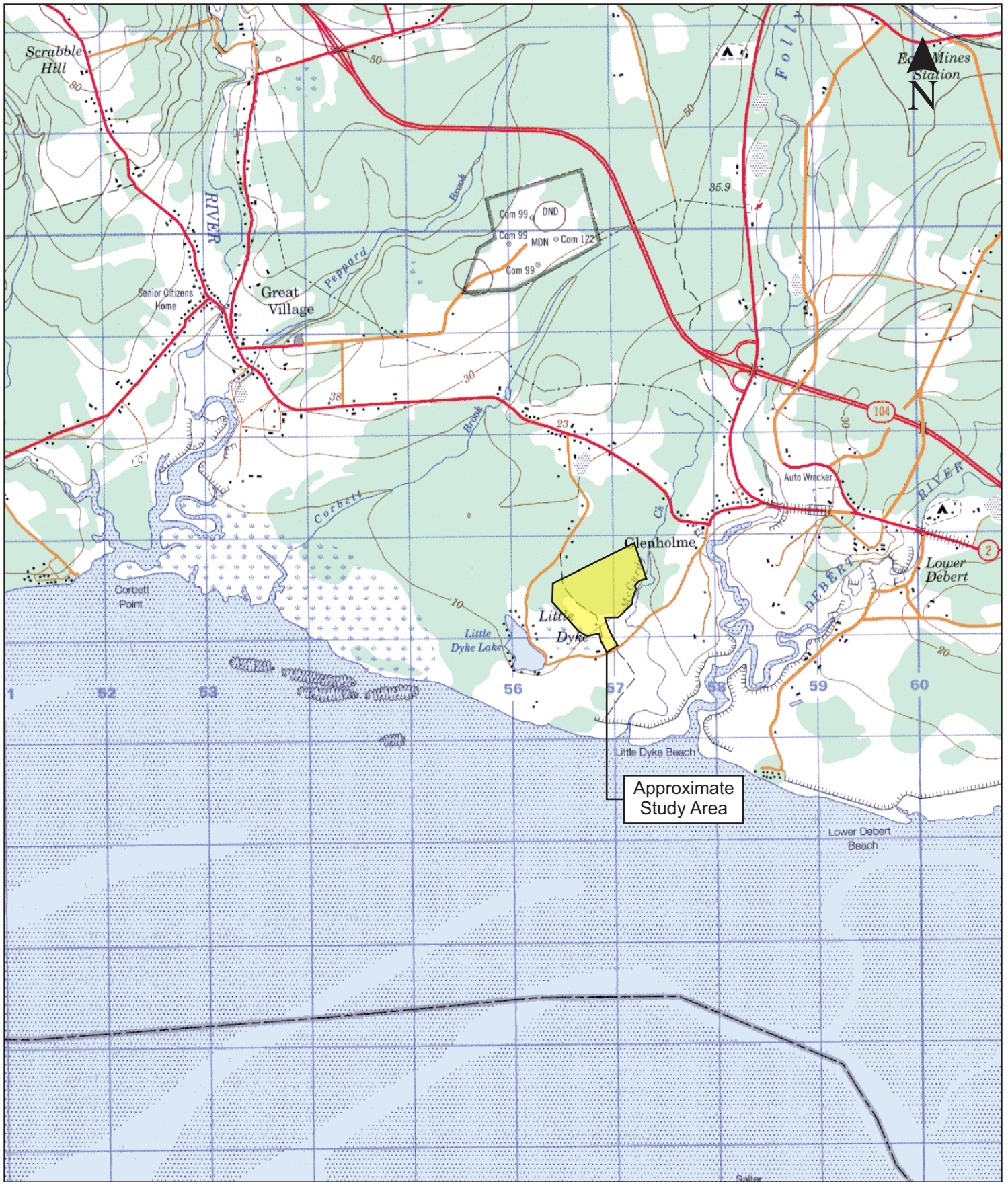
The archaeological investigation was conducted according to the terms of Heritage Research Permit A2016NS082 (Category 'C'), issued to Stewart through the Special Places Program of the Nova Scotia Department of Communities, Culture and Heritage. This report describes the archaeological screening and reconnaissance of OSCO Aggregates proposed Glenholme Pit No. 4 Aggregate Extraction Project study area, presents the results of these efforts and offers cultural resource management recommendations.

2.0 STUDY AREA

OSCO Aggregates proposed Glenholme Pit No. 4 Aggregate Extraction Project is located approximately 2.6 kilometres south-southwest of the intersection of Highway 4 and Highway 104: Cobequid Pass (*Figures 1 & 2*). The survey addressed one property (PID 20134177), which comprised a proposed impact area of approximately 50.6 hectares. Access to the area was gained off Little Dyke Road and through the existing access road (*Plate 1*).



PLATE 1: Glenholme Pit No. 4 Aggregate Extraction Project study area, Colchester County, facing northwest. November 6, 2016.



Approximate Study Area

Figure 1




GLENHOLME PIT NO.4 AGGREGATE EXTRACTION PROJECT
 ARCHAEOLOGICAL SCREENING & RECONNAISSANCE 2016
 LITTLE DYKE, NOVA SCOTIA

February 2017

Scale 1:50 000



	<i>Detailed Study Area</i>	<i>Figure 2</i>
	GLENHOLME PIT NO.4 AGGREGATE EXTRACTION PROJECT ARCHAEOLOGICAL SCREENING & RECONNAISSANCE 2016 LITTLE DYKE, NOVA SCOTIA	February 2017

3.0 METHODOLOGY

In the fall of 2016, Dillon retained CRM Group, on behalf of OSCO Aggregates, to undertake archaeological screening and reconnaissance of the proposed Glenholme Pit No. 4 Aggregate Extraction Project. The objective of the archaeological assessment was to evaluate archaeological potential within the area that may be disturbed by subsequent extraction activities. To address this objective, CRM Group developed a work plan consisting of the following components: a review of relevant site documentation to identify areas of high archaeological potential; Mi'kmaw engagement; archaeological reconnaissance of the areas that may be impacted by development activities; and, a report summarizing the results of the background research and field survey, as well as providing cultural resource management recommendations.

3.1 Background Study

The archival research component of the archaeological screening and reconnaissance was designed to explore the land use history of the study area and provide information necessary to evaluate the area's archaeological potential. To achieve these goals, CRM Group utilized the resources of various institutions including documentation available through the Nova Scotia Archives, Nova Scotia Land Information Centre, the Department of Natural Resources, the Nova Scotia Registry of Deeds and the Nova Scotia Museum.

The background study included a review of relevant historic documentation incorporating land grant records, legal survey and historic maps, local and regional histories, and consultation with knowledgeable parties. Topographic maps and aerial photographs, both current and historic, were also used to evaluate the study area. This data facilitated the identification of environmental and topographic features that would have influenced human settlement and resource exploitation patterns. The historical and cultural information was integrated with the environmental and topographic data to identify potential areas of archaeological sensitivity.

3.2 Mi'kmaw Engagement

Although there was no specific Mi'kmaw association anticipated with this study area, CRM Group contacted the Kwilmu'lw Maw-klusuaqn Negotiation Office's Archaeological Research Division (KMKNO's ARD) to see if they have any information pertaining to traditional or historical Mi'kmaw use of the study area.

3.3 Field Reconnaissance

The goals of the archaeological field reconnaissance were to conduct a visual inspection of the study area, document any areas of archaeological sensitivity or archaeological sites identified during the course of either the background study or the visual inspection, and design a strategy for testing areas of archaeological potential, as well as any archaeological resources identified within the study area. Although the ground search did not involve sub-surface testing, the researchers were watchful for topographic or vegetative anomalies that might indicate the presence of buried archaeological resources. The process and results of the field reconnaissance were documented in field notes and photographs.

Hand-held Global Positioning System (GPS) units were used to record track logs and UTM coordinates for all survey areas, as well as any identified diagnostic artifacts, formal tools, isolated finds and site locations.

4.0 RESULTS

4.1 Background Study

The following discussion details the environmental and cultural setting of the study area, as well as previous archaeological research conducted in the general area. This background study provides a framework for the evaluation of archaeological potential and the initial interpretation of any resources encountered during the field component of the assessment.

4.1.1 Environmental Setting

A number of environmental factors such as water sources, physiographic features, soil types and vegetation have influenced settlement patterns and contribute to the archaeological potential of the area.

Water Sources

Proximity to water, for both drinking and transportation, is a key factor in identifying Precontact and historic Native, as well as early Euro-Canadian, archaeological potential. There are no major waterways within the study area. The eastern edge of the study area is bounded by McCurdy Creek and the western edge is mostly bounded by a pond. The Folly River is located about 2 kilometres to the east of the study area.

Topography

The study area is located within the greater terrestrial region known as the Tidal Bay – Triassic Lowlands unit (620) (Davis & Browne 1996: 156 & 164). These region was carved out by rivers eroding eastward from the Bay of Fundy. This landscape was heavily altered by repeated glaciations during the Pleistocene. A loose mantle comprised largely of glacial till covers the area in up to 10 metres of material (Davis & Browne 1996: 164). The landscape within the area is steep and rugged with some low, wet areas. Elevation within the study area ranges from approximately 8 to 19 metres above sea level.

Soils

Soils in the study area consist of *Acadia*, *Herbert*, (ST1) and *Castley* (ST14) *series* soils (Webb et al. 1991: map). *Acadia series* soil is a firm silt loam to silty clay loam that is comprised of dyked, tidal and marine sediments. The soil is poorly drained and fairly acidic. *Herbert series* soils are a gravelly loamy sand to gravelly loam that has settled over loose glaciofluvial sands and gravels. The soils are imperfectly drained, slightly stony and very strongly to extremely acidic. *Castley series* soils are comprised of a poorly decomposed organic material over a peat of mixed origin. These soils are very poorly drained and are also very strongly to extremely acidic (Web et al. 1991: map).

Flora

In general, this area has been heavily farmed. Sugar maple, Yellow Birch and American Beech commonly form on low ridges; elsewhere pine, spruce, White Birch, Eastern Hemlock, White Pine and Red Maple occur in stable forests. Common in the Debert area are heathlands with Jack Pine dominating. Areas of salt marsh are found along the Minas Basin (Davis & Browne 1996: 165).

4.1.2 Native Land Use

The land within the study area was once part of the greater Mi'kmaw territory known as *Sipekne'katik*, meaning 'Where the Wild Potatoes Grow'. Typically lakes and watercourses would have been important transportation corridors, providing a resource base for the Mi'kmaw,

their ancestors and predecessors for millennia prior to the arrival of European settlers. Although Little Dyke Pit is within 2 kilometres of Folly River (the Debert River is a tributary of Folly River), McCurdy Brook which borders the eastern limit of the study area. However, the Little Dyke pit has no such appropriate lakes and watercourses within the study area.

In Nova Scotia, information regarding archaeological sites is stored in the Maritime Archaeological Resource Inventory (MARI), a provincial archaeological site database, maintained by the Nova Scotia Museum. This database contains information on archaeological sites registered with the province within the Borden system. The Borden system in Canada is based on a block of latitude and longitude measuring approximately 13 kilometres east-west and 18.5 kilometres north-south; each block is referenced by a four letter designator. Sites within a block are numbered sequentially as they are recorded. The study area is located within the BiCv Borden Block.

A review of MARI, determined that there are no registered archaeological sites within a one kilometre radius of the study area. It should be noted however, that the lack of archaeological data in the immediate vicinity of the study area may reflect limited archaeological investigation in the area, rather than an absence of archaeological sites. The nearest registered archaeological site is BiCv-02, a Precontact isolated find of a small quartz point, located approximately 4 kilometres west of the study area, along Spencer Brook.

CRM Group's request to KMKNO's ARD for information regarding traditional or historic Mi'kmaq provided the following information:

"Upon review of our internal GIS we have four recorded traditional use sites within a 1 kilometre radius of the proposed study area, with the primary uses of fishing, and logistical encampment. There is one MARI site a bit over 5km away, BiCu-03, which is an isolated biface fragment. The Debert complex is not very far from the study area, being less than 10km away.

In a brief review of our historical research there are no specific mentions of the immediate area. However, there are census reports from the mid to late 1800's that include Mi'kmaq living in the surrounding communities of Lower Londonderry, Londonderry, Lower Onslow and near Great Village^{[1],[2]}. This is by no means an exclusive or exhaustive list of historical documentation of the Mi'kmaq in the area but rather what has been quickly picked out from our research.

¹ Wicken, William C. (Bill). "The Objectives of Section 91(24) of the British North America Act Expert Report in the Matter of *Daniels v. Canada*." [*Daniels v. Canada*, 2013 FC 6] unpub. 1 December 2010, p.149

² *Journal and Proceedings of the House of Assembly*, 1842, 7 March 1842, p.304"

Based on the area being relatively flat, the presence of McCurdy Brook the immediate study area is ascribed high potential for encountering Precontact and/or early historic Native archaeological resources.

4.1.3 Historic Land Use

The greater area, which includes Londonderry, Glenholme, Great Village, Folly Lake and Little Dyke, was settled by Acadians in the first half of the eighteenth century, though the French had been in the area as early as 1690. Glenholme was known as "Vil Petit Louis Longue-Epée", which translates to "Village of little Louis of the long spear", and was noted on a 1756 map as

such. The settlement was destroyed after the expulsion of the Acadians in 1755 and it was not until 1762 that settlers returned to the area. With the arrival of twenty families in 1762 under the patronage of Alexander McNutt, the Township of Londonderry was established. The township was named after the town of Londonderry in Ireland, where the families originated. Londonderry grew quickly after the discovery of iron ore in 1844 led to the formation of the Acadian Charcoal Iron Co. which began mining operations in 1849-50 (*Plates 2 & 3*). At the height of its prosperity, the population of the settlement was over 5,000. On May 31, 1920, almost the entire western half of the settlement was destroyed by fire. A total of 47 buildings were destroyed (PANS 1967: 213, 242, 258, 359 & 369-370).

The closest community to the study area is Little Dyke, a settlement on the west side of the mouth of the Folly River. The earliest record of the name dates to 1828 and it likely gained its name from an early dyke that was located on the adjacent marsh. Two early settlers were Robert and Samuel Archibald from the Township of Londonderry. The Little Dyke area is commonly used for farming.

The 1874 A.F. Church map of Colchester County depicts two structures possibly within the study area (*Figure 3*). Given the historic map's scale, it is difficult to accurately determine study area boundaries on the map. McCurdy Creek is clearly depicted on the map, showing the eastern boundary for the study area. The body of water represents Little Dyke Lake (identified as Morrison's Lake on the Church map), which has several structures clustered around it. The two structures identified are located between the brook and the lake, and one of the structures is identified as belonging to Corbet.

Fletcher's 1905 geological survey of the area (*Figure 4*) shows a road in a similar orientation to Little Dyke Road as it is at present. The current access road likely corresponds to the track noted on Fletcher's map, oriented roughly north-south.

The earliest aerial photographs for the Little Dyke area date to 1938, although only a portion of the study area is captured. The 1954 air photo (*Figure 5*) shows that much of the southern half of the study area was farmland or pasture. By 1964, one of the fields appears to no longer be in use. Beyond the one farmhouse and associated outbuildings depicted in the aerial photographs, no other structures or signs of historic activity are noted within the study area.

Based on the area being relatively flat and the presence of historic activity in the general area, the study area is ascribed high potential for encountering historic archaeological resources.



PLATE 2: Acadia Mines, 1882 (Nova Scotia Archives Library: O/S F84 G76 vol. 2 / negative no. N-10106).

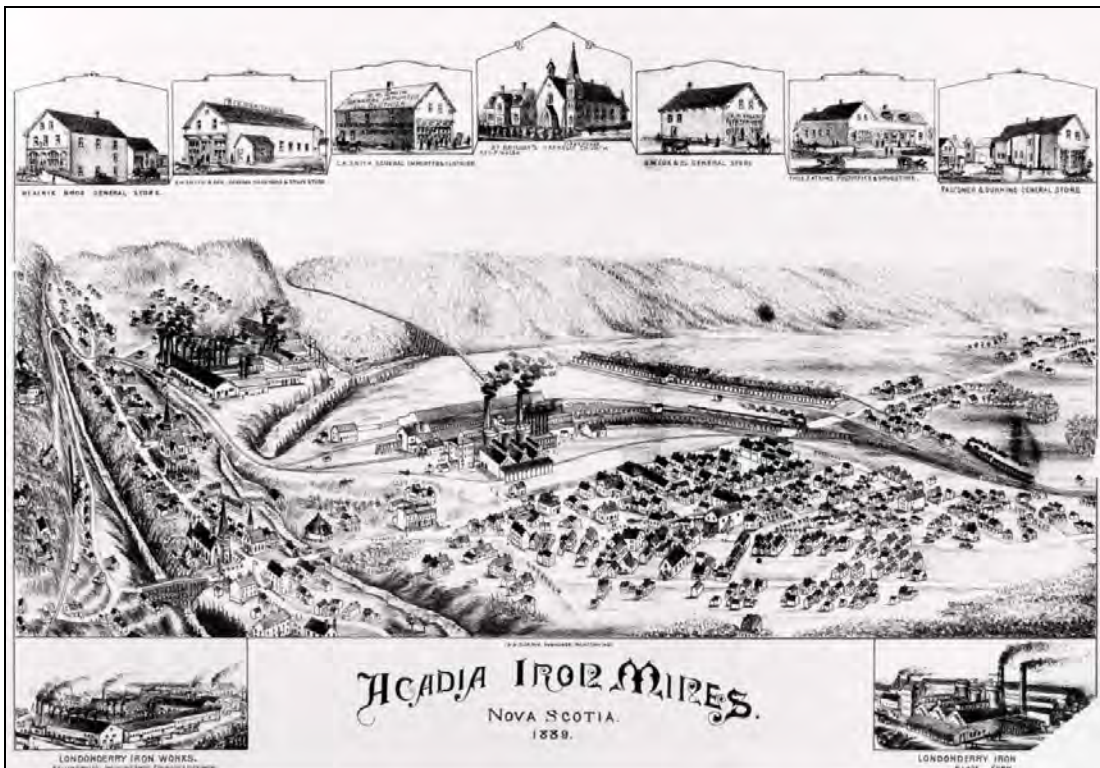
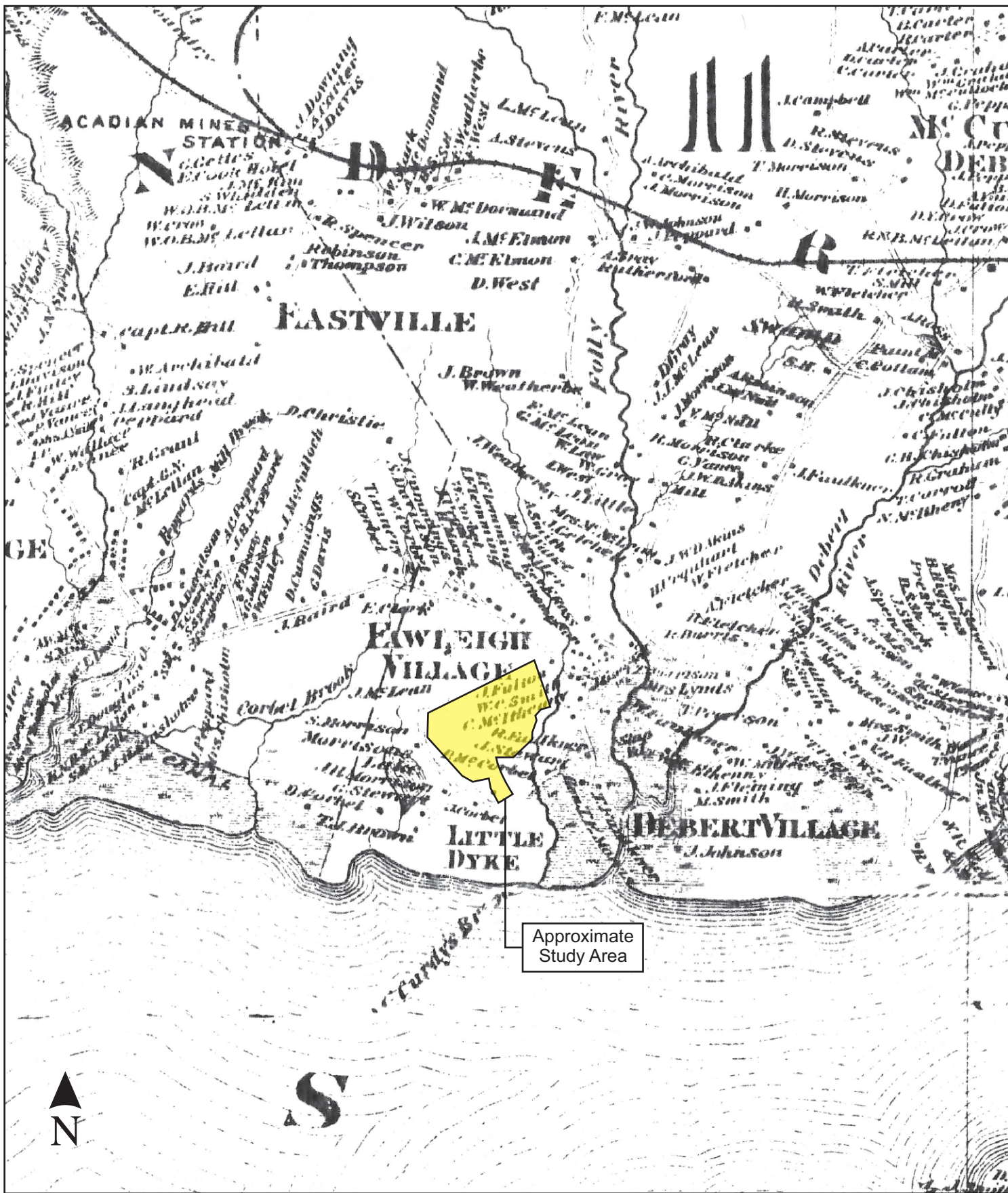


PLATE 3: Acadia Iron Mines, Nova Scotia, 1889 (Nova Scotia Archives Photo Collection: Places: Londonderry no. 4 / negative no. O/S N-68).



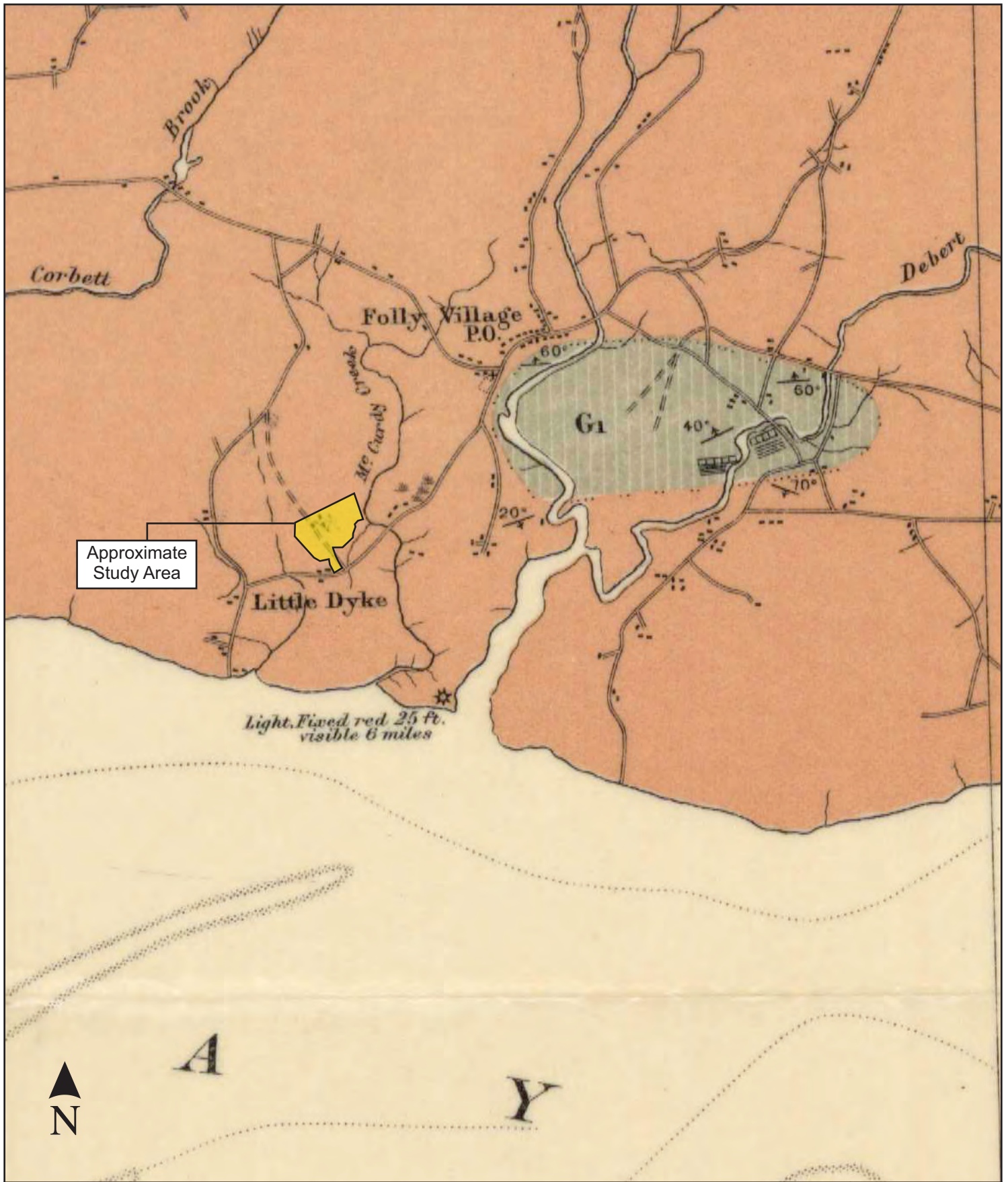
A. F. Church Map, 1874

Figure 3

GLENHOLME PIT NO.4 AGGREGATE EXTRACTION PROJECT
 ARCHAEOLOGICAL SCREENING & RECONNAISSANCE 2016
 LITTLE DYKE, NOVA SCOTIA

February 2017





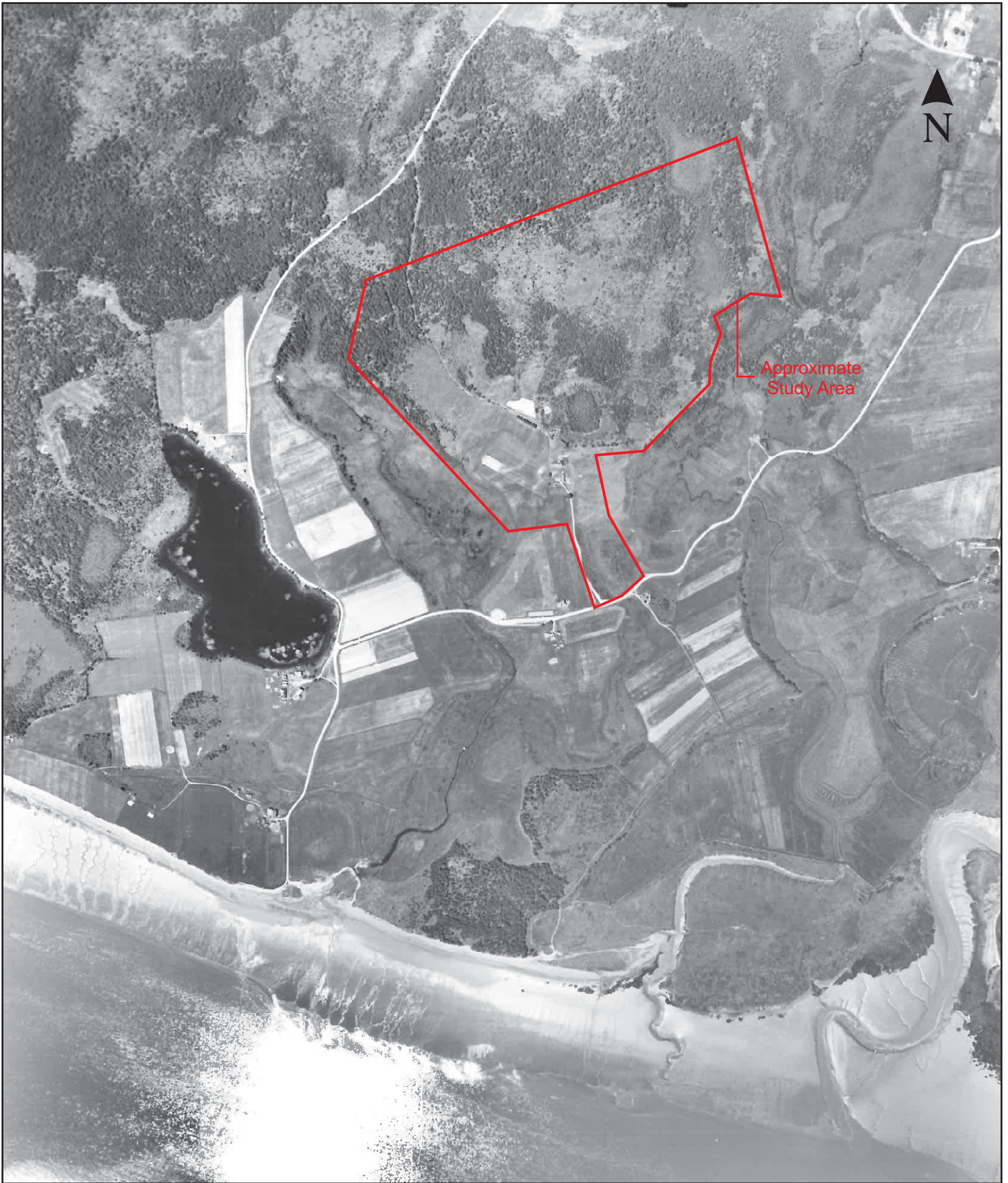
Fletcher, Sheet 64, 1905

Figure 4



GLENHOLME PIT NO.4 AGGREGATE EXTRACTION PROJECT
 ARCHAEOLOGICAL SCREENING & RECONNAISSANCE 2016
 LITTLE DYKE, NOVA SCOTIA

February 2017



Aerial Photograph, 1954

Figure 5

GLENHOLME PIT NO.4 AGGREGATE EXTRACTION PROJECT
ARCHAEOLOGICAL SCREENING & RECONNAISSANCE 2016
LITTLE DYKE, NOVA SCOTIA

February 2017



4.2 Field Reconnaissance

Fieldwork, consisting of archaeological reconnaissance, was undertaken on November 13, 2016, under overcast and dry conditions (*Figure 6*). The primary purpose of the visit was to assess the area for archaeological potential and investigate any topographical and/or cultural features that had been identified as areas of elevated potential during the background research. The existing (but not in current use) pit is located along the northern edge of the study area (*Plate 4*).

The terrain varied across the 50.2 hectare study area, consisting of both low lying, forested and sloped, undulating areas. Several sections of the study area were written off immediately due to marsh (*Plates 5 & 6*). Vegetation consisted of a mix of mature hardwood and softwood species typical of Nova Scotian forests. Ground cover consisted of a mix of moss, ferns and small shrubs. The team focused on areas of high potential identified during the background research, such as McCurdy's Brook and the farmhouse noted on aerial photography.

The area surrounding McCurdy's Brook was low and likely acts as a seasonal floodplain (*Plate 7*). The brook is small and would not be navigable by canoe. Some areas along the brook dropped steeply from the forest to the floodplain. No areas of high potential were noted along the brook. A careful inspection of the field was made to locate any remains of the old farmhouse and outbuildings. Located on the east side of the field, all that remained of the farm was a concrete foundation (*Plate 8 & 9*). The remainder of the study area was low, wet and undulating.

Although the access road to the pit appeared to follow the alignment of an old road/trail depicted on Fletcher (*Figure 4*), no features were noted along the road. About halfway along the access road toward the pit, a paved path runs adjacent to the access road (*Plate 10*). This is likely a former alignment of the access road, though it is uncertain why it was paved. Several disturbances were also noted across the study area where a small section of forest had been cut and the ground impacted and churned up. This is likely related to exploration activities (*Plate 11*).

After the reconnaissance was completed, the footprint of the study area changed, moving to the west away from McCurdy's Brook and extending further to the northwest. The small area added into the study area was carefully reviewed by B. Stewart and K. Stewart and it was determined that a return visit was not necessary given the low potential of the rest of the study area.



PLATE 4: The existing pit, facing northwest. November 6, 2016.



PLATE 5: Marsh and pond along the northwest side of the study area. Facing west; November 6, 2016.



PLATE 6: Marsh area at the southeast portion of the study area. Facing northeast; November 6, 2016.



PLATE 7: McCurdy's Brook. Facing east; November 6, 2016.



PLATE 8: Inspecting the concrete foundation of a demolished house, facing northwest. November 6, 2016.



PLATE 9: Field adjacent to the foundation; facing northeast. November 6, 2016.




PLATE 10: Paved path adjacent to the pit access road; facing south. November 6, 2016.



PLATE 11: Disturbance close to McCurdy's Brook; facing west. November 6, 2016.

Based on the various components of the background study, including environmental setting, Native land use, property history and field reconnaissance, the proposed Glenholme Pit No. 4 Aggregate Extraction Project study area is ascribed low potential for encountering Precontact and early historic Native archaeological resources and low potential for encountering historic Euro-Canadian archaeological resources.



	<i>Tracklog</i>	<i>Figure 6</i>
	GLENHOLME PIT NO.4 AGGREGATE EXTRACTION PROJECT ARCHAEOLOGICAL SCREENING & RECONNAISSANCE 2016 LITTLE DYKE, NOVA SCOTIA	February 2017

5.0 CONCLUSIONS AND RECOMMENDATIONS

The 2016 archaeological screening and reconnaissance of the Glenholme Pit No. 4 Aggregate Extraction Project study area consisted of historical background research and a visual inspection. It did not involve sub-surface testing. The background research and field reconnaissance conducted by CRM Group determined the study area exhibits low potential for encountering either Native (both Precontact and historic) or Euro-Canadian archaeological resources.

Based on these results, CRM Group offers the following management recommendations for the study area:

1. It is recommended that the study area, as defined and depicted in this report, be cleared of any requirement for future archaeological investigation.
2. In the unlikely event that archaeological deposits or human remains are encountered during activities associated with the Glenholme Pit No. 4 Aggregate Extraction Project, all work in the associated area(s) should be halted and immediate contact made with the Special Places Program (Sean Weseloh McKeane: 902-424-6475).

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