

**Suncor Energy Adelaide Wind
Power Project - Renewable
Energy Approval Amendment
Modification Report**

File No. 160960710



Prepared for:
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November 2013

**SUNCOR ENERGY ADELAIDE WIND POWER PROJECT - RENEWABLE ENERGY APPROVAL
AMENDMENT MODIFICATION REPORT**

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Introduction
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1.0 Introduction

1.1 BACKGROUND

Suncor Energy Products Inc. (Suncor) submitted a Renewable Energy Approval (REA) Application on November 28, 2012 to develop, construct and operate the Suncor Energy Adelaide Wind Power Project (the Project) within the Township of Adelaide-Metcalf, County of Middlesex, Ontario.

The Project will include 18 wind turbines (Siemens SWT-2.3-113 operated at a 2.221 MW rating) with an estimated total nameplate capacity of up to 40 MW. The proposed Project would also include access roads, meteorological tower (met tower), electrical collector lines, and a substation which would connect the Project with the provincial high voltage transmission system. Suncor elected to assess and seek approval for some alternative wind turbine locations. The REA Application considered up to four alternative turbine locations. Final selection of the turbine sites will be determined prior to Project construction and will be based on consultation activities, potential effects assessments, and detailed design / engineering work.

Suncor is seeking a minor amendment to the REA Application as a result of ongoing municipal consultation activities.

This report and its attachments provide information regarding the proposed modifications. Based on the following information, the proposed modifications are considered a "Minor Project Design Change" based upon the classification system outlined in the Ministry of the Environment's *Technical Guide to Renewable Energy Approvals* (October, 2013). As such, this document has been prepared to address the requirements of Chapter 10 "Making Changes to REA Projects" of the Technical Guide.

1.2 SUMMARY AND RATIONALE OF PROPOSED MODIFICATIONS

1.2.1 Modification #1

Suncor has consulted with the County regarding the use of their right-of-ways for the Project. Suncor discussed with the County the use of a short 675 m section of Kerwood Road right-of-way for cabling. During these discussions, the County suggested that another route would be preferable. In response, Suncor collected the field data necessary for approvals of alternate route(s). The alternate route is presented in the attached figure (**Figure 1, Appendix A**) and discussed in the following sections. It should be noted that the additional route is in addition to the original Project Location along Kerwood Road.

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1.2.2 Modification #2

As a result of consultation with the Township of Adelaide-Metcalfe staff, it became apparent that the Township would prefer to reduce, where possible, the use of road right-of-ways for the purpose of distribution cabling for wind power projects. As a result Suncor is proposing the approval of Modification 2 which may reduce the length of right-of-way required. Project Modification 2 adds an underground collector line from Turbine 9 to Newel Road (to the east). Adding this cable route may reduce the amount of cable in the municipal right-of-way that connects other Project infrastructure to the east of T9. **Figure 2, Appendix A** shows the modified location of the underground cable location from T9 east to Newel Road.

Excluding the addition of the collector line option to the substation and the change in route of the cable to T9, there is no change to the Project's nameplate capacity or to the previously proposed Project Location as it was shown and assessed in the REA Application.

The construction and installation activities for these collector lines will be completed in the same manner as the underground collector lines which are described in the Construction Plan Report, submitted as part of the REA Application. The collector lines are proposed within previously cleared agricultural fields and would avoid any infrastructure being located within natural features. The cable from T9 to Newel Road crosses a buried municipal drain which will subsequently be directionally drilled under to avoid any potential impacts to the municipal drain. The cable associated with Modification 1 would cross a natural feature and an unnamed drain which would meet the classification of a REA water body, however this natural feature and drain will also be subsequently directionally drilled under to avoid any potential impacts to the feature.

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Results of Effects Assessment for the Project Modification
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2.0 Results of Effects Assessment for the Project Modification

O. Reg. 359/09 requires that any adverse environmental effects that may result from construction, installation, operation and maintenance activities be described. The term “environment” in O. Reg. 359/09 has the same meaning as in the *Environmental Protection Act*, and includes the natural, physical, cultural, and socio-economic environment.

A screening to identify any new environmental effects that would require additional mitigation or monitoring measures beyond those outlined in the REA documents as a result of the proposed modifications to the Project was completed. Given the changes to the collector line routes involves a minor increase/change in size of the Project Location, based on O. Reg. 359/09 requirements, all parts of the Project Location and corresponding Zone of Investigation must be assessed. An update letter related to Natural Heritage Assessment and Environmental Impacts Study (NHA/EIS) (see **Appendix B**) and a modification specific Stage II Archaeological Assessment (see **Appendix C**) have been completed to assess the new portions of the Project Location and corresponding Zone of Investigation. Confirmation letters from the Ministry of Natural Resources (MNR) and Ministry of Tourism, Culture and Sport (MTCS) are also included in the above noted appendices.

Since the construction and installation methods of these underground collector lines will be completed in the same manner as the underground collector lines which have already been assessed as part of the REA Application and the work will be completed within previously cleared agricultural fields (not within any natural features), it was determined that no new environmental effects are expected.

The following consultation activities were completed to assess the potential environmental effects of Project modifications:

- Consultation with MNR regarding changes to the Natural Heritage Assessment / Environmental Impact Study (NHA/EIS) documents, including obtaining a confirmation letter from the MNR regarding the NHA/EIS addendum.
- Consultation with MTCS regarding the additional Stage 2 Archaeological Assessments that were completed as a result of the modifications, including obtaining written correspondence from the MTCS regarding the submission.

2.1 NEW MITIGATIONS MEASURES

Mitigation measures will be the same as those described for the underground collector lines in the REA Application including those previously considered for the installation of collector lines via directional drilling. The proposed modifications are minor in nature and will not result in any new impacts on the environment not previously considered in the REA Application.

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Results of Effects Assessment for the Project Modification
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As documented in the attached NHA/EIS addendum (Appendix B), the following mitigation measures are proposed with respect to directional drilling for the installation of collector lines:

- isolate the area with hay bales, sand bags, or silt fencing to surround and contain the drilling mud;
- drilling equipment will be set up, and all drilling will be conducted, a minimum of 30 m from the edge of Natural Features;
- all drilling will occur at a depth of 3 m, or as close to this depth as construction and site conditions allow;
- prior to drilling, sediment control fencing will be installed at feature edges that occur within 30 m of drilling activities;
- topsoil stripped from the drill exit site must be stockpiled in a location designated by the Inspector;
- the topsoil stockpile must be located as far as possible from the feature;
- a mobile vacuum truck will be used to pump the clay based drilling mud from the contained area to be disposed of off-site by the vacuum truck company as the waste handler, or the drilling mud will be left in the exit pit to avoid potential damage (e.g. rutting/compaction) from vehicles entering the area;
- in locations of watercourse crossings, in the event of an inadvertent return or spill of drilling lubricant, preventive and responsive measures as outlined in the Accidental Spills and Emergency Response Plan sections of the Suncor Energy Adelaide Wind Power Project Construction Plan Report will be implemented immediately;
- while refueling activities may be required at the site of the directional drill, all fuel storage and refueling activities will occur well away from Natural Features. In the event of an accidental spill, the MOE Spills Action Centre will be contacted as appropriate and emergency spill procedures will be implemented immediately; and,
- construction machinery should be checked for presence of wildlife (i.e., reptiles) daily prior to operating machinery.

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2.2 IMPACTS ON STUDIES/ REA REPORTS

2.2.1 Natural Heritage Assessment and Environmental Impact Study

The NHA/EIS (included in the REA Application) identified natural features within the Project Location and the associated 120 m Zone of Investigation around the limits of the Project Location. The Project Location requires a minor modification to account for the change in underground collector line locations.

A technical review (see **Appendix B**) was conducted to determine if the modifications result in: a change to the identification of natural features within 120 m of the new Project Location; a change to the assessment of impacts and mitigation measures; and the overall assessment of changes to the NHA/EIS. It was concluded that overall, the modifications will not result in potential effects not previously identified and mitigated in the NHA/EIS. A copy of the re-confirmation letter provided by the MNR on November 7, 2013 is included in Appendix B. (Please note that the assessment provided in Appendix B related to Modification #1 included two collector line options. While both options were confirmed by the MNR, Suncor has decided that only one option as described in this document will be carried forward as part of this modification).

Further, the proposed modifications do not require any additions to the Environmental Effects Monitoring Plan (EEMP) as submitted with the REA Application.

2.2.2 Stage II Archaeological Assessment

A Stage II Archaeological Assessment was completed specifically for Modification #1 as the Project Location associated with the modification was not previously assessed as part of the REA Application (see **Appendix C**). (Please note that the assessment provided in Appendix C related to Modification #1 included two collector line options. While both options were confirmed by the MTCS, Suncor has decided that only one option as described in this document will be carried forward as part of this modification).

The assessment surveyed a larger construction area than what is currently proposed by Suncor which resulted in the recovery of primarily mid-19th to early 20th century Euro- Canadian historic artifacts. Subsequently, it was recommended that the location of the find be subject to a Stage 3 assessment prior to any ground disturbance activities to further test the nature and density of the site. However, the find site will be avoided by the currently proposed collector line route and thus no Stage 3 assessment is required prior to the installation of the collector line.

The assessment was reviewed and accepted by the MTCS on November 12, 2013 and a copy of the letter is included in Appendix C.

The Project Location associated with Modification #2 was previously assessed as part of the Stage II Archaeological Assessment that was submitted as part of the original REA Application

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and was subsequently accepted by the MTCS in their Confirmation Letter dated May 28, 2012. As such, no additional archaeological assessment was required for Modification #2.

2.2.3 Site Plan

The Site Plan has been updated to reflect the proposed changes and is included in **Appendix A**.

2.2.4 Summary of Impacts/Changes to REA Reports and Studies

The modified locations of the underground collector line will involve a minor increase/change in size of the Project Location. The other components of the Project Location shown in the REA Application including turbines, access roads, etc. will remain the same.

The following table provides a list of the REA reports and studies that were reviewed by MOE, and notes whether changes to the reports are required due to the modifications proposed. As well, an outline of the specific changes or the justification for no change being required is provided. Any changes to the reports have been addressed by issuance of this Modification Report and its appendices.

Table 1: Summary of Impacts/Changes to REA Reports & Studies		
REA Reports & Studies	Change (Yes/No)	Discussion of change / Justification for 'no' change
REA REPORTS		
Project Description Report	Yes (minor)	The Site Plan would need to be updated to display the revised collector line routes, Appendix A.
Construction Plan Report	Yes (minor)	The Site Plan would need to be updated to display the revised collector line routes, Appendix A.
Design & Operations Report	Yes (minor)	The Site Plan would need to be updated to display the revised collector line routes, Appendix A.
Decommissioning Plan Report	No	There are no specific descriptions of the Project Location within the Decommissioning Plan Report; therefore no changes will be required.
Consultation Report	Yes (minor)	Additional consultation has been undertaken for the proposed modification to the Project, and is described in Section 3 of this Modification Document. In addition, a Notice of Modification will be issued to the Project stakeholders to notify them of the proposed modifications.
ADDITIONAL REPORTS		
Turbine Specifications Report	No	There are no changes proposed to the turbines and this report will not require any modifications.
Natural Heritage Assessment Report	Yes	See the letter addendum to the NHA/EIS in Appendix B for a detailed assessment and confirmation from the MNR.
Water Assessment Report	Yes (minor)	A minor update would be made to document a new watercourse crossing; however the minor modification would not result in new negative environmental effects or associated mitigation measures beyond those already identified.

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REA Reports & Studies	Change (Yes/No)	Discussion of change / Justification for 'no' change
Archaeological Assessments	Yes	See the addendum to the Stage II Archaeological Assessment in Appendix C for detailed information and written comments from the MTCS.
Cultural Heritage Assessment	No	No modifications are required as the area of the modifications were previously assessed and include only buried project components.
Noise Assessment Report (Appended to the Design and Operations Report)	No	No modification required since the collector lines are not a source of noise for this project.

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Consultation
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3.0 Consultation

Consultation regarding the proposed modification was undertaken with the MOE, MNR and MTCS as detailed above. Additional consultation activities will occur with Project stakeholders (public, Municipality, County, and aboriginal communities) in the form of a Notice of a Proposed Change to a REA Project. This Notice will be delivered to Project stakeholders at the time of submission of this Modification Document to the MOE. Suncor will undertake consultation with Project stakeholders related to the Modification Document as it arises following the release of the Notice.

3.1 MINISTRY OF NATURAL RESOURCES (MNR)

The MNR was advised of the proposed modification through a letter addendum to the NHA/EIS (**Appendix B**). Consultation with the MNR regarding changes to the NHA/EIS included obtaining written confirmation on November 7, 2013 that the MNR is satisfied that the NHA requirements of O. Reg. 359/09 have been met.

3.2 MINISTRY OF TOURISM, CULTURE AND SPORT (MTCS)

The MTCS was advised of the proposed modification through the completion of additional Stage 2 Archaeological Assessment that was conducted for Modification #1 (**Appendix C**). The assessment was completed and submitted to the MTCS. Correspondence from MTCS on November 12, 2013 regarding the submission is provided in **Appendix C**.

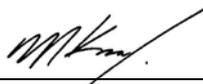
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Closure
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4.0 Closure

The proposed modifications to the underground collector lines have been adequately assessed in accordance with O. Reg. 359/09 and the MOE's Technical Guide. It has been determined that the modifications would not result in new negative environmental effects or associated mitigation measures beyond those identified as part of the original REA Application submitted for the Project. All updates to the required reports have been completed and reviewed/accepted by the applicable regulatory authorities.

This report has been prepared by Stantec for the sole use of Suncor, and may not be used by any third party without the express written consent of Suncor. The data presented in this report are in accordance with Stantec's understanding of the Project as it was presented at the time of reporting.

Prepared by  _____
(signature)

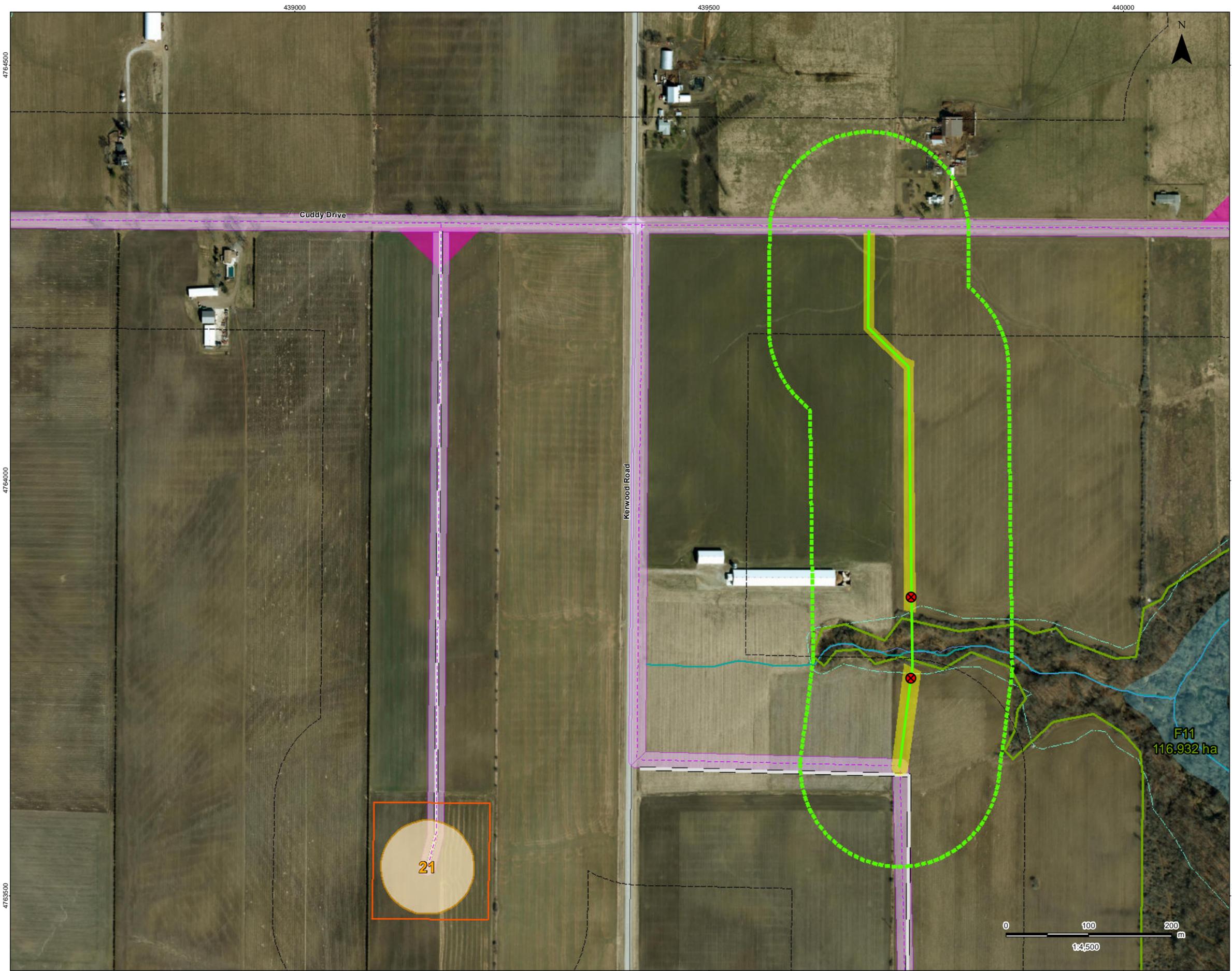
Mark Kozak, Project Manager

Reviewed by  _____
(signature)

Rob Rowland, Senior Project Manager

Appendix A:

Figures



Legend

New Proposed Collector Option

- Collector Option
- Underground Cable ROW (20m)
- HDD Location
- 120m Zone of Investigation- New Collector Option

Original/ Assessed Proposed Infrastructure

- Proposed Turbine Location
- Assessed 120m Zone Of Investigation
- Access Road
- Underground Collector Line
- Truck Turning ROW
- Turbine Laydown Area
- Underground Cable ROW (20m)

Existing Features

- Expressway / Highway
- Road
- Watercourse
- Waterbody
- Floodplain (ABCA)
- Natural Feature (Stantec)
- Regulation Limit (ABCA)



- ### 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. Orthographic imagery provided by Suncor, 2011. Imagery taken in Spring 2010.



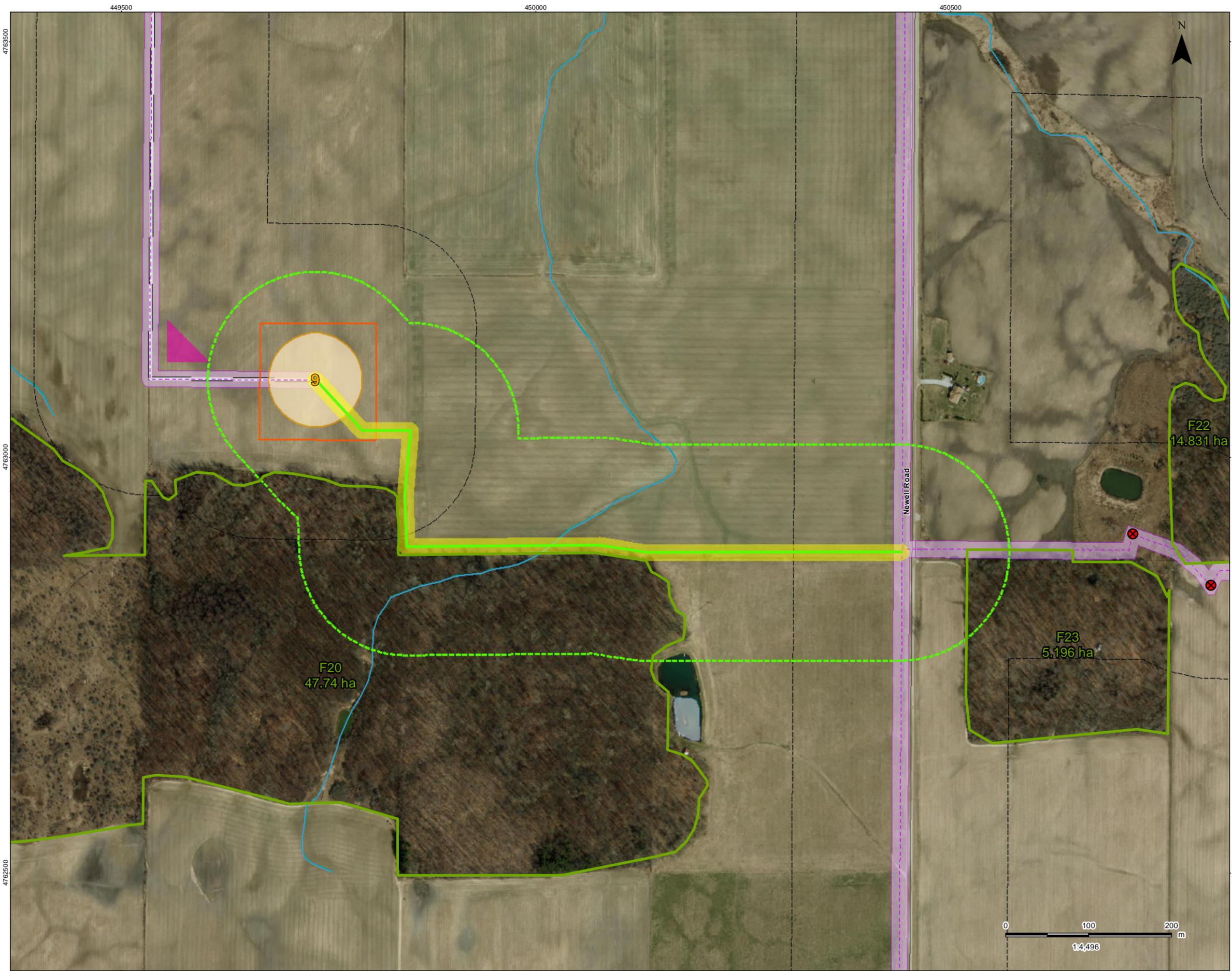
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Client/Project
Suncor Energy
Adelaide Wind Project

Figure No.
1

Title
Natural Features – Proposed Collector Line Options to Substation



- ### Legend
- New Proposed Collector Option**
 - Collector Line
 - Underground Cable ROW (20m)
 - 120m Zone of Investigation
 - Original/ Assessed Proposed Infrastructure**
 - Proposed Turbine Location
 - Assessed 120m Zone Of Investigation
 - HDD Location
 - Access Road
 - Underground Collector Line
 - Truck Turning ROW
 - Turbine Laydown Area
 - Underground Cable ROW (20m)
 - Existing Features**
 - Expressway / Highway
 - Road
 - Watercourse
 - Waterbody
 - Floodplain (ABCA)
 - Natural Feature (Stantec)



- ### Notes
- Coordinate System: NAD 1983 UTM Zone 17N
 - Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2011.
 - Orthographic imagery provided by Suncor, 2011. Imagery taken in Spring 2010.



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Client/Project
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Figure No.
2

Title
Natural features – Proposed Collector Line Modification T9 to Newell Road

Appendix B:

Letter Addendum: Natural Heritage Assessment & Environmental Impact Study, and MNR Confirmation

Ministry of
Natural Resources
Southern Region
300 Water Street
4th Floor, South Tower
Peterborough, Ontario K9J 8M5
Telephone: 705-755-3243
Fax: 705-755-3292

Ministère des
Richesses naturelles



November 7, 2013

Christopher Scott
Suncor Energy Inc.
PO Box 2844, 150 6th Ave SW
Calgary AB T2P 3E3
cscott@suncor.com

RE: Suncor Energy Adelaide Wind Project Modifications

Dear Mr. Scott,

The Ministry of Natural Resources (MNR) has received the document dated November 5, 2013 that describes modifications to the Suncor Energy Adelaide Wind Project made subsequent to MNR's letter confirming the Natural Heritage Assessment in respect of the project.

Upon review of the modifications, MNR is satisfied that the Natural Heritage Assessment requirements of Ontario Regulation 359/09 have been met. Please add this letter as an addendum to the confirmation letter issued July 31, 2012 and the re-confirmation letters issued on October 23, 2012 and February 13, 2013 for the Suncor Energy Adelaide Wind Project.

If you wish to discuss this matter further, please contact Lindsay Kingdon at Lindsay.kingdon@ontario.ca or 705-755-3215.

Sincerely,

A handwritten signature in black ink, appearing to read "Kathy Woeller".

Kathy Woeller
Southern Region Land Use Planning Supervisor
Southern Region MNR

cc Joe Halloran, A\ Renewable Energy Coordinator, Southern Region MNR
Mark Kozak, Stantec Consulting Ltd.
Narren Santos, Environmental Approvals Access & Service Integration Branch, MOE
Zeljko Romic, Environmental Approvals Access & Service Integration Branch, MOE
Nick Colella, Environmental Approvals Branch, MOE



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November 5, 2013
File: 160960710

Attention: Ms. Amy Cameron
Ontario Ministry of Natural Resources
Southern Region Renewable Energy Operations Team
4th floor, South Tower
300 Water St
PO Box 7000
Peterborough ON K9J 8M5

Dear Ms. Cameron,

Reference: Suncor Energy Adelaide Wind Project Modifications

This letter is submitted as an addendum to the Suncor Energy Adelaide Wind Project Renewable Energy Approval Application – Natural Heritage Assessment and Environmental Impact Study (NHA/EIS) that was submitted to the Ministry of Natural Resources (MNR) in July 2012, and received a confirmation letter on July 31, 2012. This letter report should therefore be read in association with that document.

The purpose of this letter is to provide the MNR with an understanding of two modifications that have been made to the location of the underground collector line, since the NHA/EIS was confirmed by MNR and to provide an assessment of the proposed change in order to identify any additional potential effects, mitigation measures, or monitoring requirements that were not considered within the NHA/EIS. These modifications include, specifically:

- the location of the underground collector line to the proposed substation; and,
- the location of the underground collector line to Turbine 9.

1. PROJECT MODIFICATION 1: UNDERGROUND COLLECTOR LINE TO PROPOSED SUBSTATION

Over the past year Suncor has consulted with both the Township of Adelaide-Metcalf and the County of Middlesex regarding the use of their right-of-ways for the project. Suncor discussed with the County of Middlesex the use of a short 675 m section of a County right-of-way for cabling (Kerwood Road). During these discussions the County of Middlesex suggested that another route would be preferable since this location was already quite busy with utilities including proposed cabling from another wind developer. At that time Suncor made plans to collect field data in preparation for an alternate route(s) on private lands should it become viable. These options are presented in the attached figure and discussed in the following sections. It should be noted that Suncor is considering these options in addition to the original Project Location along Kerwood Road.



Reference: Suncor Energy Adelaide Wind Project Modifications

A. COLLECTOR LINE OPTION 1

I. CHANGE TO IDENTIFICATION OF NATURAL FEATURES WITHIN 120 M OF THE NEW PROJECT LOCATION

As per our assessment of the original location of the underground collector line in the NHA/EIS, the location of Option 1 is not within 120 m of a natural feature. No new features are within 120 m of the Project Location as a result of the modification to the location of Option 1. No changes are required to the Records Review, Site Investigation or Evaluation of Significance reports as a result of the modified location of Option 1.

II. CHANGE TO ASSESSMENT OF IMPACTS AND MITIGATION MEASURES

Our assessment of the modified location of Option 1 is consistent with our assessment of the original location and it will not have any impact on natural heritage features. No additional mitigation measures will be required to accommodate the modified location of Option 1.

III. OVERALL ASSESSMENT OF CHANGES TO NHA/EIS

The modified location for Option 1 will not result in changes to the NHA/EIS.

B. COLLECTOR LINE OPTION 2

I. CHANGE TO IDENTIFICATION OF NATURAL FEATURES WITHIN 120 M OF THE NEW PROJECT LOCATION

Collector Line Option 2 requires a crossing of a portion of Feature 11. Feature 11 was identified in the NHA/EIS (July 2012) and occurs within 120 m of the original as well as the proposed Project Location for Option 2. There is no change to the natural heritage features associated with Feature 11. No new features are within 120 m of the Project Location as a result of the proposed modification to Option 2. A site investigation of the feature was completed and an evaluation of significance determined that Feature 11 represented significant woodland. It contained deciduous forest community ecosites (ELC codes FOD 7 and FOD7-1), which were located within 120 m of the original and modified Project Location for Option 2. Feature 11 also contained amphibian breeding (woodland), and woodland area-sensitive breeding bird habitat, neither of which is anticipated to be affected by the Project modification for Option 2.

No changes are required to the Records Review, Site Investigation or Evaluation of Significance reports as a result of the modified location for Option 2.

II. CHANGE TO ASSESSMENT OF IMPACTS AND MITIGATION MEASURES

The proposed modification involves shifting the proposed underground collector line eastwards and within forest habitat extending along a creek from the northwest corner of the woodlot in Feature 11. This modification is required based on utility congestion (as identified through consultation with the Township of Adelaide-Metcalfe and the County of Middlesex) arising in the location of the original proposed route. The modification revises the original routing so that the line will be directionally drilled underneath a narrow portion of Feature 11. Construction works will be very short term in duration; drilling of the line



Reference: Suncor Energy Adelaide Wind Project Modifications

underneath the feature would be completed within one day with additional time required for setup and removal of equipment and to clear and re-vegetate the drill pits.

Vegetation removal to accommodate the drill pits and staging areas will be restricted to the plowed agricultural fields to the north and south of Feature 11, and will be at least 30 m from Feature 11. This removal will be temporary in nature and the cleared areas will be rehabilitated to agricultural fields upon completion of construction activities. The drill pits and staging areas will be in active agricultural fields to the north and south of Feature 11, also at least 30 m from Feature 11, and will not require any clearing of natural vegetation. As all components of the Project remain outside the woodland and wildlife habitat boundaries there will be no direct loss of habitat or function of Feature 11 as a result of the proposed modification.

Other potential impacts to Feature 11 from directional drilling are erosion, sediment deposition and damage to the structural roots of the trees. Given the temporary nature of the activity, the relatively short duration of activities, the location of the activities (at least 30 m from the edge of the feature) and the erection of barrier fencing (i.e., silt fencing), the risk of increased mortality to wildlife during construction of the line is considered extremely low.

The following mitigation measures are recommended:

- isolate the area with hay bales, sand bags, or silt fencing to surround and contain the drilling mud;
- consult with MOE regarding next appropriate action among the following:
 - a mobile vacuum truck will be used to pump the drilling mud from the contained area and recycled to the return pit;
 - the drilling mud will be left in place to avoid potential damage from vehicles entering the area;
- drilling equipment will be set up, and all drilling will be conducted, a minimum of 30 m from the edge of Feature 11;
- all drilling will occur at a depth of 3 m, or as close to this depth as construction and site conditions allow;
- prior to drilling, sediment control fencing will be installed at feature edges that occur within 30 m of drilling activities;
- topsoil stripped from the drill exit site must be stockpiled in a location designated by the Inspector;
- the topsoil stockpile must be located as far as possible from the feature;
- as there is a watercourse crossing required as part of the modification, in the event of an inadvertent return or spill of drilling lubricant, preventive and responsive measures as outlined in



Reference: Suncor Energy Adelaide Wind Project Modifications

the Accidental Spills and Construction Emergency Response Plan sections of the Suncor Energy Adelaide Wind Power Project Construction Plan Report will be implemented immediately;

- while refuelling activities will be required at the site of the directional drill, all fuel storage and refuelling activities will occur well away from Feature 11. In the event of an accidental spill, the MOE Spills Action Centre will be contacted as appropriate and emergency spill procedures will be implemented immediately; and,
- construction machinery should be checked for presence of wildlife (i.e., reptiles) daily prior to operating machinery.

As a result of the proposed project modification for Option 2, the above mitigation measures should be supplemented to the Construction Plan Report and the Environmental Effects Monitoring Plan. The Construction Monitoring Plan for the proposed modification is provided in Table 1 of this letter report.

III. OVERALL ASSESSMENT OF CHANGES TO NHA/EIS

Replacement of the assessment of potential impacts and mitigation measures for Feature 11 in Table 5.1 of the NHA/EIS.

2. PROJECT MODIFICATION 2: UNDERGROUND COLLECTOR LINE TO TURBINE 9

Project Modification 2 moves the location of the underground collector line to Turbine 9 from Crathie Road (to the north) to Newel Road (to the east). Moving this cable to private land will reduce the amount of cable in the municipal right-of-way that connects other Project infrastructure to the east of T9. Figure 2 shows the location of the modified underground cable location from T9 east to Newel Road.

I. CHANGE TO IDENTIFICATION OF NATURAL FEATURES WITHIN 120 M OF THE NEW PROJECT LOCATION

Project Modification 2 places the underground collector line adjacent to (a minimum distance of 10 m from the edge), of the northern edge of Feature 20. Feature 20 was identified in the NHA/EIS (July 2012) and occurs within 120 m of the original as well as the proposed Project Location. There is no change to the natural heritage features associated with Feature 20. No new features are within 120 m of the Project Location as a result of the proposed modification. A site investigation of the feature was completed and an evaluation of significance determined that Feature 20 represented significant wetland and woodland. It contained cultural meadow (ELC code CUM1), cultural thicket (ELC code CUT1-8*), deciduous swamp (ELC code SWD2-2) and deciduous forest community ecosites (ELC code FOD 9-4), which were located within 120 m of the original and modified Project Location. Feature 20 also contained amphibian breeding (woodland), and woodland area-sensitive breeding bird habitat, neither of which is anticipated to be affected by the Project modification. The NHA/EIS also considered Feature 20 as candidate SWH for waterfowl nesting and marsh breeding birds, pending the results of habitat use surveys as per Appendix D of the NHA Guide. However, habitat use surveys completed by Stantec in 2013 determined that Feature 20 did not represent SWH for waterfowl nesting or marsh breeding birds, and was reported to MNR as such (email correspondence from V. Deschamps to A. Cameron, July 4, 2013).



November 5, 2013
Ms. Amy Cameron
Page 5 of 6

Reference: Suncor Energy Adelaide Wind Project Modifications

No changes are required to the Records Review, Site Investigation or Evaluation of Significance reports as a result of the modified location.

I. CHANGE TO ASSESSMENT OF IMPACTS AND MITIGATION MEASURES

Our assessment of the modified location is consistent with our assessment of the original location and it will not have any impact on natural heritage features. With the implementation of a minimum 10 m buffer from the feature, no additional mitigation measures will be required to accommodate the modified location of the underground collector line from Turbine 9 to Newel Road.

II. OVERALL ASSESSMENT OF CHANGES TO NHA/EIS

The modified location for the underground collector line from Turbine 9 to Newel Road will not result in changes to the NHA/EIS.

Stantec Consulting Ltd. prepared this letter report for Suncor Energy for the Adelaide Wind Power Project. Suncor Energy is committed to implementing the appropriate protection and mitigation measures as they apply to the construction and operation of the proposed Project.

Regards,

STANTEC CONSULTING LTD.

Vince Deschamps
Senior Environmental Planner
Phone: (519) 836-6050
Fax: (519) 836-2493
Vince.Deschamps@stantec.com

Attachment: Table 1: Construction Monitoring Plan
Figure 1: Natural Features – Proposed Collector Line Options to Substation
Figure 2: Natural Features – Proposed Collector Line Modification T9 to Newel Road

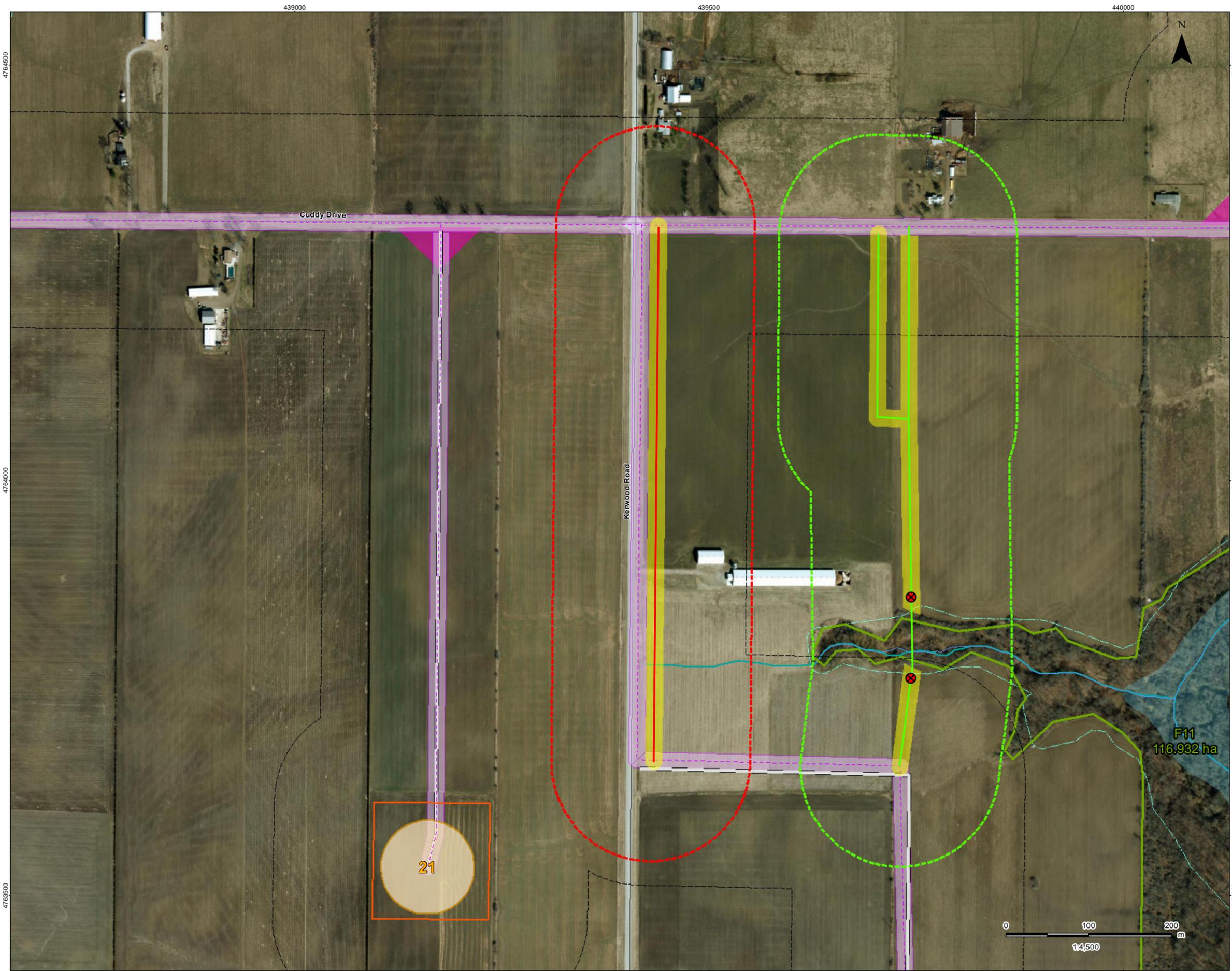
c. C. Scott, Suncor Energy Products Inc.
M. Kozak, Stantec Consulting Ltd.

vjd w:\active\60960710\reports\natural heritage assessment\addendum to mnr approved version\modification - nov 2013\rpt_60960710_nhaeis_modification
3_20131105_fin.docx



Reference: Suncor Energy Adelaide Wind Project Modifications

Table 1: Construction Monitoring Plan								
Potential Negative Effect	Mitigation Strategy	Performance Objective	Monitoring Plan				Contingency Measures	
			Methods	Location	Frequency	Rationale		Reporting
CONSTRUCTION								
Sediment deposition into Feature 11 (significant woodland, amphibian breeding (woodland), and woodland area-sensitive breeding bird habitat) from directional drilling.	Prior to drilling, sediment control fencing will be installed at feature edges that occur within 30 m of drilling activities. Drilling equipment will be set up and all drilling will be conducted a minimum of 30 m from the edge of the feature. Topsoil stripped from the drill exit site must be stockpiled in a location designated by the Inspector. The topsoil stockpile must be located as far as possible from the feature.	No soil deposition in woodland feature.	Visual inspection of soil stockpile and observation along drilling route for inadvertent soil release into the woodland.	Designated soil stockpile location and drilling route under Feature 11.	Daily during drilling.	Once drilling has been completed and the drill pits rehabilitated, there will be no further risk of soil deposition in the woodland feature.	n/a	Removal of any material inadvertently deposited into feature.



- ### Legend
- New Proposed Collector Options**
 - Collector Line- Option 1
 - Collector Line- Option 2
 - Underground Cable ROW (20m)
 - HDD Location
 - 120m Zone of Investigation- Collector Option 1
 - 120m Zone of Investigation- Collector Option 2
 - Original/ Assessed Proposed Infrastructure**
 - Proposed Turbine Location
 - Assessed 120m Zone Of Investigation
 - Access Road
 - Underground Collector Line
 - Truck Turning ROW
 - Turbine Laydown Area
 - Underground Cable ROW (20m)
 - Existing Features**
 - Expressway / Highway
 - Road
 - Watercourse
 - Waterbody
 - Floodplain (ABCA)
 - Natural Feature (Stantec)
 - Regulation Limit (ABCA)



- ### Notes
- Coordinate System: NAD 1983 UTM Zone 17N
 - Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2011.
 - Orthographic imagery provided by Suncor, 2011. Imagery taken in Spring 2010.



Stantec

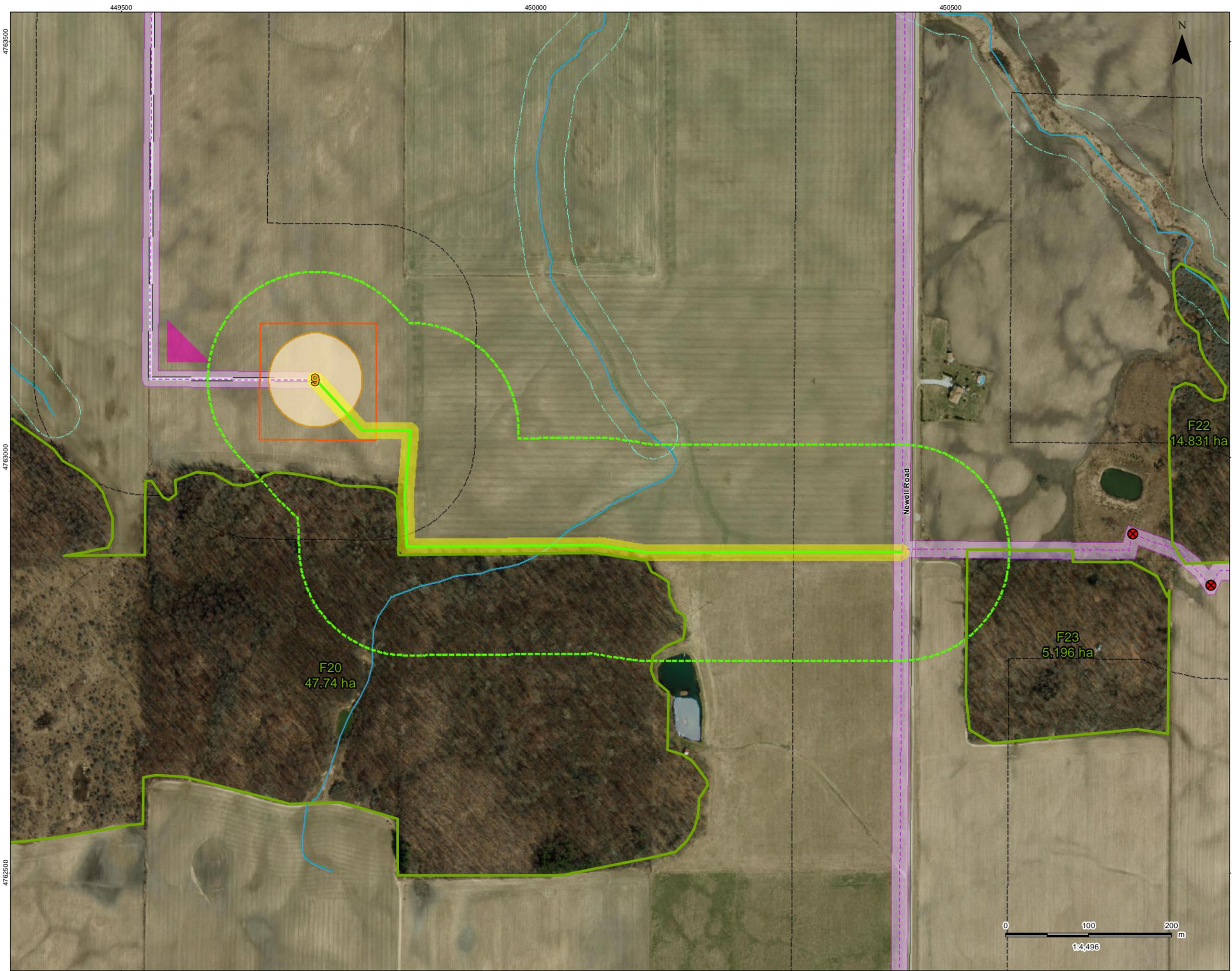
November 2013
160960710

Client/Project
Suncor Energy
Adelaide Wind Project

Figure No.
1

Title
Natural Features – Proposed Collector Line Options to Substation





Legend

New Proposed Collector Option

- Collector Line
- Underground Cable ROW (20m)
- 120m Zone of Investigation

Original/ Assessed Proposed Infrastructure

- Proposed Turbine Location
- Assessed 120m Zone Of Investigation
- HDD Location
- Access Road
- Underground Collector Line
- Truck Turning ROW
- Turbine Laydown Area
- Underground Cable ROW (20m)

Existing Features

- Expressway / Highway
- Road
- Watercourse
- Waterbody
- Floodplain (ABCA)
- Natural Feature (Stantec)
- Regulation Limit (ABCA)



- ### 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. Orthographic imagery provided by Suncor, 2011. Imagery taken in Spring 2010.



Stantec

November 2013
160960710

Client/Project
Suncor Energy
Adelaide Wind Project

Figure No.
2

Title
Natural features – Proposed Collector Line Modification T9 to Newell Road

Appendix C:
**Stage II Archaeology Assessment and MTCS
Comments**

Ministry of Tourism, Culture and Sport

Culture Programs Unit
Programs and Services Branch
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Ministre du Tourisme, de la Culture et du Sport

Unit des programmes culturels
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Nov 12, 2013

Jim Wilson (P001)
Stantec Consulting
400 - 1331 Clyde Ottawa ON K2C 3G4

RE: Review and Entry into the Ontario Public Register of Archaeological Reports: Archaeological Assessment Report Entitled, "Stage 2 Archaeological Assessment Suncor Energy Adelaide Wind Power Project ", Dated Nov 12, 2013, Filed with MTCS Toronto Office on Nov 12, 2013, MTCS Project Information Form Number P001-750-2013, OPA Reference Number FIT-F3ECN6R

Dear Mr, Wilson:

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 of the study area as depicted in Figure 4 and Tile 5 of the above titled report and recommends the following:

The Stage 2 assessment of Location 2 (AgHk-166) resulted in the recovery of primarily mid-to-late 19th century Euro- Canadian historic artifacts. Mid-19th century whiteware ceramics represent 40.48% of the recovered ceramic assemblage. An additional example of early 19th century pearlware was also recovered. Given that the site is still of further cultural heritage value or interest , it is recommended that Location 2 (AgHk-166) be subject to a Stage 3 assessment prior to any ground disturbance activities to further test the nature and density of the site.

The Stage 3 assessment should employ both the controlled surface pick-up and hand excavated test unit methodology as outlined in Table 3.1 of the Standards and Guidelines for Consultant Archaeologists (Government of Ontario 2011). Prior to conducting the field work, if the ground surface visibility has decreased since the Stage 2 archaeological assessment, the area should be re-ploughed and allowed to weather for the controlled surface pick-up. The test unit excavation should consist of one metre by one metre square test units laid out in a five metre grid and should be excavated by hand to a depth of five centimetres within the subsoil. Site specific land registry and archival research should also be conducted as part of the Stage 3 assessment to provide a more detailed 19th century documentary history of the site.

The Stage 2 assessment of Location 3 (AgHk-167) resulted in the recovery of primarily mid-19th to early 20th century Euro- Canadian historic artifacts. Mid-to-late 19th century ironstone represents 40.90% of the ceramic assemblage and mid-19th century whiteware ceramics represent 20.45% of the recovered ceramic assemblage. Additional examples of 20th century porcelain and bottle glass suggest continued occupation for some time after the 19th century. Given that the site is still of further cultural heritage value or interest, it is recommended that Location 3 (AgHk-167) be subject to a Stage 3 assessment prior to any ground

disturbance activities to further test the nature and density of the site.

The Stage 3 assessment should employ both the controlled surface pick-up and hand excavated test unit methodology as outlined in Table 3.1 of the Standards and Guidelines for Consultant Archaeologists (Government of Ontario 2011). Prior to conducting the field work, if the ground surface visibility has decreased since the Stage 2 archaeological assessment, the area should be re-ploughed and allowed to weather for the controlled surface pick-up. The test unit excavation should consist of one metre by one metre square test units laid out in a five metre grid and should be excavated by hand to a depth of five centimetres within the subsoil. Site specific land registry and archival research should also be conducted as part of the Stage 3 assessment to provide a more detailed 19th century documentary history of the site.

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,

Kathryn, Bryant
Archaeology Review Officer

cc. Archaeology Licensing Officer
Chris Scott, Suncor Energy Products Inc
Mansoor Mahmood, Ministry of Environment

¹This letter constitutes the Ministry of Tourism, Culture and Sports 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.

²In 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
Suncor Energy Adelaide Wind
Power Project**

Lot 7, Concession 2 N.E.R.
Municipality of Adelaide Metcalfe,
Middlesex County, Ontario



Stantec

Submitted to:
Mr. Chris Scott, P.Eng.
Suncor Energy Products Inc.
340 Breezewood Crescent
Waterloo ON N2L 5K5
Tel: (519) 328-0424
Email: cscott@suncor.com

Licensee: Jim Wilson
License Number: P001
PIF Number: P001-750-2013
FIT NUMBER: FIT-002187-WIN-130-601
Project Number: 160940226

REVISED REPORT
October 28, 2013

Executive Summary

A Stage 2 archaeological assessment was conducted by Stantec Consulting Ltd. (Stantec) for one additional property for the Suncor Energy Adelaide Wind Power Project on behalf of Suncor Energy Services Inc. (Suncor). Additional Stage 2 archaeological assessment was conducted in the event Suncor is required to amend the Adelaide Wind Power project REA application. 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 section 22(3) of the *Environmental Protection Act* (Government of Ontario 1990a). It was conducted on behalf of Suncor by Stantec for an approximate 5.73 hectare study area located in the Township of Adelaide Metcalfe, Middlesex County, Ontario.

A Stage 2 archaeological assessment was previously conducted by Golder Associates Ltd. (Golder) (2012b). The Stage 2 assessment focused upon the proposed wind turbine layout, including turbine sites, collector cable routes, access roads, construction roads, transmission lines, laydown areas and substations. A total of approximately 608.9 hectares was subject to Stage 2 archaeological assessment, the majority of which was assessed using the pedestrian survey method at an interval of five metres. Small areas of ditches and tree lines that could not be assessed using the pedestrian survey method were assessed using the test pit method at an interval of five metres. Fifty-one locations were found during the Stage 2 archaeological assessment. Nine of those locations were recommended for Stage 3 assessment. An additional Stage 2 archaeological assessment was conducted by Stantec in 2012 for one property for an additional collector cable route (2012). A total of approximately 0.97 hectares were subject to Stage 2 archaeological assessment, all of which was assessed using the pedestrian survey method at five metre intervals (100%). The Stage 2 assessment conducted by Stantec resulted in the identification of one archaeological site, which was not recommended for further work.

The Stage 2 assessment conducted by Stantec for this report resulted in the identification of two archaeological sites: Location 2 (AgHk-166) and Location 3 (AgHk-167). Location 2 (AgHk-166) was determined to be a mid-to-late 19th century Euro-Canadian site and Location 3 (AgHk-167) was determined to be a mid-19th to early 20th century Euro-Canadian site with an isolated pre-contact Aboriginal artifact. Based on the findings from these archaeological sites, both Location 2 (AgHk-166) and Location 3 (AgHk-167) fulfill the criteria for a Stage 3 archaeological investigation as per Section 2.2 of the *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011) and retain cultural heritage value or interest.

It is recommended that Location 2 (AgHk-166) be subject to a Stage 3 assessment prior to any ground disturbance activities to further test the nature and density of the site. The Stage 3 assessment should employ both the controlled surface pick-up and hand excavated test unit methodology as outlined in Table 3.1 of the *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011). Prior to conducting the field work, if the ground surface visibility has decreased since the Stage 2 archaeological assessment, the area should

be re-ploughed and allowed to weather for the controlled surface pick-up. The test unit excavation should consist of one metre by one metre square test units laid out in a five metre grid and should be excavated by hand to a depth of five centimetres within the subsoil. 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 as per Section 3.2.2 Standard 6 of the *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011). Site specific land registry and archival research should also be conducted as part of the Stage 3 assessment to provide a more detailed 19th century documentary history of the site.

It is also recommended that Location 3 (AgHk-167) be subject to a Stage 3 assessment prior to any ground disturbance activities to further test the nature and density of the site. The Stage 3 assessment should employ both the controlled surface pick-up and hand excavated test unit methodology as outlined in Table 3.1 of the *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011). Prior to conducting the field work, if the ground surface visibility has decreased since the Stage 2 archaeological assessment, the area should be re-ploughed and allowed to weather for the controlled surface pick-up. The test unit excavation should consist of one metre by one metre square test units laid out in a five metre grid and should be excavated by hand to a depth of five centimetres within the subsoil. 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 as per Section 3.2.2 Standard 6 of the *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011). Site specific land registry and archival research should also be conducted as part of the Stage 3 assessment to provide a more detailed 19th century documentary history of the site.

The Ministry of Tourism, Culture and Sport is asked to review the results presented within and accept this report into the Ontario Public Register of Archaeological Reports. Additional archaeological assessment is still required; hence Locations 2 and 3, recommended for further archaeological fieldwork, remain subject to Section 48(1) of the *Ontario Heritage Act* (Government of Ontario, 1990b) and may not be altered, or have artifacts removed, except by a person holding an archaeological license.

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

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Project Personnel

Licensed Archaeologist:	Jim Wilson, MA (P001)
Project Manager:	Tracie Carmichael, BA, B.Ed. (R140)
Project Coordinator:	Amanda Laprise, BA (R470)
Licensed Field Directors:	Krista Lane, BA (R382), Dennis Wilson, MA (R366)
Field Technicians:	Jace McLaughlin, BA, Victor Smith, Leanna Barclay
Report Writer:	Jennifer Morgan, MA
Office Assistant:	Lorraine Spence-Claro
Technical Review:	Jeffrey Muir, BA (R304)
Senior Review:	Tracie Carmichael, BA, B.Ed. (R140)
Proponent Contact:	Chris Scott, P.Eng., Suncor Energy Products Inc.
Ministry of Tourism, Culture and Sport:	Robert von Bitter, Ian Hember, MA

1.0 Project Context

1.1 DEVELOPMENT CONTEXT

A Stage 2 archaeological assessment was conducted by Stantec Consulting Ltd. (Stantec) for an additional property for the Suncor Energy Adelaide Wind Power Project on behalf of Suncor Energy Services Inc. (Suncor). 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 section 22(3) of the *Environmental Protection Act* (Government of Ontario 1990a). The assessment was conducted on behalf of Suncor by Stantec for an approximate 5.73 hectare study area located in the Township of Adelaide Metcalfe, Middlesex County, Ontario (Figure 1). Previous archaeological work was conducted by Golder Associates Ltd. (Golder) in 2012 (2012a, 2012b) and by Stantec (2012). A more detailed discussion of past investigations is presented in Section 1.2.

The *Green Energy Act* (Government of Ontario 2009) enabled legislation governing project assessments and approvals to be altered to allow for a more streamlined Renewable Energy Approval (REA) process. Under Section 22(1) of the REA, an archaeological assessment must be conducted if the proponent concludes that engaging in the project may have an impact on archaeological resources. Golder previously determined that archaeological potential for the recovery of pre-contact Aboriginal and Euro-Canadian historic archaeological resources exists within the study area (Golder 2012a; Golder 2012b). Currently, Ontario Regulation 359/09 of the *Environmental Protection Act* governs the REA process for renewable energy projects such as wind, anaerobic digestions, solar and thermal treatment facilities.

This assessment was undertaken in order to meet the requirements for an application for a REA, as outlined in Ontario Regulation 359/09 section 22(3) of the *Environmental Protection Act*. The Suncor Adelaide Wind Energy Project will include 28 wind turbines as well as associated infrastructure including collector cable routes, access roads, construction roads, transmission lines and substations.

Permission to enter the optioned lot within the study area and remove archaeological resources was provided by Chris Scott of Suncor. For the purposes of this Stage 2 assessment the Ministry of Tourism, Culture and Sport's (MTCS) 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011) were followed. 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 Suncor Adelaide Wind Power project area is comprised of an agricultural field, homes, farms, businesses, small communities, woodlots and several waterways located in the current Municipality of Adelaide Metcalfe, Middlesex County, Ontario (Figure 1). The Municipality of Adelaide Metcalfe was formed in 2001 when the former Townships of Adelaide and Metcalfe were amalgamated. This portion of southwestern Ontario has been occupied by First Nations peoples since the retreat of the glaciers approximately 11,000 years ago. For the majority of this time people followed a hunter gatherer lifestyle, moving seasonally between areas of localized resource abundance. Approximately 1,300 years ago, with the arrival in Ontario of corn, beans, and squash, there was a gradual move towards farming and the reliance on domesticated foodstuffs, resulting in the eventual emergence of permanent villages by the 10th century A.D. The majority of the Project area has been subject to European style agricultural practices for much of the past two centuries, with all of the land available for settlement taken up by Euro-Canadian farmers by the mid-19th century. The additional property assessed is still a ploughed agricultural field today. Historical information specifically regarding Lot 7, Concession 2 N.E.R can be found in Section 1.2.3 of this report

1.2.1 Pre-contact Aboriginal Resources

It has been demonstrated that pre-contact Aboriginal people began occupying southwestern Ontario as the glaciers receded from the land, as early as 9,000 B.C. Table 1 provides a general outline of the cultural chronology of Middlesex County, based on Ellis and Ferris (1990).

Table 1: Cultural Chronology for the Municipality of Adelaide Metcalfe

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 - 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

**STAGE 2 ARCHAEOLOGICAL ASSESSMENT
SUNCOR ENERGY ADELAIDE WIND POWER PROJECT**

Project Context

October 28, 2013

Period	Characteristics	Time Period	Comments
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

1.2.2 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). 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).

The study area first enters the Euro-Canadian historic record when the Chippewa First Nations entered into Treaty Number 21. Treaty 21 was a provisional agreement,

entered into on the 9th day of March, 1819, between John Aiken, Esquire, on behalf of His Majesty, and the Principal Men of the Chippewa Nation of Indians, inhabiting a tract of land, whereas the said John Aikens for His Majesty was to pay the said Indians 600 pounds yearly for the said tract described as follows:

“Commencing at the northerly side of the River Thames at the south west angle of the Township of London; thence along the western boundary of the Township of London, in a course north 21 degrees, 30 minutes west, twelve miles to the north west angle of the said Township; then on a course about south 62 degrees and 30 minutes west forty-eight miles more or less until it intersects a line on a course produced north two

miles from the north east angle of the Shawnee [Sombra] Township; then along the eastern boundary line of the said Township, twelve miles and a half more or less to the northern boundary line of the Township of Chatham; then east twenty-four miles more or less to the River Thames; then along the water[']s edge of the River Thames against the stream to the place of beginning, reserving a tract of land situate[d] on the northerly side of the River Thames nearly opposite to the northerly angle of the Township of Southwold and south west angle of the Del[a]ware Township containing 15,360 acres; also reserving two miles square distant about four miles above the rapids where the Indians have their improvements and nearly parallel to the Moravian Village containing 5,120 acres.”

(Morris 1943: 24-25)

Treaty Number 21 was further modified in Treaty Number 280½ (Canada 1891: 281-282) and finally confirmed in Treaty Number 25 which modified the method of quantity of payment to the First Nation Groups concerned and some minor variation in the description of the land surrender (Morris 1943: 25).

1.2.3 Historic Euro-Canadian Archaeological Resources

In the 1830s the first Euro-Canadian settlement began in the study area soon after Egremont Road was laid and historic Adelaide Township was surveyed by Peter Carroll (Carroll 1831a, Carroll 1831b). At this time, Lieutenant Governor of Canada, Sir John Colborne, recognized that the road network was insufficient to allow European settlers into the area and did not provide a sufficient military transportation route. As a result, Sir John Colborne requested that Egremont Road be surveyed in order to increase settlement of the area as well as to provide a sufficient military transportation route should the need arise (Nielsen 1993:3). Peter Carroll completed the initial survey of Adelaide Township (along with Warwick and Plympton Townships that are now part of Lambton County) in 1831. This survey lay in the route of Egremont Road along with “three tiers of lots on either side” (Nielsen 1993: 6). He then finished the remainder of the survey of the township in 1832 (Nielsen 1993). Later maps illustrate the settlement of the area through the 19th century, such as the Tremaine Map (Tremaine 1862) and the 1878 H.R. Page and Company’s Historical Atlas map (Page and Company 1878). The 1878 map (Figure 2) shows the increase in settlement by illustrating structures and landowner names. Additional historic background research for the Suncor Energy Adelaide Wind Power Project can be found in the *Stage 1 Archaeological Assessment Suncor Energy Adelaide Wind Power Project Municipality of Adelaide Metcalfe Middlesex County, Ontario* (Golder 2012a) under PIF P218-217-2011.

The additional property assessed by Stantec is located southeast of the intersection of present day Cuddy Drive and Kerwood Road on the western portion of Lot 7, Concession 2 N.E.R, Geographic Township of Adelaide, now Township of Adelaide Metcalfe, Middlesex County, Ontario (Figure 1).

The 1878 *Historic Atlas of Middlesex County* lists several landowners for Lot 7, Concession 2 N.E.R in the Geographic Township of Adelaide. This lot is broken into quarters with the western half divided into north and south portions, and the eastern half divided into east and west portions (Figure 2). The study area is located in the northwestern corner of the lot and spans the properties of two historic landowners. The owner of the northwest quarter of Lot 7, Concession 2 N.E.R is listed as a John Brook. The second owner, located adjacent to the property of John Brook to the east, and on the same lot, is a Miles Curry. According to the historic mapping, a single structure is visible in the centre of the portion of the lot owned by John Brook, while several structures are visible on the northern end of the portion of the lot owned by Miles Curry (Page and Company 1878).

1.2.4 Recent Reports

Other than the existing historic documentation, the larger Suncor Energy Adelaide Wind Power Project area has been documented in recent archaeological assessments. The Stage 1 archaeological assessment was conducted by Golder and was entitled *Stage 1 Archaeological Assessment, Suncor Energy Adelaide Wind Power Project Municipality of Adelaide Metcalfe Middlesex County, Ontario* (Golder 2012a), submitted under PIF P218-217-2011. Other archaeological assessments concerned with the Project area outside of this current report include other Stage 2 field work. Properties surrounding the additional study area were documented during the Stage 2 archaeological assessment conducted by Golder in the report entitled *Stage 2 Archaeological Assessment, Suncor Energy Adelaide Wind Power Project, Various Lots and Concessions Municipality of Adelaide Metcalfe, Middlesex County, Ontario* (Golder 2012b) under PIF P218-100-2011. An additional Stage 2 archaeological assessment was conducted by Stantec in 2012 for one property for an additional collector cable route and can be found in the report entitled *Stage 2 Archaeological Assessment, Suncor Energy Adelaide Wind Power Project, Lot 25, Concession 2 N.E.R., Municipality of Adelaide Metcalfe, Middlesex County, Ontario* (Stantec 2012), submitted under PIF P379-002-2012.

1.3 ARCHAEOLOGICAL CONTEXT

1.3.1 The Natural Environment

The additional study area is located within the Horseshoe Moraines (Chapman and Putnam 1984:127-129), specifically the tail end of the Seaforth Moraine (Hagerty and Kingston 1992:11). The soil type of the study area is a Huron series soil that is moderately drained silt loam on a gently sloping landscape (Hagerty and Kingston 1992). This soil series is suitable for agricultural practices, albeit not ideal for pre-contact Aboriginal use.

1.3.2 Previously Known Archaeological Sites and Surveys

A Stage 1 archaeological assessment was previously conducted by Golder (2012a) and resulted in the determination that the potential for pre-contact Aboriginal and Euro-Canadian

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sites was deemed to be moderate to high and therefore a Stage 2 assessment was recommended.

A Stage 2 archaeological assessment was previously conducted by Golder (2012b). The Stage 2 assessment focused upon the proposed wind turbine layout, including turbine sites, collector cable routes, access roads, construction roads, transmission lines, laydown areas and substations (Figure 3). A total of approximately 608.9 hectares was subject to Stage 2 archaeological assessment, the majority of which was assessed using the pedestrian survey method at an interval of five metres. Small areas of ditches and tree lines that could not be assessed using the pedestrian survey method were assessed using the test pit method at an interval of five metres (Golder 2012a). Fifty-one locations were found during the Stage 2 archaeological assessment. Nine of those locations were recommended for Stage 3 assessment: Location 4 (AgHk-125), Location 12 (AgHj-11), Location 15 (AgHj-12), Location 26 (AfHj-137), Location 27 (AfHj-138), Location 30 (AfHj-139), Location 36 (AgHj-15), Location 39 (AgHj-16), and Location 43 (AgHk-130). The remaining 42 sites were not recommended for further work (Golder 2012a). Table 2 summarizes the sites found by Golder (2012b) within the Suncor Adelaide Wind Energy Project.

Table 2: Archaeological Sites Found in the Initial Stage 2 Assessment by Golder (2012b)

Site	Borden Number	Site Type	Site Extents	Cultural Affiliation	Stage 3 Recommended?
Location 1	-	findspot	-	Pre-contact Aboriginal	Yes
Location 2	-	unknown	30m by 15m	Pre-contact Aboriginal	Yes
Location 3	-	findspot	-	Pre-contact Aboriginal	Yes
Location 4	AgHk-125	homestead	90m by 30m	Historic Euro-Canadian	Yes
Location 5	-	findspot	-	Pre-contact Aboriginal	Yes
Location 6	AgHk-126	findspot	-	Pre-contact Aboriginal	Yes
Location 7	-	unknown	Two artifacts 20m apart	Pre-contact Aboriginal	Yes
Location 8	AgHk-127	findspot	-	Pre-contact Aboriginal	Yes
Location 9	-	unknown	15m by 15m	Pre-contact Aboriginal	Yes
Location 10	-	findspot	-	Pre-contact Aboriginal	Yes
Location 11	AgHk-128	findspot	-	Pre-contact Aboriginal	Yes
Location 12	AgHj-11	unknown	30m by 20m	Pre-contact Aboriginal	Yes
Location 13	-	findspot	-	Pre-contact Aboriginal	Yes
Location 14	AgHj-17	findspot	-	Pre-contact Aboriginal	Yes
Location 15	AgHj-12	unknown	160m by 110m	Historic Euro-Canadian	Yes
Location 16	-	findspot	-	Pre-contact Aboriginal	Yes
Location 17	-	findspot	-	Pre-contact Aboriginal	Yes
Location 18	-	unknown	70m by 45m	Pre-contact Aboriginal	Yes
Location 19	-	findspot	-	Pre-contact Aboriginal	Yes
Location 20	AgHj-13	findspot	-	Pre-contact Aboriginal	Yes
Location 21	AgHj-14	findspot	-	Pre-contact Aboriginal	Yes
Location 22	-	unknown	Two artifacts 50 m apart	Pre-contact Aboriginal	Yes
Location 23	AfHj-135	findspot	-	Pre-contact Aboriginal	Yes
Location 24	-	findspot	-	Pre-contact Aboriginal	Yes
Location 25	AfHj-136	findspot	-	Pre-contact Aboriginal	Yes
Location 26	AfHj-137	unknown	90m by 70m	Pre-contact Aboriginal	Yes
Location 27	AfHj-138	unknown	60m by 60m	Historic Euro-Canadian	Yes
Location 28	-	unknown	15m by 5m	Pre-contact Aboriginal	Yes
Location 29	-	unknown	Two artifacts 7 m apart	Pre-contact Aboriginal	Yes

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Site	Borden Number	Site Type	Site Extents	Cultural Affiliation	Stage 3 Recommended?
Location 30	AfHj-139	unknown	Two artifacts 19.5 m apart	Pre-contact Aboriginal	Yes
Location 31	AfHj-140	findspot	-	Pre-contact Aboriginal	Yes
Location 32	AfHj-141	findspot	-	Pre-contact Aboriginal	Yes
Location 33	-	findspot	-	Pre-contact Aboriginal	Yes
Location 34	-	findspot	-	Pre-contact Aboriginal	Yes
Location 35	AgHk-129	findspot	-	Pre-contact Aboriginal	Yes
Location 36	AgHj-15	unknown	30m by 30m	Pre-contact Aboriginal	Yes
Location 37	-	findspot	-	Pre-contact Aboriginal	Yes
Location 38	-	unknown	Two artifacts 3m apart	Pre-contact Aboriginal	Yes
Location 39	AgHj-16	unknown	55m by 55m	Historic Euro-Canadian	Yes
Location 40	-	findspot	-	Pre-contact Aboriginal	Yes
Location 41	-	findspot	-	Pre-contact Aboriginal	Yes
Location 42	-	unknown	35m by 15m	Historic Euro-Canadian	Yes
Location 43	AgHk-130	unknown	Two artifacts 2m apart	Pre-contact Aboriginal	Yes
Location 44	AgHk-131	findspot	-	Pre-contact Aboriginal	Yes
Location 45	-	unknown	6m by 6m	Historic Euro-Canadian	Yes
Location 46	-	findspot	-	Pre-contact Aboriginal	Yes
Location 47	-	unknown	45m by 20m	Historic Euro-Canadian	Yes
Location 48	-	findspot	-	Pre-contact Aboriginal	Yes
Location 49	-	findspot	-	Pre-contact Aboriginal	Yes
Location 50	-	unknown	40m by 6m	Historic Euro-Canadian	Yes
Location 51	-	findspot	-	Pre-contact Aboriginal	Yes

The additional Stage 2 assessment conducted by Stantec (2012; Figure 3) focused on one property for the Suncor Adelaide Wind Power Project. A total of approximately 0.97 hectares were subject to Stage 2 archaeological assessment, all of which was assessed using the pedestrian survey method at five metre intervals (100%). The Stage 2 assessment conducted by Stantec resulted in the identification of one archaeological site (Location 1). Stantec Location 1 consisted of a pre-contact Aboriginal findspot. The recovered artifact did not fulfill any of the criteria for a Stage 3 archaeological investigation as per Section 2.2 of the Standards and Guidelines for Consultant Archaeologists (Government of Ontario 2011), and Location 1 was not recommended for Stage 3 assessment.

As for the work conducted in this report, the Ontario Archaeological Sites Database (ASDB) was consulted (Government of Ontario n.d.) and three sites were found to be within one kilometre of this study area. Table 3 summarizes the three registered archaeological sites found within one kilometre of the additional study area according to the ASDB.

Table 3: Archaeological Sites Registered Within One Kilometre of the Study Area

Location Number	Borden Number	Cultural Affiliation	Source
Suncor Adelaide 43	AgHk-130	Pre-contact Aboriginal	Golder 2012b
Suncor Adelaide 44	AgHk-131	Pre-contact Aboriginal	Golder 2012b
Golder Location 36	AgHk-133	Pre-contact Aboriginal	Golder 2012c

Suncor Adelaide 43 (AgHk-130) and Suncor Adelaide 44 (AgHk-131) were identified during the Stage 2 archaeological assessment (PIF P218-100-2011) conducted by Golder between June 2011 and March 2012. Golder Location 36 (AgHk-133) was identified upon a wind farm with an overlapping Project Location, the NextEra Energy Canada, ULC, Adelaide Wind Energy Centre, during additional Stage 2 archaeological assessment (PIF P218-277-2012) conducted by Golder between April 2012 and July 2012. Suncor Adelaide 43 (AgHk-130) consisted of a scatter of pre-contact Aboriginal artifacts including two projectile points. The first projectile point was stylistically similar to a Late Archaic Adder Orchard point. The second projectile point was similar to points identified in the Late Archaic Narrow Point tradition. Based on these considerations, Golder (2012b) recommended a Stage 3 archaeological investigation.

The Stage 2 assessment of Suncor Adelaide 44 (AgHk-131) determined that the site consisted of an isolated pre-contact Aboriginal projectile point. Stylistically the projectile point is most similar to a Late Archaic Small Point. Given the limited size of the artifact collection, Stage 3 archaeological investigation was not recommended by Golder (2012b).

Golder Location 36 (AgHk-133) consisted of an isolated pre-contact Aboriginal find. A single stemmed projectile point dated to prior to 1650 A.D. was recovered. Given the isolated nature of the find, further Stage 3 archaeological assessment was not recommended (Golder 2012b).

To the best of our knowledge, the only archaeological fieldwork conducted within 50 metres of the additional study area is related to the Suncor Adelaide Wind Power Project and can be found in the reports listed in Section 1.2.4 of this report.

1.3.3 Archaeological Potential

Archaeological potential is established by determining the likelihood that archaeological resources may be present on a subject property. Stantec applied archaeological potential criteria commonly used by the MTCS (Government of Ontario 2011) to determine areas of archaeological potential within the additional area under study. These variables included 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.

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).

In archaeological potential modeling, a distance to water criterion of 300 metres is generally employed. The closest potable water source to the additional study area is Adelaide Creek

which centrally transects Lot 7, Concession 2 N.E.R. In addition, a smaller tributary of Adelaide Creek also flows directly through the additional study area (Figure 1).

Soil texture can be an important determinant of past settlement, usually in combination with other factors such as topography. Aboriginal groups preferred well drained lighter (sandy) soil to heavier soils. The soils of the additional study area are moderately drained silt loam that may have been suitable for pre-contact Aboriginal agriculture, although not ideal.

The MTCS also views the presence of previously registered archaeological resources as a prime indicator of archaeological potential. There are three registered sites within one kilometre of the additional study area.

Due to the proximity to water sources, possibly suitable soil for agriculture, and the presence of previously identified pre-contact archaeological sites within one kilometre, the potential for pre- and post-contact Aboriginal archaeological resources within the study area was judged to be moderate to high.

Given the early settlement of the area, the identification of landowners as well as visible structures on the historic mapping for Lot 7, Concession 2 N.E.R., and the close proximity to the town of Adelaide, the additional study area is deemed to have moderate to high potential for historic Euro-Canadian archaeological resources.

1.3.4 Existing Conditions

The Stage 2 field assessment for the additional collector cable routes was conducted on June 14, 2013 under the PIF P001-750-2013 issued to Jim Wilson, MA, by the MTCS. The study area encompasses 5.73 hectares and consisted of a ploughed, well-weathered, agricultural field, a woodlot, and a creek.

2.0 Field Methods

The additional study area is encompassed within the larger Project Location that will be impacted by the construction of the Suncor Energy Adelaide Wind Power Project. The Project Location includes 28 wind turbines as well as associated infrastructure including collector cable routes, access roads, construction roads, transmission lines and substations. The additional property assessed by Stantec comprised a small area for additional collector cable routes. An area approximately 80 metres wide through the centre of Lot 7, running north to south, was assessed, as well as an additional area 20 metres wide running north to south along Kerwood Road (Figure 4). In total, 5.73 hectares were surveyed as part of the additional Stage 2 assessment.

The total area assessed consisted of a ploughed and well-weathered agricultural field, a woodlot, and a creek, and so the total study area subject to be affected by the additional collector cable routes was subject to pedestrian survey (90%), test pit survey (5%), and areas that were deemed to not require assessment (5%) as per the Standards and Guidelines for Consultant Archaeologists (Section 2.1, Standard 2a; Government of Ontario 2011). Photos 1 and 2 confirm that the conditions of the surveyed portions of the study area allowed the standards for Stage 2 pedestrian survey to be met. Photos 3 and 4 confirm that conditions in portions of the study area required test pit survey method and that this method met the standards for Stage 2 test pit survey. Finally, Photos 5 to 7 confirm the presence of a creek, or permanently wet area, areas of steep slope, and areas of heavy undergrowth, which were not assessed as they were determined to have no or low archaeological potential. Photograph locations and directions are also provided in Figure 4. During the Stage 2 archaeological assessment, the weather was clear and warm with a slight breeze. At no time were the field or weather conditions detrimental to the recovery of archaeological material. Field surface visibility was at least 85% and lighting conditions were excellent.

The area subject to pedestrian survey was assessed at five metre intervals according to Section 2.1.1 Standard 6 of the *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011b) (Photos 1 and 2). During pedestrian survey, when archaeological resources were identified, the survey transect was decreased to a one metre interval and spanned a minimal 20 metre radius around the identified artifact. This approach established if the artifact was an isolated find or if it was part of a larger artifact scatter (Government of Ontario 2011b). For areas subject to test pit survey, the survey was conducted in five metre intervals throughout a wooded area, avoiding areas of steep slope and a creek. Each test pit was excavated by hand and was approximately 30 centimetres in diameter and excavated five centimetres into sterile subsoil. All soil matrix was screened through six millimetre mesh hardware cloth to facilitate the recovery of small artifacts. Prior to backfilling, all test pits were examined for stratigraphy, cultural features, and evidence of fill. Areas of steep slope and a creek running through the study area were deemed to have no or low archaeological potential and were not surveyed.

All formal and diagnostic artifact types were collected and a UTM reading was taken using a Trimble Geo XT Geo Explorer 3000 Series handheld GPS unit, using the North American Datum (NAD) 83, with a minimal accuracy of two metres. UTM coordinates were recorded and are presented in the supplementary documentation. Figure 4 illustrates the field assessment methods across the study area and Tile 5 in the supplementary documentation of this report illustrates the field methods and results.

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. Stantec's Stage 2 survey of the proposed collector cable routes identified two historic Euro-Canadian locations. A summary of the artifacts collected for these sites and their spatial extent are provided below. Supplementary Documentation lists the UTM coordinates for both of these locations and illustrates the site locations. They are included in the supplementary documentation for this report.

Table 4: Inventory of Documentary Record

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

All of the material culture collected during the collector cable Stage 2 survey will be stored in one bankers box. It will be temporarily housed at Stantec's London office until formal arrangements can be made for its transfer to an MTCS collections facility.

3.1 LOCATION 2 (AgHk-166)

The Stage 2 assessment of Location 2 (AgHk-166) resulted in the identification of a historic Euro-Canadian site measuring approximately 100 metres by 50 metres. A representative sample of 76 Euro-Canadian artifacts was returned to the lab for processing and analysis. The artifacts collected included 42 ceramics, 13 household artifacts, 11 structural artifacts, 7 personal artifacts, 2 pieces of metal, and 1 piece of horse hardware (Table 5; Plates 1 to 3). Approximately 175 artifacts were left in the field to relocate the site if it is necessary to conduct further assessment as per Section 2.1.1, Standard 9 in the Standards and Guidelines for Consultant Archaeologists (Government of Ontario, 2011b). Table 5 is the complete artifact catalogue for Location 2 (AgHk-166) while Table 6 provides a breakdown of the recovered artifact classes.

Table 5: Location 2 (AgHk-166) Artifact Catalogue

Cat. #	Context	Artifact	Quantity	Comments
1	SURFACE	whiteware, painted	4	red lines
2	SURFACE	whiteware, sponged	3	1 red and blue, 1 red and green
3	SURFACE	whiteware, transfer printed	5	blue, 2 floral, 3 landscape
4	SURFACE	whiteware, stamped	5	3 blue, 1 blue and brown, 1 red and green

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Cat. #	Context	Artifact	Quantity	Comments
5	SURFACE	pearlware, stamped	1	brown, floral
6	SURFACE	porcelain	1	
7	SURFACE	ceramic, recent	1	
8	SURFACE	stoneware	1	brown glaze, both sides
9	SURFACE	earthenware, yellow	3	glazed
10	SURFACE	earthenware, red	5	glazed
11	SURFACE	ironstone	10	
12	SURFACE	ironstone, moulded	3	2 fruit designs, 1 wheat
13	SURFACE	glass, bottle	10	2 clear; 1 square base fragment, 1 green, 1 olive, 1 brown, 1 violet; blob top finish, 4 aqua; 1 partial neck with tooled patent finish, 1 neck with applied patent finish
14	SURFACE	glass, window	2	1 less than 1.6mm, 1 greater than
15	SURFACE	glass, dish	1	violet, rim, embossed dot decoration
16	SURFACE	white clay pipe, stem	3	
17	SURFACE	white clay pipe, bowl	2	
18	SURFACE	porcelain figurine	1	head of cherub faced boy with long curls
19	SURFACE	slate pencil	1	sharpened tip
20	SURFACE	horseshoe	1	complete, bent, 2 nails intact
21	SURFACE	nail, cut	8	
22	SURFACE	nail, undetermined	1	
23	SURFACE	metal, miscellaneous	2	
24	SURFACE	faunal remains	2	mammal, 1 tooth, 1 long bone

Table 6: Location 2 (AgHk-166) Artifact Summary

Artifact Type	Frequency	%
ceramic	42	55.26
household	15	19.74
structural	9	11.84
personal	7	9.21
metal	2	2.63
horse hardware	1	1.32
Total Artifacts	76	100.00

3.1.1 Ceramic Artifacts

The majority of recovered ceramics consisted of 17 pieces of whiteware. Also recovered from Location 2 (AgHk-166) were 13 pieces of ironstone, 8 pieces of utilitarian earthenware, one piece of recent ceramic, one piece of stoneware, one piece of pearlware, and one piece of porcelain. Plate 1 provides a sample of the ceramic artifacts recovered from Location 2 (AgHk-166). Table 6 summarizes the ceramic artifacts by ware type and Table 7 lists all of the ceramic decorative types recovered. The different ware types are discussed in further detail below.

Table 7: Location 2 (AgHk-166) Ceramic Assemblage by Ware Type

Ceramic Artifacts	Frequency	%
whiteware	17	40.48
ironstone	13	30.95
utilitarian earthenware	9	21.43
ceramics, recent	1	2.38
pearlware	1	2.38
porcelain	1	2.38
Total Ceramic Artifacts	42	100.00

Table 8: Location 2 (AgHk-167) Ceramic Assemblage by Decorative Type

Ceramic Artifacts	Frequency	%
ironstone	10	23.81
whiteware, transfer printed	5	11.91
earthenware, red	5	11.91
whiteware, stamped	5	11.91
whiteware, painted	4	9.52
whiteware, sponged	3	7.14
ironstone, moulded	3	7.14
earthenware, yellow	3	7.14
pearlware	1	2.38
porcelain	1	2.38
ceramic, recent	1	2.38
stoneware	1	2.38
Total Ceramic Artifacts	42	100.00

Whiteware

A total of 17 pieces of whiteware were recovered from Location 2 (AgHk-166). Of those 17 pieces five are transfer printed, five are stamped, four are painted, and three are sponged.

Whiteware is a variety of refined earthenware with a near-colourless glaze. By the 1830s it had replaced earlier, near-white ceramics such as pearlware and creamware. Early whiteware paste tends to be porous, but becomes more vitrified later in the 19th century (Adams 1994).

Early transfer printed whiteware often has thicker lines because of the paper used during the transfer of pattern from paper to ceramic. Later transfer printed whiteware was done using tissue paper which allowed for shading and finer line details or the use of oil and a sheet of glue were used to create a design with little dots (Stelle, Lenville J. 2001). Transfer printing was popular throughout the 19th century. Before 1830s blue was the most common colour used, during the 1830s and 1840s other colours like brown, black, red, green and purple became popular, between 1850 and 1890 only blue, black and brown were popular with a variety of colour becoming popular again in the late 19th century (Adams 1994). All five pieces of whiteware recovered from Location 2 (AgHk-166) are blue.

Stamped and sponged decorated whiteware ceramics are a form of inexpensive tableware in which a stamp or sponge was used to apply decoration. A total of five pieces of stamped whiteware and three sponged were recovered. These decorative techniques were popular in the 1840s and remained popular until the 1870s (Adams 1994). Thus, the stamped and sponged whiteware present represent a sample produced during the mid-to-late 19th century.

Painted whiteware vessels of the early 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, Lenville J. 2001). Four pieces of painted whiteware were recovered from Location 2 (AgHk-166), all of which were painted with red coloured lines.

Ironstone

A total of 13 pieces of ironstone were recovered from Location 2 (AgHk-166). Out of the 13 pieces of ironstone, 10 were plain and 3 were moulded. Ironstone, also known as white granite and stone china, was manufactured from 1815 onwards but was manufactured in large quantities particularly in the last half of the 19th century and beyond. It was used for tablewares, kitchenwares and toiletwares. Undecorated ironstone was at its peak after 1850 (Saint. Mary's University n.d.). Ironstone is a ceramic classified between earthenware and porcelain with thick vitrified white paste, a background colour of white to bluish gray tint and has a thick clear glasslike glaze (FLMNH n.d.). Due to the wide timespan of production and no maker's marks present, the sample is dated to the wide date range of 19th century.

Utilitarian Earthenware

Nine pieces of utilitarian earthenware were recovered during the Stage 2 assessment of Location 2 (AgHk-166). There are 5 red glazed earthenware, 3 yellow glazed earthenware and 1 brown glazed stoneware. 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, eventually being replaced by stoneware in the late 19th century (Adams 1994). Earthenwares with high-gloss slipped or glazed surfaces characterize Canadian sites from 1840 to 1900 (Noël Hume 1969). Stoneware has vitrified stone-like paste due to the high temperatures used to fire the pottery. The paste colours vary from white, gray and tan and are generally quite thick and durable. Stoneware was made in Ontario from 1849 onwards (Adams 1994). The utilitarian earthenwares present at Location 2 (AgHk-166) are representative of mid-to-late 19th century earthenware.

Recent Ceramics

One obviously recent ceramic sherd from the late 20th or early 21st century was recovered during the Stage 2 archaeological assessment.

Pearlware

One piece of stamped pearlware was found during the Stage 2 assessment of Location 2 (AgHk-166). Pearlware can be easily identified by a bluish glaze that appears along footing crevices because of the addition of cobalt to the glaze. The pearlware recovered from Location 2 is stamped with a brown floral pattern. Pearlware first came into production in 1779 and its popularity declined in the 1830s (Adams 1994).

Porcelain

One piece of porcelain ware was collected from Location 2 (AgHk-166). Porcelain wares are produced with very high firing temperatures, which result in a partial vitrification of the paste. Vessel bodies tend to be translucent and can be very thin. Because of its prohibitive cost, porcelain is extremely rare on 19th century sites in Ontario, but becomes relatively common by the 20th century as less expensive production techniques were developed in Europe (Kenyon 1980).

3.1.2 Household Artifacts

A total of 13 household artifacts were recovered from Location 2 (AgHk-166) including 11 glass artifacts and 2 faunal remains. Plate 2 provides a sample of the recovered household artifacts.

Glass Artifacts

The glass artifacts included 10 pieces of bottle glass and 1 glass dish fragment. Bottle glass is generally not diagnostic and is often simply categorized according to colour. Glass colours present at Location 2 (AgHk-166) include aqua, clear, green, violet, brown, and olive. Uncommon prior to the 1870s, clear or colourless glass came into widespread use after the development of automatic bottle manufacturing machines in the early 20th century (Lindsey 2013). The glass dish recovered is violet in colour with an embossed dot decoration; it is temporally non-diagnostic.

Faunal Remains

At Location 2 (AgHk-166), two faunal remains were discovered including one mammalian tooth fragment and one long bone splinter from a large unidentified mammal.

3.1.3 Structural Artifacts

Eleven structural artifacts were recovered from Location 2 (AgHk-166): 8 cut nails, 1 undetermined nail, and 2 pieces of window glass. 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 (Adams 1994:92).

Window glass can be temporally diagnostic. In the 1840s window glass thickness changed dramatically. This was in a large part due to 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 (mm) thick, while later glass is thicker (Kenyon 1980). Of the two pieces of window glass, one was less than 1.6 millimetres, which suggests a production date before 1845. The other piece is thicker than 1.6 mm and is 20th century in date. Plate 2 shows a sample of the structural artifacts recovered from Location 2 (AgHk-166).

3.1.4 Personal Artifacts

Seven personal artifacts were recovered from Location 2 (AgHk-166): three white clay pipe stems, two fragments of white clay pipe bowl, one porcelain figure, and one slate pencil. White clay pipes were a popular item in the 19th century, but declined in popularity in the last 20 years due to the increasing use of cigarettes (Adams 1994). Due to the fragmented nature of the pipe remains, more specific temporal parameters cannot be inferred.

The remaining artifacts are not temporally diagnostic. Plate 3 provides a sample of the personal artifacts collected during the Stage 2 archaeological assessment.

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3.1.5 Metal Artifacts

Two pieces of corroded metal were recovered from Location 2 (AgHk-166). These artifacts are temporally non-diagnostic.

3.1.6 Horse Hardware

One horseshoe was recovered from Location 2 (AgHk-166) which is temporally non-diagnostic.

3.2 LOCATION 3 (AGHK-167)

The Stage 2 assessment of Location 3 (AgHk-167) resulted in the identification of a historic Euro-Canadian site, with an isolated pre-contact Aboriginal artifact, measuring approximately 95 metres by 50 metres. A representative sample of 85 Euro-Canadian artifacts and the one pre-contact Aboriginal lithic tool were returned to the lab for processing and analysis. The recovered artifacts included 44 ceramics, 17 household artifacts, 11 personal artifacts, 7 structural artifacts, 5 pieces of miscellaneous metal, and one pre-contact Aboriginal lithic (Table 5; Plate 1). Approximately 100 artifacts were left in the field to relocate the site if it is necessary to conduct further assessment as per Section 2.1.1 Standard 9 in the *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario, 2011b). Table 9 is a complete artifact catalogue for Location 3 (AgHk-167) while Table 10 provides a breakdown of the recovered artifact classes.

Table 9: Location 3 (AgHk-167) Artifact Catalogue

Cat. #	Context	Artifact	Quantity	Chert	Comments
1	SURFACE	whiteware	1		
2	SURFACE	whiteware, painted	7		2 red; 1 floral, 1 blue; line, 1 green; floral, 1 green and red; lines, 1 blue and red; lines, 1 blue and black; lines
3	SURFACE	whiteware, sponged	1		blue
4	SURFACE	ironstone	8		
5	SURFACE	ironstone, moulded	10		4 handles, 1 teapot spout; floral, 1 wheat, 1 basket weave
6	SURFACE	porcelain	4		
7	SURFACE	stoneware	2		glazed, 1 bristol
8	SURFACE	stoneware, salt glazed	1		brown interior glaze
9	SURFACE	rockinghamware	2		
10	SURFACE	earthenware, red	5		glazed
11	SURFACE	earthenware, yellow	1		jar base, glazed both sides
12	SURFACE	ceramic, undetermined	2		burnt
13	SURFACE	glass, bottle	14		1 brown; partial base, 1 olive, 3 clear, 9 aqua; 5 bases, 3 circular, machine-made, 1 embossed '...JUN.9.68 PAT D FEB.12.56.DEC.17.61...' '...1968 SEP/68 DEC.22...' , 1 square base, hand blown, with

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Cat. #	Context	Artifact	Quantity	Chert	Comments
					sand pontil scar? 3 finishes; 1 partial applied prescription finish, with partial neck and shoulder, 2 partial applied packer finishes, 1 with neck.
14	SURFACE	glass, window	2		both greater than 1.6mm
15	SURFACE	glass, undetermined	1		brown, burnt
16	SURFACE	white clay pipe, stem	5		4 engraved; 1 'GLASGOW', 1 'DAV...' '...GOW', 1 '...MAN' '...ND...', 1 'HENDERSON' 'MONTREAL'
17	SURFACE	white clay pipe, bowl	3		1 thistle design
18	SURFACE	white clay pipe, elbow	1		
19	SURFACE	utensil	1		squared bone handle with remaining pin
20	SURFACE	scissors	1		handle
21	SURFACE	metal, buckle	2		
22	SURFACE	nail, cut	5		
23	SURFACE	metal, spike	1		
24	SURFACE	metal, hook	1		
25	SURFACE	metal, miscellaneous hardware	3		
26	SURFACE	biface	1	Kettle Point	preform end fragment, broken transversely, battering at end

Table 10: Location 3 (AgHk-167) Artifact Summary

Artifact Type	Frequency	%
ceramic	44	51.77
household	19	22.35
personal	11	12.94
structural	5	5.88
metal	5	5.88
pre-contact Aboriginal lithic	1	1.18
Total Artifacts	85	100.00

3.2.1 Ceramic Artifacts

The largest class of recovered ceramics consisted of 18 pieces of ironstone. Also recovered from Location 3 (AgHk-167) were nine pieces of whiteware, six pieces of utilitarian earthenware, four pieces of porcelain, three pieces of stoneware, two pieces of undetermined ceramic, and two pieces of rockinghamware. Plate 4 provides a sample of the ceramic artifacts recovered from Location 3 (AgHk-167). Table 11 summarizes the ceramic artifacts by ware type and Table 12 lists all of the ceramic decorative types recovered. The different ware types are discussed in further detail below.

Table 11: Location 3 (AgHk-167) Ceramic Assemblage by Ware Type

Ceramic Artifacts	Frequency	%
ironstone	18	40.90
whiteware	9	20.45
utilitarian earthenware	9	20.45
porcelain	4	9.10
ceramic, undetermined	2	4.55
rockinghamware	2	4.55
Total Ceramic Artifacts	44	100.00

Table 12: Location 3 (AgHk-167) Ceramic Assemblage by Decorative Type

Ceramic Artifacts	Frequency	%
ironstone, moulded	10	22.73
ironstone	8	18.18
whiteware, painted	7	15.91
earthenware, red	5	11.36
porcelain	4	9.09
rockinghamware	2	4.55
ceramic, undetermined	2	4.55
stoneware	2	4.55
whiteware	1	2.27
stoneware, salt-glazed	1	2.27
whiteware, sponged	1	2.27
earthenware, yellow	1	2.27
Total Ceramic Artifacts	44	100.00

Ironstone

A total of 18 pieces of ironstone were recovered from Location 3 (AgHk-167). Out of the 18 pieces of ironstone 10 were moulded and 8 were plain. Ironstone, also known as white granite and stone china, was manufactured from 1815 onwards but was manufactured in large quantities particularly in the last half of the 19th century and beyond. It was used for tablewares, kitchenwares and toiletwares. Undecorated ironstone was at its peak after 1850 (Saint. Mary's University n.d.). Ironstone is a ceramic classified between earthenware and porcelain with thick vitrified white paste, a background colour of white to bluish gray tint and has a thick clear glasslike glaze (FLMNH n.d.). Due to the wide timespan of production and no maker's marks present, the sample is dated to the wide date range of 19th century.

Whiteware

A total of nine pieces of whiteware were recovered from Location 3 (AgHk-167). Of those nine pieces seven are painted, one is plain, and one is sponged. Whiteware is a variety of refined earthenware with a near-colourless glaze. By the 1830's it had replaced earlier, near-white ceramics such as pearlware and creamware. Early whiteware paste tends to be porous, but becomes more vitrified later in the 19th century (Adams 1994).

Painted whiteware vessels of the early 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, Lenville J. 2001). Seven pieces of painted whiteware were recovered from Location 3 (AgHk-167), two of which were painted red; one blue; one green; one green and red; one blue and red; and one blue and black.

Stamped and sponged decorated whiteware ceramics are a form of inexpensive tableware in which a stamp or sponge was used to apply decoration. One piece of sponged whiteware was recovered. These decorative techniques were popular in the 1840s and remained popular until the 1870s (Adams 1994). Thus, the sponged whiteware represents a sample produced during the mid-to-late 19th century.

Utilitarian Earthenware

Nine pieces of utilitarian earthenware were recovered during the Stage 2 assessment of Location 3 (AgHk-167): five red glazed earthenware, one yellow glazed earthenware, one piece of plain glazed stoneware, one piece of bristol glazed stoneware, and one piece of brown salt-glazed stoneware. 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, eventually being replaced by stoneware in the late 19th century (Adams 1994). Earthenwares with high-gloss slipped or glazed surfaces characterize Canadian sites from 1840 to 1900 (Noël Hume 1969). Stoneware has vitrified stone-like paste due to the high temperatures used to fire the pottery. The paste colours vary from white, gray and tan and are generally quite thick and durable. A common glaze on stoneware is salt-glazed, which is achieved by introducing salt to the kiln during the firing process (Maryland Archaeological Conservation Lab 2012). Stoneware was made in Ontario from 1849 onwards (Adams 1994). The utilitarian earthenwares present at Location 3 (AgHk-167) are representative of mid-to-late 19th century earthenware.

Porcelain

Four pieces of porcelain ware were collected from Location 3 (AgHk-167). Porcelain wares are produced with very high firing temperatures, which result in a partial vitrification of the paste. Vessel bodies tend to be translucent and can be very thin. Because of its prohibitive cost, porcelain is extremely rare on 19th century sites in Ontario, but becomes relatively common by

the 20th century as less expensive production techniques were developed in Europe (Kenyon 1980). The presence of porcelain wares at Location 3 (AgHk-167) suggests a late 19th to early 20th century occupation.

Undetermined Ceramics

Those ceramic artifacts which could not be positively identified by type have been classified as undetermined for the sake of inclusion in this study. In total, two undetermined ceramics were recovered from Location 3 (AgHk-167).

Rockinghamware

Rockinghamware was an inexpensive brown-glazed ceramic that was popular from the mid-nineteenth through the early twentieth century. In North America, it was made from a variety of earthen- or stoneware bodies that were often yellow and relief decorated (Cleney 2004). A total of two pieces of rockinghamware were collected during the Stage 2 survey of Location 3 (AgHk-167).

3.2.2 Household Artifacts

A total of 17 household artifacts were recovered from Location 3 (AgHk-167) including 15 pieces of bottle glass, one piece of undetermined glass, a pair of scissors, and a bone handle from a utensil. The pair of scissors and the utensil are temporally non-diagnostic. Plate 5 provides a sample of the recovered household artifacts.

Glass Artifacts

The 15 glass artifacts recovered include 14 pieces of bottle glass and one undetermined piece of glass. Bottle glass is generally not diagnostic and is often simply categorized according to colour. Glass colours present at Location 3 (AgHk-167) include aqua, clear, brown, and olive. Uncommon prior to the 1870s, clear or colourless glass came into widespread use after the development of automatic bottle manufacturing machines in the early 20th century (Lindsey 2013). Three circular bottle bases are machine made and one is embossed with visible patent dates of 1956, 1961, and 1968, indicating the one bottle base dates to the mid-20th century.

3.2.3 Personal Artifacts

Eleven personal artifacts were recovered from Location 3 (AgHk-167): five white clay pipe stems, three fragments of white clay pipe bowl, two metal belt buckles, and one white clay pipe elbow. White clay pipes were a popular item in the 19th century, but declined in popularity in the last 20 years due to the increasing use of cigarettes (Adams 1994). Four of the pipe stems are engraved and include the following engravings: one "GLASGOW", one "DAV...GOW", one "MAN...ND", and one "HENDERSON MONTREAL". Clay pipe stems marked HENDERSON or HENDERSON'S represent by far the most important maker or makers. There were more than

one maker of this name in Montreal, but as manufacturers of clay pipes they all appear to fall into the period 1847 to 1876 (Walker 1983). The other clay pipes fall within broader periods of the 19th century and cannot be given specific dates. The metal buckles are not temporally diagnostic. Plate 6 provides a sample of the personal artifacts recovered from Location 3 (AgHk-167).

3.2.4 Structural Artifacts

Seven structural artifacts comprised of five cut nails and two pieces of window glass were collected from Location 3 (AgHk-167). 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 (Adams 1994:92).

Window glass can be temporally diagnostic. In the 1840s window glass thickness changed dramatically. This was in a large part due to 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 (mm) thick, while later glass is thicker (Kenyon 1980). Both pieces of window glass are thicker than 1.6 mm and are 20th century in date. Plate 5 shows a sample of the structural artifacts collected from Location 3 (AgHk-167).

3.2.5 Metal Artifacts

The five metal artifacts collected from Location 3 (AhHi-5) include three pieces of miscellaneous metal hardware, one spike, and one hook. All of these artifacts are temporally non-diagnostic.

3.2.6 Pre-Contact Aboriginal Artifacts

One pre-contact Aboriginal biface was collected from Location 3 (AgHk-167), biface base fragment. Other than to say the biface is a pre-contact Aboriginal artifact, it is temporally non-diagnostic. This lithic tool is a preform with minimal work and informal morphology which was produced from Kettle Point chert. Kettle Point formation chert is from the Late Devonian age and is situated between the Kettle Point (Late Devonian shales) and the Ipperwash Formations (Middle Devonian Limestone). It occurs as submerged outcrops that extend approximately 1350 metres into Lake Huron (Janusas 1984:3). Secondary deposits have been reported in Essex County (Janusas 1984) and in the Ausable Basin (Kenyon 1980). Kettle Point chert can be identified by the presence of a waxy lustre and occurs in a wide range of colours including brown, grey and greenish colours as well as reddish purple and dark blue varieties (Eley and von Bitter, 1989). A rusty staining on the surface of artifacts is frequently noted (Fisher 1997). Plate 7 illustrates the biface collected from Location 3 (AgHk-167).

4.0 Analysis and Conclusions

The Stage 2 assessment of one property for additional collector cable routes for the Suncor Adelaide Wind Power Project resulted in the identification of one historic Euro-Canadian archaeological site, Location 2 (AgHk-166), and one historic Euro-Canadian archaeological site with an isolated pre-contact Aboriginal artifact, Location 3 (AgHk-167). Analyses of each location are provided below along with a determination of whether further assessment is recommended for each of the two sites.

4.1 LOCATION 2 (AgHk-166)

The Stage 2 assessment of Location 2 (AgHk-166) resulted in the recovery of a large scatter of mid-to-late 19th century historic Euro-Canadian artifacts. The majority of the recovered artifacts are ceramics dated to the mid-to-late 19th century. Of these artifacts, whiteware accounts for 40.48% of the entire ceramic assemblage. While the initial manufacture date of whiteware is unknown, it became popular in Ontario after 1830 (Adams 1994). One example of early 19th century pearlware was also recovered from Location 2 (AgHk-166). Pearlware was a common ceramic in southern Ontario between 1780 and 1850 (Kenyon, 1985). Additionally, most of the nails recovered were cut nails, dating from 1830 to 1890. Spatially, Location 2 (AgHk-166) is located on Lot 7, Concession 2 N.E.R., Geographic Township of Adelaide, Middlesex County, Ontario. The 1878 historic map of Adelaide Township illustrates that by this time, Lot 7 had been partitioned into four sections; Location 2 (AgHk-166) is located on the portion that was owned by Miles Curry (Figure 2). Several structures are noted on this portion of Lot 7 on the 1878 historic mapping and are in close proximity to Location 2 (AgHk-166). The presence of more than 20 artifacts dating to the mid-to-late 19th century lends cultural value or interest to the site. Based on this consideration, Location 2 (AgHk-166) fulfills the criteria for a Stage 3 archaeological investigation as per Section 2.2, Standard 1c of the *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario, 2011).

4.2 LOCATION 3 (AgHk-167)

The Stage 2 assessment of Location 3 (AgHk-167) resulted in the recovery of a large scatter of mid-19th to early 20th century historic Euro-Canadian artifacts and one isolated pre-contact Aboriginal artifact. The majority of the recovered artifacts are ceramics dated to the mid-to-late 19th century. Ironstone accounts for majority large portion (40.90%) of the total ceramic assemblage, with just over half being of the moulded type (55.56%) and the remaining being undecorated (44.44%). Due to the wide timespan of production and no maker's marks present, the sample is dated to the 19th century in general. However, undecorated ironstone was at its peak after 1850, and the presence of a large amount of undecorated ironstone at Location 3 (AgHk-167) is suggestive of a mid-19th century occupation (Saint. Mary's University n.d.). In addition, 20.45% of the ceramic assemblage is whiteware, which became popular in Ontario

after 1830 (Adams, 1994). Four pieces of porcelain were also recovered from Location 3 (AgHk-167). Because of its prohibitive cost, porcelain is extremely rare on 19th century sites in Ontario, but becomes relatively common by the 20th century as less expensive production techniques were developed in Europe (Kenyon 1980). The presence of several porcelain wares, including a porcelain figurine, at Location 3 (AgHk-167) suggests a late 19th to early 20th century occupation. The structural artifacts also suggest a mid-19th to early 20th century date. Most of the nails recovered were cut nails, dating from 1830 to 1890 and both pieces of recovered window glass were thicker than 1.6 millimetres, dating from the late 19th century or later. Location 3 (AgHk-167) is located on Lot 7, Concession 2 N.E.R., Geographic Township of Adelaide, Middlesex County, Ontario. The 1878 historic map of Adelaide Township illustrates that by this time, Lot 7 had been partitioned into four sections; Location 3 (AgHk-167) is located on the portion that was owned by John Brook (Figure 2). A structure is noted on the portion of Lot 7 owned by John Brook and is in close proximity to Location 3 (AgHk-167). It is possible that this site represents several generations of inhabitants on this portion of Lot 7 spanning from the mid-19th century into the 20th century. However, the presence of more than 20 artifacts dating to the mid-to-late 19th century lends cultural value or interest to the site.

The recovered isolated pre-contact Aboriginal biface fragment was a common toolkit accessory over an extended period of time in southwestern Ontario, from the first post-glacial occupations until they were eventually phased out by European manufactured goods. For this reason, tools such as these are temporally non-diagnostic, with the exception that it was manufactured by pre-contact Aboriginal people. Based on the collected Euro-Canadian artifacts, Location 3 (AgHk-167) fulfills the criteria for a Stage 3 archaeological investigation as per Section 2.2, Standard 1c of the *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario, 2011).

4.3 PRELIMINARY INDICATION OF SITES POSSIBLY REQUIRING STAGE 4 ARCHAEOLOGICAL ASSESSMENT

This preliminary indication of whether any site could be eventually recommended for Stage 4 archaeological assessment is required under the *Standards and Guidelines for Consultant Archaeologists* Section 7.8.3 Standard 2c. No firm recommendation for, or against, Stage 4 archaeological assessment will be made until the forthcoming Stage 3 archaeological assessment has been conducted. Both sites have assemblages that date from at least the mid-to-late 19th century, but unless the archival research indicates otherwise, it is unlikely that neither 80% of either site's time span of occupation dates prior to 1870 nor that either site retains cultural heritage value or interest due to information value (such as historical value), other value to a community, or value as a public resource. Therefore Stage 4 mitigation of impacts will probably not be recommended for either Location 2 (AgHk-166) or Location 3 (AgHk-167). However, to reiterate, no firm recommendation concerning the possibility of Stage 4 mitigation will be made until the Stage 3 archaeological assessment has been conducted.

5.0 Recommendations

The Stage 2 assessment of the additional property for the Suncor Adelaide Wind Power Project resulted in the identification one historic Euro-Canadian site, Location 2 (AgHk-166), and one historic Euro-Canadian site with an isolated pre-contact Aboriginal biface, Location 3 (AgHk-167). Recommendations for each of these sites are provided below.

5.1 LOCATION 2 (AGHK-166)

The Stage 2 assessment of Location 2 (AgHk-166) resulted in the recovery of primarily mid-to-late 19th century Euro- Canadian historic artifacts. Mid-19th century whiteware ceramics represent 40.48% of the recovered ceramic assemblage. An additional example of early 19th century pearlware was also recovered. Given that the site is still of further cultural heritage value or interest , **it is recommended that Location 2 (AgHk-166) be subject to a Stage 3 assessment prior to any ground disturbance activities to further test the nature and density of the site.**

The Stage 3 assessment should employ both the controlled surface pick-up and hand excavated test unit methodology as outlined in Table 3.1 of the *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011). Prior to conducting the field work, if the ground surface visibility has decreased since the Stage 2 archaeological assessment, the area should be re-ploughed and allowed to weather for the controlled surface pick-up. The test unit excavation should consist of one metre by one metre square test units laid out in a five metre grid and should be excavated by hand to a depth of five centimetres within the subsoil. 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 as per Section 3.2.2 Standard 6 of the *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011). Site specific land registry and archival research should also be conducted as part of the Stage 3 assessment to provide a more detailed 19th century documentary history of the site.

5.2 LOCATION 3 (AGHK-167)

The Stage 2 assessment of Location 3 (AgHk-167) resulted in the recovery of primarily mid-19th to early 20th century Euro- Canadian historic artifacts. Mid-to-late 19th century ironstone represents 40.90% of the ceramic assemblage and mid-19th century whiteware ceramics represent 20.45% of the recovered ceramic assemblage. Additional examples of 20th century porcelain and bottle glass suggest continued occupation for some time after the 19th century. Given that the site is still of further cultural heritage value or interest, **it is recommended that Location 3 (AgHk-167) be subject to a Stage 3 assessment prior to any ground disturbance activities to further test the nature and density of the site.**

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The Stage 3 assessment should employ both the controlled surface pick-up and hand excavated test unit methodology as outlined in Table 3.1 of the *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011). Prior to conducting the field work, if the ground surface visibility has decreased since the Stage 2 archaeological assessment, the area should be re-ploughed and allowed to weather for the controlled surface pick-up. The test unit excavation should consist of one metre by one metre square test units laid out in a five metre grid and should be excavated by hand to a depth of five centimetres within the subsoil. 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 as per Section 3.2.2 Standard 6 of the *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011). Site specific land registry and archival research should also be conducted as part of the Stage 3 assessment to provide a more detailed 19th century documentary history of the site.

The Ministry of Tourism, Culture, and Sport is asked to accept this report into the Ontario Public Register of Archaeological Reports. Additional archaeological assessment is still required; hence the archaeological sites recommended for further archaeological fieldwork remain subject to Section 48(1) of the *Ontario Heritage Act* (Government of Ontario 1990b) and may not be altered, or have artifacts removed, except by a person holding an archaeological license.

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 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.

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8.0 Images

8.1 PHOTOGRAPHS

Photo 1: Pedestrian Survey, assessed at 5 metre intervals, facing south



Photo 2: Pedestrian Survey, assessed at 5 metre intervals, facing south



Photo 3: Test Pit Survey, assessed at 5 metre intervals, facing southeast



Photo 4: Test Pit Survey, assessed at 5 metre intervals, facing southeast



Photo 5: Tributary of Adelaide Creek, not assessed, facing northeast



Photo 6: Area of Steep Slope, not assessed, facing north



8.2 ARTIFACTS

Plate 1: Sample of Historic Euro-Canadian Ceramic Artifacts from Location 2 (AgHk-166)



Plate 2: Sample of Historic Euro-Canadian Household and Structural Artifacts from Location 2 (AgHk-166)



Plate 3: Sample of Historic Euro-Canadian Personal Artifacts from Location 2 (AgHk-166)



Plate 4: Sample of Historic Euro-Canadian Ceramic Artifacts from Location 3 (AgHk-167)



A. Ironstone,
Moulded, Cat. #5



B. Whiteware,
Painted, Cat. #2



C. Whiteware,
Sponged, Cat. #3



D. Earthenware, Red,
Cat. #10



E. Porcelain,
Cat. #6



F. Rockinghamware,
Cat. #9



G. Stoneware, Salt-Glazed,
Cat. #8



Plate 5: Sample of Historic Euro-Canadian Household and Structural Artifacts from Location 3 (AgHk-167)



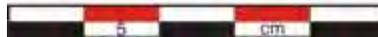
Plate 6: Sample of Historic Euro-Canadian Personal Artifacts from Location 2 (AgHk-166)



Plate 7: Pre-contact Aboriginal Biface from Location 3 (AgHk-167)

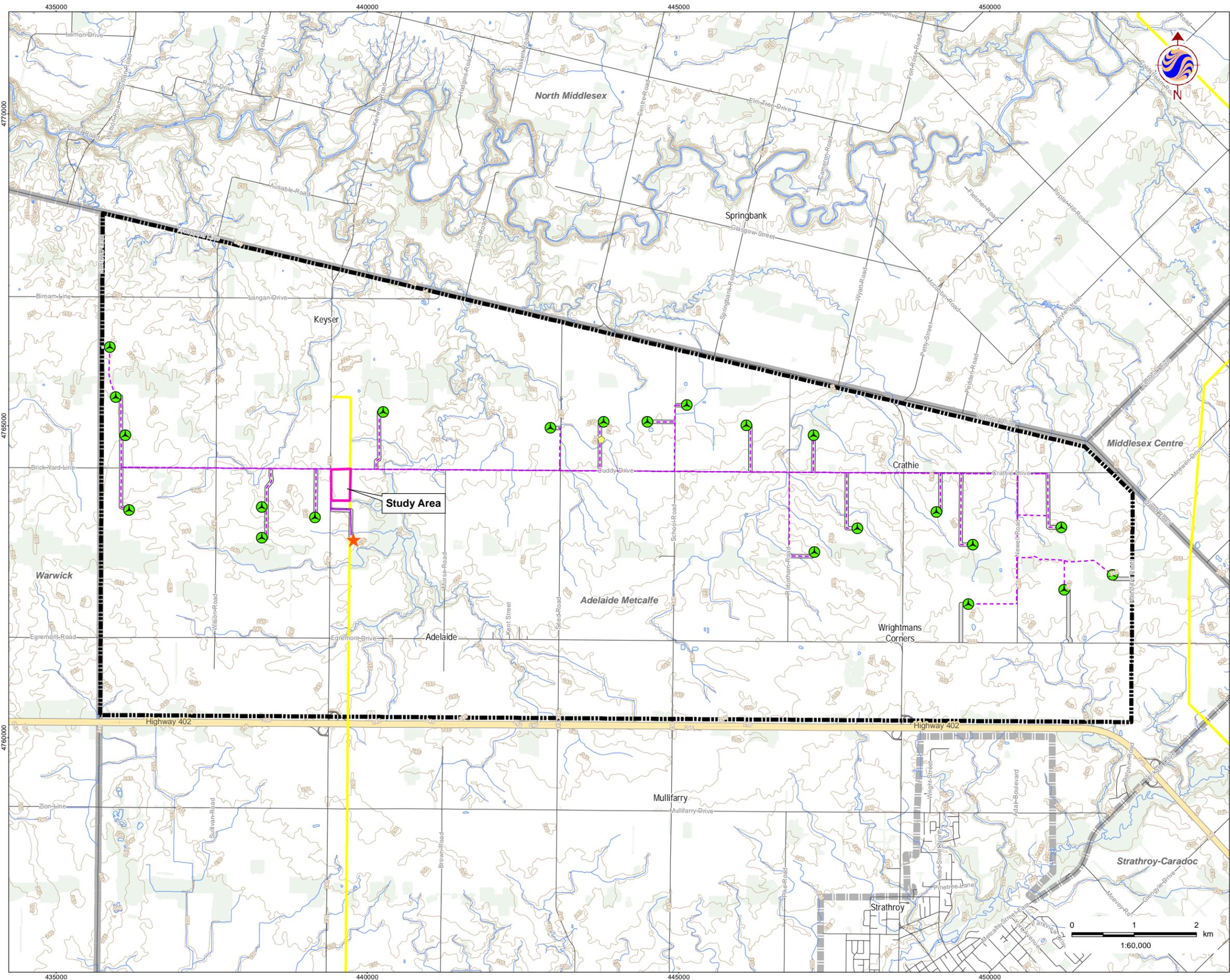


Biface, Cat. #26



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.



Legend

- Project Boundary
- Location of Study Area
- Project Components**
- Proposed Turbine Location
- Access Road
- Overhead/Underground Collector Line
- Substation
- Met Tower
- Existing Features**
- Expressway / Highway
- Road
- Existing Transmission Line
- Topographic Contour (metres ASL)
- Watercourse
- Waterbody
- Wooded Area
- Municipal Boundary



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.



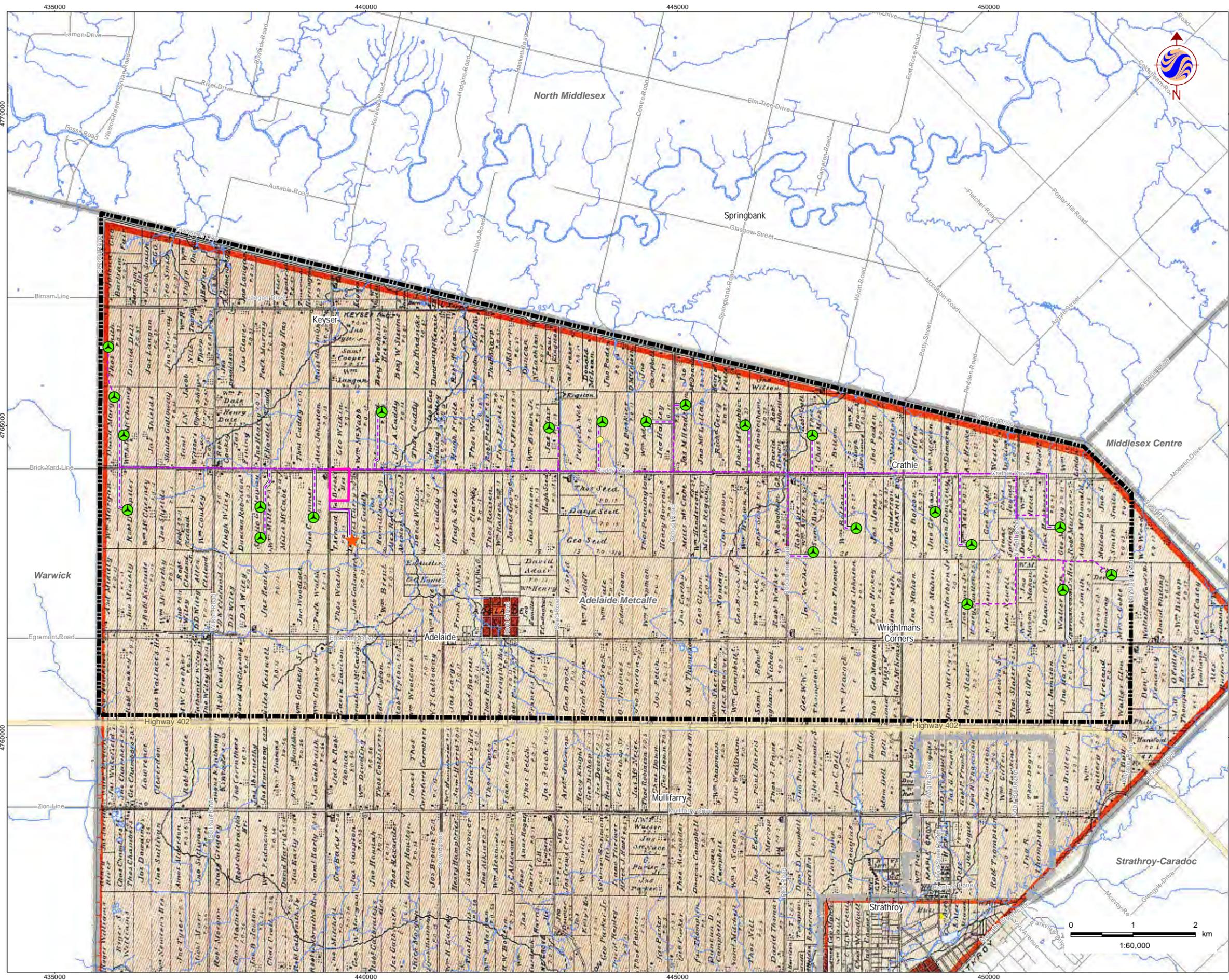
Stantec

September, 2013
160960710

Client/Project
**Suncor Energy
Adelaide Wind Power Project**

Figure No.
1

Title
Project Location & Study Area



Legend

- Project Boundary
- Location of Study Area
- Project Components**
 - Proposed Turbine Location
 - Access Road
 - Overhead/Underground Collector Line
 - Substation
 - Met Tower
- Existing Features**
 - Expressway / Highway
 - Road
 - Watercourse
 - Waterbody
 - Municipal Boundary



- ### 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.

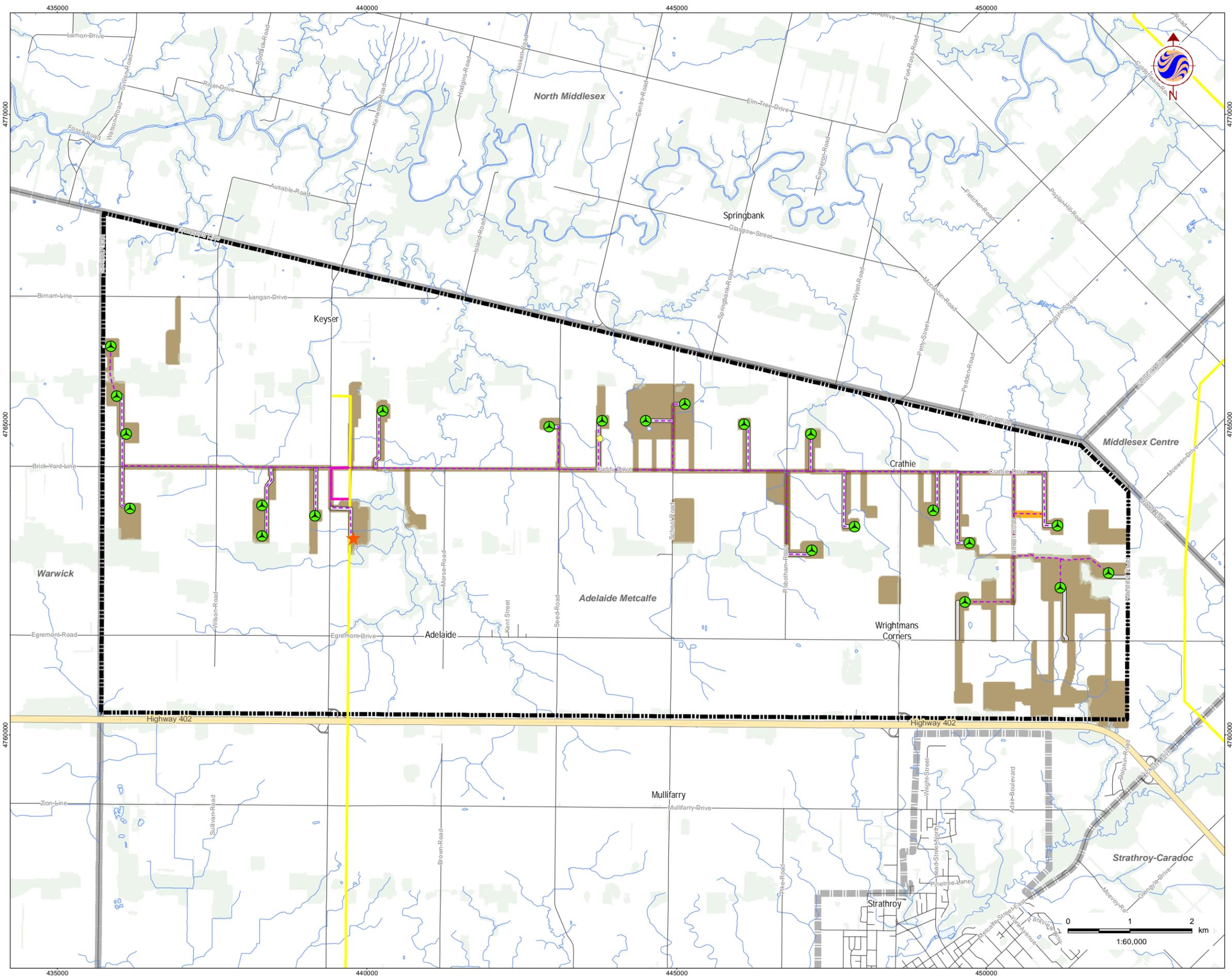


September, 2013
160960710

Client/Project
Suncor Energy
Adelaide Wind Power Project

Figure No.
2

Title
**A Portion of the 1878 Map of
Adelaide Township**



Legend

-  Project Boundary
-  Location of Study Area
- Project Components**
-  Proposed Turbine Location
-  Access Road
-  Underground Collector Line
-  Substation
-  Met Tower
- Existing Features**
-  Expressway / Highway
-  Road
-  Existing Transmission Line
-  Watercourse
-  Waterbody
-  Wooded Area
-  Municipal Boundary
- Previously Assessed Areas**
-  Previously Assessed by Golder Associates Ltd. (PIF P218-100-2011)
-  Previously Assessed by Stantec Consulting Ltd. (PIF P379-002-2012)



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.



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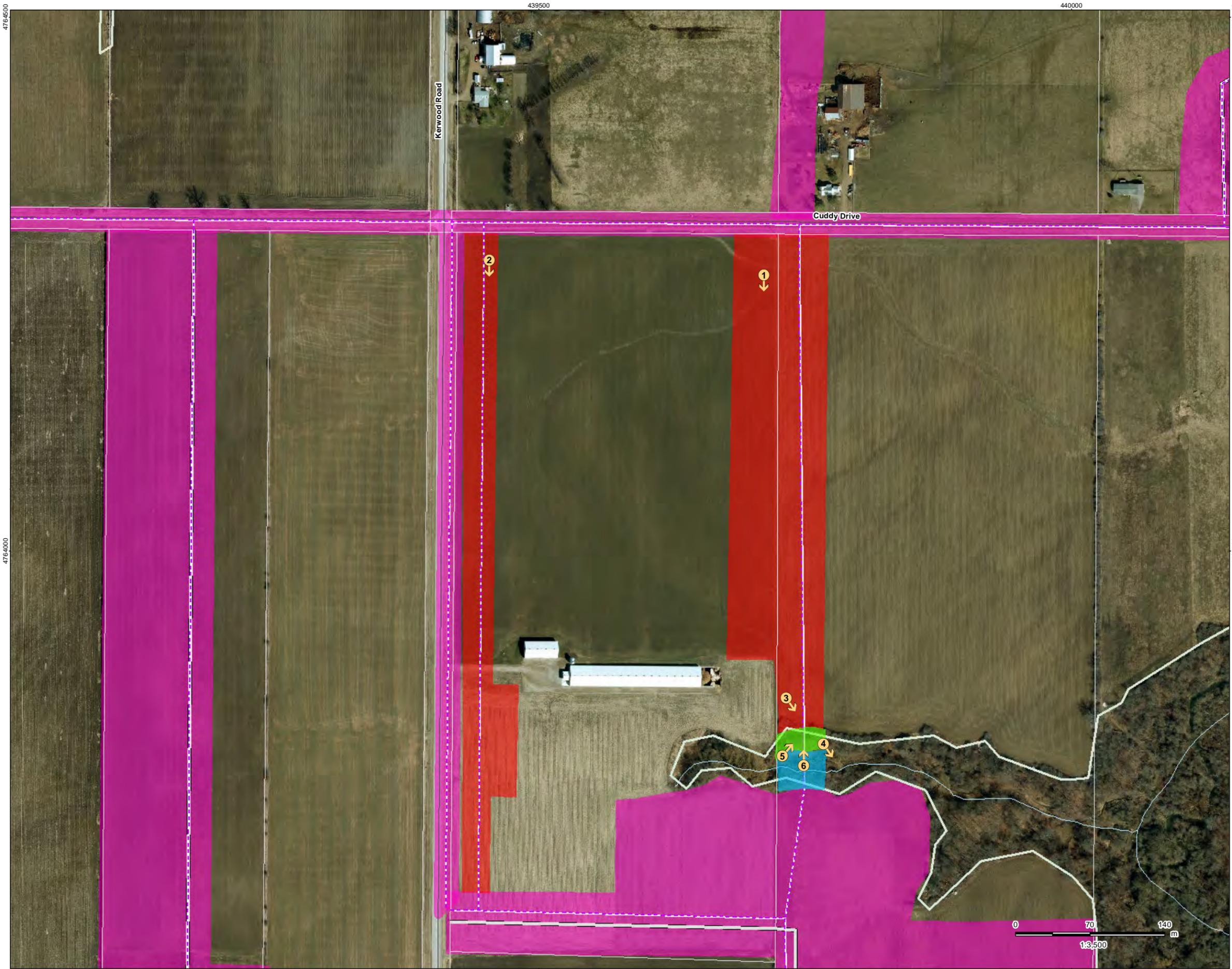
September, 2013
160960710

Client/Project
Suncor Energy
Adelaide Wind Power Project

Figure No.
3

Title
Previously Assessed Areas





Legend

- Project Components**
 - Access Road
 - - - Possible Underground Collector Line Location
- Existing Features**
 - Road
 - Watercourse
- Property Boundary**
 - Property Boundary
 - Wooded Area
- Previously Assessed Areas**
 - Previously Assessed by Golder Associates Ltd. (PIF P218-100-2011)
- Survey Methods**
 - Pedestrian Survey, Assessed at Five Metre Intervals
 - Test Pit Survey, Assessed at 5m Intervals
 - Creek with Steeply Sloped Banks, Not Assessed
 - ↑ Photo 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, 2012.
3. Orthographic imagery provided by © Suncor, 2012. Imagery taken in Spring 2010.



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October, 2013
160960710

Client/Project
Suncor Energy
Adelaide Wind Power Project

Figure No.
4

Title
Methods and Photo Locations and Directions

10.0 Closure

This report has been prepared for the sole benefit of Suncor Energy Services Inc., and may not be used by any third party without the express written consent of Stantec Consulting Ltd. and Suncor Energy Services 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.

Yours truly,



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