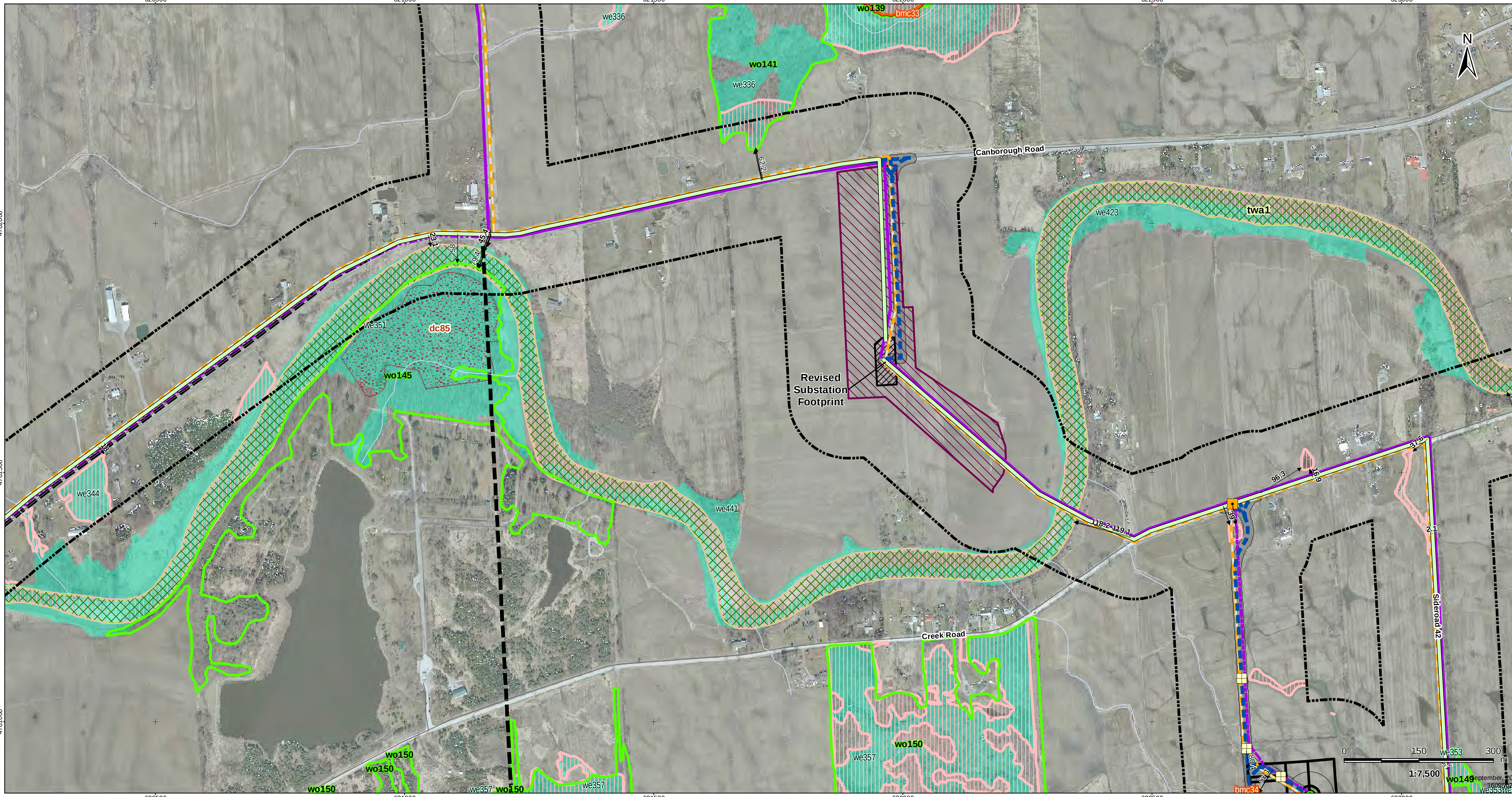


V:\01609\Active\160950269\planning\drawing\mxd_Modification_Reports\NHA\160950269_Figure_7_Significant_Natural_Features_Mapbook.mxd
Revised: 2015-09-21 By: bcowper

Stantec

Legend

- Project Study Area
- Interconnector Study Area
- 120m Zone of Investigation
- Proposed Turbine Location
- Turbine Blade Length
- Junction Box
- Proposed Culvert
- Preferred Transmission Line Route
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area
- Potential Construction Laydown Area
- Transformer Substation

Significant Wildlife Habitat

- Snake Hibernacula
- Wetland Communities
- Woodland Communities
- Turtle Wintering Area
- Generalized Wildlife Habitat
- Deer Congregation Areas (MNR) (Generalized)
- Bat Maternity Colonies

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N).
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2011.
3. Orthoimagery © First Base Solutions, 2010.

September, 2015
160950269

Client/Project

FWRN LP
Natural Heritage Assessment Report

Figure No.

7.39

Title

Significant Natural Features Figure 7.39 Revised

V:\016094\active\160950269\planning\drawing\mxd_Modification_Reports\NHA\160950269_Figure_7_Significant_Natural_Features_Mapbook.mxd
Revised: 2015-09-21 By: bcowper

622000 622500 623000 623500 624000 624500

4760000 4759500 4759000

N

Wellandport Road

Siderad 44 Road

we357 we356 we353 we358 we357 we358 we360 we361 we414

dc88 dc89 dc90 dc91 dc92 dc131 dc132 dc133 dc134

wo150 wo199 wo149 wo151

AH47

TH5 TH5

T10

New Access Road - Entrance 36

115.7 115.7 1.3 7.7 7.5 5.7 9.1 7.6 9.6 9.6 118.2 12.6 93.6 93.6 108.1 28.2 70 41.1

0 150 300 m

1:7,500

September, 2015
160950269

Legend

- Project Study Area
- Interconnector Study Area
- 120m Zone of Investigation
- Proposed Turbine Location
- Turbine Blade Length
- Junction Box
- Preferred Transmission Line Route
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area

Significant Wildlife Habitat

- Snake Hibernacula
- Wetland Communities
- Woodland Amphibian Breeding Habitat
- Woodland Communities
- Turtle Nesting Habitat/Snapping Turtle Habitat
- Turtle Habitat 30m Buffer
- Generalized Wildlife Habitat
- Deer Congregation Areas (MNR) (Generalized)

Notes

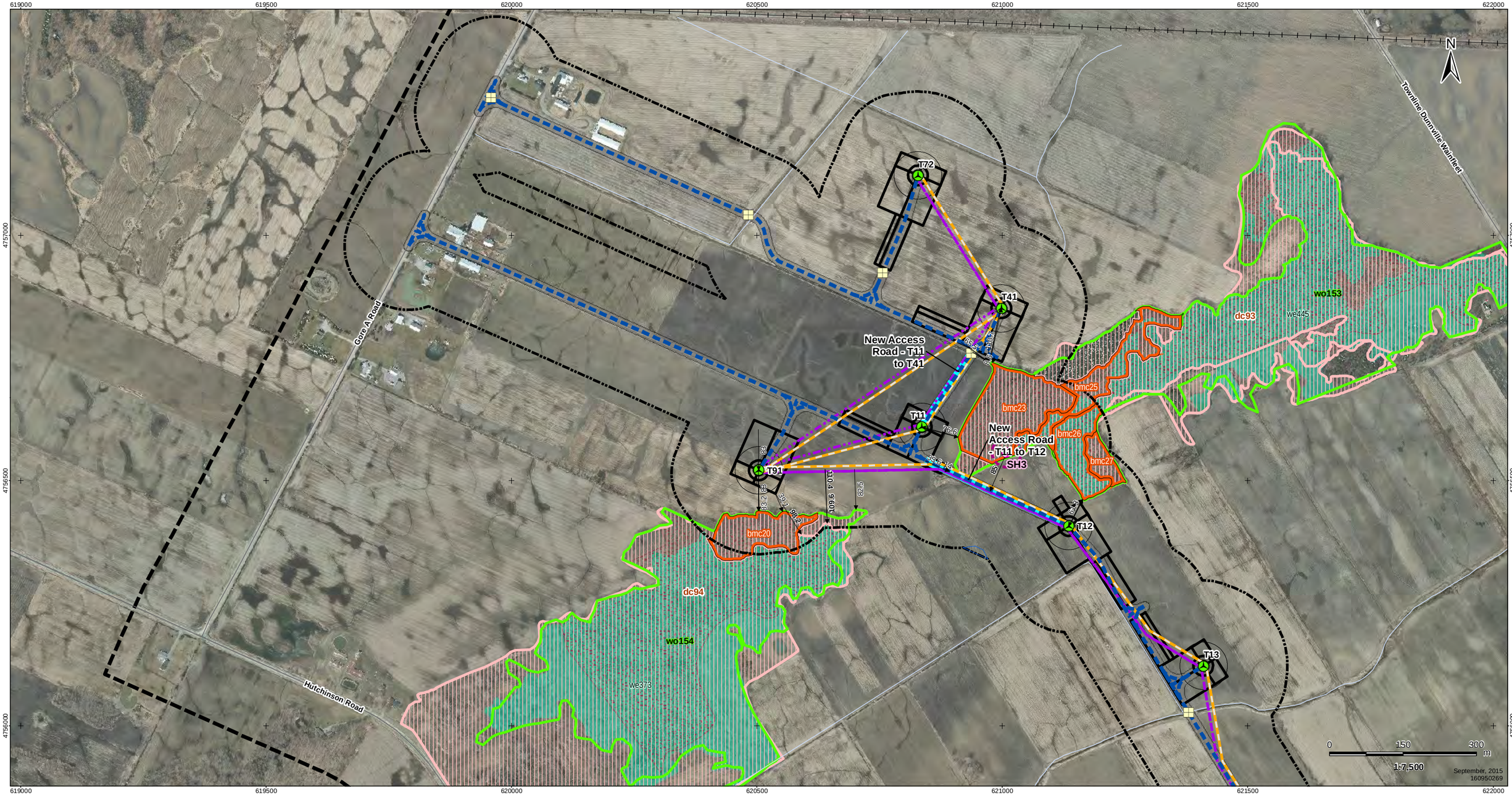
1. Coordinate System: NAD 1983 UTM Zone 17N).
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2011.
3. Orthoimagery © First Base Solutions, 2010.

Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
7.41

Title
Significant Natural Features Figure 7.41 Revised

V:\01609\Active\160950269\planning\drawing\mxd_Modification_Reports\NHA\160950269_Figure_7_Significant_Natural_Features_Mapbook.mxd
Revised: 2015-09-21 By: bcowper



Legend

- Project Study Area
- Interconnector Study Area
- 120m Zone of Investigation

Zone of Investigation Adjustments

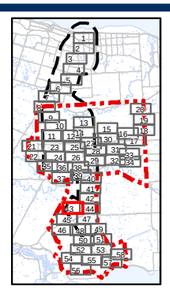
- Area Added
- Proposed Turbine Location
- Turbine Blade Length
- Proposed Culvert
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area

Significant Wildlife Habitat

- Snake Hibernacula
- Snake Hibernacula 30m Buffer
- Wetland Communities
- Woodland Communities
- Generalized Wildlife Habitat
- Deer Congregation Areas (MNR) (Generalized)
- Bat Maternity Colonies

Notes

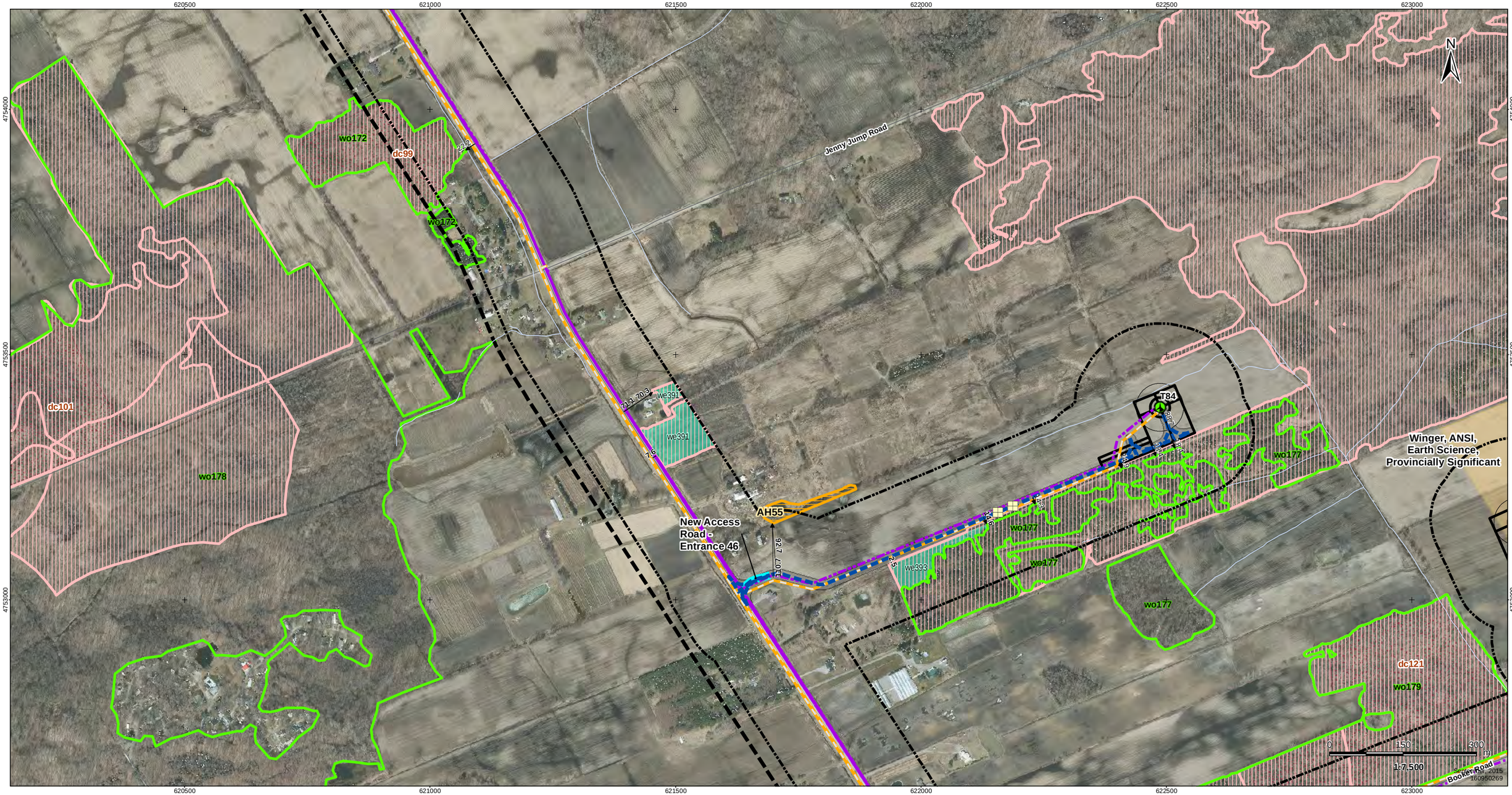
1. Coordinate System: NAD 1983 UTM Zone 17N).
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2011.
3. Orthoimagery © First Base Solutions, 2010.



Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
7.43

Title
Significant Natural Features Figure 7.43 Revised



V:\01609\active\160950269\planning\drawing\mxd_Modification_Reports\NHA\160950269_Figure_7_Significant_Natural_Features_Mapbook.mxd
Revised: 2015-09-21 By: bcowper

Stantec

Legend

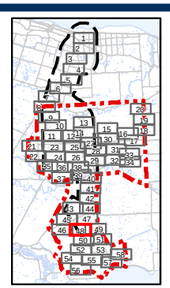
- Project Study Area
- Interconnector Study Area
- 120m Zone of Investigation
- Proposed Turbine Location
- Turbine Blade Length
- Proposed Culvert
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area

Significant Wildlife Habitat

- Snake Hibernacula
- Wetland Communities
- Wetland Amphibian Breeding Habitat
- Woodland Communities
- ANSI, Earth Science, Provincially Significant
- Generalized Wildlife Habitat
- Deer Congregation Areas (MNR) (Generalized)

Notes

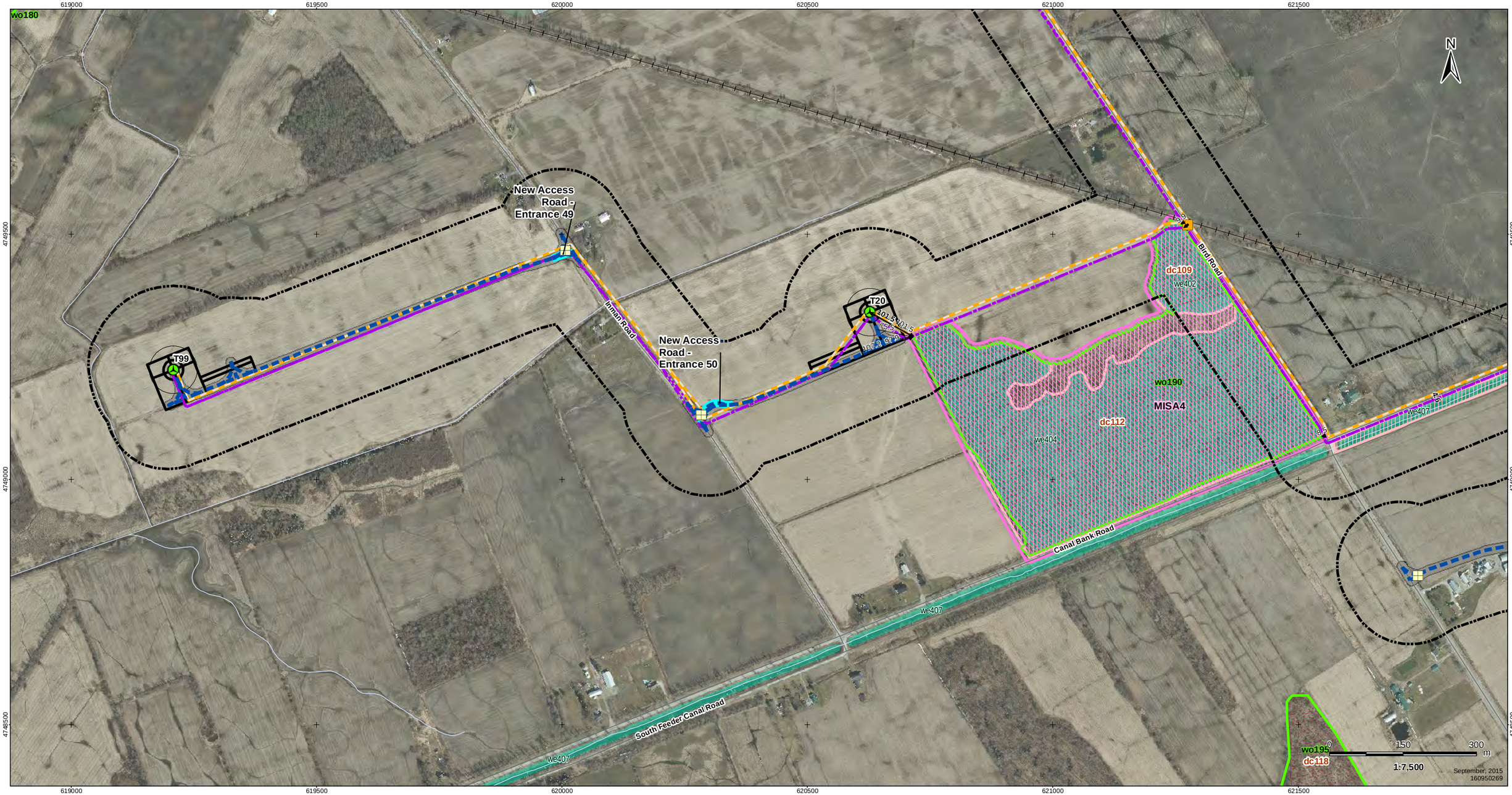
1. Coordinate System: NAD 1983 UTM Zone 17N).
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2011.
3. Orthoimagery © First Base Solutions, 2010.



Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
7.48

Title
Significant Natural Features Figure 7.48 Revised



V:\01609\Active\160950269\planning\drawing\mxd_Modification_Reports\NHA\160950269_Figure_7_Significant_Natural_Features_Mapbook.mxd
Revised: 2015-09-21 By: bcowper

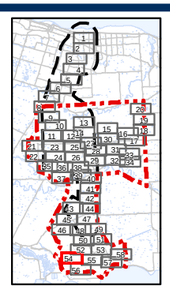
Stantec

Legend

- Project Study Area
- 120m Zone of Investigation
- Zone of Investigation Adjustments
  - Area Added
- Proposed Turbine Location
- Turbine Blade Length
- Junction Box
- Proposed Culvert
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area
- Significant Wildlife Habitat
  - Snake Hibernacula
  - Landbird Migratory Stopover
  - Wetland Communities
  - Woodland Communities
  - Generalized Wildlife Habitat
  - Deer Congregation Areas (MNR) (Generalized)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N).
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2011.
3. Orthoimagery © First Base Solutions, 2010.



Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
7.54

Title
Significant Natural Features Figure 7.54 Revised

September 22, 2015
Jim Beal

Reference: **Natural Heritage Assessment Addendum - Technical and Project Design Changes**
Niagara Region Wind Farm

Attachment B: Additional Staff CVs

Lisa Uskov Tech. Dipl.

Ecologist

Lisa Uskov is a terrestrial ecologist with a broad range of natural heritage-focused skills, who has practiced in the wildlife biology and forest management fields for several years in various capacities, for both public and private organizations. Lisa had authored environmental reports under federal, provincial and municipal standards, she has coordinated and performed aquatic and terrestrial field surveys, liaised with regulatory agency representatives, as well as technical disciplines and members of the public, and has provided technical guidance on species at risk and invasive species occurrences. Lisa is familiar with applicable policies and regulations including, but not limited to, the Provincial Policy Statement, the Endangered Species Act, the Species at Risk Act, the Migratory Birds Convention Act, and the Aggregate Resources Act.

Lisa Uskov is knowledgeable about Ontario's native wildlife species, having coordinated targeted surveys for such species as Chimney Swift, Eastern Whip-poor-will and Wood Turtle for the Ministry of Natural Resources and Bird Studies Canada. Lisa has monitored and audited forest operations and developed compliance monitoring plans in Algonquin Park. Lisa is certified to perform Ontario Wetland Evaluation System (OWES), as well as Ecological Land Classification (ELC) assessments, in addition to other certifications. Her extensive experience in the field has equipped Lisa to work safely in a wide range of environments, including remote areas, and she is skilled at using GPS, GIS, wildlife acoustics monitoring, and other relevant equipment and software.

EDUCATION

Technical Diploma, Algonquin College / Forestry Technician Diploma, Pembroke, Ontario, 2010

CERTIFICATIONS & TRAINING

Certificate, Ontario Ministry of Natural Resources / Ontario Wetland Evaluation System (OWES), North Bay, Ontario, 2013

Certificate, Ministry of Natural Resources / Ecological Land Classification (ELC), Mattawa, Ontario, 2012

Certificate, University of New Brunswick and Environment Canada / Canadian Aquatic Biomonitoring Network (CABIN) Field Technician, Pembroke, Ontario, 2009

Certificate, Ontario Ministry of Natural Resources / Ontario Forest Operations Compliance Inspector, Elk Lake, Ontario, 2015

Certificate, Ontario Ministry of Natural Resources / Ontario Lands Technician, Pembroke, Ontario, 2010

Certificate, Ontario Ministry of Natural Resources / Ontario Tree Marker, Pembroke, Ontario, 2010

Certificate, St. John Ambulance / Standard First Aid with CPR C + AED, Hamilton, Ontario, 2015

Certificate, Ontario Ministry of Natural Resources / Restricted Radio Operator, Pembroke, Ontario, 2010

Certificate, Ontario Forestry Safe Workplace Association / Professional Chainsaw Operation, Pembroke, Ontario, 2009

Certificate, Ontario Ministry of Natural Resources / SP-102 Forest Industry Firefighter, Pembroke, Ontario, 2010

Certificate, Ontario Ministry of Natural Resources / Installing Culverts on Forest Access Roads, Pembroke, Ontario, 2009

Certificate, Ontario Ministry of Natural Resources / Forest Practices Competency Steering Committee Sediment and Erosion Control for Water Crossings on Forest Access Roads, Pembroke, Ontario, 2009

AWARDS

2010 Canadian Institute of Forestry Gold Medal Award for Outstanding Academic Achievement and Citizenship

** denotes projects completed with other firms*

Lisa Uskov Tech. Dipl.

Ecologist

PROJECT EXPERIENCE

Oil & Gas

Enbridge Gas Distribution Inc. GTA Project Natural Gas Pipeline Reinforcement, Greater Toronto Area, Ontario (Ecologist)

Conducted avian nest sweeps and nest checks, and incidental wildlife observations in project Right of Way, demarcated appropriate buffer zones, and reported results to lead Environmental Inspector for the project; identified hazards onsite and performed safety reporting

TransCanada Pipelines Ltd. Energy East Pipeline Project, Ontario (Ecologist)

Coordinated the provincial vegetation assessment and monitoring program for Ontario project components. Led field crews in terrestrial field programs. Provided technical guidance on species at risk and significant natural vegetation features for project discipline lead. Collated and interpreted large datasets for inclusion in reporting

Renewable Energy

Niagara Region Wind Corporation (NRWC) Wind Project, Niagara Region, Ontario (Ecologist)

Conducted turtle exclusion fencing inspections, turtle nesting surveys, avian nest sweeps and nest checks, and Ecological Land Classification assessments. Liaised with Environmental Inspector for the project and imposed and demarcated appropriate setbacks on natural features. Identified hazards on site and performed safety reporting

Environmental Site Remediation

Georgia-Pacific Remediation Project, Thorold, Ontario (Ecologist)

Performed vegetation assessments on project remediation site, identify flora and apply ecological principles to determine success rate of planted species, report on findings to client and regulatory agencies and provide supporting guidance to client

Natural Sciences & Heritage Resources

Private Consulting Firm*, Pembroke, Ontario (Biologist)

Planned and performed field survey programs for development projects in various sectors, including species at risk inventories, monitoring, ecological assessments and rehabilitation. Served as field crew lead responsible for conducting assessments efficiently and safely. Identified flora and fauna species, mapped and categorized habitats using ELC and OWES methodologies, and liaised with clients, consultants and regulatory agencies for aspects of project environmental planning. Authored Class Environmental Assessment biological reports for renewable energy projects, Natural Environment Levels I and II reports, Environmental Impact Studies and Letters of Opinion. Prepared and submitted permit applications and monitoring reports for activities that may affect species or habitats protected under the Endangered Species Act. Provided technical advice for permitting requirements, restoration projects, development potential and mitigation techniques. Authored survey protocols, and trained and supervised staff in their implementation

Ontario Ministry of Natural Resources, Ontario Parks*, Pembroke, Ontario (Resource Management Technician, Level 2)

Coordinated the 2010 silvicultural effectiveness monitoring (SEM) program for Algonquin Park. Assessed requirements for effective survey program and implemented appropriate plans. Prepared field survey maps, conducted field surveys and SEM audits, and supervised survey staff in the field. Completed Forest Operations Inspection reports for auditing activities and assisted in Algonquin Park compliance monitoring planning. Authored final 2010 SEM report for Algonquin Park

Pembroke District Ministry of Natural Resources and Forestry*, Pembroke, Ontario (Volunteer)

Responsible for the collection and submission of data for MNR NRVIS database. Coordinated a team of 17 volunteers in the assessment and observation of over 100 chimneys within the City of Pembroke for Chimney Swift studies under Bird Studies Canada (BSC). Participated in multiple White-nose Syndrome bat hibernacula field studies across eastern Ontario. Conducted Eastern Whip-poor-will surveys according to BSC protocols

** denotes projects completed with other firms*

Lisa Uskov Tech. Dipl.

Ecologist

Toronto Wildlife Centre*, Toronto, Ontario (Rescue and Release/Senior Wildlife Care Staff)

Supervised volunteer, public, and staff assistants on wildlife rescues and hospital procedures. Kept accurate records of field activities. Conducted public tours and education sessions with enthusiasm. Performed on-camera interviews and demonstrations for television and documentary programs. Tactfully resolved wildlife issues with members of the public. Developed management protocols and trained volunteers and staff in field and office settings

** denotes projects completed with other firms*

Appendix C:

Correspondence with MTCS

Ministry of Tourism, Culture and Sport

Confirmation Letter

Ministry of Tourism, Culture and Sport

Archaeology Programs Unit
Programs and Services Branch
Culture Division
401 Bay Street, Suite 1700
Toronto ON M7A 0A7
Tel.: (416) 314-7123
Email: meagan.brooks@ontario.ca

Ministère du Tourisme, de la Culture et du Sport

Unité des programmes d'archéologie
Direction des programmes et des services
Division de culture
401, rue Bay, bureau 1700
Toronto ON M7A 0A7
Tél. : (416) 314-7123
Email: meagan.brooks@ontario.ca

Ontario

Aug 26, 2015

Walter Frank McCall (P389)
Stantec Consulting
835 Paramount Stoney Creek ON L8J 0B4

RE: Review and Entry into the Ontario Public Register of Archaeological Reports: Archaeological Assessment Report Entitled, "Stage 2 Archaeological Assessment: Niagara Region Wind Project Tap-In Location Part of Lot 21, Concession 1, Geographic Township of Clinton, Regional Municipality of Niagara, Ontario ", Dated Aug 6, 2015, Filed with MTCS Toronto Office on Aug 18, 2015, MTCS Project Information Form Number P389-0021-2013

Dear Dr. McCall:

This office has reviewed the above-mentioned report, which has been submitted to this ministry as a condition of licensing in accordance with Part VI of the Ontario Heritage Act, R.S.O. 1990, c 0.18. [1] This review has been carried out in order to determine whether the licensed professional consultant archaeologist has met the terms and conditions of their licence, that the licensee assessed the property and documented archaeological resources using a process that accords with the 2011 Standards and Guidelines for Consultant Archaeologists set by the ministry, and that the archaeological fieldwork and report recommendations are consistent with the conservation, protection and preservation of the cultural heritage of Ontario.[2]

The report documents the assessment/mitigation of the study area as depicted in Tile 1 of the Supplementary Documentation and Figure 1 of the above titled report and recommends the following:

The Stage 2 assessment of Location 51 (AhGu-31) resulted in the recovery of more than five non-diagnostic pre-contact Aboriginal artifacts from combined test pit and test unit excavations. In accordance with Section 2.2 Standard 1a and Table 3.1 of the 2011 Standards and Guidelines for Consultant Archaeologists (Government of Ontario 2011), Location 51 (AhGu-31) retains cultural heritage value or interest and meets the criteria for a Stage 3 archaeological assessment. Therefore, Stage 3 archaeological assessment is recommended for Location 51 (AhGu-31).
The Stage 3 archaeological assessment of Location 51 (AhGu-31) will be conducted according to the procedures outlined in the MTCS's 2011 Standards and Guidelines for Consultant Archaeologists (Government of Ontario 2011). The Stage 3 archaeological assessment will include the removal of a series of one metre square Stage 3 test units excavated by hand at five metre intervals over the full extent of the site in systematic levels and into the first five centimetres of subsoil. Additional test units amounting to 20% of the total number of 5 metre grid units will then be placed in the vicinity of positive Stage 2 test pits and adjacent to high-yielding units. All excavated soil will be screened through six millimetre mesh; any artifacts being recovered will be recorded and catalogued by the corresponding grid unit designation. If a subsurface

cultural feature is encountered, the plan of the exposed feature will be recorded and geotextile fabric will be placed over the unit before backfilling the unit.The artifact assemblage recovered from Location 52 (AhGu-32) does not meet any of the criteria listed in Section 2.2 or Table 3.1 of the Standards and Guidelines for Consultant Archaeologists (Government of Ontario 2011) and does not retain cultural heritage value or interest. Therefore, no further archaeological assessment is recommended for Location 52 (AhGu-32). Two archaeological sites were documented during the Stage 1-2 archaeological assessment, Location 51 (AhGu-31) and Location 52 (AhGu-32). Location 51 (AhGu-31) has been recommended for Stage 3 archaeological assessment, while Location 52 (AhGu-32) has not been recommended for Stage 3 archaeological assessment.

Based on the information contained in the report, the ministry is satisfied that the fieldwork and reporting for the archaeological assessment are consistent with the ministry's 2011 Standards and Guidelines for Consultant Archaeologists and the terms and conditions for archaeological licences. This report has been entered into the Ontario Public Register of Archaeological Reports. Please note that the ministry makes no representation or warranty as to the completeness, accuracy or quality of reports in the register.

Should you require any further information regarding this matter, please feel free to contact me.

Sincerely,

Meagan, Brooks
Archaeology Review Officer

cc. Archaeology Licensing Officer
Shiloh Berriman,Enercon Canada Inc.
Sarah Paul,Ministry of the Environment

[1]This letter constitutes the Ministry of Tourism, Culture and Sport's written comments where required pursuant to section 22 of O. Reg. 359/09, as amended (Renewable Energy Approvals under the Environmental Protection Act), regarding the archaeological assessment undertaken for the above-captioned project. Depending on the study area and scope of work of the archaeological assessment as detailed in the report, further archaeological assessment reports may be required to complete the archaeological assessment for the project under O. Reg. 359/09. In that event Ministry comments pursuant to section 22 of O. Reg. 359/09 will be required for any such additional reports.

[2]In no way will the ministry be liable for any harm, damages, costs, expenses, losses, claims or actions that may result: (a) if the Report(s) or its recommendations are discovered to be inaccurate, incomplete, misleading or fraudulent; or (b) from the issuance of this letter. Further measures may need to be taken in the event that additional artifacts or archaeological sites are identified or the Report(s) is otherwise found to be inaccurate, incomplete, misleading or fraudulent.

Stage 2 Archaeological Assessment: Niagara Region Wind Project Tap-In Location

Part of Lot 21, Concession 1,
Geographic Township of Clinton,
Regional Municipality of Niagara,
Ontario

Prepared for:

Enercon Canada Inc.
4672 Bartlett Road South
Beamsville, ON L0R 1B1

Prepared by:
Stantec Consulting Ltd.
200 - 835 Paramount Drive
Stoney Creek ON L8J 0B4
Tel: (905) 385-3234
Fax: (905) 385-3534

Licensee: Walter McCall, Ph.D.
License Number: P389
PIF Number: P389-0021-2013
FIT# FIT-FLKZ509

REVISED REPORT

File No. 160950269

August 6, 2015

Table of Contents

LIST OF TABLES

LIST OF FIGURES

Executive Summary

A Stage 2 archaeological assessment of a Tap-In Station was conducted by Stantec Consulting Ltd. (Stantec) on behalf of Niagara Region Wind Corporation for the proposed Niagara Region Wind Project. The Stage 2 assessment was undertaken in order to meet the requirements for an application for a Renewable Energy Approval, as outlined in Ontario Regulation 359/09 sections 21 and 22 under Part V.0.1 of the *Environmental Protection Act* (Government of Ontario 1990a).

The Stage 2 assessment of the proposed Tap-In Station was conducted on October 14, 2013 and October 15, 2013 under the PIF P389-0021-2013 issued to Walter McCall, Ph.D. by the Ministry of Tourism, Culture and Sport (MTCS). The proposed area of impact is approximately 35 by 35 metres. It is an agricultural parcel, located on part of Lot 21, Concession 1, Geographic Township of Clinton, Regional Municipality of Niagara, Ontario. The study area consists of an orchard and was assessed by test pit survey. The project lands were subject to Stage 1 archaeological assessment by Stantec in 2010 (Stantec 2010) and are adjacent to lands surveyed during the Stage 2 assessment of the proposed Niagara Region Wind Project (Stantec 2013). The Stage 2 archaeological assessment of the Niagara Region Wind Project Tap-In Location covers lands additional to those assessed under the previous Niagara Region Wind Project Stage 2 report.

Stantec's Stage 2 survey of the area of the proposed Tap-In Location resulted in the identification of two archaeological sites: Location 51 (AhGu-31) and Location 52 (AhGu-32). The artifact assemblage from Location 51 (AhGu-31) contains more than five pre-contact Aboriginal artifacts. In accordance with Section 2.2 Standard 1c and Table 3.1 of the 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011), Location 51 (AhGu-31) retains cultural heritage value or interest and meets the criteria for a Stage 3 archaeological assessment. Therefore, **Stage 3 archaeological assessment is recommended for Location 51 (AhGu-31).**

The Stage 3 archaeological assessment of Location 51 (AhGu-31) will be conducted according to the procedures outlined in the MTCS's 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011). The Stage 3 archaeological assessment will include the removal of a series of one metre square Stage 3 test units excavated by hand at five metre intervals over the full extent of the site in systematic levels and into the first five centimetres of subsoil. Additional test units amounting to 20% of the total number of 5 metre grid units will then be placed in the vicinity of positive Stage 2 test pits and adjacent to high-yielding units. All excavated soil will be screened through six millimetre mesh; any artifacts being recovered will be recorded and catalogued by the corresponding grid unit designation. If a subsurface cultural feature is encountered, the plan of the exposed feature will be recorded and geotextile fabric will be placed over the unit before backfilling the unit.

The artifact assemblage from Location 52 (AhGu-32) does not meet any of the criteria listed in Section 2.2 and Table 3.1 of the *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011) and does not retain cultural heritage value or interest and does not meet the criteria for Stage 3 archaeological assessment. Therefore, **a Stage 3 archaeological assessment is not recommended for Location 52 (AhGu-32).**The Ministry of Tourism, Culture and Sport is asked to accept this report into the Ontario Public Register of Archaeological Reports.

The Executive Summary highlights key points from the report only; for complete information and findings the reader should examine the complete report.

Project Personnel

Project Director:	Jim Wilson, MA Principal, Regional Discipline Leader, Archaeology (P001)
Project Manager:	Adam Hossack, BA
Licensed Archaeologist:	Walter McCall, Ph.D. (P389)
Licensed Field Directors:	Jennifer Schumacher, MA (R465)
Field Technicians:	Joel Lebaron
Lab/Office Assistants:	Brian Cowper; Jennifer Schumacher, MA (R465); Lorraine Spence-Claro
Report Writers:	Jennifer Schumacher, MA (R465); Adam Hossack, BA
Technical Review:	Colin Varley, MA (P002)
Senior Review:	Jim Wilson, MA (P001)
Proponent Contact:	Darren Croghan, Niagara Region Wind Corporation
Ministry of Tourism, Culture and Sport:	Robert von Bitter

1.0 Project Context

1.1 DEVELOPMENT CONTEXT

Stantec Consulting Ltd. (Stantec) was contracted by Niagara Region Wind Corporation (NRWC) to conduct the Stage 2 archaeological assessment of a Tap-In Station located along the 20 kilometre long overhead 115 kV transmission line linking the Niagara Region Wind Project to Ontario's power grid (Figure 1).

The Tap-In Station is part of a proposed 230 Megawatt (MW) Niagara Region Wind Project (the Project) within the Townships of West Lincoln and Wainfleet and the Towns of Grimsby and Lincoln within the Niagara Region and within Haldimand County in Southern Ontario, in response to the Government of Ontario's initiative to promote the development of renewable electricity in the province.

The basic components of the Project include 77 wind turbine generators (80 potential locations identified) each with a rated capacity of approximately 3.0 MW for a maximum installed nameplate capacity of 230 MW. An overhead and/or underground collection system connects each turbine to one of two transformer substations along a series of 34.5 kilovolt (kV) lines. Turbines are grouped into eight collector circuits that bring power (and data via fibre optic lines) to one of the transformer substations. Voltage is stepped up from 34.5kV to 115kV at each transformer substation by means of a 100 MVA base rated transformer with two stages of cooling. A 115kV transmission line transports power from each of the two transformer substations north to the Tap-In Station where the Project is connected to the Hydro One Networks Inc. (HONI) owned transmission line, south of the Queen Elizabeth Way in Lincoln. Power generated from this Project will be conveyed along the existing HONI transmission line to the Beach Transformer Station in Hamilton.

The transmission line is being constructed along the municipal Right-of-Way on overhead poles. The Project Location for the Tap-In Station includes the structure itself and its concrete foundation upon a 20 metre by 20 metre prepared base of engineered fill and crushed stone. The Project Location for the station also includes additional land to account for any construction impacts. The Tap-In Station Project Location is approximately 35 by 35 metres in size and is collectively referred to as the Tap-In Location. This assessment is being conducted as part of the pre-construction phase of the Niagara Region Wind Project's development process. An additional area was added to the north of the Tap-In Station after the Stage 2 assessment was completed by Stantec (2013). This additional area is the subject of the current Stage 2 assessment.

The Stage 2 archaeological assessment of Tap-In Location was undertaken by Stantec on behalf of NRWC in order to meet the requirements for an application for a Renewable Energy Approval, as outlined in Ontario Regulation 359/09 sections 21 and 22 under Part V.0.1 of the *Environmental Protection Act* (Government of Ontario 1990a). This archaeological assessment is

also subject to the *Ontario Heritage Act* (Government of Ontario 1990b) and the 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011).

Permission to enter the optioned lot within the study area and remove archaeological resources was provided by Darren Croghan of NRWC.

1.1.1 Objectives

The Stage 2 assessment has been conducted to meet the requirements of the Ministry of Tourism, Culture and Sport's (MTCS) *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011).

The objectives of the Stage 2 assessment were to document archaeological resources present within the study area, to determine whether any of the resources might be artifacts or archaeological sites with cultural heritage value or interest requiring further assessment, and to provide specific Stage 3 direction for the protection, management and/or recovery of the identified archaeological resources (Government of Ontario 2011).

1.2 HISTORICAL CONTEXT

The study area consists of approximately 0.2 hectares of orchard on part of Lot 21, Concession 1, Geographic Township of Clinton, Regional Municipality of Niagara, Ontario.

1.2.1 Pre-contact Aboriginal Archaeological Resources

This portion of southwestern Ontario has been demonstrated to have been occupied by people as far back as 11,000 years ago as the glaciers retreated. For the majority of this time, people were practicing hunter gatherer lifestyles with a gradual move towards more extensive farming practices. Table 1 provides a general outline of the cultural chronology of the Regional Municipality of Niagara based on Ellis and Ferris (1990).

Table 1: Cultural Chronology of Regional Municipality of Niagara

Period	Characteristics	Time Period	Comments
Early Paleo-Indian	Fluted Projectiles	9000 - 8400 B.C.	spruce parkland/caribou hunters
Late Paleo-Indian	Hi-Lo Projectiles	8400 – 8000 B.C.	smaller but more numerous sites
Early Archaic	Kirk and Bifurcate Base Points	8000 - 6000 B.C.	slow population growth
Middle Archaic	Brewerton-like points	6000 - 2500 B.C.	environment similar to present
Late Archaic	Lamoka (narrow points)	2000 - 1800 B.C.	increasing site size
	Broad Points	1800 - 1500 B.C.	large chipped lithic tools
	Small Points	1500 – 1100 B.C.	introduction of bow hunting
Terminal Archaic	Hind Points	1100 - 950 B.C.	emergence of true cemeteries
Early Woodland	Meadowood Points	950 - 400 B.C.	introduction of pottery

Table 1: Cultural Chronology of Regional Municipality of Niagara

Period	Characteristics	Time Period	Comments
Middle Woodland	Dentate/Pseudo-Scallop Pottery	400 B.C. - A.D. 500	increased sedentism
	Princess Point	A.D. 550 - 900	introduction of corn
Late Woodland	Early Ontario Iroquoian	A.D. 900 - 1300	emergence of agricultural villages
	Middle Ontario Iroquoian	A.D. 1300 - 1400	long longhouses (100m +)
	Late Ontario Iroquoian	A.D. 1400 - 1650	tribal warfare and displacement
Contact Aboriginal	Various Algonkian Groups	A.D. 1700 - 1875	early written records and treaties
Late Historic	Euro-Canadian	A.D. 1796 - present	European settlement

1.2.2 Post-contact Aboriginal Archaeological Resources

The post-contact Aboriginal occupation of Southern Ontario was heavily influenced by the dispersal of various Iroquoian-speaking communities by the New York State Iroquois and the subsequent arrival of Algonkian speaking groups from northern Ontario at the end of the 17th century and the beginning of the 18th century (Konrad 1981; Schmalz 1991). By 1690, Algonkian speakers from the north appear to have begun to repopulate Bruce County (Rogers 1978:761). This is the period in which the Mississaugas are known to have moved into southern Ontario and the lower Great Lakes watersheds (Konrad 1981). In southwestern Ontario, however, members of the Three Fires Confederacy (Chippewa, Ottawa and Potawatomi) were immigrating from Ohio and Michigan in the late 1700s (Feest and Feest 1978:778-779).

In 1763 King George III issued the *Royal Proclamation* to establish how territories acquired from the cessation of New France, including the portion of Ontario occupied by the Mississaugas, would be managed, making the provision that lands occupied by the First Nations in the interior of the continent would be reserved to them exclusively (Rogers 1978).

The study area first entered the record as a result of Treaty No. 3, December 2nd, 1792 (Mississauga) (Figure 2):

> *...was made with the Mississa[ug]a Indians 7th December, 1792, though purchased as early as 1784. This purchase in 1784 was to procure for that part of the Six Nation Indians coming into Canada a permanent abode. The area included in this Treaty is, Lincoln County excepting Niagara Township; Saltfleet, Binbrook, Barton, Glanford and Ancaster Townships, in Wentworth County; Brantford, Onondaga, Tusc[a]r[o]ra, Oakland and Burford Townships in Brant County; East and West Oxford, North and South Norwich, and Dereham Townships in Oxford County; North Dorchester Township in Middlesex County; South Dorchester, Malahide and Bayham Township in Elgin County; all Norfolk and*

> *Haldimand Counties; Pelham, Wainfleet, Thorold, Cumberland and Humberstone Townships in Welland County ... .*
>
> (Morris 1943:17-18)

1.2.3 Historic Euro-Canadian Archaeological Resources

The study area is situated in the former County of Lincoln and in the Geographic Township of Clinton on the Niagara Peninsula. The earliest written record of the Niagara Peninsula dates to an account of Niagara Falls published in 1604. The account had been written by Samuel de Champlain and was based on the stories of First Nations populations he encountered during his first trip to what is now Canada in 1603 (de Volpi 1966). Etienne Brûlé may have visited the Niagara Region as early as 1611, but it was not until 1615 that Champlain, personally, explored Lake Ontario. The Niagara River between Lake Ontario and Lake Erie was outlined in the 1632 Les Voyages de la Nouvelle France Occidentale, Dicte Canada, Faits par le Sr. De Champlain (de Volpi 1966). In 1678 Father Jean Louis Hennepin sketched the Falls (de Volpi 1966). The sketch was reproduced in 1697 in Father Hennepin's Nouvelle découverte d'un très grand pays situé dans l'Amerique, entre le Nouveau Mexique et la mer glaciale. An illustration, showing a ladder ascending the Falls, accompanied a story in a 1751 edition of *The Gentleman's Magazine*. Although French explorers, missionaries and traders would continue to pass through the area during the 17th and 18th centuries, no concerted effort was made by the French to settle the region, although a series of forts, blockhouses and fortified trading posts were constructed near present-day Youngstown, New York at the mouth of Niagara River, including: Fort Conti, 1678-1679 (destroyed by fire); Fort De Nonville, 1687-1688 (abandoned); and Fort Niagara, 1726 (captured by British forces in 1759) (Porter 1896).

The stone fort at Niagara was enlarged to its present-day size around 1755 in response to increased tension in the region between the French and British. The fort was captured by the British following a 19-day siege led by Sir William Johnson (Porter 1896). When writing about Fort Niagara and the Niagara Pennisula in his 1770 *A General History of the British Empire in America*, John Huddlestone wrote that, "Niagara is without exception the most important post in America and secures a greater number of communications, through a more extensive country, than perhaps any other pass in the world" (Wynne 1770). When the Province of Quebec was divided into Upper and Lower Canada in 1791, Lieutenant-Governor John Graves Simcoe chose Niagara as the first seat of government for Upper Canada (1792 until 1794) and began surveying the region to accommodate settlement (de Volpi 1966).

During the War of 1812, the Niagara Peninsula was the setting for a number of pivotal battles, including those at Queenston Heights, Fort George, Chippewa, Fort Niagara, and Lundy's Lane. Owing to its close proximity to the United States, the region was one of the first settled as a result of the war by United Empire Loyalists (UELs), German mercenaries, Pennsylvania German settlers, First Nations, and those wishing to take advantage of generous land grants and low tax rates aimed at stimulating settlement along the Canadian-United States border.

The Welland Canal, built between 1824 and 1830, provided a gateway between Lake Ontario and Lake Erie and established the Niagara Peninsula as an economic and commercial centre, particularly given the superior agricultural conditions in the area.

Clinton Township grew quickly as a result of incentives to settle in Upper Canada at the end of the 18th century. By 1800, at least 66 families were living in Clinton Township (Lincoln County Council 1956). Among the earliest settlers in the area was Jacob Beam, a UEL and member of Butler's Rangers. It was after Jacob Beam that Beamsville, established as a police village only three years after the founding of Lincoln County, was named. As a UEL, Jacob Beam was originally granted 400 acres of land in Clinton Township and an additional 500 acres in Grimsby Township (Lincoln County Council 1956).

Agricultural land in the former Clinton Township is fertile, being comprised of nutrient rich sandy loam soils. Excellent agricultural conditions, coupled with the township's advantageous location along the Niagara Escarpment, along the south shore of Lake Ontario made the area attractive to early settlement. By 1876 there were 600 residents, a court, Free Mason's lodge, Orange Hall, wine factory and a bell factory as well as numerous specialists including a tinsmith, druggist and doctor in the Village of Beamsville alone (Page & Co. 1876).

The 1876 *Illustrated Historic Atlas of the Counties of Lincoln and Welland* (Page & Co. 1876) shows Lot 21, Concession 1 as being owned by the Book, Adams, and Konkle families (Figure 3). The study area appears to be owned by the Konkle family. One structure is shown on the property, located outside of the study area to the north. This historic map shows a high level of settlement and supports the determination of increased Euro-Canadian archaeological potential made in the Stage 1 report (Figure 3; Stantec 2012). The property was used for agricultural purposes in the last 100 years and is an active orchard today.

1.2.4 Reports with Relevant Background Information

Two archaeological assessment reports have been written for the Niagara Region Wind Project; Table 2 provides a listing of the Stage 1 and 2 archaeological reports.

Table 2: Stage 1 and 2 Archaeological Assessment Reports for Studies in the Area

Year	Title	Author	PIF Number
2012	*Stage 1 Archaeological Assessment, Niagara Region Wind Project, Various Lots, Concession 1-6 Gainsborough Township, Concessions 7-10, Clinton Township, Regional Municipality of Niagara and Various Lots, Moulton Township, Haldimand County, Ontario.*	Stantec	P002-263-2011

Table 2: Stage 1 and 2 Archaeological Assessment Reports for Studies in the Area

Year	Title	Author	PIF Number
2013	*Stage 2 Archaeological Assessment, Niagara Region Wind Project, Various Lots, Concession 1-6 Gainsborough Township, Concessions 7-10, Clinton Township, Regional Municipality of Niagara and Various Lots, Moulton Township, Haldimand County, Ontario.*	Stantec	P002-289-2012

1.3 ARCHAEOLOGICAL CONTEXT

The Stage 2 field assessment for the study area was conducted on October 15, 2013 and October 16, 2013 under PIF P389-0021-2013 issued to Walter McCall, Ph.D. by the MTCS. The study area consists of approximately 0.2 hectares of tree farm that have been under agricultural cultivation for the past 100 years.

1.3.1 The Natural Environment

The Study Area is located in the Iroquois Plain physiographic region, which surrounds the present day western shore line of Lake Ontario (Chapman and Putnam, 1984) and is markedly different in characteristics from the topographic region at the top of the Niagara Escarpment to the south. The Iroquois Plain is a lowland which borders Lake Ontario and which in the Grimsby-Beamsville area is composed largely of sandy soils which lay in beds over clay till sediments.

The vast majority of the surficial geology around the Project Area is sandy loam with pockets of silty clay loam interspersed. More specifically the soil series is Vineland sandy loam which is imperfectly drained and has a mottled subsoil due to the high water table (Wicklund and Mathews 1963). Lot 21, Concession 1 has been in agricultural use for over 100 years, and is still an orchard today. The imperfect drainage of these soils is attested to by the fact that drainage pipes have been installed throughout the orchard.

Potable water is the single most important resource for any extended human occupation or settlement and since water sources in southwestern Ontario have remained relatively stable over time proximity to drinkable water is regarded as a useful index for the evaluation of archaeological site potential. In fact, distance to water is one of the most commonly used variables for predictive modeling of archaeological site location in Ontario. The closest source of potable water is an unnamed creek approximately 100 metres to the west of the study area which flows north into Lake Ontario.

1.3.2 Previously Known Archaeological Sites and Surveys

In order to compile an inventory of archaeological resources, the registered archaeological site records kept by the MTCS were consulted. In Ontario, information concerning archaeological sites stored in the ASDB maintained by the MTCS. This database contains archaeological sites registered according to the Borden system. Under the Borden system, Canada is divided into

grid blocks based on latitude and longitude. A Borden Block is approximately 13 kilometres east to west and approximately 18.5 kilometres north to south. Each Borden Block is referenced by a four-letter designator and sites within a block are numbered sequentially as they are found. The study area under review is within Borden Block AhGu.

Information concerning specific site locations is protected by provincial policy, and is not fully subject to the *Freedom of Information and Protection of Privacy Act*. The release of such information in the past has led to looting or various forms of illegally conducted site destruction. Confidentiality extends to all media capable of conveying location, including maps, drawings, or textual descriptions of a site location. The MTCS will provide information concerning site location to the party or an agent of the party holding title to a property, or to a licensed archaeologist with relevant cultural resource management interests.

An examination of the ASDB showed that NRWC-48 (AhGx-690) was located 25 metres from the study area. NRWC-48 (AhGx-690) was identified through a test pit survey during the Stage 2 assessment conducted by Stantec (2013). NRWC-48 (AhGX-690) consisted of one Onondaga chert spokeshave, approximately 18 pieces of Onondaga chert debitage, a piece of Bois Blanc chert debitage, and a piece of Selkirk chert debitage. With the identification of at least five non-diagnostic artifacts in a 10 metre by 10 metre area, it was determined that NRWC-48 (AhGx-690) retained cultural heritage value or interest. Based on these considerations, NRWC-48 (AhGx-690) was recommended for a Stage 3 archaeological assessment as per Section 2.2 Standard 1a.ii.2 of the MTCS's 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011).

No archaeological studies other than the previous Niagara Region Wind Project Stage 1 and Stage 2 archaeological assessments (Stantec 2012 and 2013) have been undertaken within 50 metres of the study area (personal communication, Robert von Bitter, March 31, 2014; Government of Ontario n.d.).

1.3.3 Archaeological Potential

Archaeological potential is established by determining the likelihood that archaeological resources may be present on a subject property. Criteria commonly used by the Ontario MTCS (Government of Ontario 2011) to determine areas of archaeological potential include: proximity to previously identified archaeological sites; distance to various types of water sources; soil texture and drainage; glacial geomorphology, elevated topography and the general topographic variability of the area; resource areas including food or medicinal plants, scarce raw materials and early Euro-Canadian industry; areas of early Euro-Canadian settlement and early transportation routes; properties listed on municipal register of properties designated under the *Ontario Heritage Act* (Government of Ontario 1990b); properties that local histories or informants have identified with possible archaeological sites, historical events, activities or occupants; and historic landmarks or sites.

Distance to modern or ancient water sources is generally accepted as the most important determinant of past human settlement patterns and, considered alone, may result in a determination of archaeological potential. However, any combination of two or more other criteria, such as well-drained soils or topographic variability, may also indicate archaeological potential. Finally, extensive land disturbance can eradicate archaeological potential (Wilson and Horne 1995).

The Stage 1 assessment indicated that the current study area contains elevated potential for both pre-contact Aboriginal and historic Euro-Canadian archaeological resources (Stantec 2012). Pre-contact and post-contact Aboriginal potential are moderate to high given the study area's proximity to nearby water sources. Historic Euro-Canadian potential is moderate to high given the study area's proximity to the extant historic road grid and the structure shown on the historic mapping

When the above listed criteria are applied to the study area, the archaeological potential for pre-contact Aboriginal, post-contact Aboriginal, and historic Euro-Canadian sites is deemed to be moderate to high. Thus, in accordance with Section 1.3.1 of the *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011), this report concurs with the Stage 1 archaeological assessment of the Niagara Region Wind Project (Stantec 2012) and has determined that the current study area exhibits moderate to high potential for the identification and recovery of archaeological resources.

1.3.4 Existing Conditions

The current study area comprises approximately 0.2 hectares of generally flat agricultural land. The entire study area is currently in use as an orchard and, although it has been under agricultural cultivation for the past 100 years, is currently inaccessible to ploughing.

2.0 Field Methods

The Stage 2 field assessment of the approximately 35 by 35 metre area which comprises the Tap-In Location study area was conducted on October 15, 2013 and October 16, 2013. During the Stage 2 field investigations the weather was warm and sunny. Assessment conditions were excellent and at no time were the field, weather, or lighting conditions detrimental to the recovery of archaeological material. Photos 1 to 3 confirm that field conditions met the requirements for a Stage 2 archaeological assessment, as per the *Standards and Guidelines for Consultant Archaeologists* (Section 7.8.6, Standard 1a; Government of Ontario 2011). Figure 4 provides an illustration of the Stage 2 assessment methods, as well as photograph locations and directions.

The study area lies within an active orchard and is inaccessible to ploughing. The entire extent of this area was subject to test pit assessment at a five metre interval in accordance with Section 2.1.2 of the MTCS's 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011). Each test pit was approximately 30 centimetres in diameter and excavated five centimetres into sterile subsoil. The soils were then examined for stratigraphy, cultural features, or evidence of fill. All soil was screened through six millimetre mesh hardware cloth to facilitate the recovery of small artifacts and then used to backfill the pit. All cultural material encountered was collected and recorded to the associated test pit and returned to Stantec's Hamilton office for laboratory analysis. UTM readings were taken using a Trimble Geo XH GeoExplorer 2008 Series handheld GPS unit using the North American Datum (NAD) 83 with a minimal accuracy of three metres. UTM coordinates were recorded for all positive test pits, site centroids, landmarks and site boundaries. These coordinates are presented in the supplementary documentation to this report. Figure 4 illustrates the field assessment methods across the study area and Tile 1 in the supplementary documentation illustrates the field methods and results.

Stage 2 test pitting resulted in the identification of two archaeological sites, designated Location 51 (AhGu-31) and Location 52 (AhGu-32). Following the discovery of cultural material, test pitting was completed over the entire extent of the study area. When this failed to produce sufficient archaeological resources to result in the recommendation of Stage 3 archaeological assessment, intensification following Option A for Section 2.1.3 Standard 2 of the MTCS's 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011) was undertaken on both sites. This involved the excavation of additional test pits at 2.5 metre intervals within a 5 metre radius of all positive test pits, followed by the excavation of two one-metre test units over positive test pits on each site. This resulted in the excavation of a total of seven positive test pits and four one metre test units within the study area. No subsurface features were encountered during Stage 2 assessment.

One First Nations Observer each from the Haudenosaunee Development Institute, the Mississaugas of the New Credit First Nation, and Six Nations participated in the Stage 2 archaeological assessment. Their roles are summarized in the supplementary documentation. All three Observers were present for both days of Stage 2 field work.

3.0 Record of Finds

The Stage 2 archaeological assessment was conducted employing the methods described in Section 2.0. An inventory of the documentary record generated by fieldwork is provided in Table 3 below. A total of two archaeological sites were found during the Stage 2 archaeological assessment of the study area.

Table 3: Inventory of Documentary Record

Document Type	Current Location of Document Type	Additional Comments
9 Pages of Field Notes	Stantec office in Hamilton	In original field book and photocopied in project file
2 Hand Drawn Maps	Stantec office in Hamilton	In original field book and photocopied in project file
2 Maps Provided by Client	Stantec office in Hamilton	Hard and digital copies in project file
36 Digital Photographs	Stantec office in Hamilton	Stored digitally in project file

All of the material culture collected during the Stage 2 archaeological assessment of the study area is contained in one banker's box. It will be temporarily housed at the Stantec office in London until formal arrangements can be made for its transfer to a MTCS collections facility.

3.1 LOCATION 51 (AHGU-31)

Location 51 (AhGu-31) is located within an orchard (see Tile 1 of the Supplementary Documentation). The Stage 2 archaeological assessment of this location resulted in the recovery of 40 artifacts collected from five positive test pits and two one metre test units distributed over an area measuring approximately 6 metres east to west by 8 metres north to south. Table 4 provides an artifact summary for the Stage 2 archaeological assessment of Location 51 (AhGu-31) (Plate 1 and 2).

Table 4: Location 51 (AhGu-31) Artifact Summary

Artifacts	Frequency	%
pre-contact Aboriginal	10	25.00
structural	9	22.50
ceramic	9	22.50
household	8	20.00
miscellaneous metal and tools	2	5.00
recent material	2	5.00
Total	**40**	**100.00**

3.1.1 Pre-contact Aboriginal Artifacts

A total of 10 pieces of pre-contact Aboriginal cultural material were recovered from Location 51 (AhGu-31). Of these, nine were chipping detritus and one was a drill (Plate 1).

The flake assemblage was subject to morphological analysis following the classification scheme described by Lennox *et al*. (1986) and expanded upon by Fisher (1997). The results of the morphological analysis can be found in Table 5.

Table 5: Location 51 (AhGu-31) Flake Analysis

Material	Secondary		Tertiary		Broken		Total Analyzed	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Onondaga	3	33.33	1	11.11	2	22.22	**6**	**66.7**
Lockport	2	22.22	0	0.00	1	11.11	**3**	**33.3**
Total	5	**55.56**	1	**11.11**	**3**	**33.33**	**9**	**100.00**

Secondary flakes were the type most often encountered and comprised 55.56% of the total assemblage. Broken flakes followed at 33.33%, with the least common being tertiary (11.11%). Secondary flakes are produced when a primary blank is further reduced through the removal of material from both sides of the piece. Pressure flaking generally produces smaller, thinner flakes than does percussion flaking. Tertiary flakes are produced during the further reduction of blanks into formal tool shapes. They are the result of precise flake removal through pressure flaking, where the maker applies direct pressure onto a specific part of the tool in order to facilitate flake removal.

The majority of flakes recovered from Location 51 (AhGu-31) (66.70%) were manufactured from Onondaga chert. Onondaga formation chert is from the Middle Devonian age, with outcrops occurring along the north shore of Lake Erie between Long Point and the Niagara River (Eley and von Bitter 1989). It is a high quality raw material frequently utilized by pre-contact people and often found at archaeological sites in southern Ontario. Onondaga chert occurs in nodules or irregular thin beds. It is a dense non-porous rock that may be light to dark grey, bluish grey, brown or black and can be mottled with a dull to vitreous or waxy lustre (Eley and von Bitter 1989).

Approximately 33.30% of the flakes recovered from Location 51 (AhGu-31) were composed of Lockport chert. Also known as “Ancaster” chert, Lockport variety chert is found at the crest of the Niagara escarpment between Ancaster and the Niagara River. It is a mid-quality material found in the Middle Silurian Goat Island member of the Lockport formation. The chert is light to dark grey in colour, dull to waxy in lustre and occurs both in the form of nodules and as beds of up to 8 centimetres thickness (Fox 2009).

The single formal lithic tool recovered from this location consists of the hafting element of an expanding stem drill (Plate 1:A). The drill is manufactured on Onondaga chert and measures

29.63 millimetres long by 12.74 millimetres wide by 6.49 millimetres thick. It terminates at its approximate mid-point in a torsion fracture and is missing its bit end. This artifact is not temporally diagnostic, beyond the fact that it dates to the pre-contact Aboriginal period.

3.1.2 Ceramic Artifacts

A total of nine ceramic artifacts were recovered during the Stage 2 assessment of Location 51 (AhGu-31). Of those, four are whiteware, two are ironstone, two are utilitarian, and 1 is semi-porcelain. Table 4 summarizes the ceramic artifacts by ware type. The different ware types recovered from the Stage 2 assessment are discussed below and presented in Table 9 and further summarized by decorative type in Table 10. Plate 2 illustrates an example of the ceramic artifacts recovered from Location 51 (AhGu-31).

Table 6: Location 51 (AhGu-31) Ceramic Assemblage by Ware Type

Ceramic Artifacts	Frequency	%
whiteware	4	44.45
utilitarian	2	22.22
ironstone	2	22.22
porcelain, semi	1	11.11
Total	**9**	**100.00**

Table 7: Location 51 (AhGu-31) Ceramic Assemblage by Decorative Type

Ceramic Artifacts	Frequency	%
whiteware, plain	3	33.34
earthenware, red	2	22.22
ironstone, painted	1	11.11
ironstone, plain	1	11.11
whiteware, painted	1	11.11
porcelain, semi	1	11.11
Total	**9**	**100.00**

Whiteware

Four pieces of whiteware were recovered from Location 51 (AhGu-31). Whiteware is a variety of earthenware with a near colourless glaze that replaced earlier near-white ceramics such as pearlware and creamware by the early 1830s. Early whiteware tends to have a porous paste, with more vitrified and harder ceramics becoming increasingly common during the late 19th century (Kenyon 1985). Of the 4 pieces of whiteware collected from Location 51 (AhGu-31) 3 pieces were plain and 1 was painted.

Painted whiteware vessels of the 19th century typically featured a *horror vacui* decorative style in which the majority of the piece was covered with pattern and very little of the underlying white showed through. Blue and black were the dominant colours during the first quarter of the 19th century, while polychrome patterns became increasingly popular from 1830 to 1860 (Stelle 2001). The one piece of painted whiteware recovered from Location 51 (AhGu-31) was blue (Plate 2:B).

Utilitarian Earthenware

Two pieces of utilitarian earthenware were recovered from Location 51 (AhGu-31), both clear-glazed with an unrefined red paste. From the late 18th through to the late 19th century unrefined earthenwares with red or yellow paste were the most common type of utilitarian vessels (Adams 1994).

Ironstone

Two pieces of ironstone were collected from Location 51 (AhGu-31). Ironstone, also known as white granite, stone china and graniteware, is a variety of white earthenware which was introduced to Canada by the 1820s. It was widely available in the 1840s and was extremely popular in Upper Canada by the 1860s (Collard 1967; Kenyon 1985). Decorated ironstone, including hand painted, transfer printed, sponged, and stamped, generally dates to between 1805 and 1840; undecorated ironstone was most common after 1840 (Miller 1991). Of the ironstone fragments recovered from Location 51 (AhGu-31), one is plain and one is painted with a green leaf pattern.

Semi-Porcelain

Only one piece of plain semi-porcelain was collected from Location 51 (AhGu-31). During the first half of the 19th century, improved ceramic techniques resulted in the production of a durable ware known as semi-porcelain. This hard earthenware was manufactured to emulate expensive porcelain imports, but lacked true translucency. Despite this, semi-porcelains dominated the marketplace after 1850 (Hughes 1961).

3.1.3 Non-ceramic Artifacts

A total of 21 non-ceramic Euro-Canadian artifacts were recovered from Location 51 (AhGu-31) including 9 structural, 8 household, 2 miscellaneous metal and tools, and 2 pieces of modern material. Plate 2 illustrates a sample of the non-ceramic artifacts recovered from Location 51 (AhGu-31). The various non-ceramic artifacts are discussed in further detail below.

Structural Artifacts

A total of nine structural artifacts were recovered from Location 51 (AhGu-31) including 4 pieces of window glass, 2 pieces of brick, 2 cut nails, and 1 wire nail (Plate 2). Window glass can be

temporally diagnostic. In the 1840s window glass thickness changed dramatically. This shift was a result of the lifting of the English import tax on window glass in 1845, which taxed glass by weight and encouraged manufacturers to produce thin panes. Thus, most window glass manufactured before 1845 tends to be less than 1.6 millimetres thick, while later glass is thicker (Adams 1994; Kenyon 1980). All four pieces of window glass recovered from Location 51 (AhGu-31) are greater than 1.6 millimetres in thickness, suggesting a production date after 1845.

A total of two machine cut nails and one wire nail were recovered from Location 51 (AhGu-31). Machine cut nails were cut from a flat sheet of iron and as a result their shanks have a rectangular cross-section. The head is usually rectangular and was often welded into place. Invented about 1790, cut nails saw common use from the 1830s until the 1890s. Wire nails are still in widespread use today, with a round cross-section and round head. First developed in the 1850s, they began to replace the cut nail in the 1890's (Adams 1994). The two pieces of red brick recovered are not temporally diagnostic.

Household Artifacts

The eight household artifacts recovered from Location 51 (AhGu-31)consist of six glass bottle fragments and two faunal remains. Bottle glass colour can provide a tentative temporal range for Euro-Canadian domestic sites. Colourless, or clear, glass is relatively uncommon prior to the 1870s but becomes quite widespread in the 1910s (Kendrick 1971; Fike 1987). Of the six glass bottle fragments recovered, five are clear or colourless and date to after 1870 while one is sun-coloured amethyst. The inclusion of manganese oxide, a de-colourizing agent used to offset residual iron impurities, reacts with sun exposure to give clear glass a colour similar to amethyst over time. This glass, referred to as sun coloured amethyst glass, dates from the 1880s to 1920. The two pieces of faunal material recovered from Location 51 (AhGu-31) consist of fragmentary avian skeletal elements and are temporally non-diagnostic.

Metal Artifacts

Two pieces of miscellaneous metal and metal tools were recovered from Location 51 (AhGu-31): one washer and one unidentified metal artifact. These artifacts are temporally non-diagnostic.

Recent Material

Two pieces of plastic cultural material dating to the late 20th or early 21st century were recovered from this location.

3.1.4 Artifact Catalogue

Table 8: Location 51 (AhGu-31) Complete Artifact Catalogue

Cat. #	Subunit or Context	Depth (m)	Artifact	Quantity	Comments	Chert	Morph	Form
1	Test Pit 5	0.18	porcelain, semi	1	pink			1 bowl

Table 8: Location 51 (AhGu-31) Complete Artifact Catalogue

Cat. #	Subunit or Context	Depth (m)	Artifact	Quantity	Comments	Chert	Morph	Form
2	Test Pit 5	0.18	faunal	1	avian			
3	Test Pit 5	0.18	glass, window	2	1.74mm, 2.00mm			
4	Test Pit 5	0.18	glass, bottle	1	clear			
5	Test Pit 6	0.21	whiteware, plain	1				
6	Test Pit 6	0.21	ironstone, painted	1	green leaf			1 bowl
7	Test Pit 6	0.21	chipping detritus	1		lockport	secondary	
8	Test Pit 2	0.20	drill	1	expanding stem, base	onondaga		
9	Test Pit 7	0.21	brick	1				
10	Test Pit 7	0.21	chipping detritus	1		lockport	broken	
11	Test Pit 7	0.21	glass, bottle	1	clear			
12	Test Pit 7	0.21	whiteware, plain	1				1 plate
13	Test Pit 1	0.20	glass, bottle	1	clear			
14	Test Pit 1	0.20	whiteware, plain	1				1 plate
15	Test Pit 1	0.20	metal hardware, miscellaneous	1				
16	Test Unit 1	0.23	chipping detritus	1		onondaga	secondary	
17	Test Unit 1	0.23	glass, window	2	2.22mm, 1.66mm			
18	Test Unit 1	0.23	glass, bottle	2	1 amethyst, 1 clear			
19	Test Unit 1	0.23	washer	1				
20	Test Unit 1	0.23	brick	1				
21	Test Unit 1	0.23	earthenware, red	2				2 bowl
22	Test Unit 1	0.23	plastic	2				
23	Test Unit 1	0.23	nail, cut	2				
24	Test Unit 1	0.23	faunal	1	avian			

Table 8: Location 51 (AhGu-31) Complete Artifact Catalogue

Cat. #	Subunit or Context	Depth (m)	Artifact	Quantity	Comments	Chert	Morph	Form
25	Test Unit 2	0.24	nail, wire	1				
26	Test Unit 2	0.24	ironstone, plain	1				1 plate
27	Test Unit 2	0.24	whiteware, painted	1	blue			
28	Test Unit 2	0.24	chipping detritus	1		Lockport	secondary	
29	Test Unit 2	0.24	glass, bottle	1	clear			
30	Test Unit 2	0.24	chipping detritus	2		Onondaga	secondary	
31	Test Unit 2	0.24	chipping detritus	1		Onondaga	tertiary	
32	Test Unit 2	0.24	chipping detritus	2		Onondaga	broken	

3.2 LOCATION 52 (AHGU-32)

Location 52 (AhGu-32) is located approximately 20 metres to the east of Location 51 (AhGu-31) within the orchard and immediately west of a municipal road Right-of-Way on the eastern edge of the study area (see Tile 1 in the Supplementary Documentation). The Stage 2 archaeological assessment of this location resulted in the recovery of 15 historic Euro-Canadian artifacts and four pre-contact Aboriginal artifacts collected from two positive test pits and two one metre test units over an area measuring approximately 2 metres east to west by 15 metres north to south. Table 9 provides an artifact summary for the Stage 2 archaeological assessment of Location 52 (AhGu-32).

Table 9: Location 52 (AhGu-32) Artifact Summary

Artifacts	Frequency	%
household	7	36.84
structural	5	26.32
pre-contact Aboriginal	4	21.05
ceramic	2	10.53
recent material	1	5.26
Total	**19**	100.00

3.2.1 Non-ceramic Artifacts

A total of 13 non-ceramic Euro-Canadian artifacts were recovered from Location 52 (AhGu-32), including 7 household items, 5 structural artifacts, and 1 piece of modern material. Plate 3 illustrates a sample of the non-ceramic artifacts recovered from Location 52 (AhGu-32). The various non-ceramic artifacts are discussed in further detail below.

Household Artifacts

A total of seven household artifacts were recovered from Location 52 (AhGu-32) including six pieces of bottle glass and one faunal remain (Plate 3). Bottle glass colour can provide a tentative temporal range for Euro-Canadian domestic sites. Colourless, or clear, glass is relatively uncommon prior to the 1870s but becomes quite widespread in the 1910s (Kendrick 1971; Fike 1987). Of the six glass bottle fragments recovered, two are clear or colourless and date to after 1870. The other colours represented in the bottle glass assemblage from Location 52 (AhGu-32) are green and brown. The one piece of faunal recovered from Location 52 (AhGu-32) was a fragmentary mammalian element and is temporally non-diagnostic.

Structural Artifacts

A total of five structural artifacts were recovered from Location 52 (AhGu-32) including 4 pieces of brick and 1 piece of window glass (Plate 3). Window glass can be temporally diagnostic. In the 1840s window glass thickness changed dramatically. This shift was a result of the lifting of the English import tax on window glass in 1845, which taxed glass by weight and encouraged manufacturers to produce thin panes. Thus, most window glass manufactured before 1845 tends to be less than 1.6 millimetres thick, while later glass is thicker (Adams 1994; Kenyon 1980). The single piece of window glass recovered from Location 52 (AhGu-32) is greater than 1.6 millimetres in thickness, suggesting a production date after 1845. The four pieces of red brick recovered are not temporally diagnostic.

Recent Material

One piece of cultural material dating to the late 20th or early 21st century was recovered from this location.

3.2.2 Pre-contact Aboriginal Artifacts

Four pieces of pre-contact Aboriginal cultural material were recovered from Location 52 (AhGu-32) (Plate 4). The flake assemblage was subject to morphological analysis following the classification scheme described by Lennox *et al* (1986) and expanded upon by Fisher (1997) with the exception that no attempt was made to distinguish 'primary' from 'primary bipolar' flakes. The results of the morphological analysis can be found in Table 10.

Table 10: Location 52 (AhGu-32) Flake Analysis

Material	Primary		Broken		Total Analyzed	
	Freq.	%	Freq.	%	Freq.	%
Onondaga	1	25.00	3	75.00	**4**	**100.0**
Total	**1**	**25.00**	**3**	**75.00**	**4**	**100**

Broken flakes were most often encountered and comprised 75% of the total assemblage. Primary flakes followed at 25%. Primary flakes are produced during removal of the outside, or cortex, of the stone so that a rough tool shape is produced.

All of the flakes recovered from Location 52 (AhGu-32) were manufactured from Onondaga chert. Onondaga formation chert is from the Middle Devonian age, with outcrops occurring along the north shore of Lake Erie between Long Point and the Niagara River (Eley and von Bitter 1989). It is a high quality raw material frequently utilized by pre-contact people and often found at archaeological sites in southern Ontario. Onondaga chert occurs in nodules or irregular thin beds. It is a dense non-porous rock that may be light to dark grey, bluish grey, brown or black and can be mottled with a dull to vitreous or waxy lustre (Eley and von Bitter 1989).

3.2.3 Ceramic Artifacts

A total of two ceramic artifacts were recovered during the Stage 2 assessment of Location 52 (AhGu-32). Both of these are utilitarian earthenware (Plate 3).

Utilitarian Earthenware

Two pieces of utilitarian earthenware were recovered from Location 52 (AhGu-32), both of which are clear-glazed with unrefined red paste. From the late 18th through to the late 19th century unrefined earthenwares with red or yellow paste were the most common type of utilitarian vessels (Adams 1994).

3.2.4 Artifact Catalogue

Table 11: Location 52 (AhGu-32) Artifact Catalogue

Cat. #	Subunit or Context	Depth (m)	Artifact	Quantity	Comments	Chert	Morph	Form
1	Test Pit 4		earthenware, red	2				2 bowl
2	Test Pit 3		chipping detritus	1		Onondaga	tertiary	
3	Test Unit 3	0.24	glass, bottle	2	green			
4	Test Unit 3	0.24	glass, window	1	2.41mm			
5	Test Unit 3	0.24	brick	2				
6	Test Unit 3	0.24	faunal	1				
7	Test Unit 3	0.24	plastic	1				
8	Test Unit 3	0.29	chipping detritus	2		Onondaga	broken	
9	Test Unit 4	0.23	chipping detritus	1		Onondaga	broken	
10	Test Unit 4	0.23	glass, bottle	4	1 green, 1 brown, and 2 clear			
11	Test Unit 4	0.23	brick	2				

4.0 Analysis and Conclusions

Stantec Consulting Ltd. was retained by NRWC to conduct a Stage 2 archaeological assessment for a study area measuring approximately 0.2 hectares located on part of Lot 21, Concession 1, former Township of Clinton, Regional Municipality of Niagara, Ontario. The Stage 1 archaeological assessment of the Tap-In Station study area determined that the entire study area exhibits moderate to high potential for the identification and recovery of archaeological resources. As such, a Stage 2 archaeological assessment was recommended. Two sites were encountered during Stage 2 survey, Location 51 (AhGu-31) and Location 52 (AhGu-32).

4.1 LOCATION 51 (AHGU-31)

A total of 40 artifacts were recovered from five positive test pits and two one metre test units over an area measuring approximately 6 metres east to west by 8 metres north to south. Artifact analysis of the collected assemblage from Location 51 (AhGu-31) indicates that the area represents a pre-contact Aboriginal occupation with a small historic Euro-Canadian component. Of the 30 historic Euro-Canadian artifacts fewer than 20 date to a period of occupation prior to AD 1900. Of the 10 pre-contact Aboriginal artifacts, none are temporally diagnostic beyond the fact that they date to the pre-contact period.

The presence of 10 pre-contact Aboriginal artifacts meets the criteria listed in Section 2.2 Standard 1 and Table 3.1 of the *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011). Location 51 (AhGu-31) yielded more than five non-diagnostic artifacts from combined test pit and test unit excavations and therefore retains cultural heritage value or interest.

4.2 LOCATION 52 (AHGU-32)

A total of 19 historic Euro-Canadian and pre-contact Aboriginal artifacts were recovered from two positive test pits and two one metre test units over an area measuring approximately 2 metres east to west by 15 metres north to south. Of the 30 historic Euro-Canadian artifacts fewer than 20 date to a period of occupation prior to AD 1900. Of the four pre-contact Aboriginal artifacts, none are temporally diagnostic beyond the fact that they date to the pre-contact period.

Thus, the artifact assemblage from Location 52 (AhGu-32) does not fulfill any of the criteria listed in Section 2.2 and Table 3.1 of the *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011). Location 52 (AhGu-32) does not retain cultural heritage value or interest.

5.0 Recommendations

5.1 LOCATION 51 (AHGU-31)

The Stage 2 assessment of Location 51 (AhGu-31) resulted in the recovery of more than five non-diagnostic pre-contact Aboriginal artifacts from combined test pit and test unit excavations. In accordance with Section 2.2 Standard 1a and Table 3.1 of the 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011), Location 51 (AhGu-31) retains cultural heritage value or interest and meets the criteria for a Stage 3 archaeological assessment. Therefore, **Stage 3 archaeological assessment is recommended for Location 51 (AhGu-31).**

The Stage 3 archaeological assessment of Location 51 (AhGu-31) will be conducted according to the procedures outlined in the MTCS's 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011). The Stage 3 archaeological assessment will include the removal of a series of one metre square Stage 3 test units excavated by hand at five metre intervals over the full extent of the site in systematic levels and into the first five centimetres of subsoil. Additional test units amounting to 20% of the total number of 5 metre grid units will then be placed in the vicinity of positive Stage 2 test pits and adjacent to high-yielding units. All excavated soil will be screened through six millimetre mesh; any artifacts being recovered will be recorded and catalogued by the corresponding grid unit designation. If a subsurface cultural feature is encountered, the plan of the exposed feature will be recorded and geotextile fabric will be placed over the unit before backfilling the unit.

5.2 LOCATION 52 (AHGU-32)

The artifact assemblage recovered from Location 52 (AhGu-32) does not meet any of the criteria listed in Section 2.2 or Table 3.1 of the *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011) and does not retain cultural heritage value or interest. Therefore, **no further archaeological assessment is recommended for Location 52 (AhGu-32).**

5.3 SUMMARY

Two archaeological sites were documented during the Stage 1-2 archaeological assessment, Location 51 (AhGu-31) and Location 52 (AhGu-32). Location 51 (AhGu-31) has been recommended for Stage 3 archaeological assessment, while Location 52 (AhGu-32) has not been recommended for Stage 3 archaeological assessment.

The MTCS is asked to review the results presented and accept this report into the Ontario Public Register of Archaeological Reports.

6.0 Advice on Compliance with Legislation

This report is submitted to the Ontario Minister of Tourism, Culture and Sport as a condition of licensing in accordance with Part VI of the *Ontario Heritage Act*, R.S.O. 1990, c 0.18 (Government of Ontario 1990b). The report is reviewed to ensure that it complies with the standards and guidelines that are issued by the Minister, and that the archaeological fieldwork and report recommendations ensure the conservation, protection and preservation of the cultural heritage of Ontario. When all matters relating to archaeological sites within the project area of a development proposal have been addressed to the satisfaction of the Ministry of Tourism, Culture and Sport, a letter will be issued by the ministry stating that there are no further concerns with regard to alterations to archaeological sites by the proposed development.

It is an offence under Sections 48 and 69 of the *Ontario Heritage Act* for any party other than a licensed archaeologist to make any alteration to a known archaeological site or to remove any artifact or other physical evidence of past human use or activity from the site, until such time as a licensed archaeologist has completed fieldwork on the site, submitted a report to the Minister stating that the site has no further cultural heritage value or interest, and the report has been filed in the Ontario Public Register of Archaeology Reports referred to in Section 65.1 of the *Ontario Heritage Act*.

Should previously undocumented archaeological resources be discovered, they may be a new archaeological site and therefore subject to Section 48(1) of the *Ontario Heritage Act*. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out archaeological fieldwork, in compliance with Section 48(1) of the *Ontario Heritage Act*.

The *Cemeteries Act*, R.S.O. 1990 c. C.4 and the *Funeral, Burial and Cremation Services Act*, 2002, S.O. 2002, c.33 (when proclaimed in force) require that any person discovering human remains must notify the police or coroner and the Registrar of Cemeteries at the Ontario Ministry of Consumer Services.

Archaeological sites recommended for further archaeological fieldwork or protection remain subject to Section 48 (1) of the *Ontario Heritage Act* and may not be altered, or have artifacts removed from them, except by a person holding an archaeological license.

7.0 Bibliography and Sources

Adams, Nick. 1994. *Field Manual for Avocational Archaeologists in Ontario.* Ontario Archaeological Society Inc., Archaeological Stewardship Project.

Chapman, Lyman John and Donald F. Putnam. 1984. *The Physiography of Southern Ontario*. 3rd ed. Ontario Geological Survey Special Volume 2. Toronto: Ministry of Natural Resources.

Collard, Elizabeth. 1967. *Nineteenth-Century Pottery and Porcelain in Canada*. McGill University Press, Montreal.

De Volpi, Charles Patrick. 1966. *The Niagara Peninsula: A Pictorial Record*. Montreal: Dev-Sco Publications Ltd.

Eley, Betty E. and Peter H. von Bitter 1989. *Cherts of Southern Ontario*. Toronto: Royal Ontario Museum.

Ellis, Chris J. and Neal Ferris (editors). 1990. *The Archaeology of Southern Ontario to A.D. 1650.* Occasional Publication of the London Chapter, Ontario Archaeological Society, Number 5.

Feest, Johanna and Christian Feest. 1978. Ottawa. In *Handbook of North American Indians. Volume 15, Northeast*, edited by Bruce Trigger, pp. 772-786. Washington: Smithsonian Institution Press.

Fike, Richard E. 1987. *The Bottle Book: A Comprehensive Guide to Historic, Embossed Medicine Bottles.* Gibbs M. Smith Inc., Salt Lake City.

Fisher, Jacqueline A. 1997. *The Adder Orchard Site: Lithic Technology and Spatial Organization in the Broadpoint Late Archaic*. Occasional Publications of the London Chapter, OAS, Number 3, 1997.

Fox, William. 2009. Ontario Cherts Revisited. In *Painting the Past with a Broad Brush: Papers in Honour of James Valliere Wright,* eds D Keenlyside and J Picon, pp. 363-370. Ottawa: Mercury Man Series.

Government of Ontario. 1990a. *Environmental Protection Act,* R.S.O. 1990. Last amendment: 2009, c. 33, Sched. 2, s. 3. Electronic document: http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_90a08_e.htm. Last accessed November 25, 2013.

Government of Ontario. 1990b. *Ontario Heritage Act*, R.S.O. 1990, CHAPTER O.18. Last amendment: 2009, c. 33, Sched. 11, s. 6. Electronic document: http://www.e-

laws.gov.on.ca/html/statutes/english/elaws_statutes_90o18_e.htm. Last accessed November 25, 2013.

Government of Ontario. 2011. *Standards and Guidelines for Consultant Archaeologists*. Toronto: Ministry of Tourism, Culture and Sport.

Government of Ontario. n.d. *Archaeological Sites Database (ASDB) Files*. Toronto: Culture Services Unit, Ministry of Tourism, Culture and Sport.

Hughes, G. Bernard. 1961. *English and Scottish Earthenware 1660-1860*. London: Abbey Fine Arts.

Kendrick, Grace. 1971. *The Antique Bottle Collector*. New York: Pyramid Books.

Kenyon, Ian. 1980. 19th Century Notes: Window Glass Thickness. *KEWA* (80-2).

Kenyon, Ian. 1985. A History of Ceramic Tableware in Ontario, 1780 – 1840. *Arch Notes* 85-3.

Konrad, Victor. 1981. An Iroquois Frontier: The North Shore of Lake Ontario during the Late Seventeenth Century. *Journal of Historical Geography* 7(2): 129-144.

Lennox, P., C. Dodd and C. Murphy. 1986. *The Wiacek Site: A Late Middleport Component, Simcoe County*. London: Ontario Ministry of Transportation and Communications.

Lincoln County Council. 1956. *Lincoln County, 1865-1956*. R. Janet Powell and Barbara F. Coffman, eds., St. Catharines: Lincoln County Council.

Miller, George. 1991. A Revised Set of CC Index Values for Classification and Economic Scaling of English Ceramics from 1787 to 1880. *Historical Archaeology* 25(1):1-25.

Morris, J.L. 1943. *Indians of Ontario*. 1964 reprint. Toronto: Department of Lands and Forests.

Page, H.R. and Co., 1876. *Illustrated Atlas of the Counties of Lincoln and Welland*. Toronto: H.R. Page and Co.

Porter, Peter Augustus. 1896 (Reprinted 2008). *A Brief History of Old Fort Niagara*. Niagara Falls: Crawford Press.

Rogers, E.S. 1978. Southeast Ojibwa. In *Handbook of North American Indians*. Volume 15, Northeast, edited by Bruce Trigger, pp. 760-771. Washington, D.C.: Smithsonian Institution Press.

Schmalz, Peter S. 1991. *The Ojibwa of Southern Ontario*. Toronto: University of Toronto Press.

Stantec. 2012. *Niagara Region Wind Farm Stage 1 Archaeological Assessment, Various Lots, Concessions 1-6 Gainsborough Township, Concessions 7-10 Clinton Township, Regional*

Municipality of Niagara and Various Lots, Moulton Township, Haldimand County. Report prepared for Niagara Region Wind Corporation, Oakville, Ontario.

Stantec. 2013. Niagara Region Wind Project *Final Stage 2 Archaeological Assessment, Various Lots, Concessions 1-6 Gainsborough Township, Concessions 7-10 Clinton Township, Regional Municipality of Niagara and Various Lots, Moulton Township, Haldimand County*. Report prepared for Niagara Region Wind Corporation, Oakville, Ontario.

Stelle, Lenville J. 2001. *An Archaeological Guide to Historic Artifacts of the Upper Sangamon Basin, Central Illinois, U.S.A.* Electronic document: http://virtual.parkland.edu/lstelle1/len/archguide/documents/arcguide.htm. Last accessed on September 27, 2013.

Wicklund, R.E. and B.C. Mathews. 1963. *Soil Survey of Lincoln County*. Report No. 34 of the Ontario Soil Survey. Guelph, ON: Research Branch, Canadian Department of Agriculture and the Ontario Agricultural College.

Wilson, J.A. and M. Horne 1995. *City of London Archaeological Master Plan*. London: City of London, Department of Planning and Development.

Wynne, John Huddlestone. 1770. *A General History of the British Empire in America, Volume II*. London: W. Richardson and L. Urquhart, under the Royal Exchange.

8.0 Images

8.1 PHOTOGRAPHS

Photo 1: Stage 2 Test Pit Survey Field Conditions, facing south

Photo 2: Stage 2 Test Pit Survey Field Conditions, facing north

Photo 3: Stage 2 One Metre Test Unit Excavation on Location 51 (AhGu-31), facing west

8.2 ARTIFACTS

Plate 1: Sample of Pre-contact Aboriginal Artifacts from Location 51 (AhGu-31)

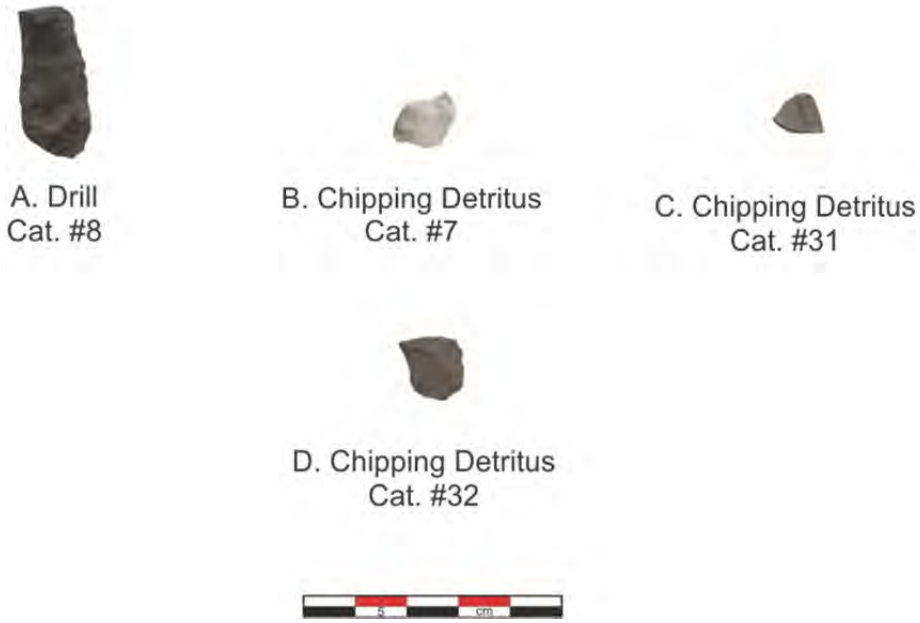


Plate 2: Sample of Historic Euro-Canadian Artifacts from Location 51 (AhGu-31)

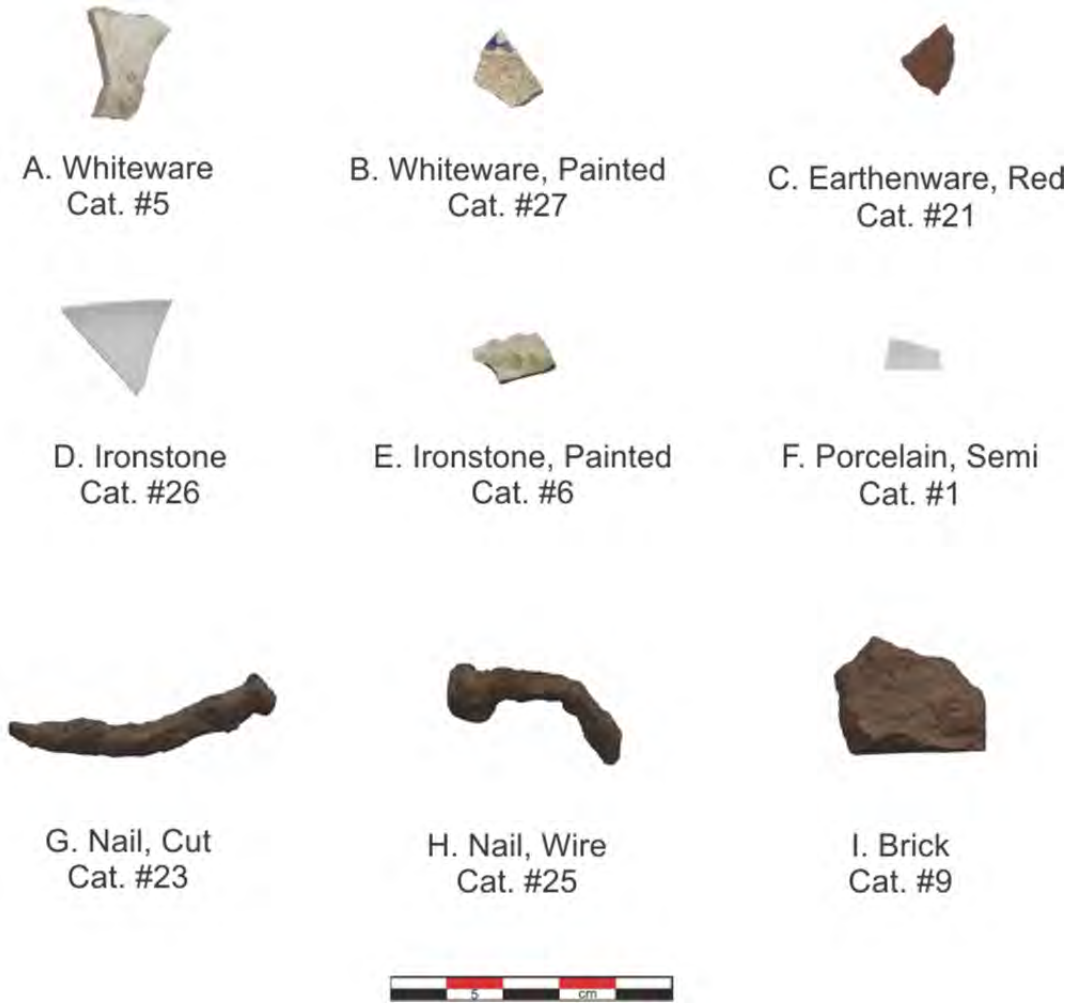


Plate 3: Sample of Historic Euro-Canadian Artifacts from Location 52 (AhGu-32)

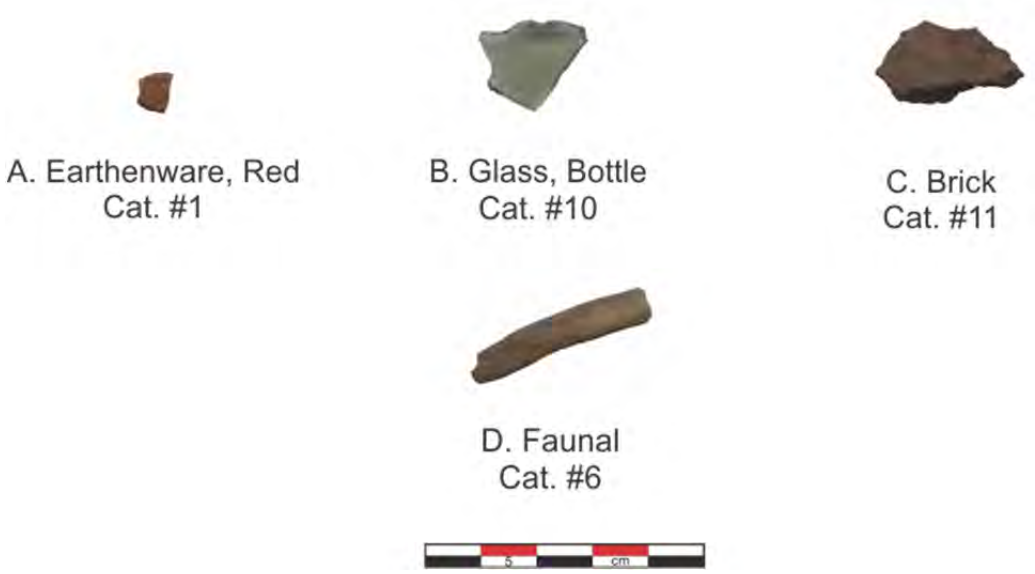
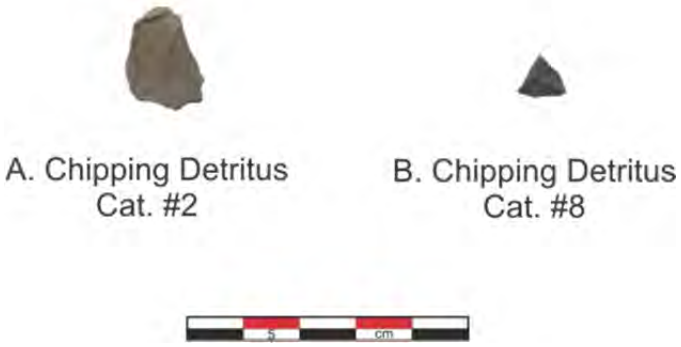


Plate 4: Sample of Pre-contact Aboriginal Artifacts from Location 52 (AhGu-32)



9.0 Maps

All maps will follow on succeeding pages. Maps identifying exact site locations do not form part of this public report; they may be found in the supplementary documentation.

V:\01609\Active\160950269\ planning\ drawing\ mxd\ 20131126_Tap_In_Archae_2AA\160950269_S2AA_Figure_1_Location_of_Study_Area.mxd
Revised: 2014-04-04 By: bcowper

April 2014
160950269

Stantec

Legend

- Study Area
- Road
- Expressway / Highway
- Active Railway
- Abandoned Railway
- Existing Structures
- Existing Transmission Line
- Watercourse
- Waterbody
- Wooded Area
- Municipality Lower Tier

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2013.

Client/Project

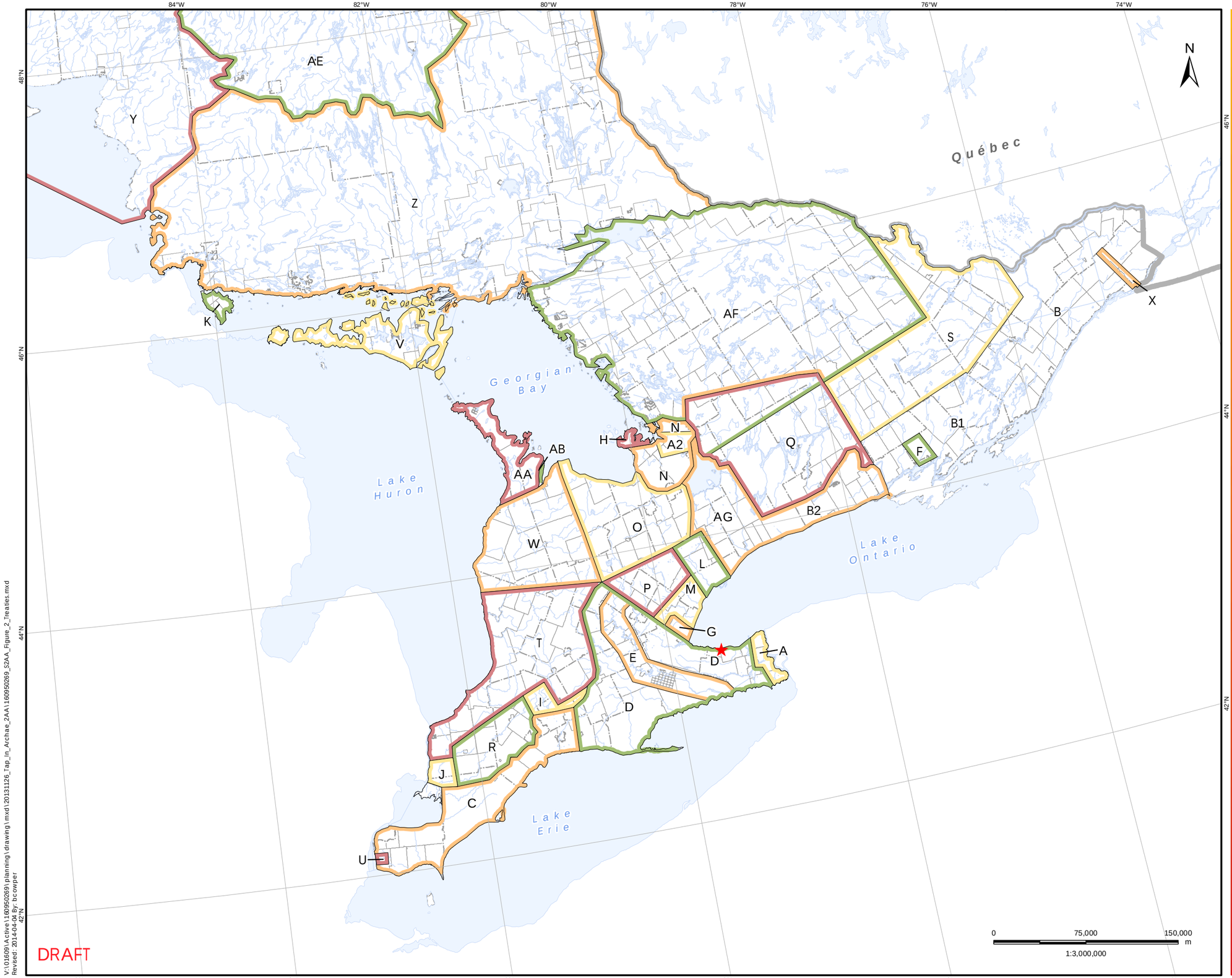
Niagara Region Wind Corporation
Niagara Region Wind Farm
Stage 2 Archaeological Assessment

Figure No.
1

DRAFT

Title

Location of Study Area



Stantec

Legend

- Study Area
- Municipal Boundary - Upper Tier
- Municipal Boundary - Lower or Single Tier
- Watercourse
- Waterbody

A Treaty No. 381, May 9th, 1781 (Mississauga and Chippewa)
B1 Crawford's Purchase, October 9th, 1783 (Mississauga)
B2 Crawford's Purchases, 1784, 1787 And 1788 (Mississauga)
A2 John Collins' Purchase, 1785 (Chippewa)
C Treaty No. 2, May 19th, 1790 (Odawa, Chippewa, Pottawatomi, and Huron)
D Treaty No. 3, December 2nd, 1792 (Mississauga)
E Haldimand Tract:from the Crown to the Mohawk, 1793
F Tyendinaga:from the Crown to theMohawk, 1793
G Treaty No. 3 3/4:from the Crown to Joseph Brant, October 24th, 1795
H Treaty No. 5, May 22nd, 1798 (Chippewa)
U Treaty No. 6, September 7th, 1796 (Chippewa)
J Treaty No. 7, September 7th, 1796 (Chippewa)
L Treaty No. 13, August 1st, 1805 (Mississauga)
M Treaty No. 13A, August 2nd, 1805 (Mississauga)
N Treaty No.16, November 18th, 1815 (Chippewa)
O Treaty No. 18, October 17th, 1818 (Chippewa)
P Treaty No. 19, October 28th 1818 (Chippewa)
Q Treaty No. 20, November 5th, 1818 (Chippewa)
R Treaty No. 21, March 9th, 1819 (Chippewa)
S Treaty No. 27, May 31st, 1819 (Mississauga)
T Treaty No. 27½, April 25th, 1825 (Ojibwa and Chippewa)
U Treaty No. 35, August 13th, 1833 (Wyandot or Huron)
V Treaty No. 45, August 9th, 1836 (Chippewa and Odawa, "For All Indians To Reside Thereon")
W Treaty No. 45½, August 9th, 1836 (Saugeen)
X Treaty No. 57, June 1st, 1847 (Iroquois of St. Regis)
Z Treaty No. 61, September 9th, 1850 (Robinson Treaty:Ojibwa)
AA Treaty No. 72, October 30th, 1854 (Chippewa)
AB Treaty No. 82, February 9th, 1857 (Chippewa)
AF Williams Treaty, October 31st and November 15th, 1923 (Chippewa and Mississauga)
AG Williams Treaty, October 31st, 1923 (Chippewa)

Notes

1. Coordinate System: NAD 1983 Statistics Canada Lambert
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2012.
3. Treaty boundaries adapted from MNR July 1980, based on map compiled by J.L. Morris 2 March 1943. For cartographic representation only.

April 2014
160950269

Client/Project

Niagara Region Wind Corporation
Niagara Region Wind Farm
Stage 2 Archaeological Assessment

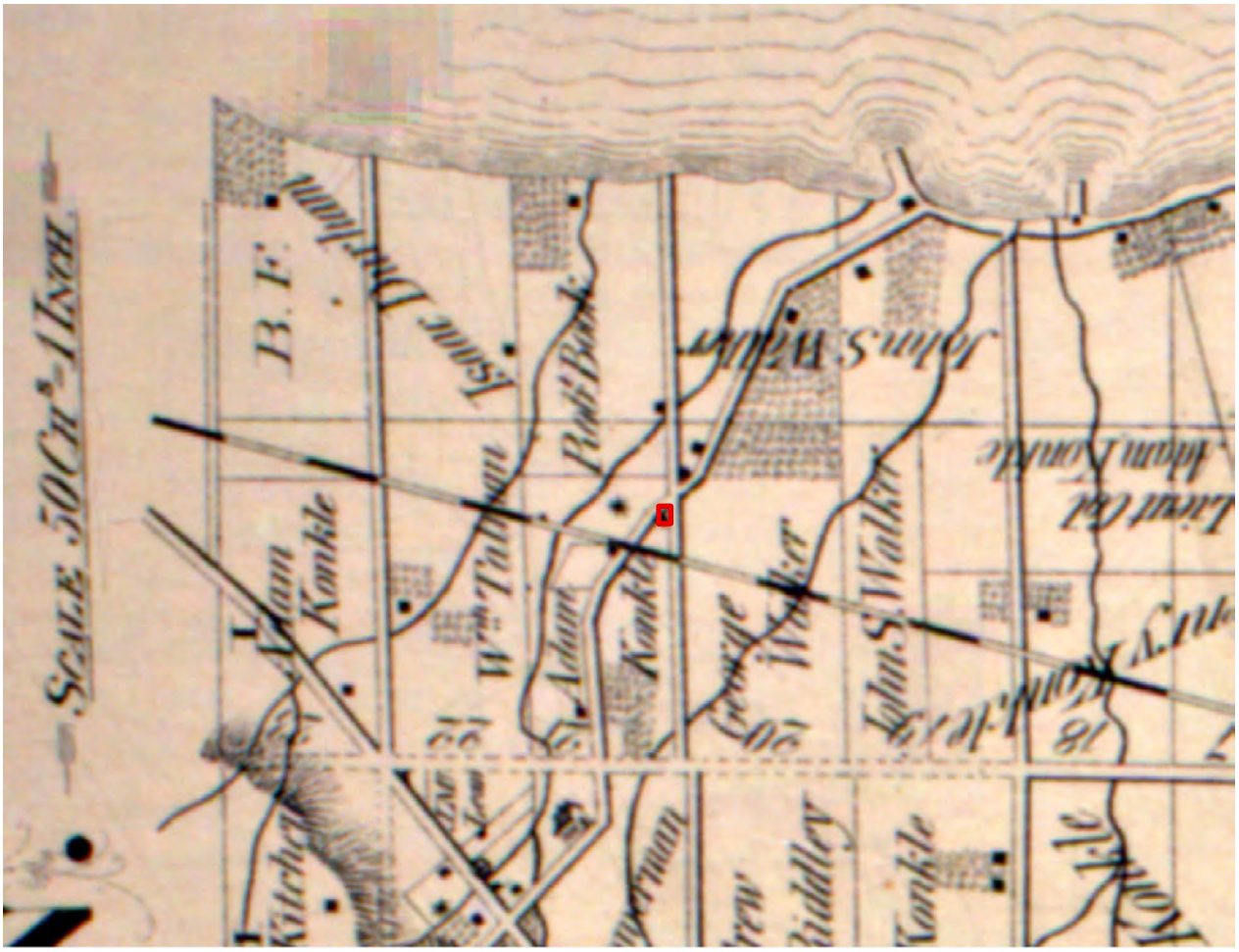
Figure No.
2

DRAFT

Title

Treaties and Purchases (Adapted from Morris 1943)

V:\01609\Active\160950269\planning\drawing\mxd\20131126_Tap_In_Archae_2AA\160950269_52AA_Figure_2_Treaties.mxd
Revised: 2014-04-04 By: bcowper



V:\01609\Active\160950269\ planning\ drawing\ mxd\ 20131126_Tap_In_Archae_2AA\160950269_S2AA_Figure_3_Portion_Map_of_Township_Clinton.mxd
Revised: 2014-04-04 By: bcowper

April 2014
160950269

Stantec

Legend

Study Area

Client/Project

Niagara Region Wind Corporation
Niagara Region Wind Farm
Stage 2 Archaeological Assessment

Figure No.
3

DRAFT

Title

Portion of 1876 Historic Atlas Map of the Township of Clinton

V:\01609\Active\160950269\planning\drawing\mxd\20131126_Tap_In_Archae_2AA\160950269_S2AA_Figure_4_Stage_2_Survey_Methods.mxd
Revised: 2014-04-07 By: bcowper

April 2014
160950269

Stantec

Legend

- Study Area Limits
- Area of Test Pit Survey, 5 Metre Intervals
- Photograph Location

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2013.
3. Orthoimagery © First Base Solutions, 2010.

Client/Project

Niagara Region Wind Corporation
Niagara Region Wind Farm
Stage 2 Archaeological Assessment

Figure No.

1 DRAFT

Title

Stage 2 Methods

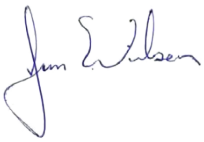
10.0 Closure

This report has been prepared for the sole benefit of NRWC and may not be used by any third party without the express written consent of Stantec Consulting Ltd. and NRWC. Any use which a third party makes of this report is the responsibility of such third party.

We trust this report meets your current requirements. Please do not hesitate to contact us should you require further information or have additional questions about any facet of this report.

STANTEC CONSULTING LTD.

Colin Varley, MA
Senior Archaeologist, Associate
Tel: (613) 738-6087
Fax: (613) 722-2799
Colin. Varley@stantec.com



Jim Wilson, MA
Regional Discipline Leader, Archaeology
Principal
Tel: (613) 722-4420
Fax: (613) 722-2799
Jim.Wilson@stantec.com

Ministry of Tourism, Culture and Sport

Confirmation Letter

From: pastport <pastport@ontario.ca>
Date: September 1, 2015 at 8:42:19 AM EDT
To: "Glenen, Paige" <Paige.Glenen@stantec.com>
Subject: PIF Number has been issued / *

Dear Paige Glenen,

Your Project Information Form (PIF) submitted for **Stage 2 AA Modifications to Access Road T11/T12 and ENT 36** on Aug 31, 2015 has been processed and PIF number **P1084-0018-2015** has been assigned to your project.

Please keep this PIF number for your records and cite it on all reports and correspondence with the ministry about this project.

The report for this project must be filed with the ministry by **Sep 1, 2016**. Please take note of this date to ensure that you file your report on time. If you miss the deadline and the report becomes overdue you will not be eligible to begin new fieldwork projects.

Please note, a PIF number issued by the ministry does not constitute ministry approval of any of your proposed fieldwork strategies. PIF numbers are used by the ministry to track archaeological fieldwork activity under your licence and to establish a due date by which you must file a report with the ministry that documents the archaeological fieldwork carried out as part of this project.

For more information about PIFs and report filing deadlines see the ministry's guide to PIFs on our website: www.mtc.gov.on.ca/en/archaeology/PIF_Protocols_EN.pdf

If you have any questions email us at PIFs@ontario.ca. Please do not reply directly to this e-mail.

Stage 2 Archaeological Assessment Modifications to Access Road T11/T12 and ENT 36, Niagara Region Wind Project

Part of Lot 41, Concession 6
Geographic Township of
Wainfleet, former Lincoln County,
now Regional Municipality of
Niagara and Part of Lots 4 and 5,
North of Forks Road, Geographic
Township of Moulton, Haldimand
County, Ontario

Prepared for:
Enercon Canada Inc.
4672 Bartlett Road South
Beamsville, ON L0R 1B1

Prepared by:
Stantec Consulting Ltd.
400-1331 Clyde Avenue
Ottawa ON CA K2C 3G4

Licensee: Paige Glenen MSc
License Number: P1084
PIF Number: P1084-0018-2015
Project Number: 160961052

ORIGINAL REPORT

September 2, 2015

Insert revision record

Table of Contents

LIST OF TABLES

LIST OF FIGURES

Executive Summary

A Stage 2 archaeological assessment of the Temporary Entrance Realignments Project Area was conducted by Stantec Consulting Ltd. (Stantec) on behalf of Enercon Canada Inc. (Enercon) for the proposed Niagara Region Wind Project. The Stage 2 assessment was undertaken in order to meet the requirements for a modification to the Renewable Energy Approval, as outlined in *Ontario Regulation 359/09* sections 21 and 22 under Part V.0.1 of the *Environmental Protection Act* (Government of Ontario 1990a).

The Stage 2 archaeological assessment of the proposed modifications was undertaken by Stantec on behalf of Enercon in order to meet the requirements for an application for a Renewable Energy Approval, as outlined in Ontario Regulation 359/09 sections 21 and 22 under Part V.0.1 of the *Environmental Protection Act* (Government of Ontario 1990a). This archaeological assessment is also subject to the *Ontario Heritage Act* (Government of Ontario 1990b) and the 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011b).

This modification involves adjustments to access road entrances, on private land owned by participating landowners, based on detailed design (engineering) and need for turning radius (driving surface) at nine entrance locations. Only two of these entrance locations extend outside of the area that was already subject to Stage 2 archaeological assessment in 2012 under PIF P002-289-2012:

- Entrance 36 to T10 and T37
- Access Road Amendment T11 and T12

The Stage 2 assessment of the proposed modifications to the access road between T11 to T12 and Entrance 36 was conducted on September 1, 2015 under PIF P1084-0018-2015 issued to Paige Glenen, M.Sc. by the MTCS. The Project Location at the access road between T11 and T12 includes two smaller areas. The northern section encompasses a 30 metre by 5 metre area in a former wooded area that was recently cut and cleared by the landowner for agricultural purposes, and a smaller section to the south within an agricultural field encompasses a 15 metre by 5 metre area. The section of agricultural field was subject to test pit survey as it is a narrow linear survey corridor of less than 10 metres for the purposes of road widening as outlined under Section 2.1.2 Standard 1f in the *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011b). The Project Location at Entrance 36 encompasses a 30 metre by 5 metre area of manicured lawn. The study area consists of a cleared wooded area, agricultural field and manicured lawn with surface conditions consistent with the requirements listed under Section 7.8.6 Standard 1a in the *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011b).

Stantec's Stage 2 survey of the area of the proposed modifications resulted in the identification of no archaeological resources. Therefore **it is recommended that no further archaeological assessment of the property is required.**

The Ministry of Tourism, Culture and Sport is asked to accept this report into the Ontario Public Register of Archaeological Reports.

The Executive Summary highlights key points from the report only; for complete information and findings the reader should examine the complete report.

Project Personnel

Licensed Archaeologist:	Paige Glenen, M.Sc. (P1084)
Project Manager:	Chris Powell, MA
Task Manager:	Paige Glenen, M.Sc. (P1084)
Task Coordinator:	Amanda Laprise, BA (R470)
Licensed Field Directors:	Krista Lane, BA (R382)
Field Technicians:	Tavis Maplesden (R467), Kirsty Walker, Quinton Wilson
First Nations Observers:	Haudenosaunee Development Institute: Sheila Silver
	Mississaugas of the New Credit First Nations: Allison LaForme
GIS Specialist:	Brian Cowper
Report Writer:	Paige Glenen, M.Sc. (P1084), Patrick Hoskins, MA (P415)
Technical Review:	Colin Varley, MA, RPA (P002)
Senior Review:	Jim Wilson, MA. (P001)

Acknowledgements

Proponent Contact:	Shiloh Berriman, Enercon Canada Inc.
Ministry of Tourism, Culture and Sport	Robert von Bitter

1.0 PROJECT CONTEXT

1.1 DEVELOPMENT CONTEXT

Enercon Canada Inc. (Enercon) is proposing to develop the Niagara Region Wind Project (FWRN-LP, formerly NRWC or the Project) with a maximum name plate capacity of 230 megawatts (MW), located within the Townships of West Lincoln and Wainfleet and the Towns of Grimsby and Lincoln in Niagara Region, as well as the Geographic Township of Rainham in Haldimand County. The Project Location spans multiple lots across Concession 1-6, Gainsborough Township, Concession 1-7, Clinton Township, Regional Municipality of Niagara and multiple lots across Moulton Township, Haldimand County, Ontario (Figure 1).

The Project consists of 77 wind turbine generators, each with a rated capacity ranging from approximately 2.3 MW to 3.0 MW for a maximum installed name plate capacity of 230 MW. An overhead and/or underground collection system connects each turbine to one of two transformer substations along a series of 34.5 kilovolt (kV) lines. Turbines are grouped into nine collector circuits that bring power (and data via fibre optic lines) to one of the transformer substations. Voltage is stepped up from 34.5kV to 115kV at each transformer substation by means of a 100 megavolt ampere (MVA) base rated transformer with two stages of cooling (via fans). A 115kV transmission line transports power from each of the two transfer substations north to the tap-in location where the Project is connected to the Hydro One Networks Inc. (HONI) owned transmission line, south of the Queen Elizabeth Way (QEW) in the Town of Lincoln. Power generated from this Project will be conveyed along the existing HONI transmission line to the Beach Transformer Station in Hamilton.

Other Project components include access roads, junction boxes (or pad-mounted disconnect switches), and associated culverts at swales and waterbody crossings. Temporary components during construction may include temporary laydown areas (for storage and staging areas at each turbine location), crane pads or mats, staging areas along access roads, delivery truck turnaround areas, central construction laydown areas, and crane paths.

Stantec Consulting Ltd. (Stantec) was contracted by Enercon Canada Inc. (Enercon) to conduct the Stage 2 archaeological assessment of proposed modifications to the access road between T11 and T12 and Entrance 36 for the Niagara Region Wind Project (FWRN-LP, formerly NRWC or the Project).

The Stage 2 archaeological assessment of the proposed modifications was undertaken by Stantec on behalf of Enercon in order to meet the requirements for an application for a Renewable Energy Approval, as outlined in Ontario Regulation 359/09 sections 21 and 22 under Part V.0.1 of the *Environmental Protection Act* (Government of Ontario 1990a). This archaeological assessment is also subject to the *Ontario Heritage Act* (Government of Ontario

1990b) and the 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011b).

This modification involves adjustments to access road entrances, on private land owned by participating landowners, based on detailed design (engineering) and need for turning radius (driving surface) at nine entrance locations, only two of these entrance locations extend outside of the area that was already subject to Stage 2 archaeological assessment in 2012 under PIF P002-289-2012:

- Entrance 36 to T10 and T37
- Access Road Amendment T11 and T12

Permission to access the Project Location to conduct the archaeological assessment and remove artifacts was provided by Shiloh Berriman of Enercon.

1.1.1 Objectives

The Stage 2 assessment has been conducted to meet the requirements of the Ministry of Tourism, Culture and Sport's (MTCS) Standards and Guidelines for Consultant Archaeologists (Government of Ontario 2011b).

The objective of the Stage 2 assessment was to provide an overview of archaeological resources on the property, specifically within the PDA, and to determine whether any of the resources might be archaeological sites with cultural heritage value or interest and to provide specific direction for the protection, management and/or recovery of these resources. In compliance with the provincial standards and guidelines set out in the MTCS' 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011), the objectives of the Stage 2 Property Assessment are as follows:

- To document archaeological resources within the Project Location;
- To determine whether the Project Location contains archaeological resources requiring further assessment; and,
- To recommend appropriate Stage 3 assessment strategies for archaeological sites identified.

1.2 HISTORICAL CONTEXT

1.2.1 Post-contact Aboriginal Resources

The post-contact Aboriginal occupation of Southern Ontario was heavily influenced by the dispersal of various Iroquoian-speaking communities by the New York State Iroquois and the subsequent arrival of Algonkian speaking groups from northern Ontario at the end of the 17th century and the beginning of the 18th century (Konrad 1981; Schmalz 1991). By 1690, Algonkian

speakers from the north appear to have begun to repopulate Bruce County (Rogers 1978:761). This is the period in which the Mississaugas are known to have moved into southern Ontario and the lower Great Lakes watersheds (Konrad 1981). Oral traditions of the Mississauga's recorded in 1904 as told by Chief Robert Paudash indicate that after the Mississauga defeat of Mohawk Nation, who retreated to their homeland south of Lake Ontario, a peace treaty was negotiated and that upon the Mississaugas return they decided to settle permanently in southern Ontario, including within the Niagara Peninsula. These events occurred around 1695 (Praxis Research Associates n.d.). In southwestern Ontario, however, members of the Three Fires Confederacy (Chippewa, Ottawa and Potawatomi) were immigrating from Ohio and Michigan in the late 1700s (Praxis Research, n.d.).

The proposed modifications fall within the lands surrendered by Treaty Number 3. Treaty Number 3

> *…was made with the Mississa[ug]a Indians 7th December, 1792, though purchased as early as 1784. This purchase in 1784 was to procure for that part of the Six Nation Indians coming into Canada a permanent abode.*
>
> *The area included in this Treaty is, Lincoln County excepting Niagara Township; Saltfleet, Binbrook, Barton, Glanford and Ancaster Townships, in Wentworth County; Brantford, Onondaga, Tusc[a]r[o]ra, Oakland and Burford Townships in Brant County; East and West Oxford, North and South Norwich, and Dereham Townships in Oxford County; North Dorchester Township in Middlesex County; South Dorchester, Malahide and Bayham Township in Elgin County; all Norfolk and Haldimand Counties; Pelham, Wainfleet, Thorold, Cumberland and Humberstone Townships in Welland County ... .*
>
> Morris 1943:17-18

1.2.2 Historic Euro-Canadian Archaeological Resources

A historical background for the entire Niagara Region Wind Project is provided in Stantec's Stage 1 archaeological assessment report (Stantec 2012) and Stage 2 archaeological assessment report (Stantec 2013). The proposed modifications to the access road between T11 and T12 are located on Lots 4 and 5, North of the Forks Road, Geographic Township of Moulton, Haldimand County Ontario. The proposed modification to Entrance 36 is located on Lot 41, Concession 6, Geographic Township of Wainfleet, former Lincoln County, now Regional Municipality of Niagara, Ontario. Below is a more specific past and present land use and settlement history of those lots.

The 1879 *Illustrated Historical Atlas of Haldimand County, Ontario*'s map of the Township of Moulton (Page and Co. 1879) indicates that the parts of Lots 4 and 5, North of Forks Road on which the proposed modifications of the access road between T11 and T12 are located were owned by Charles Disher and John McKiver respectively (Figure 2). No structures are depicted

near the assessed areas (Page and Co. 1876). The lots have been in agricultural use for over 100 years and were still used as such at the time of assessment.

The 1876 *Illustrated Historic Atlas of the Counties of Lincoln and Welland* (Page & Co. 1876) shows the part of Lot 41, Concession 6 on which the proposed modification of Entrance 36 is located was owned by James Rice (Figure 3). No structures are shown within the study area. The lot has been in agricultural use for over 100 years and was still used as such at the time of assessment.

1.2.3 Recent Reports

Two archaeological assessment reports document work within 50 metres of the modifications, the Stage 1 and Stage 2 archaeological assessment reports for the Niagara Region Wind Project. Table 1 provides a listing of the Stage 1 and 2 archaeological reports.

Table 1: Stage 1 and 2 Archaeological Assessment Reports for Studies in the Area

Year	Title	Author	PIF Number
2012	*Stage 1 Archaeological Assessment, Niagara Region Wind Project, Various Lots, Concession 1-6 Gainsborough Township, Concessions 7-10, Clinton Township, Regional Municipality of Niagara and Various Lots, Moulton Township, Haldimand County, Ontario*	Stantec	P002-263-2011
2013	*Stage 2 Archaeological Assessment, Niagara Region Wind Project, Various Lots, Concession 1-6 Gainsborough Township, Concessions 7-10, Clinton Township, Regional Municipality of Niagara and Various Lots, Moulton Township, Haldimand County, Ontario*	Stantec	P002-289-2012

1.3 ARCHAEOLOGICAL CONTEXT

1.3.1 Natural Environment

The proposed modifications are located in the Haldimand Clay Plain physiographic region, a large region that occupies the majority of the Niagara Peninsula south of the Niagara Escarpment down to Lake Erie. It is a region of approximately 1,350 square miles characterized by recessional moraines in the northern part, deep river valley in the middle, and flat and low lying ground in the south (Chapman and Putnam 1984).

The vast majority of the surficial geology of the proposed modifications consists of heavy silty clay loam, till, and alluvial deposits in flood plains spanning the length of region's waterways. The dominant soil series is Haldimand clay loam with small pockets of Lincoln clay till, predominately along waterways (Wicklund and Mathews 1963).

Potable water is the single most important resource for any extended human occupation or settlement and since water sources in southwestern Ontario have remained relatively stable over time proximity to drinkable water is regarded as a useful index for the evaluation of

archaeological site potential. In fact, distance to water is one of the most commonly used variables for predictive modeling of archaeological site location in Ontario. The closest source of potable water to the proposed modification of the access road between T11 and T12 is the North Forks Drain approximately 300 metres to the south. The closest source of potable water to the proposed modification of Entrance 36 is Little Fors Creek, a tributary of the Welland River, located approximately 300 m to the north.

1.3.2 Pre-Contact Aboriginal Resources

This portion of southern Ontario has been occupied by First Nations peoples since the retreat of the Wisconsin glacier approximately 11,000 years ago. Local environmental conditions were significantly different from what they are today. Ontario's first peoples would have crossed the landscape in small groups in search of food, particularly migratory game species. In this area, caribou may have been a Paleo-Indian diet staple, supplemented by wild plants, small game, birds, and fish. Given the low density of populations on the landscape at this time and their mobile nature, Paleo-Indian sites are small and ephemeral. They are sometimes identified by the presence of fluted points. Sites are frequently located adjacent to the shorelines of large glacial lakes.

Archaeological records indicate subsistence changes around 8,000 B.C. at the start of the Archaic Period in southern Ontario. Since the large mammal species that formed the basis of the Paleo-Indian diet became extinct or moved north with the warming of the climate, Archaic populations had a more varied diet, exploiting a range of plants and bird, mammal, and fish species. Reliance on specific food resources like fish, deer, and several nut species became more noticeable through the Archaic Period and the presence of warmer, more hospitable environs led to expansion of group and family sizes. In the archaeological record, this is evident in the presence of larger sites. The coniferous forests of earlier times were replaced by stands of mixed coniferous and deciduous trees by about 4,000 B.C. The transition to more productive environmental circumstances led to a rise in population density. As a result, Archaic sites become more abundant over time. Artifacts typical of these occupations include a variety of stemmed and notched projectile points; chipped stone scrapers; ground stone tools (e.g., celts, adzes) and ornaments (e.g., bannerstones, gorgets); bifaces or tool blanks; animal bone; and chert waste flakes, a byproduct of the tool making process.

Significant changes in cultural and environmental patterns occurred in the Early and Middle Woodland periods (*circa* 950 B.C. to 800 A.D.). Occupations became increasingly more permanent in this period, culminating in major semi-permanent villages by roughly 1,000 years ago. Archaeologically, the most significant changes by Woodland peoples were the appearance of artifacts manufactured from modeled clay and the emergence of more sedentary villages. The earliest pottery was crudely made by the coiling method and early house structures were simple oval enclosures. The Early and Middle Woodland periods are also characterized by extensive trade in raw materials, objects and finished tools, with sites in Ontario containing trade items with origins in the Mississippi and Ohio River valleys.

The Late Woodland period is marked by the emergence of the Neutral Iroquoians, one of several discrete groups that emerge from this period. Neutral settlements include large villages of several longhouses and a number of associated smaller satellite villages (hamlets), seasonally occupied sites with only one or two small "cabins" (usually associated with working horticultural fields), and camps for specialized extractive activities such as hunting and fishing.

Discrete clusters of politically allied Neutral villages have been identified from the late pre-contact and early post-contact periods. The Project Location is situated in close proximity to the Lower Grand River cluster, located on both sides of the Grand River above and below the town of Cayuga, the Upper Twenty Mile Creek cluster to the west and the Grimsby cluster to the north.

Table 2 provides a general outline of the cultural chronology of Haldimand County, based on Ellis and Ferris (1990).

Table 2: Cultural Chronology for Lincoln and Haldimand Counties

Period	Characteristics	Time	Comments
Early Paleo-Indian	Fluted Projectiles	9000 - 8400 B.C.	spruce parkland/caribou hunters
Late Paleo-Indian	Hi-Lo Projectiles	8400 - 8000B.C.	smaller but more numerous sites
Early Archaic	Kirk and Bifurcate Base Points	8000 - 6000 B.C.	slow population growth
Middle Archaic	Brewerton-like points	6000 - 2500 B.C.	environment similar to present
Late Archaic	Lamoka (narrow points)	2000 - 1800 B.C.	increasing site size
	Broad Points	1800 - 1500 B.C.	large chipped lithic tools
	Small Points	1500 - 1100B.C.	introduction of bow hunting
Terminal Archaic	Hind Points	1100 - 950 B.C.	emergence of true cemeteries
Early Woodland	Meadowood Points	950 - 400 B.C.	introduction of pottery
Middle Woodland	Dentate/Pseudo-Scallop Pottery	400 B.C. - A.D.500	increased sedentism
	Princess Point	A.D. 550 - 900	introduction of corn
Late Woodland	Early Ontario Iroquoian	A.D. 900 - 1300	emergence of agricultural villages
	Middle Ontario Iroquoian	A.D. 1300 - 1400	long longhouses (100m +)
	Late Ontario Iroquoian	A.D. 1400 - 1650	tribal warfare and displacement
Contact Aboriginal	Various Algonkian Groups	A.D. 1700 - 1875	early written records and treaties
Late Historic	Euro-Canadian	A.D. 1796 - present	European settlement

1.3.3 Previously Identified Archaeological Sites and Surveys

As part of the Stage 1 background study the Archaeological Sites Database (ASDB) was consulted. It was determined that there were 166 registered archaeological sites within a 1 km radius of the Study Area (personal communication, Robert von Bitter, MTCS). Of these 166 sites, 3 sites (or components of multi-component sites) date to the Paleo-Indian period, 32 sites date to the Archaic period and 21 sites date to the Woodland period. Another 13 sites date to the Euro-Canadian period, of which 1 is a post-contact Aboriginal site. The remaining 102 registered archaeological sites are of an indeterminate cultural affiliation. One late Woodland period ossuary is located within the Study Area, but not within constructible locations (personal communication, Robert von Bitter, MTCS).

During the Stage 2 assessment conducted by Stantec (2013), an additional 50 archaeological sites, 100 isolated findspots, and 41 artifact clusters were identified within the Project Location. Of these, four were identified within one kilometre of the proposed modification to the access road between T11 and T12. No archaeological sites were identified within one kilometre of the proposed modification to Entrance 36. NRWC-29 (AfGv-136) was recommended for a Stage 3 archaeological assessment and Isolated Findspots 6, 7, and 65 were not recommended for further work (Table 3). NRWC-29 (AfGv-136) consisted of one scraper and over 30 pieces of Onondaga chert debitage within a 50 metre by 50 metre area. Isolated Findspot 6 (AfGv-140) consisted of a Late Woodland (c. 1,100-350 B.P.) Daniels Triangular projectile point type. Isolated Findspot 7 (AfGv-141) consisted of an Early Woodland (c. 2,950-2,400 B.P.) Meadowood projectile point type. Isolated Findspot 65 consisted of one Onondaga chert core. Both Isolated Findspot 6 and 7 were registered with the MTCS and received a Borden number as per the 2011 *Standards and Guidelines for Consultant Archaeologists* Section 7.12 Standard 1.a.

Table 3: Registered and Unregistered Sites within One Kilometre of Modifications

Site Name	Borden Number	Cultural Affiliation	Original Source
NRWC-29	AfGv-136	indeterminate pre-contact Aboriginal	Stantec 2013
Isolated Findspot 6	AfGv-140	Late Woodland	Stantec 2013
Isolated Findspot 7	AgGv-141	Early Woodland	Stantec 2013
Isolated Findspot 65	N/A	indeterminate pre-contact Aboriginal	Stantec 2013

To Stantec's knowledge, the only archaeological field work conducted within 50 metres of the proposed modifications has been concerned with the Niagara Region Wind Project (Stantec 2012; Stantec 2013) and no archaeological sites have been identified within 50 metres of either modification.

1.3.4 Determination of Archaeological Potential

Archaeological potential is established by determining the likelihood that archaeological resources may be present on a subject property. Criteria commonly used by the Ontario MTCS (Government of Ontario 2011b) to determine areas of archaeological potential include:

- Proximity to previously identified archaeological sites;
- Distance to various types of water sources;
- Soil texture and drainage;
- Glacial geomorphology, elevated topography and the general topographic variability of the area;
- Resource areas including food or medicinal plants, scarce raw materials and early Euro-Canadian industry;
- Areas of early Euro-Canadian settlement and early transportation routes;
- Properties listed on municipal register of properties designated under the *Ontario Heritage Act* (Government of Ontario 1990b);
- Properties that local histories or informants have identified with possible archaeological sites, historical events, activities or occupants; and
- Historic landmarks or sites.

Distance to modern or ancient water sources is generally accepted as the most important determinant of past human settlement patterns and, considered alone, may result in a determination of archaeological potential. However, any combination of two or more other criteria, such as well-drained soils or topographic variability, may also indicate archaeological potential. Finally, extensive land disturbance can eradicate archaeological potential (Wilson and Horne 1995).

The Stage 1 assessment indicated that the current study area contains elevated potential for both pre-contact Aboriginal and historic Euro-Canadian archaeological resources (Stantec 2012). Pre-contact Aboriginal potential is moderate to high for both study areas given the proximity to nearby water sources. Post-contact Aboriginal potential is moderate to high for both study areas given the proximity to nearby water sources. Finally, historic Euro-Canadian potential is moderate to high for the ENT 36 study area given its close proximity to a 19th century road (Figure 3).

1.3.5 Existing Conditions

The Stage 2 assessment of the proposed modifications to the access road between T11 to T12 and Entrance 36 was conducted on September 1, 2015 under PIF P1084-0018-2015 issued to Paige Glenen, M.Sc. by the MTCS. The Project Location at the access road between T11 and T12 includes two smaller areas. The northern section encompasses a 30 metre by 5 metre area in a former wooded area that was recently cut and cleared by the landowner for agricultural purposes, and a smaller section to the south within an agricultural field encompasses a 15 metre by 5 metre area. The section of agricultural field was subject to test pit survey as it is a narrow linear survey corridor of less than 10 metres for the purposes of road widening as outlined under Section 2.1.2 Standard 1f in the *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011b). The Project Location at Entrance 36 encompasses a 30 metre by 5 metre area of manicured lawn. The study area consists of a cleared wooded area, agricultural field and manicured lawn with surface conditions consistent with the requirements listed under Section 7.8.6 Standard 1a in the *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011b). The lands within the study area have been used for the same purposes for over 100 years.

2.0 FIELD METHODS

The Stage 2 assessment involved a survey of all of the land to be impacted by the proposed modifications to the access road between T11 and T12 and the temporary Entrance modification at ENT 36 (T10 and T32). The study area consists of a mix of manicured lawn, agricultural field and wooded areas which was assessed by standard test pit survey survey. Test pit survey was utilized as the area in agricultural field was only approximately 5 metres by 15 meters, as outlined in outlined under Section 2.1.2 Standard 1f in the *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011b). As per the *Standards and Guidelines for Consultant Archaeologists* Section 7.8.6 Standard 1a (Government of Ontario 2011b), Photos 1 to 3 illustrate the field conditions and the visibility within the study area and confirm that conditions met the requirements for Stage 2 archaeological assessment. Photograph locations and directions are provided in the Figures 4 and 5 map which also illustrates the field assessment methods across the study area.

During the Stage 2 archaeological assessment conducted on September 1, 2015 the weather was warm and clear. As a result, field visibility and lighting conditions were excellent and in accordance with the *Standards and Guidelines for Consultant Archaeologists* Section 2.1 Standard 3 (Government of Ontario 2011b). At no time were the field or weather conditions detrimental to the recovery of archaeological material.

The entire study area recommended for Stage 2 survey was subject to a test pit survey at a five metre interval in accordance with Section 2.1.2 of the MTCS's 2011 Standards and Guidelines for Consultant Archaeologists (Government of Ontario 2011). Each test pit was approximately 30 centimetres in diameter and excavated five centimetres into sterile subsoil. The soils were then examined for stratigraphy, cultural features, or evidence of fill. All soil was screened through six millimeter mesh hardware cloth to facilitate the recovery of small artifacts and then used to backfill the pit. No artifacts were identified or collected during the test pit survey and no further archaeological field methods were employed.

First Nations Observers from the Haudenosaunee Development Institute and the Mississauga's of New Credit First Nation also participated in the Stage 2 archaeological assessment; their roles are summarized in the supplementary documentation.

3.0 RECORD OF FINDS

The Stage 2 archaeological assessment was conducted employing the methods described in Section 2.0. An inventory of the documentary record generated by fieldwork is provided in Table 4 below.

Table 4: Inventory of Documentary Record

Document Type	Current Location of Document Type	Additional Comments
2 Pages of Field Notes	Stantec office in Hamilton	In original field book and photocopied in project file
2 Hand Drawn Maps	Stantec office in Hamilton	In original field book and photocopied in project file
1 Map Provided by Client	Stantec office in Hamilton	Hard and digital copies in project file
8 Digital Photographs	Stantec office in Hamilton	Stored digitally in project file

No artifacts or archaeological sites were identified or collected during the Stage 2 assessment of the proposed modifications.

4.0 ANALYSIS AND CONCLUSIONS

The Stage 2 assessment of the proposed modifications to the access road between T11 and T12 and Entrance 36 resulted in the identification of no archaeological sites.

5.0 RECOMMENDATIONS

The Stage 2 assessment of the proposed modifications to the access road between T11 and T12 and Entrance 36 resulted in the identification of no archaeological resources. Therefore **it is recommended that no further archaeological assessment of the property is required.**

The Ministry of Tourism, Culture and Sport is asked to accept this report into the Ontario Public Register of Archaeological Reports.

6.0 ADVICE ON COMPLIANCE WITH LEGISLATION

This report is submitted to the Ontario Minister of Tourism, Culture and Sport as a condition of licensing in accordance with Part VI of the *Ontario Heritage Act*, R.S.O. 1990, c 0.18. The report is reviewed to ensure that it complies with the standards and guidelines that are issued by the Minister, and that the archaeological fieldwork and report recommendations ensure the conservation, protection and preservation of the cultural heritage of Ontario. When all matters relating to archaeological sites within the project area of a development proposal have been addressed to the satisfaction of the Ministry of Tourism, Culture and Sport, a letter will be issued by the ministry stating that there are no further concerns with regard to alterations to archaeological sites by the proposed development.

It is an offence under Sections 48 and 69 of the *Ontario Heritage Act* for any party other than a licensed archaeologist to make any alteration to a known archaeological site or to remove any artifact or other physical evidence of past human use or activity from the site, until such time as a licensed archaeologist has completed fieldwork on the site, submitted a report to the Minister stating that the site has no further cultural heritage value or interest, and the report has been filed in the Ontario Public Register of Archaeological Reports referred to in Section 65.1 of the *Ontario Heritage Act*.

Should previously undocumented archaeological resources be discovered, they may be a new archaeological site and therefore subject to Section 48(1) of the *Ontario Heritage Act*. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out archaeological fieldwork, in compliance with Section 48(1) of the *Ontario Heritage Act*.

The *Cemeteries Act*, R.S.O. 1990 c. C.4 and the *Funeral, Burial and Cremation Services Act*, 2002, S.O. 2002, c.33 (when proclaimed in force) require that any person discovering human remains must notify the police or coroner and the Registrar of Cemeteries at the Ontario Ministry of Consumer Services.

7.0 BIBLIOGRAPHY AND SOURCES

Chapman, L.J. and D.F. Putnam. 1984. *The Physiography of Southern Ontario*. Third Edition. Ontario Geological Survey. Special Volume 2. Toronto: Ontario Ministry of Natural Resources.

Ellis, Chris J. and Neal Ferris (editors). 1990. *The Archaeology of Southern Ontario to A.D. 1650*. Occasional Publication of the London Chapter, Ontario Archaeological Society, Number

Government of Ontario. 1990a. *Environmental Protection Act*, R.S.O. 1990, CHAPTER O.18. Last amendment: 2009, c. 33, Sched. 11, s. 6. Electronic document: http://www.ontario.ca/laws/statute/90e19. Last accessed August 26, 2015.

Government of Ontario. 1990b. *Ontario Heritage Act*, R.S.O. 1990, CHAPTER O.18. Last amendment: 2009, c. 33, Sched. 11, s. 6. Electronic document: http://www.ontario.ca/laws/statute/90o18. Last accessed August 26, 2015.

Government of Ontario. 2009. *The Green Energy Act*, S.O. 2009, Chapter 12, Schedule A. Last amendment: 2011, c.9, Sched. 27, s.27. Electronic document: http://www.ontario.ca/laws/statute/09g12. Last accessed August 26, 2015.

Government of Ontario. 2011a. *Ontario Regulation 359/09: Renewable Energy Approval Under Part V.0.1 of the Act*. Electronic document: https://www.ontario.ca/laws/regulation/090359. Last accessed August 26, 2015.

Government of Ontario. 2011b. *Standards and Guidelines for Consultant Archaeologists*. Toronto: Ministry of Tourism, Culture and Sport.

Government of Ontario. n.d. *Archaeological Sites Database Files*. Toronto: Archaeology Programs Unit, Ministry of Tourism, Culture and Sport.

Konrad, Victor. 1981. An Iroquois Frontier: The North Shore of Lake Ontario during the Late Seventeenth Century. *Journal of Historical Geography* 7(2): 129-144.

Morris, J.L. 1943. *Indians of Ontario*. 1964 reprint. Toronto: Department of Lands and Forests, Government of Ontario.

Page, H.R. and Co. 1876. *Illustrated Historical Atlas of the Counties of Lincoln and Welland, Ont.* Toronto: H.R. Page and Co.

Page, H.R. and Co. 1879. *Illustrated Historical Atlas of the County of Haldimand, Ont.* Toronto: H.R. Page and Co.

Praxis Research Associates. n.d. *The History of the Mississaugas of the New Credit First Nation.* Hagersville: Lands, Research and Membership, Mississaugas of the New Credit First Nation.

Schmalz, Peter S. 1991. *The Ojibwa of Southern Ontario*. Toronto: University of Toronto Press.

Stantec Consulting Ltd. 2012. *Niagara Region Wind Farm Stage 1 Archaeological Assessment, Various Lots, Concession 1-6 Gainsborough Township, Concession 7-10 Clinton Township, Regional Municipality of Niagara and Various Lots, Moulton Township, Haldimand County.* Report on file with the Ministry of Tourism, Culture and Sport, Toronto.

Stantec Consulting Ltd. 2013. *Niagara Region Wind Project Final Stage 2 Archaeological Assessment, Various Lots, Concession 1-6 Gainsborough Township, Concession 7-10 Clinton Township, Regional Municipality of Niagara and Various Lots, Moulton Township, Haldimand County.* Report on file with the Ministry of Tourism, Culture and Sport, Toronto.

Wicklund, R.E. and B.C. Matthews. 1963. *The Soil Survey of Lincoln County.* Report No. 34 of the Ontario Soils Survey. Guelph: Department of Agriculture and the Ontario Agricultural College.

Wilson, J.A. and M. Horne 1995. *City of London Archaeological Master Plan*. London: City of London, Department of Planning and Development.

8.0 IMAGES

8.1 PHOTOGRAPHS

Photo 1: Stage 2 Test Pit Survey at Five Metre Intervals at Access Road T11/T12, Facing Northwest

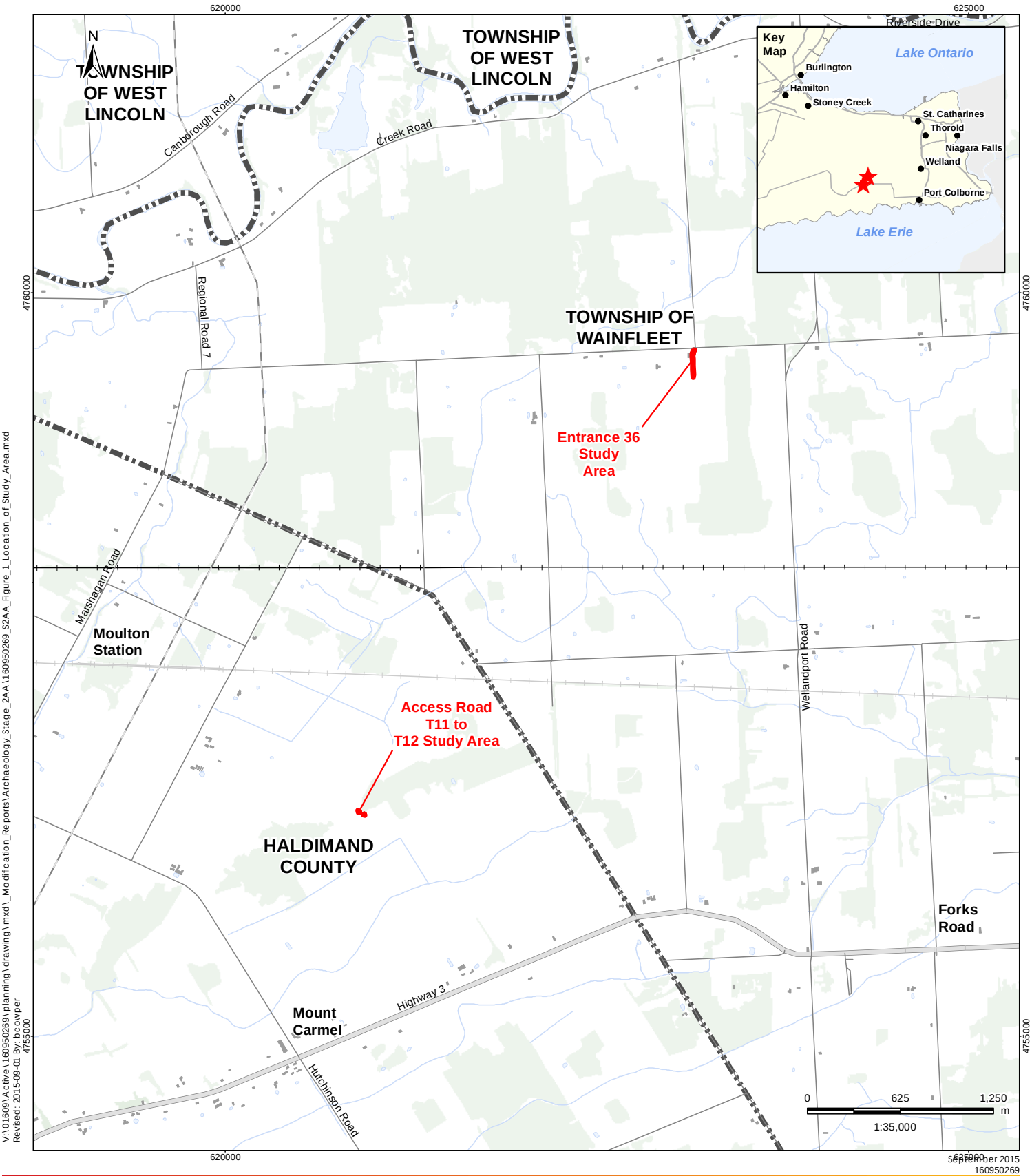
Photo 2: Stage 2 Test Pit Survey at Five Metre Intervals at Access Road T11/T12, Facing Southeast

Photo 3: Stage 2 Test Pit Survey at Five Metre Intervals at Entrance 36, Facing Southwest

Photo 4: Example of Test Pit at Entrance 36, Facing South

9.0 MAPS

All maps will follow on succeeding pages.



Stantec

Legend

- Study Area
- Road
- Expressway / Highway
- Active Railway
- Abandoned Railway
- Existing Structures
- Existing Transmission Line
- Watercourse
- Waterbody
- Wooded Area
- Municipality Lower Tier

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2013.

Client/Project

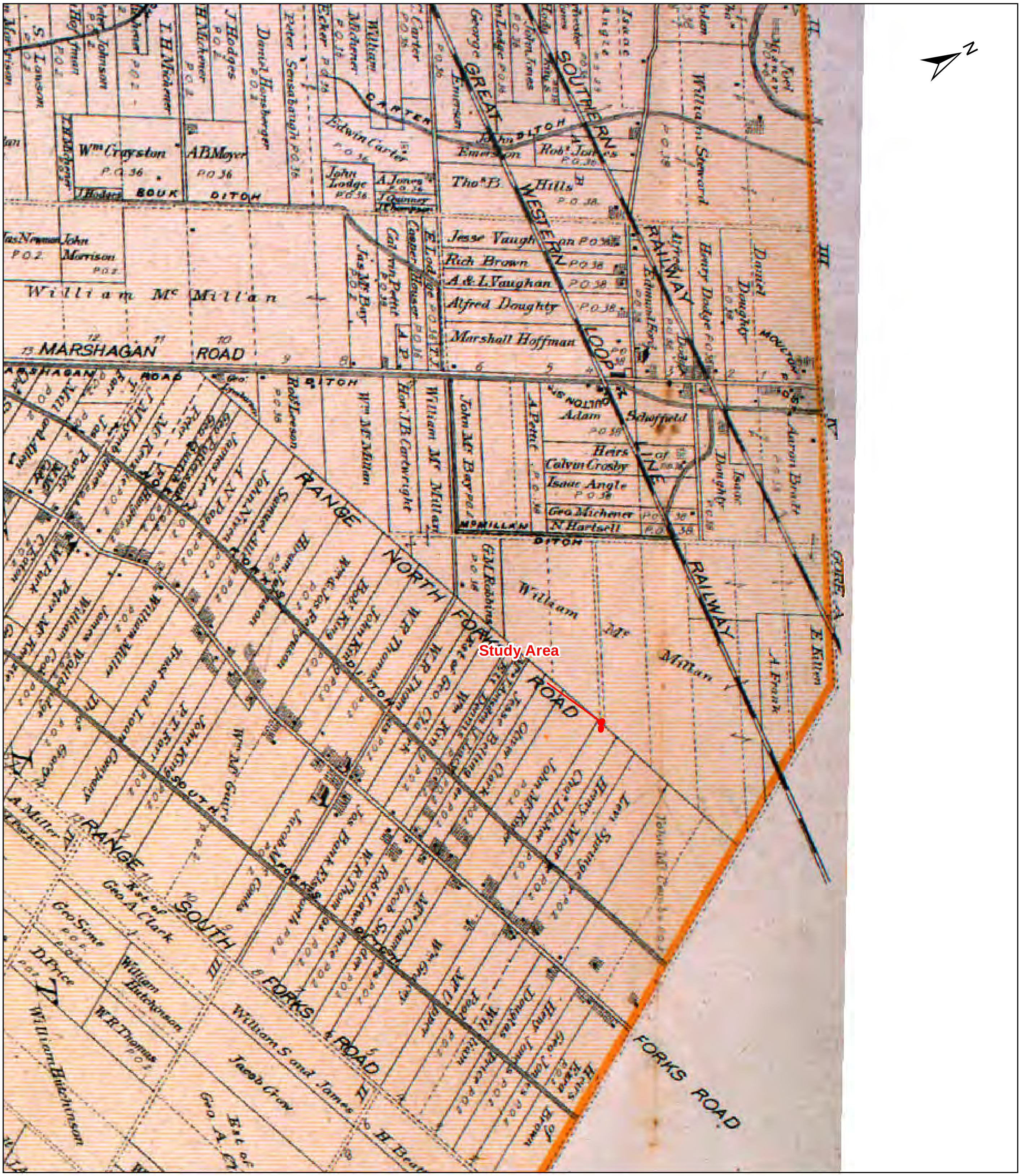
Niagara Region Wind Corporation
Niagara Region Wind Farm
Stage 2 Archaeological Assessment

Figure No.

1

Title

Location of Study Area



V:\01609\Active\160950269\planning\drawing\mxd_Modification_Reports\Archaeology_Stage_2AA\160950269_S2AA_Figure_2_Portion_Map_of_Township_Moulton_T11_to_T12.mxd
Revised: 2015-09-01 By: bcowper

September 2015
160950269

Stantec

Legend

Study Area

Client/Project

Niagara Region Wind Corporation
Niagara Region Wind Farm
Stage 2 Archaeological Assessment

Figure No.

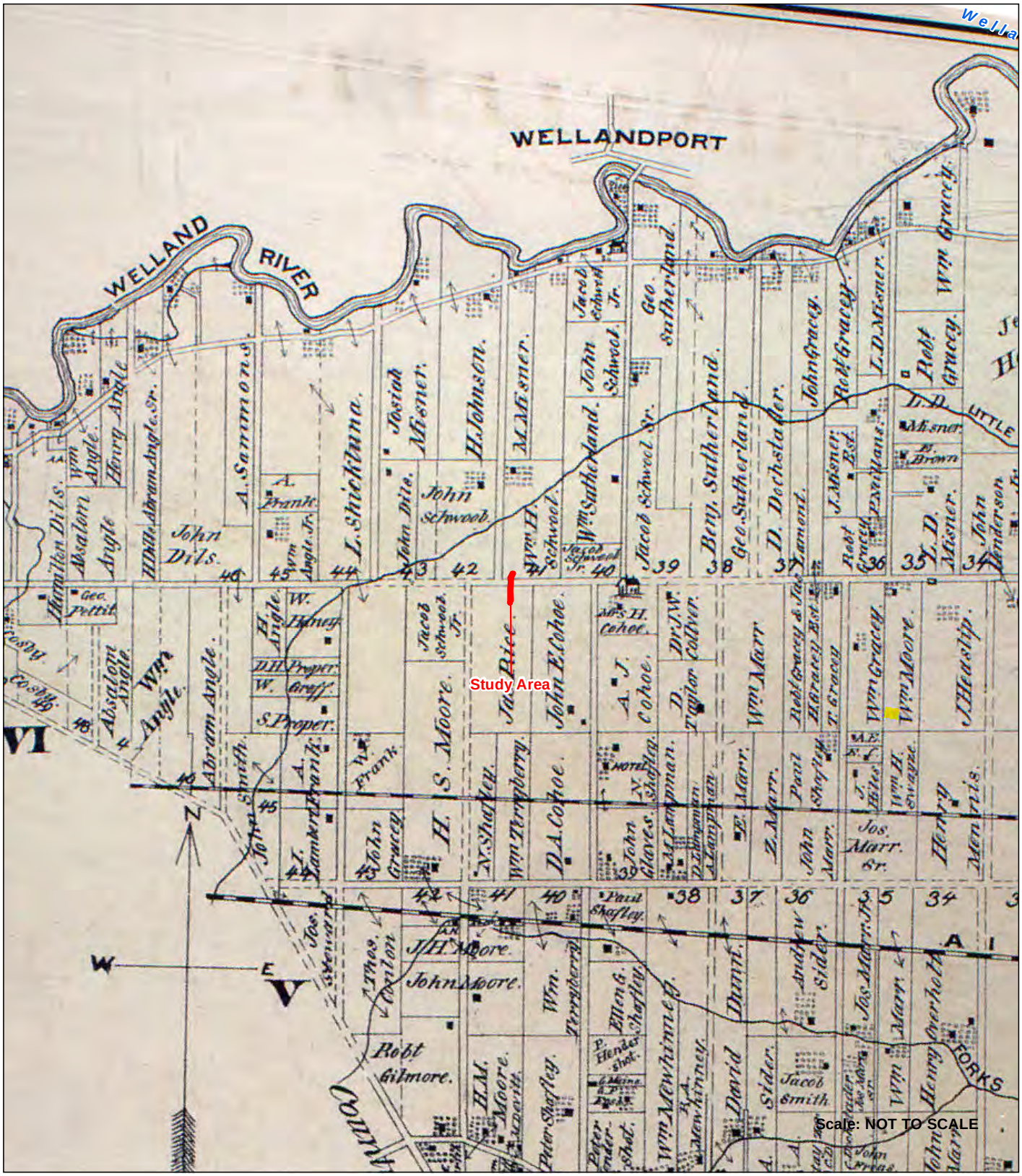
2

Title

Portion of 1879 Historic Atlas Map of the Township of Wainfleet

Notes

1. Historic Map reference: Illustrated Historical Atlas of the County of Haldimand, Ont. Toronto: H.R. Page & Co., 1879.
2. Not Scale.



V:\01609\Active\160950269\planning\drawing\mxd_Modification_Reports\Archaeology_Stage_2AA\160950269_S2AA_Figure_3_Portion_Map_of_Township_Wainfleet_Ent_36.mxd
Revised: 2015-09-01 By: bcowper

September 2015
160950269

Legend

Study Area

Notes

1. Historic Map reference: Page, H.R. and Co. 1876. Illustrated Historical Atlas of the Counties of Lincoln and Welland, Ontario. Toronto: H.R. Page and Co.
2. Not Scale.

Client/Project

Niagara Region Wind Corporation
Niagara Region Wind Farm
Stage 2 Archaeological Assessment

Figure No.

3

Title

Portion of 1876 Historic Atlas Map of the Township of Wainfleet

621000

4756500

SE18
Hofstede

SE110
Vanderknyff

T11

T12

1

2

N

0 30 60 m

1:1,500

September 2015
160950269

621000

4756500

V:\0160\Active\160950269\planning\drawing\mxd_Modification_Reports\Archaeology_Stage_2AA\160950269_S2AA_Figure_4-5_Stage2_Results.mxd
Revised: 2015-09-01 By: bcowper

Stantec

Notes

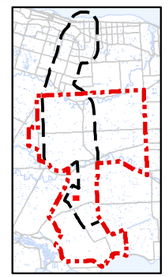
1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2013.
3. Orthoimagery © First Base Solutions, 20xx.

Legend

- Signed Property
- 120m Zone of Investigation
- Proposed Turbine Location
- Turbine Blade Length
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area

Stage 2 Archaeological Assessment

- Test Pitted at 5 metre Intervals
- Previously Assessed, 2012 (P002-289-2012)
- Photograph Location and Direction



Client/Project

Niagara Region Wind Corporation
Niagara Region Wind Farm

Figure No.

4

DRAFT

Title

Stage 2 Results
Access Road T11 to T12

623000

4759500

Sideroad 42 Road

Concession 6

3

4

SE47
Pennings

N

0 30 60 m

1:1,500

September 2015
160950269

623000

4759500

V:\01609\Active\160950269\planning\drawing\mxd_Modification_Reports\Archaeology_Stage_2AA\160950269_S2AA_Figure_4-5_Stage2_Results.mxd
Revised: 2015-09-01 By: bcowper

Stantec

Legend

- Signed Property
- 120m Zone of Investigation
- Preferred Transmission Line Route
- Collector Lines – Underground or Overhead
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area

Stage 2 Archaeological Assessment

- Test Pitted at 5 metre Intervals
- Previously Assessed, 2012 (P002-289-2012)
- Previously Disturbed, not Surveyed
- Photograph Location and Direction

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2013.
3. Orthoimagery © First Base Solutions, 20xx.

Client/Project

Niagara Region Wind Corporation
Niagara Region Wind Farm

Figure No.

5

DRAFT

Title

Stage 2 Results
Entrance 36

10.0 CLOSURE

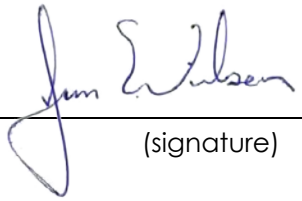
This report has been prepared for the sole benefit of Enercon Canada Inc. and may not be used by any third party without the express written consent of Stantec Consulting Ltd. and Enercon Canada Inc. Any use which a third party makes of this report is the responsibility of such third party.

We trust this report meets your current requirements. Please do not hesitate to contact us should you require further information or have additional questions about any facet of this report.

STANTEC CONSULTING LTD.

Technical Review  (signature)

Colin Varley, MA, RPA, Associate, Senior Archaeologist

Senior Review  (signature)

Jim Wilson, MA, Principal, Regional Discipline Lead, Archaeology

Appendix D:

Acoustic Assessment Report

Niagara Region Wind Farm
Acoustic Assessment Report – REA Amendment

File No. 160961052
–(160950269)

Prepared for:
FWRN LP
4672 Bartlett Road South
Beamsville, ON L0R 1B1

Prepared by:
Stantec Consulting Ltd.
300-675 Cochrane Drive, West Tower
Markham, ON L3R 0B8

February 05, 2016

Version Control

Noise Assessment Report – Niagara Region Wind Farm (230 MW), Ontario

VERSION	DATE	DESCRIPTION	PREPARED BY
1	November 2012	Noise Assessment report of NRWC 230 MW Wind energy project with substation transformers – prepared for Municipal submission	Stantec
2	December 2012	Updated Noise Assessment report of NRWC 230 MW Wind energy project with substation transformers – prepared for Public Release including comments from municipality	Stantec
3	April 2013	Prepared for Final submission to the MOE	Stantec
4	July 2013	Prepared for Final submission to the MOE – Appendix F with additional information added	Stantec
5	September 2013	Prepared for Final submission to the MOE with manufacturer data for 10 m/s wind speed added – Appendix F with additional information added	Stantec
6	May 2014	Prepared for Final submission to the MOE with receptor ID change as discussed with MOE – Appendix G with additional rational for Receptors included. Report also presents single option for wind turbine selection	Stantec
7	September 2014	Prepared for Final submission to the MOE with PORs O_1002, O_2922, O-856, O-986 moved to center of buildings and O_3139 and O-3142 designated as V_3139, V_3142 from all previous reports.	Stantec
8	October 2015	**REA Amendment:** Updated September 2014 (Included in the Final REA) report to include the following proposed changes: 1. The turbine model and tower height at 11 select locations resulting in all project turbines at 124 m hub height; 2. Update to the transformer barrier location based on detail engineering completed to date; and 3. Status change for POR 2550 from participating to non-participating (i.e. from P_2550 to O_2550) This report also serves as the supporting document for the proposed amendment application to reflect the above changes.	Stantec
9	February 2016	**REA Amendment: Info Request** Updated with response to MOE Info Requests #1, #2 and #3 (Appendix G5) and revisions to Table 6.3 and Appendix C.	Stantec

Table of Contents

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

Executive Summary

Stantec Consulting Ltd. has been retained by FWRN LP to update the Acoustic Assessment Report (updated AAR/2015 AAR) for the approved 230 MW wind energy generation facility (Approval number 4353-9HMP2R dated November 6, 2014) known as the Niagara Region Wind Farm (the Project).

The Project is located within the Townships of West Lincoln and Wainfleet and the Town of Lincoln within the Niagara Region and within Haldimand County in Southern Ontario, in response to the Government of Ontario's initiative to promote the development of renewable energy in the province. This updated AAR has been prepared in support of an application for an amendment to the above noted Renewable Energy Approval (REA) provided to the Project in accordance with Ontario Regulation 359/09.

This updated AAR is provided in support of the following changes:

- The turbine model at 11 locations will be changed to a customized E101 2.9 MW turbine with a hub height of 124 meters and a sound power level (SPL) of 102.9 dBA. This customized turbine model replaces 11 approved turbines, as follows:

    - Three (3) E82 2.3 MW with hub height 135 meters;
    - Six (6) E101 3MW with hub height 135 meters; and
    - Two (2) E101 3MW with hub height 124 meters;

- Update to the transformer barrier based on detailed engineering completed to date; and

- Status change for POR 2550 from participating to non-participating (i.e. from P_2550 to O_2550).

The Project will include the construction and operation of 77 ENERCON wind turbine generators (80 potential locations have been identified and assessed) each with a rated capacity ranging from approximately 2.9 MW to 3.0 MW with a maximum installed nameplate capacity of 230 MW. The selected wind turbine models for the Project are 69 x ENERCON E101 3.0 MW and 11 x customized ENERCON E101 2.9 MW G2/G3 models, all with a hub height of 124 m, to achieve the contract capacity of 230 MW (maximum capacity not to exceed 230 MW). The location of the turbines have not changed from the locations identified in the REA.

The proposed changes represents an improvement to the Project (turbine models with reduced sound power level; transformer barrier located closer to sources, and POR 2550 sound level reduces to levels below 40 dBA). Therefore, the acoustical effect of the proposed changes are considered minor.

This updated AAR was prepared in accordance with the requirements of the Ontario Ministry of the Environment guideline "*Noise Guidelines for Wind Farms"* (PIBs 4709e, October 2008).

The Project layout, the main noise sources and sound power levels were determined based on the information provided by planners and equipment manufacturers. The source sound power levels were used as inputs to a prediction model based on the ISO 9613 standard. The acoustic assessment considers operation under predictable worst-case operating conditions to quantify the noise emissions from the Project. The resulting sound levels at the sensitive points of reception were assessed for compliance against assessment criteria that were established following the guidelines provided in MOE publications *NPC-232* and PIBs 4709e.

The assessment considers the effects of two substation transformers, and 80 potential wind turbine generators (WTG) of which only 77 turbines would ultimately be constructed. Furthermore, this assessment presents a wind turbine layout consisting of 80 WTGs with 124 metre hub height. The assessment indicated that the noise contribution from the proposed project during the predictable worst case operation would meet the MOE noise criteria with the requirement for additional noise control for the substation transformers.

Additional information on turbine sound power data and rational for location and classification of some of the receptors previously included in the approved Noise Assessment Report (September 2014), which was included based on discussions with the MOE during the MOE technical review process and based on comments received through the 60-day EBR posting for this Project, remains in this report.

1.0 Introduction

Stantec Consulting Ltd. (Stantec) was retained by FWRN LP (FWRN) to update the acoustic assessment report (AAR) completed for REA Approval (Approval number 4353-9HMP2R dated November 6, 2014) for its proposed Niagara Region Wind Farm (the Project) with a rated generation capacity of 230 Megawatts (MW). FWRN (formally Niagara Region Wind Corporation) has approval to develop, construct, and operate the Project within the Townships of West Lincoln and Wainfleet and the Town of Lincoln within the Niagara Region and Haldimand County in Southern Ontario, in response to the Government of Ontario's initiative to promote the development of renewable energy in the province. This acoustic assessment considers the effects of the two proposed transformer substations and 80 potential wind turbine generators (WTG) of which only 77 turbines would ultimately be constructed. This report has been prepared as a supporting document for FWRN's application for amendment of the Renewable Energy Approval (REA) (Approval number 4353-9HMP2R dated November 6, 2014).

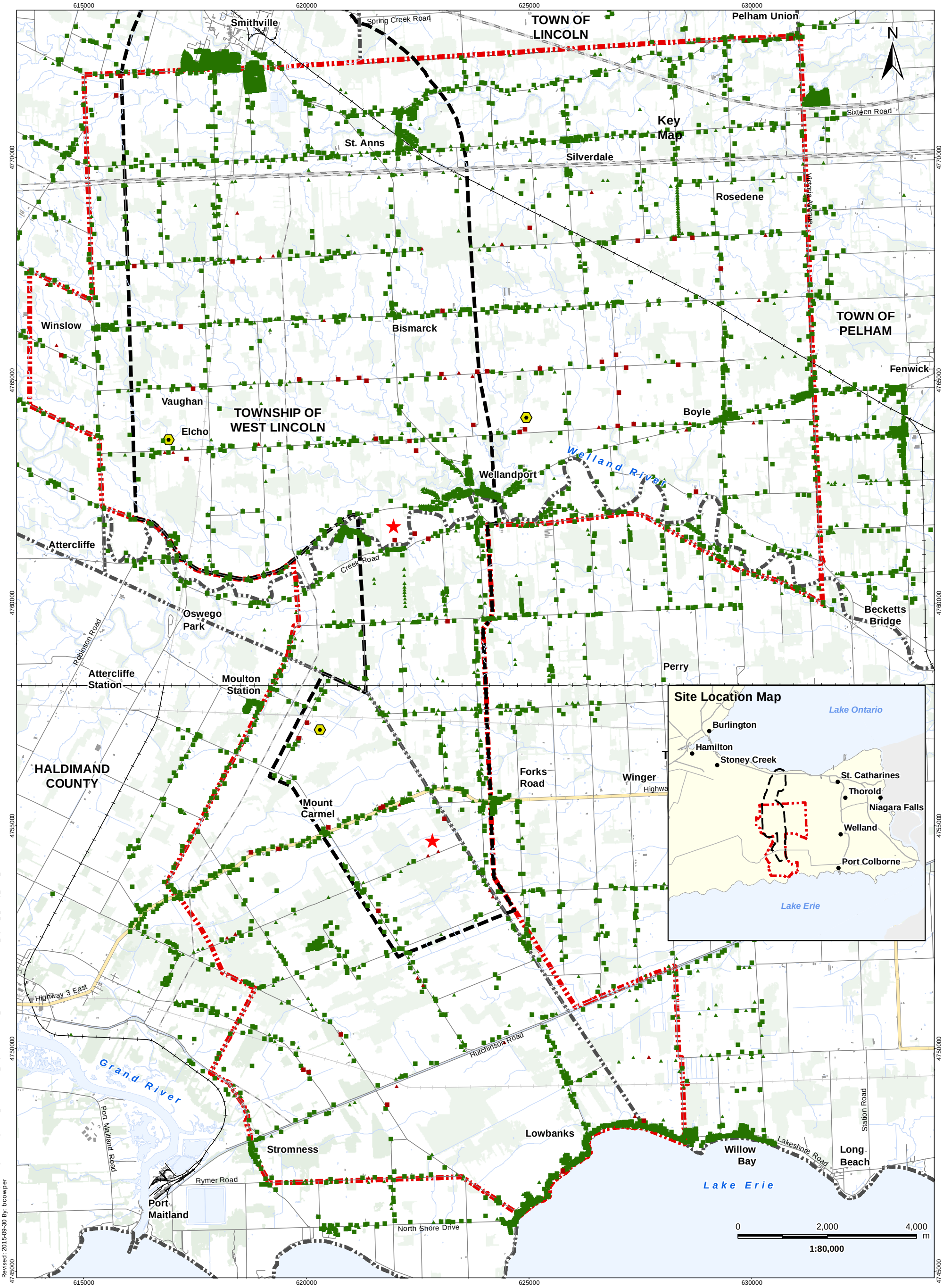
The Project study area covers approximately 27,727 ha. An area map showing the study area and sensitive Points of Reception (PORs) is provided in Figure 1.1. A zoning map of the area surrounding the Project is provided in **Appendix A**. The area's acoustical environment is best described as Class 3 (Rural) in accordance with the MOE publications NPC-232 and "*Noise Guidelines for Wind Farms"* (PIBs 4709e, October 2008). There are no notable changes in the above descriptions (i.e. study area extent, zoning, acoustical environment etc.) since approval in November 2014.

This updated acoustic assessment continue to consider the sound levels at 2670 receptors included in the REA application, which are located within approximately 1.5 km of the Project wind turbines. The receptors include all non-participating existing and vacant lot receptors as well as participating receptors as discussed further in Section 4.0.

1.1 BACKGROUND

The Ontario Regulation 359/09 (O.Reg. 359/09) made under *Environmental Protection Act*, Renewable Energy Approvals (REA) under Part V.0.1 of the Act, provides current approval requirements for renewable energy projects. The noise assessment of wind farms was previously assessed using O.Reg. 116/01 and are now assessed under O.Reg. 359/09.

According to the project classification guidelines provided under Section 2(6) of O.Reg. 359/09, the Project is classified as a Class 4 wind facility, where: no part of a wind turbine will be located in direct contact with surface water other than in a wetland; the facility has a name plate capacity greater than 50 kW; and, the greatest sound power level is greater than or equal to 102 dBA. Section 54 of O.Reg. 359/09 requires that noise studies be conducted for Class 4 wind facilities in accordance with PIBs 4709e and subsequent amendments. An assessment meeting the above noted requirements and approval was obtained (Approval number 4353-9HMP2R dated November 6, 2014). This updated AAR continues to meet the above noted requirements.



V:\01609\Active\160950269\planning\drawing\mxd_Modification_Reports\Acoustic_Assessment\160950269_Figure_1_Study_Area_Overview.mxd
Revised: 2015-09-30 By: bcowper

September 2015
160950269

Stantec

Notes
1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2011.

Legend

- Project Study Area
- Interconnector Study Area
- Transformer Substation
- Tap-in Location
- Existing Met Tower
- Road
- Expressway / Highway
- Active Railway
- Abandoned Railway
- Existing Structures
- Existing Transmission Line
- Watercourse
- Waterbody
- Wooded Area
- Municipality Lower Tier

Participating Noise Receptors
- Occupied
- Vacant

Non-participating Noise Receptors
- Occupied
- Vacant

Client/Project
FWRN LP
Niagara Region Wind Farm
Acoustic Assessment Report

Figure No.
1.1

Title
Study Area Overview

2.0 Project Description

2.1 PROJECT LOCATION

REA approval was granted by the MOECC to develop, construct, and operate the 230 MW Niagara Region Wind Farm (the Project) within the Townships of West Lincoln and Wainfleet and the Town of Lincoln within the Niagara Region and Haldimand County in Southern Ontario. The Project Study Area is centred in the Townships of West Lincoln and Wainfleet as shown in Figure 1.1.

The predominant land-use in the Project Study Area is generally agricultural. The proposed wind turbine locations and PORs considered as part of the REA approval and this amendment are provided in **Appendix B** and Figure 2.1

2.2 PROJECT DETAILS

The basic components of the Project include 77 wind turbine generators (80 potential locations identified) each with a rated generation capacity ranging from approximately 2.9 MW to 3.0 MW, for a maximum installed nameplate capacity of 230 MW. An overhead and/or underground collection system connects each turbine to one of two transformer substations via a series of 34.5 kilovolt (kV) collection lines. Turbines are grouped into nine (9) collector circuits that bring power (and data via fibre optic lines) to one of the transformer substations. Voltage is stepped up from 34.5kV to 115kV at each transformer substation by means of a 90 MVA base-rated transformer at the north sub-station and a 69 MVA transformer at the south sub-station, each with two stages of cooling. A 115kV transmission line transports power from each of the two transformer substations north to the grid tap-in location, where the Project is connected to the Hydro One Networks Inc. (HONI) owned transmission line, south of the Queen Elizabeth Way (QEW) in the Town of Lincoln. Power generated from this Project will be conveyed along the existing HONI transmission line to the Beach Transformer Station in Hamilton.

2.3 PROJECT WIND TURBINE GENERATORS

The Project will include 77 ENERCON wind turbine generators (80 potential locations identified) each with a rated capacity ranging from approximately 2.9 MW to 3.0 MW with a maximum installed nameplate capacity of 230 MW.

The selected wind turbine models for the Project are the ENERCON E101 3.0 MW and customized ENERCON E101 2.9 MW G2/G3 models achieve the contract capacity of 230 MW (maximum capacity not to exceed 230 MW). Specifications of the E101 3.0 MW and customized ENERCON E101 2.9 MW G2/G3 model turbines are summarized below in Table 2.1.

Table 2.1 Basic Wind Turbine Specifications

Manufacturer	ENERCON[2]	ENERCON[2]
Model	E101	E101 2.9 MW G2/G3
Name plate capacity (MW)	3.0 MW	2.9 MW
Hub height above grade	124 m	124 m
Blade length	48.6m	48.6 m
Rotor diameter	101 m	101 m
Blade sweep area	8,012 m^2	8,012 m^2
Rotational Speed	Variable, 4 – 14.5 rpm	4 – 14.5 rpm
Noise Emission Power Level[1]	104.8 dBA (referenced to 10^{-12} Watts)	102.9 dBA (referenced to 10^{-12} Watts)
Output Electrical Frequency	50 Hz or 60 Hz	50 Hz or 60 Hz

[1] test data from an independent consultant for the Enercon customized E101 2.9 MW G2/G3 and E101 3.0 MW models are provided in Appendix D for operating windspeed.

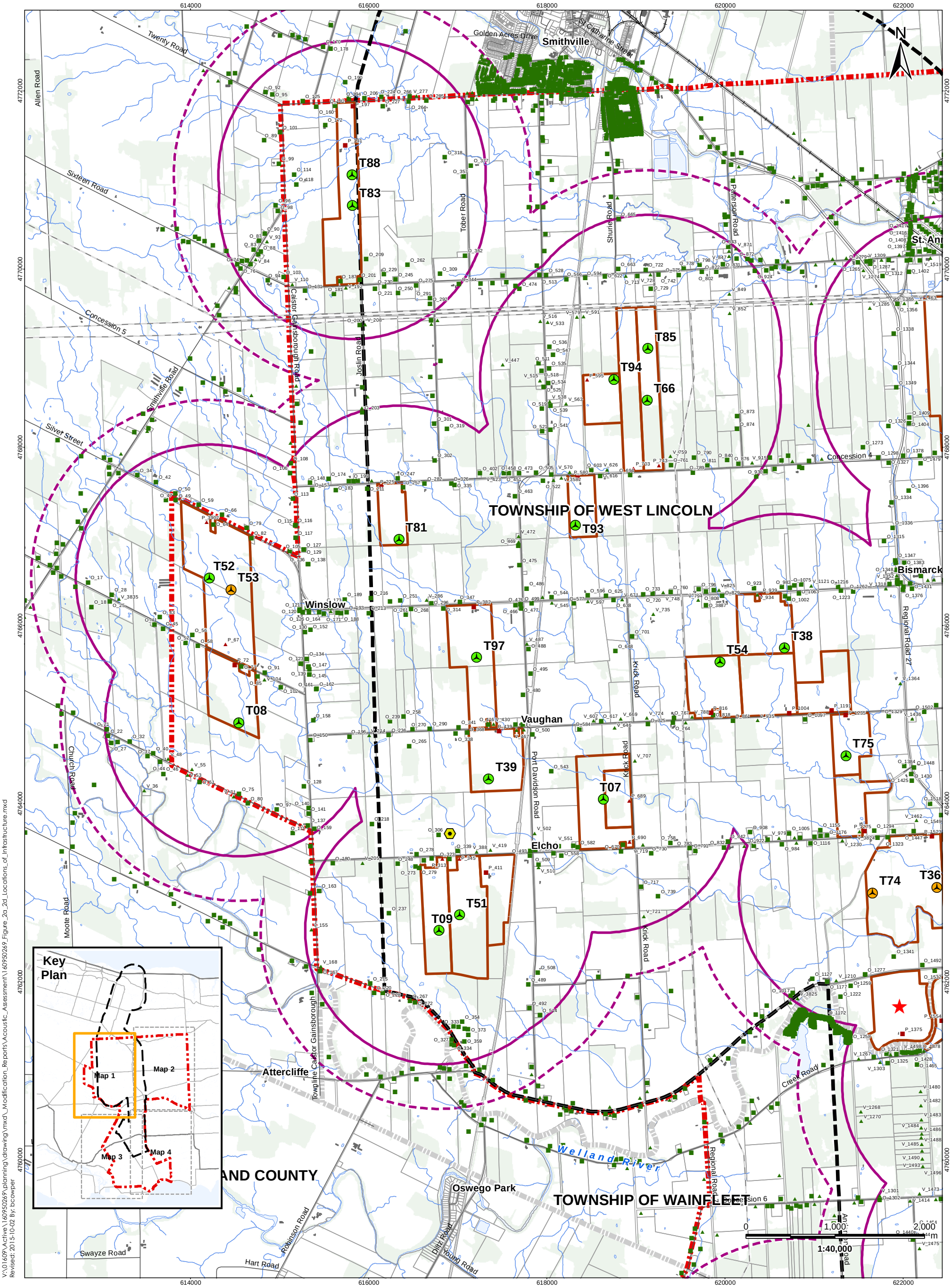
[2] Additional information on sound power data from Enercon dated April 15, 2014 for E101 3.0 MW and dated May 05, 2015 for customized E101 2.9 MW G2/G3 included in Appendix G

2.4 OPERATION SCENARIO

The wind farm will operate throughout the year during the daytime and night-time hours when favorable wind conditions exist. The facility is expected to operate 7 days a week throughout the year. A project layout diagram is included in **Appendix B**. The noise emissions for the layout shown in Figure 2.1 were assessed for hub heights of 124 m as follows:

Among the 80 WTGs, 11 will be ENERCON E101 2.9 MW G2/G3 turbine model and 69 will be ENERCON E101 3.0 MW model. All turbines will have a hub height of 124 m.

The REA, including the previous submission of the NAR (Stantec, September 2014), included turbines proposed at different hub heights (i.e. 124 m and 135 m). However, the amended project design proposes that all WTGs will be at a tower height of 124 metres. As such, the above noted operation scenario has have been assessed (as listed in Table 3.5).



V:\01609\Active\160950269\planning\drawing\mxd_Modification_Reports\Acoustic_Assessment\160950269_Figure_2a_2d_Locations_of_Infrastructure.mxd
Revised: 2015-10-02 By: bcowper

Stantec

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2012.
3. Scenario 1 – T36, T46, T53 are E82 model at hub height 135 metre; T18, T45, T47, T55, T60 and T74 are E101 model at hub height 135 metre and the rest are E101 model at hub height 124 metre.
   Scenario 2 - T36, T46, T53 are E82 model at hub height 135 metre; and the rest are E101 model at hub height 135 metre.

Legend

- Project Study Area
- Interconnector Study Area
- Proposed Turbine Location - E101 3.0 MW
- Proposed Turbine Location - E101 2.9 MW G2/G3
- Transformer Substation
- Tap-in Location
- Existing Met Tower
- 1.5 km Radius from Proposed Turbine Centre Point
- 2km Radius from Proposed Turbine Centre Point
- Road
- Expressway / Highway
- Active Railway
- Abandoned Railway
- Existing Transmission Line
- Existing Structures
- Watercourse
- Waterbody
- Wooded Area
- Municipal Boundary

Participating Noise Receptors
- Occupied
- Vacant

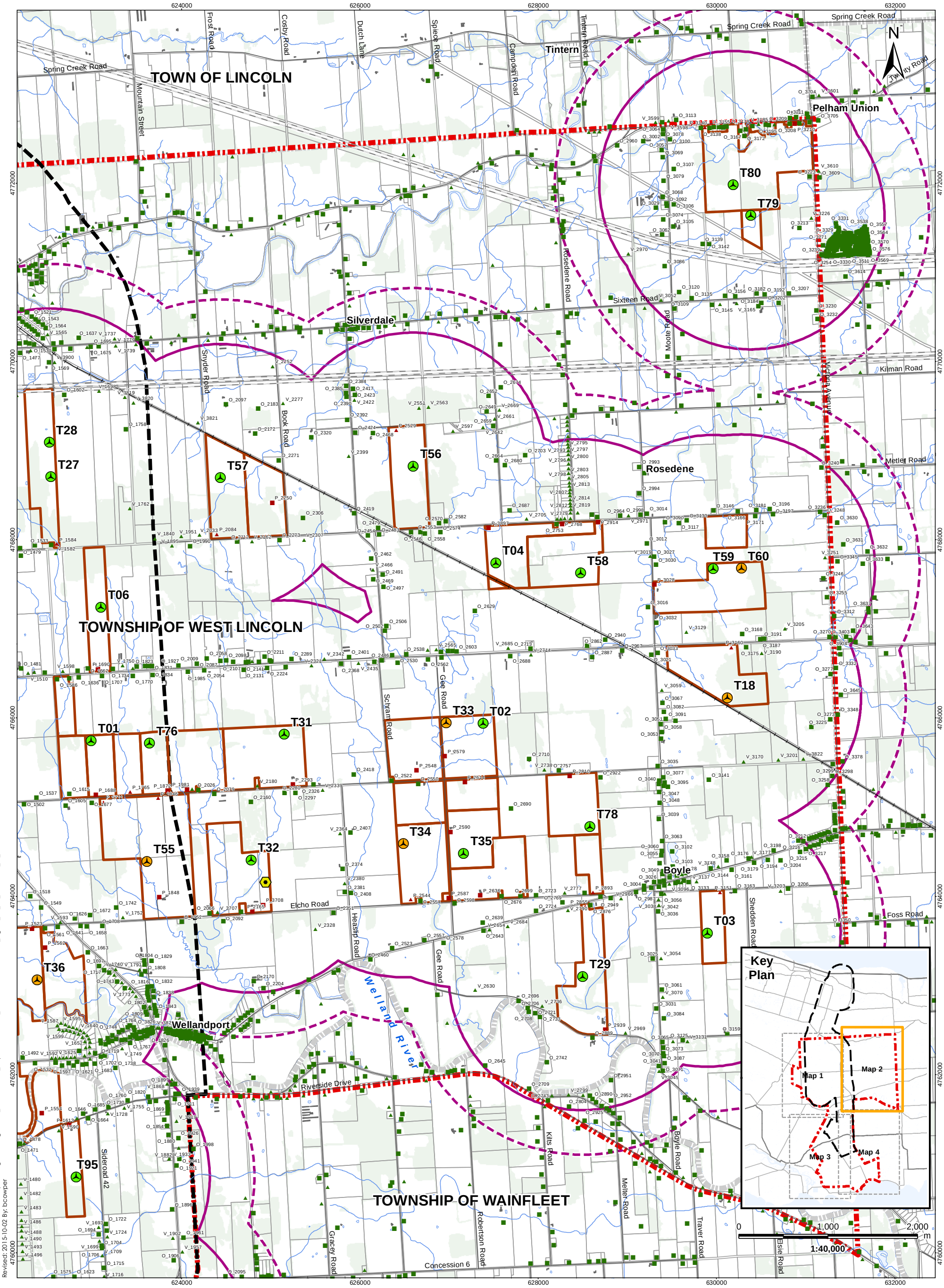
Non-participating Noise Receptors
- Occupied
- Vacant

Client/Project
FWRN LP
Niagara Region Wind Farm
Acoustic Assessment Report

October 2015
160950269

Figure No.
2.1a

Title
Locations of Project Infrastructure within Study Area: Map 1 of 4



V:\01609\Active\160950269\planning\drawing\mxd_Modification_Reports\Acoustic_Assessment\160950269_Figure_2a_2d_Locations_of_Infrastructure.mxd
Revised: 2015-10-02 By: bcowper

Stantec

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2012.
3. Scenario 1 – T36, T46, T53 are E82 model at hub height 135 metre; T18, T45, T47, T55, T60 and T74 are E101 model at hub height 135 metre and the rest are E101 model at hub height 124 metre.
   Scenario 2 - T36, T46, T53 are E82 model at hub height 135 metre; and the rest are E101 model at hub height 135 metre.

Legend

- Project Study Area
- Interconnector Study Area
- Proposed Turbine Location - E101 3.0 MW
- Proposed Turbine Location - E101 2.9 MW G2/G3
- Transformer Substation
- Tap-in Location
- Existing Met Tower
- 1.5 km Radius from Proposed Turbine Centre Point
- 2km Radius from Proposed Turbine Centre Point
- Road
- Expressway / Highway
- Active Railway
- Abandoned Railway
- Existing Transmission Line
- Existing Structures
- Watercourse
- Waterbody
- Wooded Area
- Municipal Boundary

Participating Noise Receptors
- Occupied
- Vacant

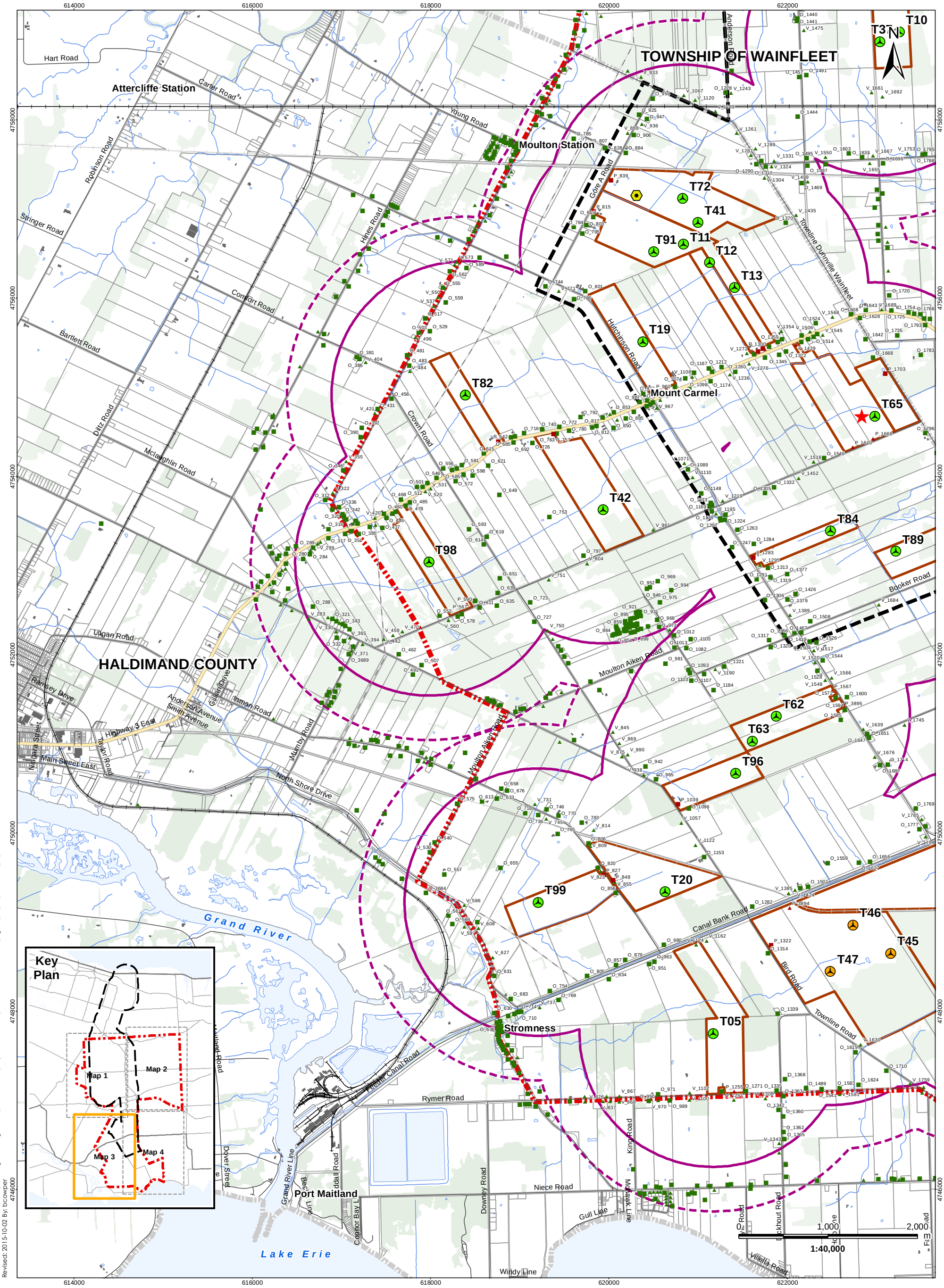
Non-participating Noise Receptors
- Occupied
- Vacant

Client/Project
FWRN LP
Niagara Region Wind Farm
Acoustic Assessment Report

October 2015
160950269

Figure No.
2.1b

Title
Locations of Project Infrastructure within Study Area: Map 2 of 4



V:\01609\Active\160950269\planning\drawing\mxd_Modification_Reports\Acoustic_Assessment\160950269_Figure_2a_2d_Locations_of_Infrastructure.mxd
Revised: 2015-10-02 By: bcowper

Stantec

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2012.
3. Scenario 1 – T36, T46, T53 are E82 model at hub height 135 metre; T18, T45, T47, T55, T60 and T74 are E101 model at hub height 135 metre and the rest are E101 model at hub height 124 metre.
   Scenario 2 - T36, T46, T53 are E82 model at hub height 135 metre; and the rest are E101 model at hub height 135 metre.

Legend

- Project Study Area
- Interconnector Study Area
- Proposed Turbine Location - E101 3.0 MW
- Proposed Turbine Location - E101 2.9 MW G2/G3
- Transformer Substation
- Tap-in Location
- Existing Met Tower
- 1.5 km Radius from Proposed Turbine Centre Point
- 2km Radius from Proposed Turbine Centre Point
- Road
- Expressway / Highway
- Active Railway
- Abandoned Railway
- Existing Transmission Line
- Existing Structures
- Watercourse
- Waterbody
- Wooded Area
- Municipal Boundary

Participating Noise Receptors
- Occupied
- Vacant

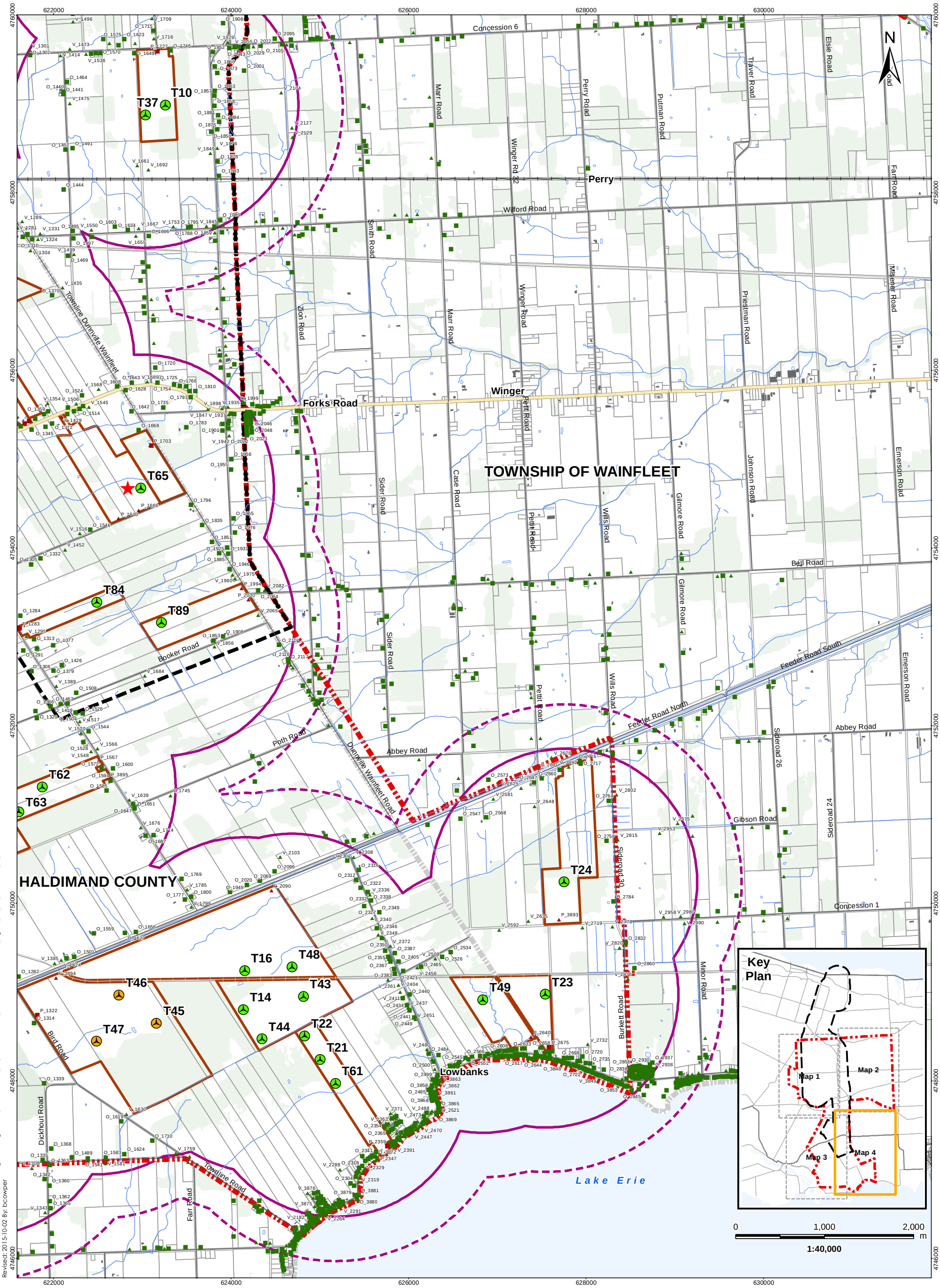
Non-participating Noise Receptors
- Occupied
- Vacant

October 2015
160950269

Client/Project
FWRN LP
Niagara Region Wind Farm
Acoustic Assessment Report

Figure No.
2.1c

Title
Locations of Project Infrastructure within Study Area: Map 3 of 4



V:\01609\Active\160950269\planning\drawing\mxd_Modification_Reports\Acoustic_Assessment\160950269_Figure_2a_2d_Locations_of_Infrastructure.mxd
Revised: 2015-10-02 By: bcowper

Stantec

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2012.
3. Scenario 1 – T36, T46, T53 are E82 model at hub height 135 metre; T18, T45, T47, T55, T60 and T74 are E101 model at hub height 135 metre and the rest are E101 model at hub height 124 metre.
   Scenario 2 - T36, T46, T53 are E82 model at hub height 135 metre; and the rest are E101 model at hub height 135 metre.

Legend

- Project Study Area
- Interconnector Study Area
- Proposed Turbine Location - E101 3.0 MW
- Proposed Turbine Location - E101 2.9 MW G2/G3
- Transformer Substation
- Tap-in Location
- Existing Met Tower
- 1.5 km Radius from Proposed Turbine Centre Point
- 2km Radius from Proposed Turbine Centre Point
- Road
- Expressway / Highway
- Active Railway
- Abandoned Railway
- Existing Transmission Line
- Existing Structures
- Watercourse
- Waterbody
- Wooded Area
- Municipal Boundary

Participating Noise Receptors
- Occupied
- Vacant

Non-participating Noise Receptors
- Occupied
- Vacant

Client/Project
FWRN LP
Niagara Region Wind Farm
Acoustic Assessment Report

October 2015
160950269

Figure No.
2.1d

Title
Locations of Project Infrastructure within Study Area: Map 4 of 4

3.0 Noise Source Summary

3.1 NOISE SOURCES

For the purpose of this Acoustic Assessment Report, the noise sources associated with the wind facility will consist of 80 WTGs (69 ENERCON E101 3.0 MW model and 11 customized E101 2.9 MW G2/G3 model), a 90 MVA transformer at the north substation and a 69 MVA transformer at the south substations. WTGs will operate throughout the year when wind conditions at hub height are within cut-in (2.5 m/s) and cut-out wind speeds (28 - 34 m/s). The noise sources associated with the WTGs were assessed for the scenario described in Section 2.4, and additional WTG specifications are provided in Table 2.1. The noise sources associated with both substation transformers were assessed at a height of 3.7 m at the identified locations. It was conservatively assumed that all equipment will operate at full rated capacity during the predictable worst case hour.

As discussed previously, eleven (11) of the turbines will be ENERCON customized E101 2.9 MW G2/G3 model and sixty-nine (69) will be ENERCON E101 3.0 MW model to meet the contractual requirements of the Project (maximum capacity not to exceed 230 MW).

Power is transferred from each turbine through an overhead and/or underground collection system to one of two transformer substations. Where two or more collector lines connect and continue as one collector line, a junction box or pad-mounted disconnect switch will be installed. These units are enclosed metal boxes approximately 2 m high, 3 m long and 2 m wide. There is no noise emission sources associated with the junction boxes.

The typical substation components include an isolation switch, circuit breakers, control and operation equipment. Transformers at both substations will be within confined boundaries. The transformer at the north substation will have a base rating of 90 MVA, while the transformer at the south substation will have a base rating of 69 MVA, both with two stages of cooling (via fan).

Noise emissions from the 90 MVA and 69 MVA transformers were identified by the design team to be less that the two 100 MVA transformers (100/133/166 ONAN/ONAF/ONAF MVA transformers). The more conservative noise emissions from the 100 MVA transformer approved for this Project were used for the purpose of updating the AAR. Consistent with the approved NAR (Stantec, September 2014), these noise emissions are assumed to have a distinct tonal character and were therefore assessed with a 5 dB penalty in the study.

At the transformer substations, voltage is stepped up from 34.5 kV to 115 kV. From the transformer substations, the power will be transferred via an overhead transmission line to interconnect with Hydro One Networks Inc's (HONI) transmission system at the tap-in location in the north end of the Interconnector Study Area. There are no noise sources associated with the collector and transmission lines.

Table 3.1 provides detailed sound emission data for the ENERCON E101 3.0 MW and customized E101 2.9 MW G2/G3 model WTGs and the corresponding test data from an independent consultant (KÖTTER Consulting Engineers for E101 3.0 MW model and T&H INGENIEURE GmnH for customized E101 2.9 MW G2/G3 model) engaged by the manufacturer (Enercon) is provided in Appendix D. Supplemental information confirming sound power data was provided by Enercon in April 2014 for E101 3.0 MW model and May 2015 for customized E101 2.9 MW G2/G3 model. These data have been included in Appendix D.

Table 3.2 provides the representative sound emission data from test data used in the analysis. Table 3.3 provides detailed sound emission data for the transformer substations. The noise sources for this Project are summarized in the Table 3.4 and illustrated in Figure 2.1. The UTM coordinates of each WTG and transformer substation are provided in Table 3.5 and Table 3.6. All sources are assumed to have continuous emissions when operating.

The sound power levels resulting from the operation of the transformers were estimated using the procedures outlined in the NEMA standard (NEMA PTR 1-1993 (R2000). The approximate size of the transformers (100/133/166 ONAN/ONAF/ONAF MVA) previously included in the REA approval was used to estimate the sound power level. This calculation can be found in Appendix D. The design team indicated that the base rate of the transformers would be 90 MVA and 69 MVA respectively (less than 100 MVA) with two stages of cooling. The transformer sound emission data provided in Table 3.3 is therefore considered conservative.

Table 3.1 Wind Turbine Sound Emission Summary

Make: ENERCON **Model: E101 3.0 MW** **Electrical Rating: 3MW** **Hub Height: 124 m** **Data Source: Enercon (Appendix D)**						
		Octave Band Sound Power Level (dB ref. 10^{-12} Watts)				
10m Height Wind Speed (m/s)		6[1]	7[1]	8[1]	9[1]	10[2]
Frequency (Hz)	63	111.3	112	112.4	112.3	112.5
	125	106.5	107.2	107.6	107.5	107.7
	250	106	106.7	107.1	107	107.2
	500	102.8	103.5	103.9	103.8	104.0
	1000	97.1	97.8	98.2	98.1	98.3
	2000	90.4	91.1	91.5	91.4	91.6
	4000	83.7	84.4	84.8	84.7	85.0
	8000	73.2	73.9	74.3	74.2	74.4
Overall (dBA ref. 10^{-12} Watts)		103.6	104.3	104.7	104.6	104.8
Make: ENERCON **Model: Customized E101 2.9 MW G2/G3** **Electrical Rating: 2.9 MW** **Hub Height: 124 m** **Data Source: Enercon (Appendix D)**						
		Octave Band Sound Power Level (dB ref. 10^{-12} Watts)				
10m Height Wind Speed (m/s)		6	7	8	9	10
Frequency (Hz)	63	109.2	111.1	111.9	109.9	109.9
	125	107.2	109.1	109.9	108.1	108.1
	250	103.7	105.6	106.4	104.7	104.7
	500	96.6	98.5	99.3	101.6	101.6
	1000	90.6	92.5	93.3	97	97
	2000	87	88.9	89.7	89	89
	4000	82.3	84.2	85	84.2	84.2
	8000	73.1	75	75.8	83	83
Overall (dBA ref. 10^{-12} Watts)		99.5	101.4	102.2.	102.9	102.9

[1] As per the data, overall sound power data is available from 6 m/s (corresponding to 1556 kW or approximately 53% of the rated power) to 8 m/s (corresponding to 2857 kW or approximately 97% of the rated power of 2.9 MW). As per the data, the maximum sound power level occurs at 9 m/s wind speed and corresponding spectral data is given in the data sheet. The spectral data for 6 m/s wind speed was obtained by scaling based on the overall data.

[2] No data was given previously for the 10 m/s wind speed since the turbine reaches 95% of rated power output at 8.3 m/s wind speed. For this model the attached test report indicates that the maximum sound power level occurs at 8.3 m/s wind speed and Enercon confirms that this level will not be exceeded. The maximum sound power level as provided from manufacturer was used (Appendix D, G). A wind shear adjusted sound data is provided in Appendix F.

Table 3.2 Highest Wind Turbine Sound Emission Corresponding to 95% or above Rated Electrical Output Power

Description	Octave Band Sound Power Level (dB ref. 10-12 Watts)								
Frequency [Hz]	**63**	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**	dB/dBA
ENERCON model E101 3.0 MW model at 8.3 m/s	112.5	107.7	107.2	104.0	98.3	91.6	85	74.4	113.9/ 104.8
ENERCON model E101 2.9 MW G2/G3 model at 9 m/s	83.7	92	96.1	98.4	97	90.2	85.2	81.9	113.3/ 102.9

Table 3.3 Substation Transformer Sound Emission Data

Description	Octave band center frequency [Hz]								
	63	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**	dB/dBA
100/133/166 ONAN/ONAF/ONAF MVA Transformers Sound power Levels [dB ref 10^{-12} watt]*	94	100	102	97	97	91	86	81	104.1/98.2

**A 5 dBA penalty was applied to transformer component of sound pressure level at each POR as discussed below. The transformers were revised to 90 MVA and 69 MVA, however data previously approved for 100 MVA was used in the model.*

Table 3.4 Noise Source Summary Table

Source ID	Source Type[1]	Source Description	Sound Power Level [dBA]	Source Location (I/O)[2]	Sound Characteristics[3, 5]	Noise Control Measures[4]
T18, T36, T45, T46, T47, T53, T55, T60, T74	P	ENERCON customized model E101 G2/G3 WTG	102.9	O	S	U
All Turbines except T18, T36, T45, T46, T47, T53, T55, T60, & T74	P	ENERCON model E101 WTG	104.8	O	S	U
ST1	P	90 MVA Transformer[6]	98(T)	O	T	B
ST2	P	69 MVA Transformer[6]	98(T)	O	T	B

1. P = Point Source V = Vertical Source VA = Vertical Area Source
2. Source Location: O = outside of building; I = inside of building
3. Sound Character, per NPC-104:
   - T= Tonal
   - C = Cyclical
   - S = Steady
   - Q = Quasi-Steady Impulsive
   - B = Buzzing
   - I = Impulsive
4. Noise Control Measures:
   - S = Silencer/Muffler
   - L = Lagging
   - A = Acoustic Lining, plenum
   - O = Other
   - U = Uncontrolled
   - B = Barrier
   - E = Acoustic Enclosure
5. Includes 5 dB penalty for tonality, for source marked with T
6. Previously used 100 MVA estimate data was used.

Table 3.5 Wind Turbine Locations

Turbine Identifier	Make and Model	Hub Height [m]	Location Coordinates (UTM 17 NAD 83)	
			X – Easting [m]	Y-Northing [m]
T01	ENERCON E101	124	622986	4765745
T02	ENERCON E101	124	627380	4765942
T03	ENERCON E101	124	629891	4763588
T04	ENERCON E101	124	627524	4767740
T05	ENERCON E101	124	621171	4747754
T06	ENERCON E101	124	623096	4767244
T07	ENERCON E101	124	618636	4764053
T08	ENERCON E101	124	614545	4764911
T09	ENERCON E101	124	616790	4762576
T10	ENERCON E101	124	623259	4758990
T11	ENERCON E101	124	620836	4756609
T12	ENERCON E101	124	621135	4756407
T13	ENERCON E101	124	621410	4756122

Table 3.5 Wind Turbine Locations

Turbine Identifier	Make and Model	Hub Height [m]	Location Coordinates (UTM 17 NAD 83)	
			X – Easting [m]	Y-Northing [m]
T14	ENERCON E101	124	624137	4748807
T16	ENERCON E101	124	624153	4749243
T18	E101 2.9 MW G2/G3	124	630123	4766229
T19	ENERCON E101	124	620380	4755516
T20	ENERCON E101	124	620627	4749341
T21	ENERCON E101	124	625004	4748242
T22	ENERCON E101	124	624829	4748510
T23	ENERCON E101	124	627540	4748974
T24	ENERCON E101	124	627752	4750239
T27	ENERCON E101	124	622535	4768708
T28	ENERCON E101	124	622517	4769096
T29	ENERCON E101	124	628498	4763100
T31	ENERCON E101	124	625150	4765821
T32	ENERCON E101	124	624781	4764410
T33	E101 2.9 MW G2/G3	124	626969	4765950
T34	E101 2.9 MW G2/G3	124	626486	4764591
T35	ENERCON E101	124	627164	4764483
T36	E101 2.9 MW G2/G3	124	622379	4763063
T37	ENERCON E101	124	623038	4758881
T38	ENERCON E101	124	620669	4765752
T39	ENERCON E101	124	617349	4764279
T41	ENERCON E101	124	620998	4756851
T42	ENERCON E101	124	619935	4753628
T43	ENERCON E101	124	624815	4748952
T44	ENERCON E101	124	624350	4748471
T45	E101 2.9 MW G2/G3	124	623160	4748650
T46	E101 2.9 MW G2/G3	124	622737	4748968
T47	E101 2.9 MW G2/G3	124	622483	4748447
T48	ENERCON E101	124	624687	4749283
T49	ENERCON E101	124	626836	4748915
T51	ENERCON E101	124	617020	4762752
T52	ENERCON E101	124	614215	4766531
T53	E101 2.9 MW G2/G3	124	614456	4766402
T54	ENERCON E101	124	619944	4765594
T55	E101 2.9 MW G2/G3	124	623610	4764393
T56	ENERCON E101	124	626599	4768825

Table 3.5 Wind Turbine Locations

Turbine Identifier	Make and Model	Hub Height [m]	Location Coordinates (UTM 17 NAD 83)	
			X – Easting [m]	Y-Northing [m]
T57	ENERCON E101	124	624435	4768696
T58	ENERCON E101	124	628473	4767629
T59	ENERCON E101	124	629964	4767676
T60	E101 2.9 MW G2/G3	124	630277	4767682
T61	ENERCON E101	124	625177	4747970
T62	ENERCON E101	124	621877	4751311
T63	ENERCON E101	124	621609	4751032
T65	ENERCON E101	124	622984	4754679
T66	ENERCON E101	124	619127	4768529
T72	ENERCON E101	124	620828	4757122
T74	E101 2.9 MW G2/G3	124	621656	4763002
T75	ENERCON E101	124	621357	4764543
T76	ENERCON E101	124	623640	4765719
T78	ENERCON E101	124	628581	4764783
T79	ENERCON E101	124	630384	4771637
T80	ENERCON E101	124	630186	4771984
T81	ENERCON E101	124	616343	4766967
T82	ENERCON E101	124	618390	4754915
T83	ENERCON E101	124	615821	4770715
T84	ENERCON E101	124	622487	4753393
T85	ENERCON E101	124	619136	4769108
T88	ENERCON E101	124	615816	4771059
T89	ENERCON E101	124	623216	4753160
T91	ENERCON E101	124	620504	4756521
T93	ENERCON E101	124	618324	4767127
T94	ENERCON E101	124	618752	4768764
T95	ENERCON E101	124	622817	4760851
T96	ENERCON E101	124	621423	4750668
T97	ENERCON E101	124	617215	4765642
T98	ENERCON E101	124	617982	4753043
T99	ENERCON E101	124	619208	4749224

*Note: “ENERCON E101” refers to the ENERCON E101 3MW model turbine, as previously approved, while “E101 2.9 MW G2/G3” refers to the customized ENERCON E101 2.9 MW model turbine.

Table 3.6 Substation Transformer Locations

Transformer Identifier	Transformer Type	Height [m]	Location Coordinates (UTM 17 NAD 83)	
			X – Easting [m]	Y-Northing [m]
ST1	90 MVA Transformer	3.7	621960	4761728
ST2	69 MVA Transformer	3.7	622837	4754679

3.2 SOUND CHARACTER ADJUSTMENTS

The MOE guideline NPC-104 outlines that the sources with distinct sound characteristics are to be penalized in the assessment. In accordance with this guideline, the resulting noise emissions associated with transformers were penalized by 5 dB to account for potential hum from transformer coils.

3.3 CUMULATIVE EFFECTS

As per the guideline requirements, cumulative effects due to other existing or crystallized wind farms have been included in this assessment. Four other existing or proposed wind farms were identified and included as having components within 5.0 km of the project WTGs. Existing turbines within this setback include the Mohawk wind farm located to the south of the project and the Rosa Flora wind turbine to the west of the project. Wind energy projects currently in development (either proposed or approved) within the 5 km setback distance include the HAF Wind Energy project to the west of the Project, the Wainfleet wind energy project to the southeast and the Grand Renewable Energy Project to the southwest. Details of these projects are included in Table 3.7 and Table 3.8. Additional wind farms considered but not included in this assessment as they were outside of the required 5 km setback include the Byng Wind Project and the Summerhaven Wind Energy Centre.

Table 3.7 Adjacent Wind Farms within 5 km of the Project

Wind farm identifier	Existing/ Approved	Turbine Model	Number of Turbines	Number of Turbines within 5 km of the Project
Mohawk Wind Farm	Existing	V82-1.65 MW-Vestas	6	6
HAF Wind Energy	Proposed	V100 1.8 MW	5	5
Wainfleet Wind Energy	Proposed	V100 1.8 MW	5	5
Rosa Flora Turbine	Existing	PWE 650	1	1
Grand Renewable Energy Project	Proposed	SWT-2.221-101 Siemens	67	6

The following table provides the location and coordinates of the adjacent wind turbines that were considered in the noise assessment. The location (UTM coordinates), and the sound data were taken from reports and developers submittals (refer Appendix F for details).

Table 3.8 Assessed Noise Sources Associated with Adjacent or Proposed Wind Farms within 5 km

Source ID	Source Description	Sound Power Level [dBA]	UTM Coordinates		
			X [m]	Y [m]	Z [m]
HAF01	HAF01(HAF Wind Energy Project)	105	604702	4775503	95
HAF02	HAF02(HAF Wind Energy Project)	105	604889	4775137	95
HAF03	HAF03(HAF Wind Energy Project)	105	606276	4774896	95
HAF04	HAF04(HAF Wind Energy Project)	105	604359	4774307	95
HAF05	HAF05(HAF Wind Energy Project)	105	606208	4773395	95
MH01	Mohawk01(V82-1.65 MW-Vestas)	102	623355	4745400	80
MH02	Mohawk02(V82-1.65 MW-Vestas)	102	622632	4746480	80
MH03	Mohawk03(V82-1.65 MW-Vestas)	102	623974	4745737	80
MH04	Mohawk04(V82-1.65 MW-Vestas)	102	623297	4746604	80
MH05	Mohawk05(V82-1.65 MW-Vestas)	102	623047	4746843	80
MH06	Mohawk06(V82-1.65 MW-Vestas)	102	622661	4745529	80
WF01	WF01(Wainfleet Wind Energy Project)	105	631359	4751252	95
WF02	WF02(Wainfleet Wind Energy Project)	105	631758	4750750	95
WF03	WF03(Wainfleet Wind Energy Project)	105	631921	4750541	95
WF04	WF04(Wainfleet Wind Energy Project)	105	632750	4748389	95
WF05	WF05(Wainfleet Wind Energy Project)	105	632706	4748817	95
RF	Rosa Flora Turbine	103.5	615270	4756417	75
GREPT57	SWT-2.221-101 - Grand Renewable	105	614355	4748118	100
GREPT58	SWT-2.221-101 - Grand Renewable	105	614974	4747470	100
GREPT59	SWT-2.221-101 - Grand Renewable	105	614326	4747732	100
GREPT60	SWT-2.221-101 - Grand Renewable	105	614680	4748176	100
GREPT61	SWT-2.221-101 - Grand Renewable	105	614750	4747811	100
GREPT62	SWT-2.221-101 - Grand Renewable	105	614705	4747338	100

- Grand Renewable Locations and data are based on Noise Assessment report by Zephyr North dated July 11, 2011;
- Mohawk location is based on construction drawing (Appendix F) and manufacturer's data (Appendix F);
- HAF Wind Energy project Locations and data are based REA report package dated November 26, 2010;
- WainFleet Wind Energy Project is based on REA package dated November, 2010; and
- Rosa Flora: This is a single small turbine. The location is based on as built location and the sound data was taken as 103.5 dBA (slightly higher than a 2.3 MW E82 model turbine). This turbine is located approximately 3,500 metres away from NRWC's nearest turbine. In addition, this is a 650 kW turbine that does not feed into the Ontario grid (i.e. electricity is delivered directly into the Rosa Flora system). Therefore, the assumption is considered very conservative. This turbine is included for completeness.

4.0 Points of Reception

4.1 DEFINITION OF A POINT OF RECEPTION

Points of Reception (PORs) were categorized into four groups for the assessment:

1. Non-participating occupied receptors – an existing building or structure that contains one or more dwellings, an existing building or structure used for an institutional purpose (i.e., education facility, nursery, health care facility, place of worship), a campsite or campground;

2. Non-participating vacant lot receptors – a lot with no existing building or structure containing a dwelling or institutional facility (i.e. not currently used as a dwelling or institutional facility) but is zoned to permit a building which could be a dwelling or institutional facility;

3. Participating occupied receptors – an existing building or structure that contains one or more dwellings and is on the same legal property as proposed Project components; and,

4. Participating vacant lot receptors - a lot with no existing building or structure containing a dwelling or institution facility but is zoned to permit a building which could be a dwelling or institutional facility and is on the same legal property as proposed Project components.

Receptors were defined based on field verifications, review of parcel data, information from planners of respective Townships or Counties, and recent aerial imagery. Stantec undertook extensive field verification to validate existing occupied PORs. All non-participating and participating receptors within 2 km of the Project WTGs as of the date August 15, 2012, were identified as receptors in the September 2014 AAR report as per O.Reg 359/09 Section 54 (1.4). On August 15, 2012, the layout of the Project turbines and all receptors were crystallized through the publication of the WTG coordinates and receptors in a Draft Site Plan Report in local newspapers and online.

The PORs were provided with a unique numbering system in the form of X_### (e.g. P_2587). In this identification system the character X represents the following:

- **'O'** represents **non-participating occupied** receptors;
- **'V'** represents **non-participating vacant lot** receptors; and,
- **'P'** represents **participating occupied/vacant lot** receptors;

Whereas the numbers ### – represents a unique identification number for each receptor. Additional rational for individual receptors that were referenced in MOE and EBR comments are included in **Appendix G.**

The noise guideline (PIBs 4709) requires that PORs be identified on vacant lots that have been zoned by the local municipality to permit residential or similar noise-sensitive uses. The legal lot/parcel data were used to determine the lot boundaries and thereby identify all vacant lots within 2 km of the Project. All vacant lots were assigned a unique POR identification number. The points of assessment for vacant lots were chosen to match the local development patterns.

4.2 EXISTING POINTS OF RECEPTION

All non-participating PORs meet or exceed the minimum requirement of 550 metre setback requirement from the centre point of the WTGs. All receptors were modeled using a height of 4.5 meters. The type and coordinates of the receptors are summarized in **Appendix C**.

Figure 1.1 and Figure 2.1 show the locations of all PORs within 2 km of the WTGs as required by Section 6.1 of 4709e. As required by Section 6.4.1 of 4709e; the noise assessment considers the sound levels at the 2670 PORs within 1.5 km of the Project WTG locations as described below:

1. 2036 non-participating occupied receptors;
2. 539 non-participating vacant lot receptors; and
3. 95 participating occupied/vacant lot receptors.

Previously POR 2550 was considered as a participating receptor and was given identification P_2550. However, through detailed design, this receptor has been removed from the Project and is now considered a non-participating receptor, where the receptor ID has been changed to O_2550 (“occupied and non-participating”) and assessed in this AAR accordingly.

For the purposes of this report, the ten (10) representative non-participating receptors, which through modeling were predicted to have the highest sound levels as a result of the Project noise sources, were shown in the previous AAR (Stantec, September 2014) and are shown below. The locations of these ten (10) receptors are summarized in Table 4.1, and the results for the remaining modeled PORs are provided in **Appendix C**.

Table 4.1 Nearby Points of Reception

POR ID	Description	UTM Coordinates		POR Height (m)	Approximate Distance to Nearest Facility Turbine (m)	Nearest Facility Turbine ID
		X	Y			
O_1097	Existing occupied dwelling	620899	4764949	4.5	612	T75
O_1153	Existing occupied dwelling	621067	4749725		584	T20
O_1344	Existing occupied dwelling	621910	4768894		640	T28
O_1707	Existing occupied dwelling	623108	4766469		734	T01
O_2160	Existing occupied dwelling	624777	4765059		649	T32
O_2522	Existing occupied dwelling	626354	4765297		718	T34
O_2598	Existing occupied dwelling	627060	4763919		573	T35
O_2690	Existing occupied dwelling	627693	4764983		728	T35
O_2710	Existing occupied dwelling	627899	4765540		657	T02
O_3030	Existing occupied dwelling	629320	4767722		646	T59

5.0 Noise Assessment Criteria

5.1 MOE GUIDELINE LIMITS

As discussed, the Project and its surroundings are considered to be located in a Class 3 (Rural) acoustical environment. The sounds of the ambient environment are expected to be dominated by natural sounds with little road traffic and minimal industrial activities. There is an industrial facility located in Haldimand County (near Mohawk Wind Farm), which dominates its surroundings. However, noises from this industrial facility are not considered in this assessment.

Table 5.1 shows the performance limits for wind turbines in Class 3 areas as outlined in PIBs 4709e.

Table 5.1 Wind Turbine Sound Pressure Limits for Class 3 Area

Wind Speed at 10 m height [m/s]	4	5	6	7	8	9	10
Wind Turbine sound pressure limits [dBA]	40.0	40.0	40.0	43.0	45.0	49.0	51.0

The analysis also includes other requirements from this guideline such as a 5 dB penalty on transformer noise to account for tonality, and use of a ground absorption co-efficient of 0.7 as discussed further in Section 6.1. In addition, the guideline requires that all adjacent wind farm WTGs within 5 km of any Project WTG must be considered for cumulative effects in evaluating sound pressure levels. To assess noise levels for this Project, wind turbine noise emissions were assessed against the most restrictive sound pressure level limit of 40.0 dBA.

6.0 Impact Assessment

6.1 METHODOLOGY

A predictive analysis was performed using the commercially available software package CADNA/A, which implements a computerized version of the algorithms described in the ISO 9613 standard. The ISO 9613 model includes geometrical divergence (distance attenuation), barrier effects due to intervening structures, ground effects, atmospheric absorption, and topography. No shielding/barriers such as existing buildings other than the barriers recommended for the transformer substation were considered in the assessment.

All sound sources (turbines and transformers) that emit noise into the environment were modeled as point sources. Topography was included in the model; however, the study area is relatively flat and topography is not expected to have a significant influence on the results. No shielding or obstacles were included in the model other than the barriers recommended for the transformer substations.

The Facility and surrounding ground surfaces were modeled as a combination of reflective and absorptive as specified in the MOE guideline. The analysis utilizes a global ground sound absorption factor of 0.7. Considering the study area is generally agricultural in nature, the actual absorption factor is expected to be closer to 1.0.

Meteorological values as required by PIBs 4709e were used to initialize several parameters in the model. These included a temperature of 10 degrees Centigrade and a relative humidity of 70%. The calculations consider spectral values of the sound data in 1/1 octave bands between 63 Hz and 8000 Hz as discussed in Section 3. As per the requirements of PIBs 4709e, the atmospheric absorption coefficients shown in Table 6.1 were used.

Table 6.1 Atmospheric Absorption Coefficient (based on 10 degree Celsius and 70% Relative Humidity)

Octave band center frequency [Hz]	63	125	250	500	1000	2000	4000	8000
Recommended atmospheric absorption coefficient [dB/km]	0.1	0.4	1.0	1.9	3.7	9.7	32.8	117

As described in Section (Operation Scenario), this assessment considers all WTGs running at full rated capacity for one full hour irrespective of wind conditions. An example of the detailed model calculations is included in **Appendix E.**

6.2 RESULTS AND RECOMMENDATIONS

The modeled results (Project effects and cumulative effects) at the identified PORs during predictable worst case operation are provided in Table 6.2 for the selected PORs. For the remaining PORs, a similar table is included in **Appendix C**. The corresponding equivalent sound level contours are provided in Figure 6.1.

Compliance at nearby PORs was established using noise barriers for both of the two transformer substations (previously used 100 MVA data estimated was used). The detailed requirements for noise barriers are as follows:

1. Substation ST1 (100/133/166 ONAN/ONAF/ONAF MVA Transformer noise source modeled (instead of 90 MVA) at a height of 3.7m with UTM Coordinates 621960, 4761728) will require a four sided barrier of 4.5 metres in height above grade. Barrier corner coordinates are provided in Appendix F

2. Substation ST2 (100/133/166 ONAN/ONAF/ONAF MVA Transformer noise source modeled (instead of 69 MVA) at a height of 3.7m with UTM Coordinates 622837, 4754679) will require a two sided barrier of 4.5 metres in height above grade. This barrier should be placed on south and west side of the transformer and extended at least 2 meters beyond the transformer such that noise flanking is negligible. Barrier corner coordinates are provided in Appendix F.

The barrier could be constructed with a variety of different materials including masonry or composite materials provided that they meet electrical and fire safety requirements. The barriers should be constructed within a 2 metre setback from the transformers. The selected material should achieve a minimum surface density of 20 kilograms per square meter (kg/m^2). The barrier should be built considering environmental factors specific to the location such as wind load and snow load so that the barrier is durable and can be maintained with minimal effort. The barrier should be constructed without any gaps within or below its extent.

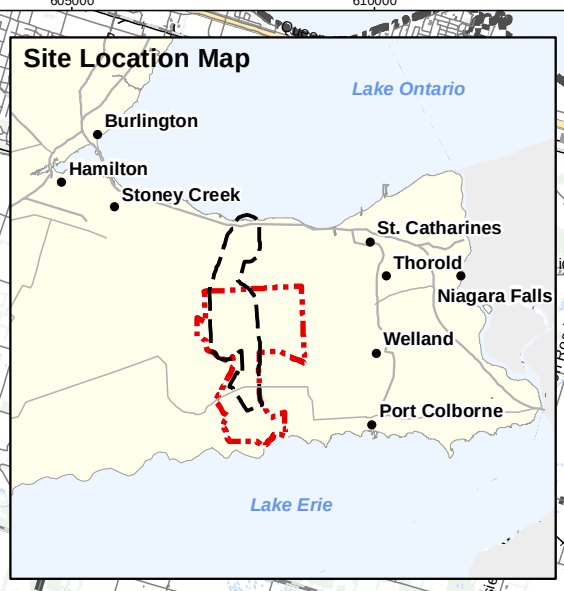
6.2.1 Project and Cumulative Effects

The project and cumulative effects were assessed and the results are shown in the following table. As discussed previously, cumulative effects due to other existing or crystallized wind farms have been included in this assessment. Four other existing or proposed wind farms were identified and included as having components within 5.0 km of the project receptors. Among the four only Mohawk Point Turbines have mutual PORs within 1.5 km from WTGs. A Noise Assessment Report for Mohawk Point Turbines is not available. Based on published locations, model and manufacturers data related to hub height and sound emissions, contributions with and without the Mohawk Point Turbines on mutual PORs were assessed and provided in Table 6.3.

Table 6.2 Noise Impact Assessment Summary Table*

POR ID	POR Description	Project Effects - Sound Level at POR (Leq, 4.5m)	Cumulative Effects - Sound Level at POR (Leq, 4.5m)	Performance Limit (Leq, dBA)	Compliance with Performance Limit? (Project/Cumulative)
O_1097	Existing occupied dwelling	40.0	40.0	40.0	Y/Y
O_1153	Existing occupied dwelling	39.9	39.9		Y/Y
O_1344	Existing occupied dwelling	40.0	40.0		Y/Y
O_1707	Existing occupied dwelling	39.9	39.9		Y/Y
O_2160	Existing occupied dwelling	39.8	39.8		Y/Y
O_2522	Existing occupied dwelling	238.9	38.9		Y/Y
O_2598	Existing occupied dwelling	39.6	39.6		Y/Y
O_2690	Existing occupied dwelling	39.7	39.7		Y/Y
O_2710	Existing occupied dwelling	39.6	39.6		Y/Y
O_3030	Existing occupied dwelling	39.6	39.6		Y/Y

* Results for all receptors are provided in **Appendix C.**



605000 610000 615000 620000 625000 630000 635000

4785000 4780000 4775000 4770000 4765000 4760000 4755000 4750000 4745000

N

Lake Ontario

TOWN OF GRIMSBY

TOWN OF LINCOLN

TOWNSHIP OF WEST LINCOLN

TOWN OF PELHAM

TOWNSHIP OF WAINFLEET

HALDIMAND COUNTY

Olive Street
Livingston Avenue
Main Street West
Main Street East
Lake Street
South Service Road
QEW Highway
Greenlane
John Street
Ridge Road East
Elm Tree Road West
Kemp Road West
Elmtree Road East
Kemp Road East
Mud Street
Regional Road 20
Young Street
Spring Creek Road
Fly Road
Fourth Avenue
Eighth Avenue
Pelham Road
Sixteen Road
Regional Road 20
Canboro Road
Welland Road
Foss Road
Webber Road
Riverside Drive
Forks Road
Highway 3
Concession 1
Lakeshore Road
Lake Erie
Grand River
Welland River
Silver Street
Caistorville Road
Smithville Road
Canborough Road
Dunnville Road
Highway 3
Haldimand Road 17
Haldimand Road 20
Haldimand Road 49
Rainham Road
Highway 3 East
Port Maitland Road
Rymer Road
Robinson Road
Church Road
Park Road South
Mountain Road
Russ Road
Grimsby Road
Thirty Road
Walker Road
Mountainview Road
Ontario Street
Bartlett Road
Sinn Road
Tufford Road
Merritt Road
Maple Grove Road
King Street
Quarry Road
Hillside Drive
Victoria Avenue
Nineteenth Street
Jordan Road
Glen Road
Mountain Road
Campden Road
Centre Street
Balfour Street
Cream Street
Mountain Street
Stevens Street
Grassie Road

0 2,000 4,000 m

1:125,000

V:\01609\Active\160950269\planning\drawing\mxd_Modification_Reports\Acoustic_Assessment\160950269_Figure_6_1_Predicted_Sound_Contours_124m_Hub.mxd
Revised: 2015-09-30 By: bcowper

Stantec

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2012.

Legend

- Project Study Area
- Interconnector Study Area
- Proposed Turbine Location - E101 3.0 MW
- Proposed Turbine Location - E101 2.9 MW G2/G3
- Transformer Substation
- Tap-in Location
- Existing Met Tower
- 5km Buffer from Proposed Turbine Locations
- Sound Level Contours (40 dBA)

- Road
- Expressway / Highway
- Active Railway
- Abandoned Railway
- Existing Structures
- Existing Transmission Line
- Waterbody
- Wooded Area
- Municipality Lower Tier

Participating Noise Receptors
- Occupied
- Vacant

Non-participating Receptors
- Occupied
- Vacant

Other Wind Turbines
- Mohawk Wind Farm (Existing)
- Rosa Flora Turbine (Existing)
- Wainfleet Wind Energy Project (Proposed)
- HAF Wind Energy Project (Proposed)
- Grand Renewable Energy Park (Proposed)
- Other Wind Farm Project (Proposed)

September 2015
160950269

Client/Project
FWRN LP
Niagara Region Wind Farm
Acoustic Assessment Report

Figure No.
6.1

Title
Predicted Equivalent Sound Level Contours (Cumulative Effects - Day/Nighttime Hours)

Table 6.3 Concordance Table for all adjacent wind farms - Scenario 1

POR UTM Coordinates		POR ID					Distance to nearest source (m)					Nearest Source ID					Level of Farm (dBA)					Level (dBA)
Easting (m)	Northing (m)	NRWC	MH	WF	RF	GREP	NRWC	MH	WF	RF	GREP	NRWC	MH	WF	RF	GREP	NRWC	MH	WF	RF	GREP	Total
621268	4747099	O_1215	not_avi	n/a	n/a	n/a	662.35637	1517.7486	>2000	>2000	>2000	T05	MH02	n/a	n/a	n/a	37.3	23.7	n/a	n/a	n/a	37.5
621537	4747106	O_1271	not_avi	n/a	n/a	n/a	743.62652	1283.8918	>2000	>2000	>2000	T05	MH02	n/a	n/a	n/a	36.6	25.7	n/a	n/a	n/a	36.9
621879	4747111	O_1335	not_avi	n/a	n/a	n/a	956.29911	1008.0841	>2000	>2000	>2000	T05	MH02	n/a	n/a	n/a	35.3	28.7	n/a	n/a	n/a	36.2
621901	4746889	O_1342	not_avi	n/a	n/a	n/a	1131.8035	859.50801	>2000	>2000	>2000	T05	MH02	n/a	n/a	n/a	34.0	30.1	n/a	n/a	n/a	35.5
621954	4746822	O_1360	not_avi	n/a	n/a	n/a	1217.4316	780.10949	>2000	>2000	>2000	T05	MH02	n/a	n/a	n/a	33.6	31.1	n/a	n/a	n/a	35.5
621958	4746643	O_1362	not_avi	n/a	n/a	n/a	1361.4849	708.51959	>2000	>2000	>2000	T05	MH02	n/a	n/a	n/a	32.7	31.9	n/a	n/a	n/a	35.3
621960	4747048	O_1363	not_avi	n/a	n/a	n/a	1058.6079	905.68931	>2000	>2000	>2000	T05	MH02	n/a	n/a	n/a	34.8	29.9	n/a	n/a	n/a	36.0
621967	4746565	O_1365	not_avi	n/a	n/a	n/a	1430.2415	683.23644	>2000	>2000	>2000	T05	MH02	n/a	n/a	n/a	32.3	32.2	n/a	n/a	n/a	35.3
621976	4747236	O_1368	not_avi	n/a	n/a	n/a	957.25414	1028.8564	>2000	>2000	>2000	T05	MH02	n/a	n/a	n/a	35.7	28.8	n/a	n/a	n/a	36.5
622210	4747133	O_1489	not_avi	n/a	n/a	n/a	1210.2272	807.09155	>2000	>2000	>2000	T05	MH02	n/a	n/a	n/a	34.7	31.7	n/a	n/a	n/a	36.5
622386	4747128	O_1541	not_avi	n/a	n/a	n/a	1322.7457	723.96275	>2000	>2000	>2000	T47	MH02	n/a	n/a	n/a	34.6	33.5	n/a	n/a	n/a	37.1
622589	4747138	O_1583	not_avi	n/a	n/a	n/a	1313.4629	596.84523	>2000	>2000	>2000	T47	MH05	n/a	n/a	n/a	34.6	35.5	n/a	n/a	n/a	38.1
622765	4747540	O_1619	not_avi	n/a	n/a	n/a	950.24082	808.19882	>2000	>2000	>2000	T47	MH05	n/a	n/a	n/a	36.7	31.4	n/a	n/a	n/a	37.8
622798	4747175	O_1624	not_avi	n/a	n/a	n/a	1310.2799	472.35075	>2000	>2000	>2000	T47	MH05	n/a	n/a	n/a	34.9	37.3	n/a	n/a	n/a	39.3
623113	4747328	O_1710	not_avi	n/a	n/a	n/a	1284.3238	534.79888	>2000	>2000	>2000	T47	MH05	n/a	n/a	n/a	35.9	35.7	n/a	n/a	n/a	38.8
624879	4746506	O_2191	not_avi	n/a	n/a	n/a	1493.5781	1187.959	>2000	>2000	>2000	T61	MH03	n/a	n/a	n/a	33.8	26.2	n/a	n/a	n/a	34.5
624935	4746736	O_2212	not_avi	n/a	n/a	n/a	1257.9161	1385.949	>2000	>2000	>2000	T61	MH03	n/a	n/a	n/a	35.2	24.9	n/a	n/a	n/a	35.6
624970	4746685	O_2226	not_avi	n/a	n/a	n/a	1301.2733	1375.2635	>2000	>2000	>2000	T61	MH03	n/a	n/a	n/a	34.9	24.8	n/a	n/a	n/a	35.3
624979	4746622	O_2231	not_avi	n/a	n/a	n/a	1362.9883	1338.5505	>2000	>2000	>2000	T61	MH03	n/a	n/a	n/a	34.5	25	n/a	n/a	n/a	35.0
624982	4746745	O_2234	not_avi	n/a	n/a	n/a	1240.3947	1425.3576	>2000	>2000	>2000	T61	MH03	n/a	n/a	n/a	35.2	24.5	n/a	n/a	n/a	35.6
624983	4746538	O_2236	not_avi	n/a	n/a	n/a	1445.2797	1287.9034	>2000	>2000	>2000	T61	MH03	n/a	n/a	n/a	34	25.2	n/a	n/a	n/a	34.5
624991	4746660	O_2239	not_avi	n/a	n/a	n/a	1322.9184	1373.7848	>2000	>2000	>2000	T61	MH03	n/a	n/a	n/a	34.7	24.7	n/a	n/a	n/a	35.1
624999	4746642	O_2243	not_avi	n/a	n/a	n/a	1339.5117	1367.3372	>2000	>2000	>2000	T61	MH03	n/a	n/a	n/a	34.6	24.8	n/a	n/a	n/a	35.0
625005	4746494	O_2245	not_avi	n/a	n/a	n/a	1486.1513	1278.8139	>2000	>2000	>2000	T61	MH03	n/a	n/a	n/a	33.7	25.2	n/a	n/a	n/a	34.3
625010	4746624	O_2248	not_avi	n/a	n/a	n/a	1356.3889	1363.9669	>2000	>2000	>2000	T61	MH03	n/a	n/a	n/a	34.5	24.7	n/a	n/a	n/a	34.9
625012	4746699	O_2249	not_avi	n/a	n/a	n/a	1282.0938	1415.1795	>2000	>2000	>2000	T61	MH03	n/a	n/a	n/a	34.9	24.5	n/a	n/a	n/a	35.3
625018	4746546	O_2251	not_avi	n/a	n/a	n/a	1433.0192	1320.9119	>2000	>2000	>2000	T61	MH03	n/a	n/a	n/a	34.0	24.9	n/a	n/a	n/a	34.5
625030	4746552	O_2256	not_avi	n/a	n/a	n/a	1425.832	1333.966	>2000	>2000	>2000	T61	MH03	n/a	n/a	n/a	34.0	24.8	n/a	n/a	n/a	34.5
625037	4746664	O_2257	not_avi	n/a	n/a	n/a	1313.394	1410.2851	>2000	>2000	>2000	T61	MH03	n/a	n/a	n/a	34.7	24.4	n/a	n/a	n/a	35.1
625041	4746506	O_2258	not_avi	n/a	n/a	n/a	1470.1881	1315.434	>2000	>2000	>2000	T61	MH03	n/a	n/a	n/a	33.8	24.9	n/a	n/a	n/a	34.3
625046	4746644	O_2260	not_avi	n/a	n/a	n/a	1332.4217	1404.4094	>2000	>2000	>2000	T61	MH03	n/a	n/a	n/a	34.6	24.4	n/a	n/a	n/a	35.0
625052	4746516	O_2261	not_avi	n/a	n/a	n/a	1459.6652	1329.8927	>2000	>2000	>2000	T61	MH03	n/a	n/a	n/a	33.8	24.8	n/a	n/a	n/a	34.3
625061	4746623	O_2263	not_avi	n/a	n/a	n/a	1351.6127	1402.6152	>2000	>2000	>2000	T61	MH03	n/a	n/a	n/a	34.5	24.4	n/a	n/a	n/a	34.9
625072	4746523	O_2267	not_avi	n/a	n/a	n/a	1450.8503	1350.245	>2000	>2000	>2000	T61	MH03	n/a	n/a	n/a	33.9	24.6	n/a	n/a	n/a	34.4
625072	4746597	O_2268	not_avi	n/a	n/a	n/a	1377.0759	1394.7902	>2000	>2000	>2000	T61	MH03	n/a	n/a	n/a	34.3	24.4	n/a	n/a	n/a	34.7
625088	4746586	O_2270	not_avi	n/a	n/a	n/a	1386.5268	1400.8735	>2000	>2000	>2000	T61	MH03	n/a	n/a	n/a	34.2	24.3	n/a	n/a	n/a	34.6
625104	4746559	O_2274	not_avi	n/a	n/a	n/a	1413.0437	1397.607	>2000	>2000	>2000	T61	MH03	n/a	n/a	n/a	34.1	24.2	n/a	n/a	n/a	34.5
625181	4746618	O_2282	not_avi	n/a	n/a	n/a	1352.4549	1493.7779	>2000	>2000	>2000	T61	MH03	n/a	n/a	n/a	34.3	23.5	n/a	n/a	n/a	34.6
625203	4746613	O_2283	not_avi	n/a	n/a	n/a	1357.4565	1509.0161	>2000	>2000	>2000	T61	MH03	n/a	n/a	n/a	34.3	23.4	n/a	n/a	n/a	34.6
625155	4746600	O_3873	not_avi	n/a	n/a	n/a	1369.8386	1462.817	>2000	>2000	>2000	T61	MH03	n/a	n/a	n/a	34.3	23.7	n/a	n/a	n/a	34.7
625126	4746569	O_3874	not_avi	n/a	n/a	n/a	1402.341	1420.7176	>2000	>2000	>2000	T61	MH03	n/a	n/a	n/a	34.1	24	n/a	n/a	n/a	34.5
621405	4747101	P_1255	not_avi	n/a	n/a	n/a	693.79611	1395.8	>2000	>2000	>2000	T05	MH02	n/a	n/a	n/a	37.0	24.7	n/a	n/a	n/a	37.2
621399	4747003	V_1251	not_avi	n/a	n/a	n/a	785.00583	1358.1888	>2000	>2000	>2000	T05	MH02	n/a	n/a	n/a	36.0	25	n/a	n/a	n/a	36.3
621755	4747019	V_1308	not_avi	n/a	n/a	n/a	938.92506	1051.991	>2000	>2000	>2000	T05	MH02	n/a	n/a	n/a	35.1	28	n/a	n/a	n/a	35.9
621908	4746516	V_1343	not_avi	n/a	n/a	n/a	1441.1541	734.74063	>2000	>2000	>2000	T05	MH02	n/a	n/a	n/a	32.1	31.5	n/a	n/a	n/a	34.8

622588	4747070	V_1581	not_avi	n/a	n/a	n/a	1380.9376	561.51313	>2000	>2000	>2000	T47	MH05	n/a	n/a	n/a	34.3	36.2	n/a	n/a	n/a	38.4
622823	4747628	V_1630	not_avi	n/a	n/a	n/a	886.71754	871.85478	>2000	>2000	>2000	T47	MH05	n/a	n/a	n/a	37.3	30.5	n/a	n/a	n/a	38.1
623378	4747182	V_1759	not_avi	n/a	n/a	n/a	1484.0734	491.29654	>2000	>2000	>2000	T45	MH05	n/a	n/a	n/a	35.5	36.6	n/a	n/a	n/a	39.1
624853	4746530	V_2182	not_avi	n/a	n/a	n/a	1476.4141	1183.5493	>2000	>2000	>2000	T61	MH03	n/a	n/a	n/a	34.0	26.3	n/a	n/a	n/a	34.7
624925	4746685	V_2207	not_avi	n/a	n/a	n/a	1309.1178	1343.1012	>2000	>2000	>2000	T61	MH03	n/a	n/a	n/a	34.9	25.1	n/a	n/a	n/a	35.3
624981	4746600	V_2232	not_avi	n/a	n/a	n/a	1383.8872	1326.4452	>2000	>2000	>2000	T61	MH03	n/a	n/a	n/a	34.3	25	n/a	n/a	n/a	34.8
624993	4746581	V_2240	not_avi	n/a	n/a	n/a	1401.5924	1322.9883	>2000	>2000	>2000	T61	MH03	n/a	n/a	n/a	34.2	25	n/a	n/a	n/a	34.7
625044	4746581	V_2259	not_avi	n/a	n/a	n/a	1395.5304	1362.5562	>2000	>2000	>2000	T61	MH03	n/a	n/a	n/a	34.2	24.6	n/a	n/a	n/a	34.7
625057	4746559	V_2262	not_avi	n/a	n/a	n/a	1415.7135	1360.1287	>2000	>2000	>2000	T61	MH03	n/a	n/a	n/a	34.1	24.6	n/a	n/a	n/a	34.6
625063	4746485	V_2264	not_avi	n/a	n/a	n/a	1489.1109	1321.2843	>2000	>2000	>2000	T61	MH03	n/a	n/a	n/a	33.7	24.8	n/a	n/a	n/a	34.2
625119	4746522	V_2276	not_avi	n/a	n/a	n/a	1449.5253	1387.96	>2000	>2000	>2000	T61	MH03	n/a	n/a	n/a	33.8	24.2	n/a	n/a	n/a	34.3
625153	4746547	V_2279	not_avi	n/a	n/a	n/a	1423.4177	1430.5401	>2000	>2000	>2000	T61	MH03	n/a	n/a	n/a	33.9	23.9	n/a	n/a	n/a	34.3
625203	4746576	V_2284	not_avi	n/a	n/a	n/a	1394.0304	1488.1008	>2000	>2000	>2000	T61	MH03	n/a	n/a	n/a	34.1	23.5	n/a	n/a	n/a	34.5
625224	4746586	V_2287	not_avi	n/a	n/a	n/a	1384.6699	1511.1822	>2000	>2000	>2000	T61	MH03	n/a	n/a	n/a	34.1	23.3	n/a	n/a	n/a	34.4
624944	4746585	V_3875	not_avi	n/a	n/a	n/a	1404.6434	1288.1235	>2000	>2000	>2000	T61	MH03	n/a	n/a	n/a	34.3	25.4	n/a	n/a	n/a	34.8
624861	4746738	V_3876	not_avi	n/a	n/a	n/a	1272.2595	1337.062	>2000	>2000	>2000	T61	MH03	n/a	n/a	n/a	35.2	25.4	n/a	n/a	n/a	35.6

not_avi	not available
n/a	no common receptors available for these farms
NRWC	Niagara Region Wind Corporation
MH	Mohawk Wind Farm
WF	Wainfleet Wind Energy
RF	Rosa Flora Turbine
GREP	Grand Renewable Energy Project

7.0 Conclusions and Closure

This report has been prepared on behalf of FWRN LP. Stantec Consulting Limited (Stantec) was retained by FWRN LP to update the Acoustic Assessment Report to support their proposed amendment to the REA for the Niagara Region Wind Farm. Stantec's assessment of changes indicated that the proposed changes improve the acoustical conditions and therefore considered minor changes. Further, Stantec's conservative assessment predicted that noise emissions during the Project's predictable worst case operation, based on the proposed changes, will continue to meet the MOE criteria at all Points of Reception with the inclusion of noise barriers at both the transformer substations.

The acoustic analysis highlighted in this report is based on information obtained from FWRN LP. The assessment represents the conditions at the Project at the time of the assessment, and the conclusions are the best judgment of the assessor based on current environmental standards and provided information. Stantec attests that to the best of our knowledge, the information presented in this report is accurate.

Respectfully Submitted,

STANTEC CONSULTING LTD.

Kana Ganesh Ph.D., P.Eng.
Sr. Acoustics, Noise and Vibration Engineer
Tel: (905) 415-6332
Fax: (905) 474-9889
Kana.ganesh@stantec.com

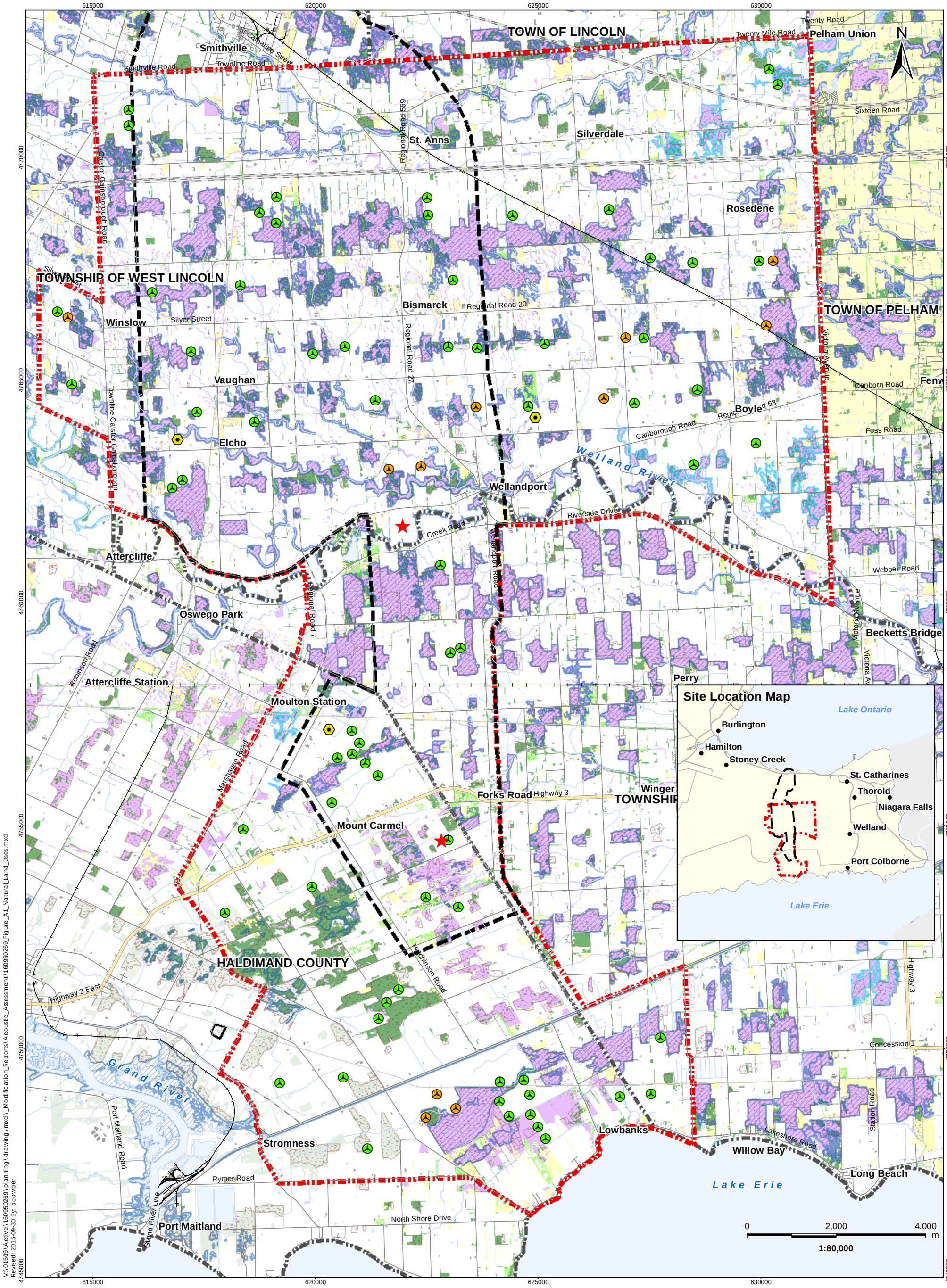
Keni Mallinen, B.A.Sc.
Acoustics, Noise and Vibration Specialist
Ph: (905) 415-6378
Fax: (905) 474-9889
Keni.mallinen@stantec.com

KG/KM

\\cd1215-f01\work_group\01609\active\160950269\planning\noise\2016\moe request 20160119\report\rpt_160961052_aar_amendment_2016_02.docx

Appendix A Zoning Maps

Note: Included from September 2014 AAR without edits



V:\101691\Active\160950269\planning\drawing\mxd_Modification_Reports\Acoustic_Assessment\160950269_Figure_A1_Natural_Land_Uses.mxd
Revised: 2015-09-30 By: bcowper

Stantec

Legend

- Project Study Area
- Interconnector Study Area
- Proposed Turbine Location - E101 3.0 MW
- Proposed Turbine Location - E101 2.9 MW G2/G3
- Transformer Substation
- Tap-in Location
- Existing Met Tower
- Road
- Expressway / Highway
- Active Railway
- Abandoned Railway
- Existing Structures
- Existing Transmission Line
- Watercourse
- Waterbody
- Wooded Area
- Municipality Lower Tier
- Greenbelt
- Deer Wintering Yard (MNR)

Vegetation Communities

- Open Water
- Open Rock/Shrub Rock Barren
- Shoreline
- Bluff
- Wetlands
- Cultural
- Woodland
- Treed Agriculture

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2012.

September 2015
160950269

Client/Project

FWRN LP
Niagara Region Wind Farm
Acoustic Assessment Report

Figure No.

A1

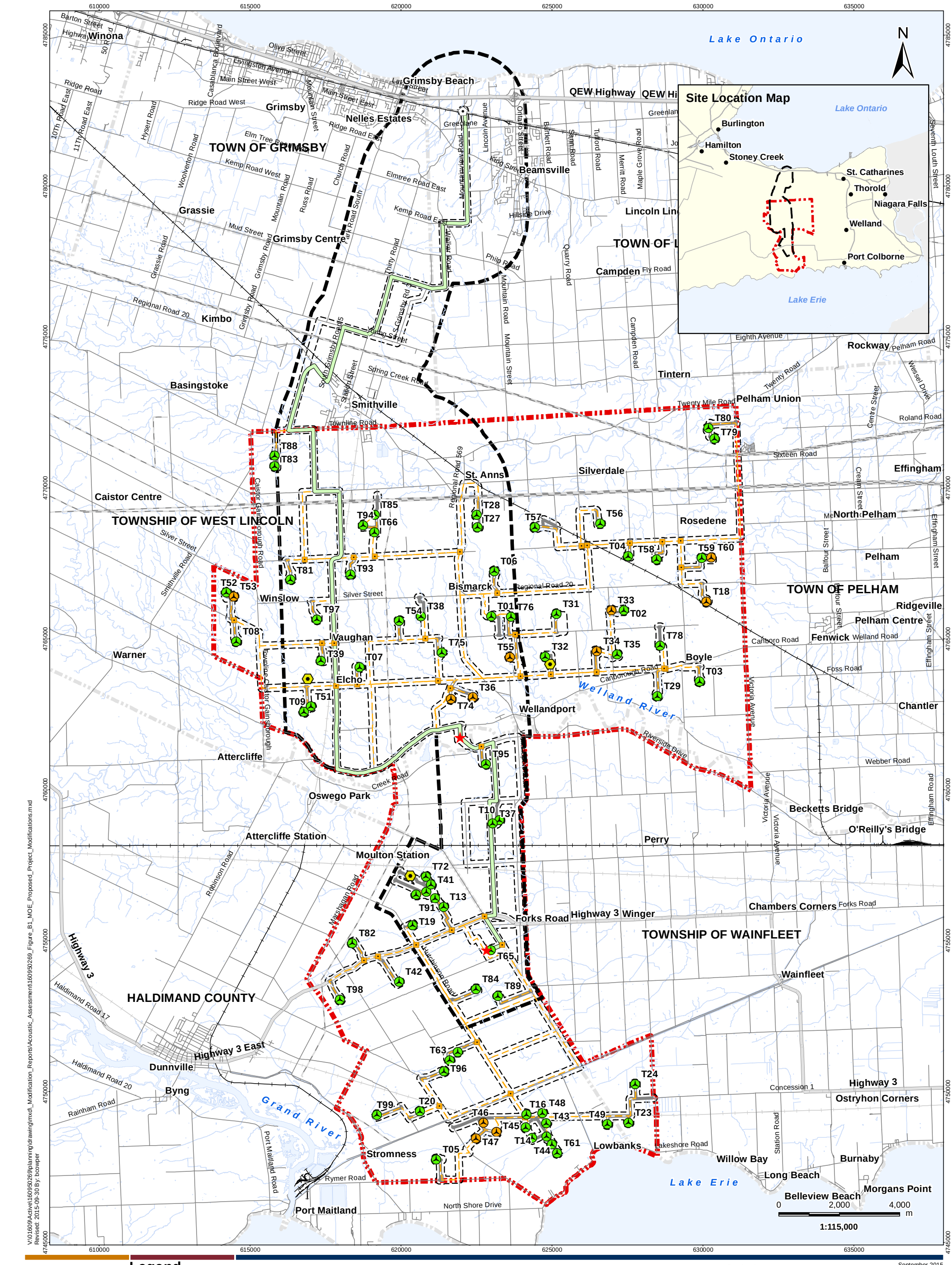
Title

Natural Land Uses

Appendix B Project Layout Plan

Note: The layout did not change; however the following turbines T18, T36, T45, T46, T47, T53, T55, T60, and T74 have been changed from their previous turbine model and heights as follows:

Turbine ID	September 2014 REA		October 2015 REA Amendment	
	Model	Hub Height	Model	Hub Height
T18	E101	135	E101 2.9 MW G2/G3	124
T33	E101	124	E101 2.9 MW G2/G3	124
T34	E101	124	E101 2.9 MW G2/G3	124
T36	E82	135	E101 2.9 MW G2/G3	124
T45	E101	135	E101 2.9 MW G2/G3	124
T46	E82	135	E101 2.9 MW G2/G3	124
T47	E101	135	E101 2.9 MW G2/G3	124
T53	E82	135	E101 2.9 MW G2/G3	124
T55	E101	135	E101 2.9 MW G2/G3	124
T60	E101	135	E101 2.9 MW G2/G3	124
T74	E101	135	E101 2.9 MW G2/G3	124



V:\01609\Active\160950269\planning\drawing\mxd_Modification_Reports\Acoustic_Assessment\160950269_Figure_B1_MOE_Proposed_Project_Modifications.mxd
Revised: 2015-09-30 By: bcowper

Legend

- Project Study Area
- Interconnector Study Area
- Zone of Investigation
- Proposed Turbine Location - E101 3.0 MW
- Proposed Turbine Location - E101 2.9 MW G2/G3
- Transformer Substation
- Tap-in Location
- Existing Met Tower
- Junction Box
- Preferred Transmission Line Route
- Alternate Transmission Route
- Collector Lines - Underground or Overhead
- Potential Access Road
- Road
- Expressway / Highway
- Active Railway
- Abandoned Railway
- Existing Transmission Line
- Watercourse
- Waterbody
- Municipality Lower Tier

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2012.
3. T18, T36, T45, T46, T47, T53, T55, T60 and T74 are E101 2.9 MW G2/G3 and all other turbines are E101 3.0 MW.

Stantec

September 2015
160950269

Client/Project
FWRN LP
Niagara Region Wind Farm
Acoustic Assessment Report

Figure No.
B1

Title
Project Component Layout

Appendix C Results for all Points of Reception (PORs)

Receptor ID	2015 Results (2015 Amend-ment) Sound Level/ Night dBA	2014 Results (2014 REA Sound Level/ Night dBA	UTM Coordinates (NAD 83, Zone 17) X [m]	Y [m]	Z [m]	Distance to the nearest Turbine [m]	Nearest Turbine ID
O_1002	39.7	39.7	620717	4766304	187	555	T38
O_1005	35.7	36.2	620722	4763669	185	1080	T75
O_101	35.0	35.0	615006	4771535	195	939	T88
O_1010	38.4	38.4	620728	4766421	188	672	T38
O_1012	35.2	35.2	620733	4752218	185	1460	T62
O_1013	35.5	35.5	620734	4752084	185	1368	T63
O_1016	39.7	39.7	620737	4755005	183	623	T19
O_1017	32.4	33.0	620737	4761846	180	1477	T74
O_102	38.5	38.5	615013	4765305	187	612	T08
O_1029	32.5	33.1	620762	4761877	180	1437	T74
O_103	33.6	33.6	615046	4769911	200	1117	T83
O_1037	38.0	38.1	620776	4766452	188	708	T38
O_105	37.3	37.4	615115	4766832	190	787	T53
O_106	33.5	33.5	615120	4767711	193	1432	T81
O_1063	38.8	38.8	620829	4766361	187	630	T38
O_1069	36.1	36.7	620841	4763620	185	1023	T74
O_1074	39.9	39.9	620855	4755100	183	632	T19
O_1075	37.8	37.8	620855	4766458	188	730	T38
O_108	33.1	33.1	615127	4767820	193	1485	T81
O_1082	35.9	35.9	620868	4752074	185	1265	T62
O_1089	36.3	36.3	620883	4754080	185	1050	T42
O_1093	36.9	36.9	620892	4751828	184	1071	T63
O_1096	39.7	39.8	620899	4750271	180	657	T96
O_1097	40.0	40.0	620899	4764949	185	612	T75
O_1098	38.9	38.9	620900	4754976	184	750	T19
O_1103	37.1	37.2	620911	4751796	184	1034	T63
O_1105	35.8	35.8	620917	4752174	185	1291	T62
O_1107	37.6	37.6	620926	4751706	183	959	T63
O_111	32.8	32.8	615148	4763671	185	1379	T08
O_1112	39.9	39.9	620954	4755166	183	673	T19
O_1116	36.4	37.2	620961	4763553	185	887	T74
O_1127	33.6	34.4	620981	4762035	180	1179	T74
O_113	34.7	34.8	615154	4767422	192	1236	T53
O_114	38.9	38.9	615165	4771059	195	651	T88
O_1142	36.7	37.4	621005	4763632	185	905	T74
O_1148	35.9	35.9	621035	4753811	185	1115	T42
O_115	36.0	36.0	615176	4767123	190	1019	T53
O_1153	39.9	40.0	621067	4749725	181	584	T20
O_1154	38.0	38.0	621068	4751784	183	926	T63
O_1155	37.1	37.8	621069	4763704	185	887	T75
O_1157	37.0	37.7	621072	4763637	185	863	T74
O_116	36.0	36.0	615177	4767127	190	1022	T53
O_1166	33.4	33.9	621121	4761603	176	1498	T74
O_1167	39.5	39.5	621121	4755212	183	801	T19
O_1169	35.8	35.8	621128	4753671	185	1194	T42
O_117	36.5	36.5	615182	4766985	190	931	T53
O_1172	33.5	34.0	621136	4761601	176	1495	T74
O_1173	35.8	35.8	621141	4753705	185	1208	T42
O_1174	38.7	38.7	621143	4755072	185	883	T19
O_1176	37.3	38.0	621145	4763647	185	823	T74
O_1177	34.3	35.0	621149	4762004	183	1120	T74
O_1178	35.8	35.8	621154	4753609	185	1220	T42
O_1179	35.8	35.8	621156	4753679	185	1222	T42
O_118	39.5	39.5	615189	4770950	195	636	T88
O_1180	33.5	34.0	621156	4761598	176	1490	T74
O_1181	39.2	39.2	621156	4755176	184	848	T19
O_1184	39.9	39.9	621175	4751605	183	718	T63
O_1186	33.6	34.1	621177	4761593	176	1488	T74
O_1192	33.7	34.2	621196	4761577	176	1497	T74
O_120	37.1	37.1	615227	4766162	190	808	T53
O_1207	35.8	35.8	621246	4753527	185	1248	T84
O_121	37.1	37.2	615227	4766178	190	804	T53
O_1211	35.8	35.8	621255	4753508	185	1238	T84
O_1212	39.2	39.2	621261	4755230	184	904	T13
O_1215	37.5	37.7	621268	4747099	187	662	T05
O_1216	36.6	36.6	621270	4766434	188	909	T38
O_1221	38.6	38.6	621290	4751870	183	811	T62
O_1222	34.8	35.4	621299	4761833	184	1222	T74
O_1223	36.7	36.7	621299	4766389	188	896	T38
O_1224	35.8	35.8	621300	4753515	185	1193	T84
O_1227	35.9	35.9	621307	4753570	185	1193	T84
O_1228	35.7	35.7	621308	4758305	185	1276	T72
O_123	36.4	36.4	615239	4765575	188	961	T08
O_124	36.4	36.4	615241	4765572	188	959	T08

Receptor ID	2015 Results (2015 Amend-ment) Sound Level/ Night dBA	2014 Results (2014 REA Sound Level/ Night dBA	UTM Coordinates (NAD 83, Zone 17)		Z [m]	Distance to the nearest Turbine [m]	Nearest Turbine ID
			X [m]	Y [m]			
O 1247	35.9	35.9	621379	4753207	185	1124	T84
O 125	34.2	34.2	615261	4771884	195	994	T88
O 1250	34.3	34.6	621396	4761324	180	1498	T95
O 1254	34.4	34.8	621405	4761352	180	1498	T95
O 1258	34.4	34.7	621410	4761334	180	1488	T95
O 1259	35.6	36.3	621411	4761957	185	1074	T74
O 126	36.9	36.9	615264	4766146	190	848	T53
O 1260	38.6	38.6	621418	4755178	183	944	T13
O 1262	36.3	36.4	621440	4766383	188	996	T38
O 1263	36.2	36.2	621441	4753401	185	1046	T84
O 1265	32.5	32.6	621491	4770071	190	1416	T28
O 127	36.7	36.7	615272	4766848	190	930	T53
O 1271	37.0	37.2	621537	4747106	188	744	T05
O 1273	35.2	35.2	621549	4768001	193	1213	T27
O 1277	36.6	37.4	621572	4762081	184	925	T74
O 1278	36.7	37.4	621573	4762080	184	926	T74
O 1279	32.7	32.8	621591	4770085	190	1355	T28
O 128	34.5	34.6	615275	4764196	185	1022	T08
O 1282	37.9	38.3	621608	4749173	182	995	T20
O 1284	36.9	36.9	621626	4753241	185	875	T84
O 1286	32.8	32.8	621629	4770089	190	1332	T28
O 1287	33.0	33.0	621630	4770057	190	1308	T28
O 1288	39.2	39.4	621630	4755368	181	786	T13
O 129	36.7	36.7	615276	4766848	190	933	T53
O 1290	39.2	39.2	621653	4757500	182	908	T72
O 1291	36.5	36.5	621659	4752845	185	993	T84
O 1292	35.2	35.4	621671	4761158	180	1186	T95
O 1294	38.4	39.3	621675	4763698	185	695	T74
O 1296	38.7	38.7	621710	4757536	182	975	T72
O 1297	38.8	39.8	621713	4763617	185	617	T74
O 1298	35.5	35.6	621721	4767883	193	1158	T27
O 130	36.4	36.4	615286	4765925	189	958	T53
O 1302	33.8	33.8	621737	4759553	183	1465	T37
O 1305	37.3	37.3	621749	4753817	183	851	T84
O 1306	36.6	36.7	621752	4752614	185	1071	T84
O 1307	38.7	38.9	621752	4755337	181	857	T13
O 131	33.8	33.8	615289	4769760	200	1093	T83
O 1310	38.7	38.7	621760	4757476	181	985	T41
O 1312	34.1	34.2	621768	4769921	186	1114	T28
O 1313	37.3	37.4	621783	4752973	185	820	T84
O 1314	38.6	39.5	621783	4748649	183	728	T47
O 1315	35.3	35.3	621786	4766948	190	1342	T06
O 1316	39.1	39.3	621795	4755456	180	769	T13
O 1317	37.9	37.9	621796	4752162	184	855	T62
O 1319	37.2	37.2	621813	4752867	185	854	T84
O 1320	38.4	38.4	621815	4752085	184	776	T62
O 1321	36.0	36.4	621815	4761193	180	1058	T95
O 1323	38.7	39.7	621824	4763625	184	645	T74
O 1325	35.7	35.9	621827	4761087	185	1018	T95
O 1326	37.2	37.2	621834	4768241	195	842	T27
O 1327	35.8	35.9	621838	4767825	193	1125	T27
O 1328	33.4	33.4	621838	4770101	188	1213	T28
O 1329	38.8	38.9	621839	4764984	185	653	T75
O 1330	35.9	36.0	621845	4766462	189	1347	T01
O 1332	37.7	37.7	621854	4753879	183	798	T84
O 1334	35.4	35.5	621869	4767380	190	1234	T06
O 1335	36.2	36.5	621879	4747111	189	956	T05
O 1336	35.4	35.5	621882	4767096	190	1222	T06
O 1337	39.0	39.2	621893	4755509	180	781	T13
O 1338	38.8	38.9	621894	4769276	190	648	T28
O 1339	38.9	39.6	621895	4747972	185	756	T47
O 134	36.1	36.1	615305	4765626	188	1043	T08
O 1340	38.4	39.2	621895	4763693	184	731	T74
O 1341	37.7	38.6	621897	4762287	180	754	T74
O 1342	35.6	35.8	621901	4746889	190	1132	T05
O 1344	40.0	40.0	621910	4768894	194	640	T28
O 1345	38.3	38.7	621910	4755364	180	908	T13
O 1347	35.7	35.8	621911	4766731	190	1291	T06
O 1348	35.7	35.8	621915	4766703	190	1299	T06
O 1349	39.8	39.8	621921	4768671	195	614	T27
O 135	36.7	36.8	615306	4766195	190	875	T53
O 1350	36.5	36.8	621921	4761187	182	956	T95
O 1351	35.8	35.9	621926	4766627	190	1323	T06
O 1353	36.0	36.1	621932	4766481	190	1285	T01

Receptor ID	2015 Results (2015 Amend-ment) Sound Level/ Night dBA	2014 Results (2014 REA Sound Level/ Night dBA	UTM Coordinates (NAD 83, Zone 17) X [m]	Y [m]	Z [m]	Distance to the nearest Turbine [m]	Nearest Turbine ID
O 1355	36.0	36.1	621935	4766509	190	1299	T01
O 1356	37.0	37.0	621935	4769608	187	775	T28
O 1357	36.0	36.1	621939	4766462	190	1269	T01
O 1359	38.9	39.2	621941	4755540	180	787	T13
O 136	36.8	36.9	615320	4766686	190	910	T53
O 1360	35.6	35.8	621954	4746822	189	1217	T05
O 1362	35.4	35.6	621958	4746643	189	1361	T05
O 1363	36.0	36.3	621960	4747048	189	1059	T05
O 1365	35.3	35.5	621967	4746565	189	1430	T05
O 1366	37.6	37.7	621970	4752213	184	907	T62
O 1367	36.1	36.2	621974	4766478	190	1249	T01
O 1368	36.5	36.9	621976	4747236	187	957	T05
O 137	33.2	33.2	615321	4763757	185	1391	T08
O 1370	39.6	39.7	621984	4756847	180	924	T13
O 1372	38.3	38.6	621986	4755401	180	923	T13
O 1373	36.9	37.2	621986	4761210	180	905	T95
O 1376	36.2	36.3	621995	4766401	189	1188	T01
O 1377	38.4	38.4	621998	4752905	185	691	T84
O 1378	36.7	36.7	622001	4767904	194	965	T27
O 1379	37.3	37.4	622002	4752621	184	911	T84
O 138	36.8	36.9	615322	4766688	190	912	T53
O 1380	36.2	36.3	622006	4766429	190	1194	T01
O 1381	37.0	37.2	622006	4761204	181	884	T95
O 1382	37.0	37.2	622006	4761204	181	884	T95
O 1383	36.0	36.0	622012	4766701	190	1212	T06
O 1384	38.5	38.8	622012	4764423	185	666	T75
O 1387	37.1	37.3	622026	4761205	181	866	T95
O 1388	37.1	37.3	622027	4761205	181	866	T95
O 139	36.1	36.1	615325	4765533	187	998	T08
O 1391	34.0	34.0	622040	4770097	190	1109	T28
O 1392	37.2	37.4	622051	4761209	181	845	T95
O 1394	33.6	33.6	622054	4770163	190	1163	T28
O 1396	36.2	36.2	622060	4767512	191	1070	T06
O 1397	33.1	33.2	622060	4770234	190	1226	T28
O 1398	33.0	33.0	622061	4770262	190	1252	T28
O 140	33.6	33.6	615327	4763951	185	1238	T08
O 1402	34.9	34.9	622064	4769972	185	987	T28
O 1404	39.0	39.0	622066	4768266	195	644	T27
O 1408	32.8	32.9	622069	4770287	190	1273	T28
O 1409	39.6	39.6	622070	4768334	195	597	T27
O 141	33.5	33.5	615327	4763885	185	1290	T08
O 1411	32.6	32.6	622075	4770330	190	1311	T28
O 1412	36.4	36.4	622077	4766472	190	1164	T01
O 1415	32.3	32.4	622080	4770375	190	1352	T28
O 1416	32.1	32.1	622080	4770423	190	1397	T28
O 1417	31.6	31.6	622081	4770512	190	1482	T28
O 1418	34.1	34.1	622081	4770099	190	1094	T28
O 1419	37.5	37.5	622081	4752247	184	958	T62
O 142	36.1	36.1	615328	4765537	187	1002	T08
O 1420	32.2	32.2	622083	4770408	190	1383	T28
O 1421	32.2	32.3	622085	4770394	190	1369	T28
O 1422	32.4	32.4	622085	4770362	190	1338	T28
O 1423	31.8	31.8	622085	4770478	190	1448	T28
O 1425	37.9	38.2	622089	4764335	185	760	T75
O 1426	37.8	37.8	622093	4752682	184	813	T84
O 1427	37.4	37.6	622094	4761205	181	805	T95
O 1428	37.4	37.6	622095	4761206	181	805	T95
O 143	36.7	36.7	615329	4766206	190	895	T53
O 1430	37.7	38.1	622097	4764255	183	794	T75
O 1431	36.5	36.6	622098	4766410	190	1109	T01
O 1437	33.7	33.7	622104	4770160	190	1141	T28
O 1438	33.4	33.5	622107	4770201	190	1179	T28
O 144	36.6	36.6	615332	4766147	190	913	T53
O 1440	36.2	36.2	622109	4759138	181	965	T37
O 1441	36.2	36.3	622110	4759110	181	957	T37
O 1444	36.0	36.1	622115	4758040	182	1249	T37
O 1446	32.9	33.0	622117	4770283	190	1252	T28
O 1447	38.3	39.0	622119	4763690	182	679	T36
O 1448	37.8	38.1	622124	4764406	185	779	T75
O 1449	32.5	32.5	622125	4770365	190	1329	T28
O 145	36.1	36.1	615333	4765448	187	954	T08
O 1454	32.7	32.7	622131	4770322	190	1286	T28
O 1456	31.5	31.5	622133	4770544	189	1498	T28
O 1457	36.4	36.4	622134	4758485	182	987	T37

Receptor ID	2015 Results (2015 Amend-ment) Sound Level/ Night dBA	2014 Results (2014 REA Sound Level/ Night dBA	UTM Coordinates (NAD 83, Zone 17) X [m]	Y [m]	Z [m]	Distance to the nearest Turbine [m]	Nearest Turbine ID
O 1458	37.6	37.8	622142	4761209	181	764	T95
O 1459	37.6	37.8	622142	4761209	181	763	T95
O 146	36.1	36.1	615334	4765447	187	954	T08
O 1461	38.7	39.3	622147	4749379	182	720	T46
O 1464	36.3	36.3	622153	4759249	181	959	T37
O 1465	37.7	37.8	622154	4761072	185	698	T95
O 1466	38.0	38.4	622157	4755511	180	965	T13
O 1467	37.5	37.5	622157	4752247	184	978	T62
O 1469	37.2	37.2	622162	4757289	180	1244	T41
O 147	36.0	36.1	615336	4765510	187	993	T08
O 1470	38.1	38.5	622163	4755583	180	926	T13
O 1471	37.7	37.9	622165	4761221	181	749	T95
O 1472	31.9	31.9	622178	4770479	190	1424	T28
O 1474	33.6	33.6	622184	4770200	190	1153	T28
O 1476	37.5	37.5	622187	4767902	193	877	T27
O 1477	34.3	34.3	622188	4770096	190	1053	T28
O 1478	37.9	38.0	622189	4761223	181	730	T95
O 1479	37.2	37.2	622195	4767822	193	949	T27
O 148	34.2	34.2	615344	4767601	192	1183	T81
O 1481	36.7	36.7	622198	4766556	190	1130	T01
O 1489	36.5	36.9	622210	4747133	186	1210	T05
O 1491	36.8	36.8	622215	4758503	182	906	T37
O 1492	37.4	38.0	622215	4762190	180	888	T36
O 1494	32.1	32.1	622216	4770446	190	1383	T28
O 1495	36.4	36.4	622217	4757569	180	1415	T41
O 1497	36.5	36.5	622226	4757487	180	1383	T41
O 150	36.1	36.1	615346	4764717	185	825	T08
O 1500	37.9	38.3	622232	4755540	180	1007	T13
O 1501	39.0	39.6	622234	4749400	182	663	T46
O 1502	37.5	37.8	622234	4765030	185	1004	T75
O 1504	37.6	37.7	622251	4752150	183	919	T62
O 1505	33.6	33.6	622251	4770213	190	1148	T28
O 1507	32.3	32.3	622256	4770417	190	1347	T28
O 1508	37.4	37.4	622259	4752371	184	1047	T84
O 1509	31.6	31.6	622264	4770549	186	1475	T28
O 1511	32.5	32.5	622288	4770391	190	1316	T28
O 1513	33.7	33.7	622292	4770204	190	1130	T28
O 1514	38.2	38.2	622294	4755568	180	1043	T13
O 1518	37.1	37.6	622302	4764000	180	940	T36
O 152	36.2	36.3	615347	4765950	189	1000	T53
O 1521	31.5	31.5	622316	4770505	185	1423	T28
O 1524	38.0	38.0	622322	4755719	182	997	T13
O 1525	32.7	32.7	622322	4770361	190	1280	T28
O 1526	37.6	37.6	622329	4752138	183	942	T62
O 1527	38.1	38.1	622334	4755597	181	1063	T13
O 1528	38.9	39.0	622338	4751818	183	686	T62
O 1530	33.9	33.9	622345	4770190	190	1108	T28
O 1532	37.0	37.5	622354	4762128	180	936	T36
O 1533	38.2	38.2	622354	4767938	193	791	T27
O 1534	32.9	32.9	622356	4770337	190	1252	T28
O 1535	32.1	32.1	622361	4770472	190	1385	T28
O 1537	37.8	38.0	622371	4765105	185	887	T01
O 1541	37.1	37.5	622386	4747128	185	1323	T47
O 1542	33.1	33.2	622389	4770304	190	1215	T28
O 1543	32.3	32.3	622395	4770443	190	1352	T28
O 1544	38.0	38.1	622396	4751936	183	812	T62
O 1546	39.6	39.7	622414	4754205	180	741	T65
O 1547	37.0	37.0	622424	4759567	180	921	T37
O 1549	37.2	37.8	622425	4763874	180	812	T36
O 1557	32.5	32.5	622442	4770413	190	1319	T28
O 1558	33.5	33.5	622444	4770259	190	1166	T28
O 1559	38.5	39.0	622454	4749660	181	748	T46
O 1560	37.8	37.9	622463	4766510	190	927	T01
O 1561	38.3	38.9	622470	4763643	180	587	T36
O 1563	37.3	37.3	622476	4759569	180	889	T37
O 1564	32.7	32.7	622479	4770376	190	1281	T28
O 1569	35.6	35.6	622512	4769991	187	895	T28
O 157	34.6	34.6	615366	4767524	192	1124	T81
O 1570	37.6	37.6	622528	4759573	180	860	T37
O 1571	38.8	38.8	622538	4767944	193	764	T27
O 1572	38.9	38.9	622542	4751516	182	696	T62
O 1575	37.1	37.1	622563	4759730	182	973	T37
O 1576	33.9	33.9	622563	4770203	190	1109	T28
O 1577	34.4	34.4	622575	4770141	190	1047	T28

Receptor ID	2015 Results (2015 Amend-ment) Sound Level/ Night dBA	2014 Results (2014 REA Sound Level/ Night dBA	UTM Coordinates (NAD 83, Zone 17) X [m]	Y [m]	Z [m]	Distance to the nearest Turbine [m]	Nearest Turbine ID
O 1579	36.2	36.6	622586	4762134	180	952	T36
O 158	36.2	36.2	615379	4764933	185	835	T08
O 1580	36.2	36.6	622587	4762136	180	950	T36
O 1583	38.1	38.4	622589	4747138	185	1313	T47
O 1585	38.8	38.8	622600	4751269	181	724	T62
O 1586	38.6	38.7	622604	4766431	190	785	T01
O 1588	37.8	38.4	622612	4763656	180	637	T36
O 159	33.2	33.2	615392	4763720	185	1461	T08
O 1594	38.3	38.3	622645	4751382	182	771	T62
O 1596	33.8	33.8	622652	4770211	190	1124	T28
O 1597	36.0	36.4	622659	4762102	180	1001	T36
O 160	35.5	35.5	615413	4771821	192	862	T88
O 1600	37.8	37.9	622669	4751522	182	820	T62
O 1602	39.5	39.5	622682	4769629	186	558	T28
O 1603	35.4	35.4	622690	4757622	180	1307	T37
O 1605	38.5	38.8	622699	4765020	185	780	T01
O 1608	36.8	36.8	622714	4755820	184	1172	T65
O 1609	35.7	36.1	622731	4762123	180	1004	T36
O 161	35.9	35.9	615415	4765286	186	947	T08
O 1611	38.1	38.2	622733	4759658	181	835	T37
O 1614	39.1	39.2	622741	4766446	190	742	T01
O 1615	39.4	39.6	622743	4765147	185	645	T01
O 1617	34.2	34.3	622753	4770142	190	1072	T28
O 1619	37.9	38.6	622765	4747540	185	950	T47
O 162	35.9	35.9	615417	4765289	186	950	T08
O 1621	35.5	35.9	622790	4762100	180	1047	T36
O 1623	37.9	38.0	622797	4759731	182	873	T10
O 1624	39.3	39.6	622798	4747175	185	1310	T47
O 1626	37.0	37.7	622801	4763750	183	806	T36
O 1627	38.9	39.4	622805	4749665	181	700	T46
O 1628	36.7	36.7	622815	4755778	185	1112	T65
O 163	32.9	32.9	615444	4763020	185	1417	T09
O 1632	35.5	35.9	622825	4762142	180	1023	T36
O 1633	39.3	39.4	622835	4766529	190	761	T06
O 1634	35.1	35.1	622839	4757583	180	1313	T37
O 1636	39.5	39.5	622845	4766455	190	724	T01
O 1637	33.3	33.3	622846	4770265	190	1215	T28
O 1638	35.6	36.0	622849	4762264	180	927	T36
O 164	36.2	36.3	615444	4766146	189	1021	T53
O 1641	37.0	37.7	622865	4763665	182	774	T36
O 1642	37.9	37.9	622878	4755538	181	865	T65
O 1643	36.3	36.3	622881	4755866	185	1191	T65
O 1645	35.2	35.6	622889	4762111	180	1080	T36
O 1646	37.2	37.4	622895	4761561	180	715	T95
O 1647	36.8	36.9	622898	4751112	181	1040	T62
O 1649	39.6	39.6	622911	4759571	181	678	T10
O 165	36.3	36.4	615446	4766221	190	1006	T53
O 1651	36.7	36.8	622917	4751069	181	1068	T62
O 1656	38.9	39.4	622927	4749678	181	736	T46
O 1657	35.1	35.5	622931	4762118	180	1095	T36
O 1658	36.9	37.6	622936	4763662	183	818	T36
O 166	36.4	36.4	615452	4766237	190	1010	T53
O 1662	39.6	39.7	622948	4766556	190	704	T06
O 1663	37.4	38.0	622949	4763367	181	646	T36
O 1664	37.6	37.7	622953	4761506	180	669	T95
O 1668	39.8	39.8	622961	4755330	180	651	T65
O 167	32.0	32.0	615459	4762118	182	1408	T09
O 1672	36.9	37.7	622974	4763788	184	878	T55
O 1675	33.7	33.8	622982	4770163	190	1164	T28
O 1677	39.5	39.9	622992	4765045	185	700	T01
O 1683	34.8	35.2	623026	4762121	180	1143	T36
O 1685	36.5	36.6	623030	4761609	180	787	T95
O 1686	34.9	35.3	623031	4762240	180	1050	T36
O 1687	36.3	36.5	623038	4750759	180	1286	T62
O 1694	37.9	37.9	623069	4760207	183	692	T95
O 1695	33.5	33.5	623070	4770170	190	1209	T28
O 1696	34.6	34.6	623074	4757512	180	1369	T37
O 1697	36.7	37.3	623074	4763216	181	712	T36
O 17	31.6	31.6	612851	4766482	190	1365	T52
O 170	30.4	30.4	615491	4772493	195	1471	T88
O 1700	34.9	35.3	623091	4762381	180	986	T36
O 1701	34.8	35.3	623093	4762347	180	1011	T36
O 1702	34.6	35.0	623094	4762202	180	1119	T36
O 1704	37.4	37.4	623102	4760082	183	820	T95

Receptor ID	2015 Results (2015 Amend-ment) Sound Level/ Night dBA	2014 Results (2014 REA Sound Level/ Night dBA	UTM Coordinates (NAD 83, Zone 17) X [m]	Y [m]	Z [m]	Distance to the nearest Turbine [m]	Nearest Turbine ID
O_1706	37.3	37.4	623105	4760054	183	848	T95
O_1707	39.9	40.0	623108	4766469	190	734	T01
O_1708	36.7	37.5	623109	4763664	184	885	T55
O_171	36.1	36.1	615497	4766131	189	1076	T53
O_1710	38.8	39.1	623113	4747328	185	1284	T47
O_1714	36.1	36.3	623127	4750769	180	1363	T62
O_1715	37.9	37.9	623127	4759827	182	848	T10
O_1717	36.3	36.9	623131	4763168	181	760	T36
O_1719	34.5	34.9	623139	4762209	180	1144	T36
O_172	38.2	38.2	615513	4771618	191	635	T88
O_1720	35.0	35.0	623145	4756031	184	1361	T65
O_1721	34.6	35.0	623146	4762335	180	1058	T36
O_1722	38.3	38.5	623153	4760323	183	626	T95
O_1723	37.8	37.9	623158	4760247	183	693	T95
O_1725	35.5	35.5	623170	4755863	182	1199	T65
O_1726	34.6	35.1	623170	4762410	180	1026	T36
O_1729	34.5	35.0	623179	4762361	180	1065	T36
O_173	36.2	36.3	615525	4766232	190	1082	T53
O_1730	35.8	35.9	623181	4761633	178	863	T95
O_1731	36.0	36.6	623190	4763145	181	815	T36
O_1732	34.4	34.8	623218	4762376	180	1085	T36
O_1733	34.5	34.9	623225	4762440	180	1051	T36
O_1734	39.8	39.9	623228	4766552	190	705	T06
O_1735	36.8	36.8	623234	4755583	180	938	T65
O_1738	34.2	34.5	623258	4762070	180	1297	T95
O_174	34.6	34.6	615549	4767647	192	1045	T81
O_1741	34.3	34.7	623263	4762397	180	1107	T36
O_1742	37.8	39.0	623265	4763874	182	624	T55
O_1743	35.4	36.0	623277	4763043	180	899	T36
O_1744	34.3	34.7	623299	4762480	180	1089	T36
O_1746	39.7	39.7	623319	4759601	180	614	T10
O_1748	34.0	34.5	623330	4762385	180	1168	T36
O_1750	39.7	39.7	623337	4766590	190	697	T06
O_1751	34.2	34.6	623339	4762501	180	1113	T36
O_1754	35.0	35.1	623359	4755842	182	1222	T65
O_1756	34.9	35.5	623361	4762971	180	986	T36
O_1757	33.9	34.3	623372	4762394	180	1198	T36
O_1758	37.5	37.5	623376	4769240	190	872	T28
O_176	36.2	36.2	615569	4766207	189	1085	T81
O_1760	34.5	34.7	623394	4761711	180	1036	T95
O_1761	34.0	34.5	623394	4762532	180	1146	T36
O_1764	34.0	34.4	623420	4762550	180	1161	T36
O_1766	34.9	34.9	623423	4755827	181	1229	T65
O_1767	33.7	34.1	623424	4762357	180	1262	T36
O_1768	33.8	34.2	623424	4762417	180	1229	T36
O_1769	37.1	37.3	623442	4750271	180	1250	T16
O_1770	39.7	39.7	623450	4766472	190	776	T76
O_1772	33.7	34.2	623451	4762445	180	1238	T36
O_1774	33.8	34.3	623464	4762529	180	1210	T36
O_1775	33.7	34.2	623472	4762494	180	1233	T36
O_1776	33.6	34.1	623477	4762429	180	1268	T36
O_1777	38.1	38.3	623480	4750042	180	1044	T16
O_178	30.7	30.7	615577	4772469	195	1430	T88
O_1780	33.6	34.1	623494	4762448	180	1274	T36
O_1781	34.7	34.7	623496	4755818	181	1249	T65
O_1782	39.3	39.4	623497	4766581	190	776	T06
O_1783	37.1	37.1	623498	4755362	182	855	T65
O_1784	33.5	34.0	623500	4762400	180	1303	T36
O_1788	34.0	34.0	623518	4757617	180	1352	T37
O_1789	33.5	34.0	623524	4762474	180	1288	T36
O_1790	33.5	33.9	623525	4762407	180	1321	T36
O_1793	34.7	34.7	623533	4755770	180	1222	T65
O_1794	35.0	35.0	623546	4755699	180	1165	T65
O_1795	33.9	34.0	623546	4757619	180	1360	T37
O_1796	39.9	39.4	623548	4754486	180	596	T65
O_1797	34.7	35.3	623551	4763122	180	1174	T36
O_1798	33.5	33.9	623551	4762474	179	1312	T36
O_18	31.8	31.8	612889	4766208	190	1365	T52
O_180	33.6	33.6	615598	4763331	185	1411	T09
O_1800	38.1	38.3	623553	4750071	180	1023	T16
O_1801	33.4	33.8	623554	4762412	180	1344	T36
O_1802	33.8	34.4	623578	4762756	180	1238	T36
O_1803	33.3	33.8	623581	4762428	178	1359	T36
O_1804	35.0	35.8	623583	4763281	182	1113	T55

Receptor ID	2015 Results (2015 Amend-ment) Sound Level/ Night dBA	2014 Results (2014 REA Sound Level/ Night dBA	UTM Coordinates (NAD 83, Zone 17)			Distance to the nearest Turbine [m]	Nearest Turbine ID
			X [m]	Y [m]	Z [m]		
O 1805	34.9	35.6	623585	4763231	181	1163	T55
O 1806	33.4	33.9	623587	4762487	178	1339	T36
O 1807	39.1	39.1	623589	4766583	190	825	T06
O 1808	34.7	35.4	623591	4763160	180	1216	T36
O 1809	33.7	34.2	623598	4762707	180	1271	T36
O 181	34.5	34.5	615610	4769720	199	1017	T83
O 1810	34.5	34.5	623599	4755765	180	1248	T65
O 1812	33.6	34.1	623609	4762668	180	1292	T36
O 1813	33.3	33.7	623609	4762433	176	1383	T36
O 1814	33.3	33.8	623610	4762496	177	1356	T36
O 1815	34.0	34.6	623615	4762914	180	1245	T36
O 1816	34.2	34.8	623617	4762986	180	1241	T36
O 1817	33.3	33.7	623618	4762448	176	1383	T36
O 1818	34.1	34.7	623618	4762957	180	1244	T36
O 1819	34.0	34.6	623620	4762897	180	1253	T36
O 182	36.1	36.1	615625	4771832	190	796	T88
O 1820	33.5	33.8	623629	4761753	180	1214	T95
O 1821	33.9	34.5	623629	4762868	180	1265	T36
O 1822	33.3	33.8	623632	4762503	176	1373	T36
O 1823	38.9	39.0	623634	4766584	190	852	T06
O 1824	33.8	34.4	623636	4762828	180	1279	T36
O 1825	33.6	33.8	623643	4761690	180	1178	T95
O 1826	33.2	33.7	623645	4762459	175	1403	T36
O 1828	33.2	33.7	623659	4762508	175	1395	T36
O 1829	34.9	35.7	623664	4763274	181	1120	T55
O 183	35.5	35.5	615631	4767514	192	898	T81
O 1830	33.2	33.6	623666	4762468	175	1418	T36
O 1831	38.8	38.9	623668	4766583	190	864	T76
O 1832	34.1	34.7	623669	4762989	180	1292	T36
O 1833	33.2	33.7	623669	4762522	175	1400	T36
O 1834	39.2	39.2	623675	4766480	190	762	T76
O 1835	38.1	37.4	623676	4754261	185	809	T65
O 1836	33.1	33.6	623680	4762473	173	1429	T36
O 1837	33.9	34.5	623685	4762938	180	1313	T36
O 1838	33.8	34.4	623686	4762870	180	1322	T36
O 1839	33.6	34.1	623697	4762779	179	1348	T36
O 184	36.1	36.1	615651	4766142	189	1076	T81
O 1841	33.5	34.0	623701	4762744	178	1360	T36
O 1842	33.4	33.9	623708	4762692	178	1380	T36
O 1843	33.4	34.0	623713	4762714	177	1380	T36
O 1844	33.3	33.5	623713	4761702	180	1237	T95
O 185	36.3	36.3	615654	4766231	190	1008	T81
O 1850	39.6	39.6	623775	4758688	180	598	T10
O 1851	37.1	36.6	623786	4754069	185	1008	T65
O 1852	37.1	37.1	623797	4759586	180	803	T10
O 1853	38.4	38.4	623801	4752959	185	618	T89
O 1854	33.4	33.5	623807	4761492	180	1179	T95
O 1857	39.8	39.8	623813	4759096	180	564	T10
O 1858	39.9	39.9	623815	4758978	180	556	T10
O 1859	33.2	33.3	623815	4757620	180	1478	T10
O 1860	38.0	38.0	623816	4759425	180	706	T10
O 1861	32.8	33.1	623817	4761799	180	1378	T95
O 1863	39.5	39.5	623819	4759148	180	581	T10
O 1867	33.4	33.5	623836	4761422	180	1168	T95
O 1869	32.9	33.1	623839	4761688	180	1321	T95
O 187	35.8	35.8	615687	4769862	199	864	T83
O 1870	33.1	33.3	623840	4761565	180	1248	T95
O 1871	32.9	33.2	623840	4761650	180	1299	T95
O 1873	38.2	38.2	623845	4759350	180	687	T10
O 1874	33.0	33.2	623845	4761610	180	1278	T95
O 1875	38.8	38.8	623846	4758712	180	649	T10
O 1878	36.7	36.8	623851	4758357	180	866	T10
O 188	36.1	36.1	615695	4766140	189	1051	T81
O 1880	33.5	33.6	623854	4761324	180	1140	T95
O 1881	39.2	39.2	623856	4758870	180	609	T10
O 1883	35.7	35.7	623863	4758191	180	1001	T10
O 1884	38.9	38.9	623866	4758798	180	636	T10
O 1885	36.6	36.2	623868	4753941	185	1017	T89
O 1889	33.3	33.3	623877	4757697	180	1433	T10
O 189	36.5	36.6	615733	4766292	190	910	T81
O 1896	34.0	34.2	623893	4760488	180	1136	T95
O 1897	32.5	32.8	623894	4761891	180	1497	T95
O 190	33.7	33.7	615737	4772095	190	1039	T88
O 1901	33.9	33.9	623905	4755396	180	1167	T65

Receptor ID	2015 Results (2015 Amend-ment) Sound Level/ Night dBA	2014 Results (2014 REA Sound Level/ Night dBA	UTM Coordinates (NAD 83, Zone 17) X [m]	Y [m]	Z [m]	Distance to the nearest Turbine [m]	Nearest Turbine ID
O 1903	34.1	34.1	623905	4755325	180	1125	T65
O 1906	34.9	35.0	623911	4759913	180	1130	T10
O 1908	37.3	37.3	623911	4753005	185	712	T89
O 1911	32.5	32.8	623922	4761722	180	1407	T95
O 1914	32.5	32.7	623932	4761784	180	1454	T95
O 1921	33.5	33.6	623945	4760981	180	1135	T95
O 1925	36.0	35.6	623956	4754005	185	1123	T89
O 1926	33.0	33.2	623963	4761287	180	1227	T95
O 1927	37.9	38.0	623963	4766585	190	924	T76
O 193	36.2	36.2	615753	4766147	189	1010	T81
O 1930	33.7	33.7	623966	4755354	180	1192	T65
O 1931	36.0	35.7	623967	4753937	185	1081	T89
O 1932	33.6	33.6	623967	4755401	180	1220	T65
O 1939	32.3	32.6	623973	4761785	180	1487	T95
O 194	35.5	35.5	615779	4771908	190	850	T88
O 1940	33.4	33.4	623975	4755437	180	1248	T65
O 1941	33.2	33.4	623977	4761052	180	1178	T95
O 1943	35.6	35.7	623981	4759631	180	965	T10
O 1946	36.1	35.8	623984	4753763	185	976	T89
O 1949	38.8	38.9	623990	4750124	180	896	T16
O 195	35.6	35.6	615780	4767618	192	861	T81
O 1952	36.9	37.9	623999	4763714	180	783	T55
O 1954	33.1	33.1	624001	4755513	181	1315	T65
O 1955	35.4	35.4	624001	4754885	180	1038	T65
O 1956	35.1	35.1	624003	4755002	180	1069	T65
O 196	34.7	34.7	615786	4764750	185	1251	T08
O 1961	33.7	33.9	624022	4760171	180	1384	T95
O 1965	35.6	35.0	624027	4754336	184	1098	T65
O 1972	33.5	33.5	624038	4755512	182	1344	T65
O 1973	35.2	35.3	624042	4759641	180	1018	T10
O 1976	35.5	35.0	624046	4754179	185	1174	T65
O 198	35.9	35.9	615832	4767617	191	827	T81
O 1985	37.8	37.9	624069	4766517	190	906	T76
O 1988	34.9	35.0	624090	4759646	180	1058	T10
O 199	36.1	36.1	615881	4767623	191	802	T81
O 1990	37.2	37.2	624096	4767928	190	839	T57
O 1998	32.4	32.6	624133	4761161	180	1352	T95
O 1999	32.2	32.2	624142	4755631	182	1499	T65
O 200	32.7	32.7	615901	4769370	200	1347	T83
O 2001	35.4	35.4	624148	4759377	180	969	T10
O 2006	33.0	33.0	624162	4755501	185	1437	T65
O 2007	33.1	33.1	624167	4755445	185	1409	T65
O 2008	33.0	33.0	624169	4755471	185	1425	T65
O 2009	37.3	37.4	624169	4766612	190	1038	T76
O 201	36.0	36.0	615902	4769876	198	842	T83
O 2010	33.1	33.1	624170	4755419	185	1398	T65
O 2011	33.1	33.1	624171	4755431	185	1405	T65
O 2012	33.2	33.2	624172	4755397	184	1388	T65
O 2013	33.2	33.2	624172	4755382	184	1381	T65
O 2014	33.3	33.3	624173	4755351	184	1366	T65
O 2015	33.2	33.3	624174	4755366	184	1374	T65
O 2016	33.3	33.3	624175	4755337	183	1361	T65
O 2017	33.3	33.3	624176	4755324	183	1355	T65
O 2019	33.4	33.4	624177	4755311	183	1350	T65
O 2020	38.4	38.5	624178	4750209	180	966	T16
O 2021	33.4	33.4	624179	4755296	183	1345	T65
O 2022	33.4	33.4	624180	4755270	182	1334	T65
O 2023	33.4	33.4	624180	4755284	182	1341	T65
O 2024	32.8	32.8	624182	4755527	185	1468	T65
O 2025	32.9	32.9	624184	4755485	185	1446	T65
O 2026	39.5	39.8	624186	4765193	185	759	T76
O 2029	34.3	34.4	624192	4759647	180	1141	T10
O 203	32.4	32.4	615928	4768391	195	1484	T81
O 2031	32.7	32.8	624197	4755529	185	1481	T65
O 2032	32.8	32.9	624198	4755486	185	1458	T65
O 2034	32.7	32.7	624208	4755530	185	1491	T65
O 2035	32.8	32.8	624210	4755486	185	1468	T65
O 2038	32.8	32.8	624221	4755452	185	1459	T65
O 2041	32.8	32.9	624222	4755439	184	1453	T65
O 2042	32.7	32.7	624223	4755485	185	1479	T65
O 2043	32.9	32.9	624223	4755421	184	1445	T65
O 2044	32.9	32.9	624225	4755394	184	1433	T65
O 2045	32.9	32.9	624226	4755406	184	1439	T65
O 2046	33.0	33.0	624233	4755347	184	1417	T65

Receptor ID	2015 Results (2015 Amend-ment) Sound Level/ Night dBA	2014 Results (2014 REA Sound Level/ Night dBA	UTM Coordinates (NAD 83, Zone 17)			Distance to the nearest Turbine [m]	Nearest Turbine ID
			X [m]	Y [m]	Z [m]		
O 2048	33.1	33.1	624237	4755304	183	1401	T65
O 2054	37.3	37.5	624254	4766534	190	1020	T76
O 2058	36.9	37.0	624283	4766667	190	1145	T76
O 206	35.4	35.4	615953	4771915	190	867	T88
O 2064	34.4	34.2	624304	4753522	185	1146	T89
O 2066	37.8	38.3	624315	4763811	180	759	T32
O 2069	38.2	38.3	624325	4750251	180	1023	T16
O 2072	33.4	33.5	624333	4759657	180	1264	T10
O 2079	39.2	39.5	624366	4765150	185	848	T32
O 2087	36.8	36.9	624435	4766639	190	1087	T31
O 209	38.4	38.4	615975	4770108	197	626	T83
O 2092	37.4	37.8	624467	4763720	180	758	T32
O 2095	32.5	32.6	624491	4759736	180	1439	T10
O 2096	37.5	37.6	624491	4750356	180	1091	T48
O 2097	35.8	35.8	624497	4769516	186	822	T57
O 2098	36.7	36.9	624500	4766648	190	1052	T31
O 21	30.9	30.9	613063	4764838	184	1483	T08
O 2101	33.0	32.9	624542	4752908	185	1349	T89
O 2105	32.2	32.3	624573	4759676	180	1482	T10
O 2107	36.8	36.9	624577	4766627	190	989	T31
O 211	37.4	37.4	615987	4767532	191	668	T81
O 2112	37.2	37.2	624622	4767976	190	744	T57
O 2116	32.5	32.4	624642	4752747	185	1484	T89
O 2117	32.5	32.4	624646	4752724	185	1494	T89
O 2119	38.8	39.1	624666	4763824	183	597	T32
O 213	36.6	36.6	616000	4766139	189	896	T81
O 2131	37.3	37.4	624697	4766537	190	847	T31
O 2141	36.9	37.0	624718	4766624	190	912	T31
O 215	34.9	34.9	616020	4761979	185	974	T09
O 2153	36.9	37.0	624750	4766629	190	901	T31
O 216	37.6	37.6	616025	4766309	190	731	T81
O 2160	39.8	40.0	624777	4765059	185	649	T32
O 2170	33.3	33.8	624811	4763046	180	1365	T32
O 2172	37.8	37.8	624824	4769191	190	629	T57
O 218	34.8	34.9	616037	4763774	185	1406	T39
O 2183	35.2	35.3	624856	4769473	188	883	T57
O 2187	36.9	37.1	624867	4766633	190	860	T31
O 2191	34.5	34.6	624879	4746506	185	1494	T61
O 22	30.8	30.8	613074	4764761	184	1478	T08
O 220	34.6	34.6	616062	4761880	185	1007	T09
O 2204	32.9	33.4	624917	4762966	180	1451	T32
O 221	35.0	35.0	616072	4769782	198	967	T83
O 2211	36.7	36.8	624929	4766687	190	894	T31
O 2212	35.6	35.7	624935	4746736	185	1258	T61
O 2224	37.5	37.7	624961	4766559	190	762	T31
O 2226	35.3	35.4	624970	4746685	185	1301	T61
O 2231	35.0	35.1	624979	4746622	185	1363	T61
O 2234	35.6	35.7	624982	4746745	185	1240	T61
O 2236	34.6	34.7	624983	4746538	185	1445	T61
O 2237	37.0	37.1	624987	4766643	190	838	T31
O 2239	35.2	35.2	624991	4746660	185	1323	T61
O 224	34.7	34.8	616142	4771934	190	934	T88
O 2243	35.1	35.2	624999	4746642	185	1340	T61
O 2245	34.3	34.4	625005	4746494	185	1486	T61
O 2247	37.0	37.2	625006	4766637	190	829	T31
O 2248	35.0	35.0	625010	4746624	185	1356	T61
O 2249	35.3	35.4	625012	4746699	185	1282	T61
O 2251	34.6	34.7	625018	4746546	185	1433	T61
O 2256	34.6	34.7	625030	4746552	185	1426	T61
O 2257	35.1	35.2	625037	4746664	185	1313	T61
O 2258	34.3	34.4	625041	4746506	183	1470	T61
O 2260	35.0	35.1	625046	4746644	185	1332	T61
O 2261	34.4	34.5	625052	4746516	182	1460	T61
O 2263	34.9	35.0	625061	4746623	185	1352	T61
O 2267	34.4	34.5	625072	4746523	182	1451	T61
O 2268	34.7	34.8	625072	4746597	185	1377	T61
O 227	35.7	35.7	616159	4771824	190	839	T88
O 2270	34.7	34.8	625088	4746586	185	1387	T61
O 2271	37.4	37.4	625090	4768892	190	684	T57
O 2273	35.6	35.7	625099	4767996	190	964	T57
O 2274	34.5	34.6	625104	4746559	183	1413	T61
O 228	35.2	35.2	616162	4761879	185	938	T09
O 2280	39.6	39.9	625153	4765162	185	659	T31
O 2281	37.5	37.7	625166	4766569	190	749	T31

Receptor ID	2015 Results (2015 Amend-ment) Sound Level/ Night dBA	2014 Results (2014 REA Sound Level/ Night dBA	UTM Coordinates (NAD 83, Zone 17) X [m]	Y [m]	Z [m]	Distance to the nearest Turbine [m]	Nearest Turbine ID
O 2282	34.7	34.8	625181	4746618	184	1352	T61
O 2283	34.7	34.8	625203	4746613	183	1357	T61
O 2285	34.9	35.0	625216	4746654	185	1316	T61
O 2286	34.7	34.8	625221	4746627	184	1344	T61
O 2289	36.8	37.0	625233	4766666	190	849	T31
O 229	36.0	36.0	616174	4769943	197	849	T83
O 2290	34.7	34.8	625236	4746625	183	1346	T61
O 2292	34.7	34.8	625245	4746632	183	1340	T61
O 2295	34.7	34.8	625259	4746638	183	1335	T61
O 2297	39.4	39.6	625277	4765161	185	672	T31
O 230	34.9	34.9	616175	4769802	198	979	T83
O 2301	35.7	35.7	625310	4750478	180	1348	T48
O 2304	35.8	35.9	625344	4746847	185	1135	T61
O 2306	35.5	35.6	625364	4768244	190	1033	T57
O 2310	35.6	35.6	625384	4746817	183	1171	T61
O 2311	36.2	36.2	625407	4746921	183	1074	T61
O 2312	36.5	36.5	625412	4750263	180	1220	T48
O 2313	36.4	36.5	625413	4746964	182	1033	T61
O 2315	36.5	36.5	625435	4746977	181	1026	T61
O 2316	35.9	36.0	625437	4750373	180	1323	T48
O 2318	36.8	36.8	625445	4747020	181	987	T61
O 2320	35.0	35.0	625454	4769146	190	1114	T57
O 2322	36.8	36.9	625461	4750173	180	1180	T48
O 2324	36.8	36.9	625478	4747042	181	975	T61
O 2325	37.6	37.7	625479	4747151	183	872	T61
O 2326	39.2	39.5	625479	4765253	187	656	T31
O 2327	37.7	37.8	625499	4749969	180	1063	T48
O 2330	37.1	37.2	625512	4747098	181	934	T61
O 2332	36.8	36.9	625542	4750126	180	1201	T48
O 2333	37.2	37.2	625546	4747118	181	929	T61
O 2337	37.2	37.3	625570	4747137	181	921	T61
O 2338	37.1	37.2	625577	4750033	180	1165	T48
O 2341	37.3	37.3	625590	4747158	181	911	T61
O 2344	37.1	37.2	625621	4747149	181	933	T61
O 2346	38.3	38.4	625643	4749718	180	1051	T48
O 2349	37.5	37.5	625669	4749900	180	1160	T48
O 2350	38.6	38.6	625700	4749604	180	1063	T48
O 2351	35.9	36.5	625705	4763815	182	1100	T32
O 2354	38.9	38.9	625733	4747483	185	739	T61
O 2355	39.0	39.0	625735	4749464	180	1053	T43
O 2357	38.9	38.9	625755	4747505	185	742	T61
O 236	35.4	35.4	616227	4764771	185	1225	T39
O 2362	39.1	39.1	625772	4749396	180	1055	T43
O 2365	38.2	38.3	625776	4747425	185	810	T61
O 2366	37.3	37.3	625778	4747273	185	920	T61
O 2367	39.1	39.1	625783	4749372	180	1055	T43
O 2368	36.3	36.7	625788	4766608	190	1013	T31
O 2369	37.3	37.4	625793	4747293	185	915	T61
O 237	39.6	39.6	616230	4762769	185	592	T09
O 2370	39.2	39.2	625796	4749342	180	1055	T43
O 2373	38.2	38.3	625800	4747446	185	814	T61
O 2374	37.8	38.7	625805	4764309	185	738	T34
O 2376	38.9	38.9	625814	4747573	185	751	T61
O 2377	38.2	38.2	625823	4747460	185	823	T61
O 2378	37.2	37.2	625824	4747298	184	933	T61
O 238	38.0	38.0	616240	4766268	189	706	T81
O 2381	36.9	37.7	625831	4764047	183	852	T34
O 2382	37.2	37.2	625836	4747309	184	933	T61
O 2383	39.3	39.3	625838	4749261	180	1056	T49
O 2384	33.3	33.3	625845	4769726	188	1175	T56
O 2385	33.7	33.7	625845	4769647	188	1116	T56
O 2386	38.8	38.8	625845	4747585	185	771	T61
O 2387	38.7	38.7	625846	4749441	180	1121	T49
O 2388	39.4	39.4	625846	4749209	180	1032	T49
O 2389	37.2	37.2	625848	4747318	183	935	T61
O 239	35.5	35.5	616242	4764924	185	1209	T97
O 2390	33.9	34.0	625849	4769603	188	1081	T56
O 2392	35.3	35.3	625859	4769346	190	905	T56
O 2393	38.2	38.2	625859	4747503	185	827	T61
O 2394	38.7	38.8	625861	4747604	185	775	T61
O 2400	38.2	38.3	625873	4747523	185	827	T61
O 2401	36.0	36.4	625878	4766685	190	1130	T31
O 2405	38.9	38.9	625888	4749340	180	1039	T49
O 2406	37.2	37.3	625893	4747366	184	937	T61

Receptor ID	2015 Results (2015 Amend-ment) Sound Level/ Night dBA	2014 Results (2014 REA Sound Level/ Night dBA	UTM Coordinates (NAD 83, Zone 17)			Distance to the nearest Turbine [m]	Nearest Turbine ID
			X [m]	Y [m]	Z [m]		
O 2407	38.8	39.9	625894	4764712	185	605	T34
O 2408	36.9	37.8	625899	4764035	183	809	T34
O 2409	38.1	38.2	625900	4747540	185	842	T61
O 2415	38.0	38.1	625916	4747540	185	855	T61
O 2416	37.4	37.4	625918	4747416	185	926	T61
O 2417	33.6	33.7	625925	4769697	187	1102	T56
O 2418	38.2	38.8	625932	4765367	188	905	T31
O 2419	36.4	36.5	625935	4768297	190	848	T56
O 2420	39.7	39.8	625936	4748931	180	900	T49
O 2421	39.1	39.1	625937	4749236	180	954	T49
O 2423	34.1	34.1	625941	4769625	188	1035	T56
O 2424	36.5	36.6	625948	4769204	190	753	T56
O 2431	37.2	37.2	625972	4747436	184	958	T61
O 2434	39.7	39.8	625982	4748851	180	856	T49
O 2436	37.2	37.2	625989	4747446	183	966	T61
O 2439	37.1	37.2	626003	4747453	183	975	T61
O 2440	39.6	39.6	626011	4748970	180	827	T49
O 2441	39.7	39.8	626012	4748793	180	833	T49
O 2443	37.1	37.1	626025	4747464	183	988	T61
O 2446	37.0	37.0	626047	4747475	183	1001	T61
O 2449	39.7	39.7	626063	4748714	180	799	T49
O 245	35.1	35.1	616304	4769881	198	964	T83
O 2450	37.0	37.0	626063	4747489	183	1008	T61
O 2453	37.0	37.1	626079	4747520	184	1008	T61
O 2454	36.1	36.2	626091	4768045	190	931	T56
O 2460	33.8	34.4	626118	4763293	180	1349	T34
O 2462	35.5	35.7	626127	4767789	190	1138	T56
O 2465	38.9	38.9	626141	4749284	180	787	T49
O 2468	38.3	38.4	626147	4769196	190	585	T56
O 2469	35.2	35.5	626150	4767552	190	1350	T56
O 247	37.3	37.3	616326	4767649	190	683	T81
O 2471	36.4	37.0	626162	4766627	190	1053	T33
O 2472	36.6	36.6	626163	4747516	180	1086	T61
O 2474	36.6	36.6	626175	4747529	180	1091	T61
O 2475	36.9	36.9	626176	4747597	181	1067	T61
O 2477	36.9	36.9	626202	4747638	181	1077	T61
O 2478	36.6	36.6	626203	4747555	180	1107	T61
O 2479	36.9	37.0	626204	4768136	190	794	T56
O 248	37.5	37.6	616326	4763327	185	883	T09
O 2483	36.6	36.7	626215	4768059	190	857	T56
O 2484	38.9	38.9	626227	4748303	180	863	T49
O 2485	37.7	37.7	626228	4747899	181	1054	T61
O 2486	36.5	37.1	626244	4766648	190	1006	T33
O 2487	37.5	37.6	626246	4747868	180	1074	T61
O 2489	37.6	37.7	626253	4747906	181	1078	T61
O 2490	37.4	37.4	626257	4747839	180	1088	T61
O 2491	35.6	35.8	626258	4767611	190	1261	T56
O 2492	37.3	37.4	626259	4747823	180	1092	T61
O 2493	37.2	37.3	626261	4747803	180	1097	T61
O 2496	37.7	37.7	626265	4747946	180	1088	T61
O 2497	35.5	35.7	626266	4767468	190	1288	T04
O 2498	37.1	37.2	626267	4747779	180	1107	T61
O 2499	37.9	37.9	626270	4748015	180	1063	T49
O 25	33.3	33.3	613095	4766267	190	1150	T52
O 250	34.1	34.1	616332	4769729	199	1110	T83
O 2500	38.5	38.6	626279	4748214	180	895	T49
O 2502	35.8	36.3	626281	4766978	190	1236	T33
O 2504	37.7	37.7	626294	4747974	180	1086	T49
O 2506	35.7	36.2	626298	4767029	190	1270	T33
O 2507	37.2	37.3	626299	4747846	180	1129	T61
O 2509	37.8	37.8	626303	4748007	180	1053	T49
O 251	38.3	38.3	616354	4766279	189	688	T81
O 2510	37.2	37.2	626304	4747829	180	1136	T61
O 2511	37.3	37.4	626305	4747876	180	1131	T61
O 2512	37.1	37.1	626311	4747811	180	1145	T61
O 2513	37.0	37.0	626312	4747791	180	1150	T61
O 2514	37.9	37.9	626320	4748042	180	1014	T49
O 2515	36.9	36.9	626325	4747766	180	1166	T61
O 2516	37.9	38.0	626330	4748071	180	984	T49
O 2517	36.8	36.8	626334	4747749	180	1178	T61
O 2518	36.7	36.8	626337	4747737	180	1183	T61
O 2519	38.8	38.8	626337	4748288	180	801	T49
O 2520	36.7	36.7	626342	4747723	180	1190	T61
O 2521	36.6	36.6	626343	4747701	180	1197	T61

Receptor ID	2015 Results (2015 Amend-ment) Sound Level/ Night dBA	2014 Results (2014 REA Sound Level/ Night dBA	UTM Coordinates (NAD 83, Zone 17) X [m]	Y [m]	Z [m]	Distance to the nearest Turbine [m]	Nearest Turbine ID
O 2522	38.9	40.0	626354	4765297	185	718	T34
O 2523	34.6	35.3	626361	4763416	184	1182	T34
O 2524	36.6	37.3	626362	4766706	190	970	T33
O 2526	39.2	39.3	626380	4749394	180	662	T49
O 2528	37.9	37.9	626398	4748093	180	931	T49
O 2530	37.1	37.8	626421	4766621	190	866	T33
O 2531	37.9	37.9	626423	4748105	180	909	T49
O 2532	38.0	38.0	626463	4748127	180	872	T49
O 2533	38.2	38.2	626466	4748167	180	835	T49
O 2534	39.3	39.3	626476	4749447	180	642	T49
O 2535	38.1	38.1	626501	4748157	180	828	T49
O 2538	37.1	37.8	626522	4766716	190	887	T33
O 2539	38.2	38.2	626524	4748172	180	806	T49
O 2542	38.3	38.3	626556	4748183	180	783	T49
O 2545	38.5	38.5	626575	4748212	180	750	T49
O 2546	38.0	38.1	626575	4768084	190	741	T56
O 2547	33.3	33.4	626585	4750955	180	1370	T24
O 2549	38.9	38.9	626643	4748260	180	683	T49
O 2550	39.8	40.9	626653	4765264	180	693	T34
O 2552	38.8	38.8	626675	7478246	190	688	T49
O 2553	38.2	38.3	626678	4768086	185	743	T56
O 2554	38.9	39.7	626679	4763944	180	675	T34
O 2556	39.1	39.1	626713	4748274	181	653	T49
O 2557	35.7	36.3	626722	4763508	190	1070	T35
O 2558	38.3	38.4	626729	4768070	190	766	T56
O 2562	38.2	39.1	626766	4766655	180	734	T33
O 2564	39.2	39.2	626804	4748276	180	640	T49
O 2566	39.2	39.2	626860	4748277	180	639	T49
O 2568	33.9	33.9	626872	4750965	190	1141	T24
O 257	38.5	38.5	616387	4767550	190	585	T81
O 2570	39.1	39.1	626887	4768182	180	704	T56
O 2571	39.5	39.5	626893	4748300	181	618	T49
O 2573	32.1	32.1	626896	4751391	190	1435	T24
O 2574	38.9	39.0	626902	4768082	190	710	T04
O 2575	38.2	38.9	626912	4766743	190	795	T33
O 2576	38.6	39.4	626914	4766676	180	728	T33
O 2578	35.8	36.3	626937	4763480	185	1028	T35
O 258	36.1	36.1	616391	4764975	180	1060	T97
O 2580	39.6	39.6	626955	4748315	190	611	T49
O 2582	39.2	39.3	626964	4768205	180	720	T56
O 2583	39.0	39.0	626977	4748260	190	670	T49
O 2585	38.3	39.0	626986	4766755	180	805	T33
O 2588	39.0	39.1	626999	4748265	180	670	T49
O 2589	39.7	39.7	627000	4748324	180	613	T49
O 2591	39.1	39.1	627019	4748271	180	670	T49
O 2593	39.8	39.8	627022	4748337	190	608	T49
O 2595	38.5	39.1	627035	4766753	180	806	T33
O 2596	39.1	39.1	627037	4748277	185	669	T49
O 2598	39.6	40.0	627060	4763919	180	573	T35
O 2599	39.1	39.1	627064	4748280	180	674	T49
O 2601	39.7	39.7	627077	4748338	190	626	T49
O 2603	38.6	39.2	627085	4766744	180	802	T33
O 2604	39.1	39.1	627086	4748281	180	681	T49
O 2605	39.7	39.7	627100	4748337	180	635	T49
O 2606	39.0	39.1	627103	4748278	180	691	T49
O 2607	39.0	39.0	627123	4748276	180	700	T49
O 2608	39.7	39.7	627130	4748341	180	645	T49
O 2609	39.0	39.0	627136	4748281	189	702	T49
O 261	37.6	37.6	616418	4766122	180	848	T81
O 2610	39.0	39.0	627154	4748279	180	711	T49
O 2611	39.7	39.7	627155	4748349	180	650	T49
O 2613	38.9	38.9	627171	4748274	180	723	T49
O 2616	39.7	39.7	627186	4748353	180	662	T49
O 2617	38.9	38.9	627189	4748272	180	734	T49
O 2618	38.9	38.9	627202	4748276	180	737	T49
O 2619	39.7	39.7	627215	4748356	198	676	T49
O 262	35.6	35.6	616437	4770047	180	908	T83
O 2620	38.9	38.9	627224	4748276	180	747	T49
O 2623	38.9	39.0	627245	4748288	180	747	T23
O 2624	38.9	38.9	627263	4748288	180	740	T23
O 2627	39.6	39.6	627280	4748361	180	666	T23
O 2628	39.0	39.0	627281	4748294	190	728	T23
O 2629	39.6	39.8	627288	4767199	180	590	T04
O 2632	38.9	38.9	627299	4748292	180	723	T23

Receptor ID	2015 Results (2015 Amend-ment) Sound Level/ Night dBA	2014 Results (2014 REA Sound Level/ Night dBA	UTM Coordinates (NAD 83, Zone 17) X [m]	Y [m]	Z [m]	Distance to the nearest Turbine [m]	Nearest Turbine ID
O 2633	39.6	39.6	627310	4748364	180	652	T23
O 2634	38.8	38.8	627323	4748286	180	721	T23
O 2637	38.5	38.5	627350	4748253	182	745	T23
O 2639	37.5	37.8	627376	4763706	191	805	T35
O 264	34.0	34.0	616451	4771878	181	1036	T88
O 2643	36.9	37.2	627384	4763616	180	895	T35
O 2644	38.3	38.3	627392	4748246	184	743	T23
O 2645	31.4	31.7	627404	4762100	180	1482	T29
O 2646	38.3	38.3	627410	4748249	180	736	T23
O 2647	32.9	32.9	627413	4751359	190	1171	T24
O 2649	34.4	34.4	627423	4769441	185	1029	T56
O 265	36.3	36.4	616456	4764645	180	965	T39
O 2650	38.6	38.6	627427	4748278	180	706	T23
O 2651	39.0	39.0	627435	4748323	190	659	T23
O 2652	33.4	33.5	627442	4769615	180	1155	T56
O 2653	38.5	38.5	627446	4748276	180	704	T23
O 2656	38.4	38.4	627479	4748272	180	705	T23
O 2658	39.5	39.5	627487	4748373	190	603	T23
O 2659	34.8	34.9	627496	4769279	192	1005	T56
O 266	33.5	33.5	616460	4771937	180	1089	T88
O 2660	32.6	32.7	627500	4751408	180	1196	T24
O 2662	38.2	38.2	627519	4748261	190	713	T23
O 2664	36.3	36.4	627527	4768886	180	930	T56
O 2665	38.6	38.7	627531	4748309	180	666	T23
O 2666	38.2	38.2	627535	4748264	180	710	T23
O 2667	38.0	38.1	627547	4748255	180	719	T23
O 2668	38.0	38.0	627562	4748256	184	719	T23
O 267	36.1	36.1	616466	4761785	180	855	T09
O 2671	38.7	38.7	627568	4748325	180	650	T23
O 2673	38.0	38.0	627577	4748254	190	721	T23
O 2674	32.6	32.7	627580	4769711	185	1322	T56
O 2676	39.0	39.3	627588	4764000	180	643	T35
O 2677	37.8	37.8	627600	4748248	180	728	T23
O 2679	38.7	38.7	627617	4748335	189	644	T23
O 268	38.0	38.0	616479	4766186	190	793	T81
O 2680	36.2	36.3	627626	4768833	180	1027	T56
O 2682	37.3	37.4	627652	4748215	180	768	T23
O 2683	37.5	37.5	627656	4748237	180	746	T23
O 2686	37.4	37.4	627670	4748230	190	755	T23
O 2687	39.2	39.3	627677	4768331	190	611	T04
O 2688	38.7	39.1	627685	4766692	180	810	T02
O 2689	37.3	37.3	627686	4748225	189	763	T23
O 2690	39.7	40.0	627693	4764983	180	728	T35
O 2691	32.1	32.1	627701	4751505	180	1267	T24
O 2692	37.2	37.2	627717	4748220	180	775	T23
O 2693	37.4	37.4	627752	4748260	180	745	T23
O 2694	36.9	36.9	627754	4748204	180	799	T23
O 2695	36.8	36.8	627769	4748199	178	809	T23
O 2696	36.4	36.5	627782	4762826	180	767	T29
O 2697	36.6	36.6	627788	4748190	181	822	T23
O 2698	37.2	37.2	627798	4748260	185	759	T23
O 2699	38.3	38.5	627802	4764005	183	797	T35
O 27	30.9	30.9	613114	4764680	185	1449	T08
O 270	36.5	36.5	616496	4764832	181	1017	T39
O 2700	36.5	36.5	627802	4748187	181	830	T23
O 2701	36.3	36.3	627831	4748175	182	850	T23
O 2702	36.9	37.0	627839	4748259	190	776	T23
O 2703	35.0	35.1	627855	4768947	182	1252	T04
O 2704	36.2	36.2	627859	4748181	180	855	T23
O 2706	36.8	36.9	627881	4762747	183	711	T29
O 2707	36.0	36.0	627882	4748165	180	878	T23
O 2708	36.7	36.8	627896	4762700	182	723	T29
O 2709	31.3	31.5	627898	4761841	190	1395	T29
O 2710	39.6	40.0	627899	4765540	184	657	T02
O 2711	36.4	36.4	627901	4748225	185	832	T23
O 2712	35.9	35.9	627904	4748163	190	890	T23
O 2713	38.2	38.5	627915	4766778	184	993	T02
O 2715	35.7	35.7	627930	4748148	180	914	T23
O 2716	31.4	31.4	627931	4751602	180	1374	T24
O 2717	31.6	31.6	627939	4751567	185	1341	T24
O 2718	35.6	35.6	627945	4748147	179	921	T23
O 272	36.2	36.2	616524	4761770	184	849	T09
O 2720	36.4	36.4	627959	4748275	180	815	T23
O 2721	37.2	37.3	627967	4762691	185	671	T29

Receptor ID	2015 Results (2015 Amend-ment) Sound Level/ Night dBA	2014 Results (2014 REA Sound Level/ Night dBA	UTM Coordinates (NAD 83, Zone 17) X [m]	Y [m]	Z [m]	Distance to the nearest Turbine [m]	Nearest Turbine ID
O 2722	35.4	35.4	627972	4748139	185	940	T23
O 2723	38.1	38.3	627974	4764010	185	938	T35
O 2724	37.8	38.0	627976	4763835	184	902	T29
O 2726	35.2	35.2	627990	4748126	185	960	T23
O 2728	35.7	35.7	627995	4748199	185	899	T23
O 273	39.0	39.0	616527	4763296	184	735	T51
O 2730	35.1	35.1	628003	4748120	184	972	T23
O 2731	35.1	35.1	628016	4748118	180	980	T23
O 2733	37.3	37.4	628021	4762645	182	659	T29
O 2734	34.9	34.9	628031	4748109	185	995	T23
O 2735	35.4	35.4	628043	4748196	183	927	T23
O 2737	34.8	34.8	628057	4748105	184	1011	T23
O 2740	34.6	34.6	628077	4748089	185	1035	T23
O 2741	34.9	34.9	628087	4748145	180	994	T23
O 2742	33.5	33.6	628095	4762136	185	1046	T29
O 2743	30.9	31.1	628110	4761706	183	1447	T29
O 2745	34.1	34.2	628148	4748066	181	1093	T23
O 2748	34.0	34.0	628171	4748057	199	1114	T23
O 275	34.0	34.0	616533	4769817	181	1146	T83
O 2751	33.8	33.8	628196	4748045	184	1138	T23
O 2752	34.2	34.2	628200	4748127	190	1074	T23
O 2753	39.7	39.8	628208	4768177	180	609	T58
O 2755	33.6	33.7	628217	4748032	190	1160	T23
O 2757	38.8	39.1	628232	4765412	180	720	T78
O 2758	37.1	37.1	628232	4750703	180	667	T24
O 2761	33.5	33.5	628244	4748025	180	1182	T23
O 2764	33.4	33.4	628255	4751154	180	1044	T24
O 2765	33.4	33.4	628260	4748018	185	1198	T23
O 2769	38.2	38.3	628271	4763928	180	858	T29
O 2772	33.3	33.3	628278	4748019	180	1208	T23
O 2776	33.2	33.2	628289	4748004	185	1226	T23
O 278	38.2	38.2	616539	4763431	180	833	T51
O 2781	33.1	33.1	628302	4747997	180	1240	T23
O 2784	38.4	38.4	628309	4750020	180	599	T24
O 2785	33.0	33.0	628319	4747991	185	1255	T23
O 279	39.4	39.4	616567	4763277	180	694	T51
O 2794	32.9	32.9	628333	4747985	190	1268	T23
O 28	33.5	33.5	613117	4766344	181	1114	T52
O 280	30.8	30.8	616570	4753077	175	1413	T98
O 2804	30.5	30.7	628344	4761639	180	1469	T29
O 2806	32.9	32.9	628346	4747996	185	1268	T23
O 281	39.0	39.0	616618	4763368	190	736	T51
O 282	37.4	37.4	616629	4767594	180	690	T81
O 2822	32.6	32.6	628390	4747969	180	1317	T23
O 2824	32.5	32.5	628406	4747962	180	1332	T23
O 2828	32.3	32.4	628430	4747943	180	1362	T23
O 2829	32.3	32.3	628440	4747943	180	1369	T23
O 2832	36.0	36.0	628445	4749553	184	975	T24
O 2834	32.6	32.6	628455	4748023	180	1320	T23
O 2835	32.2	32.2	628455	4747937	181	1384	T23
O 2837	32.2	32.2	628473	4747938	185	1394	T23
O 2838	32.7	32.8	628501	4748126	180	1282	T23
O 284	31.2	31.2	616648	4753130	185	1337	T98
O 2840	32.7	32.7	628502	4748109	185	1294	T23
O 2841	32.6	32.6	628502	4748077	185	1316	T23
O 2842	32.8	32.8	628504	4748144	185	1273	T23
O 2843	32.6	32.6	628504	4748091	185	1308	T23
O 2844	32.4	32.5	628510	4748056	181	1336	T23
O 2845	31.8	31.9	628513	4747894	185	1454	T23
O 2846	32.8	32.8	628514	4748154	185	1273	T23
O 2847	32.4	32.4	628516	4748041	185	1351	T23
O 2849	38.6	38.7	628519	4764037	194	748	T78
O 285	32.9	32.9	616650	4771887	185	1175	T88
O 2851	32.5	32.5	628522	4748090	185	1322	T23
O 2852	32.6	32.6	628523	4748104	185	1313	T23
O 2853	32.6	32.6	628526	4748119	185	1306	T23
O 2854	32.4	32.5	628526	4748075	185	1335	T23
O 2856	32.8	32.8	628527	4748161	185	1280	T23
O 2857	32.3	32.3	628529	4748037	185	1363	T23
O 2858	32.7	32.7	628531	4748138	185	1296	T23
O 2859	32.4	32.4	628532	4748064	181	1346	T23
O 2860	35.1	35.1	628545	4749267	185	1047	T23
O 2861	32.7	32.7	628545	4748162	186	1293	T23
O 2862	37.7	38.0	628548	4766811	185	821	T58

Receptor ID	2015 Results (2015 Amend-ment) Sound Level/ Night dBA	2014 Results (2014 REA Sound Level/ Night dBA	UTM Coordinates (NAD 83, Zone 17)			Distance to the nearest Turbine [m]	Nearest Turbine ID
			X [m]	Y [m]	Z [m]		
O 2863	32.6	32.6	628549	4748136	185	1312	T23
O 2864	32.3	32.3	628552	4748053	185	1369	T23
O 2865	32.2	32.2	628552	4748030	185	1384	T23
O 2866	32.6	32.6	628557	4748163	185	1301	T23
O 2867	32.5	32.5	628561	4748131	185	1325	T23
O 2869	32.2	32.2	628567	4748056	185	1378	T23
O 2870	32.4	32.4	628572	4748123	185	1338	T23
O 2871	32.5	32.5	628576	4748152	185	1323	T23
O 2872	32.1	32.1	628578	4748034	185	1401	T23
O 2873	31.4	31.6	628579	4761757	185	1346	T29
O 2874	32.1	32.2	628580	4748056	185	1388	T23
O 2875	32.3	32.4	628581	4748116	185	1350	T23
O 2876	38.4	38.5	628586	4763901	185	806	T29
O 2877	32.4	32.4	628587	4748140	185	1339	T23
O 2878	32.5	32.5	628589	4748165	185	1325	T23
O 2879	32.1	32.1	628591	4748060	180	1393	T23
O 288	30.7	30.8	616680	4752540	185	1396	T98
O 2881	32.0	32.0	628592	4748035	185	1411	T23
O 2882	32.2	32.3	628596	4748104	184	1369	T23
O 2883	31.7	31.8	628601	4747963	185	1466	T23
O 2884	32.4	32.4	628603	4748165	190	1336	T23
O 2885	38.3	38.5	628603	4768282	185	666	T58
O 2886	32.3	32.3	628604	4748129	185	1359	T23
O 2887	37.0	37.4	628604	4766679	185	958	T58
O 2888	32.1	32.1	628606	4748066	180	1400	T23
O 2889	36.8	36.9	628607	4762414	180	695	T29
O 289	31.4	31.4	616683	4753201	185	1308	T98
O 2890	31.3	31.4	628609	4761726	185	1378	T29
O 2891	32.1	32.2	628612	4748097	185	1386	T23
O 2892	32.0	32.0	628612	4748042	185	1421	T23
O 2894	32.0	32.1	628617	4748071	185	1406	T23
O 2895	32.2	32.2	628619	4748119	185	1377	T23
O 2896	32.3	32.3	628621	4748158	185	1355	T23
O 2899	31.9	31.9	628630	4748046	182	1432	T23
O 29	31.3	31.3	613184	4764691	185	1378	T08
O 290	37.5	37.5	616685	4764840	185	869	T39
O 2900	32.1	32.1	628631	4748114	185	1390	T23
O 2902	32.0	32.0	628642	4748092	185	1412	T23
O 2903	31.9	31.9	628643	4748071	185	1426	T23
O 2904	32.2	32.2	628644	4748153	185	1376	T23
O 2905	31.8	31.9	628646	4748046	184	1444	T23
O 2907	31.0	31.2	628649	4761688	185	1420	T29
O 2909	31.8	31.8	628660	4748043	200	1457	T23
O 291	33.2	33.2	616689	4769671	190	1357	T83
O 2910	38.4	38.6	628661	4768255	185	654	T58
O 2911	32.0	32.0	628661	4748116	185	1412	T23
O 2912	31.9	31.9	628668	4748083	185	1437	T23
O 2913	32.1	32.1	628669	4748152	185	1397	T23
O 2915	31.7	31.7	628675	4748037	185	1472	T23
O 2917	31.8	31.8	628687	4748086	185	1451	T23
O 2918	32.0	32.0	628690	4748148	185	1416	T23
O 2919	31.6	31.6	628695	4748041	199	1485	T23
O 292	33.0	33.0	616690	4769607	185	1408	T83
O 2920	31.7	31.7	628696	4748062	185	1473	T23
O 2921	31.8	31.8	628698	4748101	185	1450	T23
O 2922	39.2	39.4	628703	4765352	185	582	T78
O 2923	38.4	38.5	628700	4763994	184	797	T78
O 2925	30.8	30.9	628709	4761647	185	1468	T29
O 2926	31.6	31.7	628713	4748074	185	1479	T23
O 2927	31.9	31.9	628714	4748143	185	1439	T23
O 2928	31.7	31.8	628716	4748110	185	1460	T23
O 2929	31.5	31.6	628716	4748046	185	1498	T23
O 2930	31.9	32.0	628720	4748184	185	1421	T23
O 2931	31.6	31.7	628724	4748091	185	1478	T23
O 2932	31.7	31.7	628730	4748114	185	1468	T23
O 2935	31.6	31.6	628742	4748102	185	1485	T23
O 2937	31.9	31.9	628749	4748208	185	1431	T23
O 2938	31.7	31.7	628751	4748130	189	1476	T23
O 2940	37.7	38.0	628752	4766880	185	800	T58
O 2949	38.2	38.3	628811	4763979	180	836	T78
O 2951	32.4	32.5	628817	4761935	183	1208	T29
O 2952	31.0	31.2	628817	4761709	189	1428	T29
O 296	38.5	38.5	616705	4766250	185	794	T97
O 2960	31.2	31.2	628885	4772422	188	1373	T80

Receptor ID	2015 Results (2015 Amend-ment) Sound Level/ Night dBA	2014 Results (2014 REA Sound Level/ Night dBA	UTM Coordinates (NAD 83, Zone 17) X [m]	Y [m]	Z [m]	Distance to the nearest Turbine [m]	Nearest Turbine ID
O 2964	37.5	37.7	628917	4768271	189	780	T58
O 2967	36.9	37.4	628942	4766756	185	990	T58
O 297	39.3	39.3	616708	4763383	185	705	T51
O 2987	37.9	38.0	629098	4764048	185	898	T78
O 2993	34.2	34.6	629134	4768816	185	1359	T58
O 2994	35.7	36.1	629134	4768523	185	1112	T58
O 2998	37.0	37.4	629147	4768284	180	939	T58
O 3002	33.0	33.0	629179	4772474	185	1120	T80
O 3004	37.8	38.0	629188	4764115	185	880	T03
O 3005	37.9	38.0	629188	4764072	185	854	T03
O 3006	34.5	34.9	629189	4768750	194	1325	T59
O 301	33.6	33.6	616739	4768265	185	1357	T81
O 3012	38.7	39.0	629217	4767955	185	798	T59
O 3014	37.0	37.4	629221	4768293	185	966	T59
O 3016	38.5	38.9	629229	4767241	190	850	T58
O 302	35.3	35.3	616743	4767851	189	971	T81
O 3021	36.8	37.6	629266	4766710	185	983	T18
O 3023	37.9	38.0	629268	4764095	185	804	T03
O 3025	38.8	38.9	629286	4763298	185	671	T03
O 3026	37.8	37.9	629300	4764159	185	823	T03
O 3027	39.3	39.7	629302	4767812	187	676	T59
O 3029	35.6	35.6	629319	4771724	185	905	T80
O 3030	39.6	40.0	629320	4767722	182	646	T59
O 3031	36.2	36.3	629324	4762740	186	901	T29
O 3032	38.0	38.5	629326	4767072	189	878	T59
O 3033	37.0	37.8	629339	4766729	188	930	T18
O 3035	36.1	36.7	629342	4765463	185	1021	T78
O 3036	39.1	39.2	629343	4763833	185	601	T03
O 3039	37.2	37.4	629352	4764867	186	775	T78
O 3040	36.3	36.8	629354	4765263	179	910	T78
O 3041	32.3	32.4	629354	4762097	185	1318	T29
O 3043	38.0	38.1	629355	4764103	187	744	T03
O 3046	36.3	36.8	629357	4765296	186	930	T78
O 3047	36.5	36.9	629357	4765167	185	866	T78
O 3048	36.8	37.1	629360	4765047	185	822	T78
O 3049	37.4	37.5	629360	4764369	185	882	T78
O 3050	37.8	37.9	629362	4764166	188	785	T03
O 3051	36.3	37.3	629373	4765934	188	805	T18
O 3053	36.1	37.0	629378	4765764	185	878	T18
O 3055	37.2	37.4	629381	4764460	185	862	T78
O 3056	38.4	38.5	629382	4764027	180	673	T03
O 3057	35.0	35.1	629384	4772373	188	891	T80
O 3058	36.2	37.2	629385	4765843	185	832	T18
O 306	38.3	38.3	616788	4763650	185	843	T39
O 3060	37.2	37.4	629387	4764508	185	851	T78
O 3061	37.3	37.4	629387	4762951	187	812	T03
O 3062	35.4	35.4	629387	4771422	185	976	T80
O 3063	37.1	37.3	629388	4764620	185	823	T78
O 3064	33.3	33.4	629391	4772685	184	1060	T80
O 3065	33.8	33.9	629393	4762366	185	1157	T29
O 3066	37.6	37.7	629393	4764248	189	828	T03
O 3067	36.7	37.9	629393	4766170	185	732	T18
O 3068	36.5	36.5	629397	4771847	180	801	T80
O 3069	35.5	35.6	629398	4772293	183	847	T80
O 3071	31.9	32.0	629398	4762039	184	1391	T29
O 3072	33.4	33.5	629401	4762305	182	1203	T29
O 3073	33.0	33.1	629401	4762237	186	1249	T29
O 3074	36.1	36.1	629402	4771595	185	875	T80
O 3075	34.2	34.2	629402	4772553	185	969	T80
O 3076	37.5	37.6	629402	4764284	187	852	T03
O 3077	36.1	36.6	629402	4765330	185	987	T78
O 3078	33.9	33.9	629403	4772607	185	1000	T80
O 3079	36.5	36.5	629406	4772028	186	781	T80
O 3080	36.2	36.7	629407	4765239	185	943	T78
O 3081	37.8	37.9	629408	4764174	189	760	T03
O 3082	36.7	37.8	629409	4766070	180	731	T18
O 3083	32.8	32.9	629410	4762205	182	1278	T29
O 3084	35.3	35.4	629411	4762630	185	1027	T29
O 3085	38.0	38.2	629415	4764124	190	718	T03
O 3086	34.1	34.1	629416	4771069	175	1123	T79
O 3087	32.2	32.3	629417	4762131	187	1336	T29
O 3088	36.1	36.6	629418	4765276	198	971	T78
O 309	33.6	33.6	616802	4769948	185	1245	T83
O 3090	38.0	38.5	629423	4768195	188	750	T59

Receptor ID	2015 Results (2015 Amend-ment) Sound Level/ Night dBA	2014 Results (2014 REA Sound Level/ Night dBA	UTM Coordinates (NAD 83, Zone 17)			Distance to the nearest Turbine [m]	Nearest Turbine ID
			X [m]	Y [m]	Z [m]		
O 3091	36.6	37.8	629431	4765990	185	732	T18
O 3092	36.9	36.9	629440	4771774	185	775	T80
O 3093	36.9	36.9	629442	4771747	186	781	T80
O 3095	36.0	36.5	629455	4765226	185	980	T78
O 3097	37.7	37.9	629475	4764211	185	750	T03
O 3098	37.5	37.7	629476	4764261	180	791	T03
O 3100	35.2	35.2	629479	4772495	185	872	T80
O 3102	36.8	37.0	629502	4764502	185	963	T78
O 3103	37.2	37.4	629507	4764337	185	843	T03
O 3105	37.0	37.0	629516	4771517	185	817	T80
O 3106	37.8	37.8	629518	4771765	183	703	T80
O 3107	37.4	37.4	629518	4772160	190	691	T80
O 3109	32.4	32.5	629528	4770594	185	1349	T79
O 3111	38.2	38.4	629540	4764147	189	661	T03
O 3112	37.2	38.5	629540	4765971	185	637	T18
O 3113	34.2	34.2	629548	4772711	185	967	T80
O 3115	37.7	37.8	629556	4764234	185	728	T03
O 3116	38.3	38.4	629568	4764156	185	654	T03
O 3117	38.9	39.4	629577	4768185	180	639	T59
O 312	31.7	31.7	616817	4753735	186	1354	T98
O 3120	33.5	33.6	629582	4770783	185	1172	T79
O 3122	37.7	37.8	629606	4764250	181	721	T03
O 3125	33.4	33.5	629621	4762383	185	1234	T03
O 3126	38.3	38.4	629632	4764175	185	643	T03
O 3128	37.7	37.8	629647	4764257	185	712	T03
O 3130	39.1	39.7	629667	4768216	185	617	T59
O 3133	38.6	38.7	629688	4764157	185	604	T03
O 3135	33.6	33.7	629724	4770707	183	1140	T79
O 3138	36.6	36.7	629824	4772622	189	733	T80
O 314	38.9	38.9	616841	4766189	188	663	T97
O 3141	35.0	36.0	629915	4765308	184	944	T18
O 3143	37.2	37.2	629923	4772624	185	692	T80
O 3144	37.1	37.2	629933	4764309	185	723	T03
O 3145	33.8	33.9	629952	4770636	187	1090	T79
O 3146	38.9	39.6	629968	4768328	183	652	T59
O 3147	37.3	37.3	629971	4772629	181	680	T80
O 3150	37.5	37.5	630028	4772631	181	666	T80
O 3153	37.6	37.6	630049	4772629	181	659	T80
O 3154	37.7	37.7	630077	4772627	181	652	T80
O 3155	37.7	37.7	630096	4772635	184	657	T80
O 3156	34.9	35.0	630098	4770737	181	944	T79
O 3157	37.7	37.7	630112	4772634	186	655	T80
O 3158	35.9	36.1	630112	4764401	183	843	T03
O 3159	32.8	32.8	630120	4762457	180	1154	T03
O 316	32.3	32.3	616853	4753410	186	1187	T98
O 3161	36.4	36.6	630171	4764294	185	760	T03
O 3163	38.6	38.6	630205	4764058	184	565	T03
O 3164	35.1	35.1	630211	4770734	187	919	T79
O 3166	38.8	39.7	630237	4768317	179	637	T60
O 3167	38.3	38.3	630267	4772592	190	613	T80
O 3168	38.8	40.0	630298	4766936	184	728	T18
O 3169	32.5	32.6	630302	4762506	180	1157	T03
O 317	32.4	32.4	616853	4753307	176	1159	T98
O 3172	39.2	39.2	630312	4772528	185	559	T80
O 3173	38.5	38.5	630316	4763230	175	556	T03
O 3174	38.0	38.0	630329	4772606	190	638	T80
O 3175	38.6	40.0	630331	4766793	187	602	T18
O 3176	34.7	35.0	630362	4764424	175	960	T03
O 3178	37.4	37.4	630401	4772642	187	692	T80
O 3179	34.7	34.9	630421	4764377	193	951	T03
O 318	34.5	34.6	616856	4771254	187	1058	T88
O 3180	38.6	39.6	630433	4768265	187	604	T60
O 3181	37.7	38.8	630445	4768333	184	672	T60
O 3182	35.3	35.4	630448	4770760	185	879	T79
O 3183	36.0	36.0	630466	4763116	185	744	T03
O 3184	34.1	36.0	630469	4770621	190	1019	T79
O 3187	37.9	39.1	630491	4766885	185	753	T18
O 3189	34.4	34.4	630504	4770660	193	984	T79
O 319	33.9	33.9	616880	4768207	190	1351	T81
O 3191	37.6	38.9	630537	4766889	185	780	T18
O 3192	35.1	35.2	630538	4770754	180	896	T79
O 3193	36.6	36.6	630551	4772660	188	768	T80
O 3194	33.7	34.0	630576	4764410	180	1071	T03
O 3195	36.5	36.5	630587	4772655	186	781	T80

Receptor ID	2015 Results (2015 Amend-ment) Sound Level/ Night dBA	2014 Results (2014 REA Sound Level/ Night dBA	UTM Coordinates (NAD 83, Zone 17)			Distance to the nearest Turbine [m]	Nearest Turbine ID
			X [m]	Y [m]	Z [m]		
O 3196	36.8	37.8	630596	4768345	186	736	T60
O 3197	37.0	38.1	630635	4768286	189	702	T60
O 3198	33.1	33.5	630640	4764516	185	1193	T03
O 32	32.1	32.1	613320	4764699	180	1243	T08
O 320	32.3	32.3	616900	4753630	180	1231	T98
O 3202	33.9	34.0	630699	4770660	189	1027	T79
O 3204	33.0	33.3	630720	4764407	188	1165	T03
O 3206	33.5	33.7	630804	4764082	180	1038	T03
O 3207	34.3	34.4	630811	4770764	181	971	T79
O 3208	35.1	35.1	630819	4772667	184	931	T80
O 3209	34.5	34.5	630826	4772734	180	986	T80
O 321	31.6	31.6	616900	4752401	182	1257	T98
O 3211	34.0	34.0	630894	4772746	190	1040	T80
O 3212	31.7	32.2	630918	4764626	184	1460	T03
O 3213	39.2	39.2	630929	4771501	180	562	T79
O 3214	34.3	34.4	630930	4772674	190	1014	T80
O 3215	31.8	32.2	630939	4764497	190	1387	T03
O 3216	31.5	32.0	630975	4764619	190	1496	T03
O 3217	31.5	31.9	631003	4764528	182	1456	T03
O 3218	33.1	33.1	631016	4772782	181	1151	T80
O 3219	33.3	33.3	631029	4772740	180	1132	T80
O 3222	33.6	33.6	631042	4772683	180	1105	T80
O 3223	37.2	37.2	631043	4772073	190	790	T79
O 3225	33.0	34.4	631065	4765902	185	997	T18
O 323	39.9	39.9	616908	4763380	185	639	T51
O 3230	31.9	32.0	631121	4770571	185	1296	T79
O 3232	31.4	31.6	631133	4770475	185	1382	T79
O 3236	33.2	34.2	631162	4768311	181	1085	T60
O 3239	34.9	34.9	631179	4771200	185	907	T79
O 3240	31.2	32.1	631179	4768810	180	1444	T60
O 3243	34.8	34.8	631192	4771191	180	923	T79
O 3244	35.3	35.3	631194	4771305	185	875	T79
O 3246	34.5	35.7	631197	4767565	180	927	T60
O 3247	34.6	34.6	631209	4771190	185	938	T79
O 3248	33.0	34.0	631213	4768277	181	1109	T60
O 3252	34.5	34.5	631226	4771189	180	954	T79
O 3253	34.6	34.7	631231	4771238	182	937	T79
O 3254	34.3	34.4	631237	4771182	185	967	T79
O 3255	34.0	35.2	631237	4767355	180	1014	T60
O 3256	34.6	34.7	631246	4771269	182	938	T79
O 3257	34.3	34.4	631246	4771193	190	970	T79
O 3258	30.7	31.6	631247	4765249	180	1491	T18
O 3259	34.6	34.6	631248	4771260	190	943	T79
O 326	36.3	36.3	616928	4767591	180	855	T81
O 3262	34.6	34.7	631251	4771283	180	937	T79
O 3263	34.5	34.5	631254	4771245	181	954	T79
O 3264	34.3	34.4	631254	4771208	180	970	T79
O 3265	34.7	34.7	631257	4771307	180	933	T79
O 3266	34.7	34.7	631257	4771296	180	937	T79
O 3267	34.7	34.7	631260	4771320	182	932	T79
O 3268	34.3	34.3	631263	4771214	180	975	T79
O 3269	34.7	34.7	631266	4771335	180	932	T79
O 327	32.9	32.9	616931	4761298	189	1285	T09
O 3270	33.1	34.3	631269	4766911	180	1256	T60
O 3271	34.7	34.7	631271	4771347	190	933	T79
O 3273	32.0	33.2	631274	4765985	180	1177	T18
O 3275	34.7	34.7	631279	4771354	181	939	T79
O 3276	34.3	34.4	631279	4771262	190	970	T79
O 3277	32.6	33.8	631280	4766492	184	1187	T18
O 3278	34.0	34.1	631280	4771189	180	1002	T79
O 3279	34.4	34.4	631283	4771277	180	968	T79
O 328	33.2	33.3	616935	4761352	181	1232	T09
O 3280	34.3	34.3	631285	4771260	180	977	T79
O 3281	34.6	34.7	631285	4771361	180	943	T79
O 3282	34.3	34.4	631285	4771273	180	972	T79
O 3283	34.4	34.4	631288	4771295	180	967	T79
O 3284	34.5	34.5	631289	4771324	180	957	T79
O 3285	34.4	34.5	631289	4771309	180	962	T79
O 3286	34.5	34.5	631289	4771325	180	957	T79
O 3288	34.4	34.4	631290	4771308	180	963	T79
O 3289	34.3	34.4	631290	4771285	180	972	T79
O 3290	34.4	34.4	631290	4771295	180	968	T79
O 3291	34.3	34.4	631290	4771285	180	972	T79
O 3293	34.6	34.6	631296	4771372	180	950	T79

Receptor ID	2015 Results (2015 Amend-ment) Sound Level/ Night dBA	2014 Results (2014 REA Sound Level/ Night dBA	UTM Coordinates (NAD 83, Zone 17)			Distance to the nearest Turbine [m]	Nearest Turbine ID
			X [m]	Y [m]	Z [m]		
O 3294	34.4	34.5	631298	4771332	184	963	T79
O 3295	33.9	33.9	631298	4771191	180	1017	T79
O 3296	34.4	34.4	631299	4771331	181	964	T79
O 3297	34.2	34.2	631299	4771262	190	989	T79
O 3298	30.7	31.6	631300	4765347	190	1472	T18
O 3299	30.9	31.9	631303	4765483	180	1396	T18
O 3300	34.4	34.4	631307	4771338	180	970	T79
O 3301	34.5	34.5	631307	4771384	180	957	T79
O 3302	34.4	34.4	631307	4771338	181	970	T79
O 3303	34.1	34.2	631307	4771273	181	992	T79
O 3304	34.1	34.1	631313	4771279	182	995	T79
O 3305	33.9	34.0	631316	4771241	184	1013	T79
O 3306	33.7	33.8	631317	4771189	180	1035	T79
O 3307	34.4	34.5	631318	4771393	180	965	T79
O 3308	34.1	34.1	631318	4771288	180	997	T79
O 3309	34.3	34.3	631318	4771347	180	978	T79
O 331	31.7	31.7	616942	4752377	180	1235	T98
O 3310	34.3	34.3	631318	4771345	180	979	T79
O 3311	34.1	34.2	631320	4771304	185	993	T79
O 3312	33.1	34.3	631322	4767144	180	1175	T60
O 3313	34.3	34.3	631324	4771363	180	979	T79
O 3315	34.1	34.2	631325	4771316	180	994	T79
O 332	31.1	31.1	616948	4752188	180	1341	T98
O 3320	34.2	34.3	631328	4771361	181	984	T79
O 3321	33.9	33.9	631329	4771247	180	1023	T79
O 3323	34.3	34.4	631331	4771404	180	975	T79
O 3325	34.2	34.3	631332	4771368	180	986	T79
O 3327	34.2	34.2	631334	4771367	180	987	T79
O 3328	34.1	34.1	631334	4771332	180	997	T79
O 3329	34.3	34.4	631336	4771422	180	976	T79
O 333	34.3	34.4	616953	4761501	183	1087	T09
O 3330	33.6	33.6	631337	4771187	180	1054	T79
O 3331	34.6	34.6	631338	4771558	190	958	T79
O 3332	32.3	33.5	631342	4766557	180	1263	T18
O 3333	34.2	34.2	631344	4771379	180	994	T79
O 3334	34.5	34.5	631344	4771513	180	968	T79
O 3335	34.0	34.1	631345	4771339	180	1006	T79
O 3337	33.7	33.8	631346	4771255	180	1035	T79
O 3338	34.3	34.3	631348	4771431	180	986	T79
O 3339	34.1	34.2	631348	4771380	180	998	T79
O 334	32.8	32.8	616962	4761288	180	1300	T09
O 3340	33.8	33.8	631349	4771266	180	1034	T79
O 3341	34.1	34.1	631354	4771384	180	1002	T79
O 3342	33.8	33.9	631354	4771295	182	1029	T79
O 3343	33.5	33.5	631354	4771189	180	1068	T79
O 3344	33.8	33.8	631356	4771285	185	1034	T79
O 3345	33.2	34.3	631356	4767756	180	1082	T60
O 3346	33.9	34.0	631358	4771344	180	1017	T79
O 3347	33.8	33.9	631358	4771307	190	1028	T79
O 3348	31.6	32.8	631361	4766038	180	1253	T18
O 3349	34.2	34.2	631361	4771435	190	998	T79
O 335	36.3	36.3	616965	4767579	186	872	T81
O 3350	30.3	30.5	631364	4763681	180	1476	T03
O 3351	34.1	34.2	631365	4771446	182	999	T79
O 3352	33.4	33.4	631365	4771192	180	1077	T79
O 3353	33.8	33.8	631367	4771308	180	1037	T79
O 3354	34.1	34.2	631368	4771458	180	1001	T79
O 3355	34.2	34.2	631369	4771499	180	995	T79
O 3356	33.9	34.0	631370	4771377	180	1020	T79
O 3357	34.1	34.2	631371	4771468	180	1002	T79
O 3358	33.8	33.9	631372	4771347	180	1029	T79
O 3359	34.2	34.2	631373	4771486	180	1000	T79
O 336	32.6	32.6	616972	4753658	180	1182	T98
O 3360	34.0	34.0	631373	4771410	181	1014	T79
O 3361	33.3	33.3	631377	4771191	180	1089	T79
O 3362	33.8	33.9	631380	4771370	180	1031	T79
O 3363	33.9	33.9	631380	4771402	180	1023	T79
O 3364	33.8	33.8	631382	4771349	180	1039	T79
O 3365	33.7	33.8	631386	4771360	180	1040	T79
O 3366	33.6	33.7	631387	4771317	181	1053	T79
O 3367	33.2	33.2	631390	4771193	180	1100	T79
O 3369	33.8	33.8	631394	4771402	180	1037	T79
O 3370	33.5	33.5	631400	4771313	180	1067	T79
O 3371	33.4	33.5	631402	4771301	180	1072	T79

Receptor ID	2015 Results (2015 Amend-ment) Sound Level/ Night dBA	2014 Results (2014 REA Sound Level/ Night dBA	UTM Coordinates (NAD 83, Zone 17)		Z [m]	Distance to the nearest Turbine [m]	Nearest Turbine ID
			X [m]	Y [m]			
O 3373	33.1	33.1	631404	4771195	180	1112	T79
O 3374	33.3	33.3	631409	4771259	180	1093	T79
O 3375	33.3	33.3	631410	4771269	180	1090	T79
O 3376	33.0	33.1	631411	4771195	180	1118	T79
O 3377	33.3	33.4	631411	4771285	190	1086	T79
O 3378	30.5	31.5	631412	4765515	185	1474	T18
O 338	39.3	39.3	616977	4764788	180	631	T39
O 3380	33.5	33.6	631419	4771377	180	1067	T79
O 3381	33.5	33.5	631420	4771366	180	1071	T79
O 3382	33.6	33.7	631424	4771441	180	1058	T79
O 3385	32.9	33.0	631427	4771200	180	1130	T79
O 3387	33.6	33.6	631427	4771426	180	1064	T79
O 3388	33.3	33.3	631432	4771333	180	1092	T79
O 3389	33.5	33.5	631435	4771414	185	1074	T79
O 339	39.4	39.4	617003	4763469	180	717	T51
O 3390	33.2	33.3	631435	4771320	180	1098	T79
O 3391	33.4	33.5	631436	4771402	180	1077	T79
O 3392	33.4	33.4	631439	4771391	180	1084	T79
O 3393	33.2	33.2	631439	4771304	180	1107	T79
O 3394	33.3	33.4	631441	4771375	180	1089	T79
O 3395	32.9	32.9	631441	4771211	180	1140	T79
O 3396	33.0	33.0	631445	4771257	180	1127	T79
O 3397	32.9	32.9	631445	4771227	180	1137	T79
O 3398	33.1	33.1	631446	4771291	180	1117	T79
O 3399	32.9	33.0	631446	4771241	195	1134	T79
O 34	31.3	31.3	613403	4767688	180	1414	T52
O 340	34.3	34.3	617008	4761498	180	1100	T09
O 3401	33.2	33.2	631449	4771333	180	1108	T79
O 3402	33.2	33.2	631451	4771347	189	1106	T79
O 3403	32.1	33.2	631455	4766912	180	1407	T60
O 3404	33.1	33.1	631455	4771322	180	1117	T79
O 3405	33.0	33.0	631460	4771305	180	1126	T79
O 3407	32.9	32.9	631464	4771272	180	1140	T79
O 3409	32.8	32.8	631469	4771241	185	1156	T79
O 341	39.2	39.3	617011	4764858	180	670	T39
O 3410	32.8	32.8	631471	4771255	180	1152	T79
O 3411	33.2	33.2	631472	4771413	180	1111	T79
O 3412	33.1	33.1	631472	4771386	180	1117	T79
O 3413	33.2	33.2	631473	4771438	180	1107	T79
O 3414	33.1	33.2	631473	4771400	180	1114	T79
O 3415	32.7	32.8	631473	4771232	180	1162	T79
O 3416	32.6	32.6	631476	4771201	180	1176	T79
O 3418	33.0	33.1	631476	4771372	180	1124	T79
O 3419	32.6	32.7	631477	4771218	180	1171	T79
O 342	33.1	33.1	617013	4753575	180	1106	T98
O 3420	32.5	32.6	631478	4771189	180	1182	T79
O 3421	33.0	33.0	631479	4771351	180	1132	T79
O 3422	33.0	33.0	631481	4771364	180	1130	T79
O 3423	32.9	33.0	631483	4771341	180	1138	T79
O 3424	32.9	32.9	631483	4771325	180	1142	T79
O 3425	33.1	33.2	631484	4771441	180	1117	T79
O 3426	33.1	33.1	631485	4771417	180	1123	T79
O 3427	33.0	33.1	631486	4771393	180	1128	T79
O 3428	32.8	32.9	631487	4771314	180	1149	T79
O 3429	33.0	33.0	631487	4771380	180	1133	T79
O 343	32.0	32.0	617014	4752344	180	1194	T98
O 3430	33.0	33.1	631488	4771406	180	1128	T79
O 3431	32.9	33.0	631491	4771369	180	1139	T79
O 3432	32.7	32.8	631491	4771290	180	1160	T79
O 3433	32.9	32.9	631493	4771357	180	1143	T79
O 3434	32.8	32.9	631495	4771346	180	1149	T79
O 3435	32.6	32.7	631495	4771262	180	1173	T79
O 3436	32.8	32.8	631496	4771336	180	1152	T79
O 3437	32.7	32.8	631498	4771316	180	1159	T79
O 3438	32.6	32.6	631498	4771248	180	1180	T79
O 3439	33.0	33.0	631500	4771438	196	1134	T79
O 344	33.0	33.0	617014	4769829	180	1486	T83
O 3440	32.5	32.5	631504	4771225	180	1193	T79
O 3441	32.4	32.5	631505	4771214	180	1198	T79
O 3442	32.4	32.4	631506	4771200	180	1204	T79
O 3443	32.9	32.9	631511	4771436	180	1145	T79
O 3444	32.8	32.9	631514	4771409	180	1153	T79
O 3445	32.8	32.8	631516	4771394	180	1157	T79
O 3446	32.7	32.8	631518	4771381	180	1162	T79

Receptor ID	2015 Results (2015 Amend-ment) Sound Level/ Night dBA	2014 Results (2014 REA Sound Level/ Night dBA	UTM Coordinates (NAD 83, Zone 17)			Distance to the nearest Turbine [m]	Nearest Turbine ID
			X [m]	Y [m]	Z [m]		
O 3447	32.7	32.8	631518	4771369	180	1165	T79
O 3448	32.7	32.7	631519	4771355	180	1169	T79
O 3450	32.4	32.4	631526	4771243	180	1208	T79
O 3451	32.6	32.6	631526	4771341	180	1180	T79
O 3452	32.2	32.3	631526	4771204	180	1222	T79
O 3453	32.7	32.7	631528	4771381	180	1172	T79
O 3454	32.3	32.3	631528	4771221	180	1218	T79
O 3455	32.7	32.7	631529	4771406	180	1168	T79
O 3456	32.6	32.7	631531	4771370	180	1178	T79
O 3458	32.5	32.6	631550	4771399	180	1190	T79
O 3459	32.5	32.5	631554	4771378	180	1198	T79
O 346	32.2	32.2	617022	4754066	180	1403	T98
O 3460	32.4	32.5	631554	4771364	180	1202	T79
O 3461	32.2	32.3	631555	4771281	180	1224	T79
O 3462	32.2	32.2	631559	4771264	180	1233	T79
O 3463	32.2	32.3	631562	4771291	180	1228	T79
O 3464	32.1	32.1	631565	4771243	180	1245	T79
O 3465	32.0	32.1	631565	4771233	180	1249	T79
O 3466	32.5	32.5	631568	4771443	180	1200	T79
O 3467	32.2	32.2	631568	4771305	180	1230	T79
O 3468	32.0	32.0	631568	4771218	180	1256	T79
O 3469	31.9	32.0	631570	4771206	189	1261	T79
O 347	38.9	38.9	617025	4766263	180	650	T97
O 3470	32.2	32.2	631571	4771314	180	1230	T79
O 3471	32.3	32.4	631573	4771387	180	1215	T79
O 3472	32.2	32.2	631576	4771327	180	1232	T79
O 3473	32.3	32.3	631578	4771368	180	1224	T79
O 3474	32.2	32.3	631579	4771343	180	1230	T79
O 3475	32.4	32.4	631580	4771450	180	1210	T79
O 3476	32.2	32.3	631580	4771355	180	1229	T79
O 3477	32.0	32.1	631582	4771279	180	1250	T79
O 3478	32.0	32.1	631584	4771269	180	1256	T79
O 3479	31.9	32.0	631587	4771252	180	1263	T79
O 348	31.4	31.4	617029	4752154	180	1303	T98
O 3480	32.0	32.1	631591	4771290	180	1256	T79
O 3481	31.9	31.9	631591	4771241	180	1271	T79
O 3482	31.9	31.9	631591	4771227	180	1275	T79
O 3483	32.3	32.3	631592	4771457	180	1221	T79
O 3484	31.8	31.9	631593	4771215	180	1280	T79
O 3485	32.0	32.0	631594	4771279	180	1262	T79
O 3486	31.8	31.8	631597	4771201	180	1288	T79
O 3487	31.9	32.0	631598	4771267	180	1269	T79
O 3488	32.1	32.2	631602	4771381	180	1244	T79
O 3489	31.8	31.9	631602	4771250	180	1278	T79
O 349	33.2	33.2	617030	4753552	180	1079	T98
O 3490	32.2	32.3	631604	4771463	180	1233	T79
O 3491	31.8	31.8	631605	4771238	180	1285	T79
O 3492	31.8	31.8	631605	4771226	180	1289	T79
O 3493	31.7	31.8	631605	4771208	180	1295	T79
O 3494	32.0	32.1	631608	4771349	180	1257	T79
O 3495	32.1	32.2	631610	4771424	180	1245	T79
O 3496	31.9	31.9	631615	4771309	180	1274	T79
O 3497	31.8	31.9	631616	4771275	180	1284	T79
O 3498	32.1	32.2	631617	4771465	180	1245	T79
O 3499	32.0	32.1	631617	4771388	180	1258	T79
O 3500	31.7	31.8	631619	4771263	180	1290	T79
O 3501	31.7	31.8	631622	4771251	180	1297	T79
O 3502	31.7	31.7	631623	4771238	180	1302	T79
O 3503	32.0	32.1	631625	4771432	180	1258	T79
O 3504	31.9	31.9	631626	4771356	180	1273	T79
O 3505	31.6	31.7	631627	4771224	180	1310	T79
O 3506	31.7	31.8	631628	4771278	180	1295	T79
O 3507	31.6	31.6	631628	4771210	180	1316	T79
O 3508	31.8	31.8	631630	4771314	180	1287	T79
O 3509	32.0	32.0	631630	4771436	180	1262	T79
O 351	33.7	33.7	617040	4753351	180	991	T98
O 3510	31.7	31.7	631630	4771263	180	1301	T79
O 3511	31.5	31.6	631631	4771199	180	1322	T79
O 3512	32.0	32.1	631632	4771474	180	1259	T79
O 3513	31.6	31.6	631637	4771238	180	1315	T79
O 3514	31.9	31.9	631637	4771401	180	1275	T79
O 3515	31.6	31.7	631637	4771250	180	1312	T79
O 3516	31.9	32.0	631638	4771443	180	1269	T79
O 3517	31.8	31.9	631639	4771363	180	1285	T79

Receptor ID	2015 Results (2015 Amend-ment) Sound Level/ Night dBA	2014 Results (2014 REA Sound Level/ Night dBA	UTM Coordinates (NAD 83, Zone 17) X [m]	Y [m]	Z [m]	Distance to the nearest Turbine [m]	Nearest Turbine ID
O 3518	31.7	31.8	631640	4771322	180	1295	T79
O 3519	31.5	31.5	631641	4771211	180	1327	T79
O 352	32.0	32.0	617042	4752319	180	1186	T98
O 3520	31.5	31.6	631642	4771224	180	1324	T79
O 3521	31.9	32.0	631643	4771479	180	1269	T79
O 3522	31.9	31.9	631646	4771450	180	1276	T79
O 3523	31.6	31.7	631648	4771296	180	1309	T79
O 3524	31.6	31.6	631649	4771281	180	1314	T79
O 3525	31.7	31.7	631652	4771327	180	1305	T79
O 3526	31.9	31.9	631652	4771492	180	1276	T79
O 3527	31.8	31.8	631653	4771410	180	1289	T79
O 3528	31.5	31.6	631655	4771268	180	1324	T79
O 3529	31.7	31.8	631656	4771371	180	1300	T79
O 3530	31.5	31.5	631657	4771255	180	1329	T79
O 3531	31.8	31.9	631658	4771457	180	1287	T79
O 3532	31.9	31.9	631661	4771505	180	1283	T79
O 3533	31.6	31.7	631661	4771335	180	1312	T79
O 3534	31.4	31.5	631661	4771242	180	1337	T79
O 3535	31.4	31.4	631663	4771228	180	1343	T79
O 3536	31.7	31.8	631664	4771417	180	1299	T79
O 3537	31.5	31.6	631664	4771295	180	1325	T79
O 3538	31.8	31.9	631665	4771515	180	1287	T79
O 3539	31.3	31.4	631665	4771215	180	1349	T79
O 354	34.7	34.7	617052	4761555	180	1054	T09
O 3540	31.8	31.8	631665	4771462	180	1293	T79
O 3541	31.6	31.7	631667	4771377	180	1309	T79
O 3542	31.4	31.5	631668	4771281	181	1333	T79
O 3543	31.3	31.4	631668	4771203	180	1356	T79
O 3544	31.4	31.5	631671	4771267	180	1339	T79
O 3545	31.7	31.8	631674	4771470	180	1301	T79
O 3546	31.4	31.4	631675	4771254	180	1346	T79
O 3547	31.5	31.6	631675	4771340	180	1325	T79
O 3548	31.3	31.4	631677	4771239	180	1353	T79
O 3549	31.6	31.7	631678	4771424	180	1311	T79
O 3550	31.3	31.3	631679	4771230	181	1357	T79
O 3551	31.2	31.3	631680	4771215	180	1363	T79
O 3552	31.7	31.7	631681	4771478	180	1306	T79
O 3553	31.5	31.6	631681	4771386	180	1321	T79
O 3554	31.4	31.5	631683	4771309	180	1340	T79
O 3555	31.4	31.4	631685	4771297	180	1345	T79
O 3556	31.3	31.4	631685	4771283	180	1349	T79
O 3557	31.6	31.7	631688	4771484	180	1312	T79
O 3558	31.4	31.5	631689	4771346	180	1337	T79
O 3559	31.5	31.6	631691	4771432	180	1323	T79
O 356	33.5	33.5	617054	4753518	180	1042	T98
O 3560	31.3	31.3	631692	4771269	180	1359	T79
O 3561	31.4	31.4	631693	4771322	180	1347	T79
O 3562	31.2	31.3	631693	4771253	180	1364	T79
O 3563	31.2	31.3	631694	4771241	180	1369	T79
O 3564	31.5	31.5	631696	4771400	181	1333	T79
O 3565	31.2	31.2	631697	4771227	180	1375	T79
O 3566	31.3	31.4	631698	4771311	181	1353	T79
O 3567	31.1	31.2	631701	4771216	180	1383	T79
O 3568	31.4	31.4	631701	4771355	181	1347	T79
O 3569	31.1	31.1	631703	4771200	195	1389	T79
O 357	33.5	33.5	617066	4771041	180	1251	T88
O 3570	31.2	31.3	631706	4771294	180	1366	T79
O 3571	31.2	31.3	631707	4771280	180	1370	T79
O 3572	31.1	31.2	631710	4771253	180	1381	T79
O 3573	31.1	31.2	631711	4771268	180	1378	T79
O 3574	31.1	31.1	631713	4771240	181	1387	T79
O 3575	31.0	31.1	631717	4771228	181	1394	T79
O 3576	31.0	31.1	631719	4771213	180	1400	T79
O 359	33.0	33.0	617076	4761329	180	1280	T09
O 360	34.0	34.1	617078	4761475	180	1138	T09
O 3609	36.0	36.0	631154	4772066	182	881	T79
O 3614	32.0	32.0	631445	4770958	195	1260	T79
O 362	33.1	33.2	617085	4770150	180	1384	T83
O 363	32.1	32.1	617088	4752282	185	1174	T98
O 3630	32.4	33.4	631354	4768192	185	1191	T60
O 3631	32.5	33.5	631420	4767947	185	1173	T60
O 3632	30.9	31.9	631694	4767869	185	1428	T60
O 3633	31.3	32.3	631642	4767730	188	1365	T60
O 3637	31.0	32.0	631701	4767230	190	1494	T60

Receptor ID	2015 Results (2015 Amend-ment) Sound Level/ Night dBA	2014 Results (2014 REA Sound Level/ Night dBA	UTM Coordinates (NAD 83, Zone 17) X [m]	Y [m]	Z [m]	Distance to the nearest Turbine [m]	Nearest Turbine ID
O_3641	31.8	32.9	631502	4766874	188	1467	T60
O_3643	31.7	32.8	631531	4766979	190	1437	T60
O_3645	31.7	32.9	631392	4766256	180	1270	T18
O_367	34.2	34.2	617106	4753383	185	940	T98
O_368	40.0	40.0	617107	4764795	180	570	T39
O_3684	32.0	32.1	617946	4749326	180	1266	T99
O_3689	31.0	31.0	617081	4752007	185	1373	T98
O_37	32.9	33.0	613520	4764532	200	1092	T08
O_3703	32.1	32.2	614637	4770098	182	1336	T83
O_3704	31.6	31.6	631075	4772971	180	1329	T80
O_3705	32.9	32.9	631140	4772702	180	1194	T80
O_372	34.0	34.0	617115	4761467	180	1156	T09
O_373	33.5	33.6	617120	4761409	180	1213	T09
O_375	31.5	31.5	617131	4752087	195	1279	T98
O_377	32.8	32.8	617149	4771162	180	1338	T88
O_378	34.2	34.3	617159	4753504	180	944	T98
O_381	32.1	32.1	617171	4755339	177	1291	T82
O_3826	33.3	33.8	623726	4762663	180	1406	T36
O_383	34.5	34.5	617182	4753468	183	906	T98
O_3846	34.4	34.4	628108	4748075	180	1064	T23
O_3847	37.0	37.0	627732	4748213	180	785	T23
O_3848	37.0	37.0	627743	4748209	180	792	T23
O_385	35.0	35.0	617196	4753357	185	846	T98
O_3851	36.2	36.3	627925	4748226	180	842	T23
O_3852	32.8	32.8	628359	4747978	180	1290	T23
O_3853	32.7	32.7	628374	4747972	180	1304	T23
O_3854	38.3	38.3	627588	4748288	180	688	T23
O_3855	38.3	38.3	627506	4748265	180	710	T23
O_3856	39.1	39.1	627213	4748301	180	721	T49
O_3857	39.1	39.1	627198	4748299	181	715	T49
O_3858	37.6	37.6	626251	4747899	180	1077	T61
O_3859	37.6	37.6	626321	4747961	180	1084	T49
O_386	32.3	32.3	617203	4755320	180	1254	T82
O_3860	37.6	37.6	626343	4747992	180	1047	T49
O_3864	37.5	37.5	626252	4747852	180	1081	T61
O_3865	36.5	36.6	626343	4747690	180	1199	T61
O_3866	36.5	36.5	626340	4747669	180	1201	T61
O_3867	36.4	36.4	626336	4747652	180	1202	T61
O_3868	36.4	36.4	626323	4747633	180	1194	T61
O_3869	36.4	36.4	626314	4747623	183	1189	T61
O_3870	37.2	37.3	625872	4747344	184	935	T61
O_3871	37.2	37.2	625814	4747285	182	936	T61
O_3872	37.4	37.5	625632	4747199	184	896	T61
O_3873	34.7	34.8	625155	4746600	183	1370	T61
O_3874	34.5	34.6	625126	4746569	184	1402	T61
O_3879	34.9	35.0	625393	4746711	180	1277	T61
O_3880	34.6	34.7	625420	4746669	180	1324	T61
O_3881	34.8	34.9	625439	4746710	188	1287	T61
O_3887	38.9	38.9	619787	4766229	180	654	T54
O_390	32.9	32.9	617216	4754442	189	1266	T82
O_3903	32.7	33.9	631337	4766911	190	1311	T60
O_3904	32.4	33.5	631377	4766781	180	1370	T18
O_392	33.0	33.0	617228	4754548	185	1219	T82
O_40	33.5	33.5	613583	4764565	195	1022	T08
O_4001	38.7	38.7	623313	4768678	191	779	T27
O_402	35.6	35.6	617251	4767706	190	1171	T81
O_41	36.8	36.8	613595	4766009	180	811	T52
O_412	35.8	35.8	617318	4753434	185	771	T98
O_416	40.0	40.0	617342	4764890	195	610	T39
O_42	32.5	32.5	613613	4767611	190	1237	T52
O_43	37.8	37.8	613659	4766095	180	706	T52
O_431	34.1	34.1	617404	4754760	180	998	T82
O_437	37.3	37.3	617459	4753423	185	646	T98
O_44	33.7	33.7	613659	4764467	180	990	T08
O_441	36.3	36.3	617474	4753582	180	741	T98
O_445	36.9	36.9	617504	4753535	190	686	T98
O_45	37.4	37.4	613695	4765962	191	770	T52
O_451	36.2	36.2	617519	4767706	180	991	T93
O_456	35.5	35.5	617562	4754870	180	829	T82
O_457	37.1	37.1	617574	4753578	191	673	T98
O_458	36.4	36.4	617575	4767712	185	951	T93
O_46	33.3	33.4	613699	4764333	180	1024	T08
O_460	37.2	37.2	617608	4753605	182	675	T98
O_462	32.9	32.9	617642	4752002	190	1095	T98

Receptor ID	2015 Results (2015 Amend-ment) Sound Level/ Night dBA	2014 Results (2014 REA Sound Level/ Night dBA	UTM Coordinates (NAD 83, Zone 17) X [m]	Y [m]	Z [m]	Distance to the nearest Turbine [m]	Nearest Turbine ID
O_463	37.6	37.6	617645	4767451	185	752	T93
O_465	39.2	39.2	617649	4764887	190	678	T39
O_466	38.2	38.2	617650	4766226	180	729	T97
O_468	36.4	36.4	617667	4753742	190	767	T98
O_469	38.3	38.3	617681	4766893	195	684	T93
O_47	34.3	34.3	613724	4767407	192	1004	T52
O_473	36.9	36.9	617690	4767712	195	863	T93
O_474	33.5	33.5	617694	4769777	190	1465	T94
O_475	37.9	37.9	617694	4766675	190	775	T93
O_476	37.9	38.0	617704	4766234	190	768	T97
O_477	38.1	38.1	617712	4766191	180	741	T97
O_478	37.2	37.2	617721	4753673	185	683	T98
O_479	38.9	38.9	617730	4764887	185	717	T39
O_480	38.8	38.8	617735	4765218	180	671	T97
O_481	35.8	35.8	617736	4755358	180	790	T82
O_483	36.6	36.6	617761	4755244	180	710	T82
O_485	37.1	37.1	617769	4753711	190	701	T98
O_486	37.6	37.6	617775	4766414	187	900	T93
O_488	39.1	39.1	617795	4765735	184	588	T97
O_489	34.9	35.0	617796	4761971	195	1100	T51
O_49	34.8	34.8	613837	4767406	183	953	T52
O_491	32.0	32.0	617801	4751777	182	1279	T98
O_492	33.5	33.6	617805	4761707	185	1306	T51
O_493	37.9	37.9	617810	4763414	185	981	T39
O_494	38.0	38.0	617815	4763472	186	932	T39
O_495	38.8	38.8	617817	4765458	190	630	T97
O_499	37.6	37.6	617830	4766248	195	864	T97
O_50	34.2	34.2	613831	4767480	185	1024	T52
O_500	38.9	38.9	617839	4764776	180	698	T39
O_501	36.2	36.2	617845	4753885	180	853	T98
O_503	35.1	35.1	617866	4755617	185	875	T82
O_504	37.9	37.9	617872	4763481	193	954	T39
O_505	37.9	37.9	617880	4767714	183	736	T93
O_507	32.7	32.7	617899	4751882	185	1163	T98
O_508	35.0	35.0	617900	4762107	185	1090	T51
O_509	37.5	37.5	617908	4763318	195	1035	T07
O_511	37.1	37.1	617910	4768943	180	861	T94
O_512	36.4	36.4	617911	4753884	193	844	T98
O_513	33.7	33.7	617916	4769930	181	1434	T94
O_514	32.8	32.8	617922	4761628	180	1441	T51
O_517	34.4	34.4	617938	4755770	195	967	T82
O_518	37.5	37.5	617940	4768855	195	817	T94
O_519	37.4	37.4	617943	4768435	190	873	T94
O_52	38.1	38.2	613944	4765805	195	774	T52
O_521	37.2	37.2	617950	4768177	193	994	T94
O_522	38.9	38.9	617958	4767627	180	619	T93
O_524	36.4	36.4	617963	4753926	195	884	T98
O_525	37.8	37.8	617967	4768677	193	790	T94
O_528	33.9	33.9	617992	4769931	180	1393	T94
O_529	35.7	35.7	617993	4755630	180	817	T82
O_530	31.7	31.8	617993	4749785	195	1338	T99
O_534	38.3	38.3	618020	4768720	195	734	T94
O_535	38.2	38.2	618025	4768885	195	737	T94
O_536	37.6	37.6	618030	4769124	195	807	T94
O_539	38.2	38.2	618041	4768466	180	771	T94
O_540	31.8	31.8	618043	4749895	195	1345	T99
O_541	37.8	37.8	618043	4768196	193	908	T94
O_542	38.9	38.9	618049	4767696	185	632	T93
O_543	39.9	39.9	618050	4764364	190	663	T07
O_544	37.4	37.4	618055	4766318	180	852	T93
O_546	36.4	36.4	618066	4753981	195	943	T98
O_547	38.3	38.3	618072	4769034	185	732	T94
O_548	37.7	37.7	618075	4763443	183	829	T07
O_552	37.6	37.7	618102	4752438	185	616	T98
O_554	38.3	38.3	618137	4763527	180	725	T07
O_555	33.3	33.3	618140	4756114	180	1225	T82
O_556	36.7	36.7	618143	4754091	180	860	T82
O_557	33.0	33.1	618154	4749537	185	1099	T99
O_558	37.7	37.7	618164	4763414	180	794	T07
O_559	34.1	34.1	618169	4755954	190	1063	T82
O_56	39.2	39.3	614021	4765893	180	666	T52
O_561	33.6	33.6	618199	4749072	180	1020	T99
O_562	32.8	32.8	618214	4756304	191	1400	T82
O_566	34.9	34.9	618220	4769883	181	1200	T85

Receptor ID	2015 Results (2015 Amend-ment) Sound Level/ Night dBA	2014 Results (2014 REA Sound Level/ Night dBA	UTM Coordinates (NAD 83, Zone 17) X [m]	Y [m]	Z [m]	Distance to the nearest Turbine [m]	Nearest Turbine ID
O_568	36.8	36.8	618238	4754073	180	855	T82
O_569	33.7	33.8	618245	4748974	182	995	T99
O_572	36.6	36.6	618280	4753947	182	952	T98
O_574	36.9	36.9	618293	4754092	180	828	T82
O_575	31.7	31.8	618296	4750327	185	1431	T99
O_576	38.8	38.8	618297	4763528	187	625	T07
O_577	37.0	37.1	618303	4766248	184	880	T93
O_578	36.8	36.8	618304	4752426	190	696	T98
O_58	38.6	38.7	614085	4765773	183	731	T53
O_581	37.1	37.1	618348	4754124	185	792	T82
O_582	38.8	38.8	618348	4763512	185	612	T07
O_583	36.8	36.8	618351	4752454	185	695	T98
O_584	37.6	37.7	618367	4764837	183	829	T07
O_585	36.7	36.7	618369	4754020	180	895	T82
O_589	33.2	33.2	618402	4756339	195	1424	T82
O_59	36.1	36.1	614091	4767353	185	831	T52
O_593	38.7	38.7	618429	4753408	190	578	T98
O_594	35.6	35.6	618431	4769899	187	1060	T85
O_596	37.3	37.3	618460	4766335	184	803	T93
O_598	36.7	36.7	618470	4754010	185	908	T82
O_601	37.1	37.1	618500	4752601	190	681	T98
O_603	39.6	39.6	618501	4767745	180	643	T93
O_606	36.3	36.4	618524	4748999	185	720	T99
O_61	35.4	35.4	614106	4764244	185	799	T08
O_611	36.2	36.3	618548	4752531	181	764	T98
O_613	32.5	32.6	618577	4750354	185	1294	T99
O_614	38.0	38.0	618596	4753240	185	645	T98
O_615	37.8	37.8	618599	4754260	190	688	T82
O_616	39.7	39.7	618600	4767679	185	617	T93
O_617	37.1	37.1	618611	4764927	185	875	T07
O_619	37.5	37.5	618629	4753322	185	705	T98
O_621	36.9	36.9	618647	4754122	190	834	T82
O_622	36.2	36.2	618653	4769912	186	938	T85
O_625	37.0	37.0	618664	4766334	180	862	T93
O_630	31.9	32.0	618715	4747980	180	1338	T99
O_631	34.2	34.2	618716	4748394	181	964	T99
O_633	32.9	33.0	618742	4750384	185	1251	T99
O_635	35.3	35.3	618744	4752549	180	908	T98
O_636	31.5	31.6	618745	4747868	185	1432	T99
O_638	36.6	36.7	618750	4766286	185	943	T93
O_639	35.9	35.9	618751	4752695	192	844	T98
O_64	39.0	39.0	614260	4767133	180	604	T52
O_644	31.4	31.5	618761	4747824	185	1469	T99
O_648	36.1	36.1	618771	4765711	185	1179	T54
O_649	36.3	36.3	618773	4753790	185	1089	T98
O_651	36.3	36.3	618776	4752856	180	816	T98
O_652	31.7	31.7	618779	4747884	180	1406	T99
O_655	38.4	38.4	618784	4749608	180	572	T99
O_656	31.5	31.6	618788	4747833	182	1452	T99
O_658	32.7	32.7	618790	4750498	192	1341	T99
O_66	37.5	37.6	614355	4767243	180	726	T52
O_660	31.4	31.4	618793	4747800	190	1482	T99
O_663	35.9	35.9	618800	4769997	188	951	T85
O_665	32.2	32.2	618805	4770558	180	1487	T85
O_670	38.2	38.2	618835	4763464	181	622	T07
O_674	39.0	39.0	618855	4763539	182	558	T07
O_676	32.9	32.9	618859	4750473	180	1298	T99
O_680	32.2	32.2	618871	4747948	180	1319	T99
O_683	33.2	33.2	618897	4748136	185	1131	T99
O_685	37.9	37.9	618903	4754436	185	702	T82
O_692	37.5	37.5	618932	4754380	190	761	T82
O_694	38.9	38.9	618934	4767685	180	827	T93
O_696	32.4	32.5	618938	4747969	185	1283	T99
O_698	37.7	37.7	618948	4754449	185	727	T82
O_701	36.4	36.4	618956	4765877	180	1028	T54
O_704	32.6	32.6	618973	4747988	180	1258	T99
O_710	32.7	32.7	618994	4747997	190	1245	T99
O_713	36.8	36.8	619016	4769921	180	822	T85
O_714	32.7	32.8	619017	4747997	185	1241	T99
O_716	37.4	37.4	619049	4754486	180	786	T82
O_717	34.5	34.6	619060	4763065	181	1075	T07
O_718	34.5	34.6	619062	4750221	187	1008	T99
O_720	36.5	36.5	619084	4766349	190	1088	T93
O_722	36.2	36.2	619111	4769990	185	883	T85

Receptor ID	2015 Results (2015 Amend-ment) Sound Level/ Night dBA	2014 Results (2014 REA Sound Level/ Night dBA	UTM Coordinates (NAD 83, Zone 17) X [m]	Y [m]	Z [m]	Distance to the nearest Turbine [m]	Nearest Turbine ID
O_723	34.4	34.4	619117	4752583	185	1225	T98
O_725	37.0	37.0	619137	4764895	185	980	T07
O_726	37.0	37.0	619143	4754376	185	926	T82
O_727	33.7	33.7	619161	4752370	190	1357	T98
O_729	38.3	38.3	619168	4769781	181	674	T85
O_730	36.3	36.4	619171	4763444	187	810	T07
O_733	36.5	36.6	619188	4766356	187	1074	T54
O_735	36.9	36.9	619195	4766128	181	920	T54
O_736	34.9	35.0	619206	4750201	180	978	T99
O_739	33.6	33.7	619250	4762961	200	1253	T07
O_74	31.4	31.4	614526	4770053	185	1454	T83
O_740	37.0	37.0	619251	4754532	190	942	T82
O_742	36.5	36.6	619254	4769937	180	838	T85
O_744	36.5	36.6	619288	4756133	181	1254	T19
O_746	34.8	34.8	619302	4750262	185	1043	T99
O_75	35.5	35.5	614546	4764110	185	801	T08
O_753	38.6	38.6	619334	4753549	180	606	T42
O_754	34.6	34.6	619339	4748226	183	1006	T99
O_758	35.7	35.8	619387	4763561	200	898	T07
O_76	31.5	31.5	619387	4770002	188	1445	T83
O_760	36.8	36.8	619390	4766373	193	956	T54
O_761	38.2	38.3	619394	4767799	185	778	T66
O_763	36.9	36.9	619413	4754483	185	1002	T42
O_764	37.3	37.4	619414	4764906	180	868	T54
O_765	36.6	36.7	619424	4749986	185	792	T99
O_767	37.6	37.6	619429	4764966	180	812	T54
O_769	34.1	34.1	619435	4748125	189	1122	T99
O_77	39.1	39.2	614572	4765536	181	626	T08
O_770	35.3	35.3	619436	4750194	185	997	T99
O_772	36.9	36.9	619444	4754555	189	1049	T42
O_775	36.0	36.0	619482	4769933	189	895	T85
O_778	35.2	35.2	619538	4770010	200	988	T85
O_78	31.8	31.8	614580	4770090	185	1390	T83
O_780	37.0	37.0	619552	4754514	182	965	T42
O_783	34.6	34.8	619603	4763499	180	1115	T07
O_784	38.0	38.0	619606	4756798	183	940	T91
O_785	34.9	34.9	619606	4757790	180	1393	T72
O_786	38.4	38.4	619608	4755988	192	905	T19
O_789	36.8	36.8	619638	4767714	190	962	T66
O_79	38.4	38.5	614630	4767094	193	700	T52
O_790	37.6	37.6	619653	4767887	182	829	T66
O_791	34.4	34.5	619666	4763471	185	1183	T07
O_792	37.1	37.1	619681	4754666	180	1069	T42
O_793	35.9	36.0	619694	4750115	180	1016	T99
O_795	38.9	38.9	619701	4756726	189	828	T91
O_796	37.3	37.4	619704	4766408	185	849	T54
O_797	38.8	38.8	619715	4753107	187	565	T42
O_798	34.4	34.4	619717	4770049	185	1106	T85
O_80	34.6	34.6	614645	4764003	180	913	T08
O_801	39.3	39.3	619736	4756077	187	854	T19
O_802	34.8	34.8	619741	4769967	180	1051	T85
O_803	39.1	39.1	619748	4756818	181	812	T91
O_805	35.7	35.8	619757	4748395	180	994	T99
O_806	37.1	37.2	619771	4749883	183	867	T99
O_807	35.9	36.0	619785	4757734	189	1210	T72
O_808	37.7	37.7	619786	4766379	200	801	T54
O_81	32.2	32.2	614678	4770050	193	1322	T83
O_811	36.5	36.5	619803	4767795	185	998	T66
O_812	37.3	37.3	619811	4754551	180	931	T42
O_813	39.6	39.6	619825	4756909	185	782	T91
O_817	37.4	37.4	619862	4754569	188	944	T42
O_818	39.3	39.3	619866	4764992	189	607	T54
O_819	37.8	37.8	619877	4766395	190	804	T54
O_82	39.3	39.4	614687	4766978	180	620	T53
O_820	38.5	38.5	619878	4749607	186	772	T99
O_822	34.2	34.2	619905	4769965	184	1152	T85
O_824	37.5	37.5	619930	4754661	183	966	T19
O_828	37.0	37.1	619952	4757684	188	1040	T72
O_829	38.5	38.5	619969	4766331	200	738	T54
O_83	33.0	33.0	614709	4770220	185	1218	T83
O_831	33.5	33.5	619978	4770050	183	1264	T85
O_832	34.0	34.3	619989	4763509	181	1458	T07
O_834	35.8	35.8	620000	4748356	193	1168	T20
O_840	35.7	35.8	620025	4767858	183	1121	T66

Receptor ID	2015 Results (2015 Amend-ment) Sound Level/ Night dBA	2014 Results (2014 REA Sound Level/ Night dBA	UTM Coordinates (NAD 83, Zone 17) X [m]	Y [m]	Z [m]	Distance to the nearest Turbine [m]	Nearest Turbine ID
O_842	34.2	34.4	620035	4763579	185	1478	T07
O_843	32.4	32.4	620036	4770250	185	1455	T85
O_844	34.0	34.0	620038	4752219	189	1413	T42
O_85	39.5	39.5	614752	4765425	185	554	T08
O_850	37.6	37.6	620054	4754545	185	925	T42
O_851	34.0	34.1	620054	4752228	184	1405	T42
O_853	37.8	37.8	620056	4754721	185	858	T19
O_854	34.1	34.1	620065	4752227	181	1407	T42
O_856	40.0	40.0	620072	4749305	181	556	T20
O_857	36.5	36.6	620078	4748520	185	988	T20
O_858	34.1	34.1	620079	4752233	185	1403	T42
O_859	34.2	34.2	620079	4752315	200	1321	T42
O_86	33.1	33.1	614761	4770161	185	1196	T83
O_860	34.2	34.2	620086	4752296	189	1340	T42
O_861	38.9	39.0	620088	4764931	185	679	T54
O_862	34.1	34.1	620093	4752242	185	1395	T42
O_863	34.2	34.2	620093	4752284	185	1353	T42
O_865	34.1	34.1	620105	4752239	185	1400	T42
O_866	34.2	34.2	620106	4752267	200	1372	T42
O_87	33.7	33.7	614772	4770315	185	1123	T83
O_870	34.1	34.2	620120	4752244	185	1397	T42
O_872	32.7	32.7	620132	4770116	195	1417	T85
O_873	36.3	36.3	620136	4768350	195	1024	T66
O_874	36.0	36.0	620137	4768205	193	1060	T66
O_876	35.2	35.2	620153	4767816	185	1249	T66
O_877	34.3	34.3	620169	4752284	185	1364	T42
O_878	34.2	34.3	620173	4752261	182	1387	T42
O_879	37.0	37.1	620181	4748575	200	887	T20
O_88	33.4	33.4	614790	4770195	185	1155	T83
O_880	34.4	34.4	620181	4752372	185	1280	T42
O_881	34.4	34.4	620184	4752360	185	1292	T42
O_882	34.4	34.4	620189	4752345	185	1308	T42
O_883	34.3	34.3	620189	4752292	183	1360	T42
O_884	38.7	38.7	620189	4757633	185	818	T72
O_885	37.8	37.8	620191	4754654	185	883	T19
O_886	34.3	34.4	620195	4752330	185	1324	T42
O_887	34.3	34.3	620200	4752270	196	1384	T42
O_89	34.0	34.0	614826	4771447	185	1063	T88
O_891	34.4	34.4	620216	4752341	185	1318	T42
O_893	34.4	34.4	620223	4752324	185	1335	T42
O_894	34.4	34.4	620230	4752307	185	1353	T42
O_895	34.5	34.5	620239	4752402	185	1263	T42
O_896	34.5	34.5	620242	4752387	185	1279	T42
O_897	34.4	34.5	620244	4752368	185	1297	T42
O_899	34.3	34.3	620249	4752249	199	1415	T42
O_90	34.5	34.5	614834	4770398	185	1037	T83
O_900	34.4	34.4	620250	4752337	185	1329	T42
O_902	34.4	34.4	620255	4752321	185	1346	T42
O_903	34.5	34.6	620259	4752407	185	1263	T42
O_904	34.3	34.4	620270	4752252	184	1416	T42
O_906	37.8	37.8	620278	4757830	184	897	T72
O_907	38.2	38.2	620279	4754728	185	795	T19
O_908	34.6	34.9	620283	4763681	185	1377	T75
O_909	34.4	34.5	620286	4752338	189	1337	T42
O_91	38.7	38.7	614837	4765471	185	632	T08
O_910	34.6	34.6	620288	4752415	185	1263	T42
O_911	34.4	34.4	620291	4752258	185	1416	T42
O_912	34.4	34.5	620292	4752320	185	1355	T42
O_914	34.7	34.7	620302	4752472	185	1213	T42
O_916	34.6	34.6	620312	4752422	185	1263	T42
O_917	34.5	34.5	620316	4752330	185	1352	T42
O_918	34.5	34.5	620316	4752349	185	1334	T42
O_919	34.4	34.5	620321	4752281	195	1401	T42
O_92	31.5	31.5	614845	4771984	185	1340	T88
O_920	34.6	34.7	620322	4752446	185	1244	T42
O_921	34.7	34.7	620323	4752482	183	1210	T42
O_922	34.3	34.7	620324	4763531	188	1433	T74
O_923	38.3	38.4	620325	4766419	186	750	T38
O_924	32.7	32.7	620336	4769979	184	1483	T85
O_925	36.4	36.5	620336	4758057	185	1056	T72
O_926	34.6	34.7	620337	4752435	183	1259	T42
O_927	38.9	38.9	620344	4754837	185	680	T19
O_929	34.7	34.7	620351	4752483	192	1218	T42
O_930	34.5	34.5	620352	4767672	185	1495	T66

Receptor ID	2015 Results (2015 Amend-ment) Sound Level/ Night dBA	2014 Results (2014 REA Sound Level/ Night dBA	UTM Coordinates (NAD 83, Zone 17) X [m]	Y [m]	Z [m]	Distance to the nearest Turbine [m]	Nearest Turbine ID
O_931	34.6	34.7	620358	4752433	185	1268	T42
O_932	34.5	34.5	620361	4752290	182	1404	T42
O_937	39.8	39.8	620385	4754933	200	583	T19
O_94	32.6	32.6	614868	4769874	182	1271	T83
O_942	36.8	36.8	620409	4750749	184	1017	T96
O_945	38.6	38.6	620420	4754790	185	727	T19
O_946	35.4	35.4	620425	4752743	184	1011	T42
O_947	37.0	37.0	620427	4758011	183	975	T72
O_948	39.1	39.1	620431	4754854	185	664	T19
O_949	34.6	34.6	620436	4752316	195	1404	T42
O_95	32.0	32.0	614923	4771958	184	1267	T88
O_950	33.7	33.9	620447	4746993	182	1050	T05
O_951	37.5	37.6	620449	4748529	185	832	T20
O_952	35.4	35.4	620457	4752753	184	1019	T42
O_955	38.7	38.7	620466	4754813	185	708	T19
O_957	34.8	35.3	620480	4763593	184	1293	T75
O_958	38.8	38.8	620489	4754832	184	693	T19
O_959	35.6	35.7	620490	4758240	195	1168	T72
O_96	36.5	36.5	614958	4770714	182	863	T83
O_963	37.8	37.9	620510	4748556	181	794	T20
O_965	37.6	37.7	620529	4750602	185	896	T96
O_968	34.8	34.8	620540	4752389	185	1379	T42
O_969	35.5	35.5	620548	4752823	185	1012	T42
O_97	33.9	33.9	614969	4763936	185	1064	T08
O_971	34.7	34.8	620551	4747071	185	922	T05
O_973	34.8	34.8	620562	4752314	185	1456	T42
O_975	34.9	35.0	620571	4752590	195	1217	T42
O_98	36.6	36.6	614983	4770652	182	840	T83
O_980	39.2	39.3	620617	4748743	185	599	T20
O_981	35.6	35.6	620635	4751902	188	1306	T63
O_983	38.4	38.4	620638	4766431	185	680	T38
O_984	35.2	35.7	620640	4763545	187	1151	T74
O_986	39.7	39.8	620647	4766310	185	559	T38
O_989	34.9	35.0	620682	4746999	195	899	T05
O_99	36.6	36.6	614996	4771180	185	829	T88
O_994	35.1	35.2	620698	4752728	185	1180	T42
P_1004	39.6	39.7	620721	4765017	180	737	T38
P_1039	39.1	39.1	620777	4750321	185	733	T96
P_1191	40.5	40.6	621195	4765046	185	529	T75
P_1235	41.3	41.3	621355	4764993	188	451	T75
P_1255	37.3	37.5	621405	4747101	185	694	T05
P_1275	38.4	39.2	621564	4763692	185	695	T74
P_1283	36.7	36.7	621621	4753094	181	916	T84
P_1293	39.3	39.4	621674	4755402	181	767	T13
P_1300	39.3	39.4	621726	4755431	183	760	T13
P_1322	38.7	39.5	621819	4748739	180	725	T47
P_1375	38.6	39.3	621991	4761415	180	1000	T95
P_1429	38.2	38.5	622096	4755479	180	940	T13
P_1523	38.6	39.3	622322	4763635	179	575	T36
P_1554	37.8	38.0	622432	4761563	180	810	T95
P_1562	41.0	41.5	622470	4763422	182	370	T36
P_1567	38.9	39.0	622501	4751591	193	685	T62
P_1584	38.9	38.9	622599	4767952	180	759	T27
P_1610	42.6	42.7	622733	4754331	181	429	T65
P_1613	38.6	38.7	622739	4761436	180	590	T95
P_1666	46.0	46.0	622961	4754427	185	253	T65
P_1688	40.3	40.6	623038	4765135	190	612	T01
P_1690	39.8	39.9	623062	4766552	182	694	T06
P_1703	41.7	41.7	623101	4755153	185	488	T65
P_1711	39.9	40.3	623121	4765056	180	702	T01
P_1727	39.9	39.9	623171	4759596	185	613	T10
P_1765	41.0	41.4	623422	4765171	185	590	T76
P_1846	40.5	41.0	623736	4765098	180	629	T76
P_1848	40.0	41.5	623749	4763990	185	427	T55
P_1872	40.7	41.0	623844	4765184	191	573	T76
P_191	43.4	43.4	615738	4771386	190	336	T88
P_197	36.5	36.5	615823	4771824	185	765	T88
P_1981	39.9	40.2	624061	4765197	185	671	T76
P_1994	35.6	35.3	624118	4753544	185	980	T89
P_2030	35.2	35.0	624194	4753418	190	1011	T89
P_2084	38.3	38.3	624395	4768064	180	634	T57
P_2090	39.1	39.2	624454	4750143	183	892	T48
P_2165	38.9	39.2	624792	4763832	190	578	T32
P_225	37.9	38.0	616142	4767556	190	622	T81

Receptor ID	2015 Results (2015 Amend-ment) Sound Level/ Night dBA	2014 Results (2014 REA Sound Level/ Night dBA	UTM Coordinates (NAD 83, Zone 17) X [m]	Y [m]	Z [m]	Distance to the nearest Turbine [m]	Nearest Turbine ID
P_2250	37.9	38.0	625016	4768416	185	644	T57
P_2293	40.0	40.2	625246	4765256	185	573	T31
P_2359	37.3	37.3	625758	4747261	190	917	T61
P_2529	40.5	40.5	626407	4769228	185	446	T56
P_2544	38.8	39.7	626570	4763961	186	636	T34
P_2548	39.9	40.9	626634	4765414	185	632	T33
P_2579	42.6	43.8	626952	4765571	188	380	T33
P_2587	40.2	40.7	626995	4763978	185	533	T35
P_2590	45.1	45.4	627015	4764720	185	280	T35
P_2614	40.7	41.4	627178	4765280	190	693	T02
P_2636	40.4	40.6	627349	4764012	185	506	T35
P_2640	41.0	41.1	627377	4748490	180	510	T23
P_2675	39.3	39.3	627582	4748380	180	596	T23
P_2768	39.7	39.8	628268	4768175	190	583	T58
P_2810	39.4	39.6	628355	4765347	189	607	T78
P_2855	38.4	38.5	628527	4763886	185	786	T29
P_2893	38.6	38.7	628615	4764042	185	742	T78
P_2914	39.0	39.2	628670	4768195	190	599	T58
P_2939	37.4	37.5	628752	4762502	180	650	T29
P_3028	39.4	39.8	629305	4767498	185	683	T59
P_313	39.7	39.7	616826	4763379	185	657	T51
P_3140	36.9	36.9	629869	4772625	185	715	T80
P_3151	40.0	40.0	630039	4764044	185	480	T03
P_3160	39.1	40.4	630165	4766791	190	564	T18
P_3171	39.3	40.3	630312	4768255	188	574	T60
P_3210	34.7	34.7	630878	4772668	180	973	T80
P_345	40.0	40.0	617016	4763383	185	631	T51
P_3708	39.6	39.8	624914	4763900	185	527	T32
P_3708	39.6	39.8	624914	4763900	185	527	T32
P_382	39.6	39.6	617180	4766206	189	566	T97
P_3893	41.7	41.7	627693	4749818	180	425	T24
P_3894	38.9	39.5	622029	4749158	182	733	T46
P_3895	38.4	38.4	622621	4751424	182	753	T62
P_3897	42.0	42.1	627442	4768130	190	398	T04
P_3902	38.5	38.5	614181	4767160	193	630	T52
P_411	40.4	40.4	617317	4763230	185	563	T51
P_439	40.3	40.3	617463	4764813	185	546	T39
P_461	39.7	39.7	617609	4764824	185	604	T39
P_567	37.9	37.9	618224	4752489	184	604	T98
P_580	40.1	40.1	618345	4767663	190	537	T93
P_590	37.5	37.5	618408	4752569	185	637	T98
P_595	44.7	44.7	618453	4768755	195	299	T94
P_642	38.3	38.3	618759	4754396	185	637	T82
P_67	39.4	39.5	614393	4765788	190	618	T53
P_689	44.1	44.1	618924	4764034	185	289	T07
P_690	38.9	39.0	618929	4763574	181	562	T07
P_703	39.1	39.1	618972	4767763	191	781	T66
P_72	39.1	39.1	614498	4765557	190	648	T08
P_743	38.7	38.7	619257	4767798	192	743	T66
P_757	36.9	36.9	619378	4754477	185	1015	T42
P_815	39.4	39.4	619830	4756972	180	811	T91
P_816	39.5	39.6	619841	4765022	188	581	T54
P_827	38.9	38.9	619941	4749526	180	711	T20
P_839	39.5	39.5	620023	4757321	182	829	T72
P_848	39.6	39.6	620050	4749472	181	592	T20
P_939	39.1	39.2	620400	4766345	187	651	T38
P_960	40.0	40.0	620500	4754958	183	571	T19
V_104	39.4	39.4	614831	4765389	188	557	T08
V_1041	35.8	36.4	620779	4763617	185	1070	T74
V_1052	35.8	36.4	620802	4763561	185	1021	T74
V_1057	39.1	39.1	620810	4750114	180	794	T20
V_1067	35.9	35.9	620840	4758277	185	1155	T72
V_1071	36.4	36.4	620845	4754148	185	1048	T42
V_110	33.7	33.7	615144	4769829	200	1115	T83
V_1100	35.9	36.0	620903	4747004	186	796	T05
V_1102	36.7	36.8	620907	4747084	186	720	T05
V_1108	39.7	39.7	620934	4755121	183	681	T19
V_1110	36.1	36.2	620939	4753991	185	1068	T42
V_1120	36.2	36.3	620968	4758224	185	1111	T72
V_1121	37.5	37.6	620969	4766447	188	757	T38
V_1122	39.7	39.8	620971	4749867	180	628	T20
V_1124	38.8	38.9	620978	4748746	182	691	T20
V_1162	38.6	38.8	621095	4748789	182	724	T20
V_1189	36.9	37.0	621193	4758095	184	1040	T72

Receptor ID	2015 Results (2015 Amend-ment) Sound Level/ Night dBA	2014 Results (2014 REA Sound Level/ Night dBA	UTM Coordinates (NAD 83, Zone 17) X [m]	Y [m]	Z [m]	Distance to the nearest Turbine [m]	Nearest Turbine ID
V 1190	38.4	38.4	621193	4751834	183	861	T62
V 1195	35.8	35.8	621203	4753582	185	1268	T42
V 1210	34.8	35.5	621249	4762014	185	1069	T74
V 1219	35.8	35.9	621277	4753727	185	1255	T84
V 1230	38.0	38.9	621316	4763588	185	677	T74
V 1236	38.6	38.6	621357	4755146	183	978	T13
V 1243	35.7	35.7	621369	4758305	185	1301	T72
V 1251	36.4	36.6	621399	4747003	188	785	T05
V 1261	38.0	38.0	621434	4757850	183	947	T72
V 1267	34.2	34.5	621502	4761141	181	1346	T95
V 1268	33.2	33.4	621523	4760546	185	1329	T95
V 1270	33.1	33.2	621530	4760438	185	1352	T95
V 1272	39.5	39.7	621547	4755384	182	751	T13
V 1274	33.1	33.1	621552	4769986	188	1313	T28
V 1276	38.8	38.9	621570	4755267	182	870	T13
V 1281	38.9	38.9	621593	4757604	182	904	T72
V 1285	35.3	35.3	621628	4769559	186	1002	T28
V 1289	38.2	38.3	621646	4757675	182	987	T72
V 1295	36.9	37.0	621694	4753007	185	881	T84
V 1301	33.7	33.8	621735	4759605	182	1491	T37
V 1303	35.3	35.5	621740	4761101	183	1105	T95
V 1304	39.4	39.4	621743	4757353	181	898	T41
V 1308	35.9	36.2	621755	4747019	189	939	T05
V 1309	33.1	33.2	621757	4770099	189	1259	T28
V 1318	35.9	36.0	621804	4766414	189	1314	T38
V 1324	38.3	38.4	621825	4757476	181	1037	T41
V 1331	37.9	37.9	621852	4757544	181	1100	T41
V 1333	36.2	36.5	621857	4761186	181	1016	T95
V 1343	34.9	35.1	621908	4746516	189	1441	T05
V 1352	35.9	36.0	621926	4766561	190	1337	T01
V 1354	39.4	39.6	621934	4755632	180	717	T13
V 1361	33.3	33.4	621956	4770161	190	1203	T28
V 1364	37.4	37.6	621966	4765351	185	1013	T75
V 1385	38.4	38.9	622014	4749325	182	807	T46
V 1386	37.5	37.6	622014	4769614	186	722	T28
V 1389	37.2	37.2	622032	4752446	184	1051	T84
V 1414	35.2	35.3	622079	4759548	183	1168	T37
V 1424	38.5	39.1	622087	4749360	182	759	T46
V 1435	38.6	38.6	622101	4756932	180	1065	T13
V 1436	37.7	37.9	622102	4764951	185	850	T75
V 1443	37.5	37.7	622114	4761205	181	787	T95
V 1452	38.9	38.9	622129	4753983	182	691	T84
V 1462	37.7	38.4	622150	4763812	180	783	T36
V 1463	38.4	38.4	622150	4769623	185	642	T28
V 1473	35.6	35.6	622184	4759623	180	1132	T37
V 1475	36.9	36.9	622185	4759011	181	863	T37
V 1480	38.1	38.1	622196	4760773	185	625	T95
V 1482	37.6	37.7	622200	4760616	185	659	T95
V 1483	37.0	37.0	622205	4760457	185	728	T95
V 1484	36.5	36.6	622205	4760364	185	782	T95
V 1485	36.1	36.1	622205	4760252	184	856	T95
V 1486	36.3	36.3	622207	4760296	184	824	T95
V 1488	35.8	35.9	622209	4760180	183	905	T95
V 1490	35.6	35.7	622211	4760102	183	964	T95
V 1493	35.5	35.6	622215	4760015	182	1030	T95
V 1496	35.4	35.5	622220	4759930	181	1098	T95
V 1498	38.1	38.2	622231	4761225	180	695	T95
V 1499	36.8	36.8	622232	4757310	180	1317	T41
V 1506	38.2	38.2	622255	4755623	181	982	T13
V 1510	37.0	37.1	622278	4766506	190	1039	T01
V 1516	39.1	39.1	622296	4754165	180	795	T84
V 1517	37.9	37.9	622298	4752046	183	847	T62
V 1519	34.3	34.4	622304	4770121	190	1047	T28
V 1520	38.5	38.5	622310	4751917	183	744	T62
V 1531	37.3	37.4	622348	4766512	190	998	T01
V 1536	36.7	36.7	622366	4759563	180	958	T37
V 1545	38.0	38.0	622398	4755588	181	1082	T65
V 1548	39.0	39.0	622425	4751713	182	679	T62
V 155	32.2	32.3	615358	4762588	185	1432	T09
V 1550	35.8	35.8	622428	4757584	180	1434	T37
V 1565	33.2	33.2	622495	4770305	190	1210	T28
V 1566	38.3	38.4	622498	4751743	182	757	T62
V 1568	37.4	37.4	622508	4755790	183	1147	T13
V 1573	36.4	36.9	622543	4762185	180	894	T36

Receptor ID	2015 Results (2015 Amend-ment) Sound Level/ Night dBA	2014 Results (2014 REA Sound Level/ Night dBA	UTM Coordinates (NAD 83, Zone 17) X [m]	Y [m]	Z [m]	Distance to the nearest Turbine [m]	Nearest Turbine ID
V_1578	36.3	36.7	622586	4762187	180	901	T36
V_1581	38.5	38.7	622588	4747070	185	1381	T47
V_1582	38.7	38.7	622589	4767849	193	789	T06
V_1587	38.1	38.7	622606	4762550	180	561	T36
V_1589	37.7	38.2	622621	4762509	180	605	T36
V_1590	39.1	39.2	622624	4761373	182	556	T95
V_1591	37.6	37.6	622632	4759683	181	899	T37
V_1592	36.1	36.6	622632	4762187	180	912	T36
V_1593	37.5	38.1	622640	4763709	180	696	T36
V_1595	38.1	38.6	622649	4762580	180	554	T36
V_1598	38.7	38.7	622666	4766527	190	836	T06
V_1599	37.4	37.9	622667	4762496	180	636	T36
V_1601	36.0	36.4	622670	4762187	180	923	T36
V_1604	37.7	38.2	622695	4762561	180	594	T36
V_1606	35.9	36.3	622708	4762189	180	934	T36
V_1607	37.2	37.7	622709	4762499	180	654	T36
V_1612	37.3	37.8	622737	4762539	180	635	T36
V_1616	36.9	37.4	622747	4762488	180	683	T36
V_1618	35.7	36.2	622755	4762191	180	950	T36
V_1620	37.0	37.4	622780	4762530	180	667	T36
V_1622	36.6	37.1	622792	4762474	180	720	T36
V_1625	35.6	36.0	622800	4762197	180	963	T36
V_1629	36.6	37.1	622823	4762514	180	706	T36
V_1630	38.1	38.9	622823	4747628	185	887	T47
V_1631	37.8	37.9	622825	4761513	180	662	T95
V_1635	36.2	36.7	622841	4762453	180	765	T36
V_1639	37.0	37.1	622853	4751164	181	988	T62
V_1640	36.3	36.8	622862	4762497	180	744	T36
V_1644	35.9	36.3	622886	4762421	180	818	T36
V_1648	36.0	36.5	622902	4762474	180	788	T36
V_1650	35.3	35.7	622911	4762211	180	1005	T36
V_1652	35.6	36.0	622917	4762374	180	874	T36
V_1653	38.6	38.7	622920	4759684	181	772	T10
V_1654	35.4	35.8	622925	4762306	180	934	T36
V_1655	34.8	34.8	622926	4757514	180	1372	T37
V_1659	33.8	33.9	622939	4770159	190	1144	T28
V_1660	35.7	36.2	622939	4762441	180	837	T36
V_1661	40.0	40.0	622945	4758310	180	579	T37
V_1665	35.5	35.9	622958	4762404	180	878	T36
V_1667	35.0	35.0	622961	4757598	180	1285	T37
V_1669	35.1	35.5	622968	4762245	180	1008	T36
V_1670	35.2	35.7	622969	4762316	180	952	T36
V_1671	35.3	35.8	622972	4762365	180	916	T36
V_1673	35.0	35.4	622974	4762174	180	1070	T36
V_1676	36.5	36.6	622983	4750853	180	1198	T62
V_168	32.1	32.1	615464	4762174	185	1386	T09
V_1684	39.1	39.2	623027	4752564	184	626	T89
V_1689	35.8	35.8	623059	4755875	184	1198	T65
V_1692	39.6	39.6	623068	4758264	180	618	T37
V_1693	38.5	38.5	623069	4760288	183	617	T95
V_1698	37.0	37.0	623074	4769670	187	800	T28
V_1699	37.6	37.6	623077	4760135	183	761	T95
V_1709	37.4	37.4	623109	4759967	182	931	T95
V_1716	38.5	38.5	623130	4759737	181	758	T10
V_1724	37.5	37.5	623166	4760181	183	756	T95
V_1728	36.3	36.4	623172	4761561	180	794	T95
V_1736	35.7	36.3	623245	4763115	181	868	T36
V_1737	32.7	32.7	623247	4770258	190	1373	T28
V_1739	33.1	33.1	623259	4770177	189	1312	T28
V_1740	35.7	36.3	623260	4763182	181	889	T36
V_1745	35.2	35.3	623317	4751215	181	1444	T62
V_1747	35.2	35.8	623329	4763033	180	951	T36
V_1749	33.9	34.4	623333	4762292	180	1227	T36
V_1752	37.3	38.4	623344	4763761	184	686	T55
V_1753	34.4	34.4	623349	4757624	180	1295	T37
V_1755	35.0	35.2	623360	4761626	180	946	T95
V_1759	39.1	39.4	623378	4747182	185	1484	T45
V_1762	37.9	37.9	623417	4768353	193	952	T27
V_1763	34.7	35.3	623418	4762970	180	1044	T36
V_177	36.1	36.1	615576	4766159	189	1114	T81
V_1771	39.5	39.5	623450	4766553	190	777	T06
V_1773	34.5	35.1	623454	4762934	180	1083	T36
V_1778	34.3	34.9	623489	4762879	180	1125	T36
V_1779	32.6	32.6	623489	4770192	190	1466	T28

Receptor ID	2015 Results (2015 Amend-ment) Sound Level/ Night dBA	2014 Results (2014 REA Sound Level/ Night dBA	UTM Coordinates (NAD 83, Zone 17) X [m]	Y [m]	Z [m]	Distance to the nearest Turbine [m]	Nearest Turbine ID
V_1785	37.6	37.8	623506	4750154	180	1117	T16
V_1791	34.9	35.6	623527	4763179	181	1155	T36
V_1799	38.7	38.9	623552	4749960	180	936	T16
V_1840	37.4	37.5	623700	4768015	191	979	T06
V_1845	33.5	33.6	623722	4757626	180	1429	T37
V_1847	34.1	34.1	623739	4755564	180	1164	T65
V_1849	38.0	38.0	623769	4758446	180	745	T10
V_1856	37.9	38.0	623812	4752888	185	655	T89
V_1868	32.6	32.9	623837	4761892	180	1458	T95
V_1876	37.7	37.7	623848	4758506	180	762	T10
V_1882	33.9	34.0	623858	4761052	180	1060	T95
V_1895	37.2	37.3	623893	4767932	190	937	T57
V_1898	33.4	33.4	623897	4755576	180	1281	T65
V_1902	34.3	34.4	623905	4760164	180	1287	T95
V_1919	32.8	33.0	623943	4761474	180	1287	T95
V_192	35.2	35.2	615747	4769791	199	927	T83
V_1929	35.4	35.5	623964	4759698	180	999	T10
V_1933	33.1	33.3	623969	4761177	180	1198	T95
V_1935	33.0	33.0	623970	4755588	180	1341	T65
V_1937	33.3	33.3	623971	4755503	180	1285	T65
V_1942	33.9	33.9	623979	4755268	180	1156	T65
V_1951	37.5	37.6	623996	4768037	190	792	T57
V_1957	34.1	34.3	624007	4760011	180	1266	T10
V_1960	36.0	35.8	624016	4753703	185	967	T89
V_1964	35.3	35.4	624026	4759635	180	1002	T10
V_1975	35.9	35.7	624046	4753656	185	966	T89
V_1995	39.7	40.0	624119	4765202	185	705	T76
V_2000	34.5	34.6	624147	4759649	180	1105	T10
V_2033	38.0	38.0	624200	4768053	190	685	T57
V_205	35.2	35.2	615932	4763336	185	1146	T09
V_2055	33.9	34.0	624254	4759649	180	1194	T10
V_2065	34.5	34.3	624307	4753245	185	1094	T89
V_208	32.8	32.8	615962	4769375	200	1347	T83
V_2082	34.0	33.8	624378	4753524	185	1218	T89
V_2103	36.5	36.6	624554	4750520	180	1244	T48
V_2104	32.8	32.9	624567	4759129	180	1315	T10
V_2127	32.0	32.1	624689	4758735	180	1452	T10
V_2129	31.9	32.0	624691	4758627	180	1477	T10
V_214	34.8	34.9	616008	4764767	185	1427	T39
V_2162	36.7	36.8	624788	4767981	190	798	T57
V_2164	36.9	37.0	624791	4766635	190	890	T31
V_217	36.7	36.7	616033	4767628	191	729	T81
V_2180	39.8	40.0	624850	4765241	185	653	T31
V_2182	34.7	34.8	624853	4746530	185	1476	T61
V_2207	35.3	35.4	624925	4746685	185	1309	T61
V_2232	34.9	35.0	624981	4746600	185	1384	T61
V_2240	34.8	34.8	624993	4746581	185	1402	T61
V_2252	32.2	32.3	625021	4769945	185	1380	T57
V_2259	34.7	34.8	625044	4746581	185	1396	T61
V_2262	34.6	34.7	625057	4746559	185	1416	T61
V_2264	34.2	34.3	625063	4746485	180	1489	T61
V_2276	34.3	34.4	625119	4746522	180	1450	T61
V_2277	34.0	34.1	625139	4769530	190	1091	T57
V_2279	34.4	34.5	625153	4746547	180	1423	T61
V_2284	34.5	34.6	625203	4746576	180	1394	T61
V_2287	34.5	34.6	625224	4746586	180	1385	T61
V_2288	37.1	37.1	625229	4747002	185	970	T61
V_2291	34.5	34.6	625244	4746595	181	1377	T61
V_2294	34.5	34.6	625253	4746601	181	1371	T61
V_2296	34.5	34.6	625264	4746606	181	1367	T61
V_2305	34.6	34.7	625346	4746645	181	1335	T61
V_2307	35.0	35.1	625372	4767998	190	1169	T57
V_2308	35.3	35.4	625381	4750522	180	1420	T48
V_2317	35.7	35.8	625440	4746864	180	1137	T61
V_2319	36.0	36.1	625448	4746909	180	1095	T61
V_2321	37.0	37.2	625457	4766589	190	827	T31
V_2323	36.2	36.3	625477	4746957	180	1057	T61
V_2328	35.3	35.8	625502	4763629	182	1063	T32
V_2329	36.5	36.5	625505	4747000	180	1024	T61
V_2336	36.9	36.9	625564	4750098	180	1198	T48
V_2339	38.6	39.0	625581	4765192	190	762	T31
V_2340	38.1	38.1	625588	4749828	180	1053	T48
V_2342	36.3	36.6	625601	4766665	190	957	T31
V_2345	36.7	36.8	625627	4747097	180	982	T61

Receptor ID	2015 Results (2015 Amend-ment) Sound Level/ Night dBA	2014 Results (2014 REA Sound Level/ Night dBA	UTM Coordinates (NAD 83, Zone 17) X [m]	Y [m]	Z [m]	Distance to the nearest Turbine [m]	Nearest Turbine ID
V 2347	36.8	36.8	625644	4747112	180	977	T61
V 2348	38.6	38.6	625657	4749645	180	1036	T48
V 2361	39.9	39.9	625768	4749138	180	971	T43
V 2363	38.9	38.9	625774	4747519	185	749	T61
V 2364	38.3	39.2	625776	4764704	185	719	T34
V 2371	39.4	39.4	625796	4747633	185	705	T61
V 2372	38.6	38.6	625797	4749519	180	1134	T43
V 2380	37.3	38.2	625830	4764146	184	792	T34
V 2391	36.9	37.0	625852	4747279	181	966	T61
V 2395	37.0	37.0	625863	4747290	181	966	T61
V 2397	37.7	37.7	625864	4747417	185	882	T61
V 2399	36.9	37.0	625873	4768936	190	735	T56
V 2404	39.6	39.6	625886	4749083	180	965	T49
V 2410	37.0	37.0	625901	4747325	180	969	T61
V 2411	39.7	39.7	625905	4748999	180	934	T49
V 2414	37.0	37.0	625913	4747339	180	969	T61
V 2422	34.3	34.4	625939	4769572	188	997	T56
V 2427	37.1	37.2	625953	4747404	184	960	T61
V 2428	37.0	37.0	625954	4747376	180	978	T61
V 2429	37.1	37.2	625967	4747415	183	965	T61
V 2430	37.0	37.0	625968	4747385	180	984	T61
V 2433	36.9	37.0	625982	4747394	180	990	T61
V 2435	36.2	36.7	625984	4766616	190	1153	T31
V 2437	39.7	39.8	625994	4748823	180	847	T49
V 2438	36.9	37.0	625997	4747405	180	996	T61
V 2442	36.9	36.9	626015	4747412	180	1007	T61
V 2444	36.8	36.9	626027	4747420	180	1012	T61
V 2447	36.8	36.8	626047	4747434	180	1022	T61
V 2451	39.7	39.7	626075	4748689	180	794	T49
V 2452	36.7	36.8	626078	4747452	180	1039	T61
V 2455	36.7	36.7	626094	4747463	180	1048	T61
V 2456	38.9	38.9	626095	4749275	180	823	T49
V 2458	37.0	37.0	626100	4747535	183	1020	T61
V 2459	36.7	36.7	626110	4747474	180	1057	T61
V 2461	36.7	36.7	626123	4747484	180	1063	T61
V 2464	36.6	36.7	626139	4747496	180	1073	T61
V 2466	35.3	35.6	626146	4767665	190	1245	T56
V 2467	36.8	36.8	626146	4747542	181	1059	T61
V 2470	36.6	36.6	626155	4747507	180	1082	T61
V 2473	36.8	36.8	626169	4747565	181	1071	T61
V 2480	39.1	39.1	626208	4748353	180	842	T49
V 2488	36.7	36.7	626249	4747641	181	1121	T61
V 2494	38.7	38.7	626263	4748246	180	881	T49
V 2495	36.7	36.8	626264	4747660	181	1130	T61
V 2505	38.2	38.3	626298	4748134	180	948	T49
V 2508	39.0	39.0	626300	4749376	180	707	T49
V 2551	37.2	37.3	626664	4769482	190	661	T56
V 2561	37.7	38.4	626760	4766764	190	840	T33
V 2563	36.9	37.0	626766	4769489	190	685	T56
V 2565	38.0	38.6	626859	4766770	190	827	T33
V 2577	39.5	39.6	626931	4748310	180	613	T49
V 2581	33.1	33.2	626957	4751172	180	1227	T24
V 2592	39.0	39.1	627021	4749700	180	806	T49
V 2597	38.2	38.3	627046	4769223	190	598	T56
V 2625	33.0	33.1	627266	4751300	180	1167	T24
V 2630	34.2	34.5	627294	4762944	180	1214	T29
V 2635	40.0	40.0	627347	4749801	180	597	T24
V 2642	35.5	35.6	627383	4769262	190	897	T56
V 2648	34.7	34.8	627420	4751093	180	917	T24
V 2654	37.0	37.3	627452	4763625	182	906	T35
V 2655	38.9	38.9	627457	4748315	180	664	T23
V 2661	34.4	34.5	627512	4769358	190	1057	T56
V 2669	33.8	33.9	627564	4769455	190	1152	T56
V 2678	31.4	31.4	627611	4751640	180	1409	T24
V 2684	37.2	37.5	627659	4763662	183	959	T35
V 2685	38.5	38.9	627663	4766786	190	890	T02
V 2705	39.7	39.7	627870	4768233	190	603	T04
V 2714	38.1	38.5	627919	4766710	190	938	T02
V 2719	40.0	40.0	627958	4749727	180	552	T24
V 2732	37.1	37.1	628019	4748409	183	741	T23
V 2736	38.6	38.7	628044	4762768	181	562	T29
V 2738	38.9	39.2	628067	4765420	190	819	T78
V 2747	31.0	31.2	628154	4761763	172	1381	T29
V 2754	39.1	39.2	628211	4768233	190	659	T58

Receptor ID	2015 Results (2015 Amend-ment) Sound Level/ Night dBA	2014 Results (2014 REA Sound Level/ Night dBA	UTM Coordinates (NAD 83, Zone 17) X [m]	Y [m]	Z [m]	Distance to the nearest Turbine [m]	Nearest Turbine ID
V 2763	39.1	39.2	628252	4768237	190	647	T58
V 277	33.1	33.1	616538	4771946	193	1144	T88
V 2777	38.4	38.5	628295	4764039	185	797	T78
V 2778	37.5	37.5	628297	4749736	180	741	T24
V 2779	39.1	39.2	628297	4768243	190	639	T58
V 2790	38.4	38.5	628332	4763843	185	761	T29
V 2792	33.5	33.7	628333	4769115	186	1492	T58
V 2793	33.7	33.9	628333	4769078	186	1455	T58
V 2795	33.8	34.0	628335	4769042	187	1419	T58
V 2796	34.2	34.4	628337	4768962	188	1340	T58
V 2797	34.0	34.2	628338	4769002	188	1380	T58
V 2798	35.0	35.1	628339	4768802	190	1181	T58
V 2799	31.3	31.5	628340	4761775	172	1335	T29
V 2800	34.4	34.6	628341	4768908	189	1286	T58
V 2801	34.7	34.9	628341	4768857	190	1235	T58
V 2802	32.7	32.7	628341	4751223	180	1147	T24
V 2803	35.3	35.4	628342	4768748	190	1127	T58
V 2805	35.5	35.7	628345	4768698	190	1077	T58
V 2807	36.1	36.3	628349	4768607	190	985	T58
V 2808	35.9	36.0	628350	4768645	190	1023	T58
V 2809	36.6	36.7	628353	4768532	190	911	T58
V 2811	36.9	37.0	628355	4768495	190	874	T58
V 2812	37.2	37.3	628355	4768454	190	834	T58
V 2813	36.3	36.5	628356	4768571	190	949	T58
V 2814	37.5	37.6	628358	4768416	190	795	T58
V 2815	35.9	35.9	628358	4750714	180	770	T24
V 2816	37.7	37.9	628360	4768382	190	761	T58
V 2817	39.1	39.2	628361	4768243	190	624	T58
V 2818	38.4	38.5	628363	4768305	190	685	T58
V 2819	38.1	38.2	628364	4768346	190	725	T58
V 2820	36.4	36.4	628376	4749501	180	966	T24
V 2825	32.8	32.8	628407	4748020	183	1289	T23
V 283	30.3	30.3	616635	4752407	180	1489	T98
V 2830	38.4	38.5	628442	4768304	190	675	T58
V 2836	35.6	35.6	628470	4749149	181	947	T23
V 2839	31.5	31.6	628502	4761766	180	1335	T29
V 286	38.5	38.5	616651	4766283	189	750	T81
V 287	31.2	31.2	616652	4753170	180	1336	T98
V 2953	32.6	32.6	628828	4750787	180	1207	T24
V 2958	33.5	33.5	628872	4749845	180	1187	T24
V 2966	38.0	38.1	628932	4763973	185	883	T78
V 2969	36.0	36.0	628980	4762465	180	797	T29
V 2970	32.2	32.3	629010	4771209	190	1408	T80
V 2971	37.3	37.5	629011	4768268	186	835	T58
V 2975	31.5	31.5	629032	4750901	180	1441	T24
V 2980	32.5	32.5	629064	4749852	180	1368	T24
V 299	31.7	31.7	616733	4753247	180	1265	T98
V 2990	32.3	32.3	629108	4749771	181	1434	T24
V 3019	39.2	39.5	629255	4767813	185	722	T59
V 303	31.9	31.9	616766	4753266	180	1236	T98
V 3038	38.6	38.7	629349	4763961	185	658	T03
V 3042	38.9	39.0	629354	4763899	185	621	T03
V 3045	32.0	32.1	629355	4762034	183	1368	T29
V 3052	32.3	32.4	629377	4770692	189	1381	T79
V 3054	39.3	39.3	629378	4763305	185	586	T03
V 3059	36.8	37.9	629385	4766314	189	742	T18
V 3070	36.8	36.9	629398	4762870	185	871	T03
V 3089	38.6	38.7	629420	4764026	185	644	T03
V 3096	38.1	38.2	629471	4764140	185	694	T03
V 3104	33.5	33.6	629510	4762372	182	1246	T29
V 3121	38.4	38.5	629605	4764154	185	635	T03
V 3129	38.5	39.4	629661	4766963	189	774	T59
V 3131	33.2	33.3	629672	4762372	181	1235	T03
V 3137	38.7	38.8	629776	4764164	185	588	T03
V 3139	39.1	39.1	629843	4771318	185	628	T79
V 3142	39.8	39.8	629916	4771316	185	567	T79
V 3148	36.7	36.8	630019	4764335	185	759	T03
V 3152	34.1	34.2	630041	4770645	185	1049	T79
V 3165	34.4	34.5	630225	4770651	185	998	T79
V 3170	35.5	36.8	630304	4765510	190	741	T18
V 3177	34.5	34.8	630393	4764440	188	989	T03
V 3185	36.8	36.9	630471	4772665	176	739	T80
V 3190	37.8	39.2	630505	4766725	190	627	T18
V 3199	36.1	36.1	630648	4772658	180	818	T80

Receptor ID	2015 Results (2015 Amend-ment) Sound Level/ Night dBA	2014 Results (2014 REA Sound Level/ Night dBA	UTM Coordinates (NAD 83, Zone 17) X [m]	Y [m]	Z [m]	Distance to the nearest Turbine [m]	Nearest Turbine ID
V_3201	33.9	35.2	630692	4765529	190	902	T18
V_3203	34.2	34.3	630720	4764061	187	954	T03
V_3205	36.6	37.8	630765	4767001	190	838	T60
V_322	32.0	32.0	616904	4753814	180	1325	T98
V_3226	37.7	37.7	631065	4771610	182	681	T79
V_3251	34.2	35.3	631220	4767803	185	950	T60
V_330	31.3	31.3	616939	4752260	180	1304	T98
V_337	31.8	31.8	616974	4752356	180	1219	T98
V_355	32.2	32.3	617052	4754168	180	1460	T98
V_3581	37.5	37.5	617952	4766319	190	890	T93
V_3582	39.8	39.8	618166	4767657	192	553	T93
V_3583	39.6	39.6	618075	4767629	193	561	T93
V_3598	33.7	33.7	629463	4772699	185	1017	T80
V_3599	32.9	32.9	629316	4772682	185	1116	T80
V_36	31.3	31.3	613482	4764148	180	1308	T08
V_3601	31.2	31.2	631149	4772987	182	1391	T80
V_3610	35.8	35.8	631146	4772144	180	915	T79
V_365	31.8	31.8	617092	4752191	180	1231	T98
V_3707	38.0	38.5	624405	4763819	180	700	T32
V_3707	38.0	38.5	624405	4763819	180	701	T32
V_371	31.3	31.3	617114	4752046	180	1321	T98
V_374	34.1	34.1	617130	4753476	180	955	T98
V_376	31.6	31.6	617132	4752106	180	1264	T98
V_3819	36.0	36.0	623362	4769601	189	985	T28
V_3820	35.9	35.9	623461	4769538	190	1043	T28
V_3821	37.6	37.6	624183	4769314	189	667	T57
V_3822	32.5	33.7	630973	4765544	190	1091	T18
V_3824	38.3	39.2	621508	4763690	184	703	T74
V_3825	32.6	33.1	620813	4761813	177	1457	T74
V_3827	33.7	34.2	623643	4762762	180	1300	T36
V_3828	33.6	34.2	623646	4762744	180	1307	T36
V_3829	33.1	33.6	623728	4762528	175	1451	T36
V_3830	33.1	33.5	623747	4762525	175	1470	T36
V_3835	34.1	34.1	613197	4766295	190	1045	T52
V_3849	34.2	34.2	628133	4748067	183	1084	T23
V_3850	36.1	36.1	627942	4748221	185	854	T23
V_3861	37.5	37.5	626313	4747934	180	1112	T49
V_3862	37.6	37.7	626355	4748001	180	1032	T49
V_3863	37.6	37.7	626366	4748014	180	1017	T49
V_3875	34.8	34.9	624944	4746585	185	1405	T61
V_3876	35.7	35.8	624861	4746738	185	1272	T61
V_3877	34.7	34.8	625005	4746569	185	1412	T61
V_388	39.4	39.4	617212	4763461	185	735	T51
V_3886	31.3	31.3	616850	4752417	180	1293	T98
V_3892	31.9	31.9	627803	4751535	180	1297	T24
V_3900	35.6	35.6	622573	4769993	186	899	T28
V_394	32.1	32.1	617236	4752117	180	1189	T98
V_4000	36.4	36.5	615236	4765530	188	928	T08
V_404	32.8	32.8	617271	4755281	180	1177	T82
V_419	39.1	39.1	617366	4763479	185	800	T39
V_420	35.8	35.8	617372	4753536	180	784	T98
V_421	33.9	33.9	617373	4754711	180	1037	T82
V_423	35.8	35.8	617381	4767709	191	1108	T93
V_424	36.3	36.4	617384	4753456	180	727	T98
V_430	39.9	39.9	617402	4764893	185	616	T39
V_442	33.4	33.5	617474	4752173	181	1007	T98
V_447	34.6	34.6	617505	4768925	195	1257	T94
V_459	34.2	34.2	617577	4752220	182	917	T98
V_467	39.5	39.5	617660	4764826	185	629	T39
V_470	35.0	35.0	617682	4752260	182	838	T98
V_471	38.4	38.4	617684	4766934	190	668	T93
V_472	38.5	38.5	617686	4767001	190	650	T93
V_48	34.5	34.6	613751	4764503	185	892	T08
V_482	39.1	39.1	617742	4764831	185	677	T39
V_484	37.0	37.0	617767	4755182	180	678	T82
V_487	39.2	39.2	617779	4765797	188	585	T97
V_496	35.2	35.2	617827	4755564	180	859	T82
V_502	38.6	38.7	617864	4763668	185	799	T39
V_510	37.4	37.4	617908	4763284	185	1035	T51
V_515	37.4	37.4	617923	4768749	195	829	T94
V_516	35.7	35.7	617928	4769415	195	1050	T94
V_520	36.7	36.7	617944	4753834	180	792	T98
V_53	35.2	35.2	613971	4764324	185	821	T08
V_531	36.6	36.6	617998	4753864	180	821	T98

Receptor ID	2015 Results (2015 Amend-ment) Sound Level/ Night dBA	2014 Results (2014 REA Sound Level/ Night dBA	UTM Coordinates (NAD 83, Zone 17) X [m]	Y [m]	Z [m]	Distance to the nearest Turbine [m]	Nearest Turbine ID
V_533	36.3	36.3	618011	4769403	195	978	T94
V_537	34.0	34.0	618034	4755913	180	1059	T82
V_538	38.3	38.3	618036	4768512	195	759	T94
V_545	37.3	37.3	618057	4766254	190	913	T93
V_55	36.0	36.0	614020	4764387	185	742	T08
V_550	33.6	33.6	618082	4756015	180	1143	T82
V_551	38.4	38.4	618102	4763559	185	727	T07
V_560	36.8	36.8	618197	4752389	184	688	T98
V_563	40.0	40.0	618217	4768489	195	601	T94
V_570	39.5	39.5	618259	4767725	192	601	T93
V_571	32.8	32.8	618270	4756379	180	1469	T82
V_573	32.7	32.7	618291	4756410	180	1498	T82
V_579	38.2	38.2	618337	4769461	195	811	T94
V_586	35.1	35.2	618376	4749190	180	833	T99
V_587	34.7	34.8	618376	4748946	180	877	T99
V_591	38.6	38.6	618410	4769465	194	780	T94
V_597	37.0	37.0	618462	4766271	186	867	T93
V_607	37.2	37.2	618524	4764929	185	884	T07
V_608	36.2	36.2	618535	4748930	180	735	T99
V_626	39.4	39.4	618675	4767749	190	715	T93
V_627	35.5	35.6	618694	4748607	180	803	T99
V_646	37.4	37.4	618761	4764853	185	810	T07
V_653	31.6	31.6	618782	4747855	180	1433	T99
V_657	31.4	31.5	618789	4747811	180	1474	T99
V_669	36.9	36.9	618830	4764950	185	918	T07
V_671	36.6	36.6	618845	4766292	186	984	T93
V_682	36.7	36.7	618887	4769924	190	853	T85
V_707	39.3	39.4	618987	4764486	185	558	T07
V_71	35.2	35.2	614487	4764079	183	834	T08
V_719	37.5	37.6	619078	4763539	181	678	T07
V_721	33.1	33.2	619090	4762737	180	1392	T07
V_724	36.9	37.0	619123	4764964	185	1033	T07
V_728	36.6	36.6	619162	4769939	190	832	T85
V_731	34.2	34.3	619171	4750322	181	1099	T99
V_737	33.4	33.4	619223	4748045	180	1178	T99
V_745	35.3	35.4	619297	4750161	181	942	T99
V_748	36.7	36.7	619308	4766370	188	1003	T54
V_750	33.5	33.5	619311	4752272	185	1493	T42
V_751	35.4	35.4	619325	4752841	185	996	T42
V_759	39.0	39.0	619387	4767898	193	683	T66
V_771	37.4	37.4	619440	4756078	180	1095	T19
V_781	37.7	37.8	619558	4764910	185	785	T54
V_788	38.4	38.4	619630	4764978	185	692	T54
V_794	38.1	38.1	619700	4766284	188	731	T54
V_804	38.0	38.0	619754	4753023	185	631	T42
V_809	37.3	37.3	619790	4749853	180	857	T99
V_814	36.5	36.5	619828	4750030	180	1017	T99
V_823	38.7	38.7	619906	4749574	180	757	T20
V_825	37.9	37.9	619930	4766397	189	803	T54
V_826	31.6	31.7	619935	4746988	182	1454	T05
V_830	31.9	32.1	619977	4747046	182	1388	T05
V_837	31.8	32.0	620011	4746987	183	1391	T05
V_838	37.7	37.7	620011	4754703	184	893	T19
V_84	32.7	32.8	614732	4770110	200	1245	T83
V_845	34.5	34.6	620042	4751132	184	1456	T96
V_846	32.6	32.6	620047	4770202	185	1424	T85
V_847	32.8	32.8	620047	4770144	185	1380	T85
V_849	34.7	34.7	620051	4769722	188	1103	T85
V_852	35.6	35.7	620056	4769504	190	1002	T85
V_855	39.8	39.8	620068	4749448	181	569	T20
V_864	37.7	37.7	620095	4754636	185	925	T19
V_867	32.5	32.6	620115	4747051	183	1268	T05
V_868	32.2	32.4	620116	4746984	183	1306	T05
V_869	35.0	35.1	620119	4751004	183	1346	T96
V_871	32.3	32.3	620121	4770225	185	1490	T85
V_875	35.3	35.4	620143	4750856	182	1293	T96
V_888	37.3	37.3	620209	4757857	184	961	T72
V_890	35.6	35.6	620212	4750883	182	1230	T96
V_915	34.7	34.8	620307	4767830	193	1372	T66
V_93	34.3	34.4	614859	4770309	200	1044	T83
V_933	34.1	34.1	620362	4758485	182	1441	T72
V_934	39.1	39.1	620362	4766347	188	669	T38
V_935	38.9	39.0	620366	4764935	187	782	T54
V_936	37.2	37.2	620367	4757957	184	953	T72

Receptor ID	2015 Results (2015 Amend-ment) Sound Level/ Night dBA	2014 Results (2014 REA Sound Level/ Night dBA	UTM Coordinates (NAD 83, Zone 17) X [m]	Y [m]	Z [m]	Distance to the nearest Turbine [m]	Nearest Turbine ID
V_938	36.7	36.8	620388	4750654	181	1035	T96
V_961	38.5	38.5	620501	4753403	185	609	T42
V_967	38.3	38.3	620536	4754767	185	765	T19
V_970	34.3	34.4	620551	4747000	185	977	T05
V_976	38.9	38.9	620577	4754856	184	689	T19
V_979	35.2	35.7	620607	4763615	185	1193	T75

Appendix D Equipment Specification

Transformer Dimensions and Lw calculation

Transformer 100 MVA

SPL NEMA:	88	dB	**Note 1**					
Transformer Dimensions:	H:	2.5	L:	2.9	W:	3.7	**Note 2**	
Estimated Transformer Area	33							
NEMA Area	58							
Lw:	106	dB						

Correction Factors

Octave Band Centre Freq {hz}	31.5	63	125	250	500	1000	2000	4000	8000	dBz/dBA
Correction (Bies and Hansen)		5	7	2	2	-4	-9	-14	-21	

Adjustment to match NEMA power **10**

Oct. Band Level (Linear)		101	103	98	98	92	87	82	75	106
A weight Correction		26	16	9	3	0	-1	-1	1	
Oct. Band Level (A-Weighted)		74	87	89	94	92	88	83	74	**98**

Acoustical datasheet for a measurement of a wind power turbine

Acoustic measurements for a determination of acoustic emission effect of a wind power turbine type ENERCON E 101 (Power reduced to 2,950 kW) in accordance to DIN 61400-11 / IEC 61400-11 :2002 on 05.05.2014, Project No. 15-054-GH-02

General information		**Technical data (from the manufacturer)**	
Turbine manufacturer:	Enercon GmbH	Maximum rated power:	3,050 kW
	Dreekamp 5	Measured rated power:	2,950 kW (reduced)
	D-26605 Aurich	Rotor diameter:	101 m
Serial no.:	1010356	Hub height over the ground:	135,4 m
WT location:	WP Dalwitz	Tower construction:	Steel and precast concrete
		Power control:	Pitch
Rotor additional data (from the manufacturer)		**Additional data of the gearbox and the generator (from the manufacturer)**	
Rotor blade manufacturer:	ENERCON GmbH	Gearbox manufacturer:	none
Type:	E 101-1	Gearbox type:	none
Rotor blade control:	variable	Generator manufacturer:	ENERCON GmbH
No. of rotor blades:	3	Generator type:	G101/30-G2
Nominal rotor speed:	4 -14.7 RPM	Nominal generator speed:	4 -14.7 RPM
Measured rotor speed:	4 -14.1 RPM (reduced)	Measured generator speed:	4 -14.1 RPM (reduced)

Power curve: OM II 2,950 kW (from the manufacturer)

	Reference point		Noise emission parameters	Note
	Standardized wind speed at 10 m height	Electrical power		
Sound-power-level $L_{WA,P}$	6 ms^{-1}	1,556 kW	99.5 dB(A)	(1)
	7 ms^{-1}	2,255 kW	101.4 dB(A)	
	7.8 ms^{-1}	2,803 kW	102.0 dB(A)	
	8 ms^{-1}	2,857 kW	102.2 dB(A)	
Tonality at a close range K_{TN}	6 ms^{-1}	1,556 kW	0 dB	(1)
	7 ms^{-1}	2,255 kW	0 dB	
	7.8 ms^{-1}	2,803 kW	0 dB	
	8 ms^{-1}	2,857 kW	0 dB	
Impulsiveness at a close range K_{IN}	6 ms^{-1}	1,556 kW	0 dB	(1)
	7 ms^{-1}	2,255 kW	0 dB	
	7.8 ms^{-1}	2,803 kW	0 dB	
	8 ms^{-1}	2,857 kW	0 dB	

Note:

(1) For the acoustic-power-levels denoted here are derived at an operation point with 95% of the reduced rated power (2,950 kW) under the consideration of the given power curve and the hub height of the WT at v_{10} = 7.8 ms^{-1} at 10 m height above the ground.

Measured by:

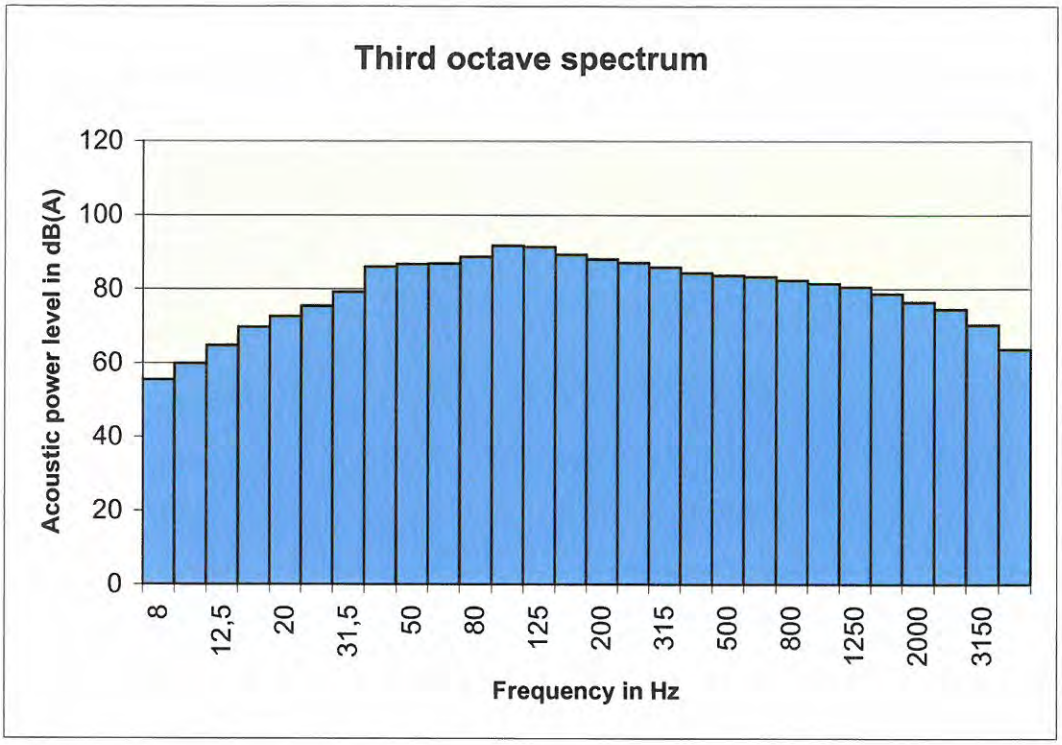
T&H Ingenieure GmbH
Bremerhavener Heerstraße 10
D-28717 Bremen
www.th-ingenieure.de
info@th-ingenieure.de
Tel.: +49(0) 421 698993-15

T&H INGENIEURE
Immissionsschutz und technische Akustik

T&H Ingenieure GmbH
Messstelle nach § 26 BImSchG zur Ermittlung von Geräuschemissionen und -immission
Bremerhavener Heerstraße 10 D-28717 Bremen

Date: 22.05.2015

Signature
Dipl. Ing. (FH) Jürgen Hünerberg

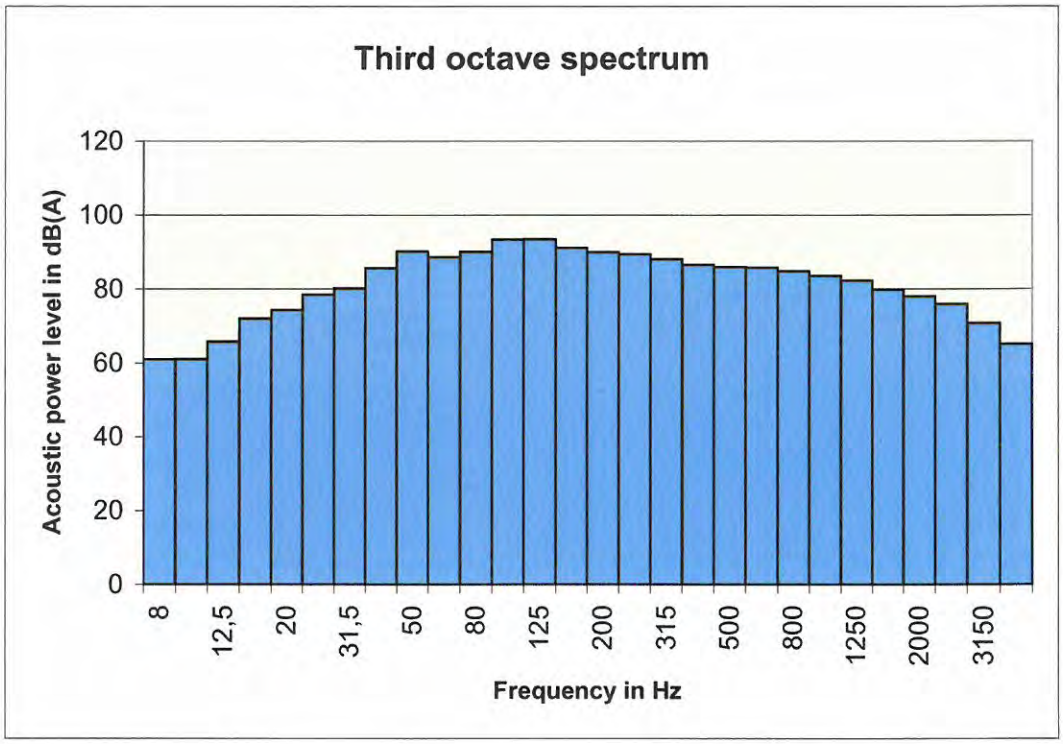


Third octave sound power level for vs = 6 m/s in dB(A)

Frequency in Hz	$L_{WA,P}$ in dB(A)	Uncertainty Uc in dB	Frequency in Hz	$L_{WA,P}$ in dB(A)	Uncertainty Uc in dB
20	55,4	3,2	500	88,1	1,1
25	59,9	1,8	630	87,1	1,2
31,5	64,8	1,7	800	86,0	1,2
40	69,7	1,5	1 k	84,4	1,4
50	72,6	1,9	1,25 k	83,7	1,6
63	75,5	2,0	1,6 k	83,3	1,6
80	79,3	1,7	2 k	82,4	1,5
100	86,0	1,6	2,5 k	81,6	1,4
125	86,7	1,3	3,15 k	80,6	1,7
160	86,9	1,3	4 k	78,7	2,1
200	88,7	1,2	5 k	76,5	3,0
250	91,7	1,1	6,3 k	74,6	2,6
315	91,4	1,1	8 k	70,3	2,2
400	89,3	1,1	10 k	63,7	3,4

Appendix 4.5.1

Background corrected third octave spectra at vs = 6 m/s

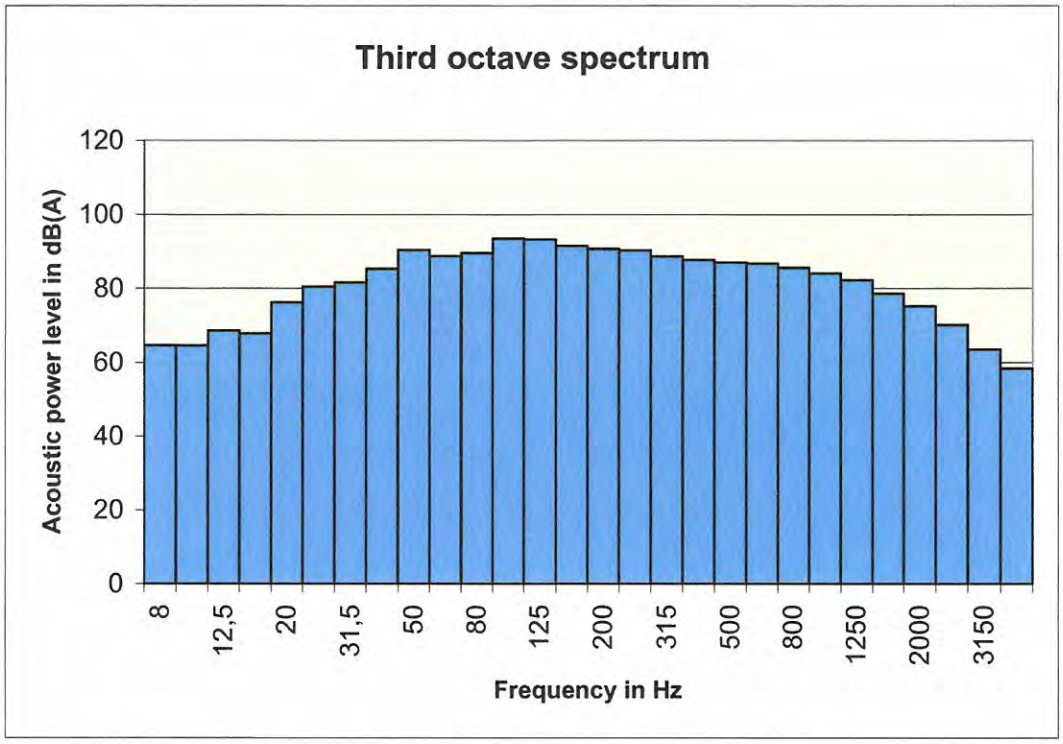


Third octave sound power level for vs = 7 m/s in dB(A)

Frequency in Hz	$L_{WA,P}$ in dB(A)	Uncertainty Uc in dB	Frequency in Hz	$L_{WA,P}$ in dB(A)	Uncertainty Uc in dB
20	61,0	1,3	500	90,0	1,2
25	61,1	2,1	630	89,4	1,3
31,5	65,8	1,9	800	88,1	1,4
40	72,1	1,4	1 k	86,6	1,6
50	74,3	1,7	1,25 k	86,0	1,8
63	78,5	1,6	1,6 k	85,8	1,7
80	80,2	1,6	2 k	84,9	1,6
100	85,6	1,4	2,5 k	83,6	1,8
125	90,2	1,1	3,15 k	82,3	2,1
160	88,6	1,2	4 k	79,9	2,7
200	90,0	1,2	5 k	78,1	3,0
250	93,4	1,1	6,3 k	76,0	2,6
315	93,4	1,1	8 k	70,8	3,2
400	91,2	1,1	10 k	65,2	3,5

Appendix 4.5.2

Background corrected third octave spectra at vs = 7 m/s

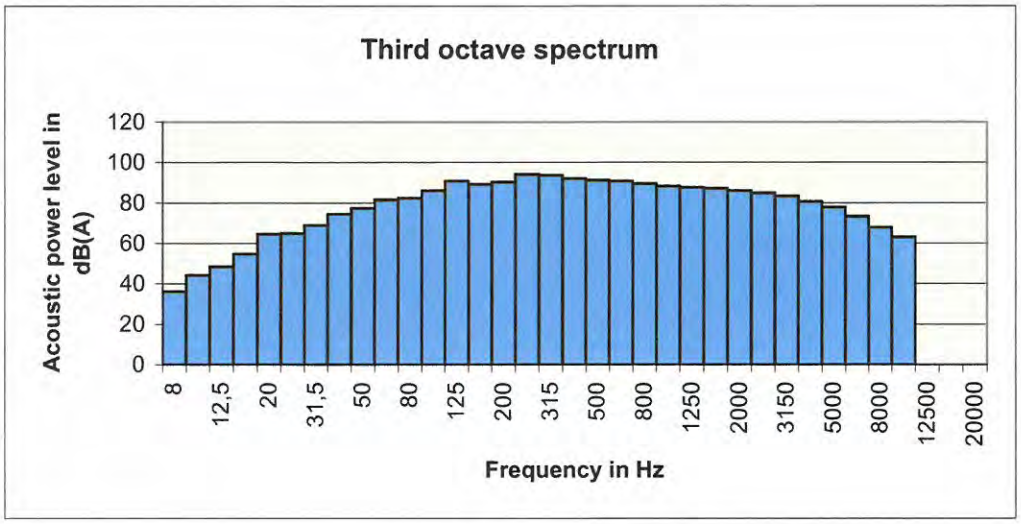


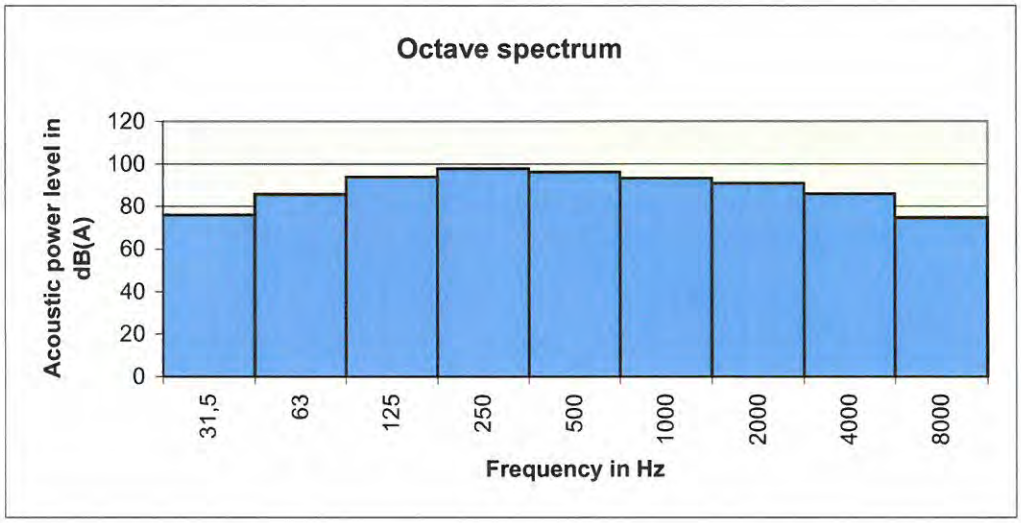
Third octave sound power level for vs = 8 m/s in dB(A)

Frequency in Hz	$L_{WA,P}$ in dB(A)	Uncertainty Uc in dB	Frequency in Hz	$L_{WA,P}$ in dB(A)	Uncertainty Uc in dB
20	64,6	2,6	500	90,7	1,2
25	64,6	2,6	630	90,3	1,2
31,5	68,6	2,9	800	88,6	1,4
40	67,9	7,6	1 k	87,7	1,3
50	76,3	2,7	1,25 k	87,0	1,3
63	80,5	2,1	1,6 k	86,7	1,3
80	81,6	2,0	2 k	85,6	1,3
100	85,4	1,5	2,5 k	84,0	1,5
125	90,4	1,2	3,15 k	82,3	1,8
160	88,7	1,2	4 k	78,6	2,6
200	89,6	1,4	5 k	75,2	3,4
250	93,5	1,3	6,3 k	70,2	4,0
315	93,2	1,2	8 k	63,5	5,3
400	91,5	1,3	10 k	58,4	6,2

Appendix 4.5.3

Background corrected third octave spectra at vs = 8 m/s





Third octave sound power level for v_s = 7,8 m/s in dB(A)												
Frequency	8	10	12,5	16	20	25	31,5	40	50	63	80	100
$L_{WA,P}$	36,2	44,2	48,4	54,7	64,5	64,9	69,0	74,5	77,3	81,5	82,5	86,0
Frequency	125	160	200	250	315	400	500	630	800	1 k	1,25 k	1,6 k
$L_{WA,P}$	90,7	89,2	90,4	94,0	93,7	92,0	91,3	90,8	89,4	88,3	87,6	87,2
Frequency	2 k	2,5 k	3,15 k	4 k	5 k	6,3 k	8 k	10 k				
$L_{WA,P}$	86,1	84,8	83,4	80,6	77,8	73,3	67,7	63,1				
Oactave sound power level for v_s =7,8 m/s in dB(A)												
Frequency	31,5	63	125	250	500	1000	2000	4000	8000			
$L_{WA,P}$	75,9	85,7	93,8	97,8	96,1	93,3	90,9	86,0	74,7			

Appendix 4.5.4

Background corrected third octave and octave spectrum at vs = 7.8 m/s

Sound Power Level of the ENERCON E-101 2.9 MW G2/G3

Publisher:

ENERCON Canada Inc.

700, rue de La Gauchetière ouest Bureau 1200
Montréal, QC, H3B 5M2
+1 514 ENERCON (+1 514 363 7266)

The following represents the sound power level of the E-101 2.9 MW G2/G3 for the entire operational range of wind speeds in accordance with the measurement technique IEC 61 400 – 11:2002 and A1:2006.

Sound Power Level (SPL) for the E-101 2.9 MW G2/G3

Hub Height / Vs in 10m height		124m	
6 m/s		**99.5 dB(A)**	
7 m/s		**101.4 dB(A)**	
8 m/s		**102.2 dB(A)**	
9 m/s		**102.9* dB(A)**	
10 m/s		**102.9* dB(A)**	
>95% rated power		**102.2 dB(A)**	

Measurement results of the octave band corresponding to 95% or higher rated power are presented in the table below. ENERCON confirms the measurement values to be representative values of the E-101 2.9 MW noise levels.

	Octave band sound power level in dB(A)								
Frequency (Hz)	63	125	250	500	1,000	2,000	4,000	8,000	dB(A)
E-101 2.9 MW @ 8m/s	84.7	93.4	97.2	95.6	92.6	90.3	84.4	71.1	102.2

*Recommended broadband sound power level for use in noise model. The typical octave bands corresponding to the sound power level at 9 m/s and 10 m/s are provided in the table below.

	Octave band sound power level in dB(A) for 9 m/s and 10 m/s								
Frequency (Hz)	63	125	250	500	1,000	2,000	4,000	8,000	dB(A)
Sound power level	83.7	92.0	96.1	98.4	97.0	90.2	85.2	81.9	102.9

1. The relation between the sound power level and the standardized wind speed Vs in 10 m height as shown above is valid on the premise of a logarithmic wind profile with a roughness length of 0.05m. The relation between the sound power level and the wind speed at hub heights applies for all hub heights. During the sound measurements the wind speeds are derived from the power output and the power curve of the WEC.

2. A tonal audibility of $\mathbf{\Delta L_{a,k} \leq 2\ dB}$ can be expected over the whole operational range and is valid in the near vicinity of the turbine according to IEC 61 400 -11 ed. 2.
3. Sound power level values provided in the table are valid for the calculated power curve of the E-101 D0331249-0 (V1.0).

4. Due to typical measurement uncertainties, if the sound power level is measured according to the accepted method, the measured values can differ from the values shown in this document in the range of +/- 1dB.

   Accepted measurement method:
   IEC 61400-11 ed.2 (“Wind turbine generator systems – Part 11: Acoustic noise measurement techniques; Second edition, 2002 – 12”).

   If the difference between tonal noise and background noise during a measurement is less than 6 dB, a higher uncertainty must be considered.

5. The sound power level of a wind turbine depends on several factors such as, but not limited to, regular maintenance and day-to-day operation in compliance with the manufacturer’s operating instructions.

Sound Power Level of the ENERCON E-101 3.0 MW

Publisher:

ENERCON Canada Inc.

1000, rue de La Gauchetière ouest Bureau 2310
Montréal, QC, H3B 4W5
+1 514 ENERCON (+1 514 363 7266)

The following represents the sound power level of the E-101 3.0 MW for the entire operational range of wind speeds in accordance with the measurement technique IEC 61 400 – 11:2002 and A1:2006.

Sound Power Level (SPL) for the E-101 with 3.0 MW rated power

Hub Height / Vs in 10m height	99m	124m	135m
6 m/s	**103.6 dB(A)**	**103.6 dB(A)**	**103.8 dB(A)**
7 m/s	**104.3 dB(A)**	**104.3 dB(A)**	**104.5 dB(A)**
8 m/s	**104.8 dB(A)**	**104.8 dB(A)**	**104.8 dB(A)**
9 m/s	**104.8 dB(A)**	**104.8 dB(A)**	**104.8 dB(A)**
10 m/s	**104.8 dB(A)**	**104.8 dB(A)**	**104.8 dB(A)**
95% rated power	**104.8 dB(A)**	**104.8 dB(A)**	**104.8 dB(A)**

Measurement results of the octave band corresponding to 95% or higher rated power are presented in the table below. ENERCON confirms the measurements values to be representative values of the E-101 3.0 MW noise levels.

	Octave band sound power level in dB(A)								
Frequency (Hz)	63	125	250	500	1,000	2,000	4,000	8,000	dB(A)
E-101 3.0 MW @ 8.3m/s	86.3	91.6	98.6	100.8	98.3	92.8	85.9	73.3	104.8

1. The relation between the sound power level and the standardized wind speed Vs in 10 m height as shown above is valid on the premise of a logarithmic wind profile with a roughness length of 0.05m. The relation between the sound power level and the wind speed at hub heights applies for all hub heights. During the sound measurements the wind speeds are derived from the power output and the power curve of the WEC.

2. A tonal audibility of $\mathbf{\Delta L_{a,k} \leq 2\ dB}$ can be expected over the whole operational range and is valid in the near vicinity of the turbine according to IEC 61 400 -11 ed. 2.

3. Sound power level values provided in the table are valid for the **Operational Mode I**. The respective power curve is the calculated power curve of the E-101 dated October 2009 (Rev 2.0).

4. Due to typical measurement uncertainties, if the sound power level is measured according to the accepted method, the measured values can differ from the values shown in this document in the range of +/- 1dB.

   Accepted measurement method:
   IEC 61400-11 ed.2 (“Wind turbine generator systems – Part 11: Acoustic noise measurement techniques; Second edition, 2002 – 12”).

   If the difference between total noise and background noise during a measurement is less than 6 dB, a higher uncertainty must be considered.

5. The sound power level of a wind turbine depends on several factors such as, but not limited to, regular maintenance and day-to-day operation in compliance with the manufacturer’s operating instructions.

KÖTTER CONSULTING ENGINEERS

Summary of Test Report (Measured hub height of 99 m) /1/

Master Data Sheet "Geräusche" (*Noise*), in accordance with "Technische Richtlinien für Windenergieanlagen, Teil 1: Bestimmung der Schallemissionswerte" *(Technical Guidelines for Wind Turbine Generators, Part 1: Determination of sound emission values)*

Rev. 18 of February 1, 2008 (Editor: Fördergesellschaft Windenergie e.V. Stresemannplatz 4, D-24103 Kiel)

Extract of Test Report 213122-02.01 IEC
on noise emission of wind turbine generator of type E-101

General Data			Technical Data (manufacturer's specifications)	
Manufacturer of WTG:	Enercon GmbH		Rated power (generator):	3,050 (3,250) kW
Serial number:	1010002		Diameter of rotor:	101 m
Location of WTG (approx.):	49733 Haren		Hub height above ground:	99 m
Geographic co-ordinates:	GK longitude:	25.76.214	Type of tower:	conical tubular concrete
	GK latitude:	58.59.856	Power control:	Pitch
Complementary rotor data (manufacturer's specifications)			**Complementary data of gear unit and generator (manufacturer's specifications)**	
Manufacturer of rotor blade:	Enercon		Manufacturer of gear unit:	not applicable
Type of rotor blade:	E-101-1		Type of gear unit:	not applicable
Blade setting angle:	variable		Manufacturer of generator:	Enercon
Number of rotor blades:	3		Type of generator:	G-101/30-G2
Rotor speed range:	5 to 14.7 rpm. (mode OM I)		Rated speed of generator:	5 to 14.7 rpm. (mode OM I)

Calculated Performance Chart: Performance characteristic E101 3 MW OM I ; calculated by ENERCON (Rev. 1.0)

	Reference Point: standardized wind speed at a height of 10 m	Reference Point: true electrical power	Noise emission parameters	Observations
sound power level $L_{WA,P}$	6 ms^{-1}	1,414 kW	103.6 dB(A)	
	7 ms^{-1}	2,077 kW	104.3 dB(A)	
	8 ms^{-1}	2,751 kW	104.8 dB(A)	
	9 ms^{-1}	2,987 kW	104.6 dB(A)	(1)
	10 ms^{-1}	3,050 kW	--	(2)
tonal audibility $\Delta L_{a,k}$	6 ms^{-1}	1,414 kW	- 1.5 dB	
	7 ms^{-1}	2,077 kW	0 dB	
	8 ms^{-1}	2,751 kW	0 dB	
	9 ms^{-1}	2,987 kW	0 dB	(1)
	10 ms^{-1}	3,050 kW	--	(2)
impulse adjustment for immediate vicinity K_{IN}	6 ms^{-1}	1,414 kW	0 dB	
	7 ms^{-1}	2,077 kW	0 dB	
	8 ms^{-1}	2,751 kW	0 dB	
	9 ms^{-1}	2,987 kW	0 dB	(1)
	10 ms^{-1}	3,050 kW	--	(2)

Third-octave band sound power level for v_s = 6 ms^{-1} in dB(A)

Frequency	50	63	80	100	125	160	200	250	315	400	500	630
$L_{WA,P}$	78.3	81.8*	83.0**	84.2	89.6	85.7*	89.2	92.7	94.1	94.6	95.1	94.9
Frequency	800	1,000	1,250	1,600	2,000	2,500	3,150	4,000	5,000	6,300	8,000	10,000
$L_{WA,P}$	93.5	91.6	90.0	89.0	85.4	84.1	82.3	79.3	74.8	67.8*	64.7**	65.3**

Octave band sound power level for v_s = 6 ms^{-1} in dB(A)

Frequency	63	125	250	500	1,000	2,000	4,000	8,000
$L_{WA,P}$	85.6*	91.9	97.2	99.6	96.7	91.5	84.6	70.3*

Third-octave band sound power level for v_s = 7 ms^{-1} in dB(A)

Frequency	50	63	80	100	125	160	200	250	315	400	500	630
$L_{WA,P}$	78.9	83.3	84.0	84.9	88.2	86.4*	89.6	94.7	94.9	95.4	95.8	95.5
Frequency	800	1,000	1,250	1,600	2,000	2,500	3,150	4,000	5,000	6,300	8,000	10,000
$L_{WA,P}$	94.0	92.0	90.4	89.3	86.1	84.7	82.9	79.9	74.4*	68.4*	64.6**	62.7**

Octave band sound power level for v_s = 7 ms^{-1} in dB(A)

Frequency	63	125	250	500	1,000	2,000	4,000	8,000
$L_{WA,P}$	87.3	91.5	98.4	100.3	97.1	91.9	85.0	71.5**

KÖTTER
CONSULTING ENGINEERS

Third-octave band sound power level	for v_s = 8 ms^{-1} in dB(A)											
Frequency	50	63	80	100	125	160	200	250	315	400	500	630
$L_{WA,P}$	82.1	82.8	84.4	88.4	86.8	90.1	94.8	95.0	95.6	96.3	96.2	82.1
Frequency	800	1,000	1,250	1,600	2,000	2,500	3,150	4,000	5,000	6,300	8,000	10,000
$L_{WA,P}$	95.0	93.3	91.5	90.4	86.7	85.4	83.7	80.9	75.9	69.7*	67.1**	65.5**

Octave band sound power level	for v_s = 8 ms^{-1} in dB(A)							
Frequency	63	125	250	500	1,000	2,000	4,000	8,000
$L_{WA,P}$	86.3	91.6	98.6	100.8	98.3	92.8	86.0	73.3**

Third-octave band sound power level	for v_s = 9 ms^{-1} in dB(A)											
Frequency	50	63	80	100	125	160	200	250	315	400	500	630
$L_{WA,P}$	78.6	81.9	82.4*	83.9	87.8	85.9*	88.6	93.8	94.2	95.1	96.0	96.3
Frequency	800	1,000	1,250	1,600	2,000	2,500	3,150	4,000	5,000	6,300	8,000	10,000
$L_{WA,P}$	95.4	93.8	92.3	91.0	87.4	86.0	84.1	81.1	76.7	71.7	68.4	66.8*

Octave band sound power level	for v_s = 9 ms^{-1} in dB(A)							
Frequency	63	125	250	500	1,000	2,000	4,000	8,000
$L_{WA,P}$	86.0	90.8	97.6	100.6	98.8	93.5	86.4	74.2

This summary of the test report is valid only in combination with the manufacturer's certificate dated 12/03/2013.

These specifications do not replace the test report mentioned above (particularly for noise immission predictions).

Observations:
(1) Maximum value of standardized wind speed during the WTG-operation measurement v_s = 8,9 m/s
(2) Due to weather conditions, no data available during WTG operation
* Difference between working and background noise < 6 dB, correction by 1.3 dB
** Difference between working and background noise < 3 dB, values shall not be presented

/1/ Wind turbine generator systems – Part 11: Acoustic noise; measurement techniques (IEC 61400-11:2002 and A1:2006); German version DIN EN 61400-11:2007

Measured by: KÖTTER Consulting Engineers
- Rheine -

Date: 23/04/2013

Dipl.-Ing. Oliver Bunk Matthias Humpohl, B.Sc.

KÖTTER
CONSULTING ENGINEERS
Bonifatiusstraße 400 · 48432 Rheine
Tel. 0 59 71 - 97 10 0 Fax 0 59 71 - 97 10 43

KÖTTER CONSULTING ENGINEERS

Vorläufiger Auszug aus dem Prüfbericht

Stammblatt "Geräusche", entsprechend den *"Technischen Richtlinien für Windenergieanlagen, Teil 1: Bestimmung der Schallemissionswerte"*

Rev. 18 vom 01.Februar 2008 (Herausgeber: Fördergesellschaft Windenergie e.V. Stresemannplatz 4, D-24103 Kiel)

Auszug aus dem Prüfbericht 213121-01.01
zur Schallemission einer Windenergieanlage vom Typ E-101

Allgemeine Angaben		Technische Daten (Herstellerangaben)	
Anlagenhersteller	Enercon GmbH	Nennleistung (Generator):	3.0 (3.25) MW
Seriennummer:	1010002	Rotordurchmesser:	101 m
WEA-Standort (ca.):	49733 Haren	Nabenhöhe über Grund:	99 m
Standortkoordinaten:	RW: 25.76.214	Turmbauart:	Beton
	HW: 58.59.856	Leistungsregelung:	Pitch
Ergänzende Daten zum Rotor (Herstellerangaben)		**Ergänzende Daten zu Getriebe und Generator (Herstellerangaben)**	
Rotorblatthersteller	Enercon	Getriebehersteller	entfällt
Typenbezeichnung Blatt:	E-101-1	Typenbezeichnung Getriebe:	entfällt
Blatteinstellwinkel:	variabel	Generatorhersteller	Enercon
Rotorblattanzahl:	3	Typenbezeichnung Generator:	G-101/30-G2
Rotordrehzahlbereich:	5 - 14,7 U/min	Generatornenndrehzahl:	14,7 U/min

Leistungskurve: Leistungskennlinie E101 3 MW OM I (berechnet) der Enercon GmbH zur E-101 vom 05.07.2012

	Referenzpunkt: Normierte Windgeschwindigkeit in 10 m Höhe	Referenzpunkt: Elektrische Wirkleistung	Schallemissions-Parameter	Bemerkungen
Schallleistungs-Pegel $L_{WA,P}$	6 ms^{-1}	1.414 kW	103,6 dB(A)	
	7 ms^{-1}	2.077 kW	104,3 dB(A)	
	8 ms^{-1}	2.751 kW	104,7 dB(A)	
	9 ms^{-1}	2.987 kW	104,6 dB(A)	
	10 ms^{-1}	3.050 kW	-- dB(A)	(2)
	8,3 ms^{-1}	*2.850 kW*	*104,8 dB(A)*	*(1)*
Tonzuschlag für den Nahbereich K_{TN}	6 ms^{-1}	1.414 kW	0 dB bei 116 Hz	
	7 ms^{-1}	2.077 kW	0 dB	
	8 ms^{-1}	2.751 kW	0 dB	
	9 ms^{-1}	2.987 kW	0 dB	
	10 ms^{-1}	3.050 kW	-- dB	(2)
	8,3 ms^{-1}	*2.850 kW*	*0 dB*	*(1)*
Impulszuschlag für den Nahbereich K_{IN}	6 ms^{-1}	1.414 kW	0 dB	
	7 ms^{-1}	2.077 kW	0 dB	
	8 ms^{-1}	2.751 kW	0 dB	
	9 ms^{-1}	2.987 kW	0 dB	
	10 ms^{-1}	3.050 kW	-- dB	(2)
	8,3 ms^{-1}	*2.850 kW*	*0 dB*	*(1)*

Terz-Schallleistungspegel für v_s = 8,3 ms^{-1} in dB(A) entsprechend dem maximalen Schallleistungspegel

Frequenz	50	63	80	100	125	160	200	250	315	400	500	630
$L_{WA,P,max}$	78,8	82,1	82,7	84,4	88,4	86,7	90,0	94,8	95,0	95,6	96,3	96,2
Frequenz	800	1.000	1.250	1.600	2.000	2.500	3.150	4.000	5.000	6.300	8.000	10.000
$L_{WA,P,max}$	95,0	93,3	91,5	90,4	86,6	85,4	83,7	80,8	75,8	69,7*	67,1**	65,5**

Oktav-Schallleistungspegel für v_s = 8,3 ms^{-1} in dB(A) entsprechend dem maximalen Schallleistungspegel

Frequenz	63	125	250	500	1.000	2.000	4.000	8.000
$L_{WA,P,max}$	86,3	91,6	98,6	100,8	98,3	92,8	85,9	73,3**

Dieser Auszug aus dem Prüfbericht gilt nur in Verbindung mit der Herstellerbescheinigung vom 13.03.2013.

Die Angaben ersetzen nicht den o. g. Prüfbericht (insbesondere bei Schallimmissionsprognosen).

Bemerkungen:
(1) Die normierte Windgeschwindigkeit von v_s = 8,3 ms^{-1} entspricht 95 % der Nennleistung.
(2) Witterungsbedingt keine Daten vorhanden
* Abstand zwischen Anlagengeräusch und Fremdgeräusch < 6 dB, Pegelkorrektur um 1,3 dB
** Abstand zwischen Anlagengeräusch und Fremdgeräusch < 3 dB, keine Pegelkorrektur

Gemessen durch: KÖTTER Consulting Engineers GmbH & Co. KG

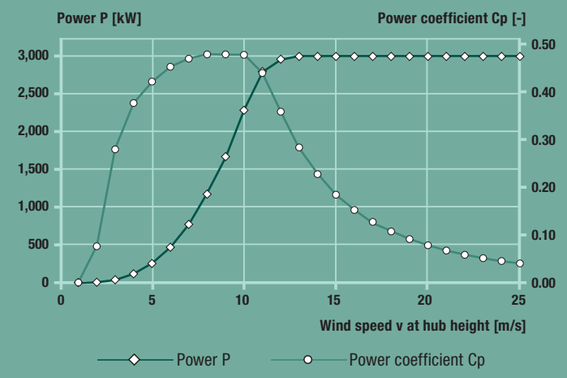
Datum: 13.03.2013 i. V. Dipl.-Ing. Oliver Bunk i. A. Matthias Humpohl, B. Sc.

KÖTTER CONSULTING ENGINEERS
Bonifatiusstraße 400 · 48432 Rheine
Tel. 0 59 71 - 97 10 0 · Fax 0 59 71 - 97 10 43

E-101

3,000 kW

Calculated power curve



Wind [m/s]	Power P [kW]	Power coefficient Cp [-]
1	0.0	0.000
2	3.0	0.076
3	37.0	0.279
4	118.0	0.376
5	258.0	0.421
6	479.0	0.452
7	790.0	0.469
8	1,200.0	0.478
9	1,710.0	0.478
10	2,340.0	0.477
11	2,867.0	0.439
12	3,034.0	0.358
13	3,050.0	0.283
14	3,050.0	0.227
15	3,050.0	0.184
16	3,050.0	0.152
17	3,050.0	0.127
18	3,050.0	0.107
19	3,050.0	0.091
20	3,050.0	0.078
21	3,050.0	0.067
22	3,050.0	0.058
23	3,050.0	0.051
24	3,050.0	0.045
25	3,050.0	0.040

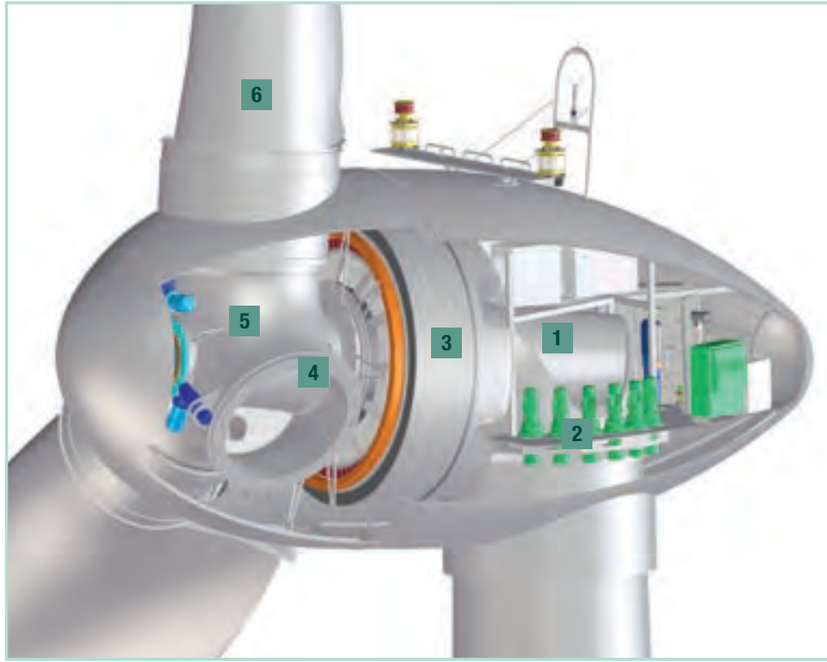
ρ = 1.225 kg/m³

For more information on the ENERCON power curve, please see the last page.

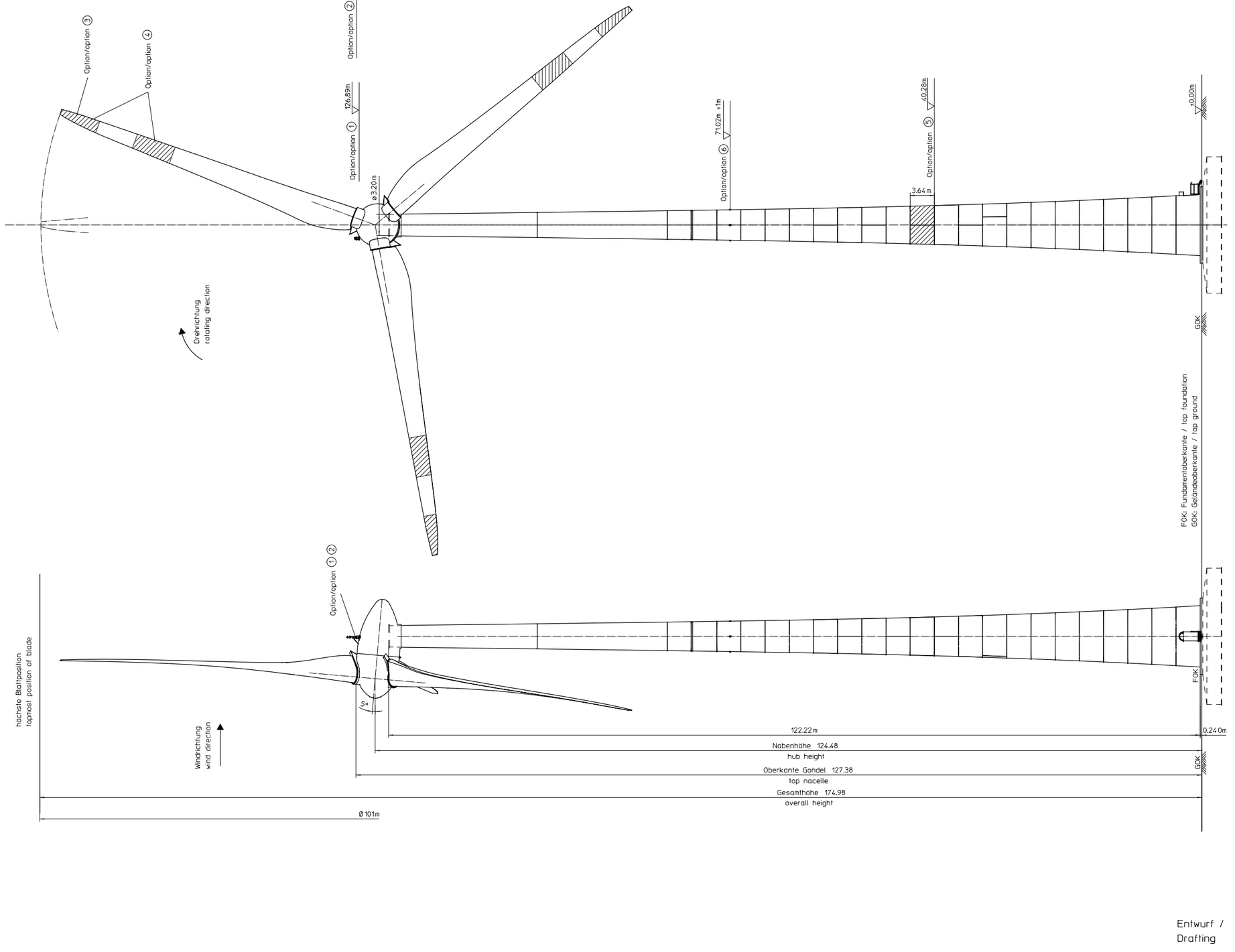
Technical specifications E-101

Rated power:	3,000 kW
Rotor diameter:	101 m
Hub height:	99 m / 135 m
Wind zone (DIBt):	WZ III
Wind class (IEC):	IEC/NVN IIA
WEC concept:	Gearless, variable speed Single blade adjustment
Rotor	
Type:	Upwind rotor with active pitch control
Rotational direction:	Clockwise
No. of blades:	3
Swept area:	8,012 m²
Blade material:	GRP (epoxy resin); Built-in lightning protection
Rotational speed:	Variable, 4–14.5 rpm
Pitch control:	ENERCON single blade pitch system; one independent pitch system per rotor blade with allocated emergency supply
Drive train with generator	
Hub:	Rigid
Main bearing:	Double-row tapered/cylindrical roller bearings
Generator:	ENERCON direct-drive annular generator
Grid feed:	ENERCON inverter
Brake systems:	– 3 independent pitch control systems with emergency power supply – Rotor brake – Rotor lock, latching (15°)
Yaw system:	Active via yaw gear, load-dependent damping
Cut-out wind speed:	28–34 m/s (with ENERCON storm control*)
Remote monitoring:	ENERCON SCADA

*For more information on the ENERCON storm control feature, please see the last page.



1 Main carrier
2 Yaw drive
3 Annular generator
4 Blade adapter
5 Rotor hub
6 Rotor blade



Projektbezogene Angaben / project specific data
Projekt / project:
Geländehöhe über NN / ground height above sea level:
Gesamthöhe über NN / total height above sea level:
Optionen / options:
① Nachtkennzeichnung / night marking: w - Rot / w - Red
② Tageskennzeichnung / daylight marking: weißes Blitzlicht mit Sichtweitenreduzierung / white flashlight with visibility reduction
③ Tageskennzeichnung / daylight marking: 6m rot (RAL 3020) / graues Rotorblatt (RAL 7038) / 6m red (RAL 3020) grey rotor blade (RAL 7038)
④ Tageskennzeichnung / daylight marking: rot/grau/rot (RAL 3020 / RAL 7038 / RAL 3020) je 6m lang / red/grey/red (RAL 3020 / RAL 7038 / RAL 3020) every 6m long
⑤ Tageskennzeichnung / daylight marking: 3,83m Farbfeld RAL 3020 / 3,83m colour field RAL 3020
⑥ Nachtkennzeichnung / night marking: Hindernisfeuer auf jeder Turmachse 10CD / obstruction fire on every tower axis 10CD

Statisch und Konstruktiv nicht geprüft

Entwurf / Drafting

ENERCON GmbH
Dreekamp 5
26605 Aurich
Germany

Oberfläche DIN ISO 1302 — Allgemeintoleranzen / General tolerances: DIN ISO 2768

	Datum / Date	Name
Bearb. / Drawn by	08.07.2010	Stienert
Kontrolliert / Checked		
Norm / Norm		

WRD-Turm

Ansicht Betonfertigteilturm
View Precast Concrete Tower
E-101 E1/BF/125/w

101.00.008 - 0

Sprache / Language: DE — Blatt / Sheet: 1

Maßstab / Scale: 1:200 — Gewicht / Weight: KG

ID Nr.: KM649659

Rev.	Änderung / Change	n. Norm	Name

No guarantee can be given in respect of the translation.

WIND ENERGY CONVERTER CHARACTERISTICS E-101

Rotor	
Type	E-101
Rotor diameter	101 m
Swept area	8012 m^2
Power regulation	Pitch
RPM	4 –14,5 min^{-1}
Cut in wind	2,5 m/s
Cut out wind	28 – 34 m/s
Survival wind speed	59,5 m/s

Gear Box	
Not applicable	No gearbox

Blades	
Manufacturer	ENERCON
Blade length	48,5 m
Material	GRP (Epoxy)
Lightning protection	included

Generator	
Manufacturer	ENERCON
Nominal Power	3000 kW
Type (model)	Synchronous, direct-drive ringgenerator
Protection classification	IP 23
Insulation class	F

Yaw System	
Type	electrical motors
Yaw control	Active (based on wind vane signal)
Yaw rate	0,5°/sec

Controller	
Manufacturer	ENERCON
Type	microprocessor
Grid connection	Via ENERCON inverter
Remote communication	ENERCON Remote Monitoring System
UPS	included

Braking System	
Aerodynamic brake	- three independent blade pitch systems with emergency supply - rotor brake - rotor lock, locking at 30°

Tower			
Hub heights	99 m	135 m	
Tower	Prefab concrete	Prefab concrete	
Design Wind Class	**IIA**	**IIA**	

Sources: Design Assessment

Prevention

All mechanical and electrical components of the wind energy converter in which overheating or short circuits could potentially ignite a fire are permanently monitored by sensors – primarily to ensure their proper functioning – while the WEC is running. If the WEC control system detects irregularities, the wind energy converter stops or continues with limited power. This function is the most effective component of the fire safety system.

Components

Special fire safety components of the E-70 E4 include:

- One Hekatron ORS 142 smoke detector (see appendix for data sheet) on the rotor head side of the stator support ring
- One Hekatron ORS 142 smoke detector on the machine house side of the stator support ring
- One Hekatron ORS 142 smoke detector on the bottom side of the main carrier (i.e., at the tower top)
- One hand-held CO_2 fire extinguisher in the nacelle
- If required by national regulations, one hand-held CO_2 fire extinguisher in the tower base (ENERCON personnel carry an additional fire extinguisher in their Service vehicles)
- Fire retardant or hardly inflammable or incombustible materials for specific components.

No smoke detectors are installed inside the tower and in the tower base. Since the WEC cooling system transports air from the tower base to the area above the tower top at high speed, the smoke detectors in the nacelle are able to detect a fire in the tower or the tower base.

Safe stopping of the wind energy converter in hazardous situations

The emergency pitch unit of each rotor blade consists of blade relay box, capacitor box, and pitch motor. If a safety-relevant sensor reports a fault or a safety switch is triggered, the wind energy converter stops immediately. The pitch control boxes disconnect the pitch motors from the control system and switch the contactors in the blade relay boxes to power supply by the capacitor boxes. The rotor blades automatically move into feathered position independently of each other until switched off by limit switches on the blade bearings. In case of an emergency stop of the rotor (in the event of a fire) an additional electromechanical brake is used. Decelerating the rotor from its rated speed to a standstill takes 10 to 15 seconds.

Fire during WEC operation

There are no persons present in the wind energy converter while it is running. If a fire is detected the rotor of the WEC stops as quickly as possible (emergency stop). The smoke detectors and/or temperature sensors generate signals that are immediately forwarded by the SCADA remote monitoring system to ENERCON Service, who in turn will immediately alert the local fire service and the utility operating the grid. They decide on site which measures are required. The ENERCON Service Center is staffed 24/7 and can thus be contacted at any time

Fire while persons are present

In this scenario, follow the instructions and rules of conduct below.

- Stop the wind energy converter and turn off the main switch, if still possible. Otherwise, push the EMERGENCY STOP button.
- Call the fire service.
- Rescue any injured persons from the danger zone and ensure first aid is provided.
- Use carbon dioxide fire extinguishers to fight the fire; follow the operating instructions of the fire extinguishers. Only try to fight the fire if you can do so without putting your own safety at risk and if the escape route is clear.
- If the fire cannot be extinguished immediately, do not continue fire fighting efforts. Evacuate the wind energy converter and any ancillary buildings, and leave the WEC. Cordon off a wide area around the WEC.
- If it is no longer possible to descend safely in the tower, climb up into the nacelle and use rescue equipment (abseiling device) to leave the nacelle through the winch hatch.
- Notify the technical manager of the relevant utility company.
- Clear access roads for emergency services.
- Notify ENERCON Service.

If the *Maintenance* status has been activated during service work on the wind energy converter, any signals generated by smoke detectors and other sensors are **not** transmitted to ENERCON Service.

Maintenance

In the event of a SCADA system fault a corresponding message is sent to the ENERCON Service Center that will then initiate troubleshooting measures at once. The smoke detectors and the SCADA system are inspected in the setting of the annual electrical maintenance. Inspection and maintenance of fire extinguishers is performed in accordance with national regulations.