North Kent Wind 1 Project
Water Body Report

Prepared for:
AECOM
105 Commerce Valley Drive West, 7th Floor
Markham, ON
L3T 7W3

Project No. 1612 | May 2016

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

North Kent Wind 1 Project
Water Body Report

Project Team:

Staff	Role
Andrew Ryckman	Project Advisor
Pamela Hammer	Project Manager/ Biologist
Nyssa Clubine	Stream Corridor and Environmental Analyst
Blair Baldwin	Aquatic Biologist
Steve Burgin	Aquatic Biologist
Kaitlin Boddaert	GIS Technician

Report submitted on May 17, 2016

Andrew Ryckman
Senior Terrestrial and Wetland Biologist

TABLE OF CONTENTS

List of Tables

List of Maps

1.0 Project Description

Natural Resource Solutions Inc. (NRSI) was retained in March 2015 by AECOM, on behalf of North Kent Wind 1 LP, by its general partner, North Kent Wind 1 GP Inc. (North Kent Wind 1) to conduct a Water Body Assessment and Report in accordance with the Renewable Energy Approval (REA) Regulation, Ontario Regulation 359/09. The Water Body Assessment includes a records review and site investigation, provided under a separate cover, and the Water Body Report includes a complete assessment of impacts to any water bodies occurring at a proposed wind energy generating facility of 46 permitted wind turbines, with up to 36 wind turbines expected to be operational, with a nameplate capacity of up to 100 megawatts (MW). The total number of operational turbines will depend on the nominal turbine power rating of each turbine.

The North Kent Wind 1 Project (Project) is being proposed by North Kent Wind 1. North Kent Wind 1 is a joint venture limited partnership owned by affiliates of Pattern Renewable Holdings Canada ULC (Pattern Development) and Samsung Renewable Energy Inc. (Samsung Renewable Energy). North Kent Wind 1 is proposing to develop the Project north of the City of Chatham in the Municipality of Chatham-Kent, Ontario. The Project Study Area is generally bounded by Oldfield Line to the north, Bear Line Road to the west, Pioneer Line and Pine Line / Darrell Line to the south, and Centre Sideroad and Caledonia Road to the east. The Project will be located primarily on privately owned land with some components (e.g., electrical collector lines) being placed along public right-of-ways, none of which are proposed on provincial Crown land.

According to Ontario Regulation (O. Reg.) 359/09, the Project Location is defined as "*...a part of land and all or part of any building or structure in, on or over which a person is engaging in or proposes to engage in the project and any air space in which a person is engaging in or proposes to engage in the project*". As described therein, the Project Location boundary is the outer limit of where site preparation and construction activities will occur (i.e., disturbance areas) and where permanent infrastructure will be located, including the air space occupied by turbine blades. For the purposes of this report, NRSI will refer to the areas within 120m of the Project Location as the 'Project Area'. See Maps 1 to 10 for an illustration of the Project Area.

In accordance with the REA Regulation, NRSI conducted a thorough records review of available background resources to identify any water bodies within 120m, or lake trout (*Salvelinus namaycush*) lakes within 300m, of the Project Location, as defined by the REA Regulation. This assessment included a detailed review of available background information from a variety of sources, including the Ministry of Natural Resources and Forestry (MNRF), St. Clair Region Conservation Authority (SCRCA), Lower Thames Valley Conservation Authority (LTVCA), municipal files, existing studies, and aerial imagery, and other available online and/or published resources.

Also in accordance with the REA Regulation, NRSI conducted a site investigation to identify and characterize water bodies (lakes, seepage areas, permanent/intermittent watercourses) within 120m, or lake trout lakes within 300m, of the Project Location. Site investigations were conducted within the Project Area to confirm the presence/absence of water bodies identified within the records review, as well as to document new water bodies that were not previously identified. Field investigations also focused on the characterization of these features. The results of these assessments are provided in the *North Kent Wind 1 Project Water Body Assessment* (NRSI 2015a). Based on a review of these results and the proposed North Kent Wind 1 Project layout and design plans, an impact assessment was conducted to identify any potential impacts to water bodies located within the Project Area. The results of the impact assessment are provided in this report.

2.0 REA Regulations

Ontario Regulation (O. Reg.) 359/09 – *Renewable Energy Approvals* under *Part V.0.1 of the Act* (herein referred to as the REA Regulation), made under the *Environmental Protection Act* (*EPA*), identifies the requirements for the development of renewable energy projects in Ontario. In accordance with the REA Regulation, the proposed North Kent Wind 1 Project, classified as a Class 4 wind facility, is required to complete a REA submission.

Section 39, subsection (1) of the REA Regulation states, in relation to Class 4 wind facilities with no turbines or transformers within 30m of a water body, that "no person shall construct, install or expand a renewable energy generation facility as part of a renewable energy project at a project location that is in any of the following locations":

1. A lake or within 30 meters of the average annual high water mark of a lake.
2. A permanent or intermittent stream or within 30 meters of the average annual high water mark or a permanent or intermittent stream.
3. A seepage area or within 30 meters of a seepage area.

Section 40, subsection (1) of the REA Regulation states, in relation to any proposed facility, that "no person shall construct, install or expand a renewable energy generation facility as part of a renewable energy project at a project location that is in any of the following locations":

1. within 120 meters of the average annual high water mark of a lake, other than a lake trout lake that is at or above development capacity;
2. within 300 meters of the average annual high water mark of a lake trout lake that is at or above development capacity;
3. within 120 meters of the average annual high water mark of a permanent or intermittent stream; or
4. within 120 meters of a seepage area.

However, Sections 39(1) and 40(1) do not apply if the applicant submits a report that:

1. identifies and assesses any negative environmental effects of the project on a water body referred to in paragraphs 1 to 3 of Section 39 (1) and 1 to 4 of Section 40 (1) (above) and on land within 30 meters of the water body;
2. identifies mitigation measures in respect of any negative environmental effects mentioned in clause (i);
3. describes how the environmental effects monitoring plan addresses any negative environmental effects mentioned in clause (i); and describes how the construction plan report prepared in accordance with Table 1 of the REA

Regulation addresses any negative environmental effects mentioned in clause (i).

In accordance with Section 39 and 40 of the REA Regulation, this report has been prepared to identify and assess any negative environmental effects on water bodies located within 30m of the Project Location (Sections 6 and 7). Tables 3 through 5 of this report identify any mitigation measures to address the environmental impacts on water bodies identified in Sections 6 and 7.

Additional information relating to the development of this project, including detailed descriptions of the construction activities, has been provided in the *Construction Plan Report* (AECOM 2015a). This document provides construction details and potential environmental impacts associated with the construction of the North Kent Wind 1 Project. Additional information relating to the operation and decommissioning of this project has been provided in the *Design and Operations Report* (AECOM 2015b) and *Decommissioning Plan Report* (AECOM 2015c). A summary of the potential environmental effects, proposed mitigation measures, and monitoring programs that will be implemented during the construction and operational phases of the Project is also provided in Table 4-4 of the *Construction Plan Report* (AECOM 2015a) and Table 6-2 of the *Design and Operations Report* (AECOM 2015b) to satisfy the requirements as outlined in the REA Regulation. The Water Body Report has been used to develop the Environmental Effects Monitoring Plan included in the *Design and Operations Report* (AECOM 2015b), completed by AECOM under separate cover.

As part of this project, NRSI has considered all aspects relating to provincially Threatened and Endangered species; however, since these species are addressed through a separate permitting process under the *Endangered Species Act* (2007), they have not been discussed within the *Water Body Assessment* or Water Body Report. These species will be addressed in full detail, including a description and results of field assessments, potential impacts, and recommended mitigation measures, as part of a separate reporting process to be addressed with the MNRF, as required.

3.0 Summary of Records Review

In accordance with the REA Regulation, a thorough records review for the proposed North Kent Wind 1 Project Area was completed (NRSI 2015a). This records review included correspondence with regional and provincial agency staff and a review of several available online and published resources. The results of this records review have been summarized in

Table 1 below. For more detail, refer to the *North Kent Wind 1 Project Water Body Assessment* (NRSI 2015a).

Table 1. Summary of the Records Review for the North Kent Wind 1 Project

Criteria	Associated Potential Water Bodies
i. In a water body	The records review has identified 48 potential water bodies as overlapping the Project Location, including 6 within the Maxwell Creek drainage area, 27 within the Little Bear Creek drainage area, 6 within the Big Creek Drain drainage area, 3 within the Rankin Creek drainage area, 1 within the Marchand Drain drainage area, and 5 within the Southwest Lower Thames drainage area. These overlaps represent proposed crossing locations for access roads, collection lines, and/or construction disturbance areas. All of these potential water bodies may represent potential permanent or intermittent watercourses or drainage features. Within the SCRCA jurisdiction, these potential water bodies are designated as warmwater fisheries or intermittent drainage features. Marchand Drain, located within the Project Area, was not displayed on available thermal classification mapping. Thermal regime information was not available from the LTVCA at the time of this report.
ii. Within 120 m of the average annual high water mark of a lake, other than a lake trout lake that is at or above development capacity	None
iii. Within 300 m of the average annual high water mark of a lake trout lake that is at or above development capacity	None

Criteria	Associated Potential Water Bodies
iv. Within 120 m of the average annual high water mark of a permanent or intermittent stream	The records review has identified 54 potential water bodies within 120m of the Project Location, including 7 within the Maxwell Creek drainage area, 30 within the Little Bear Creek drainage area, 6 within the Big Creek Drain drainage area, 5 within the Rankin Creek drainage area, 1 within the Marchand Drain drainage area, and 5 within the Southwest Lower Thames drainage area. All of these water bodies represent potential permanent or intermittent watercourses or drainage features. Within the SCRCA jurisdiction, these water bodies are designated as warmwater fisheries or intermittent drainage features. Marchand Drain, located within the Project Area, was not displayed on available thermal classification mapping. Thermal regime information was not available from the LTVCA at the time of this report.
v. Within 120 m of a seepage area	None

4.0 Summary of Site Investigation

Comprehensive site investigations for the North Kent Wind 1 Project were conducted on several dates in 2015 (NRSI 2015a). These site investigations included site-specific habitat assessments of drainage features throughout the Project Area, as well as 2 alternative site investigations. Site investigations were focused on confirming the presence/absence of potential water bodies within the Project Area identified during the records review. A total of 80 drainage features were assessed for the site investigation, 62 of which were confirmed as water bodies based on the O.Reg 359/09 definition of a water body. No lakes, lake trout lakes, or seepage areas were identified within the North Kent Wind 1 Project Area. A summary of the site investigation results is provided in Table 2 below.

Table 2. Summary of Site Investigations for the North Kent Wind 1 Project

Criteria	Associated Water Body
i. In a water body	Site investigations identified 53 confirmed water bodies to be overlapping the Project Location, including 4 within the Maxwell Creek drainage area, 25 within the Little Bear Creek drainage area, 9 within the Big Creek Drain drainage area, 3 within the Rankin Creek drainage area, 1 within the Marchand Drain drainage area, and 11 within the Southwest Lower Thames River drainage area. These overlaps represent proposed crossing locations for access roads, collection lines and/or construction disturbance areas. All of these water bodies represent permanent or intermittent drainage features. It is likely that these confirmed waterbodies are designated as warmwater fisheries or intermittent drainage features, based on the information provided in the records review (Thames-Sydenham and Region Source Protection Committee 2014).
ii. Within 120 m of the average annual high water mark of a lake, other than a lake trout lake that is at or above development capacity	None
iii. Within 300 m of the average annual high water mark of a lake trout lake that is at or above development capacity	None

Criteria	Associated Water Body
iv. Within 120 m of the average annual high water mark of a permanent or intermittent stream	Site investigations identified 62 confirmed water bodies to be located within 120m of the Project Location, including 6 within the Maxwell Creek drainage area, 29 within the Little Bear Creek drainage area, 10 within the Big Creek Drain drainage area, 4 within the Rankin Creek drainage area, 1 within the Marchand Drain drainage area, and 12 within the Southwest Lower Thames River drainage area. All of these water bodies represent permanent or intermittent drainage features, with thermal regimes as identified in Table 2 section i.
v. Within 120 m of a seepage area	None

The results of this site investigation will be used, in conjunction with the records review, to identify potential impacts associated with the proposed development activities of the North Kent Wind 1 Project.

5.0 Description of the Proposed Undertaking

The following sections provide information pertaining to the design, construction, operation, and decommissioning activities associated with the proposed undertaking for the North Kent Wind 1 Project.

5.1 General Project Description

The proposed design layout includes the installation of 46 permitted turbines, as well as associated supporting infrastructure, including temporary construction offices, temporary laydown areas, crane pads, an operations and maintenance (O&M) building, access roads, meteorological towers, pad-mounted transformers, collection lines, collector substation, microwave tower, transmission lines, as needed and point of interconnection (POI) (AECOM 2015d).

Up to 36 Siemens 3.2MW wind energy generating turbines are proposed for a total installed capacity of up to 100MW, although 46 proposed turbine locations will be permitted. Each turbine is to be mounted on concrete foundations, either as a pile or spread-footing type foundation and equipped with a transformer located outside the base of the tower (AECOM 2015d).

Energy generated by the wind energy project will be collected via 34.5kV underground and above ground collector lines and directed to a substation that will step-up the voltage from 34.5kV to 230kV. From the substation, the Project will connect to a Hydro One Network Inc. (Hydro One) transmission line at the POI (AECOM 2015d).

A number of other supporting facilities will also be required. They include a collector substation, O&M building, POI, meteorological towers, and a microwave tower (AECOM 2015d).

Access roads will be constructed to allow for access to turbines and other supporting facilities during construction, installation, operation and maintenance of the Project (AECOM 2015d).

Project design details are provided in the *Design and Operations Plan Report* (AECOM 2015b).

5.2 Construction

Construction of the Project is anticipated to begin in summer or fall of 2016 and is expected to be completed by the fall of 2017, although the exact timeline may shift either earlier or later depending on several other factors during the permitting and construction phases. During site preparation and construction of the proposed Project, the following key activities will be undertaken (AECOM 2015a):

- Preparation of temporary work areas, including clearing and grubbing of vegetation;
- Construction of new access roads;
- Site grading as necessary;
- Preparation and establishment of construction staging area;
- Preparation of the collector substation laydown area;
- Blasting for the purposes of excavating wind turbine foundations, if required;
- Turbine site and crane pad construction;
- Turbine foundations construction;
- Delivery of construction vehicles and equipment;
- Wind turbine assembly and installation;
- Installation of pad-mounted transformers;
- Installation of electrical collector lines on private lands and/or in municipal road allowances;
- O&M building construction;
- Installation of microwave and meteorological towers;
- Installation of the interconnection station on private lands;
- Turbine testing and commissioning; and
- Clean up and reclamation of construction laydown and staging areas.

Based on current layouts, vegetation clearing, tree removal grubbing, and grading will occur throughout the Project Area to accommodate the access roads, turbines, crane pads, lay-down areas, and associated buildings. A detailed impact assessment associated with vegetation removal, related to terrestrial and wetland habitats within the Project Area, is provided in the *Natural Heritage Environmental Impact Study Report* (NRSI 2015b).

Up to 36 operational turbines are expected to be installed as part of the North Kent Wind 1 Project. As part of the turbine erection, laydown areas and crane pads will be placed around the base of the turbine. Within this area, the ground will be leveled. The crane

pads, measuring approximately 0.2 acres, will require the removal of topsoil and addition of a mixture of heavier granular material, native materials and engineered fill, as appropriate. Individual turbine laydown areas will measure approximately 1.5 acres (AECOM 2015a).

The electrical collector system will consist of pad-mounted transformers, junction boxes and underground collector lines installed along turbine access roads on private property and a buried or above ground collection system running along municipal road right-of-ways. Underground electrical collector lines will be installed in a trench, 1.2m deep at minimum, and/or in conduits installed by directional drilling. All excavated soil will be retained and used to fill the trench after cables have been laid.

Overhead collector lines, if required, along public road allowances, will require installation of wood, steel or concrete monopoles to a depth of approximately 5 to 6m, and will be spaced approximately 45 to 60m apart (AECOM 2015a).

The access roads, including shoulders, will be up to 15m wide during the construction phase in order to accommodate cranes and transportation equipment used to deliver wind turbine components. Access road construction will include clearing and grubbing of any vegetation, excavation of the topsoil layer, and adding a layer of compacted material. The access roads will be constructed of native material or engineered fill. A woven geotextile or cement stabilized soil will also be used where necessary. Following construction and installation activities, roads may be reduced to 8 to 12m wide, including the shoulder, travel width, and ditch. Where possible, access roads will follow property boundaries and will be located in such a way to minimize disturbance to agricultural operations and limit the number of water body crossings. All roads associated with the Project will be designed to minimize road and soil erosion and allow for stormwater runoff and drainage (AECOM 2015a).

As necessary, ditches and culverts will be constructed to maintain existing site drainage. New culverts may be required to maintain drainage in ditches at junctions with roadways. These will be constructed to support the construction equipment and delivery trucks. The details of culverts and their installation, in addition to erosion control

measures, will be determined in consultation with the SCRCA, the LTVCA, the Municipality of Chatham-Kent, and local landowners, as part of the permitting process (AECOM 2015a).

A number of other supporting facilities will also be constructed for this project. These supporting facilities include a collector substation, O&M building, POI, meteorological towers, and a microwave tower (AECOM 2015d).

Additional information relating to the development of this Project, including detailed descriptions of the construction activities, is provided in the *Construction Plan Report* (AECOM 2015a), prepared in accordance with Section 39 (2)(d) and 40 (2)(d) of the REA Regulation. This document provides construction details and identifies mitigation measures to reduce or eliminate impacts to water bodies within the Project Area. This document was reviewed for the completion of this report.

5.3 Operation

The operational phase of the North Kent Wind 1 Project will include the operation and maintenance of up to 36 wind energy generating turbines. The operation of the project is expected to begin in late 2017, and the operational lifespan of the project is approximately 20 years unless otherwise extended (AECOM 2015b).

During operations and maintenance of the proposed project, the following key activities will be undertaken:

- Preventative and unplanned maintenance of Project components;
- North Kent Wind 1 staff transport;
- Natural heritage field monitoring;
- Field monitoring to evaluate the performance of the Project components and to conduct investigations / field visits to follow-up with any complaints received by North Kent Wind 1;
- Meter calibrations;
- Remote operation of the wind turbines; and
- Grounds maintenance in the vicinity of project components.

As part of the operation of the facility, potable water will be supplied by a well(s) or through the municipal water system. A septic bed will be constructed for the disposal of sewage from the O&M building (AECOM 2015b).

To effectively manage runoff during the operation of the Project, drainage channels may be constructed adjacent to the access roads, as required. The details of these channels, including sizing and location, will be determined during the detailed design stage of the Project.

No additional sedimentation control measures, such as a storm water management facility, are anticipated to be required during operation as sedimentation from the access roads is predicted to be lower than that from agricultural fields (AECOM 2015b, 2015d).

Vegetation control will be required around the overhead collector lines, and transmission line, as needed, if installed on poles, to prevent any damage to the lines and ensure safe operation. The vegetation is typically cleared by mechanized equipment (e.g., chainsaw / hydro axe) (AECOM 2015b).

Additional information relating to the design and operation of this Project, including detailed descriptions of the operational activities, is provided in the *Design and Operations Plan Report* (AECOM 2015b), prepared in accordance with Section 39 (2) and 40 (2) of the REA Regulation. This document provides design and operation details and identifies mitigation measures to reduce or eliminate impacts to water bodies within the Project Area. This document was reviewed for the completion of this report.

5.4 Decommissioning

The Project is anticipated to be in operation for 20 years. Following the operational term of the Project, all components of the Project are expected to be decommissioned as described in the *Decommissioning Plan Report* (AECOM 2015c). If, in the unlikely event that the Project development is stopped during construction, the Project will be decommissioned as set out in the *Decommissioning Plan Report* (AECOM 2015c).

If the Project is not extended past its current commercial operational life (via replacing or upgrading Project components), the wind turbine, including the tower, generator, auxiliary equipment, above ground cables / poles, and fixtures, will be removed. Foundations will be removed to approximately 1m below grade and replaced with topsoil. Access road removal will be dependent on the requirements and agreements in place with the individual landowner. Affected lands will be restored so that pre-

construction land use can continue, at the discretion of landowners. If agreed upon with the landowner, access roads may be left in place (AECOM 2015c).

Decommissioning procedures will be similar, but in reverse order to those carried out in the construction phase (AECOM 2015a). Key decommissioning activities associated with the proposed project include:

- Construction of a crane pad and wind turbine laydown area at each turbine;
- Disassembly and removal of wind turbine infrastructure (hubs, nacelles, blades and towers);
- Removal of pad-mounted transformers;
- Excavation of wind turbine foundations to a depth of 1m below grade;
- Reclamation of agricultural land (at the discretion of landowners);
- Widening of access roads up to 15m to accommodate cranes and transportation equipment to remove turbine components;
- Excavation and removal of granular base material and crushed gravel used for access roads (at discretion of landowners);
- Removal of culverts (at the discretion of landowners);
- All electrical collector aboveground infrastructure will be removed. Where the underground collector lines come to the surface, the collector lines will be cut and excavated to a depth of approximately 1m, below grade;
- Removal of overhead collector lines and transmission poles that are not shared with Hydro One or other utilities;
- Disconnection of the collector substation;
- Disassembly and removal of the collector substation, microwave and meteorological towers, and transmission and grid connection infrastructure; and
- Disassembly and removal of the operations and maintenance building infrastructure (at the discretion of landowners).

As part of the turbine removal, laydown areas and crane pads will be re-established around the base of the turbine. Within this area, the ground may require leveling. Following the removal of turbines, the land is expected to return to land use present prior to turbine installation (i.e. agriculture). Removal of turbine components will also include the removal of the top 1m of the underground foundation, including any rebar or anchor bolts. Excavated foundation areas will be backfilled with subsoil and topsoil to match the original soil horizons and elevation, and the area will be graded and contoured (AECOM 2015c).

Following decommissioning of select Project components, the granular base material and crushed gravel used to construct the access roads will be removed from the site, at the discretion of the landowners. Culverts that were installed during construction will

also be removed unless otherwise requested by the landowner. Any removal of the culverts will be completed in consultation with, and will receive approval from, the applicable regulatory agencies, if required (AECOM 2015c).

During the decommissioning of the project, the underground collector lines will be cut and excavated to a depth of approximately 1m below grade. Overhead collector lines and transmission poles that are not shared with Hydro One or other utilities will be removed (AECOM 2015c).

The collector substation and point of interconnection will be dismantled and removed in accordance with provincial regulatory requirements at the time of the decommissioning. The O&M Building would be either disposed of or changed for an appropriate use based on consultation with the landowner at that time (AECOM 2015c).

The meteorological towers and microwave tower will be removed unless otherwise requested by the County of Chatham-Kent or local aviation groups (and agreed to by North Kent Wind 1) to have the towers remain in place. If removed, the towers will be dismantled and components will be re-used, recycled or disposed of in the appropriate facilities. Concrete foundations will be removed completely to a depth of approximately 1m to allow for the reinstatement of previous land use (AECOM 2015c).

Additional information relating to the decommissioning of this Project, including detailed descriptions of the decommissioning activities, is provided in the *Decommissioning Plan Report* (AECOM 2015c), prepared in accordance with Section 39 (2)(d) and 40 (2)(d) of the REA Regulation. This document provides decommissioning details and identifies mitigation measures to reduce or eliminate impacts to water bodies within the Project Area. This document was reviewed for the completion of this report.

6.0 Impact Assessment

6.1 Approach to Impact Assessment

For the purpose of this report, the analysis of potential impacts focuses on water bodies within 30m of the Project Location, as per the REA Regulation, and has been divided into 2 categories. Firstly, generalized potential impacts on water bodies related to each project phase including design, construction, operation, and decommissioning will be presented and discussed. Secondly, specific impacts to each water body identified within the Project Area will be discussed based on the site specific features and functions of the water body as well as the proposed works. These impacts are grouped by water body type, as identified by the REA Regulation, Section 30, and include lakes, lake trout lakes, permanent or intermittent watercourses, springs and seeps.

This approach allows for all potential impacts to water bodies, as they relate to Project construction, operation, and decommissioning, to be identified and addressed clearly and concisely.

All identified impacts are discussed in this section assuming no mitigations are applied, and are therefore described as a "worst case scenario" for impacts to water bodies. Recommendations to mitigate identified impacts as well as monitoring of effectiveness of these measures are discussed in Section 7.0.

6.2 Generalized Project Phase Impacts

Project development and construction activities, if not mitigated appropriately, have the potential to affect water bodies. These impacts have the potential to affect surface water quality and quantity, including the health of aquatic species and their habitat, and general stream hydrology. These impacts range in degree from temporary disturbance to permanent loss or impairment.

Impacts associated with each Project phase including construction, operation, and decommissioning are discussed below in Sections 6.2.1 through 6.2.3. Specific impacts associated with each water body within the Project Area are discussed in Section 6.3. A summary of monitoring recommendations is provided in Section 6.4.

6.2.1 Construction

Potential impacts identified for the construction phase of the North Kent Wind 1 Project are based on the understanding of project works described in Section 5.1 and 5.2.

The Project layout dictates which water bodies will be directly impacted based on the orientation of project components (i.e., access roads that cross a water body), and the level of risk associated with the impact based on the proximity of the project component to the water body (i.e., 5m away versus 30m away). It is inferred that the greater the distance a water body is from a project component, the lower the risk of impacts to the feature from construction activities. Construction related impacts resulting from the installation and erection of project components located in, or within 30m of, water bodies are discussed in Table 3. In addition to distance, other factors that determine the level of risk that the impact may have on a water body include topography (the variation in slope leading towards the water body), the permeability of soils, and the density of vegetation and/or ground litter surrounding the water body (i.e. dead grass, leaves, twigs and logs).

Within the proposed North Kent Wind 1 Project Area, turbine access roads and electrical collector lines traverse permanent and intermittent water bodies and therefore are located within these features. The REA Regulation sets clear guidelines as to where wind development is acceptable. In the case of Class 4 wind facilities, like the proposed North Kent Wind 1 Project, the development of turbines and transformer stations is prohibited in, and within 30m of, all water bodies. All other ancillary project components, including transmission lines and access roads, can be located at any distance from, including within, a water body if it is demonstrated that it will result in no negative environmental effects, through the completion of an impact study, which is assessed as part of this report. The location of project components for the North Kent Wind 1 Project is in accordance with the established water body setbacks as set out in the REA Regulation.

Table 3 includes a summary of the significance of construction related impacts following the application of recommended mitigation measures. The likelihood of the identified

impact is also provided in Table 3. The majority of impacts are highly unlikely and represent very rare events.

Table 3. Summary of Construction Activities, Potential Negative Environmental Effects, Recommended Mitigation Measures, Net Effects, and Resulting Impact Significance for the North Kent Wind 1 Project

Construction Activity	Potential Negative Effects	Recommended Mitigation Measures	Net Effects	Resulting Impact Significance
Turbine Erection Overhead Collector Lines Installation	• Increased erosion, sedimentation, and turbidity resulting from removal of upland and riparian vegetation. • Degradation of water quality from contamination by oils, gasoline, grease, and other materials due to accidental spills, as a result of the proximity of construction vehicles and machinery to water bodies. • Increase in impervious surfaces and increased surface run-off down a steep slope (i.e. a valley, or steep side slopes of municipal drains), resulting from re-grading of land and resulting in increased potential for erosion and downstream sedimentation. • Soil compaction as a result of heavy machinery and the stockpiling of heavy materials (i.e. soils) reducing the permeability of soils and their ability to retain water during rain/snow melt events resulting in an increase in surface water run-off which will ultimately increase the erosion potential and the amount of sediment being transported into adjacent water bodies. Soil compaction can restrict re-vegetation of construction and temporary lay down areas. • Decreased infiltration to key areas (e.g. areas of recharge) due to newly impervious cover leading to interruptions to the natural water cycle. • Stockpiles of construction related materials, such as soil, shrubs, trees and root wads in or near a water body can result in debris or sediment entering the water body if the stockpiles are not properly contained. This can result in the disturbance of flow patterns, increase the risk of flooding, erosion and sedimentation, and impair water quality. • Increased sedimentation resulting from dust and debris settling in water bodies if blasting occurs.	• Schedule construction activities near water (within 30m) to occur within the low flow period of the late summer months, where possible, to avoid or minimize impacts. • If in-water work is required (e.g. for culvert installation and or collector lines installation), adhere to required timing windows confirmed through consultation with regulatory agencies, including the MNRF. • Time clearing, grubbing, and grading activities to avoid seasonally wet periods where possible. • Implement riparian planting after construction, as soon as weather permits, to stabilize water body banks and encourage rapid re-vegetation of disturbed soils. This will aid in preventing potential bank collapse and erosion, which, in turn, will minimize sedimentation, support fish habitat, and protect sensitive ecological functions that occur in water bodies. • If insufficient time is available in the growing season to establish vegetative cover, apply overwintering treatments such as erosion control blankets, fiber matting, rock (i.e. large, clean angular rocks) reinforcement/armoring or equivalent to contain the site over the winter period. Plant vegetative cover as soon as is feasible in the next growing season, followed by maintenance and inspection. • Operate construction equipment (i.e., cranes, back hoes etc.) in a manner that minimizes disturbance to the water body banks and stays outside of the water body and bank area. Machinery should arrive on site in clean condition. Frequent checks and maintenance should ensure that no fluid leaks occur. Machinery must be refueled, washed, and serviced a minimum of 30m away from all water bodies and other drainage features to prevent any deleterious substances from entering a water body. • Store fuel and other construction related materials securely away from any drainage features and locate construction staging areas 30m away from any water body. • Develop a Spill Prevention and Response Plan (SPRP) prior to commencement of construction that provides a detailed response system to deal with events such as the release of petroleum, oils and lubricants or other hazardous liquids and chemicals. Keep a spill kit on site at all times and train on-site workers in the proper use of this kit and to be fully aware of the SPRP. • Confine construction equipment to designated, controlled vehicle access routes to minimize the potential for soil compaction. • Remove construction debris from the site and stabilize it to prevent debris from entering the nearby water bodies. • Remove and dispose of any waste generated from the site appropriately off site according to provincial standards including but not limited to O.Reg102/94, O.Reg 103/94, R.R.O. 1990, Regulation 347. • Avoid construction during high volume rain events, as determined by the Environmental Construction Monitor and significant snow melt/thaw events, where possible, and resume once soils have been stabilized or mitigation measures have been installed (i.e. heavy-duty silt fences, coir logs, or straw mats around any soil stockpiles) to avoid risk of erosion, soil compaction or the potential for sediment release into nearby water bodies. • Develop a Flood Response Plan (FRP) to deal with on-site flooding in order to mitigate any possible effects to the aquatic environment. • Develop an Erosion and Sediment Control Plan (ESC) to minimize the potential for construction related sediment release into nearby water bodies (ESC Guideline), and prepare ESC condition reports as part of the monitoring and maintenance plan. • Monitor erosion and sediment control systems frequently for effectiveness, repairing deficient controls in a timely manner and using an adaptive management approach when deemed appropriate. • If required, perform in-water work in dry conditions, where possible. If this is not possible, short-term isolated dewatering will be required. Prior to dewatering, isolate the work area with the installation of a temporary water containment structure. The structure should form an impermeable enclosure that will prevent debris and sediment from escaping into the surrounding water body. Construct a by-pass channel to maintain flow through the water body and prevent back flooding, which could ultimately overtop the water containment structure. Additional permits may be required for in-water work. • Install an in-stream sediment filter (e.g. Siltsoxx or Filtersoxx) downstream of water containment structure	• The application of the ESC Plan and maintenance of erosion and sediment control systems will prevent impacts to water bodies from increased erosion, sedimentation, and turbidity due to the removal of upland riparian vegetation. In addition, the removal of vegetation will be localized. • Spills are highly unlikely and the application of a SPRP will mitigate any potential impact to water bodies due to accidental spills. • The increase in impervious surfaces and grading activities is minimal and highly localized. The application of the ESC Plan and maintenance of erosion and sediment control systems will mitigate the increased potential for erosion and downstream sedimentation. • The reduction of soil permeability and infiltration capacity as a result of heavy machinery and stockpiling of heavy materials is minimal, localized, and temporary in nature. Stockpiling of material and the use of heavy machinery is expected to be localized and temporary in nature. • The reduction in infiltration to key areas due to newly impervious surfaces is minimal. The use of permeable materials on access roads, parking lots, etc. will reduce the impact of decreased infiltration. • Stockpiles of debris will be removed from the site and stabilized according to the ESC Plan. Change in flow patterns, flooding, erosion and sedimentation are highly unlikely following the application of the ESC Plan. • Blasting activities are highly unlikely and will be highly localized. Locating blasting sites as far away from water bodies as possible, using blasting mats to contain debris and dampening the surface to keep dust down will mitigate the effects that blasting activities may have on local water bodies.	Not significant

Construction Activity	Potential Negative Effects	Recommended Mitigation Measures	Net Effects	Resulting Impact Significance
		dewatering discharge should be dissipated (i.e. splash pads, sand bags, hay bales etc.) and may require splitting discharge to more than one location. • Monitor water levels immediately before and during dewatering activities, to determine if dewatering activities are resulting in alteration of water levels within the water body. • Dewatering discharge rates should be evaluated as to not result in erosion and sedimentation to receiving water body. • If discharging to a municipal storm sewer system, ensure that groundwater quality meets the objectives of the municipal storm sewer by-law prior to discharge. To mitigate potential effects associated with the discharge, sample for turbidity prior to discharge to ensure the water is suitable for discharge and will not result in an impact to the receiving water body. If the groundwater is not suitable for discharge, identify alternate disposal locations or carry out adequate treatment. The success of all mitigation will be verified though groundwater quality sampling. • Prior to surface water dewatering, collect and relocate fish to a suitable location, preferably downstream and away from the construction area. This should be executed through the development of a Fish Salvage Plan and by a qualified fisheries biologist. • Horizontal directional drilling should be executed at a depth that limits the potential impacts associated with the possibility of a 'frac-out' (i.e. the escape of drilling mud and/or fluids into the environment as a result of a spill, drilling tunnel collapse or rupture of mud to the surface due to excessive pressure from an obstruction within the borehole). A minimum depth will be provided on design drawings and will be included in discussions with the conservation authorities. • Locate drilling entry/exit shafts beyond the top of bank, at a distance that allows the minimum depth, as identified on design drawings, to be reached while below the water body. This distance should be agreed upon with regulatory agencies. • Develop and implement an emergency 'frac-out' response plan including steps to contain, monitor and clean-up in response to the event. • Where possible, locate blasting sites away from water bodies, use blasting mats to contain debris, and spray the surface of the blast site with water to keep dust down.		
Underground Collector Lines – Directional Drilling Method	• Increased erosion, sedimentation, and turbidity resulting from removal of upland and riparian vegetation. • Degradation of water quality from contamination by oils, gasoline and grease, drilling frac-out, and other materials due to accidental spills, as a result of the proximity of construction vehicles and machinery to water bodies. • Increase in impervious surfaces and increased surface run-off down a steep slope (i.e. a valley, or steep side slopes of municipal drains), resulting from re-grading of land and resulting in increased potential for erosion and downstream sedimentation.	• Schedule construction activities near water (within 30m) to occur within the low flow period of the late summer months, where possible, to avoid or minimize impacts. • Time clearing, grubbing, and grading activities to avoid seasonally wet periods where possible. • Implement riparian planting after construction, as soon as weather permits, to stabilize water body banks and encourage rapid re-vegetation of disturbed soils. This will aid in preventing bank collapse and erosion, which, in turn, will minimize sedimentation, support fish habitat, and protect sensitive ecological functions that occur in water bodies. • If insufficient time is available in the growing season to establish vegetative cover, apply overwintering treatments such as erosion control blankets, fiber matting, rock (i.e. large, clean angular rocks) reinforcement/armoring or equivalent to contain the site over the winter period. Plant vegetative cover as soon as is feasible in the next growing season, followed by maintenance and inspection. • Operate construction equipment (i.e., cranes, back hoes etc.) in a manner that minimizes disturbance to the water body banks and stays outside of the water body and bank area. Machinery should arrive on site in clean condition. Frequent checks and maintenance should ensure that no fluid leaks occur. Machinery must be refueled, washed, and serviced a minimum of 30m away from all water bodies and other drainage features to prevent any deleterious substances from entering a water body. • Store fuel and other construction related materials securely away from any drainage features and locate construction staging areas 30m away from any water body. • Develop a SPRP prior to commencement of construction that provides a detailed response system to deal with events such as the release of petroleum, oils and lubricants or other hazardous liquids and chemicals. Keep a spill kit on site at all times and train on-site workers in the proper use of this kit and to be fully aware of the SPRP. • Confine construction equipment to designated, controlled vehicle access routes to minimize the potential for soil compaction.	• The application of the ESC Plan and maintenance of erosion and sediment control systems will prevent impacts to water bodies from increased erosion, sedimentation, and turbidity due to the removal of upland riparian vegetation. In addition, the removal of vegetation will be localized. • Spills are highly unlikely and the application of a SPRP and emergency 'frac-out' response plan will mitigate any potential impact to water bodies. • The increase in impervious surfaces and grading activities is minimal and highly localized. The application of the ESC Plan and maintenance of erosion and sediment control systems will mitigate the increased potential for erosion and downstream sedimentation.	Not Significant

Construction Activity	Potential Negative Effects	Recommended Mitigation Measures	Net Effects	Resulting Impact Significance
		• Remove construction debris from the site and stabilize it to prevent debris from entering the nearby water bodies. • Remove and dispose of any waste generated from the site appropriately off site according to provincial standards including but not limited to O.Reg102/94, O.Reg 103/94, R.R.O. 1990, Regulation 347. • Avoid construction during high volume rain events, as determined by the Environmental Construction Monitor and significant snow melt/thaw events, where possible, and resume once soils have been stabilized or mitigation measures have been installed (i.e. heavy-duty silt fences, coir logs, or straw mats around any soil stockpiles) to avoid risk of erosion, soil compaction or the potential for sediment release into nearby water bodies. • Develop a Flood Response Plan (FRP) to deal with on-site flooding in order to mitigate any possible effects to the aquatic environment. • Develop an Erosion and Sediment Control Plan (ESC) to minimize the potential for construction related sediment release into nearby water bodies (ESC Guideline), and prepare ESC condition reports as part of the monitoring and maintenance plan. • Monitor erosion and sediment control systems frequently for effectiveness, repairing deficient controls in a timely manner and using an adaptive management approach when deemed appropriate. • Horizontal directional drilling should be executed at a depth that limits the potential impacts associated with the possibility of a 'frac-out' (i.e. the escape of drilling mud and/or fluids into the environment as a result of a spill, drilling tunnel collapse or rupture of mud to the surface due to excessive pressure from an obstruction within the borehole). A minimum depth will be provided on design drawings and will be included in discussions with the conservation authorities. • Locate drilling entry/exit shafts beyond the top of bank, at a distance that allows the minimum depth, as identified on design drawings, to be reached while below the water body. This distance should be agreed upon with regulatory agencies. • Develop and implement an emergency 'frac-out' response plan including steps to contain, monitor and clean-up in response to the event.		
Underground Collector Lines – Open Trench Method	• Increased erosion, sedimentation, and turbidity resulting from removal of upland and riparian vegetation. • Degradation of water quality from contamination by oils, gasoline, grease, and other materials due to accidental spills, as a result of the proximity of construction vehicles and machinery to water bodies. • Excess suspended sediment that is carried downstream during the installation and removal of temporary structures. • Minor, isolated, short term dewatering of shallow groundwater from excavation areas required when excavation intercepts an area of shallow groundwater table conditions.	• Schedule construction activities near water (within 30m) to occur within the low flow period of the late summer months, where possible, to avoid or minimize impacts. • If in-water work is required (e.g. for culvert installation and or collector lines installation), adhere to required timing windows confirmed through consultation with regulatory agencies, including the MNRF. • Time clearing, grubbing, and grading activities to avoid seasonally wet periods where possible. • Implement riparian planting after construction, as soon as weather permits, to stabilize water body banks and encourage rapid re-vegetation of disturbed soils. This will aid in preventing bank collapse and erosion, which, in turn, will minimize sedimentation, support fish habitat, and protect sensitive ecological functions that occur in water bodies. • If insufficient time is available in the growing season to establish vegetative cover, apply overwintering treatments such as erosion control blankets, fiber matting, rock (i.e. large, clean angular rocks) reinforcement/armoring or equivalent to contain the site over the winter period. Plant vegetative cover as soon as is feasible in the next growing season, followed by maintenance and inspection. • Operate construction equipment (i.e., cranes, back hoes etc.) in a manner that minimizes disturbance to the water body banks and stays outside of the water body and bank area. Machinery should arrive on site in clean condition. Frequent checks and maintenance should ensure that no fluid leaks occur. Machinery must be refueled, washed, and serviced a minimum of 30m away from all water bodies and other drainage features to prevent any deleterious substances from entering a water body. • Store fuel and other construction related materials securely away from any drainage features and locate construction staging areas 30m away from any water body. • Develop a Spill Prevention and Response Plan (SPRP) prior to commencement of construction that provides a detailed response system to deal with events such as the release of petroleum, oils and lubricants or other hazardous liquids and chemicals. Keep a spill kit on site at all times and train on-site workers in the proper use of this kit and to be fully aware of the SPRP. • Confine construction equipment to designated, controlled vehicle access routes to minimize the potential for	• The application of the ESC Plan and maintenance of erosion and sediment control systems will prevent impacts to water bodies from increased erosion, sedimentation, and turbidity due to the removal of upland riparian vegetation. In addition, the removal of vegetation will be localized. • Spills are highly unlikely and the application of a SPRP will mitigate any potential impact to water bodies. • The release of excess suspended sediment downstream is unlikely and may occur only during in water work. Using directional drilling methods will eliminate this impact. Performing in water work in the dry and isolating the work area will prevent increases in suspended sediment if in water work is required. • The extent of dewatering will be localized and minimal. Impacts to water levels due to dewatering activities are highly unlikely. Monitoring water levels immediately before, during and after dewatering activities will help to mitigate any impacts.	Not Significant

Construction Activity	Potential Negative Effects	Recommended Mitigation Measures	Net Effects	Resulting Impact Significance
		soil compaction. • Remove construction debris from the site and stabilize it to prevent debris from entering the nearby water bodies. • Remove and dispose of any waste generated from the site appropriately off site according to provincial standards including but not limited to O.Reg102/94, O.Reg 103/94, R.R.O. 1990, Regulation 347. • Avoid construction during high volume rain events, as determined by the Environmental Construction Monitor and significant snow melt/thaw events, where possible, and resume once soils have been stabilized or mitigation measures have been installed (i.e. heavy-duty silt fences, coir logs, or straw mats around any soil stockpiles) to avoid risk of erosion, soil compaction or the potential for sediment release into nearby water bodies. • Develop a Flood Response Plan (FRP) to deal with on-site flooding in order to mitigate any possible effects to the aquatic environment. • Develop an Erosion and Sediment Control Plan (ESC) to minimize the potential for construction related sediment release into nearby water bodies (ESC Guideline), and prepare ESC condition reports as part of the monitoring and maintenance plan. • Monitor erosion and sediment control systems frequently for effectiveness, repairing deficient controls in a timely manner and using an adaptive management approach when deemed appropriate. • If required, perform in-water work in dry conditions, where possible. If this is not possible, short-term isolated dewatering will be required. Prior to dewatering, isolate the work area with the installation of a temporary water containment structure. The structure should form an impermeable enclosure that will prevent debris and sediment from escaping into the surrounding water body. Construct a by-pass channel to maintain flow through the water body and prevent back flooding, which could ultimately overtop the water containment structure. Additional permits may be required for in-water work. • Install an in-stream sediment filter (e.g. Siltsoxx or Filtersoxx) downstream of water containment structure dewatering discharge should be dissipated (i.e. splash pads, sand bags, hay bales etc.) and may require splitting discharge to more than one location. • Prior to surface water dewatering, collect and relocate fish to a suitable location, preferably downstream and away from the construction area. This should be executed through the development of a Fish Salvage Plan and by a qualified fisheries biologist. • Dewatering discharge rates should be evaluated as to not result in erosion and sedimentation to receiving water body.		
Access Roads – Water Body Crossing Installations	• Increased erosion, sedimentation, and turbidity resulting from removal of upland and riparian vegetation. • Degradation of water quality from contamination by oils, gasoline, grease, and other materials due to accidental spills, as a result of the proximity of construction vehicles and machinery to water bodies. • Increase in impervious surfaces and increased surface run-off down a steep slope (i.e. a valley, or steep side slopes of municipal drains), resulting from re-grading of land and resulting in increased potential for erosion and downstream sedimentation. • Release of suspended sediment that is carried downstream during the installation and removal of temporary structures. • Changes in water chemistry resulting in decreased water quality, potentially resulting in changes in benthic invertebrate and fish community.	• Where possible, avoid seasonally wet periods when conducting clearing, grubbing, and grading activities. • Avoid construction during high volume rain events (as determined by an Environmental Construction Monitor) and significant snow melt/thaw events, where possible, and resume once soils have been stabilized or mitigation measures have been installed (i.e. heavy-duty silt fences, coir logs, or straw mats around any soil stockpiles) to avoid risk of erosion, soil compaction or the potential for sediment release into nearby water bodies. • Develop a FRP to deal with on-site flooding in order to mitigate any possible effects to the aquatic environment. • Develop an ESC Plan that will minimize the potential for construction related sediment release into nearby water bodies (ESC Guideline). • Monitor erosion and sediment control systems frequently for effectiveness, repairing deficient controls in a timely manner and using an adaptive management approach when deemed appropriate. • If required, perform in-water work in dry conditions, where possible. If this is not possible, short-term isolated dewatering will be required. Prior to dewatering, isolate the work area with the installation of a temporary water containment structure. The structure should form an impermeable enclosure that will prevent debris and sediment from escaping into the surrounding water body. Construct a by-pass channel to maintain flow through the water body and prevent back flooding, which could ultimately overtop the water containment structure. Additional permits may be required for in-water work.	• The application of the ESC Plan and maintenance of erosion and sediment control systems will prevent impacts to water bodies from increased erosion, sedimentation, and turbidity due to the removal of upland riparian vegetation. In addition, the removal of vegetation will be localized. • Spills are highly unlikely and the application of a SPRP will mitigate any potential impact to water bodies. • The increase in impervious surfaces and grading activities is minimal and highly localized. The application of the ESC Plan and maintenance of erosion and sediment control systems will mitigate the increased potential for erosion and downstream sedimentation. • The release of excess suspended sediment downstream is unlikely and may occur only during in water work. Using directional drilling methods will	Not Significant

Construction Activity	Potential Negative Effects	Recommended Mitigation Measures	Net Effects	Resulting Impact Significance
		• Install an in-stream sediment filter (e.g. Siltsoxx or Filtersoxx) downstream of water containment structure dewatering discharge should be dissipated (i.e. splash pads, sand bags, hay bales etc.) and may require splitting discharge to more than one location. • Operate construction equipment (i.e. cranes, back hoes etc.) in a manner that minimizes disturbance to the water body banks, and stay outside of the water body and bank area as much as possible. • Machinery should arrive on site in clean condition. Frequent checks and maintenance should ensure that no fluid leaks occur. Machinery must be refueled, washed, and serviced a minimum of 30m away from all water bodies and other drainage features to prevent any deleterious substances from entering a water body. • Store fuel and other construction related materials securely away from any drainage features and locate construction staging areas 30m away from any water body. • Develop a SPRP prior to commencement of construction that provides a detailed response system to deal with events such as the release of petroleum, oils and lubricants or other hazardous liquids and chemicals. Keep a spill kit on site at all times and train on-site workers in the proper use of this kit and to be fully aware of the SPRP. • Restrict construction equipment to designated, controlled vehicle access routes to minimize the potential for soil compaction. • Remove construction debris adjacent to water bodies and stabilize it to prevent debris from entering the nearby water bodies. • Remove and dispose of any waste generated from the Project appropriately off site according to provincial standards including but not limited to O.Reg102/94, O.Reg 103/94, R.R.O. 1990, Regulation 347. • If dewatering is required, isolate the work area and establish a by-pass channel to maintain flow quantity through the water body. • Dewatering discharge rates should be evaluated as to not result in erosion and sedimentation to receiving water body. • Collect and relocate fish to a suitable location, preferably downstream and away from the construction area, prior to surface water dewatering. This should be executed through the development of a Fish Salvage Plan and by a qualified fisheries biologist.	eliminate this impact. Performing in water work in the dry and isolating the work area will prevent increases in suspended sediment if in water work is required. • Changes in water quality are highly unlikely and related only to spills. Following the SPRP and locating machine fueling and maintenance activities away from water bodies will prevent contamination of water bodies.	

Construction Activity	Potential Negative Effects	Recommended Mitigation Measures	Net Effects	Resulting Impact Significance
Access Roads and Ancillary Facilities	• Increased erosion, sedimentation, and turbidity resulting from removal of upland and riparian vegetation. • Changes in water chemistry resulting in decreased water quality by accidental spills of oils, gasoline, grease, and other materials. • Increase in impervious surfaces and increased surface run-off down a steep slope (i.e. a valley, or steep side slopes of municipal drains), resulting from re-grading of land and resulting in increased potential for erosion and downstream sedimentation. • Decreased infiltration to key areas (e.g. areas of recharge due to newly impervious cover leading to interruptions to the natural water cycle). • Soil compaction as a result of heavy machinery and the stockpiling of heavy materials (i.e. soils) reducing the permeability of soils and their ability to retain water during rain/snow melt events resulting in an increase in surface water run-off which will ultimately increase the erosion potential and the amount of sediment being transported into adjacent water bodies. Soil compaction can restrict re-vegetation of construction and temporary lay down areas. • Stockpiles of construction related materials, such as soil, shrubs, trees and root wads in or near a water body can result in debris or sediment entering the water body if the stockpiles are not properly contained. This can result in the disturbance of flow patterns, increase the risk of flooding, erosion and sedimentation, and impair water quality.	• Where possible, avoid seasonally wet periods when conducting clearing, grubbing, and grading activities. Avoid construction during high volume rain events (as determined by an Environmental Construction Monitor) and significant snow melt/thaw events, where possible, and resume once soils have been stabilized (i.e. heavy-duty silt fences, coir logs, or straw mats around any soil stockpiles) to avoid risk of erosion, soil compaction or the potential for sediment release into nearby water bodies. • Develop a FRP to deal with on-site flooding in order to mitigate any possible effects to the aquatic environment. • Develop an ESC Plan that will minimize the potential for construction related sediment release into nearby water bodies (ESC Guideline). • Monitor erosion and sediment control systems frequently for effectiveness, repairing deficient controls in a timely manner and using an adaptive management approach when deemed appropriate. • Operate construction equipment (i.e. cranes, back hoes etc.) in a manner that minimizes disturbance to the water body banks, and stay outside of the water body and bank area as much as possible. • Machinery should arrive on site in clean condition. Frequent checks and maintenance should ensure that no fluid leaks occur. Machinery must be refueled, washed, and serviced a minimum of 30m away from all water bodies and other drainage features to prevent any deleterious substances from entering a water body. • Store fuel and other construction related materials securely away from any drainage features and locate construction staging areas 30m away from any water body. • Develop a SPRP prior to commencement of construction that provides a detailed response system to deal with events such as the release of petroleum, oils and lubricants or other hazardous liquids and chemicals. Keep a spill kit on site at all times and train on-site workers in the proper use of this kit and to be fully aware of the SPRP. • Restrict construction equipment to designated, controlled vehicle access routes to minimize the potential for soil compaction. • Remove construction debris adjacent to water bodies and stabilize it to prevent debris from entering the nearby water bodies. • Remove and dispose of any waste generated from the Project appropriately off site according to provincial standards including but not limited to O.Reg102/94, O.Reg 103/94, R.R.O. 1990, Regulation 347. • Monitor water levels immediately before and during dewatering activities, to determine if dewatering activities are resulting in alteration of water levels within the water body. • Dewatering discharge rates should be evaluated as to not result in erosion and sedimentation to receiving water body. • If discharging to a municipal storm sewer system, ensure that groundwater quality meets the objectives of the municipal storm sewer by-law prior to discharge. To mitigate potential effects associated with the discharge, sample for turbidity prior to discharge to ensure the water is suitable for discharge and will not result in an impact to the receiving water body. If the groundwater is not suitable for discharge, identify alternate disposal locations or carry out adequate treatment.	• The application of the ESC Plan and maintenance of erosion and sediment control systems will prevent impacts to water bodies from increased erosion, sedimentation, and turbidity due to the removal of upland riparian vegetation. In addition, the removal of vegetation will be localized. • Changes in water quality are highly unlikely and related only to spills or frac-out events. Following the SPRP and locating machine fueling and maintenance activities away from water bodies will prevent contamination of water bodies. • The increase in impervious surfaces and grading activities is minimal and highly localized. The application of the ESC Plan and maintenance of erosion and sediment control systems will mitigate the increased potential for erosion and downstream sedimentation. • The reduction in infiltration to key areas due to newly impervious surfaces is minimal. The use of permeable materials on access roads, parking lots, etc. will reduce the impact of decreased infiltration. • The reduction of soil permeability and infiltration capacity as a result of heavy machinery and stockpiling of heavy materials is minimal, localized, and temporary in nature is highly unlikely. Stockpiling of material and the use of heavy machinery is expected to be localized and temporary in nature. • Stockpiles of debris will be removed from the site and stabilized according to the ESC Plan. Change in flow patterns, flooding, erosion and sedimentation are highly unlikely following the application of the ESC Plan.	Not Significant.

6.2.2 Operation

During the operational phase of the project, it is anticipated that impacts to water bodies will be limited. Operational phase impacts are associated with increases in traffic due to access requirements within the Project Area, as well as ongoing maintenance activities. The risks related to these activities include contaminant spills and erosion and sedimentation from maintenance activities (i.e. removal of vegetation). These impacts may result in the degradation of surface water quality within receiving water bodies.

Operational related impacts resulting from the maintenance of the North Kent Wind 1 Project and associated mitigation measures for these impacts are summarized in Table 4.

Table 4. Summary of Operational Activities, Potential Negative Environmental Effects, Recommended Mitigation Measures, Net Effects, and Resulting Impact Significance for the North Kent Wind 1 Project

Operational Activity	Potential Negative Effects	Recommended Mitigation	Net Effects	Resulting Impact Significance
Vegetation Control Increased Vehicle Use	• Degradation of water quality from contamination by oils, gasoline, grease, and other materials due to accidental spills, as a result of the proximity of construction vehicles and machinery to water bodies. • Increase in surface run-off resulting from clearing of vegetation, increase in impervious surfaces, and soil compaction from vehicles accessing the site, resulting in increased erosion and sedimentation.	• Store fuel and maintenance related materials at least 30m away from any drainage features. • Implement a SPRP to provide a detailed response system to deal with events such as the release of petroleum, oils and lubricants or other hazardous liquids and chemicals. A spill kit must also be kept on site at all times and on-site workers must be trained in the use of this kit and be fully aware of the SRP. • Develop an ESC that will minimize the potential for operations related sediment release into nearby water bodies (ESC Guideline). • Confine vehicles to designated controlled access routes to minimize the potential for soil compaction.	• Spills during the operational phase are rare. The application of a SPRP will mitigate any potential impact to water bodies. • The increase in impervious surfaces is minimal and highly localized. Vehicles will be confined to designated access routes. • The application of the ESC Plan and maintenance of erosion and sediment control systems will prevent impacts to water bodies from increased erosion, sedimentation, and turbidity due to the removal of upland riparian vegetation, increased impervious surfaces, and soil compaction.	Not Significant

6.2.3 Decommissioning

The decommissioning phase impacts are essentially the same as the construction phase. However, the decommissioning phase impacts have the potential to be of a lesser extent. This is due to water body crossing structures remaining in place if landowners request that access roads remain. Please see Section 6.2.1 for potential negative effects and mitigation measures associated with decommissioning of the North Kent Wind 1 Wind Project.

If a decision is made to discontinue the operation of the Project, removal of all turbines and associated infrastructure will occur. It is recommended that all water body crossing structures remain in place following decommissioning of the Project. Leaving structures in place will eliminate the need for additional in-water work that will reduce the potential for sedimentation, contaminant spills and physical impacts to habitat commonly associated with this type of work. Additionally, this will minimize the necessary remediation activities that are required to rehabilitate the site following the destruction and alteration of riparian vegetation and in-stream aquatic habitat.

If a decision is made to remove all crossing structures upon decommissioning of the Project, it is recommended that a comprehensive management plan be prepared prior to the commencement of any activities. This plan will include the required steps for removing structures and creating the lowest collective footprint of impact on the site. Consultation with the appropriate agencies (e.g. SCRCA and LTVCA) should occur prior to decommissioning activities to address any required in-water work. All in water work will follow the timing windows provided by the Aylmer district MNRF, or will otherwise be discussed with the MNRF.

6.3 Site Specific Water Body Impacts and Mitigations

In accordance with the REA Regulation, the proposed North Kent Wind 1 Project Area has been assessed by NRSI Biologists for the presence of water bodies through the completion of a records review and site investigations. Water bodies identified within 30m of the Project Location were further evaluated for potential impacts as they relate to the proposed undertaking. General project phase impacts are discussed in Section 6.2. Site specific impacts to confirmed water bodies are discussed below.

For the purpose of this report, the analysis of potential impacts has been divided by water body type, as defined by the REA Regulation. For the North Kent Wind 1 Project this includes permanent and intermittent water bodies, which is divided into water body crossings and water bodies within 0.1 to 30m of the Project Location. Since there were no lakes, lake trout lakes, or seepage areas identified within the Project Area, these features have not been specifically addressed in this report.

The following section outlines potential site specific impacts on water bodies associated with the proposed North Kent Wind 1 Project.

6.3.1 Permanent and Intermittent Water Bodies

A total of 62 permanent and intermittent water bodies have been identified within the North Kent Wind 1 Project Area, 53 of which are present within 30m of, or overlapping, the Project Location. These water bodies contribute to water quality and quantity, and also provide direct or in-direct habitat for fish and other aquatic organisms.

NRSI identified 53 water bodies that will be crossed by project components (access road, collector lines, and/or construction disturbance area) at 127 individual locations (specific water bodies may have infrastructure crossing at multiple locations). Each of these 127 crossing locations involves at least one type of project component, but may involve multiple project components (i.e. access road and underground or overhead collector lines). In addition to these crossing locations, there are 15 permanent or intermittent water bodies that have infrastructure proposed within 30m of the Project Location, without the infrastructure specifically crossing the water body. Refer to Maps 2 to 10 for specific crossing and assessment locations.

6.4 Monitoring

An adaptive management approach to the protection of water bodies requires regular site inspections and monitoring by a designated on-site Environmental Monitor(s) (EM). Understanding the condition of the natural ecosystem throughout all phases of the Project will form the basis upon which to consider altering construction methods, environmental protection measures, and monitoring programs. Ultimately, any determination related to the application of mitigation and contingency measures will be

informed by ongoing analyses of monitoring data, and rely on the experience and judgment of the on-site EM in consultation with the SCRCA, LTVCA, MNRF, Ministry of the Environment and Climate Change (MOECC) and the Fisheries and Oceans, Canada (DFO) as regulatory agencies.

Active construction monitoring will be required at all locations where drainage features and water bodies are located within 120m of the Project Location. Post-construction monitoring may also be required to certify that proper restoration, stabilization, and overall quality of runoff is returned to pre-construction conditions, as assessed by the EM, as well as to satisfy regulatory permitting and/or authorizations.

General recommended monitoring activities are summarized in Table 5 below.

Table 5. Summary of General Monitoring Recommendations

Recommended Monitoring	Project Phase	Recommended Frequency of Monitoring
Monitor on-site conditions (i.e. erosion and sediment control measures, spills, flooding)	• Construction phase	• Weekly, during active construction periods • Prior to, during and after forecasted rain events or significant snowmelt events, as determined by the Environmental Monitor • Daily, during extended rain or snowmelt periods • Monthly, during inactive construction periods • As detailed in the ESC Plan, SRP, and FRP
Monitor meteorological conditions from Environment Canada	• Construction phase	• Daily review of weather forecasts
Monitor end point of dewatering discharge for water quality and erosion (if dewatering)	• Construction phase	• Daily erosion checks during discharge of water • Water quality (turbidity) prior to discharge, once a week thereafter or as described by agencies
Monitor by-pass channel (if applicable)	• Construction phase	• Daily checks of the channel to ensure it is functioning appropriately and water is flowing through as designed
Monitor aquatic habitat at drilling locations (if drilling) (i.e. potential frac-out)	• Construction phase	• Continuous monitoring by an EM, during drilling operations underneath a water body, to identify frac-out (if it occurs)
Monitor surface water quality for general parameters (i.e. turbidity)	• Pre-construction (to document baseline conditions) • Construction phase	• Pre-construction sampling should be conducted over multiple seasons to establish baseline conditions • Pre-construction monitoring stations should be located upstream of construction area to provide baseline conditions • Frequent measurements of turbidity during construction • Other general water quality parameters as required by to meet MOECC Policy 2 standards for discharging to a water body
Monitor water levels within water bodies during groundwater dewatering	• Pre-construction (to document baseline conditions) • Construction phase • Post-construction	• Monitor water levels immediately before, during, and after dewatering • Staff gauge readings daily during dewatering • Continuous level loggers (logged in 1 hour increments and downloaded daily during active dewatering)

7.0 Environmental Impact Study Summary

A summary of general project phase potential impacts, recommended mitigation measures, and resulting significance of impacts to water bodies within the Project Area is presented in Table 6. With the appropriate application of the recommended mitigation measures outlined in this report, it is anticipated that there will be no significant impacts to water bodies within the Project Area.

Table 6. Summary of General Project Phase Potential Impacts, Recommended Mitigation Measures, and Resulting Significance of Impact

Potential Impact	Recommended Mitigation Measure(s)	Resulting Impact Significance[i]
Construction Phase		
Erosion and sedimentation	• implement trenchless (i.e. directional drilling) technology at crossings, where possible • minimize potential for soil compaction (see Soil Compaction in Table 8) • controlled vehicle and machinery access routes, minimize disturbance by keeping construction equipment outside of, and at least 30m away from, water bodies • avoid clearing, grubbing and grading activities during seasonally wet periods, where possible • avoid work if high volume rain events or snow melt events (as determined by the Environmental Monitor) are observed, resuming once soils have been stabilized (i.e. heavy-duty silt fences, coir logs, or straw mats around any soil stockpiles) to avoid risk of erosion, soil compaction or the potential for sediment release into nearby water bodies • implement FRP if on-site flooding occurs • implement ESC Plan, and monitor erosion and sediment control systems frequently for effectiveness, repairing deficient controls in a timely manner and using an adaptive management approach when deemed appropriate • stabilize banks as soon as possible after construction disturbance (i.e., plantings, rock, etc.); if insufficient time is available in the growing season to establish vegetative cover, an overwintering treatment such as erosion control blankets, fibre matting etc. should be applied to contain the site over the winter period. Plant vegetative cover as soon as is feasible in the next growing season, followed by maintenance and inspection • work in dry conditions (i.e., low flow period) or isolate in-water work area with use of a water containment structure (i.e. cofferdams) • install an in-stream sediment filter (e.g. Siltsoxx or Filtersoxx) downstream of water containment structure dewatering discharge should be dissipated (i.e. splash pads, sand bags, hay bales etc.) and may require splitting discharge to more than one location • dewatering discharge rates should be evaluated as to not result in erosion and sedimentation to receiving water body	Not Significant
Water quality impairment	• implement ESC Plan • implement SPRP • keep machinery clean, and refuel a minimum of 30m away from any water body • fuel and other construction related chemicals stored securely away from water bodies • any discharge to a water body must meet MOECC Policy 2 standards (at or better water quality than that of the receiving water body)	Not Significant

Potential Impact	Recommended Mitigation Measure(s)	Resulting Impact Significance[i]
Alteration of local drainage patterns (crossing structures)	• construction to maintain existing surface water drainage patterns and functions (including grading and structures) • restrict construction to the appropriate in-water work timing windows, as indicated by regulatory agencies, including the local MNRF district (Aylmer) • when using a water containment structure, a qualified fisheries biologist will remove any fish prior to dewatering the work area and after any flooding or inundation of the work area • utilize existing roads and road crossing structures where possible • crossing structures should be sized and positioned appropriately(angle and embedded) and installed correctly according to municipal engineering standards in order to avoid alterations in stream hydrology, scouring or flooding crossing structures • crossing structures should be positioned appropriately (angle and embedded) to avoid erosion issues and allow fish passage • crossing structure type should be determined in consultation with agency and municipality staff and should consider sensitivity of the water body and location of crossing • permeable materials should be used for new impervious surfaces (e.g. access roads, turbine foundations, parking lots, etc.) • installation of underground collection lines should implement trenchless (i.e. directional drilling) technology at crossings, where possible	Not Significant
Alteration of local drainage patterns (in-water work)	• restrict construction to the appropriate in-water work timing windows, as indicated by regulatory agencies, including the local MNRF district (Aylmer) • isolate work area with a water containment structure or work in dry conditions using accepted methods to bypass flows such as damming • downstream flows should be maintained at all times during in-water works • machinery should be operated in a manner that minimizes disturbance to the banks and bed of the water body • when using a water containment structure, a qualified fisheries biologist will remove any fish prior to dewatering the work area and after any flooding or inundation of the work area • stabilize banks as soon as possible after construction disturbance with riparian plantings to prevent bank collapse and erosion	Not Significant
Water level alteration	• monitor water levels immediately before and during dewatering activities to identify alteration to water levels as a result of dewatering activities • maintain downstream flow during in-water work to prevent back flooding and overtopping of water containment structure	Not Significant
Soil compaction	• confine vehicles to designated access routes • staging areas should be located a minimum of 30m away from water bodies	Not Significant

Potential Impact	Recommended Mitigation Measure(s)	Resulting Impact Significance[i]
Debris entering a water body	• construction debris and material stockpiles should be stabilized (i.e. tarps) at least 30m away from water bodies • refuse and other debris and construction material should be appropriately disposed of off-site • staging areas should be located at least 30 m away from water bodies • drilling shafts should be located beyond the top of bank, at a distance that allows the minimum depth, as identified on design drawings, to be reached while below the water body. This distance should be agreed upon with regulatory agencies.	Not Significant
Drilling 'Frac-out'	• horizontal directional drilling should be conducted at a minimum depth identified on design drawings to limit potential impacts associated with a 'frac-out' • develop emergency response plan in the event of a 'frac-out' when drilling below a water body; this plan will deal with issues associated with water level alteration, water quality and erosion & sedimentation • emergency response plan for drilling 'frac-out' to be reviewed and approved by the EM • develop and apply the SPRP as appropriate	Not Significant
Operational Phase		
Water quality impairment	• implement Spill Prevention and Response Plan • address any impacts resulting from design or construction phases	Not Significant
Decommissioning		
• see construction related impacts and recommended mitigation		

[1] Considers if recommended mitigation measures are applied

8.0 Summary and Conclusions

A detailed assessment of the water bodies within and adjacent to the proposed North Kent Wind 1 Project occurred through the use of a detailed records review and site investigations conducted by NRSI biologists (NRSI 2015a).

Through the completion of these studies, NRSI confirmed the presence of 62 water bodies within the Project Area, all of which were identified as permanent or intermittent drainage features. These water bodies are present within 120m of, or cross, the Project Location. Of these 62 water bodies, 53 were identified as crossing the Project Location in at least one location, totaling 127 individual crossing locations. The remaining water bodies are found within 120m of the Project Location without specifically overlapping with the Project Location.

No lakes, lake trout lakes or seepage areas were identified within the North Kent Wind 1 Project Area.

If recommended mitigation measures are employed as described in this report, no significant impacts are anticipated on the identified water bodies as a result of the development of the North Kent Wind 1 Project.

9.0 References

AECOM. 2015a. North Kent Wind 1 Project – Construction Plan Report. November 2015.

AECOM. 2015b. North Kent Wind 1 Project – Design and Operations Report. November 2015.

AECOM. 2015c. North Kent Wind 1 Project – Decommissioning Plan Report. November 2015.

AECOM. 2015d. North Kent Wind 1 Project – Project Description Report. November 2015.

Government of Canada. 2015. Fisheries Act. Amended February 26, 2015

Government of Ontario. 2015. Ontario Water Resources Act.

Natural Resource Solutions Inc. (NRSI). 2015a. North Kent Wind 1 Project – Water Body Assessment. December 2015.

Natural Resource Solutions Inc. (NRSI). 2015b. North Kent Wind 1 Project – Natural Heritage Assessment Environmental Impact Study Report. October 2015.

Newcombe, C.P. and D.D. MacDonald. 1991. Effects of Suspended Sediments on Aquatic Ecosystems, North American Journal of Fish Management, 11:72-82.

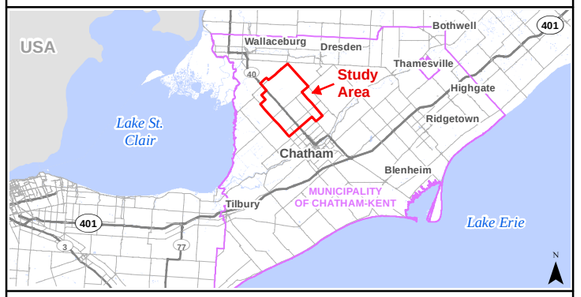
Thames-Sydenham and Region Source Protection Committee. 2014. Watershed Characterization Report St. Clair Region Source Protection Area. Map 18 Municipal Drain Classifications

Maps

Map 1

North Kent Wind 1 Project

Key Map



Legend

- Map Extent
- Utility Line
- Highway
- Primary Road
- Secondary Road

Project Location

- Project Area (120m Buffer)
- Construction Disturbance Area
- Proposed Turbine
- Proposed Meteorological Tower
- Proposed Collection Line
- Proposed Access Road
- Proposed POI/ Substation/ Laydown/ O&M Building
- Proposed Laydown Area

Aquatic Features

- Permanent Watercourse
- Intermittent Watercourse
- SCRCA Watercourse
- Open Water

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Map Produced by Natural Resource Solutions Inc. This map is proprietary and confidential and must not be duplicated or distributed by any means without express written permission of NRSI. Data provided by MNRF© & SCRCA. Copyright: Queen's Printer Ontario.

Project: 1612
Date: May 17, 2016

NAD83 - UTM Zone 17
Size: 11x17"
1:75,000

0 1 2 3 Kilometers

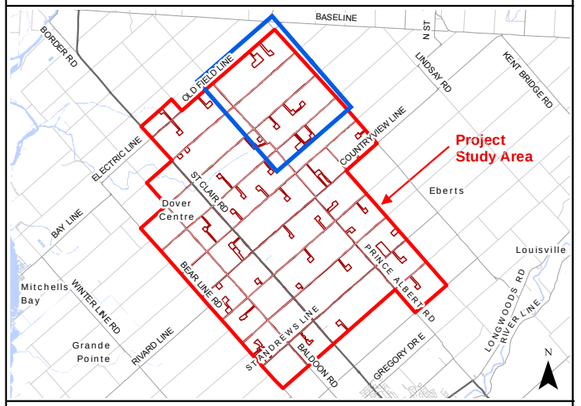
N

Path: X:\1612_NorthKentWP\NRSI_1612_AQU_Map1_KeyMap_75K_2016_05_17_LEH.mxd

Map 2

North Kent Wind 1 Project

Water Body Assessment



Legend

- Utility Line
- Primary Road
- Secondary Road

Project Location

- Project Area (120m Buffer)
- Construction Disturbance Area
- Proposed Turbine
- Proposed Meteorological Tower
- Proposed Collection Line
- Proposed Access Road

Aquatic Features

- Permanent Watercourse
- SCRCA Watercourse
- Open Water

Water Body Assessment

- Water Body Location (WB)
- Non-Water Body Location (NWB)

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Map Produced by Natural Resource Solutions Inc. This map is proprietary and confidential and must not be duplicated or distributed by any means without express written permission of NRSI. Data provided by MNRF© & SCRCA. Copyright: Queen's Printer Ontario. Imagery: AECOM (March 2015).

Project: 1612 Date: October 22, 2015	NAD83 - UTM Zone 17 Size: 11x17" **1:17,500**

0 500 1,000 Metres

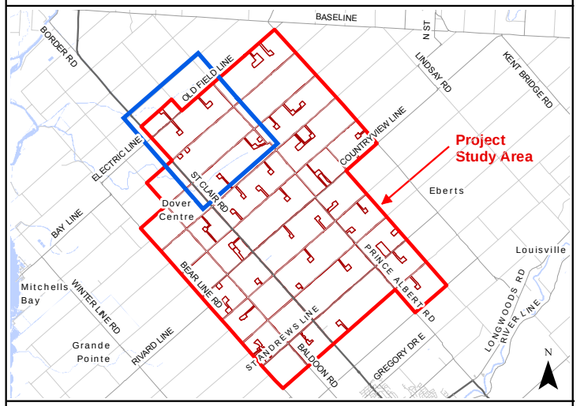
N

Path: X:\1612_NorthKentWP\NRSI_1612_AQU_Map2toMap10_WaterBodyAssessment_18K_2015_09_20_KEB.mxd

Map 3

North Kent Wind 1 Project

Water Body Assessment



Legend

- Utility Line
- Highway
- Primary Road
- Secondary Road

Project Location

- Project Area (120m Buffer)
- Construction Disturbance Area
- Proposed Turbine
- Proposed Collection Line
- Proposed Access Road

Aquatic Features

- Permanent Watercourse
- SCRCA Watercourse
- Open Water

Water Body Assessment

- Water Body Location (WB)
- Non-Water Body Location (NWB)

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Map Produced by Natural Resource Solutions Inc. This map is proprietary and confidential and must not be duplicated or distributed by any means without express written permission of NRSI. Data provided by MNRF© & SCRCA. Copyright: Queen's Printer Ontario. Imagery: AECOM (March 2015).

Project: 1612 Date: October 22, 2015	NAD83 - UTM Zone 17 Size: 11x17" **1:17,500**

0 500 1,000 Metres

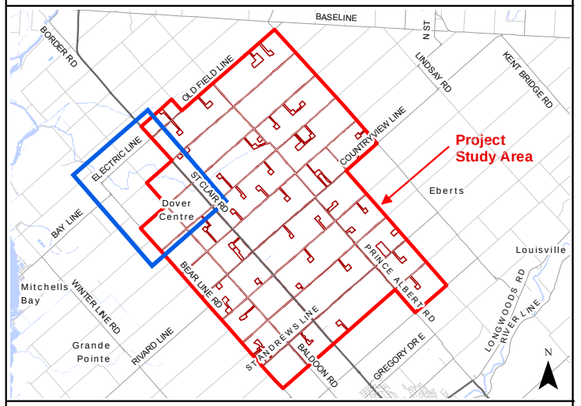
N

Path: X:\1612_NorthKentWP\NRSI_1612_AQU_Map2toMap10_WaterBodyAssessment_18K_2015_09_20_KEB.mxd

Map 4

North Kent Wind 1 Project

Water Body Assessment



Legend

- Highway
- Primary Road
- Secondary Road

Project Location

- Project Area (120m Buffer)
- Construction Disturbance Area
- Proposed Turbine
- Proposed Collection Line
- Proposed Access Road

Aquatic Features

- Permanent Watercourse
- Intermittent Watercourse
- SCRCA Watercourse
- Open Water

Water Body Assessment

- Water Body Location (WB)
- Non-Water Body Location (NWB)

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Map Produced by Natural Resource Solutions Inc. This map is proprietary and confidential and must not be duplicated or distributed by any means without express written permission of NRSI. Data provided by MNRF© & SCRCA. Copyright: Queen's Printer Ontario. Imagery: AECOM (March 2015).

Project: 1612 Date: October 22, 2015	NAD83 - UTM Zone 17 Size: 11x17" **1:17,500**

0 500 1,000 Metres

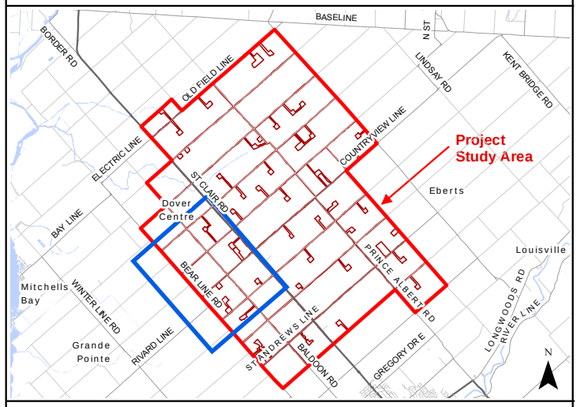
N

Path: X:\1612_NorthKentWP\NRSI_1612_AQU_Map2toMap10_WaterBodyAssessment_18K_2015_09_20_KEB.mxd

Map 5

North Kent Wind 1 Project

Water Body Assessment



Legend

- Highway
- Primary Road
- Secondary Road

Project Location

- Project Area (120m Buffer)
- Construction Disturbance Area
- Proposed Turbine
- Proposed Collection Line
- Proposed Access Road

Aquatic Features

- Permanent Watercourse
- Intermittent Watercourse
- SCRCA Watercourse

Water Body Assessment

- Water Body Location (WB)
- Non-Water Body Location (NWB)

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Map Produced by Natural Resource Solutions Inc. This map is proprietary and confidential and must not be duplicated or distributed by any means without express written permission of NRSI. Data provided by MNRF© & SCRCA. Copyright: Queen's Printer Ontario. Imagery: AECOM (March 2015).

Project: 1612 Date: October 22, 2015	NAD83 - UTM Zone 17 Size: 11x17" **1:17,500**

0 500 1,000 Metres

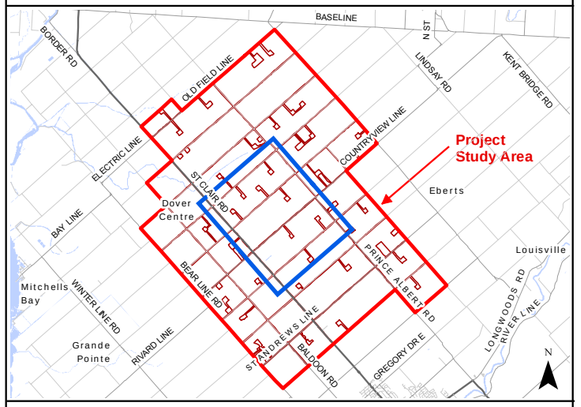
N

Path: X:\1612_NorthKentWP\NRSI_1612_AQU_Map2toMap10_WaterBodyAssessment_18K_2015_09_20_KEB.mxd

Map 6

North Kent Wind 1 Project

Water Body Assessment



Legend

- Utility Line
- Highway
- Primary Road
- Secondary Road

Project Location

- Project Area (120m Buffer)
- Construction Disturbance Area
- Proposed Turbine
- Proposed Collection Line
- Proposed Access Road
- Proposed POI/ Substation/ Laydown/ O&M Building

Aquatic Features

- Permanent Watercourse
- SCRCA Watercourse
- Open Water

Water Body Assessment

- Water Body Location (WB)
- Non-Water Body Location (NWB)

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Map Produced by Natural Resource Solutions Inc. This map is proprietary and confidential and must not be duplicated or distributed by any means without express written permission of NRSI. Data provided by MNRF© & SCRCA. Copyright: Queen's Printer Ontario. Imagery: AECOM (March 2015).

Project: 1612 Date: October 22, 2015	NAD83 - UTM Zone 17 Size: 11x17" **1:17,500**

0 500 1,000 Metres

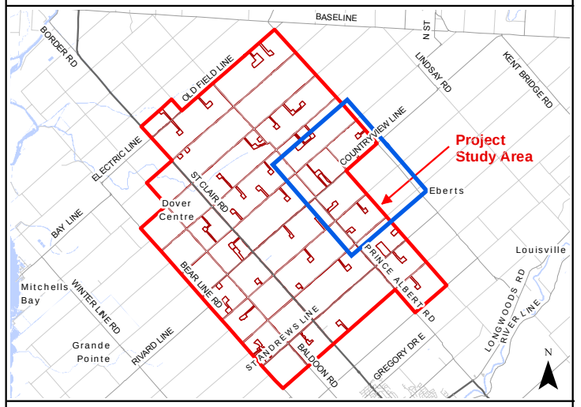
N

Path: X:\1612_NorthKentWP\NRSI_1612_AQU_Map2toMap10_WaterBodyAssessment_18K_2015_09_20_KEB.mxd

Map 7

North Kent Wind 1 Project

Water Body Assessment



Legend

- Utility Line
- Primary Road
- Secondary Road

Project Location

- Project Area (120m Buffer)
- Construction Disturbance Area
- Proposed Turbine
- Proposed Collection Line
- Proposed Access Road
- Proposed POI/ Substation/ Laydown/ O&M Building

Aquatic Features

- Permanent Watercourse
- SCRCA Watercourse

Water Body Assessment

- Water Body Location (WB)
- Non-Water Body Location (NWB)

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Map Produced by Natural Resource Solutions Inc. This map is proprietary and confidential and must not be duplicated or distributed by any means without express written permission of NRSI. Data provided by MNRF© & SCRCA. Copyright: Queen's Printer Ontario. Imagery: AECOM (March 2015).

Project: 1612 Date: October 22, 2015	NAD83 - UTM Zone 17 Size: 11x17" **1:17,500**

0 500 1,000 Metres

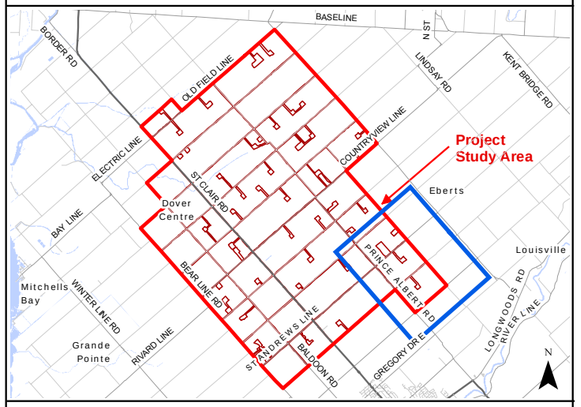
N

Path: X:\1612_NorthKentWP\NRSI_1612_AQU_Map2toMap10_WaterBodyAssessment_18K_2015_09_20_KEB.mxd

Map 8

North Kent Wind 1 Project

Water Body Assessment



Legend

- Utility Line
- Primary Road
- Secondary Road

Project Location

- Project Area (120m Buffer)
- Construction Disturbance Area
- Proposed Turbine
- Proposed Collection Line
- Proposed Access Road
- Proposed POI/ Substation/ Laydown/ O&M Building

Aquatic Features

- Permanent Watercourse
- SCRCA Watercourse

Water Body Assessment

- Water Body Location (WB)
- Non-Water Body Location (NWB)

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Map Produced by Natural Resource Solutions Inc. This map is proprietary and confidential and must not be duplicated or distributed by any means without express written permission of NRSI. Data provided by MNRF© & SCRCA. Copyright: Queen's Printer Ontario. Imagery: AECOM (March 2015).

Project: 1612 Date: October 22, 2015	NAD83 - UTM Zone 17 Size: 11x17" **1:17,500**

0 500 1,000 Metres

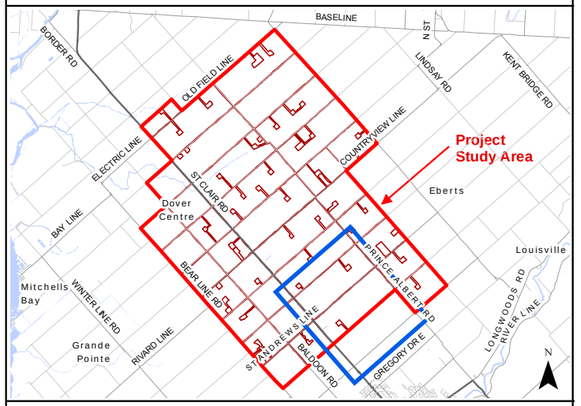
N

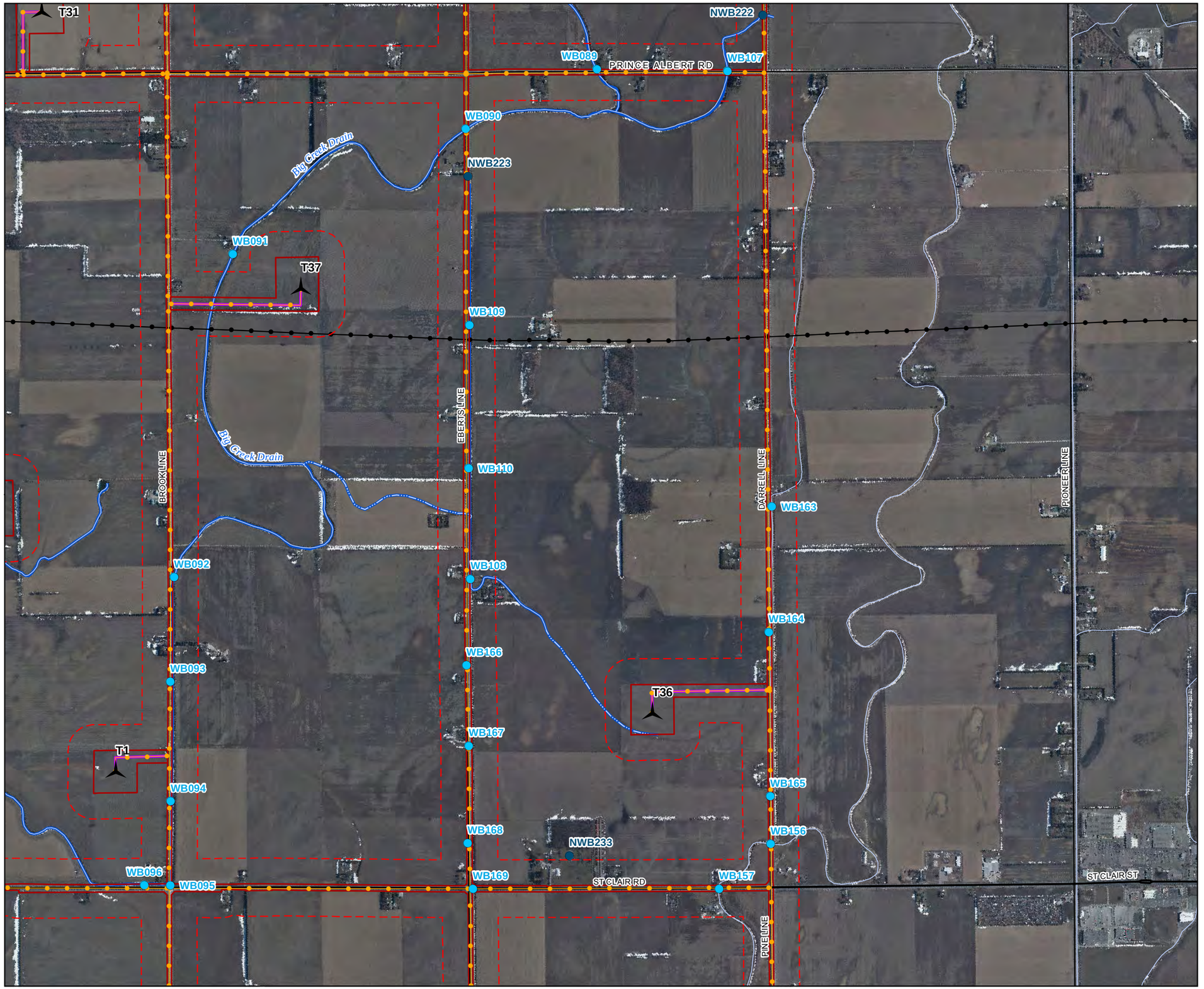
Path: X:\1612_NorthKentWP\NRSI_1612_AQU_Map2toMap10_WaterBodyAssessment_18K_2015_09_20_KEB.mxd

Map 9

North Kent Wind 1 Project

Water Body Assessment





Legend

- Utility Line
- Highway
- Primary Road
- Secondary Road

Project Location

- Project Area (120m Buffer)
- Construction Disturbance Area
- Proposed Turbine
- Proposed Collection Line
- Proposed Access Road

Aquatic Features

- Permanent Watercourse
- Intermittent Watercourse
- SCRCA Watercourse

Water Body Assessment

- Water Body Location (WB)
- Non-Water Body Location (NWB)

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Map Produced by Natural Resource Solutions Inc. This map is proprietary and confidential and must not be duplicated or distributed by any means without express written permission of NRSI. Data provided by MNRF© & SCRCA. Copyright: Queen's Printer Ontario. Imagery: AECOM (March 2015).

Project: 1612 Date: October 22, 2015	NAD83 - UTM Zone 17 Size: 11x17" **1:17,500**

0 500 1,000 Metres

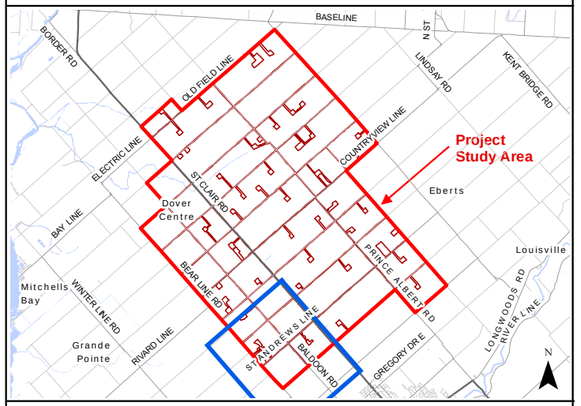
N

Path: X:\1612_NorthKentWP\NRSI_1612_AQU_Map2toMap10_WaterBodyAssessment_18K_2015_09_20_KEB.mxd

Map 10

North Kent Wind 1 Project

Water Body Assessment



Legend

- Highway
- Primary Road
- Secondary Road

Project Location

- Project Area (120m Buffer)
- Construction Disturbance Area
- Proposed Turbine
- Proposed Meteorological Tower
- Proposed Collection Line
- Proposed Access Road
- Proposed Laydown Area

Aquatic Features

- Permanent Watercourse
- SCRCA Watercourse

Water Body Assessment

- Water Body Location (WB)
- Non-Water Body Location (NWB)

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Map Produced by Natural Resource Solutions Inc. This map is proprietary and confidential and must not be duplicated or distributed by any means without express written permission of NRSI. Data provided by MNRF© & SCRCA. Copyright: Queen's Printer Ontario. Imagery: AECOM (March 2015).

Project: 1612 Date: October 22, 2015	NAD83 - UTM Zone 17 Size: 11x17" **1:17,500**

0 500 1,000 Metres

N

Path: X:\1612_NorthKentWP\NRSI_1612_AQU_Map2toMap10_WaterBodyAssessment_18K_2015_09_20_KEB.mxd