APPENDIX A

Certificates and Approvals Received

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March 22, 2012 (approved)
January 6, 2013 (amended)

Terry Norman
Chebucto Terence Bay Wind Field Limited
5 Bligh St.
Dartmouth, N.S.
B3A 1K8

Dear Chebucto Terence Bay Wind Field Limited:

Re: Community Feed-In Tariff Approval

On behalf of the Nova Scotia Department of Energy, I am approving the request to increase capacity for the Terence Bay Wind project. Attached is your Community Feed-In Tariff (COMFIT) approval for your 7.2 MW large-wind project in Terence Bay, NS (COMFIT application #243). This is a reissuance of Ministerial Conditions for project 243, as the project has been amended from 6 MW to 7.2 MW. Attached to this letter is a certificate indicating your approval.

In order to maintain your COMFIT approval, you must comply with the conditions set by Nova Scotia Power Incorporated, the Renewable Electricity Regulations made under Section 5 of the *Electricity Act* and all program Directives. You will also be expected to comply with the terms and conditions of the project as outlined in your COMFIT application and supplemental information provided to the department. Any alterations to this submission (technology type, partnership structure etc.) must be submitted in writing and approved by the Department.

As a condition of approval, your project will be expected to complete:

- Community Consultation: Two public information sessions must be held prior to the construction of the project. Results of the information session must be submitted to the Department of Energy, outlining any community concerns with the proposed project.

- Environmental Assessment

- Project Time Line and Milestones: A detailed project schedule including timelines and key milestones must be submitted to the Department of Energy within 60 days. You will be required to report regularly on the progress of the project, as outlined in the submission.

- Partnership and Financing: Finalized partnership, equity and other financing arrangements must be submitted to the Department of Energy prior to project construction.

- Evidence of Ownership Structure: A list of at least 25 shareholders from the community in which the project is located is required in accordance to COMFIT Directive 006.

These conditions are not an exhaustive list of the permits and approvals needed for your project. COMFIT approval does not supersede any additional regulations, permits or approval required by other government authorities as your project unfolds. Projects must still comply with all other conditions and milestones as set by government entities and Nova Scotia Power Inc. Failure to meet additional requirements may result in revocation of your COMFIT approval, even though they may not be an explicit condition at this time.

A COMFIT guidance note is attached with information pertaining to the implementation of your project. The guidance note is not a condition of approval, but information that may be useful to you as you implement your project. As per Directive 004: Annual Progress reports, the Department looks forward to receiving your annual reports on how COMFIT proceeds have assisted in meeting community sustainability goals.

Please note that you are also required to submit a report to the Department of Energy within 30 days of your project's connection to the distribution grid as identified in Section 34 of the Renewable Electricity Regulations. Failure to do so may result in revocation of your COMFIT approval.

If you have any questions about your approval, or if we can be of further assistance to you, please call COMFIT Clerk at (902) 424-5293 and a representative will be happy to assist you.

Sincerely,

Andrew Younger
Minister

Enclosure

№. Project 243

Community Feed-In Tariff Approval

This certifies that *Chebucto Terence Bay Wind Field Limited* has received Community Feed-In Tariff Approval by the Nova Scotia Department of Energy for a 7.2 MW large wind project in Terence Bay, Nova Scotia. Approval may be revoked should a project not meet the requirements of the Community Feed-In Tariff program or deviate from details specified in its Community Feed-In Tariff application.

NOVA SCOTIA
Department of Energy

Andrew Younger
Minister

№. Project 243

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NOVA SCOTIA
Department of Energy

Andrew Younger
Minister

THIS IS NOT A BUILDING PERMIT

THIS PERMIT DOES NOT AUTHORIZE ANY CONSTRUCTION ACTIVITY

THIS PERMIT CERTIFIES COMPLIANCE WITH LAND USE BYLAW REQUIREMENTS ONLY, AND NO REVIEW WAS COMPLETED BY DEVELOPMENT ENGINEERING, THE HALIFAX REGIONAL WATER COMMISSION, THE BUILDING INSPECTOR, OR ANY OTHER AUTHORITY HAVING JURISDICTION.

PRIOR TO UNDERTAKING ANY CONSTRUCTION ACTIVITY, A BUILDING PERMIT IS REQUIRED TO CERTIFY COMPLIANCE WITH THE TECHNICAL REQUIREMENTS OF THE APPLICABLE BUILDING CODE REGULATIONS AND REQUIREMENTS OF THE ABOVE NOTED REVIEW AGENCIES.

DEVELOPMENT PERMIT — HRM File Number 136473

GRANTED TO

RESL LTD

Project Description

MISCELLANEOUS ACTIVITIES

Subject Property: PID #00384966

Property owner(s): DEAL EXCAVATING SERVICES LIMITED

APPROVAL CONDITIONS

LARGE SCALE (4 TURBINE) WIND FACILITY - RIVER ROAD, TERENCE BAY
ACCESS PERMIT FROM NS TRANSPORTATION & INFRASTRUCTURE MUST BE OBTAINED

This permit has been issued based on plans and specifications provided by the applicant. Any departure from the approved plans requires submission of revised plans and the approval of the Municipality in the form of a revised permit.

THIS DEVELOPMENT PERMIT EXPIRES 1 YEAR FROM THE DATE OF ISSUE.

ISSUING OFFICE

HALIFAX REGIONAL MUNICIPALITY

7071 Bayers Rd, Suite 2005,
Halifax, NS B3L 2C2
Tel: (902) 490-5650
Fax: (902) 490-4645

DATE OF ISSUANCE Tuesday, January 28, 2014

ISSUED BY SEAN AUDAS

SIGNATURE

APPENDIX B

ENERCON E92 Technical Description

Technical Description

ENERCON Wind energy converter
E-92 2.35 MW

ENERCON
ENERGY FOR THE WORLD

Legal notice

Publisher

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Table of contents

1 Overview of E-92 2.35 MW

The ENERCON E-92 wind energy converter is a direct-drive wind energy converter with a three-bladed rotor, active pitch control, variable speed operation, and a nominal power of 2350 kW. It has a rotor diameter of 92 m and can be supplied with hub heights of 78.00 m to 138.00 m.

Fig. 1: Complete view of ENERCON E-92

2 ENERCON wind energy converter concept

ENERCON wind energy converters are characterised by the following features:

Gearless

The E-92 drive system comprises very few rotating components. The rotor hub and the rotor of the annular generator are directly interconnected to form one solid unit. This reduces the mechanical strain and increases technical service life. Maintenance and service costs are reduced (fewer wearing parts, no gear oil change, etc.) and operating expenses also decrease. Since there are no gears or other fast rotating parts, the energy loss between generator and rotor as well as noise emissions are considerably reduced.

Active pitch control

Each of the three rotor blades is equipped with a pitch unit. Each pitch unit consists of an electrical drive, a control system, and a dedicated emergency power supply. The pitch units limit the rotor speed and the amount of power extracted from the wind. In this way, the maximum output of the E-92 can be accurately limited to nominal power, even at short notice. By pitching the rotor blades into the feathered position, the rotor is stopped without any strain on the drive train caused by the application of a mechanical brake.

Indirect grid connection

The power produced by the annular generator is fed into the distribution or transport grid via the ENERCON Grid Management System. The ENERCON Grid Management System, which consists of a rectifier, a DC link and a modular inverter system, ensures maximum energy yield with excellent power quality. The electrical properties of the annular generator are therefore irrelevant to the behaviour of the wind energy converter in the distribution or transport grid. Rotational speed, excitation, output voltage and output frequency of the annular generator may vary depending on the wind speed. In this way, the energy contained in the wind can be optimally exploited even in the partial load range.

3 E-92 components

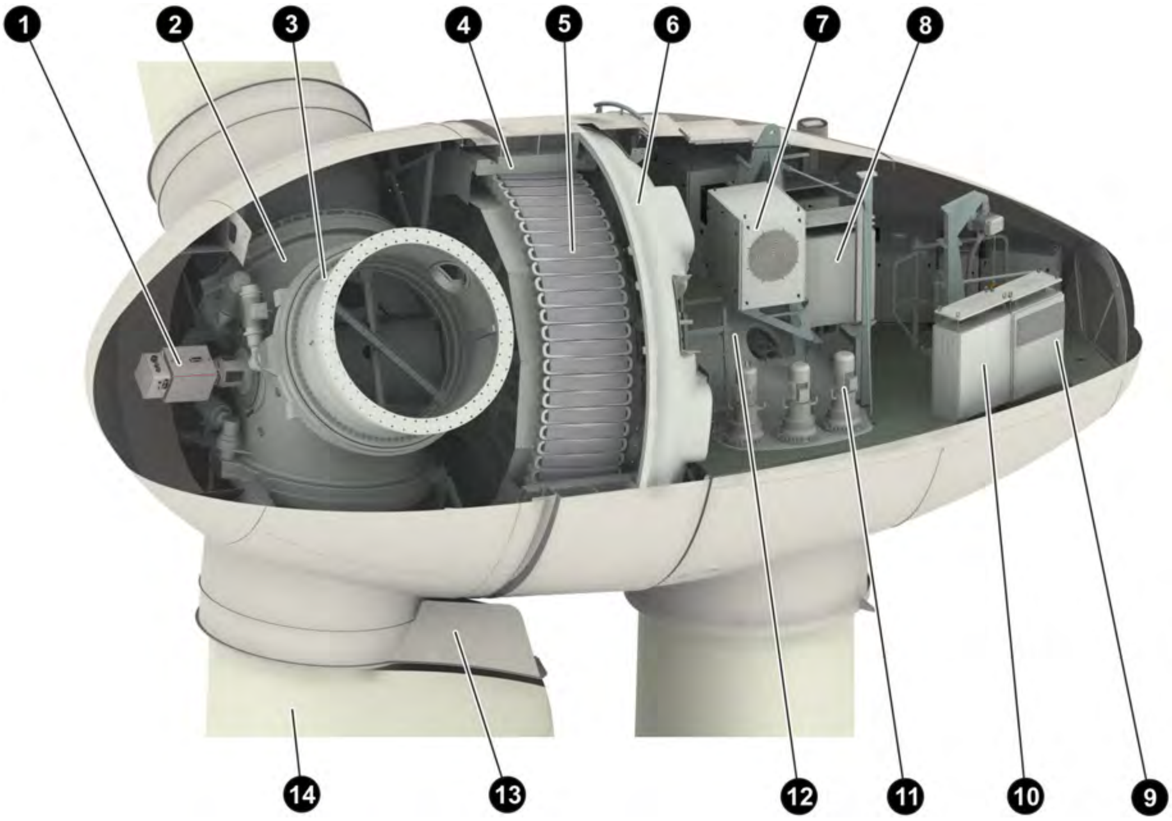


Fig. 2: View of ENERCON E-92 nacelle

1	Slip ring unit	8	Generator filter cabinet
2	Rotor hub	9	Excitation controller box
3	Blade adapter	10	Nacelle converter cabinet
4	Generator stator	11	Yaw drives
5	Generator rotor	12	Main carrier
6	Stator shield	13	Blade extension
7	Rectifier cabinet	14	Rotor blade

3.1 Rotor blades

The rotor blades made of glass-fibre reinforced plastic (glass fibre + epoxy resin) have a major influence on the wind energy converter's yield and its noise emission. The shape and profile of the E-92 rotor blades were designed with the following criteria in mind:

- High power coefficient
- Long service life
- Low noise emissions
- Low mechanical strain
- Efficient use of material

One special feature to be pointed out is the new rotor blade profile, which extends down to the nacelle. This design eliminates the loss of the inner air flow experienced with conventional rotor blades. In combination with the streamlined nacelle, utilisation of the wind supply is considerably optimised.

The rotor blades of the E-92 were specially designed to operate with variable pitch control and at variable speeds. The PU-based surface coating protects the rotor blades from environmental impacts such as UV radiation and erosion. This coating is highly resistant to abrasion and visco-hard.

Microprocessor-controlled pitch units that are independent of one another adjust each of the three rotor blades. An angle encoder in each rotor blade constantly monitors the set blade angle and ensures blade angle synchronisation across all three blades. This provides for quick, accurate adjustment of blade angles according to the prevailing wind conditions.

3.2 Nacelle

3.2.1 Annular generator

ENERCON wind energy converters (WECs) are equipped with a multi-polar, separately excited synchronous generator (annular generator). The WEC operates at variable speeds so as to optimally utilise the wind energy potential. The annular generator therefore produces alternating current with varying voltage, frequency and amplitude.

The windings in the stator of the annular generator form two three-phase alternating current systems that are independent of each other. Both systems are rectified independently of each other in the nacelle and combined by the direct-current distribution system. In the tower base the inverters reconvert the current into three-phase current whose voltage, frequency, and phase position conform to the grid.

Consequently, the annular generator is not directly connected to the receiving power grid of the utility/power supply company; instead, it is completely decoupled from the grid by the full-scale converter.

3.3 Tower

The tower of the E-92 wind energy converter is either a steel tower or a concrete tower made of precast segments. Towers with different heights are available.
All towers are painted and equipped with weather and corrosion protection at the factory. This means that no work is required in this regard after assembly except for repairing any defects or transport damage. By default, the bottom of the tower comes with graduated paintwork (can be dispensed with if desired).

Steel towers are steel tubes that taper linearly towards the top. They are prefabricated and consist of a small number of large sections. Flanges with drill holes for bolting are welded to the ends of the sections.

The tower sections are simply stacked on top of each other and bolted together at the installation site. They are linked to the foundation by means of a bolt cage.

The concrete tower is assembled from the precast concrete elements at the installation site. As a rule, segments are dry-stacked; however, a compensatory grout layer can be applied. Vertical joints are closed by means of bolt connections.

Towers are pre-tensioned vertically by means of prestressing steel tendons. The prestressing tendons run vertically either through ducts in the concrete elements or externally along the interior tower wall. They are anchored to the foundation.

For technical and financial reasons, the top slender part of the E-92 concrete tower is made of steel. For instance, installing the yaw bearing directly on the concrete elements is unfeasible, and the considerably thinner wall of the steel section provides for more space in the tower interior.

4 Grid Management System

The annular generator is coupled to the grid through the ENERCON Grid Management System. The main components of this system are a rectifier, a DC link, and several modular inverters.

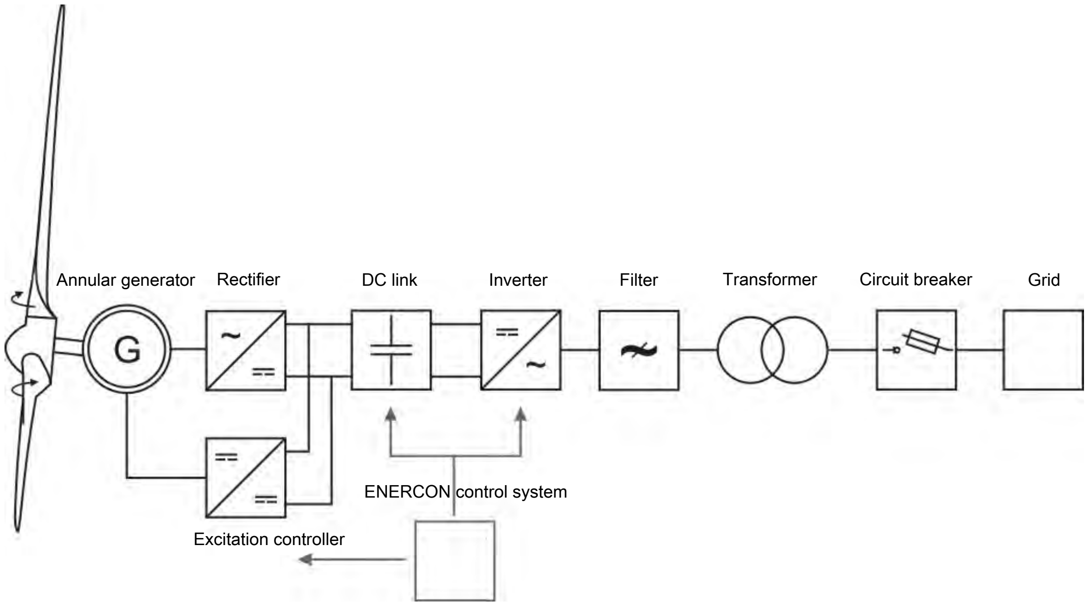


Fig. 3: Simplified electric diagram of ENERCON WEC

The Grid Management System, generator excitation and pitch control are all managed by the control system to achieve maximum energy yield and excellent power quality.

Decoupling the annular generator from the grid guarantees ideal power transmission conditions. Sudden changes in wind speed are translated into controlled change in order to maintain stable grid feed. Conversely, possible grid faults have virtually no effect on WEC mechanics. The power injected by the E-92 can be precisely regulated from 0 kW to 2350 kW.

In general, the features required for a certain wind energy converter or wind farm to be connected to the receiving power grid are predefined by the operator of that grid. To meet different requirements, ENERCON wind energy converters are available with different configurations.

The inverter system in the tower base is dimensioned according to the particular WEC configuration. As a rule, a transformer inside or near the wind energy converter converts 400 V low voltage to the desired medium voltage.

Reactive power

If necessary, an E-92 equipped with standard FACTS (Flexible AC Transmission System) control can supply reactive power in order to contribute to reactive power balance and to maintaining voltage levels in the grid. The maximum reactive power range is available at an output as low as 10 % of the nominal active power. The maximum reactive power range varies, depending on the WEC configuration.

FT configuration

By default, the E-92 comes equipped with FACTS technology that meets the stringent requirements of specific grid codes. It is able to ride through grid faults (undervoltage, overvoltage, automatic reclosing, etc.) of up to 5 seconds (FT = FACTS + FRT [Fault Ride Through]) and to remain connected to the grid during these faults.

If the voltage measured at the reference point exceeds a defined limit value, the ENERCON wind energy converter changes from normal operation to a specific fault operating mode.

Once the fault has been cleared, the wind energy converter returns to normal operation and feeds the available power into the grid. If the voltage does not return to the operating range admissible for normal operation within an adjustable time frame (5 seconds max.), the wind energy converter is disconnected from the grid.

While the system is riding through a grid fault, various fault modes using different grid feed strategies are available, including feeding in additional reactive current in the event of a fault. The control strategies include different options for setting fault types.

Selection of a suitable control strategy depends on specific grid code and project requirements that must be confirmed by the particular grid operator.

FTQ configuration

The FTQ configuration (FT plus Q+ option) comprises all features of the FT configuration. In addition, it has an extended reactive power range.

FTQS configuration

The FTQS configuration comprises all features of the FTQ configuration and has been expanded to include the STATCOM (Static Synchronous Compensator) option. The STATCOM option enables the wind energy converter to output and absorb reactive power regardless of whether it generates and feeds active power into the grid. It is thus able to actively support the power grid at any time, similar to a power plant.

Frequency protection

ENERCON wind energy converters can be used in grids with a nominal frequency of 50 Hz or 60 Hz.

The range of operation of the E-92 is defined by a lower and upper frequency limit value. Overfrequency and underfrequency events at the WEC reference point trigger frequency protection and cause the WEC to shut down after the maximum delay time of 60 seconds has elapsed.

Power-frequency control

If temporary overfrequency occurs as a result of a grid fault, ENERCON wind energy converters can reduce their power feed dynamically to contribute to restoring the balance between the generating and transmission networks.
As a pre-emptive measure, the active power feed of ENERCON wind energy converters can be limited during normal operation. During an underfrequency event, the power reserved by this limitation is made available to stabilise the frequency. The characteristics of this control system can be easily adapted to different specifications.

5 Safety system

The E-92 comes with a large number of safety features whose purpose is to permanently keep the WEC inside a safe operating range. In addition to components that ensure safe stopping of the wind energy converter, these include a complex sensor system. It continuously captures all relevant operating states of the wind energy converter and makes the relevant information available through the ENERCON SCADA remote monitoring system.

If any safety-relevant operating parameters are out of the permitted range, the WEC will continue running at limited power or it will stop.

5.1 Safety equipment

Emergency stop button

In an ENERCON wind energy converter there are emergency stop buttons next to the tower door, on the control cabinet in the tower base, on the nacelle control cabinet and, if required, on further levels of the E-module. Actuating an emergency stop button activates the rotor brake. Emergency pitching of the rotor blades takes place.

The following are still supplied with power:

- Rotor brake
- Beacon system components
- Lighting
- Sockets

Main switch

In an ENERCON wind energy converter, main switches are installed on the control cabinet and the nacelle control cabinet. When actuated, they de-energise virtually the entire wind energy converter.

The following are still supplied with power:

- Beacon system components
- Service hoist
- Sockets
- Lighting
- Medium-voltage area

5.2 Sensor system

A large number of sensors constantly monitor all safety-relevant mechanical and electrical assemblies of the ENERCON wind energy converter as well as all relevant ambient parameters (e.g. rotor speed, temperature, wind speed, blade load, vibrations).

During normal operation, the WEC control system regularly checks all sensors for proper function; where this is not possible, ENERCON Service performs this check in the course of WEC maintenance.

The major part of the sensors deployed is redundant. This redundancy enables a plausibility check by matching of the reported values. Thus, even after one sensor has failed, the wind energy converter can continue running safely until the defective sensor is replaced.

Speed monitoring

The control system of the ENERCON wind energy converter regulates the rotor speed by adjusting the blade angle such that the speed does not significantly exceed rated speed even during very high winds. However, pitch control may not be able to react quickly enough to sudden events such as strong gusts of wind or a sudden drop of the generator load. If the rated speed is exceeded by more than 15 %, the control system stops the rotor by means of emergency pitching. After three minutes, the wind energy converter automatically attempts to restart. If this fault occurs more than five times within 24 hours, the control system assumes a defect and does not attempt any further restarts.

In addition to the electronic monitoring system, an electromechanical overspeed switch is located inside or close to each of the three pitch control boxes. Each of these switches can stop the wind energy converter by means of an emergency shutdown. The switches respond if the rotor speed exceeds the rated speed by more than 25 %. To enable the wind energy converter to restart, the overspeed switches must be reset manually after the cause of the overspeed has been identified and eliminated.

Vibration monitoring

The vibration sensor serves to detect excessive vibrations and shocks such as might be caused by a malfunction in the rectifier. It is mounted on the bottom of the main carrier of the wind energy converter and consists of a limit switch with a spring rod that has a ball attached to one end by a chain. The ball sits on top of a short vertical pipe. In the event of strong vibrations, the ball falls from its seat on the pipe, activates the switch by pulling the chain and thereby initiates emergency pitching of the rotor blades that stops the rotor.

Air gap monitoring

Microswitches distributed along the rotor circumference monitor the width of the air gap between the rotor and the stator of the annular generator. If any of the switches is triggered because the distance has dropped below the minimum distance, the wind energy converter stops and restarts automatically after a brief delay.

If the fault recurs within 24 hours, the wind energy converter remains stopped until the cause has been eliminated.

Oscillation monitoring

Oscillation monitoring detects excessive oscillation or excursion of the wind energy converter tower top.

Two acceleration sensors detect the acceleration of the nacelle along the direction of the hub axis (longitudinal oscillation) and perpendicular to this axis (transverse oscillation). The WEC control system uses this input to continually calculate the tower excursion compared to its resting position. If the excursion exceeds the permissible limit, the wind energy converter stops. It restarts automatically after a short delay. The acceleration sensors are mounted on the same support as the vibration sensor. If multiple out-of-range tower oscillations are recorded within a 24-hour period, the wind energy converter does not attempt any further restarts.

Temperature monitoring

Temperature sensors continuously measure the temperature of WEC components that need to be protected from excessive heat.

In the event of excessive temperatures, the power output of the wind energy converter is reduced. If necessary, the WEC stops. The wind energy converter cools down and typically restarts automatically as soon as the temperature falls below a predefined limit.

Some measuring points are equipped with additional overtemperature switches. These also initiate a stop of the wind energy converter, however, without an automatic restart after cooling down.

At low temperatures, some assemblies such as the pitch system emergency power supply and the generator are heated in order to keep them operational.

Noise monitoring

Sensors located in the rotor head respond to loud knocking sounds such as might be caused by loose or defective components. If any of these sensors detects any noise and there is nothing to indicate a different cause, the wind energy converter stops.

In order to rule out exterior causes for the noise (mainly the impact of hail during a thunderstorm), the signals from all wind energy converters in a wind farm are matched against each other. If the sensors in multiple WECs are detecting noise at the same time, an exterior cause is assumed. The noise sensors are deactivated briefly so that none of the wind energy converters in the wind farm stops.

Cable untwisting

Once the nacelle has rotated more than twice but less than three times in one direction from its neutral position, the wind energy converter's control system uses the next opportunity to untwist the cables. As soon as the WEC stops due to lack of wind, the nacelle turns back by three full rotations. If no lack of wind occurs and the nacelle movement exceeds three rotations, the wind energy converter stops regardless of the wind speed and turns the nacelle back by four full rotations.

Once the cables have been untwisted the wind energy converter automatically resumes operation.

The cable twist sensors are located on the cable twist limit switch, which is installed on the gear rim of the yaw bearing. In addition, a right limit switch and a left limit switch are installed to signal whether the tolerance limit has been exceeded in either direction. If any of these limit switches is triggered, the wind energy converter stops and does not restart automatically because this condition indicates a fault in the WEC control system.

6 Control system

The E-92 control system is based on a microprocessor system developed by ENERCON and uses sensors to query all WEC components and collect data such as wind direction and wind speed. Using this information, it adjusts the operating mode of the E-92 accordingly. The WEC display of the control cabinet in the tower base shows the current status of the wind energy converter and any fault that may have occurred.

6.1 Yaw system

The yaw bearing with an externally geared rim is mounted on top of the tower. The yaw bearing allows the nacelle to rotate, thus providing for yaw control.

If the difference between the wind direction and the rotor axis direction exceeds the maximum permissible value, the yaw drives are activated and adjust the nacelle position according to the wind direction. The yaw motor control system ensures smooth starting and stopping of the yawing motion. The WEC control system monitors the yaw system. If it detects any irregularities it deactivates yaw control and stops the wind energy converter.

6.2 Pitch control

Functional principle

The pitch control system modifies the angle of attack, i.e., the angle at which the air flow meets the blade profile. Changes to the blade angle change the lift at the rotor blade and thus the force with which the rotor blade turns the rotor.

During normal operation (automatic mode) the blade angle is adjusted in a way that ensures optimal exploitation of the energy contained in the wind while avoiding overload of the wind energy converter. Wherever possible, boundary conditions such as noise optimisation are also fulfilled in the process. In addition, blade angle adjustment is used to decelerate the rotor aerodynamically.

If the wind energy converter achieves nominal power output and the wind speed continues to increase, the pitch system turns the rotor blades just far enough out of the wind to keep the rotor speed and the amount of energy extracted from the wind, i.e., the energy to be converted by the generator, within or just slightly above the rated limits.

Assembly

Each rotor blade is fitted with a pitch unit. The pitch unit consists of a pitch control box, a blade relay box, a pitch motor and a capacitor box. The pitch control box and the blade relay box control the pitch motor. The capacitor box stores the energy required for emergency pitching; during WEC operation, it is kept charged and tested continually.

Blade angle

Special rotor blade positions (blade angles) of the E-92:

A: 2.5°	Regular position during partial load operation: Maximum exploitation of available wind energy.
B: 60°	Idle mode (wind energy converter does not feed any power into the grid because the wind speed is too low): Depending on the wind speed, the rotor spins at low speed or stands still (if there is no wind at all).
C: 92°	Feathered position (rotor has been stopped manually or automatically): The rotor blades do not generate any lift even in the presence of wind; the rotor stands still or moves very slowly.

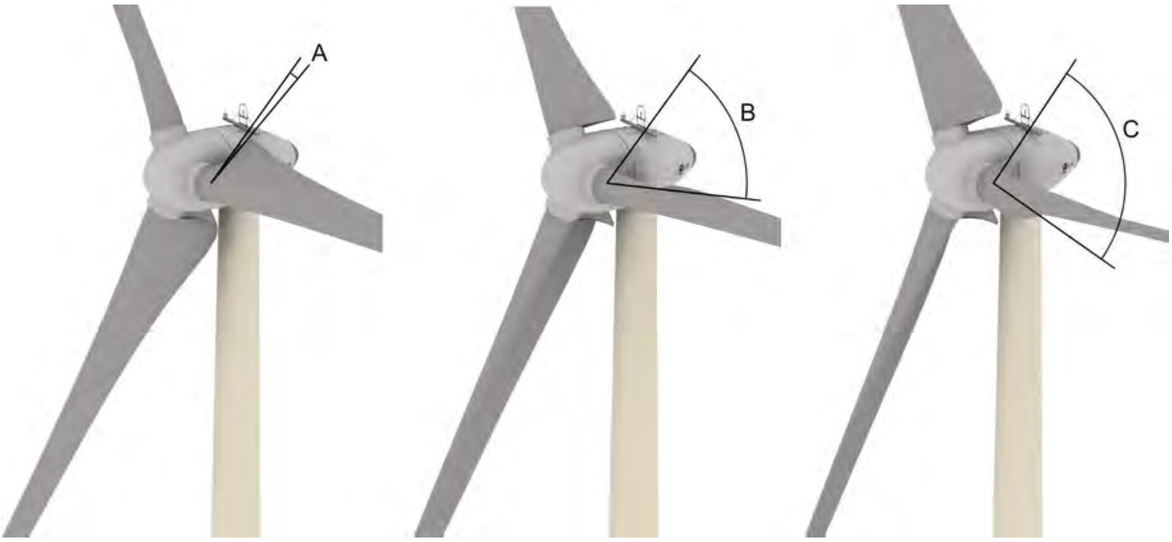


Fig. 4: Special blade positions

6.3 WEC start

6.3.1 Start lead-up

As long as the main status is > 0, the wind energy converter remains stopped. As soon as the main status changes to 0, the WEC is ready and the start-up procedure is initiated. If certain boundary conditions for start-up, e.g. charging of the emergency pitching capacitors, have not been fulfilled yet, status `0:3 - Start lead-up` is displayed.

During the start lead-up, a wind measurement and alignment phase of 150 seconds begins.

6.3.2 Wind measurement and nacelle alignment

After completing the start lead-up, status `0:2 - Turbine operational` is displayed.

If the control system is in automatic mode, the average wind speed is above 1.8 m/s and the wind direction deviation is sufficient for yawing, the WEC will start alignment with the prevailing wind direction. 60 seconds after completing the start lead-up the WEC goes into idle mode. The rotor blades are slowly pitched in as a check is performed on the emergency pitching capacitors.

If the WEC is equipped with load control sensors, the rotor blades will stop at an angle of 70° and adjust the load measurement points, which might take several minutes. During this time, status `0:5 - Calibration of load control` is displayed.

If the average wind speed during the wind measurement and alignment phase of 150 seconds is above the current start wind speed (about 2.0 m/s), the start-up procedure is initiated (status `0:1`). Otherwise, the wind energy converter remains in idle mode (status `2:1 - Lack of wind : Wind speed too low`).

Auxiliary power supply

As the wind energy converter does not supply any active power at that moment, the electrical energy consumed by the WEC is taken from the grid.

6.3.3 Generator excitation

Once the rotor reaches a certain rotational speed that depends on the WEC type (for instance, approx. 3 rpm with the E-82), generator excitation is initiated. The electricity required for this purpose is temporarily taken from the grid. Once the generator reaches a sufficient speed the WEC supplies itself with power. The electricity for self-excitation is then taken from the DC link; the energy taken from the grid is reduced to zero.

6.3.4 Power feed

As soon as the DC link voltage is sufficient and the excitation controller is no longer connected to the grid, power feed is initiated. After the rotational speed has increased due to sufficient wind and with a power setpoint $P_{set} > 0$, the line contactors on the low-voltage side are closed and the WEC starts feeding power into the grid.

The number of activated inverters is gradually increased, depending on the number necessary for the power generated by the generator. Power control regulates the excitation current so that power is fed according to the required power curve.

The power increase gradient (dP/dt) after a grid fault or a regular start-up can be defined within a certain range in the control system. For more detailed information, see the *Grid Performance* data sheet for the particular ENERCON WEC type.

6.4 Operating modes

After completion of the E-92 start-up procedure the wind energy converter switches to automatic mode (normal operation). While in operation, the WEC constantly monitors wind conditions, optimises rotor speed, generator excitation and generator power output, aligns the nacelle position with the wind direction, and captures all sensor statuses.

In order to optimise power generation in highly diverse wind conditions when in automatic mode, the WEC changes between three operating modes, depending on the wind speed. In certain circumstances the WEC stops if provided for by the WEC configuration (e.g. shadow shutdown). In addition, the utility company into whose grid the generated power is fed can be given the option to directly intervene in the operation of the wind energy converter by remote control, e.g. in order to temporarily reduce the power feed.

The E-92 switches between the following operating modes:

- Full load operation
- Partial load operation
- Idle mode

6.4.1 Full load operation

Wind speed
v ≥ 14 m/s

With wind speeds at and above the rated wind speed, the wind energy converter uses pitch control to maintain rotor speed at rated (approx. 16.5 rpm) and thus limits the power to its nominal value of 2350 kW.

Storm control enabled (normal case)

Storm control enables operation of the WEC even at very high wind speeds; however, the rotor speed and the power output are reduced.

If wind speeds exceed approx. 28 m/s (12-second average) and keep increasing, the rotational speed will be reduced linearly from 16.5 rpm to a low speed at about 34 m/s by pitching the rotor blades out of the wind accordingly. The power fed into the grid decreases in accordance with the speed/power curve in the process.

At wind speeds above 34 m/s (10-minute average) the rotor blades are almost in the feathered position. The WEC runs in idle mode and without any power output; it does, however, remain connected to the receiving grid. Once the wind speed falls below 34 m/s, the WEC restarts its power feed.

Storm control is activated by default and can only be deactivated by remote control or on site by ENERCON Service.

Storm control disabled

If, by way of exception, storm control is disabled, the wind energy converter will be stopped for safety reasons if the wind speed exceeds 25 m/s (3-minute average) or 30 m/s (15-second average). If none of the above events occurs within 10 minutes after stopping, the wind energy converter will be restarted automatically.

6.4.2 Partial load operation

Wind speed
2.5 m/s ≤ v < 14 m/s

During partial load operation (i.e., the wind speed is between the cut-in wind speed and the rated wind speed) the maximum possible power is extracted from the wind. Rotor speed and power output are determined by the current wind speed. Pitch control already starts as the WEC approaches full load operation so as to achieve a smooth transition.

6.4.3 Idle mode

Wind speed
v < 2.5 m/s

At wind speeds below 2.5 m/s no power can be fed into the grid. The wind energy converter runs in idle mode, i.e., the rotor blades are turned almost completely out of the wind (60° blade angle) and the rotor turns slowly or stops completely if there is no wind at all.

Slow movement (idling) puts less strain on the hub bearings than longer periods of complete standstill; in addition, the WEC can resume power generation and power feed more quickly as soon as the wind picks up.

6.5 Safe stopping of the wind energy converter

The ENERCON wind energy converter can be stopped by manual intervention or automatically by the control system.

The causes are divided into groups by risk.

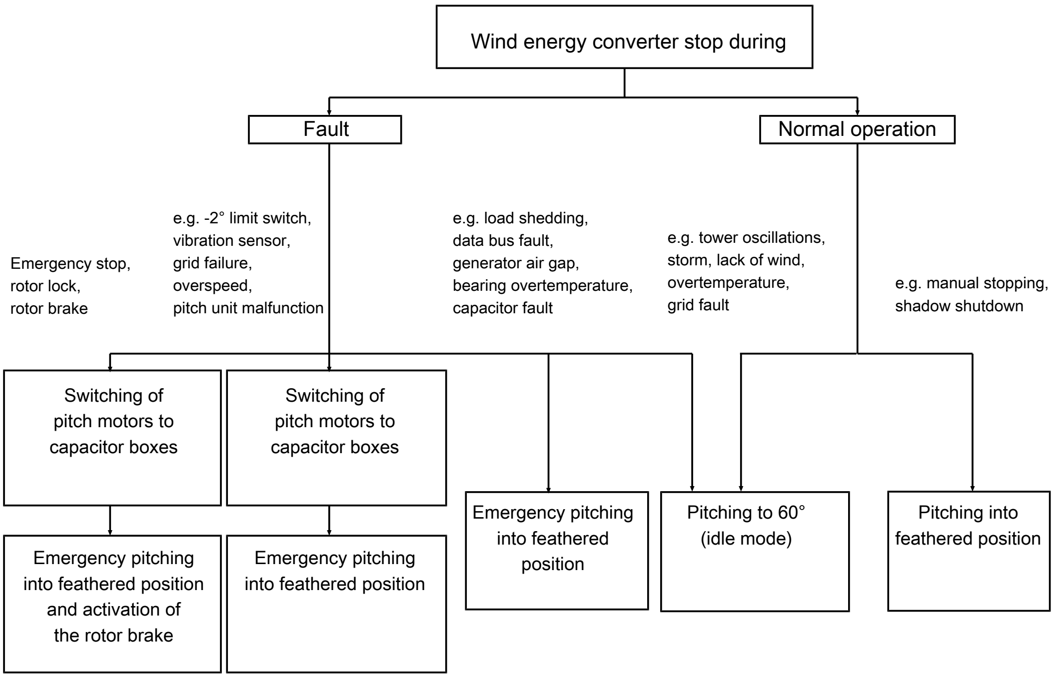


Fig. 5: Overview of stopping procedures

Stopping the wind energy converter by means of pitch control

In the event on a fault that is not safety-relevant, the WEC control system pitches the rotor blades out of the wind, causing the rotor of the wind energy converter to stop.

Emergency pitching

For emergency pitching, the pitch motors are supplied with power by the capacitor boxes. The rotor blades move automatically and independently of each other into a position in which they do not generate any lift; this is called the feathered position.

Since the three pitch units are interconnected but also operate independently of each other, if one component fails, the remaining pitch units can still function and stop the rotor.

Emergency braking

If a person presses an emergency stop button, or if the rotor lock is used while the rotor is turning, the control system initiates an emergency braking procedure.

This means that in addition to the emergency pitching of the rotor blades, the rotor brake is applied. The rotor is decelerated from rated speed to a standstill within 10 to 15 seconds.

7 Remote monitoring

By default, all ENERCON wind energy converters are equipped with the ENERCON SCADA (Supervisory Control And Data Acquisition) system that connects them to the ENERCON Service Center. The Service Center can retrieve each WEC's operating data at any time and instantly respond to any irregularities or malfunctions.

The ENERCON SCADA system also transmits all status messages to the ENERCON Service Center, where they are permanently stored. This ensures that the practical experience gained through the long-term operation of ENERCON wind energy converters is incorporated into their continued development.

Connection of the individual wind energy converters is through a dedicated personal computer (ENERCON SCADA wind farm server), which is typically located in one of the wind farm WECs or in the associated substation. There is one ENERCON SCADA wind farm server in every wind farm.

The ENERCON SCADA system, its properties and its operation are described in separate documentation.

At the operator/owner's request, monitoring of the wind energy converters can be performed by a third party.

8 Maintenance

In order to ensure the long-term safe and optimum operation of the wind energy converter, maintenance is required at regular intervals.

Frequency

One mechanical maintenance, one visual maintenance, one grease maintenance and one electrical maintenance are carried out per year. The maintenance activities are spread out over the year so that every wind energy converter is being serviced once per quarter. The first maintenance is carried out at 300 operating hours after commissioning.

Electrical maintenance

Electrical maintenance includes checks or tests of the following items:

- Sensors, detectors, measuring equipment, push buttons, switches, and fuses
- Shadow shutdown and noise optimisation (depending on equipment)
- Overspeed switch and emergency pitch system
- Transmission (depending on equipment)
- Accuracy of yaw angle and blade angle
- Start-up procedure and software version
- Release circuits and safety circuits
- Cables and connections
- Lightning protection and earthing

Mechanical maintenance

Mechanical maintenance includes checks or tests of the following items:

- Fasteners (in particular of rotor blades) and weld seams
- Tightening torques (300-h maintenance)
- Yaw gears and pitch gears
- Safety ladders
- Tower cooling system
- Load-bearing parts
- Rotor brake
- Rotor blades

Visual maintenance

During visual maintenance – as during the other maintenance activities – technicians check the wind energy converter carefully for damage (for example, damaged cables or rotor blades) and listen for unusual noises during operation (for example, noise from the bearings).

Grease maintenance

During grease maintenance, technicians additionally fill up or replace lubrication components, and apply lubrication to seals.

9 Technical specifications – E-92 2.35 MW

General	
Manufacturer	ENERCON GmbH Dreekamp 5 26605 Aurich, Germany
Type designation	E-92
Nominal power	2350 kW
Hub heights	78.3 m, 84.0 m, 84.6 m, 98.4 m, 104.0 m, 108.4 m, 138.4 m
Rotor diameter	92.0 m
IEC wind class (ed. 3)	IIA
Extreme wind speed at hub height (10-min. mean)	42.5 m/s
	Corresponds to a load equivalent of approx. 59.5 m/s (3 sec. gust)
Annual average wind speed at hub height	8.5 m/s

Rotor with pitch control	
Type	Upwind rotor with active pitch control
Rotational direction	Clockwise (downwind)
Number of rotor blades	3
Rotor blade length	43.8 m
Swept area	6647.6 m²
Rotor blade material	GRP / epoxy resin; w/ integrated lightning protection
Speed range	Variable; 5 to 17 rpm
Tip speed	up to 81.9 m/s
Cut-out wind speed	28–34 m/s (w/ optional ENERCON storm control)
Survival wind speed	59.5 m/s
Conical angle	0°
Rotor axis angle	5°
Pitch control	One independent pitch system per rotor blade with dedicated emergency power supply

Drive train with generator	
WEC concept	Gearless; variable speed; full-scale converter
Hub	Rigid
Storage	Double-row tapered / cylindrical roller bearing
Generator	Direct-drive ENERCON annular generator

Drive train with generator	
Grid feed	ENERCON inverters with high clock speed and sinusoidal current
IP degree of protection / Insulation class	IP 23 / F

Brake system	
Aerodynamic brake	Three independent pitch systems with emergency power supply
Rotor brake	Rotor lock, latching (10°)

Yaw control	
Type	Electrical motor control
Control	Active, via yaw gears

Control system	
Type	Microprocessor
Grid feed	ENERCON inverter
Remote monitoring system	ENERCON SCADA
UPS	integrated

Tower variants			
Hub height	Total height	Design	Wind class
78.3 m	124.3 m	Steel tower with foundation basket	IEC IIA
84.0 m	130.0 m	Precast concrete tower with steel section (external prestressing)	IEC IIA
84.6 m	130.6 m	Precast concrete tower with steel section	IEC IIA
84.6 m	130.6 m	Steel tower with foundation basket	IEC IIA
98.4 m	144.4 m	Precast concrete tower with steel section	IEC IIA
98.4 m	144.4 m	Precast concrete tower with steel section (external prestressing)	IEC IIA
104.0 m	150.0 m	Precast concrete tower with steel section	IEC IIA

Tower variants			
108.4 m	154.4 m	Precast concrete tower with steel section	IEC IIA
138.4 m	184.4 m	Precast concrete tower with steel section	IEC IIA

APPENDIX C

ENERCON E92 Foundation Construction Concept

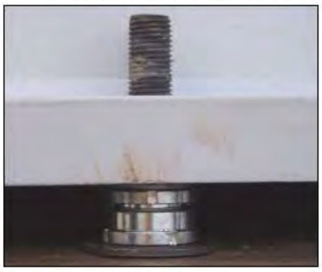
Bolt Cage foundation design

Erected and adjusted bolt cage

Foundation reinforcement with integrated bolt cage

Following inspection, the surface is covered with soil.

Placing the bottom tower segment



Compensation elements

Bolting the tower segment

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ENERCON CANADA INC.

APPENDIX D

ENERCON E92 Access Roads and Crane Platforms

Access Roads
&
Crane Platforms

E-92 84m and 98m Hub Height

Access road and crane pad construction including any construction outlined in this document must be in compliance with local laws and regulations including but not limited to the construction industry safety code in the province of Quebec.

In the event that any of the general specifications outlined in this document cannot be met, please consult the Enercon Project Manager in Charge or the General Manager of Enercon Canada inc in order to find an appropriate solution.

For Clarity mt stands for Metric Tonne.

1. Assembling the Tower and Wind Energy Converter

The tower and wind energy converter are installed in three stages (work steps):

Step 1
Preassembly of the first prefabricated concrete tower sections (supplied as half shells) in the location described in 6.2, with subsequent assembly on the foundation.
The 82 m prefabricated concrete tower consists of 5 half shells.
The 97 m prefabricated concrete tower consists of 8 half shells.

Step 2
Assembly of the remaining, one-piece, prefabricated concrete tower sections.

Step 3
Completion of the tower - achieved by assembling the top steel section, partial preassembly of the supplied converter components and subsequent assembly of the wind energy converter.

2. Crane technology

Details of crane technology

Crane availability is subject to change.
The following crane technology is typically used for the work steps described above:

	Step 1	**Step 2**		**Step 3**	
Typical Crane	GMK 6350	AC500-2	M16000	CC2800-1 WT	CC2800-1 NT
Crane type	300 mt telescopic	500 mt telescopic	500 mt lattice tower	800 mt lattice tower	800 mt lattice tower
Length	25 m	36 m	16 m	25.4 m (Boom up)	25.4 m (Boom up)
Width	3 m	3 m	8.84m	10.4 m	5 m (Clearance 8.25m outriggers up, 16.5m outriggers down)
Track width	-	-	1.52m	2 m	1.5 m
Supporting base	10 m x 10 m (Supports)	10 m x 10 m (Supports)	13 m X 13m (Mats)	13 m x 13 m (Mats)	13 m x 13 m (Mats)
Outreach	12 m	22 m	22 m	24 m	24 m
Weight	123 mt	170 mt	400 mt	360 mt	360 mt
Height	-	-	100m	120m	120m

Crane swing out radius can be larger than its length based on configuration.
Specifications exclude single blade erection which would require different crane technology.

2.2 Supporting Base Outreach

The **supporting base** for telescopic cranes describes the distance between the four support cylinders arranged in a square (in metres). For a Crawler, it describes the area of the mats that will distribute the cranes weight.

The **outreach** is the minimum distance between the crane hook and the slewing centreline.
Example: With a working radius of 24 m, the distance from the slewing centreline to the centre of the foundation would be at least 24 m.

2.3 Installing the lattice tower crane

The following work steps need to be performed:

- Drive crane into crane designated assembly area
- Move the assembled crane to position and align the crane with the centre of the WEC (taking into account the working radius)
- Use approx. 35 trucks to mobilize and demobilize the crane
- Support the crane on the crane platform using load distribution plates and
- Assemble jib

2.4 Assembling the jib

The individual jib (lattice tower and telescopic cranes in steps 2 and 3) components should be assembled across a span of 130 m with the aid of an auxiliary crane. It should then be installed. During this process, the auxiliary crane must be positioned to the side of the jib of the main crane. See Appendix A for crane pad layouts.
In order to facilitate consecutive assembly of the individual jib components, a stable roadway will be required for the auxiliary crane to travel along. You are advised to make use of the existing access road for the wind energy converter. If the existing access road is not suitable, a temporary roadway has to be constructed for the purpose of assembling the jib; this roadway has to be agreed with the competent ENERCON Project Manager on a case-by-case basis.

3. Access Roads

Access Roads must allow a fully assembled wide track or narrow track crane, depending on road width, to travel freely and without restriction from pad to subsequent pad within a sector of the wind farm.

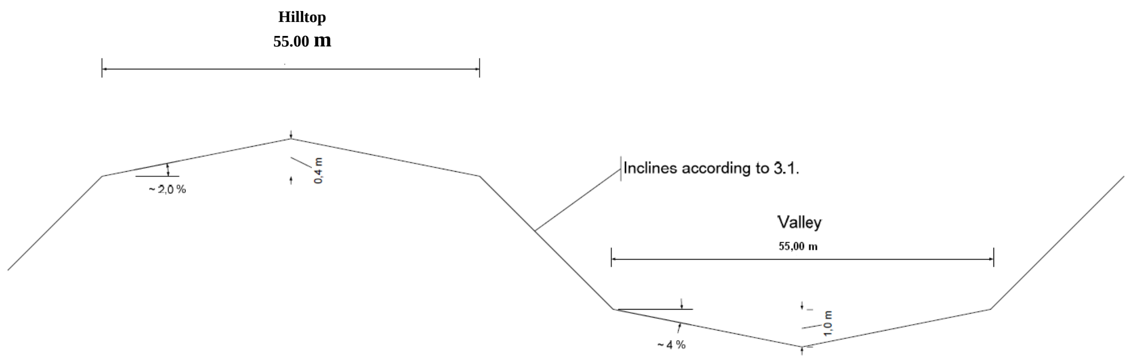
Access should be ensured at all times; access roads should be **frost-proof**. Even in case of heavy rainfall, access roads must be accessible and keep their bearing capacities. Minimum requirements are also applicable during winter.

In the event of snowfall and icing, the customer has to provide a gritting and snow clearance service during opening hours of the construction site as per the construction schedule to ensure accessibility of the roads. The customer will make available the service outside the opening hours at Enercon's expenses, upon request.

3.1 Minimum Requirements on Access Roads for Transport of Components, Crane Travel and Crane Assembly

Minimum permitted crane pad compaction	35mt/m^2
Minimum permitted compaction for crane area where assembled, on road	40mt/m^2
Useable access road width for jib assembly	18m
Useable access road width	11m
Clearance width for access road	12m
Clearance width access road in curves	See Appendix B
Maximum permitted incline with compact graveled surface on access road for trucks only (this does not apply to cranes walking or driving)	10 %
Maximum permitted incline with asphalt surface on access road for trucks only (this does not apply to cranes walking or driving)	15%
Useful width where crane is walking	11m
Clearance width in curves where crane is walking	See Appendix B
Clearance height , where crane is walking	120m
Maximum permitted Incline with compact graveled surface	7%
Maximum permitted Incline with paved surface	10 %
Maximum permitted Incline in curves with lateral incline	4%
Maximum permitted Cross gradient	1 deg
Ground clearance of transport vehicles	0.10m
General requirements:	
Truck Access Road Ability to withstand an axle load of up to	12mt
Ability to withstand an overall weight of up to xxx for crane assembled " walking "	400 mt
Ability to withstand an overall weight of up to xxx for Truck vehicles	165mt
Roadway width in curves, see 4.1 and Appendix B Curve Drawings	
No obstacles on inside/outside of curves	
Verification of carriageway bearing capacity	
Verification of bridge bearing capacity	
Verification of bearing capacity of culverts and pipework	
Verification of distances from Ditch, trenches, hollows and watercourses	
Verification of distances from high voltage/electrical/telephone cables	

Humps and Bumps on the Road



Excluding 2.4 jib assembly area which must be level.

3.2 Access road bearing capacity

The construction of the access roads has to be agreed with the geotechnical expert.

Their bearing capacity has to be proven and recorded by the geotechnical expert and results must be submitted to Enercon 6 months prior to Installation works.

During the construction phase inspections have to be carried out at appropriate distances and at regular intervals. The access road must be maintained continuously during the entire construction phase.

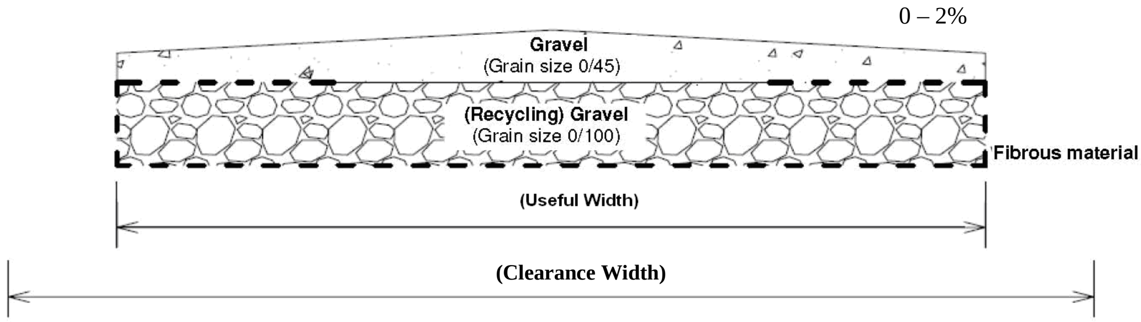
The interpretations and results must be forwarded to the Project Manager of ENERCON Canada in charge.

In case of cohesive soils, the use of a geotextile or geogrid is recommended, as this guarantees better distribution of the load to the access road’s subgrade. It will also increase the access road’s permanency and durability.

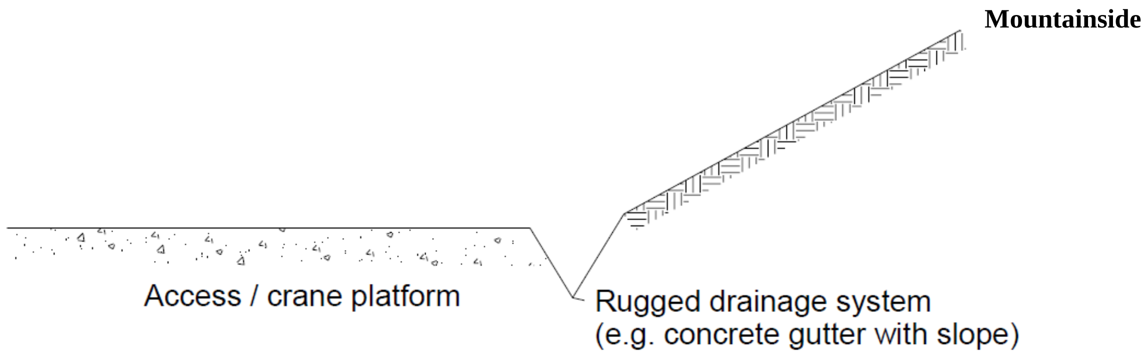
Data for geotechnical experts:

Natural ground	$E_{v2} \geq 45$ MPa
Substructure (e.g. sand)	$E_{v2} \geq 80$ MPa
Base / wearing course	$E_{v2} \geq 100$ MPa
Ratio E_{v2} / E_{v1}	≤ 2.2

3.3 Example of Access Road Construction

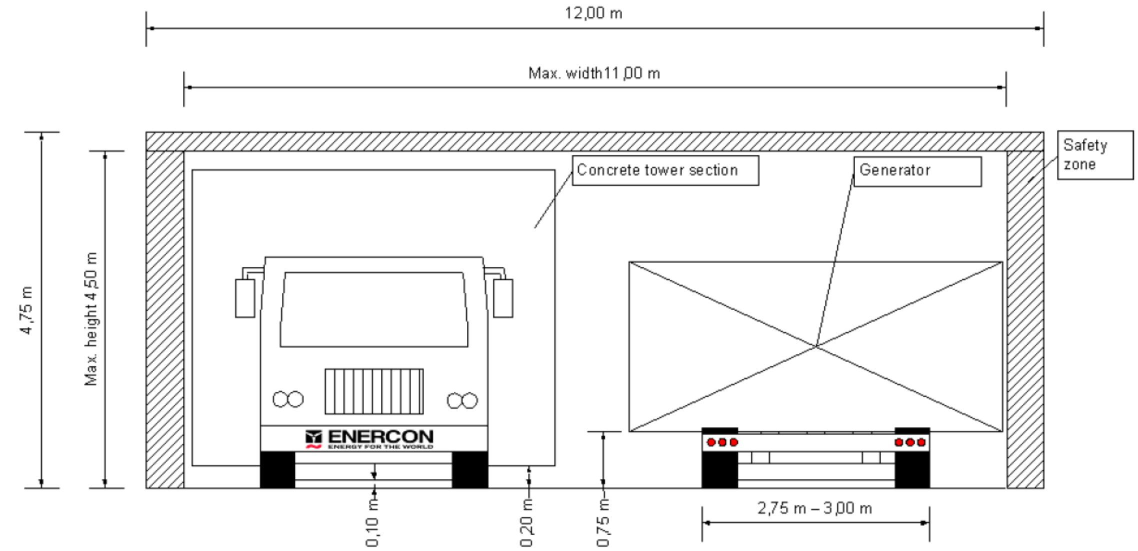


Notice:
The structure illustrated above is merely an example of average-grade load bearing soil. If the subsoil is soft (boggy soil, etc.), it might be necessary to use more backfill, install a geogrid and use gravel.

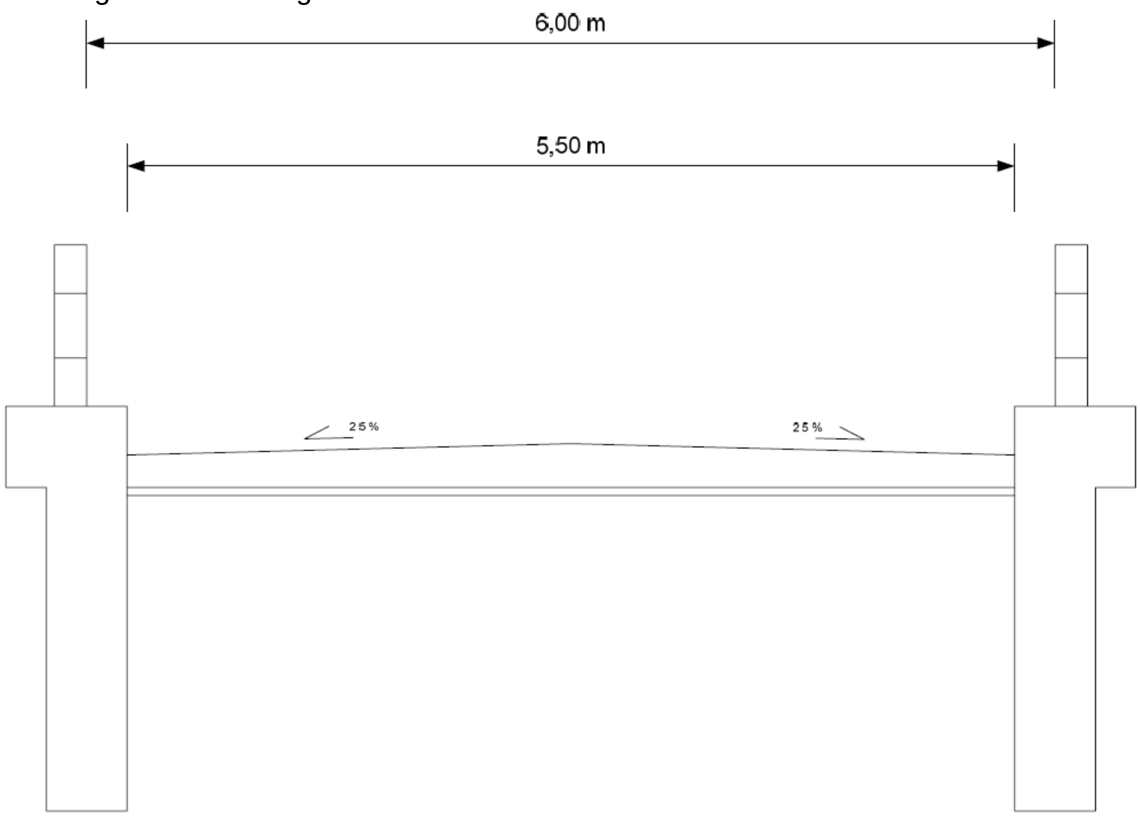


If access roads or crane platforms are constructed directly next to a mountain or slope, a rugged drainage system (e.g. concrete gutter, drainage pipe) must be installed at the edges of these surfaces. This drainage system is to prevent these surfaces from being flooded due to water flowing down the mountain slope during heavy rainfalls or due to snow and ice.

3.4 Transport Loading Gauge



For bridges the following minimum measurements are valid:



Bridge Specifications do not apply if cranes must travel over the bridge fully assembled.

4. Radii of Curves

4.1 Minimum Requirements on Intersections and Curves

In contrast to intersections, areas involving curves do not require the same degree of surfacing.

Intersections and Curves
See Appendix B for detailed turn sweeps of an E-92 rotor blade for different curve and intersection configurations.
The area indicated by the dotted pattern has to be clear of obstacles.
The hatched areas have to be compacted ground, as the transported load may overlap into these areas.

Curves
For roads with two or more subsequent curves, like S curves, a minimum straight distance of 55.00m between two curves must be insured.

5. Transport and Logistics

5.1 Basic Transport Requirements

The transport vehicles should not exceed the maximum axle load of 12mt. Thus, a transport vehicle with an actual overall weight of 165mt has at least 13 axles plus towing vehicle.

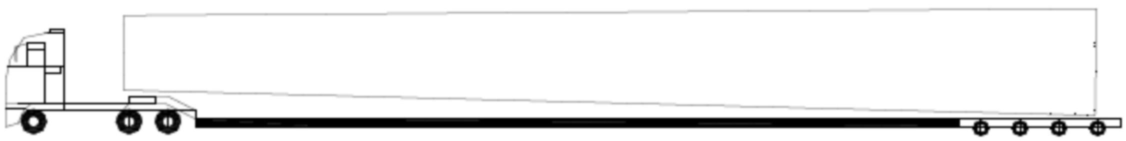
About 35 transport cycles are required to deliver the entire wind turbine, including the tower, to the construction site. The following vehicles are used on ENERCON construction sites:

- Lowloader trailers
- Flatbed trailers
- Semi trailers and
- Adapter vehicles

The vehicles are telescopic to some extent in terms of length and width, and can be shortened to regular length once they have been unloaded. Maximum vehicle length is 51m (rotor blade).

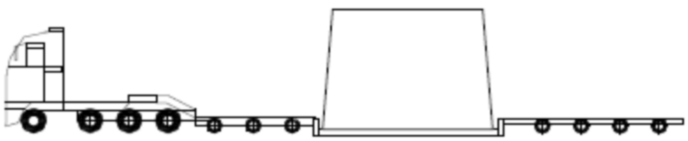
5.2 Overview of Transport Vehicles

Semi-LKW/ Semi-Platform Trailer – Stahlturmsektionen / Steel-Tower Sections



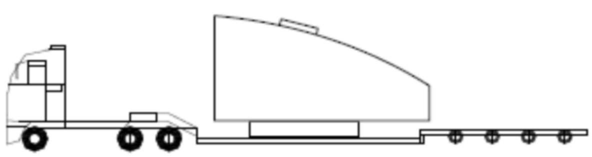
Adapter-Fahrzeug/ Adapter-Loader – Stahlturmsektionen / Steel-Tower Sections

Tiefbett-LKW / Low-bed Trailer – Fertigbetonteilturm / Concrete Tower Sections



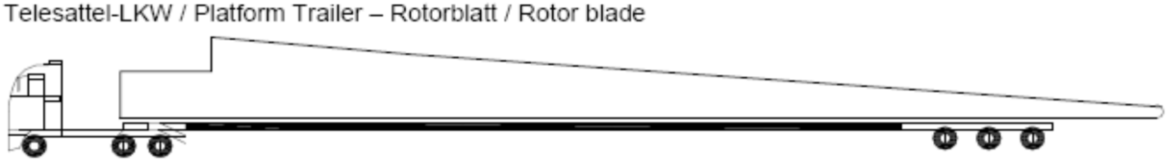
Semi-LKW / Semi-Platform Trailer – Generator / Generator

Tiefbett-LKW / Low-bed Trailer – Maschinenhaus / Nacelle



Tiefbett-LKW / Low-bed Trailer – Nabe / Hub

Telesattel-LKW / Platform Trailer – Rotorblatt / Rotor blade



6. Crane Platform

6.1 Minimum requirements on crane platforms

The crane platform is the key to ensuring a trouble-free, safe working process during the installation phase. For this reason, it has to be **permanent and frost-proof**.

Appendix A provides crane platform schematics.

The construction of the crane platform has to be agreed with the geotechnical expert. Its bearing capacity has to be proven and recorded by the geotechnical expert. This may be done by way of Plate Tests. During the construction phase inspections have to be carried out at appropriate distances and at regular intervals. The assessments and results must be forwarded to the ENERCON Project Manager in charge 6 months prior to the start of installation works.

In general, it should be a coarse-grained, **completely levelled surface** (**0° to max. +/- 0.15°)** with a top surface made from aggregate with a grain size of 0 – 45 mm.

The crane platform should be located above ground level to ensure that surface water is properly dispersed. The upper edge of the crane platform has to be located maximum 200mm below the foundation's upper edge. It is necessary to ensure a good **drainage on the crane platform.**

After completion of Step 2, the crane platform has to be re-worked to the original specification.

When crawler cranes must be assembled entirely on the access road, the access road beneath the crawler crane must be compacted to **40 mt/m^2**

During foundation construction, the crane platform may also serve as a storage area for materials (e.g. reinforcing steel) and machinery.

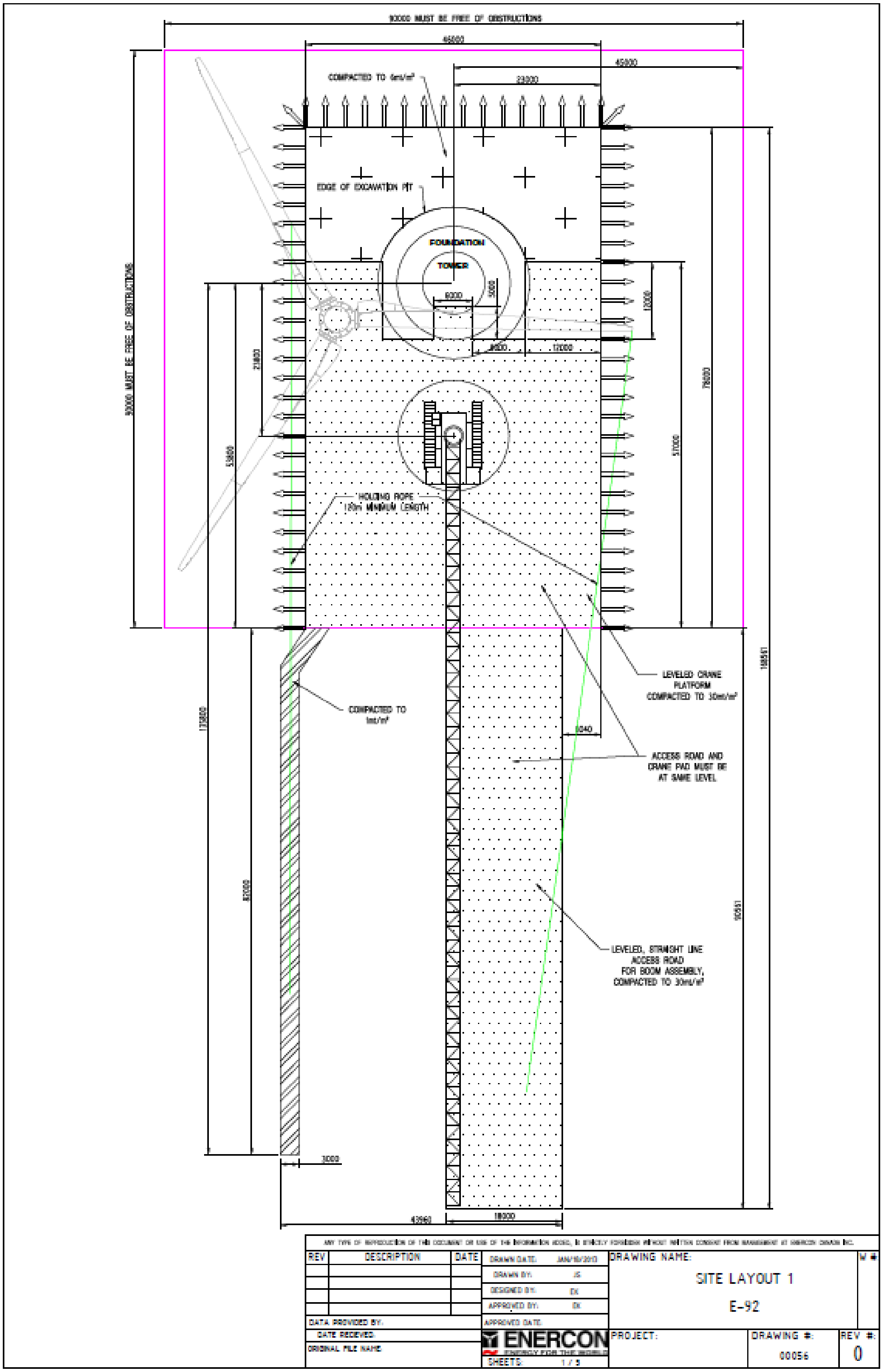
When constructing crane platforms near slopes, please contact the ENERCON Project Manager in charge. Special construction measures to erect the jib and further actions might be necessary. (Superlift equipment / suspended load).

The axes according to the foundation drawings (axis I (door), axes II-IV) have to be marked visibly on the foundation. This will be done by the ENERCON Project Manager in charge. In addition, marking rods have to be installed on the crane platform after completion of foundation construction. They have to be aligned with axes I-III at the end and the beginning of the crane platform. This way, the crane can be centred in a correct position in relation to the WEC.

Please pay special attention to the holding rope lines (indicated in green) as they are essential to the lift. The path on which the winch is positioned and operated must be clear of obstacles.

For cranes to travel from pad to pad, recent road bearing tests on roads and crane pads must be given to ENERCON no later than 3 days prior to commencement of crane travel. According to ACNOR-Z150, crane operators have the right to decide if the road conditions are safe for travel. If the roads require an upgrade the work must be completed prior to the start of crane travel. Updated tests must be performed and the results given to ENERCON. The tests must be performed by an accredited geotechnical expert registered in Quebec and must be signed by an engineer registered in Quebec.

Appendix A – Crane Platform Layouts


46000
45000
23000
COMPACTED TO 6mt/m²
EDGE OF EXCAVATION PIT
FOUNDATION
TOWER
HOLDING ROPE
120m MINIMUM LENGTH
COMPACTED TO
1mt/m²
LEVELED CRANE
PLATFORM
COMPACTED TO 30mt/m²
ACCESS ROAD AND
CRANE PAD MUST BE
AT SAME LEVEL
LEVELED, STRAIGHT LINE
ACCESS ROAD
FOR BOOM ASSEMBLY,
COMPACTED TO 30mt/m²
3000
18000
REV
DESCRIPTION
DATE
DATA PROVIDED BY:
DATE RECEIVED:
ORIGINAL FILE NAME:
DRAWING NAME:
SITE LAYOUT 1
E-92
PROJECT:
DRAWING #:
00056
REV #:
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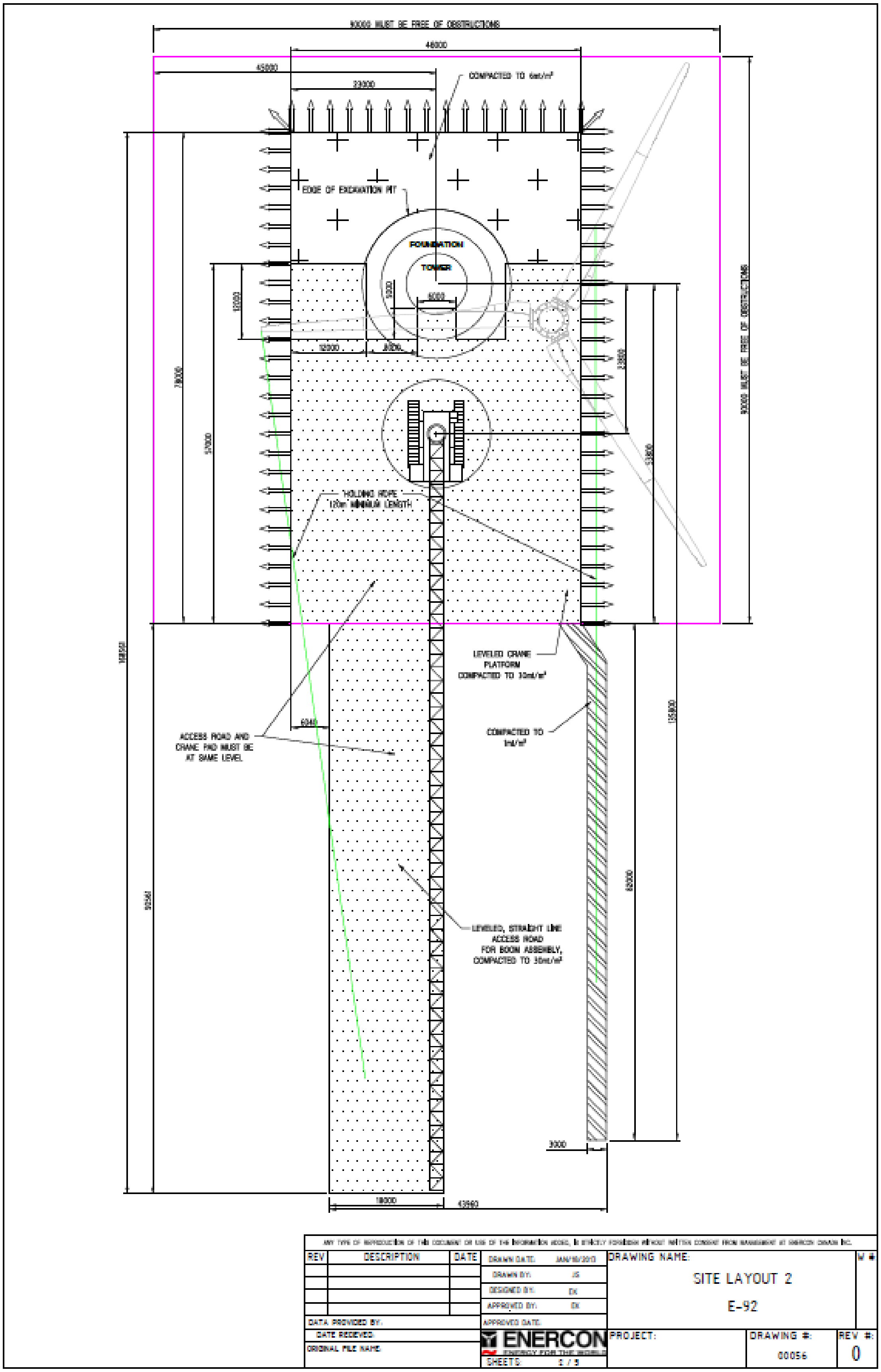
ENERCON
ENERGY FOR THE WORLD


90000 MUST BE FREE OF OBSTRUCTIONS
46000
45000
23000
COMPACTED TO 6mt/m²
EDGE OF EXCAVATION PIT
FOUNDATION
TOWER
HOLDING ROPE
120m MINIMUM LENGTH
LEVELED CRANE
PLATFORM
COMPACTED TO 30mt/m²
ACCESS ROAD AND
CRANE PAD MUST BE
AT SAME LEVEL
COMPACTED TO
1mt/m²
LEVELED, STRAIGHT LINE
ACCESS ROAD
FOR BOOM ASSEMBLY,
COMPACTED TO 30mt/m²
REV
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E-92
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ENERGY FOR THE WORLD
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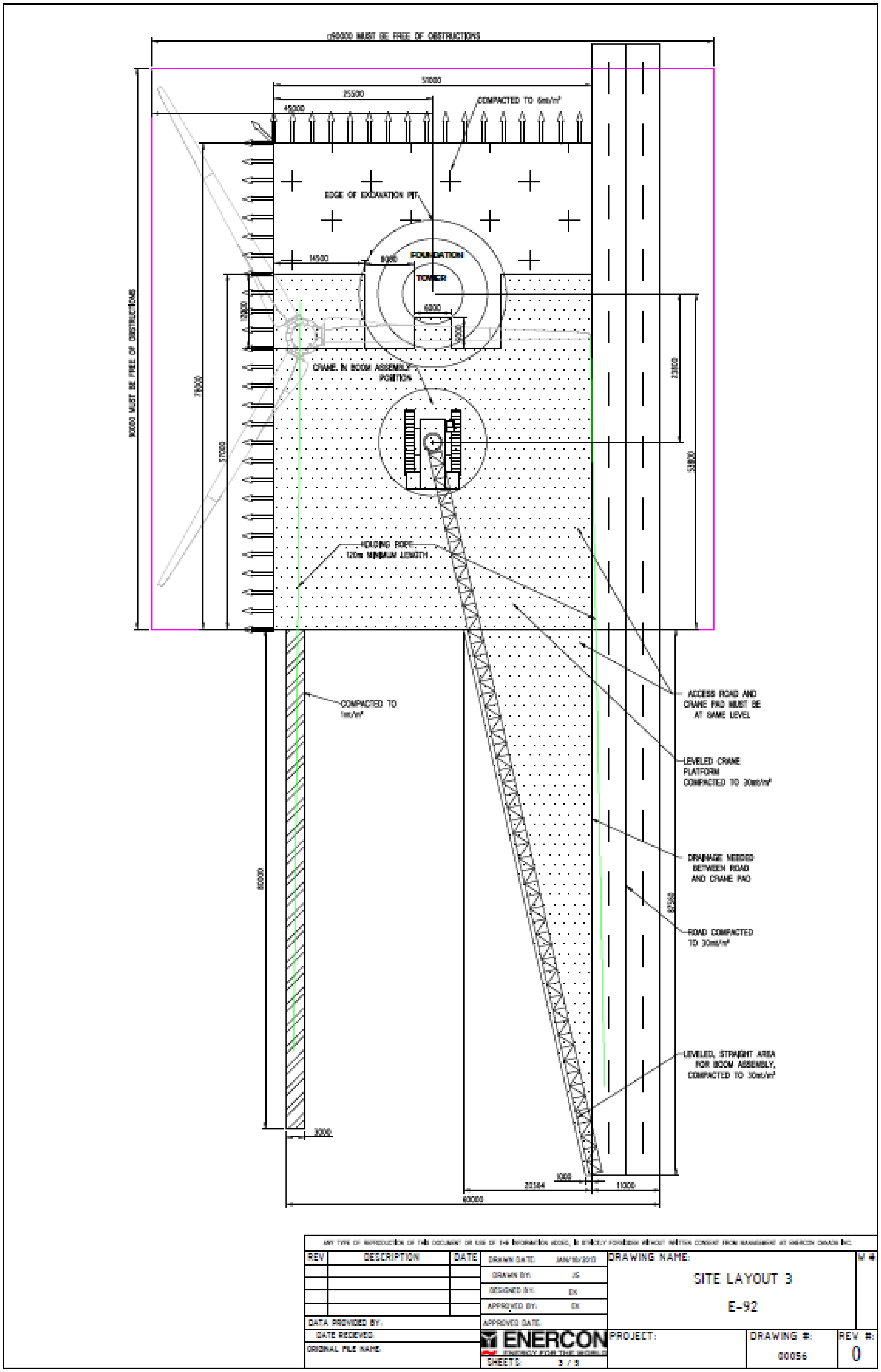
≥90000 MUST BE FREE OF OBSTRUCTIONS
51000
25500
45000
COMPACTED TO 6mt/m²
EDGE OF EXCAVATION PIT
14500
8000
FOUNDATION
TOWER
6800
12000
5000
CRANE IN BOOM ASSEMBLY POSITION
90000 MUST BE FREE OF OBSTRUCTIONS
78000
57000
23800
51800
HOLDING POINT, 120m MINIMUM LENGTH
ACCESS ROAD AND CRANE PAD MUST BE AT SAME LEVEL
COMPACTED TO 1mt/m²
LEVELED CRANE PLATFORM COMPACTED TO 30mt/m²
DRAINAGE NEEDED BETWEEN ROAD AND CRANE PAD
85000
ROAD COMPACTED TO 30mt/m²
LEVELED, STRAIGHT AREA FOR BOOM ASSEMBLY, COMPACTED TO 30mt/m²
3000
20584
11000
60000
REV
DESCRIPTION
DATE
DRAWN DATE: JAN/10/2013
DRAWN BY: JS
DESIGNED BY: DK
APPROVED BY: DK
APPROVED DATE:
DATA PROVIDED BY:
DATE RECEIVED:
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E-92
ENERCON
ENERGY FOR THE WORLD
SHEETS: 3 / 5
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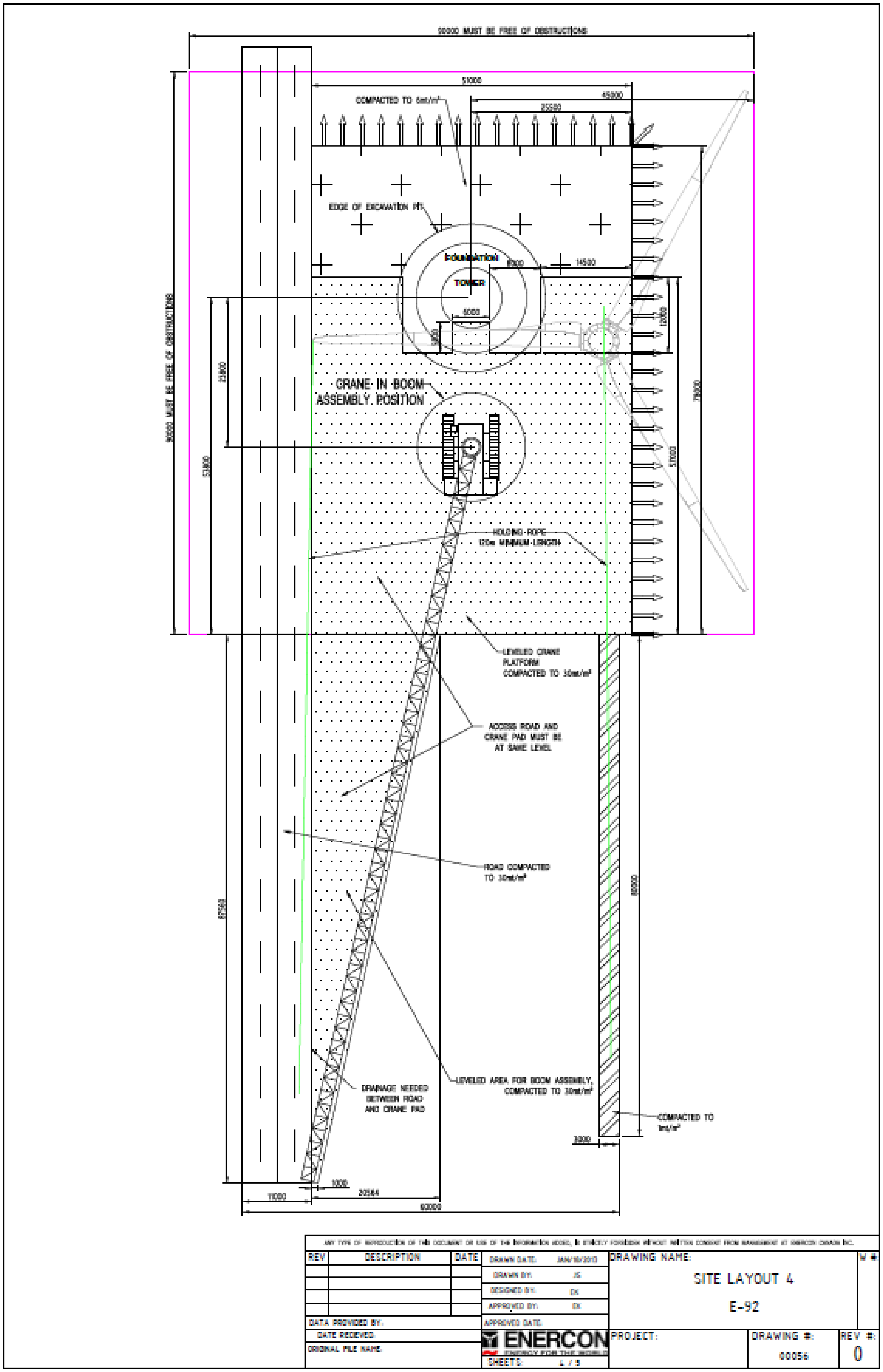
REV #: 0


90000 MUST BE FREE OF OBSTRUCTIONS
51000
45000
25500
EDGE OF EXCAVATION PIT
FOUNDATION
TOWER
14500
CRANE IN BOOM ASSEMBLY POSITION
HOLDING ROPE
120m MINIMUM LENGTH
LEVELED CRANE PLATFORM COMPACTED TO 30mt/m²
ACCESS ROAD AND CRANE PAD MUST BE AT SAME LEVEL
ROAD COMPACTED TO 30mt/m²
LEVELED AREA FOR BOOM ASSEMBLY, COMPACTED TO 30mt/m²
DRAINAGE NEEDED BETWEEN ROAD AND CRANE PAD
REV
DESCRIPTION
DATE
DRAWN DATE:
DRAWN BY:
DESIGNED BY:
APPROVED BY:
APPROVED DATE:
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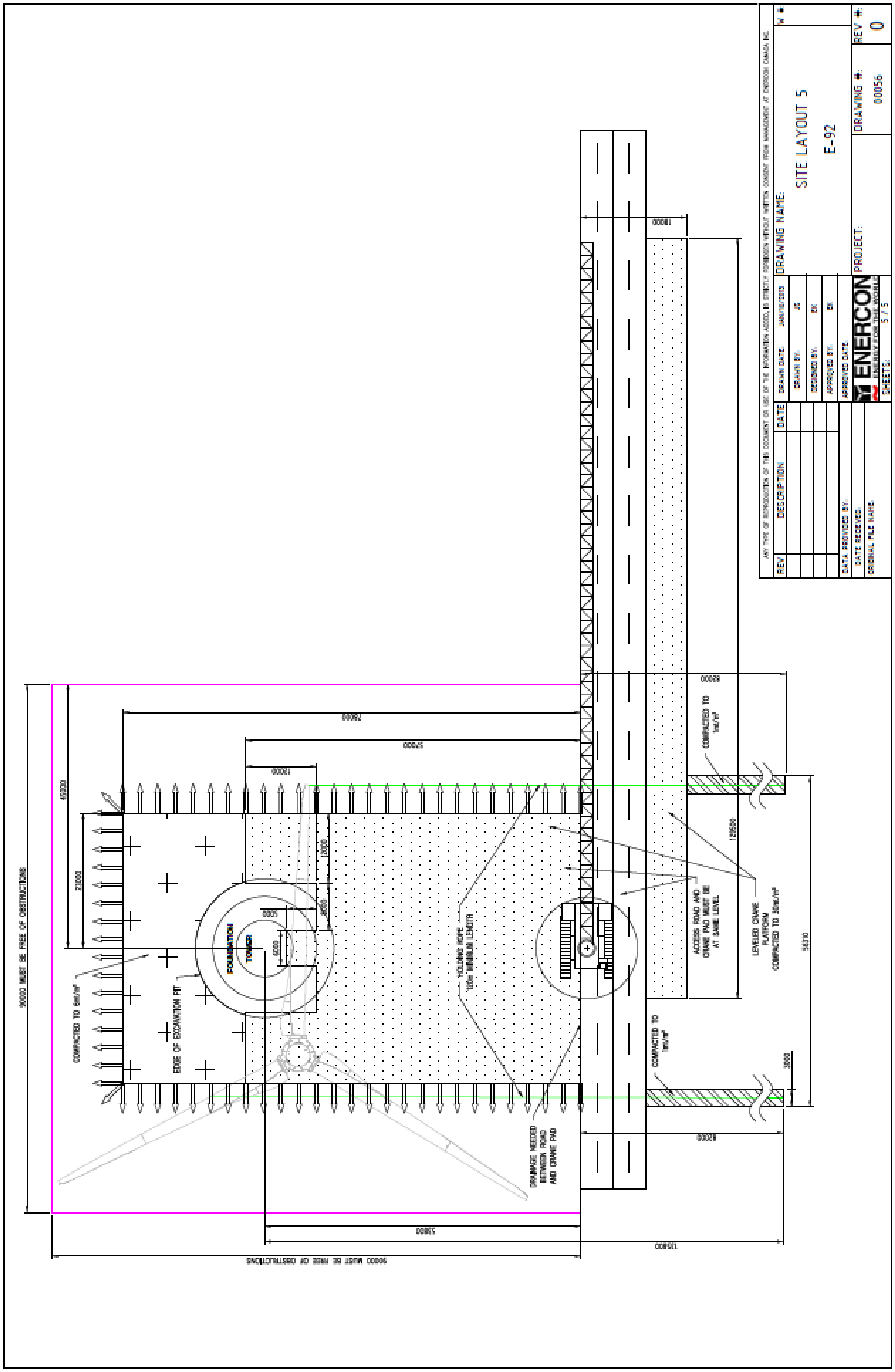
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SITE LAYOUT 5
E-92
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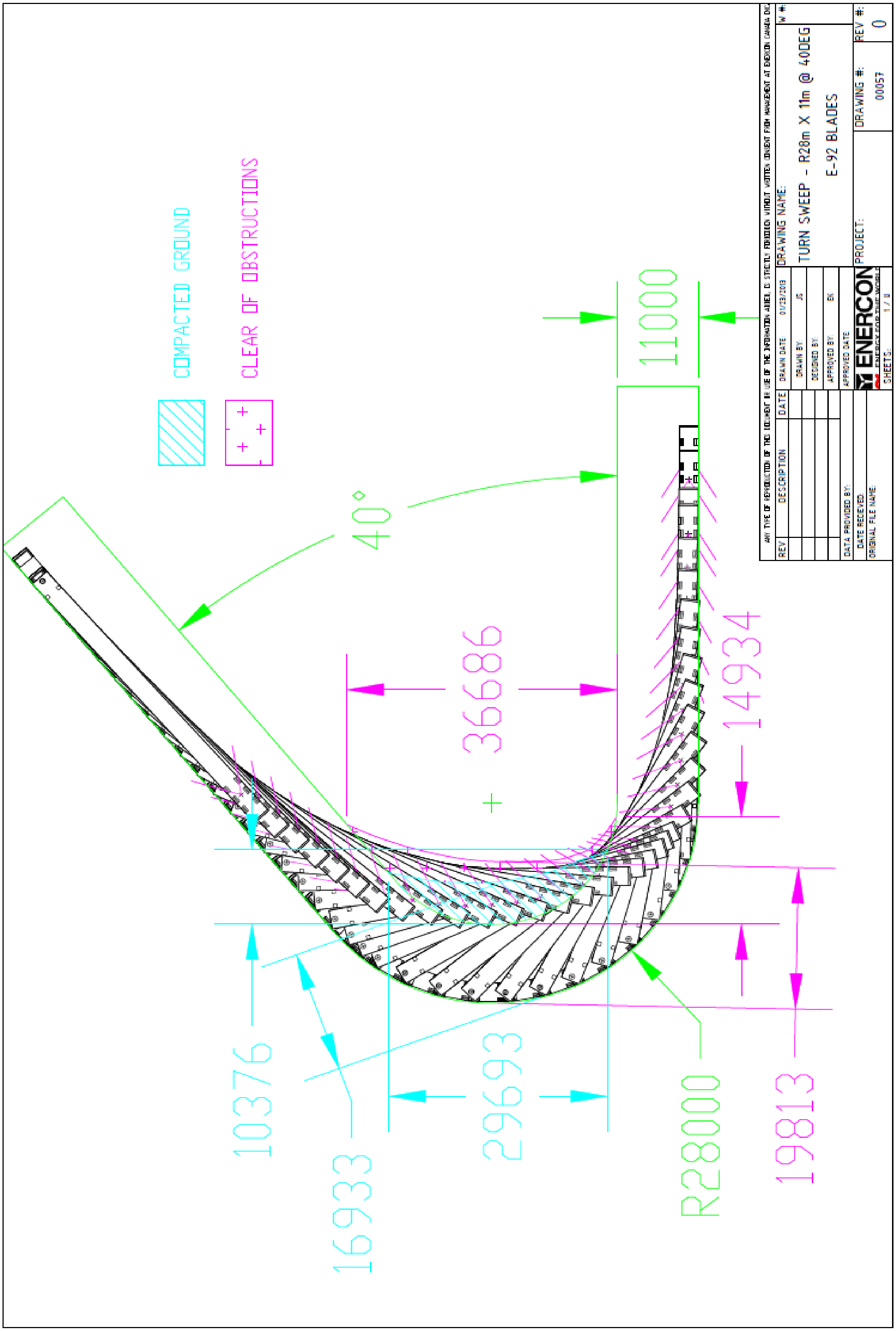
ENERCON

Appendix B – Road Curve Drawings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01/23/2013
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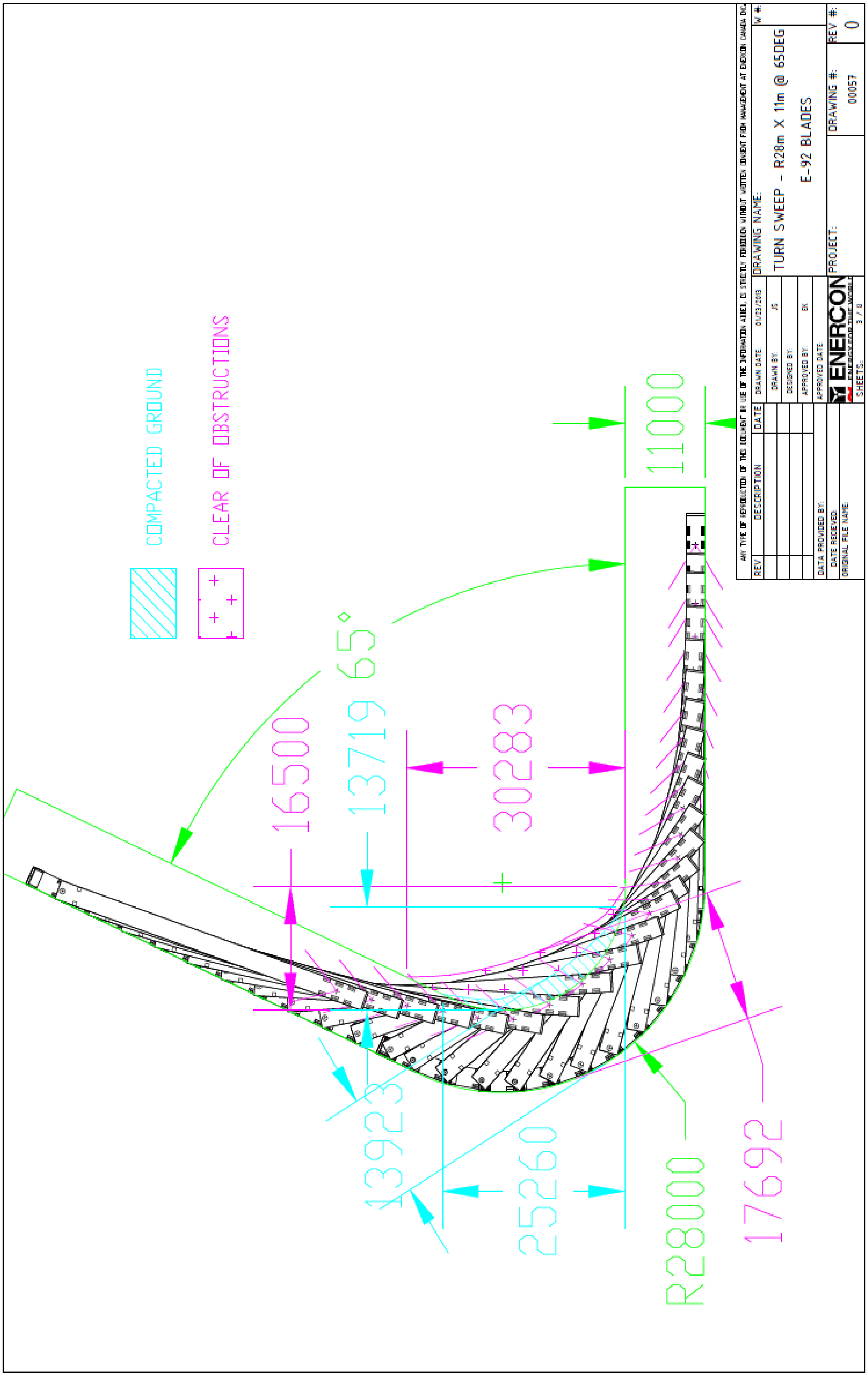
ENERCON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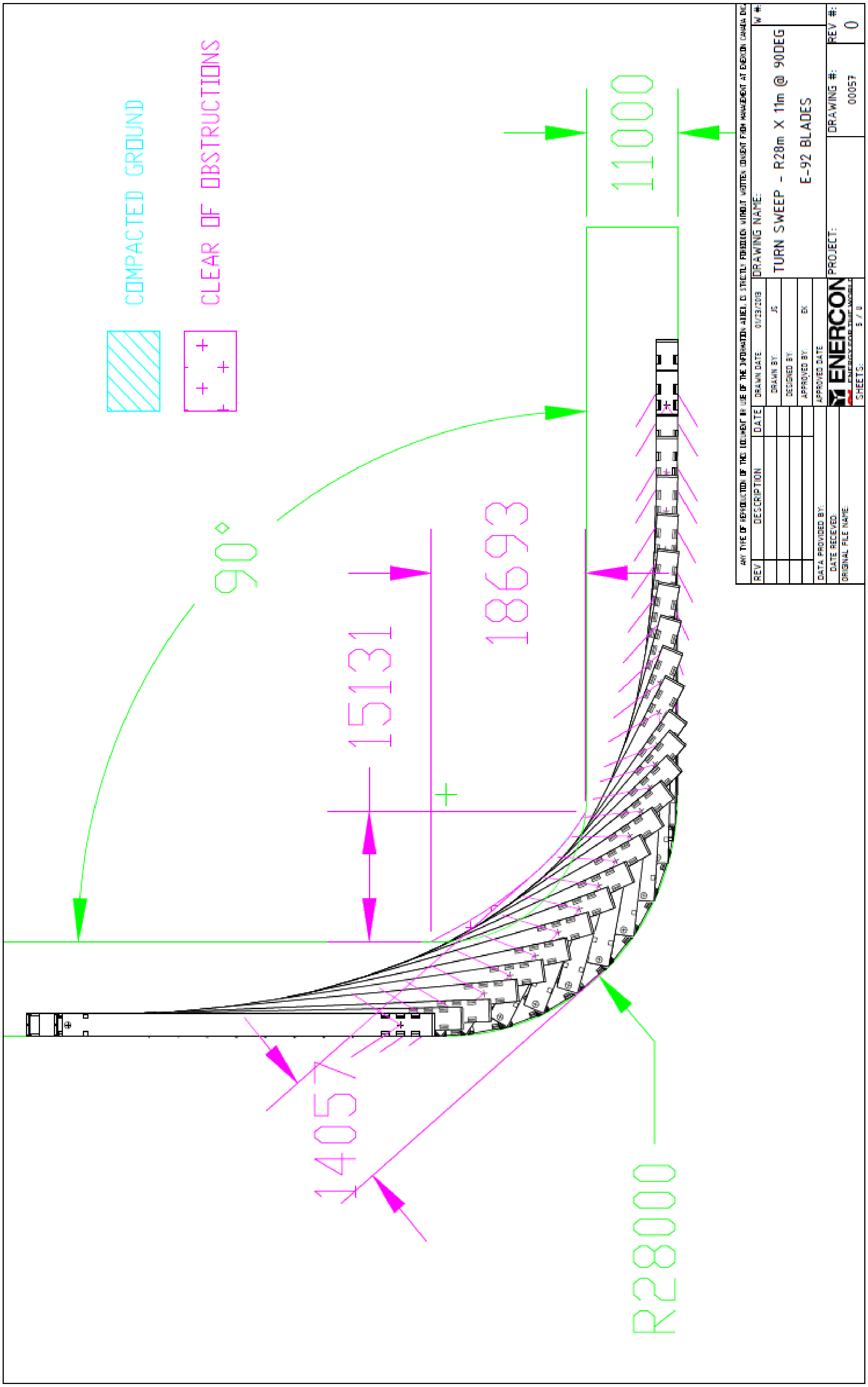
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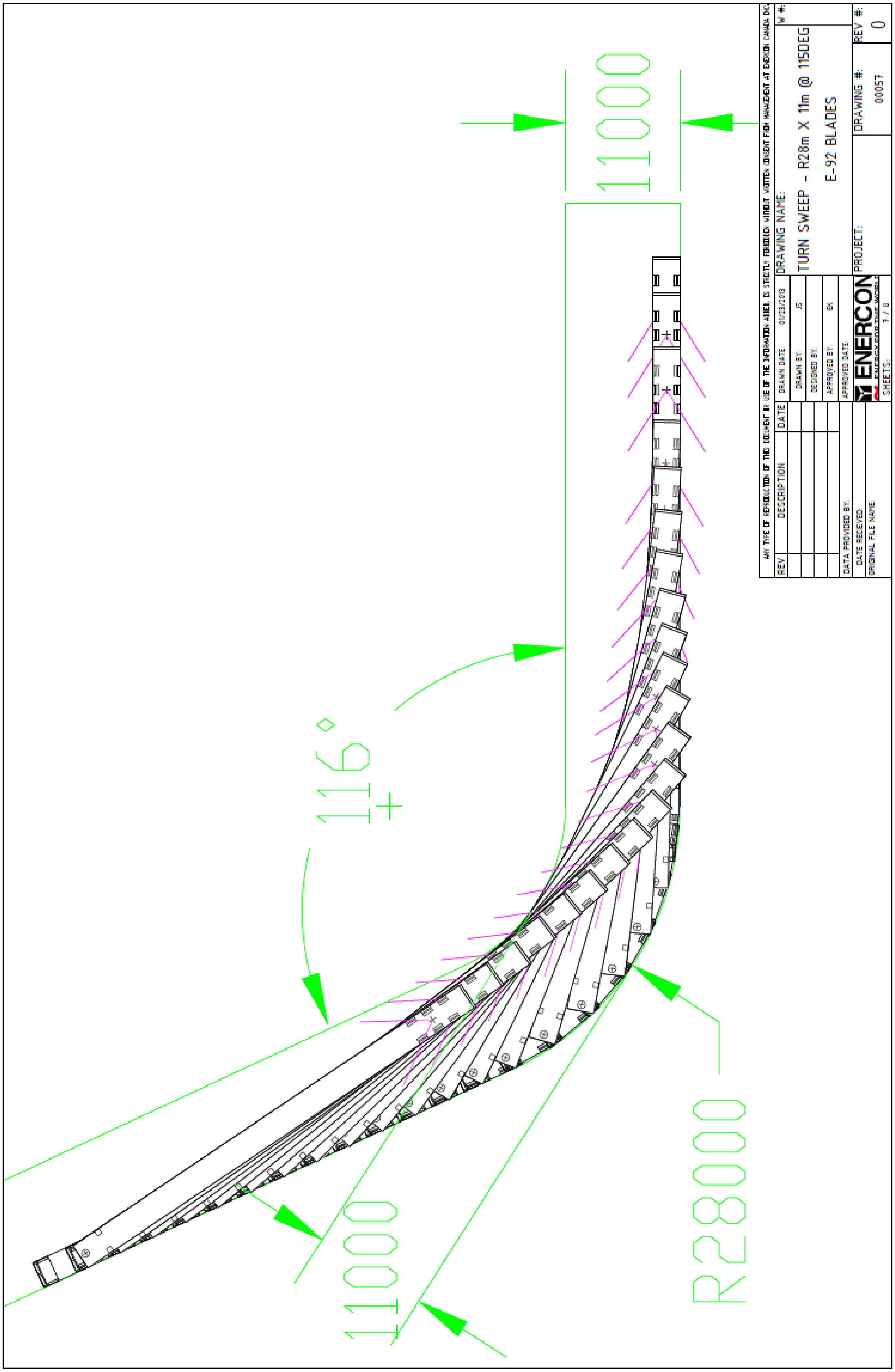
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ENERCON

APPENDIX E

ENERCON E92 Rotor Blade De-Icing System

Technical Description

ENERCON Wind energy converters
Rotor blade de-icing system
Operation in a running wind energy converter

ENERCON
ENERGY FOR THE WORLD

Legal notice

Publisher

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VAT ID no.: DE 181 977 360

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1 Introduction

Ice may form on the rotor blades of wind energy converters in specific weather conditions. Ice formation adversely affects the aerodynamic properties and hence the energy yield. With thick ice build-up there is also the risk of chunks of ice detaching, creating a safety hazard in the surroundings of the WEC. In addition, ice forming unevenly on the three rotor blades results in an imbalance that can cause undesirable oscillation.

ENERCON wind energy converters are equipped with a reliable ice detection system. Once ice formation is detected, wind energy converters without a rotor blade de-icing system are shut down. This results in yield losses.

In many cases, incipient ice build-up can be melted in WECs with a rotor blade de-icing system even with the WEC running. This significantly reduces downtimes.

ENERCON offers rotor blade de-icing by means of recirculating air for its E-44, E-48, E-53, E-70, E-82 and E-101 series of wind energy converters (E-92 under way). The system is described in this document.

2 Operating principle

A fan heater installed on additional webs near the blade flange (see Figure 1) heats up the air inside the rotor blades to a maximum of 72°C.

The interior of ENERCON rotor blades is subdivided by webs. These webs are used to guide a recirculating hot air stream passing through the rotor blade (Figure 2). From the fan heater, the heated air flows directly along the blade's leading edge profile to the blade tip and then back between the main webs to the blade flange. The returning air is then reheated and passed into the rotor blade. In this way the blade's leading edge profile is heated up to a point above freezing, allowing ice build-up on the blade to melt.

Each rotor blade is equipped with an individual rotor blade de-icing system.

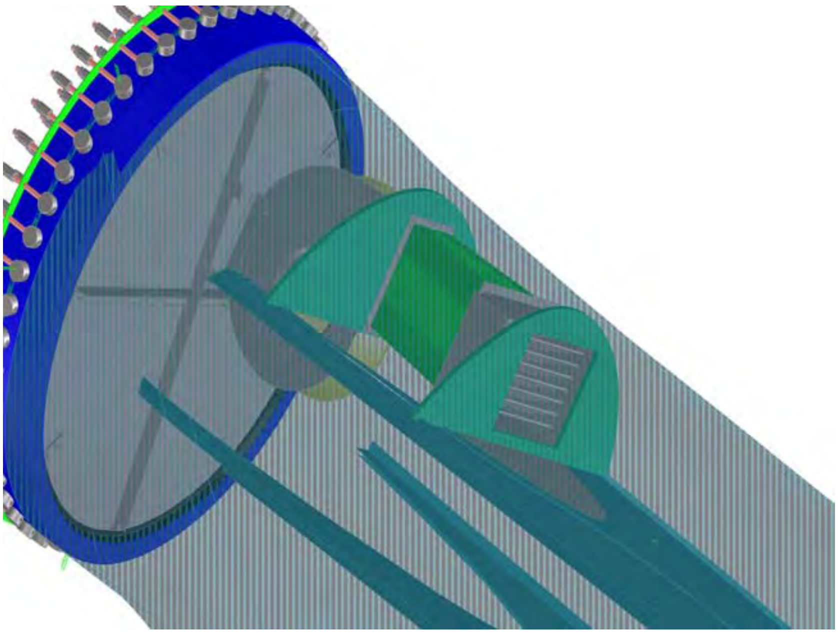

Fig. 1: Fan heater integrated into the rotor blade

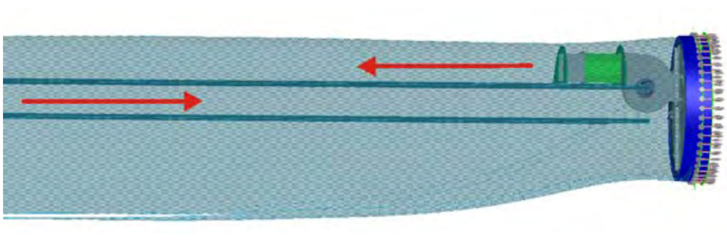

Fig. 2: Representation of air flow

Lightning protection The fan heater is earthed. The rotor blade shell and the GRP webs act as insulators that prevent arcing between the lightning conductor and the fan heater.

Power input The wind energy converter's own power consumption increases while the rotor blade de-icing system is active. Rated power (i.e., maximum power input) depends on the WEC type; please see table below.

WEC type	Rated power (per blade)
E-44, E-48, E-53	12.2 kW
E-70 E4	24 kW
E-82, E-82 E2, E-82 E3	29 kW
E-92	under development
E-101	81 kW (preliminary, under validation)

Power input can be capped. This requires appropriate adjustment of the WEC control system settings. However, reducing the power input will also reduce the efficiency of the rotor blade de-icing system.

Safety The rotor blade de-icing system serves to reduce downtimes caused by ice formation. However, while the rotor blade de-icing system is active, melting ice may detach and drop down from the rotor blades.

3 Operating modes

Automatic mode

In automatic mode the rotor blade de-icing system is activated with the WEC still running once ice formation is detected, provided that de-icing is permitted with the WEC still running. In this event the rotor blade de-icing system will be activated by a secondary ENERCON ice detection system with a narrower tolerance range. This will detect and melt even thin ice build-up at an early stage. If, in extreme weather conditions (e.g. freezing rain), ice build-up continues to grow despite activation of the rotor blade de-icing system, the wind energy converter will be stopped by the regular ENERCON ice detection system responding.

The rotor blade de-icing system will continue operating for another 20 minutes (shut-off delay) after the ice detection system no longer detects any icing.

The de-icing process will be repeated as soon as new ice build-up is detected.

Manual mode

Manual operation in a running WEC is also possible. In this event the rotor blade de-icing system must be activated manually. The rotor blade de-icing system will then operate for a previously defined period of time and shut off automatically afterwards.

Safety instructions

Activation of the rotor blade de-icing system in a running WEC at an early stage can significantly reduce ice-build-up. Nevertheless, ice build-up cannot be completely ruled out even if the heating system is activated at an early stage. The WEC may throw off ice that has been melted by the heating system.

The operator/owner will be liable for the consequences of any ice throw caused by rotor blade de-icing in a running WEC.

Technical Description

ENERCON Wind energy converters
Rotor blade de-icing system
Operation with wind energy converter at standstill

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ENERGY FOR THE WORLD

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1 Introduction

Ice may form on the rotor blades of wind energy converters in specific weather conditions. Ice formation adversely affects the aerodynamic properties and hence the energy yield. With thick ice build-up there is also the risk of chunks of ice detaching, creating a safety hazard in the surroundings of the WEC. In addition, ice forming unevenly on the three rotor blades results in an imbalance that can cause undesirable oscillation.

ENERCON wind energy converters are equipped with a reliable ice detection system. Once ice formation is detected, wind energy converters without a rotor blade de-icing system are shut down. This results in yield losses.

In WECs with a rotor blade de-icing system, downtimes are significantly reduced because heating the rotor blades melts the ice at an early stage and the WEC is operational much sooner.

ENERCON offers rotor blade de-icing by means of recirculating air for its E-44, E-48, E-53, E-70, E-82 and E-101 series of wind energy converters (E-92 under way). The system is described in this document.

2 Operating principle

A fan heater installed on additional webs near the blade flange (see Figure 1) heats up the air inside the rotor blades to a maximum of 72°C.

The interior of ENERCON rotor blades is subdivided by webs. These webs are used to guide a recirculating hot air stream passing through the rotor blade (Figure 2). From the fan heater, the heated air flows directly along the blade's leading edge profile to the blade tip and then back between the main webs to the blade flange. The returning air is then reheated and passed into the rotor blade. In this way the blade's leading edge profile is heated up to a point above freezing, allowing ice build-up on the blade to melt.

Each rotor blade is equipped with an individual rotor blade de-icing system.

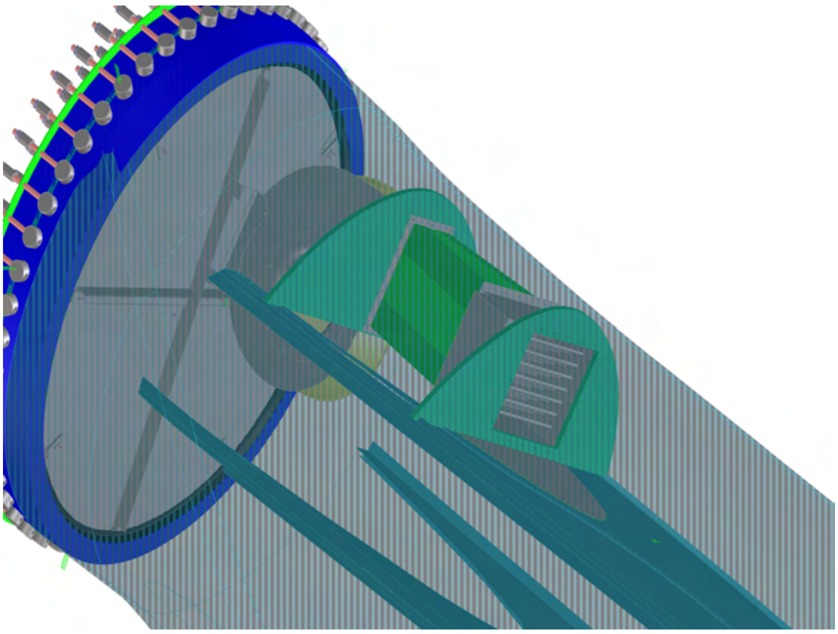

Fig. 1: Fan heater integrated into the rotor blade

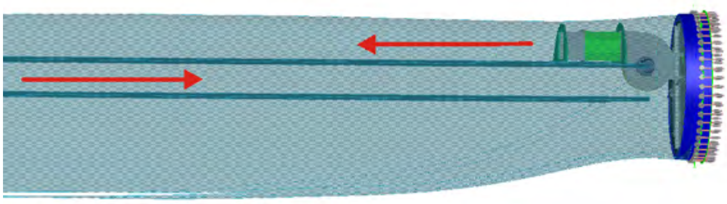

Fig. 2: Representation of air flow

Lightning protection

The fan heater is earthed. The rotor blade shell and the GRP webs act as insulators that prevent arcing between the lightning conductor and the fan heater.

Power input

The wind energy converter's own power consumption increases while the rotor blade de-icing system is active. Rated power (i.e., maximum power input) depends on the WEC type; please see table below.

WEC type	Rated power (per blade)
E-44, E-48, E-53	12.2 kW
E-70 E4	24 kW
E-82, E-82 E2, E-82 E3	29 kW
E-92	under development
E-101	81 kW (preliminary, under validation)

Power input can be capped. This requires appropriate adjustment of the WEC control system settings. However, reducing the power input will also reduce the efficiency of the rotor blade de-icing system.

Safety The rotor blade de-icing system serves to reduce downtimes caused by ice formation. However, while the rotor blade de-icing system is active, melting ice may detach and drop down from the rotor blades.

3 Operating modes

As a rule, the rotor blade de-icing system runs in automatic mode. However, it can also be activated manually.

Automatic mode

While in automatic mode, once the ENERCON ice detection system (power curve method) detects ice formation and the wind energy converter is shut down, the rotor blade de-icing system is automatically activated. The WEC starts up automatically after a heating period defined by means of the WEC’s control system. If ice is still detected on the rotor blades after the restart, the WEC will shut down again and initiate the de-icing process once more.

Since rotor blade de-icing is not intended for sites where potential ice throw causes a considerable safety hazard in the surrounding area, the de-icing system cannot be activated by means of the Labko sensor.

Automatic mode cannot be activated if the *Automatic restart after icing* function is disabled. This is typically the case in WECs at sensitive sites where automatic rotor blade de-icing is not permitted.

Manual mode

In manual mode the rotor blade de-icing system must be manually activated once ice formation has been detected. The rotor blade de-icing system is then in operation for a defined period of time. This period can be extended or shortened as required. After the heating period the wind energy converter will start up automatically if the *Automatic restart after icing* function is enabled.

Safety instructions

While the rotor blade de-icing system is active, melting ice may detach and drop down from the rotor blades. Persons must therefore either remain inside the tower or keep a safe distance from the WEC while the rotor blade de-icing system is on and for some time afterwards.

APPENDIX F

ENERCON E92 Lightning Protection

Technical Description

ENERCON Wind Energy Converters
Lightning Protection

ENERCON
ENERGY FOR THE WORLD

Legal notice

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Table of contents

1 General information

Lightning strikes can set parts of buildings on fire and destroy them. In addition, conductive connections or induction can transmit the strong electric currents into the interior of the building where they can cause further damage. Due to their exposed locations, wind energy converters are particularly at risk.

In order to prevent damage from lightning strikes and to ensure safe operation, all ENERCON wind energy converters are fitted with a lightning protection system. It conducts the lightning current from the rotor blades or top of the nacelle into the ground.

The following provides an overview of the design and functionality of the lightning protection systems in ENERCON wind energy converters.

External lightning protection

External lightning protection includes all measures aimed at preventing damage to the wind energy converter from lightning strikes. Lightning rods on the rotor blades, down conductors, an earthing system and WEC-specific metal components are part of the external lightning protection system. The external lightning protection system also reduces the interference fields created by the lightning current inside the wind energy converter. No significant partial lightning currents can enter the structure.

Internal lightning protection

Additional measures have been implemented to protect the electrical and electronic equipment inside the WEC. These are referred to as the internal lightning protection. This includes an equipotential bonding system as well as various surge protection devices (SPD).

Lightning protection level (LPL)

The LPL is rated on a scale from IV (low) to I (high). With a probability of 99 %, no lightning current will exceed the maximum parameter values defined for LPL I. All ENERCON wind energy converters are designed for LPL I.

2 External lightning protection

2.1 Rotor blade

The rotor blades of the ENERCON wind energy converter have a built-in lightning protection system that transmits the lightning current safely from the lightning strike at the lightning rod via various lightning conductors to the nacelle.

The lightning protection system of the rotor blade comprises the following elements:

- Rotor blade tip made from cast aluminium (conductive)
- Lightning rod (copper, 50 mm²; or aluminium, 40 mm x 3 mm)
- Metal receptors (where needed)
- Discharge ring at blade joint (E-44 to E-115)
- Steel part of rotor blade (E-126)

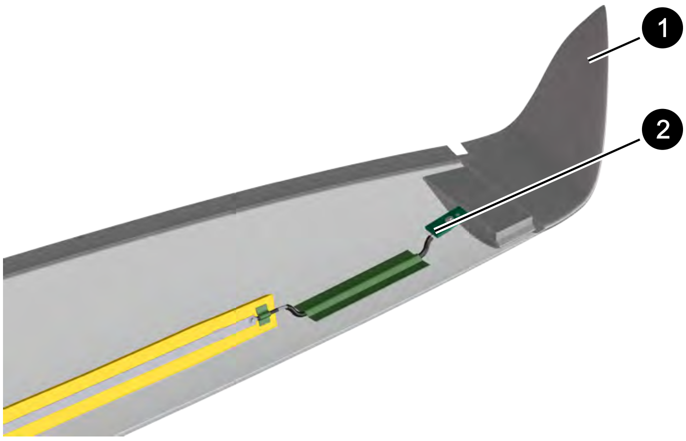

Fig. 1: Rotor blade tip (E-101)

1	Rotor blade tip made from cast aluminium	2	Connection to lightning conductor

The rotor blade tip made from cast aluminium is conductive. A lightning conductor connects it to the discharge ring at the blade root (E-44 to E-115) or to the steel part of the rotor blade (E-126). The distance between the discharge ring and the conductive parts near the blade joint is large enough to prevent flashovers.

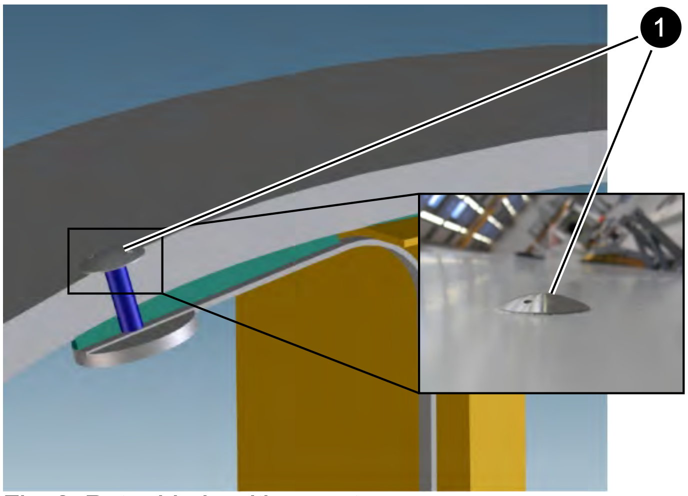

Fig. 2: Rotor blade with receptor

1	Receptor

With long rotor blades, certain rotor positions can lead to an undefined lightning strike between rotor blade tip and nacelle. Depending on the length and the design of the rotor blades, additional metal receptors may be installed on the front and back of the rotor blades to prevent such an event. These receptors are connected to the lightning conductor.

2.2 Nacelle

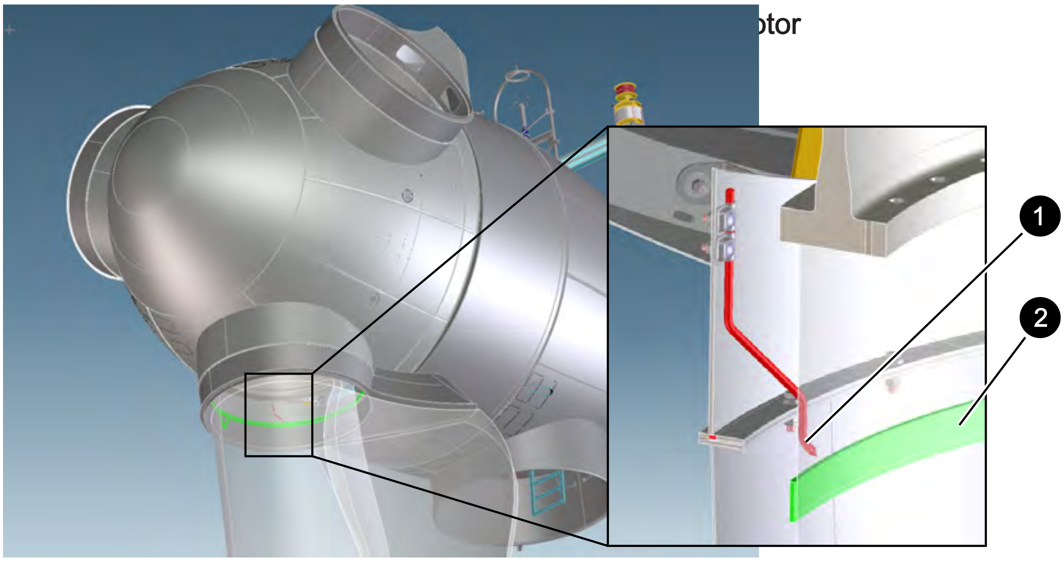

Fig. 3: Discharge ring at blade joint (E-44 to E-115)

1	Lightning rod (stationary)	2	Discharge ring (rotating)

In wind energy converter types E-44 to E-115, three lightning rods – one per rotor blade – are installed on the spinner (1). Each lightning rod transmits the lightning current from the discharge ring (2) via the spark gap to the spinner which is made of aluminium. The lightning rod has a conical tip in order to form as large an electrical field as possible relative to the surroundings. Because lightning is discharged early, passing from the blade root to the spinner which is isolated from the rotor hub, the blade flange bearings themselves do not experience any lightning current.

In the E-126, the large-surface blade flange bearings conduct the lightning current to the rotor hub.

Connection between spinner/rotor and machine house

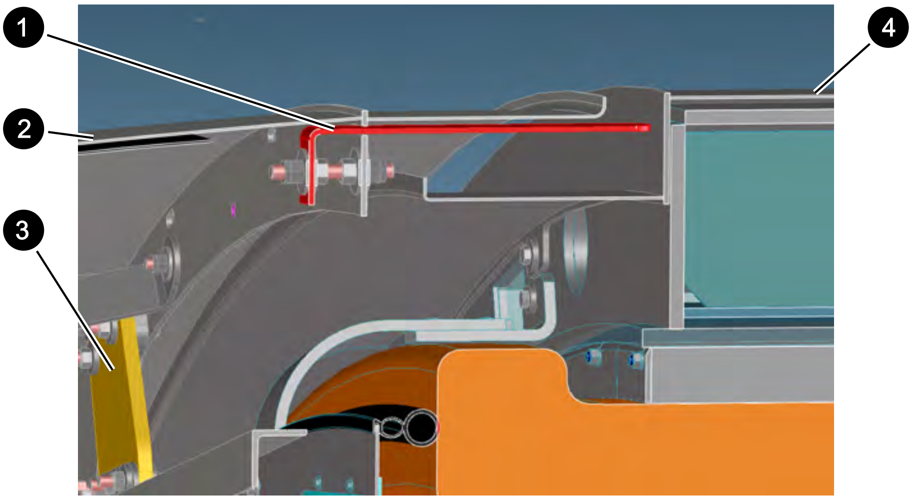

Fig. 4: Lightning bracket (E-44 to E-115)

1	Lightning bracket	3	Spinner insulation
2	Spinner	4	Machine house casing

Types E-44 to E-115 have a wider spark gap, consisting of three lightning brackets (1). If the machine house casing (4) is made from aluminium, the spark gap passes the lightning current from the spinner (2) to the casing. From there, the lightning currents are conducted through the connecting metal parts to the main carrier. With insulated casings, the spark gap passes the lightning current to the stator.

In the E-126, the rotor bearing transmits the lightning current to the main carrier in the machine house.

This arrangement allows a lightning strike to be conducted to the support structure regardless of the current position of the rotor and the current rotor blade angle. The connection between the main carrier and the tower is ensured by large-surface yaw bearing.

Lightning conductors are fitted on the rear of the machine house casing in order to protect the measuring equipment; they also form a cage around the wind measuring unit.

2.3 Tower

Steel tower

Steel towers are conductive so that lightning current is discharged through them. The flange joints of the tower sections are spray-galvanised.

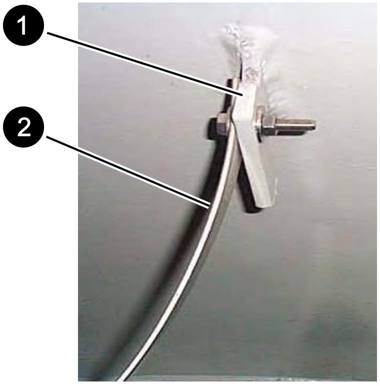

Fig. 5: Brackets with terminal lugs

1	Bracket	2	Terminal lug

Two brackets welded to the tower are used to connect the terminal lugs of the foundation earth electrode.

Concrete tower

The concrete tower is fitted with at least four lightning conductors that are distributed evenly around the tower circumference. They are made of hot-dip galvanised strip steel (30 mm × 3.5 mm), installed vertically in the precast concrete segments, and electrically linked from the foundation upwards to the top steel section.

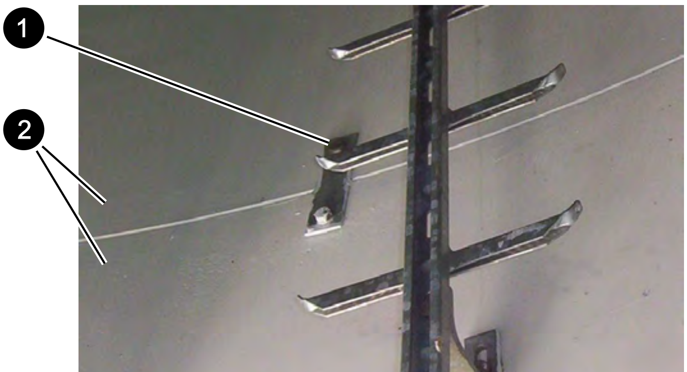

Fig. 6: Steel strip between two precast concrete segments

1	Steel strip as lightning conductor	2	Precast concrete segments with gluing joint

To ensure the link between the lightning conductors described above, the horizontal joints between the individual precast concrete segments (2) are bridged using hot-dip galvanised strip steel links (1) (30 mm × 3.5 mm) and bolt connections (M12 and conical spring washers). The minimum cross section of 50 mm² for lightning conductors made of hot-dip galvanised strip steel, as required by DIN EN 62305-3, is thus maintained also with regards to the bolt connection.

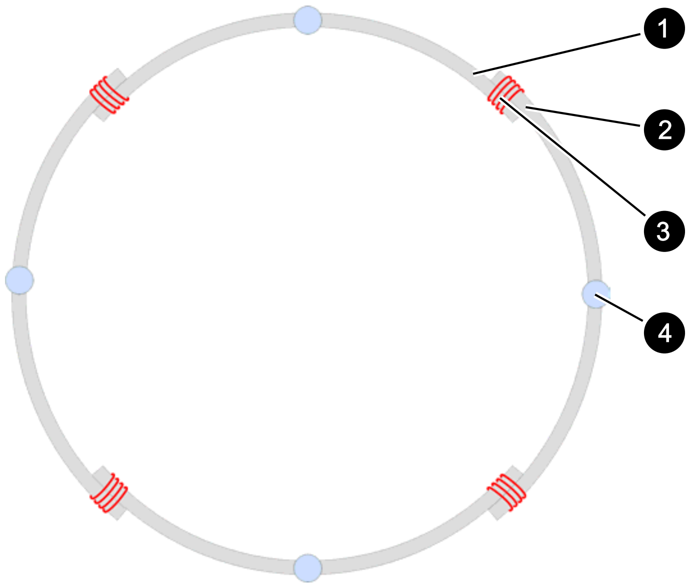

Fig. 7: Ring conductor in precast concrete segment (schematic)

1	Rebar section (4x)	3	Tying wire loop (16x)
2	Rebar overlap (4x)	4	Cross connectors (4x)

Each precast concrete segment also has a concentric, electrically closed ring conductor (Ø ≥ 10 mm). The ring conductor consists of multiple rebar sections (1). Each rebar overlap (2) is at least 500 mm long. For each rebar connection, at least four tying wire loops (3) are tightly wrapped around the rebar overlap. Cross connectors (4) link the rebar sections to the abovementioned lightning conductors.

The lightning conductors/earthing profiles run to the base of the concrete tower. Further cross connectors link them to the inner earthing ring.

2.4 Foundation

2.4.1 General information

Earthing systems protect people and property from hazards that can arise from short circuits or earth faults and from transient events such as lightning strikes and switching operations. They ensure the effectiveness of the (residual current) protective devices and the availability of a reference potential for electrical components. In addition, they prevent excessive voltage spikes and differences in potential.

If lightning strikes, the part of the ground through which the electric current travels experiences a rising potential in the direction of the wind energy converter. The level of the step voltage depends in part on the earth resistance (shape and dimensions) of the foundation earth electrode and of the outer earthing system. The permitted step and touch voltages must not be exceeded, so as to minimise the risks for people nearby.

2.4.2 Design

The foundation is equipped with earthing rings that are interconnected by several earthing profiles. The earthing rings are also connected to the foundation reinforcement steel. They consist of hot-dip galvanised strip steel with a cross-section of 100 mm². The cross connectors are protected with anti-corrosion tape.

Depending on the conditions on site, additional earthing rods are connected. In the case of deep foundations with reinforced concrete piles, these piles are also connected to the earthing rings.

The measurement of the earth resistance is taken. If the earth resistance is too high, project-specific modifications of the earthing system are required. It must be ensured that the permitted step and touch voltages (see ch. 2.4.1, p. 10) are not exceeded.

> Depending on the contractual scope of supply, either ENERCON or the customer is responsible for implementing improvements of the earthing system that lower the earth resistance and the step and touch voltages.

2.4.3 Earthing in concrete tower foundations

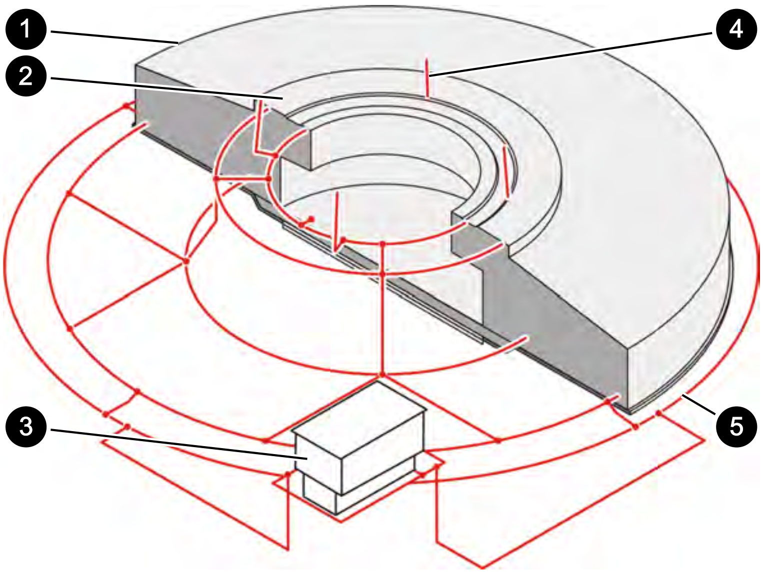

Fig. 8: Earthing in concrete tower foundations

1	Concrete tower foundation	4	Terminal lug (4x)
2	Concrete tower plinth	5	Earthing ring
3	External transformer station (if present)		

2.4.4 Earthing in steel tower foundations

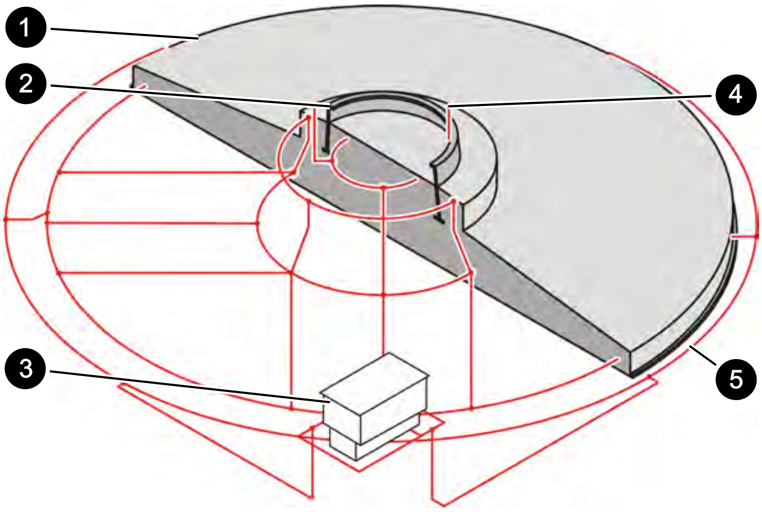

Fig. 9: Earthing in steel tower foundations

1	Steel tower foundation	4	Terminal lug (2x)
2	Steel tower plinth	5	Earthing ring
3	External transformer station (if present)		

2.5 Overview of the external lightning protection system

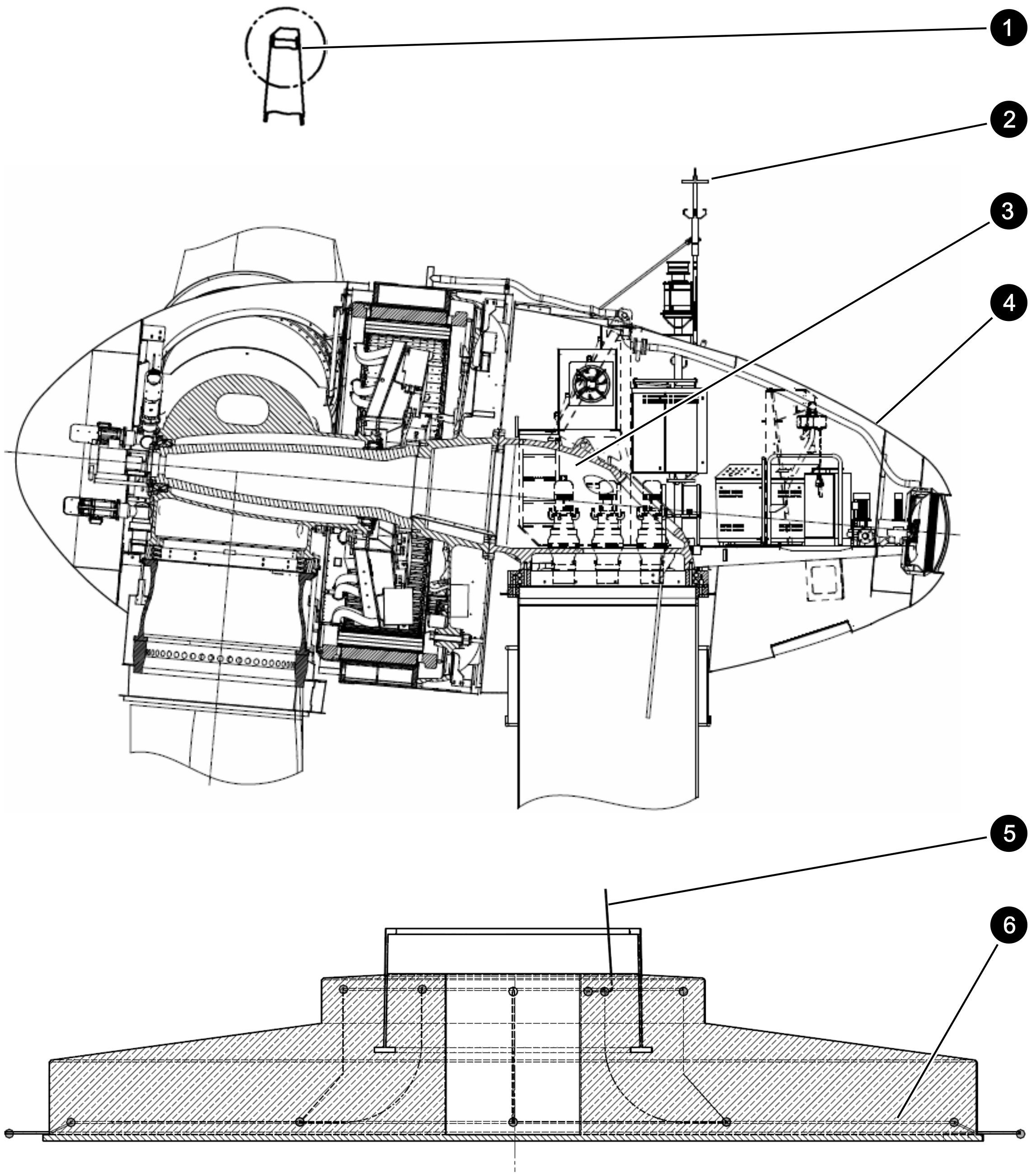

Fig. 10: Overview of the external lightning protection system

1	Rotor blade tip	4	Machine house casing
2	Cage around wind measuring unit	5	Terminal lug of lightning rod/PE
3	Main carrier	6	Earthing ring

3 Internal lightning protection

The following measures are taken for internal lightning protection.

- All conductive main components of the wind energy converter such as rotor hub, nacelle, tower, electrical cabinets, transformer PE cables, and foundation are connected to the bonding bar using adequate cross sections and the shortest possible cable lengths.
- Surge arresters with low-impedance earthing are installed directly at the LV or 400V supply input. The generator phases and the neutral points are earthed using surge arresters.
- All PCBs with their own power supply units are fitted with high attenuation filters.
- All analog and digital signal inputs and outputs are protected from high voltages and currents by RCDs and suppressor diodes.
- Electronic control equipment is galvanically isolated via optocouplers, isolation amplifiers and relays. The communication inside the wind energy converter uses optical fibre.
- Data transmission (modem) is protected by a surge protection module for data interfaces.
- Capacitors and surge arresters limit grid and generator overvoltage. The capacitance of the capacitors in connection with the surge arresters is sufficient to absorb the energy from lightning strikes without damage. The capacitance of the DC link alone, when already charged by the DC link voltage, is enough to absorb sufficient energy.

4 Applicable standards

The following standards have been applied.

DIN 18014:2007-09	Foundation earth electrodes - General planning criteria
DIN VDE 0151; VDE 0151:1986-06	Materials and minimum dimensions of earth electrodes with respect to corrosion
DIN VDE 0100-540; VDE 0100-540:2012-06	Low-voltage electrical installations - Part 5-54: Selection and erection of electrical equipment - Earthing arrangements and protective conductors
DIN EN 61400-1; VDE 0127-1:2011-08	Wind turbines – Part 1: Design requirements
DIN EN 61400-24; VDE 0127-24:2011-04	Wind turbines – Part 24: Lightning Protection
DIN EN 50308; VDE 0127-100:2005-03	Wind turbines – Protective measures – Requirements for design, operation and maintenance
DIN EN 62305; VDE 0185-305:2011-10	Protection against lightning (series of standards)
DIN EN 62561-2; VDE 0185-561-2:2013-02	Lightning protection system components (LPSC) - Part 2: Requirements for conductors and earth electrodes
DIN EN 61936-1; VDE 0101-1:2011-11	Power installations exceeding 1kV - Part 1: Common rules

Table of figures

APPENDIX G

ENERCON E92 Extract of Noise Test Report

Extract of test report — page 1/2

Master Sheet "Noise", according to "Technische Richtlinien für Windenergieanlagen, Teil 1: Bestimmung der Schallemissionswerte"
Extract of test report according to Annex C of [1]

Extract of test report M111 164/02
regarding noise emission of wind turbine (WT) Enercon E-92

General		Technical specifications (manufacturer)	
Manufacturer:	Enercon GmbH Dreekamp 5 26605 Aurich	Rated power (generator): Rotor diameter: Hub height above ground:	2.350 kW 92 m 98 m
Serial number:	920001	Tower design:	tube tower
WT-location:	RW: 2.592.266 HW: 5.914.847	material: Power control:	concrete pitch

Complementations of rotor (manufacturer)		Complementations of gear and generator (manufacturer)	
blades:	Enercon GmbH	Manufacturer of gear:	---
Type of blades:	E-92-1	Type of gear:	---
Pitch angel:	variable	Manufacturer of generator:	Enercon GmbH
Number of blades:	3	Type of generator:	G-92 /23-G1
Rated speed(s)/speed range:	6 - 17 rpm	Rated speed(s)/speed range:	6 - 17 rpm

test report of power curve: Enercon GmbH: Calculated output curve of the E-92 (Vers. 1.0 / 17.11.2011)

Noise emission parameter	Reference		Noise emission values	Remarks
	Standardized wind speed at 10 m above ground	Electric power		
Sound Power level $L_{WA,P}$	6 m/s	1227,8 kW	103,7 dB(A)	[3]
	7 m/s	1823,4 kW	105,4 dB(A)	
	8 m/s	2155,7 kW	104,9 dB(A)	
	9 m/s	-- kW	-- dB(A)	
	10 m/s	-- kW	-- dB(A)	
	8,4 m/s	*2233,0* kW	*104,6* dB(A)	[4]
Tonality (close-up range) K_{TN}	6 m/s	1227,8 kW	-- dB	[3]
	7 m/s	1823,4 kW	-- dB	
	8 m/s	2155,7 kW	-- dB	
	9 m/s	-- kW	-- dB	
	10 m/s	-- kW	--- dB	
	8,4 m/s	*2233,0* kW	*--- dB*	[4]
Impulsivity (close-up range) K_{IN}	6 m/s	1227,8 kW	--- dB	[3]
	7 m/s	1823,4 kW	--- dB	
	8 m/s	2155,7 kW	--- dB	
	9 m/s	-- kW	--- dB	
	10 m/s	-- kW	--- dB	
	8,4 m/s	*2233,0* kW	*--- dB*	[4]

one third octave sound power level at reference point v_{10} = 6 m/s

frequency	50	63	80	100	125	160	200	250	315	400	500	630
$L_{WA,P,1/3\ octave}$	76,7	80,3	83,3	87,6	88,8	91,0	87,1	89,7	91,9	91,0	91,3	94,4
frequency	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000
$L_{WA,P,1/3\ octave}$	93,9	94,2	93,8	92,8	89,0	89,1	86,7	85,1	81,1	74,7	73,8	74,9

octave sound power level at reference point v_{10} = 6 m/s

frequency	63	125	250	500	1000	2000	4000	8000
$L_{WA,P,octave}$	85,7	94,1	94,8	97,3	98,7	95,5	89,8	79,3

one third octave sound power level at reference point v_{10} = 7 m/s

frequency	50	63	80	100	125	160	200	250	315	400	500	630
$L_{WA,P,1/3\ octave}$	78,4	82,0	85,0	89,3	90,5	92,7	88,8	91,4	93,6	92,7	93,0	96,1
frequency	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000
$L_{WA,P,1/3\ octave}$	95,6	95,9	95,5	94,5	90,7	90,8	88,4	86,8	82,8	76,4	75,5	76,6

octave sound power level at reference point v_{10} = 7 m/s

frequency	63	125	250	500	1000	2000	4000	8000
$L_{WA,P,octave}$	87,4	95,8	96,5	99,0	100,4	97,2	91,3	81,0

one third octave sound power level at reference point v_{10} = 8 m/s

frequency	50	63	80	100	125	160	200	250	315	400	500	630
$L_{WA,P,1/3\ octave}$	77,9	81,5	84,5	88,8	90,0	92,2	88,3	90,9	93,1	92,2	92,5	95,6
frequency	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000
$L_{WA,P,1/3\ octave}$	95,1	95,4	95,0	94,0	90,2	90,3	87,9	86,3	82,3	75,9	75,0	76,1

octave sound power level at reference point v_{10} = 8 m/s

frequency	63	125	250	500	1000	2000	4000	8000
$L_{WA,P,octave}$	86,9	95,3	96,0	98,5	99,9	96,7	90,8	80,5

one third octave sound power level at reference point v_{10} = 9 m/s

Frequenz	50	63	80	100	125	160	200	250	315	400	500	630
$L_{WA,P,Terz}$	--	--	--	--	--	--	--	--	--	--	--	--
Frequenz	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000
$L_{WA,P,Terz}$	--	--	--	--	--	--	--	--	--	--	--	--

octave sound power level at reference point v_{10} = 9 m/s

Frequenz	63	125	250	500	1000	2000	4000	8000
$L_{WA,P,Terz}$	--	--	--	--	--	--	--	--

one third octave sound power level at reference point v_{10} = 10 m/s

Frequenz	50	63	80	100	125	160	200	250	315	400	500	630
$L_{WA,P,Terz}$	--	--	--	--	--	--	--	--	--	--	--	--
Frequenz	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000
$L_{WA,P,Terz}$	--	--	--	--	--	--	--	--	--	--	--	--

octave sound power level at reference point v_{10} = 10 m/s

Frequenz	63	125	250	500	1000	2000	4000	8000
$L_{WA,P,Terz}$	--	--	--	--	--	--	--	--

This test report extract is only valid with the manufacturer's certificate from 21.9.2013.
The declarations in this extract are only valid in combination with the test report M111 164/02 from 28.10.2013 [5]
(especially for calculations of sound propagation).

Remarks:

[1] Technische Richtlinien für Windenergieanlagen, Teil 1: Bestimmung der Schallemissionswerte Rev. 18 vom 01.02.2008 (Herausgeber: Fördergesellschaft Windenergie e.V., Stresemannplatz 4, D-24103 Kiel)

[2] IEC TS 61400-11 Wind turbines. Part 11: Acoustic noise measurement techniques. November 2002 (November 2012)

[3] In this windclass no values were determined

[4] sound power level for the wind speed at 95 % rated power (v10 = 8,4 m/s) considering the conditions on the day of measurement, the power curve the above mentionted power curve and the hub height of the investigated WT

[5] Müller-BBM testreport M111 164/02 28.10.2013

Müller-BBM GmbH
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NIEDERLASSUNG GELSENKIRCHEN
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TELEFON (0209) 9 83 08 - 0

Date of measurement: 2013-09-29
Date of extract of test report: 2013-10-28

Schallemission FGW 2013 Konformitätssiegel

DAkkS Deutsche Akkreditierungsstelle D-PL-14119-01-00

Dipl.-Ing. (FH) M. Köhl

Durch die DAkkS Deutsche Akkreditierungsstelle GmbH nach DIN EN ISO/IEC 17025 akkreditiertes Prüflaboratorium. Die Akkreditierung gilt für die in der Urkunde aufgeführten Prüfverfahren.

APPENDIX H

ACCDC Shortlist of Species of Concern

ACCDC Shortlist of Species of Concern

Species found within 25 km of the project site and listed by the ACCDC as 'S1' or 'S2', listed by COSEWIC, SARA or NS ESA, or with a NS DNR General Status of 'Sensitive', 'May Be At Risk' or 'At Risk'

Scientific Name	Common Name	S-Rank	General Status (NS DNR)	NS ESA	COSEWIC	SARA
Bird						
Actitis macularius	Spotted Sandpiper	S3S4B	Sensitive			
Anas acuta	Northern Pintail	S2B	May Be At Risk			
Anas discors	Blue-winged Teal	S3B	May Be At Risk			
Anas strepera	Gadwall	S2B	May Be At Risk			
Botaurus lentiginosus	American Bittern	S3S4B	Sensitive			
Bucephala clangula	Common Goldeneye	S2B,S5N	Secure			
Calidris canutus rufa	Red Knot rufa ssp	S2S3M	At Risk	Endangered	Endangered	Endangered
Calidris maritima	Purple Sandpiper	S3N	Sensitive			
Calidris minutilla	Least Sandpiper	S1B,S5M	Secure			
Calidris pusilla	Semipalmated Sandpiper	S3M	Sensitive			
Caprimulgus vociferus	Whip-Poor-Will	S1?B	Sensitive			
Carduelis pinus	Pine Siskin	S3S4B,S5N	Sensitive			
Cathartes aura	Turkey Vulture	S2S3B	Sensitive			
Chaetura pelagica	Chimney Swift	S2S3B	At Risk	Endangered	Threatened	Threatened
Charadrius melodus melodus	Piping Plover melodus ssp	S1B	At Risk	Endangered	Endangered	Endangered
Charadrius semipalmatus	Semipalmated Plover	S1S2B,S5M	Secure			
Charadrius vociferus	Killdeer	S3S4B	Sensitive			
Chordeiles minor	Common Nighthawk	S3B	At Risk	Threatened	Threatened	Threatened
Coccyzus erythropthalmus	Black-billed Cuckoo	S3?B	May Be At Risk			
Contopus cooperi	Olive-sided Flycatcher	S3B	At Risk	Threatened	Threatened	Threatened
Contopus virens	Eastern Wood-Pewee	S3S4B	Sensitive	Vulnerable	Special Concern	

Scientific Name	Common Name	S-Rank	General Status (NS DNR)	NS ESA	COSEWIC	SARA
Dendroica castanea	Bay-breasted Warbler	S3S4B	Sensitive			
Dendroica striata	Blackpoll Warbler	S3S4B	Sensitive			
Dendroica tigrina	Cape May Warbler	S3?B	Sensitive			
Dolichonyx oryzivorus	Bobolink	S3S4B	Sensitive	Vulnerable	Threatened	
Dumetella carolinensis	Gray Catbird	S3B	May Be At Risk			
Empidonax flaviventris	Yellow-bellied Flycatcher	S3S4B	Sensitive			
Euphagus carolinus	Rusty Blackbird	S2S3B	May Be At Risk	Endangered	Special Concern	Special Concern
Gallinago delicata	Wilson's Snipe	S3S4B	Sensitive			
Gavia immer	Common Loon	S3B,S4N	May Be At Risk			
Hirundo rustica	Barn Swallow	S3B	Sensitive	Endangered	Threatened	
Histrionicus histrionicus pop. 1	Harlequin Duck - Eastern pop.	S2N	At Risk	Endangered	Special Concern	Special Concern
Icterus galbula	Baltimore Oriole	S2S3B	May Be At Risk			
Larus delawarensis	Ring-billed Gull	S1?B,S5N	Secure			
Limosa haemastica	Hudsonian Godwit	S3M	Sensitive			
Molothrus ater	Brown-headed Cowbird	S2S3B	May Be At Risk			
Myiarchus crinitus	Great Crested Flycatcher	S2B	May Be At Risk			
Perisoreus canadensis	Gray Jay	S3S4	Sensitive			
Petrochelidon pyrrhonota	Cliff Swallow	S3B	May Be At Risk			
Phalacrocorax carbo	Great Cormorant	S3	Sensitive			
Phalaropus fulicaria	Red Phalarope	S2S3M	Sensitive			
Phalaropus lobatus	Red-necked Phalarope	S2S3M	Sensitive			
Pheucticus ludovicianus	Rose-breasted Grosbeak	S3S4B	Sensitive			

Scientific Name	Common Name	S-Rank	General Status (NS DNR)	NS ESA	COSEWIC	SARA
Picoides arcticus	Black-backed Woodpecker	S3S4	Sensitive			
Pinicola enucleator	Pine Grosbeak	S3?B,S5N	May Be At Risk			
Piranga olivacea	Scarlet Tanager	S2B	Undetermined			
Pluvialis dominica	American Golden-Plover	S3M	Sensitive			
Podilymbus podiceps	Pied-billed Grebe	S3B	Sensitive			
Poecile hudsonica	Boreal Chickadee	S3	Sensitive			
Riparia riparia	Bank Swallow	S3B	May Be At Risk			
Sayornis phoebe	Eastern Phoebe	S3S4B	Sensitive			
Sterna dougallii	Roseate Tern	S1B	At Risk	Endangered	Endangered	Endangered
Sterna hirundo	Common Tern	S3B	Sensitive			
Sterna paradisaea	Arctic Tern	S3B	May Be At Risk			
Sturnella magna	Eastern Meadowlark	S1B	Sensitive			
Toxostoma rufum	Brown Thrasher	S1?B	Undetermined			
Tringa melanoleuca	Greater Yellowlegs	S3B,S5M	Sensitive			
Tringa semipalmata	Willet	S2S3B	May Be At Risk			
Tyrannus tyrannus	Eastern Kingbird	S3S4B	Sensitive			
Vermivora peregrina	Tennessee Warbler	S3S4B	Sensitive			
Vireo gilvus	Warbling Vireo	S1?B	Undetermined			
Wilsonia canadensis	Canada Warbler	S3B	At Risk	Endangered	Threatened	Threatened
Wilsonia pusilla	Wilson's Warbler	S3S4B	Sensitive			
Fish						
Salmo salar	Atlantic Salmon	S2	May Be At Risk			
Herpetofauna						
Chelydra serpentina	Snapping Turtle	S5	Secure	Vulnerable	Special Concern	Special Concern
Dermochelys coriacea	Leatherback Sea Turtle	S1S2N	N/A		Endangered	Endangered

Scientific Name	Common Name	S-Rank	General Status (NS DNR)	NS ESA	COSEWIC	SARA
Glyptemys insculpta	Wood Turtle	S3	Sensitive	Threatened	Threatened	Threatened
Invertebrate						
Alasmidonta undulata	Triangle Floater	S2S3	Secure			
Amblyscirtes hegon	Salt and Pepper Skipper	S2	N/A			
Callophrys henrici	Henry's Elfin	S2	Secure			
Callophrys niphon	Eastern Pine Elfin	S2	Secure			
Danaus plexippus	Monarch	S2B	Sensitive		Special Concern	Special Concern
Enallagma signatum	Orange Bluet	S1	N/A			
Erynnis juvenalis	Juvenal's Duskywing	S2S3	Secure			
Gomphaeschna furcillata	Harlequin Darner	S3	Sensitive			
Pantala hymenaea	Spot-Winged Glider	S2B	Sensitive			
Pieris oleracea	Mustard White	S2	Senstive			
Plebejus saepiolus	Greenish Blue	S1	N/A			
Polygonia comma	Eastern Comma	S2	N/A			
Polygonia satyrus	Satyr Comma	S1	Sensitive			
Somatochlora forcipata	Forcipate Emerald	S2	May Be At Risk			
Somatochlora kennedyi	Kennedy's Emerald	S1S2	May Be At Risk			
Nymphalis l-album	Compton Tortoiseshell	S1S2	Secure			
Nymphalis milberti	Milbert's Tortoiseshell	S2	Secure			
Nymphalis vaualbum j-album	Compton Tortoiseshell	S1S2	Secure			
Satyrium calanus	Banded Hairstreak	S2	Undetermined			
Satyrium calanus falacer	Banded Hairstreak	S2	Undertermined			
Lichen						
Collema nigrescens	a lichen	S2S3	Sensitive			
Degelia plumbea	Blue Felt Lichen	S2	Secure	Vulnerable	Special Concern	

Scientific Name	Common Name	S-Rank	General Status (NS DNR)	NS ESA	COSEWIC	SARA
Erioderma pedicellatum (Atlantic pop.)	Boreal Felt Lichen - Atlantic pop.	S1S2	At Risk	Endangered	Endangered	Endangered
Everniastrum catawbiense	a Lichen	S1S2	May Be At Risk			
Leptogium corticola	a lichen	S2S3	Sensitive			
Pseudevernia cladonia	Ghost Antler Lichen	S2S3	Sensitive			
Sticta fuliginosa	a lichen	S3?	Sensitive			
Mammals						
Alces americanus	Moose	S1	At Risk	Endangered		
Lasiurus cinereus	Hoary Bat	S1	Undetermined			
Myotis lucifugus	Little Brown Myotis (Little Brown Bat)	S1	Sensitive	Endangered	Endangered	
Puma concolor pop. 1	Cougar - Eastern pop.	SH	Undetermined			
Vascular Plants						
Bartonia virginica	Yellow Bartonia	S3	Secure			
Cardamine pratensis	Cuckoo Flower	S1	May Be At Risk			
Carex adusta	Lesser Brown Sedge	S2S3	Sensitive			
Clethra alnifolia	Sweet Pepperbush	S1	Sensitive	Vulnerable	Special Concern	Special Concern
Crassula aquatica	Water Pygmyweed	S2	Sensitive			
Crataegus submollis	Quebec Hawthorn	S1?	Undetermined			
Eleocharis olivacea	Yellow Spikerush	S2S3	Sensitive			
Eleocharis ovata	Ovate Spikerush	S2?	Sensitive			
Elymus wiegandii	Wiegand's Wild Rye	S1	May Be At Risk			
Empetrum eamesii	Pink Crowberry	S3	Sensitive			
Empetrum eamesii ssp. atropurpureum	Pink Crowberry	S2S3	Secure			
Empetrum eamesii ssp. eamesii	Pink Crowberry	S2S3	Sensitive			
Fraxinus nigra	Black Ash	S2S3	Sensitive	Threatened		

Scientific Name	Common Name	S-Rank	General Status (NS DNR)	NS ESA	COSEWIC	SARA
Galium aparine	Catchweed Bedstraw	S1	Undetermined			
Hedeoma pulegioides	American False Pennyroyal	S2S3	Sensitive			
Helianthemum canadense	Rockrose	S1	May Be At Risk	Endangered		
Hieracium kalmii	Kalm's Hawkweed	S2?	Undetermined			
Hieracium kalmii var. fasciculatum	Kalm's Hawkweed	S1?	Undetermined			
Hieracium kalmii var. kalmii	Kalm's Hawkweed	S2?	Undetermined			
Hudsonia ericoides	Pinebarren Golden Heather	S2	Sensitive			
Hypericum majus	Large St John's-wort	S1	May Be At Risk			
Juncus greenei	Greene's Rush	S1S2	May Be At Risk			
Liatris spicata	Dense Blazing Star	No Status	N/A			
Limosella australis	Southern Mudwort	S3	Sensitive			
Listera australis	Southern Twayblade	S2	May Be At Risk			
Minuartia groenlandica	Greenland Stitchwort	S2	Sensitive			
Montia fontana	Water Blinks	S1	May Be At Risk			
Oenothera fruticosa ssp. glauca	Narrow-leaved Evening Primrose	S2	Undetermined			
Plantago rugelii	Rugel's Plantain	S2	Undetermined			
Polygala polygama	Racemed Milkwort	S1	Undetermined			
Polygala sanguinea	Blood Milkwort	S2S3	Sensitive			
Polygonum buxiforme	Small's Knotweed	S2S3	Undetermined			
Ranunculus sceleratus	Cursed Buttercup	S1S2	May Be At Risk			
Senecio pseudoarnica	Seabeach Ragwort	S2	Sensitive			

Scientific Name	Common Name	S-Rank	General Status (NS DNR)	NS ESA	COSEWIC	SARA
Solidago hispida	Hairy Goldenrod	S1?	May Be At Risk			
Spiranthes ochroleuca	Yellow Ladies'-tresses	S2S3	Sensitive			
Suaeda calceoliformis	Horned Sea-blite	S2S3	Secure			
Symphyotrichum undulatum	Wavy-leaved Aster	S2	Sensitive			
Vaccinium uliginosum	Alpine Bilberry	S2	Sensitive			

APPENDIX I

Wetland Indicator Status for Plant Species

Wetland Indicator Status for Plant Species

Wetland Indicator Status Definitions [1]

Indicator Code	Indicator Status	Designation	Comment
OBL	Obligate Wetland	Hydrophyte	Almost always occur in wetlands
FACW	Facultative Wetland	Hydrophyte	Usually occur in wetlands, but may occur in non-wetlands
FAC	Facultative	Hydrophyte	Occur in wetlands and non-wetlands
FACU	Facultative Upland	Nonhydrophyte	Usually occur in non-wetlands, but may occur in wetlands
UPL	Obligate Upland	Nonhydrophyte	Almost never occur in wetlands
TBD	To Be Determine		Status not yet determined

[1] Lichvar, R.W., N.C. Melvin, M.L. Butterwick, and W.N. Kirchner. 2012. *National Wetland Plant List indicator rating definitions.* U.S. Army Corps of Engineers, Engineer Research and Development Center, Cold Regions Research and Engineering Laboratory ERDC/CRREL TR-12-1.

APPENDIX J

Archaeological Resource Impact Assessment

Chebucto Terence Bay Wind Farm

Archaeological Resource Impact Assessment

Heritage Research Permit A2014NS010

June 20, 2014

D a v i s   M a c I n t y r e   &   A s s o c i a t e s   L i m i t e d
1 0 9   J o h n   S t e w a r t   D r i v e ,   D a r t m o u t h ,   N S   B 2 W   4 J 7

Chebucto Terence Bay Wind Farm

Archaeological Resource Impact Assessment

Heritage Research Permit A2014NS010
Project No. 14-003.1

Principal Investigator: April MacIntyre
Report Compiled by: April MacIntyre & Stephen Davis

Report Submitted to:

CBCL Limited
1489 Hollis Street, PO Box 606
Halifax, NS B3J 2R7

- and -

Coordinator, Special Places
NS Dept. of Communities, Culture and Heritage
PO Box 456, STN Central
Halifax, NS B3J 2R5

Cover Image: Proposed location of turbine #3, looking north.

Executive Summary

Davis MacIntyre & Associates Limited conducted an archaeological resource impact assessment of the proposed Chebucto Terence Bay Wind Farm in Halifax County. An earlier assessment of the project in 2012 included a historic background study and field reconnaissance of the project area in order to determine the potential for archaeological resources within the impact zone. Since then, a new road and turbine layout has been devised and a follow-up reconnaissance was conducted. The assessment concluded that there was no historic record of land use in the general area and that there was little in the area to have attracted First Nations peoples. The reconnaissance did not reveal any evidence of past cultural activity and the study area was determined to be of low archaeological potential. Therefore, no further mitigation is recommended. However, in the event that the locations of access roads, turbines, or easements change, it is recommended that these areas be subjected to an archaeological assessment. Furthermore, in the unlikely event that archaeological resources are encountered during ground disturbance, it is required that all disturbance activity cease and the Coordinator of Special Places (902-424-6475) be contacted immediately.

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1.0 Introduction

Davis MacIntyre & Associates Limited was retained by CBCL Limited, on behalf of Chebucto Terence Bay Wind Field Limited (CTB), to conduct an archaeological resource impact assessment of the proposed Chebucto Terence Bay Wind Farm in Halifax County. The purpose of the assessment was to determine the potential for archaeological resources within the development zone and to provide any recommendations for further mitigation, if deemed necessary.

This assessment was completed under Category C Heritage Research Permit A2014NS010 issued by the Nova Scotia Department of Communities, Culture and Heritage. This report conforms to the standards required by the Department of Communities, Culture and Heritage as specified under the guidelines of the Special Places Protection Act (R.S., c. 438, s. 1.).

2.0 Study Area

CTB proposes to construct a 7.2 MW wind farm at Terence Bay in Halifax Regional Municipality. The project will require three turbines erected on concrete pads, as well as access roads and a transmission line. The transmission line will be erected along an easement to be sought from the Nova Scotia Department of Natural Resources through Parcel DE-1 (Figure 2.0-1).

Terence Bay is located in the Pennant Barrens (Natural Theme Region #851, Figure 2.0-2). This region is characterized by thin rocky tills and exposed granite bedrock. The granite surface has an irregular drainage pattern with many lakes and ponds interconnected by slow-moving streams. Many wetlands are associated with the streams and wetlands can also be found in depressions which are isolated from other surface water. Soils are mainly well-drained loams and a number of small drumlins occur between Spryfield and Pennant. Much of the area is covered by coastal barrens. In inland areas, stands of maple, oak and birch occur on the well-drained soils. Small mammal diversity and population in the inland barrens is low. [1]

[1] Davis and Browne, 1996:210-211.

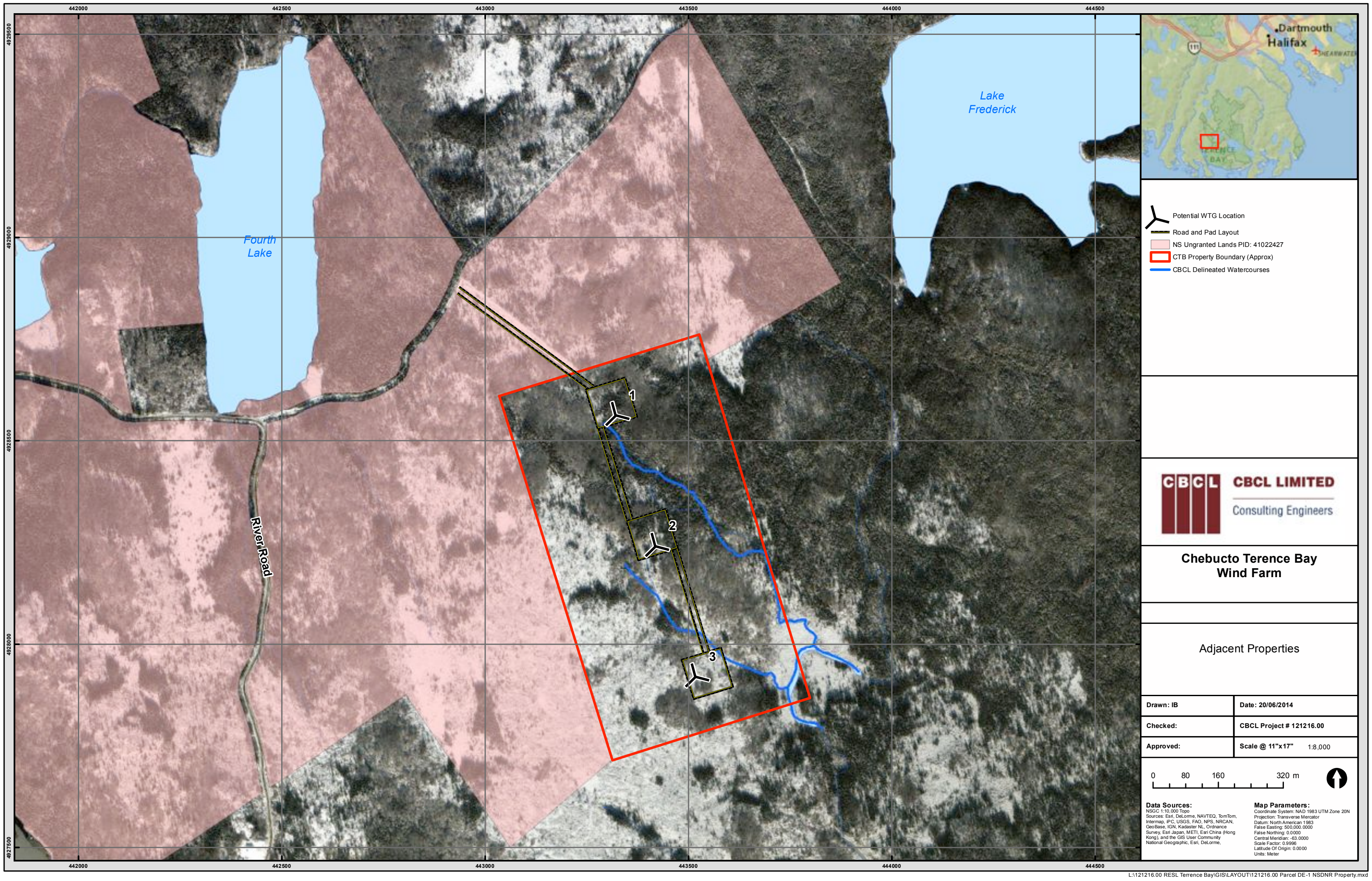


Figure 2.0-1: Aerial map of the study area showing the proposed locations of the turbines, access roads and the transmission line easement through NSDNR's ungranted lands.

Figure 2.0-2: Natural Theme Regions showing the Pennant Barrens (region #851, highlighted).[2] The approximate location of the study area is indicated by the red ellipse.

3.0 Methodology

A historic background study was conducted by Davis MacIntyre & Associates Limited in August 2012 and was updated in May 2014. During the initial background study, historical maps and manuscripts and published literature were consulted at Nova Scotia Archives in Halifax. The Maritime Archaeological Resource Inventory, a database of known archaeological resources in the Maritime region, was searched to understand prior archaeological research and known archaeological resources neighboring the study area. A second search of the database was conducted in May 2014 to ensure that no additional resources had been recorded since the 2012 assessment. Finally, a field reconnaissance was conducted on May 12, 2014 in order to further evaluate the potential for both buried and surficial archaeological resources.

[2] After Davis and Browne, 1996.

3.1 Maritime Archaeological Resource Inventory

The Maritime Archaeological Resource Inventory was accessed on May 10, 2014 in order to determine if known archaeological sites or resources exist within or near the study area.

Three shipwrecks have been recorded in the waters off the coast of Prospect. Two of these wrecks date to the 18th century while the third dates to the late 19th century. An isolated find dating to the Late Archaic period (5,000 to 2,500 years BP) was found on the beach on an island in Prospect Bay and a Ceramic period (2,500 to 500 years BP) site as well as an isolated find were recorded on the Nine Mile River system near Shad Bay to the west of the proposed wind farm. An early Ceramic period (2,500 to 2,400 years BP) Adena culture burial was reported and excavated by Stephen Davis in the Bayview Park subdivision near White's Lake in the 1980s. The burial site overlooks Prospect Bay and is located approximately 5 kilometers northwest of the proposed wind farm. Further afield, the remains of a late 18th through early 20th century fishing village have been recorded and investigated at Coote Cove in the Crystal Crescent Provincial Park and finally, several 19th century homesteads have been recorded on the southwest side of Otter Lake, nine kilometers north of the study area.

The field reconnaissance of the 2012 proposed wind farm did not reveal any evidence of past cultural activity.

3.2 Historic Background

3.2.1 The Precontact Period

The history of human occupation in Nova Scotia has been traced back approximately 11,000 years ago, to the Palaeo-Indian period or *Sa'qewe'k L'nu'k* (11,000 – 9,000 years BP). The only significant archaeological evidence of Palaeo-Indian settlement in the province exists at Debert/Belmont in Colchester County.

The *Saqiwe'k Lnu'k* period was followed by the *Mu Awsami Kejikawe'k L'nu'k* (Archaic period) (9,000 – 2,500 years BP), which included several traditions of subsistence strategy. The Maritime Archaic people exploited mainly marine resources while the Shield Archaic concentrated on interior resources such as caribou and salmon. The Laurentian Archaic is generally considered to be a more diverse hunting and gathering population.

The Archaic period was succeeded by the Woodland/Ceramic period or *Kejikawek L'nu'k* (2,500 – 500 years BP). Much of the Archaic way of subsistence remained although it was during this period that the first exploitation of marine molluscs is seen in the archaeological record. It was also during this time that ceramic technology was first introduced.

The Woodland period ended with the arrival of Europeans and the beginning of recorded history. The initial phase of contact between First Nations people and Europeans, known as the Protohistoric period, was met with various alliances particularly between the Mi'kmaq and French.

The Mi'kmaq inhabited the territory known as *Mi'kma'ki* or *Megumaage*, which included all of Nova Scotia including Cape Breton, Prince Edward Island, New Brunswick (north of the Saint John River), the Gaspé region of Quebec, part of Maine and southwestern Newfoundland (Figure 3.2-1). The area roughly encompassing Halifax, Lunenburg, Kings, Hants and Colchester Counties was known as *Sipekni'katik* or "wild potato area".[3]

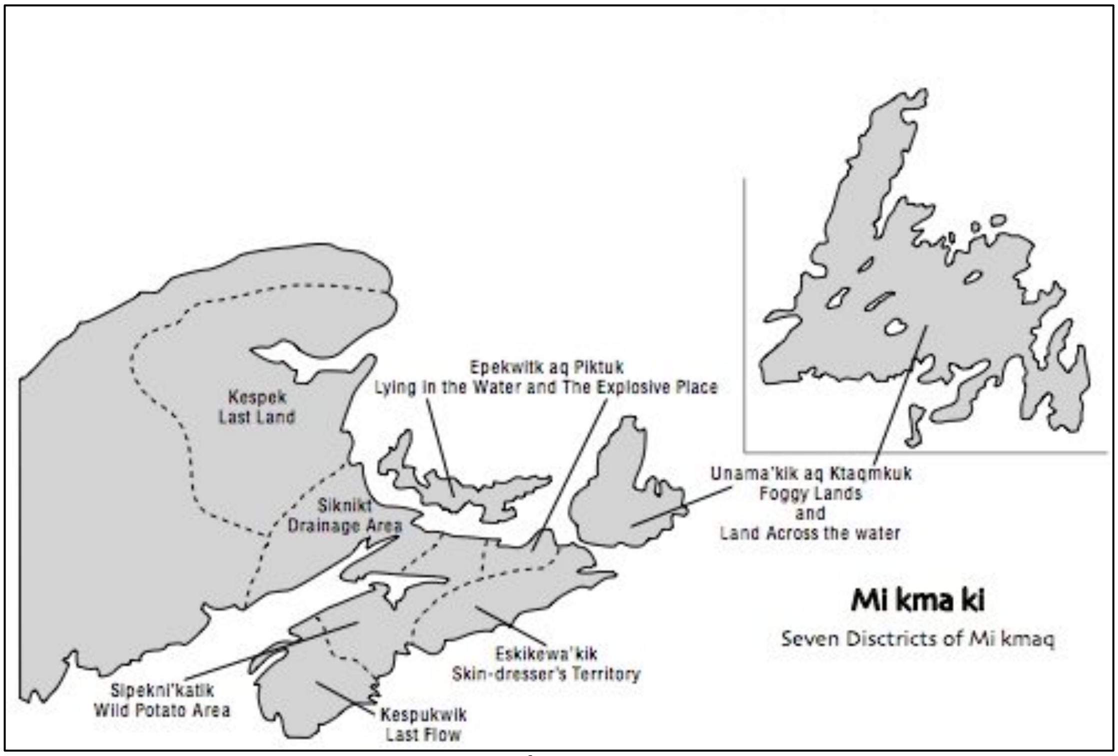


Figure 3.2-1: Map of the Mi'kmaq districts.[4]

[3] Public Archives of Nova Scotia, 1967:515.
[4] Confederacy of Mainland Mi'kmaq, 2007:11.

Archaeological evidence shows that the ancestors of the Mi'kmaq settled along the waterways of Prospect and Shad Bays and may have also settled along Terence Bay and the inward reaches of the river. However, to date, no archaeological evidence has been recorded to indicate First Nations land use along this river. The proposed wind farm is located on rugged terrain more than 1.5 kilometers inland from the river and 700 meters from the nearest lake on this system (Fourth Lake).

3.2.2 The Historic Period

There is little documented regarding the area inland from Terence Bay. The earliest European settlers most certainly took up land along the Atlantic coast where there was convenient access to the fisheries, shipping, and navigational routes. The community of Terence Bay, at the mouth of the river, was probably named after an early settler. Through time, the name of the settlement was known by several variations of the name – Terrants Bay, Tern Bay, Turns Bay, Turner Bay, and Turner Bay Rock.[5]

The earliest settlers in Terence Bay were German Protestants who arrived in 1753. In the 19th century, Irish settlers arrived. The land on which the wind farm is currently proposed was granted to one David Kirk sometime in the first half of the century but it is not known if he actually settled the land (Figure 3.2-2). It is more likely, given the terrain, that the land was used for logging as agricultural pursuits in this area would have been fruitless.

[5] Fergusson, 1967:668.

Figure 3.2-2: Part of the Crown Lands index sheet for Halifax County showing the land granted to David Kirk in the 19th century which is now owned by RESL.[6] The land between the Old Brookside Road (south side of Fourth Lake) and project lands has always been government property.

Maps from the latter half of the 19th century and early part of the 20th century do not indicate any settlement or land use in the study area (Figures 3.2-3 and 3.2-4).

[6] Department of Lands and Forests, 2009.

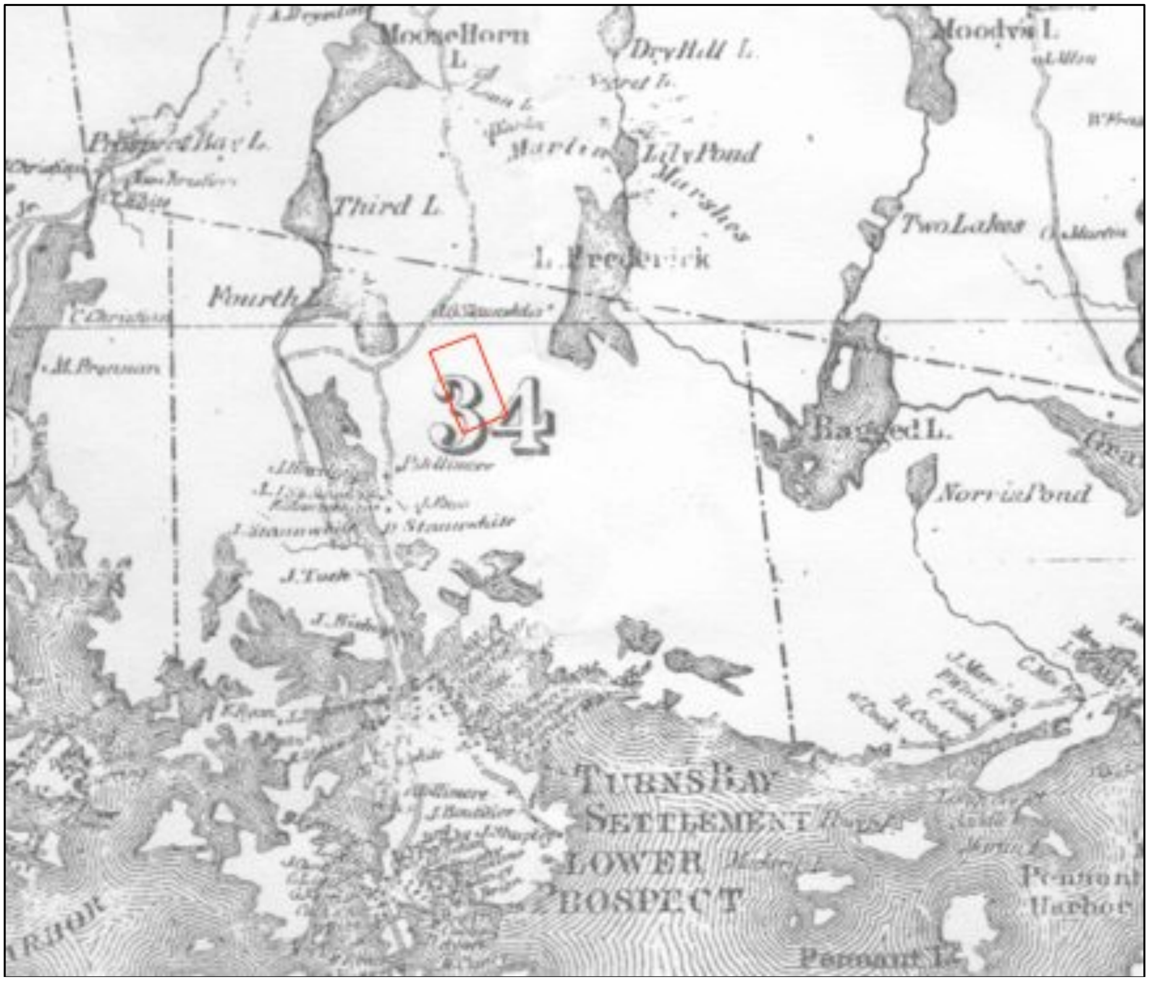


Figure 3.2-3: Part of Ambrose F. Church's map of Halifax County in 1865 showing the area of Terrance Bay (labeled Turn's Bay) with the approximate boundary of the RESL property shown.[7]

[7] Church, 1865.

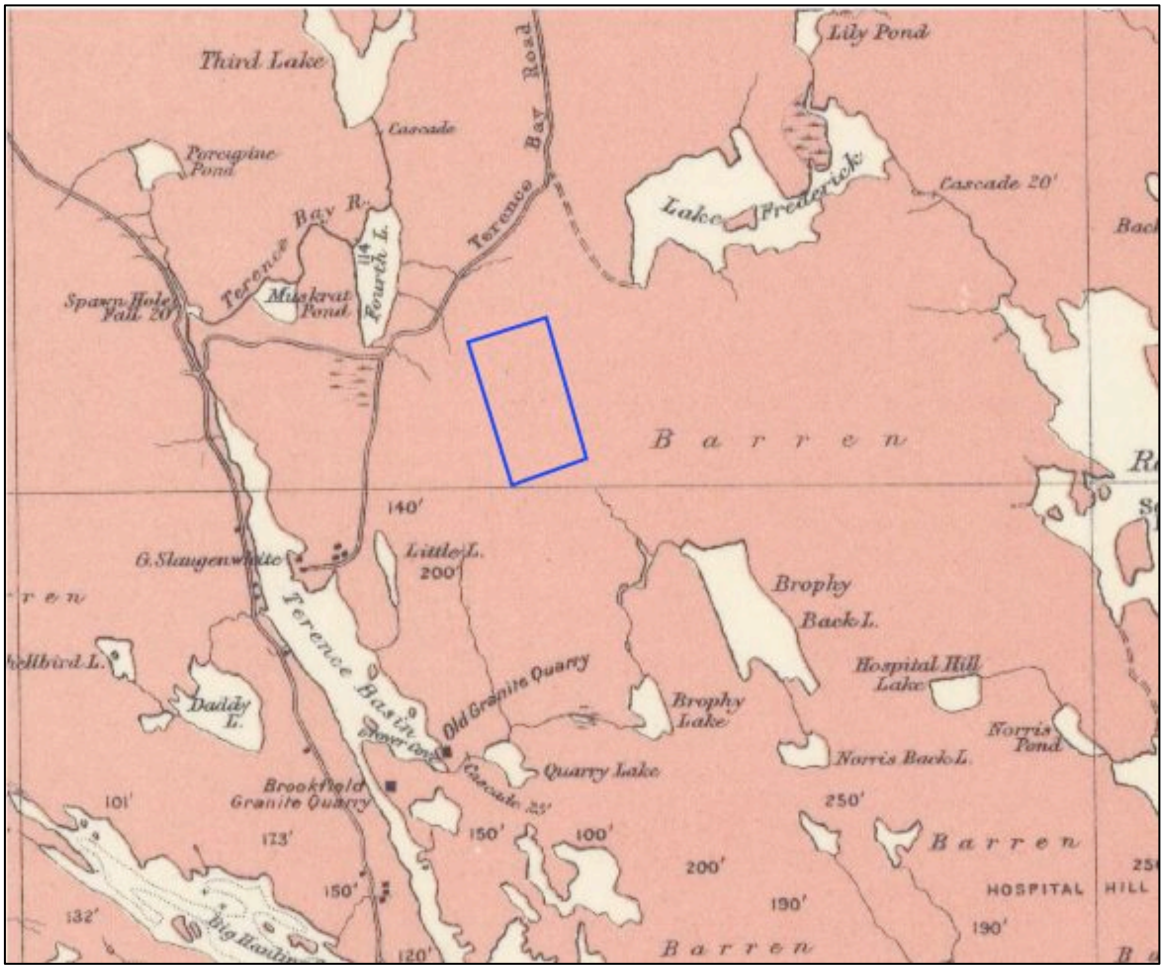


Figure 3.2-4: Part of the Geological Survey of Canada map of Prospect in 1907 with the approximate boundary of the RESL property shown.[8]

3.3 Field Reconnaissance

An archaeological field reconnaissance of the study area was conducted by Davis MacIntyre & Associates Limited on May 12, 2014. The power easement, access roads and proposed turbine sites were located with the aid of a hand-held GPS unit and field notes and photographs were taken in various places throughout the project area.

The power easement runs along the northeast side of an existing trail through a densely wooded area. Between the easement and the trail is an artificial ridge or bulldozed push-up that was created by construction of the trail (Plate 1). The trail is currently used by ATV traffic and there is evidence of hunting and recreational shot gun target sports (including skeet shooting) along the trail. At the end of the trail, a meteorological or

[8] Faribault, 1907.

MET tower has been erected. An area approximately 100 meters by 100 meters has been cleared and grubbed around the MET tower and a geotechnical test pit was excavated to the south southwest of the tower. The exposed soil surrounding the tower is comprised of granite till and there was no evidence of any cultural deposits upon survey of the exposed soils.

Turbine #1 is accessed just southeast of the MET tower through a small Black Spruce swamp. The turbine site itself is located in a mature mixed-wood (Spruce, Pine, Fir, birch and maple) forest (Plate 2). The forest floor is hummocky with a fern and brush cover. There is no evidence of past logging or other cultural activity in this area. There are several well-used game trails to the south and southwest of the turbine site.

The access road between Turbines #1 and #2 is through a mature forest with rocky granite outcrops and shoulder-high brush. A wetland has been recently flagged along the course of the access road. Turbine #2 is located in an area of waist to shoulder-high brush with a moss and fern-covered forest floor. Spruce and birch predominate (Plate 3). Again, there is no evidence of past logging or other cultural activity.

The access road to Turbine #3 is through a thinner forest at the north end, transitioning to scrubland with granite outcrops (Plates 3 and 4). The access road passes through a small wetland approximately 100 meters north of the turbine site. The turbine itself is located in scrubland with granite outcrops and glacial erratics (Plate 5). There is very little soil development here with very sparse young White birch, tea berries and dwarf juniper. There is no evidence of past cultural activity along the access road or in the area of the planned turbine.

4.0 Results and Discussion

Historical documents do not indicate any past land use within the study area and the site affords little to have attracted First Nations peoples. The reconnaissance indicated that the property is characterized by thin rocky soils and exposed glacial erratics and bedrock. The erratics and bedrock are not of a quality that would exhibit petroglyphs and there was no evidence of past cultural activity, including logging, in the study area. The only water sources within the study area are from small wetlands which drain toward a stream at the southeast end of the property and this latter watercourse was likely never a navigable route, nor suitable for resource exploitation as it is simply draining a minor wetland.

5.0 Conclusions and Recommendations

No archaeological resources were encountered during the reconnaissance and the study area was determined to be of low archaeological potential. The historic background study, likewise, did not indicate any past land use in the area and there is little, if anything, in the study area to have attracted First Nations peoples. Therefore, no further mitigation is recommended. However, should the locations of the proposed turbines, access roads or easements change, it is recommended that a reconnaissance be conducted.

In the unlikely event that archaeological resources are encountered during construction, it is required that all activity cease and the Coordinator of Special Places (902-424-6475) be contacted immediately regarding a suitable method of mitigation.

6.0 References Cited

Church, Ambrose F. 1865. Topographical Township Map of Halifax County. A. F. Church & Co., Halifax.

Confederacy of Mainland Mi'kmaq. 2007. *Kekina'muek: Learning about the Mi'kmaq of Nova Scotia*. Eastern Woodland Publishing, Truro.

Davis, Derek and Sue Browne. 1996. Natural History of Nova Scotia, Volume II: Theme Regions. Nimbus Publishing and Nova Scotia Museum, Halifax.

Department of Lands and Forests. 2009 (updated). Crown Lands Index Sheet no. 57: Halifax County.

Faribault, E. R. 1907. Province of Nova Scotia: Halifax County (Propsect Sheet, no. 69). Geological Survey of Canada, Ottawa.

Fergusson, C. Bruce. 1967. Place-Names and Places of Nova Scotia. Public Archives of Nova Scotia, Halifax.

Plates

Plate 1: The existing ATV trail between on the southwest side of the power easement, looking south southwest toward the MET tower.

Plate 2: Proposed site of Turbine #1, looking southwest.

Plate 3: Proposed site of turbine #2, looking west northwest.

Plate 4: A portion of the access road between Turbines #2 and #3, looking north northwest.

Plate 5: Proposed location of Turbine #3, looking north.

Appendix A:
Heritage Research Permit

NOVA SCOTIA

Heritage Research Permit (Archaeology)

Special Places Protection Act **1989**

(Original becomes Permit when approved by Communities, Culture and Heritage)

Office Use Only
Permit Number:
A2014NS010

Greyed out fields will be made publically available. Please choose your project name accordingly

Surname MacIntyre	First Name April
Project Name Terence Bay Wind Project	
Name of Organization Davis MacIntyre & Associates Limited	
Representing (if applicable)	
Permit Start Date 27 February 2014	Permit End Date 30 June 2014
General Location: South side of Brookside Road, Terence Bay, Halifax County	

Specific Location: *(cite Borden numbers and UTM designations where appropriate and as described separately in accordance with the attached Project Description. Please refer to the appropriate Archaeological Heritage Research Permit Guidelines for the appropriate Project Description format)*

20 T 443419.23 E 4928240.64 N (Turbine #2)

Permit Category:
Please choose one

- [ ] Category A – Archaeological Reconnaissance
- [ ] Category B – Archaeological Research
- [x] Category C – Archaeological Resource Impact Assessment
- [x] I certify that I am familiar with the provisions of the *Special Places Protection Act* of Nova Scotia and that I have read, understand and will abide by the terms and conditions listed in the Heritage Research Permit Guidelines for the above noted category.

Signature of applicant April MacIntyre	Date 07 February 2014
Approved by Executive Director [signature]	Date Feb 27-14

APPENDIX K

Mi’kmaq Ecological Knowledge Study

Terence Bay Wind Power

Mi'kmaq Ecological Knowledge Study

Prepared for: CBCL Limited

Membertou
GEOMATICS SOLUTIONS

December 2013
Version 1

M.E.K.S. Project Team

Jason Googoo, Project Manager

Dave Moore, Author and Research

Craig Hodder, Author and GIS Technician

Katy McEwan, MEKS Interviewer

John Sylliboy, MEKS Traditionalist

Prepared by:	Reviewed by:
______________________	______________________
Craig Hodder, Author	Jason Googoo, Manager

Executive Summary

This Mi'kmaq Ecological Knowledge Study, also commonly referred to as a MEKS or a Traditional Ecological Knowledge Study (TEKS), was developed by Membertou Geomatics Solutions (MGS) on behalf of CBCL Limited for the proposed Terrence Bay Community Wind Power project. This project is being undertaken by Chebucto Terence Bay Wind Field Limited under the Community Feed-In Tariff (COMFIT) program administrated by the Nova Scotia Department of Energy.

The MEKS mandate is to consider land and water areas which the proposed project will utilize and to identify what Mi'kmaq traditional use activities have occurred, or are currently occurring within and in proximity to the project site. In addition, consideration is given to the Mi'kmaq ecological knowledge that presently exists in regards to the area. In order to ensure accountability and ethic responsibility of this MEKS, its development has adhered to the "Mi'kmaq Ecological Knowledge Protocol". This protocol is a document established by the Assembly of Nova Scotia Mi'kmaq Chiefs, which speaks to the process, procedures and results that are expected of a MEKS.

The Mi'kmaq Ecological Knowledge Study consisted of two major components:

- **Mi'kmaq Traditional Land and Resource Use Activities**,
  both past and present,
- A **Mi'kmaq Significance Species Analysis**, considering the resources that are important to Mi'kmaq use.

The Mi'kmaq Traditional Land and Resource Use Activities component utilized interviews as the key source of information regarding Mi'kmaq use in the Project Site and Study Area. The Project Site is an area located approximately 19 km southwest of Halifax, Nova Scotia. The Study Area consists of areas within 5 km of the proposed project's property boundary, and this larger area includes the communities of Brookside, Terence Bay, Terence Bay River, and Whites Lake.

Interviews were undertaken by the MEKS Team with Mi'kmaq hunters, fishers, and plant gatherers, who shared with the team the details of their knowledge of traditional use activities. The interviews were took place in November and December, 2013.

Informants were shown topographical maps of the Project Site and Study Area and asked to identify both where they undertake their activities as well as to identify where and what activities were undertaken by other Mi'kmaq. A total of nine informants were interviewed. Permission was requested of the interviewee(s) to have their information incorporated into the GIS data. These interviews allowed the team to develop a collection of data that reflected both the most recent Mi'kmaq traditional use in this area, as well as historic accounts. All interviewee's names are kept confidential; they will not be released by MGS as part of a consent agreement between MGS and the interviewee to ensure confidentiality.

The data gathered was also considered with regards to Mi'kmaq Significance. Each species identified was analyzed by considering its use as a food/sustenance resource, a medicinal/ceremonial plant resource, or an art/tools resource. These resources were considered with respect to their availability or abundance both in the areas listed above, and in areas adjacent to or in other areas outside of these areas; their use and their importance to the Mi'kmaq were taken into account.

Project Site

Based on the data collected during the interview process, no Mi'kmaq traditional use activities reported on the project property, either historically or currently.

Study Area

Based on the data documentation and its analysis, it was concluded that the Mi'kmaq have historically undertaken traditional use activities in the broader Study Area and that this practice continues to occur today. These activities primarily involve the harvesting of fish, but also include the harvesting of animal, plant, and tree species; these activities occur in varying locations throughout the Study Area and at varying times of the year.

Mackerel and **trout** were found to be the most fished species in the Study Area. **Deer** was the only hunted species within the Study Area. With the small number of gathering areas identified, it is difficult to categorize the area as a particular gathering area type.

Table of Contents

1.0 INTRODUCTION

1.1 Membertou Geomatics Solutions

Membertou Geomatics Solutions (MGS) is a Membertou First Nation company that was developed as a result of the 2002 Supreme Court Marshall Decision. MGS was established as a commercially viable company that could provide expertise in the field of GIS Services, Database Development, Land Use Planning Services and Mi'kmaq Ecological Knowledge Studies (MEKS). MGS is one of many companies established by the Membertou First Nation – Membertou Corporate Division; these companies provide employment opportunities for aboriginal persons and contribute to Membertou's growth and development initiatives. Membertou's excellent management and accountability with respect to their operations is further enhanced by their ISO 9001:2008 certification.

For the development of this MEKS, MGS brings to the table a team whose expertise and skills with land documentation have developed a sound MEKS procedure. The team skills include expertise in the area of historical Mi'kmaq research, GIS data analysis, Mi'kmaq environmental knowledge, and Mi'kmaq community connections.

1.2 Terence Bay Wind Power Project

The project proponent, Chebucto Terence Bay Wind Field Limitedis owned by Chebucto Wind Farm Inc., Renewable Energy Services Limited and a number of individual investors from Nova Scotia, is proposing to build a 7.2 MW wind farm on 100 acres of private land (PID – 00384966) in the River Road area near Terence Bay, Nova Scotia. The proposed project received a COMFIT Certificate from the Nova Scotia Department of Energy on April 16, 2012.

CBCL Limited, on behalf of Chebucto Terence Bay Wind Field Limited and its parters, has contracted MGS to undertake a MEKS for this Terence Bay Wind Power project.

2.0 MI'KMAQ ECOLOGOCAL KNOWLEDGE STUDY SCOPE & OBJECTIVES

2.1 Mi'kmaq Ecological Knowledge

The Mi'kmaq people have a long-existing, unique and special relationship with the land and its resources, which includes the harvesting of resources, the conservation of resources and spiritual ideologies. This relationship is intimate in its overall character, as it has involved collective and individual harvesting of the resources for various purposes, be it sustenance, medicinal, ceremonial and/or conservation. This enduring relationship has allowed the Mi'kmaq to accumulate generations of ecological information and this knowledge is maintained by the Mi'kmaq people and has been passed on from generation to generation, from elder to youth, ***kisaku kinutemuatel mijuijij***.

The Mi'kmaq Ecological Information which is held by various Mi'kmaq individuals is the focus of Mi'kmaq Ecological Knowledge Studies (MEKS), also commonly referred to as Traditional Ecological Knowledge Studies (TEKS). When conducting a MEKS, ecological information regarding Mi'kmaq/Aboriginal use of specific lands, waters, and their resources are identified and documented by the project team.

Characteristically, MEKS have some similar components to those of an Environmental Assessment, yet differ in many ways. Among their purpose, Environmental Assessments seek to measure the impact of developmental activity on the environment and its resources. This is often done by prioritizing significant effects of project activities in accordance with resource legislation, such as the *Species at Risk Act*.

Mi'kmaq Ecological Knowledge Studies are also concerned with the impacts of development activities on the land and its resources, but MEKS do so in the context of the land and resource practices and knowledge of the Mi'kmaq people. It is extremely important that this distinction is identified and understood when developing an environmental presentation of the Study Area in terms of the Mi'kmaq use of the land, waters and their resources, i.e., Mi’kmaq use, differs from that of non-Mi’kmaq. Thus, the MEKS provides ecological data which is significant to Mi’kmaq society and adds to the more comprehensive ecological understanding of the Study Area.

2.2 Mi’kmaq Ecological Knowledge Study Mandate

MGS was awarded the contract to undertake a Mi’kmaq Ecological Knowledge Study for CBCL Limited with regards to the proposed Terence Bay Wind Power Project. This necessitated the documentation of key environmental information in regards to the project activities and its possible impact on the water, land, and the resources located therein. The MEKS was prepared as per the **Mi’kmaq Ecological Knowledge Study Protocol** ratified by the Assembly of Nova Scotia Mi’kmaq Chiefs on November 22, 2007.

MGS proposed to gather necessary data by developing a MEKS which identified Mi’kmaq traditional land use activity within the proposed project site and in surrounding areas within a 5 kilometer radius of the project site. The MEKS would also identify, gather, and document the collective body of ecological knowledge which is held by individual Mi’kmaq people. The information gathered by the MEKS team is documented within this report and presents a thorough and accurate understanding of the Mi’kmaq’s use of the land and resources within both the Project Site and the larger Study Area.

MGS understands that this study will be included in the Environmental Assessment under the Nova Scotia *Environmental Assessment Act* that will be submitted to the Nova Scotia Department of Energy by CBCL Limited and will be used as an indicator identifying Mi’kmaq traditional land and resource use within the Study Area.

It must be stated, however, that this MEKS is <u>not</u> intended to be used for Consultation purposes by government and/or companies or to replace any Consultation process that may be required or established in regards to Aboriginal people. As well, this report

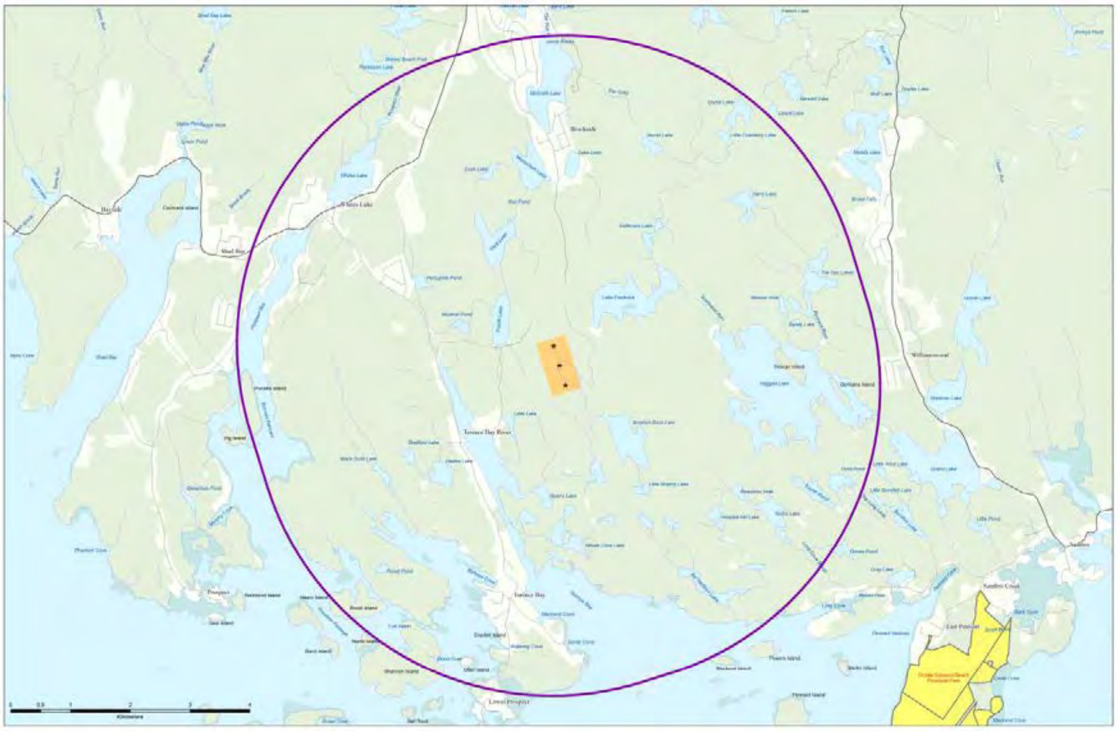
cannot be used for the justification of the Infringement of S.35 Aboriginal Rights that may arise from the project.

2.3 Mi'kmaq Ecological Knowledge Study Scope & Objective

This MEKS identifies Mi'kmaq ecological information regarding Mi'kmaq traditional land, water and resource use within the Project Site and Study Area. The data includes reference to Mi'kmaq uses from both the past and present time frames. The MEKS report identifies where the proposed project activities may impact the traditional land and resource of the Mi'kmaq. Where such possible impact occurrences are identified, the study will also provide recommendations that should be undertaken by the proponent. Wherever the MEKS identifies any possible infringements with respect to Mi'kmaq constitutional rights, the MEKS provides recommendations on necessary steps to initiate formal consultation with the Mi'kmaq. Through the development of this MEKS, Mi'kmaq ecological knowledge and traditional land, water and resource use are identified and can be taken into account by those parties that are considering the Terance Bay Wind Farm project.

2.4 MEKS Study Area

This MEKS focuses on both the proposed turbine locations within the project site and on the adjacent Study Area; the latter consists of areas within a 5 kilometer radius of the Project Site.



Project Site (orange highlight) and Study Area (purple line)

3.0 METHODOLOGY

3.1 Interviews

As a first step to gathering traditional use data, the MEKS team initiated dialogue and correspondence with Mi'kmaq communities in close proximity to the Project Site, namely Gold River, Wildcat, Cole Harbour, Shubenacadie, and Millbrook. Discussions identified those individuals who either undertake traditional land use activities or those who are knowledgeable of the land and resources within the area. An initial list of key people was then developed by the team. These individuals were then contacted by the MEKS team members and interviews scheduled.

For this MEKS, fourteen (14) individuals provided information in regards to past and present traditional use activities. Interviewees resided within or were from the communities of Gold River, Wildcat, Cole Harbour, Shubenacadie, and Millbrook. All of the interviews that were completed following the procedures identified within the Mi'kmaq Ecological Knowledge Protocol (MEKP) document. Prior to each interview, interviewees were provided with information about the MEKS, including its purpose, its use, the protocol regarding the non-disclosure of their personal information in any report, and the future use of the traditional use information provided.

Interviewees were asked to sign a consent form providing permission for MGS to utilize their interview information within this MEKS. During each interview, individuals were provided maps of the Project Site and Study Area and asked various questions regarding Mi'kmaq use activities, including where they undertook their activities, or where they knew of activities undertaken by others, when such activities were undertaken, and how each type of resource was utilized. When required, interviews were conducted in the Mi'kmaq language.

3.2 Literature and Archival Research

With regards to this MEKS, various archival documents, maps, oral histories and published works were reviewed in order to obtain accurate information regarding the past or present Mi'kmaq use or occupation relevant to the Project Site and Study Area. A complete listing of the documents that were referenced is outlined within the *Sources* section.

3.3 Field Sampling

Site visits to the Project Site took place in September, 2013 by MGS staff members, guided by a Mi'kmaq ecological knowledge holder over a period of two days. A member of CBCL staff also joined the team during the site visit.

The site visits consisted of walkthroughs of the Project Site, noting and identifying any particular species in the area, plant and animal habitats, or other land and water features or areas that would be of importance to the Mi'kmaq.

Site Visit Observations

As a result of the site visit, twenty five (25) species of plants, trees, and animal signs were observed and recorded. The most common observations recorded were signs of deer (tracks and trails), and white birch trees; four observations were recorded for each.

Other species of plants and trees identified were Labrador tea, pitcher plant, alder, aspen, balsam, black spruce, ferns, golden thread, juniper, maple, mountain ash, poplar, wild raisin, bayberry, cherry tree, cranberry, fox berry, huckleberry, larch, partridge berry, pin cherry, sarsaparilla, and snowberry.

Deer tracks found at the start of the site visit

4.0 MI'KMAQ LAND, WATER AND RESOURCE USE

4.1 Overview

The Mi'kmaq Land, Water and Resource Use Activities component of the MEKS provides relevant data and analysis in regards to Mi'kmaq traditional use activities that occur, or have occurred, within the Study Area. It identifies the type of traditional use activities that are occurring, provides the general areas where activities are taking place and presents an analysis regarding the significance of the resource and the activity.

The information on the Mi'kmaq traditional use activitiesvthat is provided by interviewees is considered both in terms of "Time Periods" and in regards to the "Type of Use", i.e., the resources that is being utilized. The Time Periods that the MEKS team differentiates traditional use activities by are as follows:

"Present" – a time period within the last 10 years;
"Recent Past" – a time period from the last 11 – 25 years ago; and
"Historic Past" – a time period previous to 25 years in the past

The "Type of Use" categories include spiritual use, sustenance use, such as fishing and hunting or medicinal gathering activities.

Finally, the study analyzes the traditional use data in consideration of the type of land and resource use activities and the resource that is being accessed. This is the Mi'kmaq Significant Species Analysis, an analysis which ascertains whether a species may be extremely significant to Mi'kmaq use alone. And, if a loss of the resource was to occur through project activities, that the loss be unrecoverable and prevent such Mi'kmaq use in the future. This component is significant to the study as it provides details as to Mi'kmaq use activities that must be considered within the environmental understanding of the Project Site and Study Area.

By analyzing the traditional use data with these variables, the MEKS thoroughly documents Mi'kmaq traditional use of the land and resources in a manner that allows a detailed understanding of potential effects of project activities on Mi'kmaq traditional use activities and resources.

4.2 Limitations

By undertaking documentation research and interviews with Mi'kmaq traditional activity users, this study has identified no Mi'kmaq Traditional Use activities occurring in the Project Site, but activities have occurred or continue to occur in the Study Area. The study has been undertaken in a manner to identify traditional use activities that the MEKS team believes is complete and thorough, as required by the MEKP. Historical documents within public institutions were accessed and reviewed and individuals from nearby Mi'kmaq communities were interviewed. The interviews were undertaken with key Mi'kmaq community people, identified initially by the MEKS team, who are involved and are knowledgeable regarding traditional use activities. As a result of the historical documentation review and the interview process, the MEKS team is confident that this MEKS has identified both accurate and a sufficient amount of data to properly reflect the traditional use activities that are occurring in the Study Area.

The MEKS process is highly dependent on the information that is provided to the team. Because only some of the Mi'kmaq traditional activity users and not all Mi'kmaq traditional activity users are interviewed, there is always the possibility that some traditional use activities may not have been identified by the MEKS.

4.3 Historical Review Findings

Project Site and Study Area

The Project Site is located approximately 4.6 km southeast of the intersection of Highway 333 and the road between the communities of Whites Lake and Terence Bay. The project Site is located within the Mi’kmaq Political District of Mi’kmaq Sipekne’katik which includes the central portion of the province including the LaHave River and Cornwallis River watersheds, Bay of Fundy, Minas Basin watersheds and the Atlantic Coast from the LaHave River to East River Sheet Harbour. *(1)*

In a historic context the study area extends beyond the Study Area to include the Mi’kmaq history of the region and for the purposes of this review that includes much of Halifax County and particularly Halifax Harbour and the western portion to Ingramport on St. Margarets Bay. The historic Records only offer glimpses of the Mi’kmaq presence in this portion of the province, but give an indication of their widespread occupation of and activities conducted within the region.

Landscape

The Project Site is located on the south east face of a promontory that rises to a peak elevation of 69m between Fourth Lake and Frederick Lake. The Project Site itself has 3 high points separated by 2 southeast flowing brooks with 2 high points having an elevation of 65m and the remaining high point elevation of 60m.

With the exception of the southwest corner of the Project Site and the land to the south, the area is underlain with Ground Moraine of Stony Till Plain material of a stony- sandy matrix derived from the local bedrock at the base of glacial ice sheets and released when the receding ice sheets melted. The Stony Till Plain in this area is characterized by rolling to flat topography with many surface boulders. To the northeast and northwest are Silty Drumlin mounds of till material that use as much as 15-20m in elevation over the surrounding landscape; these were formed by the ice during Phase 1 of glaciation and modified by subsequent phases. The mounds have an oval footprint on the landscape with the longer axis orientated parallel with the forming ice flow direction. The drumlin fields within the Study Area have a steep northwest to southeast orientation and are comprised of ice transported silty till material including red clay derived from areas north of the Study Area. The land at the southwest corner of the Project Site and extending south to the coastline is exposed Bedrock. *(2)*

The coastal exposed bedrock, including the underlying bedrock of the entire Project Site is Granite of Muscovite Biotite Monzogranite of the Liscomb Complex. The 380 Ma old bedrock is only 1 formation of the number that comprise the granite pluton that has an eastern extent at Chebucto Head, arcing northwestward through St. Margarets Bay and extending from Mt. Uniake to Sherbrooke Lake. The Pluton which was once an underground pool of molten rock that slowly cooled, continues arcing southwestward through the southwestern portion of Hants County, forming the South Mountain of Kings and Annapolis Counties and through the Eastern portion of Digby County reaching its western extent near Kemptville, Yarmouth County. *(3)*

The hard granite pluton came to the surface through the erosion of overlying rock by successive periods of glaciation with the last period, the Wisconsin Period, beginning 75,000 years ago and ending approximately 10,000 years ago. There were 4 distinct phases of glaciation over the province. Phase 1 ice flows moved eastward across the region including Prince Edward Island and Cape Breton Island before shifting flow direction southeastward across the present day Bay of Fundy, Mainland Nova Scotia and Cape Breton Island. The Ice flow across the Project Site and Study Area in this phase was eastward and then at some time shifted to a southeast flow direction. *(4)*

The Phase 2 ice center was located north of present day Prince Edward Island with flow direction south over mainland Nova Scotia and southeast over lower southeast portions of Cape Breton Island. The ice flow associated with Phase 2 was directly south over the Project Site and Study Area. *(4)*

The Phase 3 ice centre was located parallel to the present day Nova Scotia Atlantic Coast and extended on land from Cape Sable, through Cape Canso to the offshore and approximately south of present day Louisbourg, Cape Breton Island. From this ice divide, ice flows moved northeast across eastern portions of Cape Breton Island, northwest across western portions of Cape Breton Island, northeast across northern portions of the mainland from Cape George to the Minas Basin, and west to northwest across the present day Annapolis Valley and Digby Neck. On the Atlantic side of the ice divide, the flow direction was in a southeast direction over the Scotia Shelf including the Project Site and Project Area. *(4)*

Phase 4 was a period when several remnant ice sheets were located throughout the province and advanced and receded in a radial direction from the ice centers. Cape Breton had two glaciers; one was centered on the Highlands and the second on the Bas d'Or Lakes. The Chignecto Glacier was centered near Baie Verte and Cape Tormentine. The Chedabucto Glacier filled the present day Chedabucto Bay and St. Georges Bay with a westward ice flow across the central portion of the province into the Northumberland Strait, Minas Basin and the Atlantic. The Chedabucto Glacier flowed westward to the Atlantic and extended from the ice center near the Strait of Canso to approximately the Project Site and Project Area. The South Mountain Ice Cap was centered near the present day Kejimkujik National Park and had a westward radial ice sheet flow direction. *(4)*

The Study Area was completely ice free approximately 12,000 years Before Present. The receding ice margin was located roughly 40 km to the northwest of the present day shores deep within St. Margarets Bay, but still covering the northern portion of the province from south east of the Annapolis Basin, the entire Eastern Shore eastward of Cole Harbour and the western half of Cape Breton Island. *(5)*

At one time the coastal shoreline along the Atlantic Ocean was approximately 20 km beyond the present-day shoreline of Chebuctou Head at the mouth of Halifax Harbour. *(6)* The well- studied and documented sea level rise that has taken place in Halifax Harbour is a good example of the changes that have occurred to the Atlantic coastline. The

Ancient Sackville River and chain of lakes were all submerged by rising sea levels over a period from 11,600 to 7,000 years Before Present. Sea levels in the Scotia Shelf region rose 65 to 70m during that period and inundated ancient coastal plains and river valleys in the region to approximate the present-day shoreline; the latter continued to rise, but at a much reduced rate to present levels. *(7)* Sea level rise on the Atlantic Coast was a combination of land rebound after the ice sheets receded, rising ocean temperatures and the water released by melting glaciers. *(8)* As the heavily weighted ice sheet centers located in the Gulf of St Lawrence depressed the earth's mantle, the areas of the mantel at the ice sheet margins rose slightly. As the weight of the ice sheets diminished as the ice melted, the depressed center areas rebounded and rose in elevation while the mantel of the margin areas lowered in elevation. *(9)* Ocean temperatures gradually increased, and every 1 degree Celsius increase in water temperature, increased ocean levels by 60.0 cm due to volume expansion. *(8)* The rebound and ocean temperature rise combined with the influx of glacial melt water transformed the ancient shoreline of the Halifax region. The shoreline of present day Bedford Basin, for example, is 23.0m above the submerged ancient boulder edged lake shoreline of approximately 6,000 years ago. *(7)* Drumlin hills became islands; some gradually became submerged shoals as did the waterfalls of the Ancient Sackville River south of Mill Cove and Roach Cove. Lakes became silt filled basins and channels within the present-day Halifax Harbour and Bedford Basin. *(7)*

The ice resistant granite was exposed at promontories where very little to no till cover remained. This is the case at the southwestern corner of the Project Site, characteristics which extend to the coast. The soils that developed on the tills share the characteristics of the underlying parent material. There is no soil classification for the Project Site. It is Rockland where there is 60 percent exposed bedrock; the till that exists is very stony. The soils that developed on the Stony Till Plain to the east and west of the Project Site are Gibraltar Soil that is a Brown Sandy Loam over a Strong Brown Sandy Loam with good to excessive drainage; it is unsuitable for agriculture. The Silty Drumlins to the east of the Project Site developed Wolfville Soils that are a Dark Reddish Brown Loan to Sandy Clay Loam; these are suitable for crops where the till is deep enough. *(10)*

Pre-contact

The rising sea levels also submerged any possible archaeological trace of the ancient peoples that may have utilized the natural animal migration routes and former coastal plains. The earliest known Paleo-Indian site within Nova Scotia is located 108 km north of Halifax at Debert, N.S. The artifacts found at the Debert site are dated to be 10,600, +/- 47, years Before Present. This is within the same period of the glacial re-advances of the Younger Dryas Period of 11,000 and 10,000 years Before Present and rising sea levels of 11,600 to 7,000 years Before Present. *(7)(8)* It is theorized that the re-advancement of the glaciers during the Younger Dryas period created inhospitable conditions which pushed the peoples south to warmer climates. *(6)*

A single Paleo-Indian Period artifact was found in north Dartmouth in 1986. The Chambers Point, as the partially completed stone tool was named, was found on high ground above Lake Micmac; no other artifacts were found with it. [3] The Chambers Point's contextual origin may never be known as it was interpreted that the fluted point preform was brought into the Dartmouth street yard with fill from an unknown source. It was thought at the time that the fill material originated at a near-by quarry, but museum staff were unable to narrow down a site location. The point material, however, is a distinct opaque chalcedony which is the predominant material found at the Debert Site. No chalcedony quarries as a source of this distinctive material have been discovered in the region of the Debert Site. It is thought that the quarry site has since been submerged by rising sea levels. *(11)*

There are Archaic Period sites found outside the urban area of Halifax. The Archaic period of 9,000 to 2,500 years ago are also within the time period of rising sea levels and many more former coastal and river sites may have since been submerged. *(6)*

One site that spanned a period of the Late Archaic period of 3,000 years ago to the Early Historic Period is located on the shore of the Shubenacadie River downriver of Shubenacadie Grand Lake. The Shubenacadie River has long been a transportation route between the Bay of Fundy and the Atlantic Coast, and the site is one of many sites in a cluster found along the river downstream of Shubenacadie Grand Lake. The artifacts collected consist of 582 specimens of stone flakes derived from stone tool making by the early Mi'kmaq and dated by the manufacture techniques. *(12)*

Other Archaic sites found within the Halifax area are isolated finds of broad and narrow Bayonets, Axes, Gouges, Ulus, Weights and Plummets. *(13)* Although the locations of the sites are only approximate, the following is a list of locations of Archaic finds within the Halifax area *(13)*:

Elmsdale	Enfield
Grand Lake Sites	Kinsac Lake
Preston	Stewiacke
Dartmouth Sites	Nine Mile Lake
Moody Lake	Windsor Junction
Rafter Lake	Little River Harbour
Todds Island	Musquodobit
Sawlor Lake	Chezzetcook Lake

The Coastal Maritime Woodland Period sites of 2,500 to 500 years ago were not as overyly impacted by rising sea levels as earlier periods, but were impacted by coastal erosion of the glacial tills by successive storms and constant wave action.

In 1837, a spear point and hollow stone tubes were found in Dartmouth near the waterfront. The hollow tube artifacts were later identified as Ohio pipestone and dated between 2,600 and 2,100 years ago and are indicative of the trade network that existed between the early peoples of Northeast North America. *(6)* This type of find is associated with burials. There was similar find at Whites Lake, 5km northwest of the Project Site. The Whites Lake burial site is of the same tradition and period as the 1837 Dartmouth find. Laboratory analysis of charcoal determined that the Whites Lake Site dates between 2260 and 2440 years Before Present. *(11)* The Whites Lake site was discovered when disturbed by road construction. The burial remains were recorded in detail and with the assistance of the Mi'kmaq Grand Council and the Mi'kmaq Association of Cultural Studies, the remains were reburied and the site protected. *(6)*

The Susquehanna Tradition is a period beginning approximately 4000 years Before Present with the movement of early peoples originating in the area of what is today southern New England interacting with and influencing the peoples of the Maritime Peninsula. The distinctive tool making tradition of broad bladed projectiles and drills as well as cremation burials mark this movement and influence. The Susquehanna Tradition period is believed to mark a transition in adopting innovation including the use of pottery. Susquehanna Tradition artifacts of broad bladed projectiles and drills have been found in clusters sites within the Lake Rossignol-Mersey River drainage area; a single specimen was also found at Indian Gardens. The sites found shown early peoples preference for river outlets on large lakes. *(46)*

The remains found within the Whites Lake burial site were originally cremated near the burial mound and show evidence of high heat. During the original burial the cremated remains were then gathered and placed within the burial mound along with the burial artifacts that also show evidence of high heat exposure. *(11)*

The rituals associated with the burial mound at Whites Lake differs from the burial ritual described by Nicholas Denys 339 years ago where Early Mi'kmaq burials were at common burial ground sites. The deceased was covered in a soft skin or beaver robe and bound with their legs against their chest and touching the chin. The hole was lined with fir and cedar boughs and gifts of weapons, snowshoes, utensils, beads and clothing to accompany them into the land of souls where previously deceased friends and family awaited. *(14)* The nature of early Mi'kmaq was to compete for the best gift given and they gave the very best of what they had. The quality of the gifts was such that they sometimes deprived themselves of the necessities for survival. *(14)*

McNabs Island was occupied by Mi’kmaq in the period leading up to the initial settlement of Halifax in 1749. A Maritime Woodland period shell midden was discovered on McNabs Island which contains refuse of bones, shells and broken tools discarded by the early Mi’kmaq that provide valuable insight into their daily lives. *(6)* Artifacts found include 82 prehistoric ceramic sherds which when compared to other known sites is estimated to be 1,600 years Before Present. *(13)*

A Woodland Period site is located near the shore southeast of East Pennant this was an accidental discovery during an archeological dig of a 1794 Scottish Settler fishing village. While excavating a foundation depression, archaeologists found previously disturbed Mi’kmaq artifacts including stone flakes, two arrowheads and hide scrapping tools. The Mi’kmaq location was interpreted as a seasonal coastal settlement where Mi’kmaq would spend much of the warmer months of the year before moving inland for the winter. *(6)*

The seasonal migration inland led the Mi’kmaq up river systems to interior lake shores during the winter where small family groups hunted game and fished the rivers and lakes. Some of the larger river systems have since been dammed for power generation; during routine maintenance the lake levels are lowered and sometimes revealing early Mi’kmaq seasonal settlements. Maritime Woodland Period sites have been found on the shores of Sandy Lake, north of Head of St. Margarets Bay, and on the Indian River System entering St Margarets Bay. The Sandy Lake site was dated at 1,500 to 1,000 years Before Present; it contained 3,500 artifacts of stone flakes, pottery, tools and food bones while the Indian River sites provided evidence of seasonal camp locations. *(15)(16)*

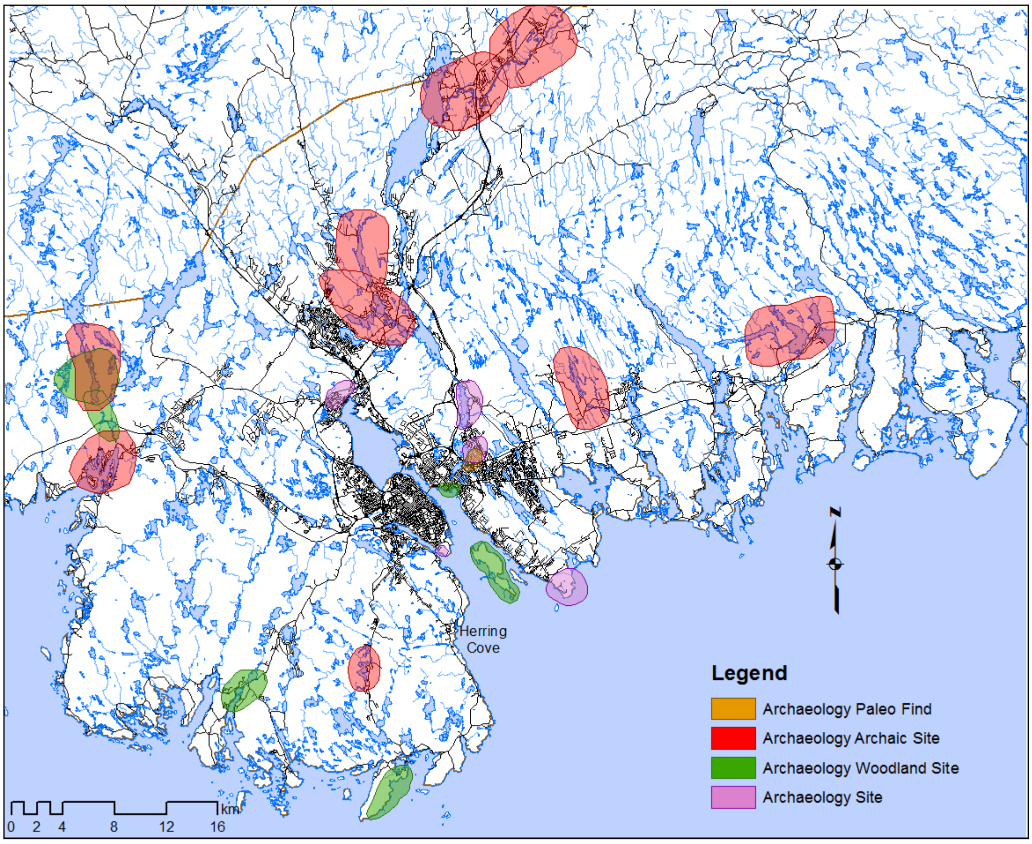
There are isolated finds of a scraper at Hartlen Point, Eastern Passage and a celt found at Lake Charles. *(13)*

Other early Mi’kmaq finds within the region include the petroglyphs located on the Bedford Barrens. These petroglyphs are carved into the exposed bedrock on a high ridge overlooking the Bedford Basin and straight down Halifax Harbour to and through the high points of McNabs Island.

The Bedford Barrens Petroglyphs consist of a carved eight pointed star within a carved circle, approximately 300mm in diameter, with small stars inscribed between each of the eight points. Accompanying the eight pointed star is an obscure carving that has been interpreted as a human figure connected to female reproductive parts by a carved straight line. *(6)* Similar figures of the same interpretation of female reproductive parts are found among the Petroglyphs of Lake Kejimkujik and the Medway River. *(17)* The Petroglyphs are subject to interpretation. One proposed purpose of the eight pointed star is to measure the seasons where the points align with mid-season moon and sun rises and settings. *(18)* The location does offer a southeast view of the rising sun and may have been used for ritual purposes. *(19)* Among the Lake Kejimkujik and the Medway River Petroglyphs are 2 circular carvings similar to the circular carving at the Bedford Barrens site; these have been interpreted as Chief's Totems. One Totem has eight points while the other has seven points; both are enclosed within a circle with designs contained within. *(17)* Although more likely to be a product of artistic license, modern depictions of historic Mi'kmaq Grand Chief Membertou as used by Canada Post show the Bedford Barrens eight pointed star petroglyph as a large medallion worn by Chief Membertou. *(20)*

The Bedford Barrens Petroglyphs have been studied by the Nova Scotia Museum and have been identified to be Mi'kmaq, but archeologists are unable to determine if the carvings were created using stone or metal tools and are therefore unable to date them. The use of stone tools would date the petroglyphs prior to European contact. *(6)*

Other petroglyphs in the Halifax area include carvings found on a promontory in North Dartmouth overlooking Lake Micmac and Halifax Harbour. The North Dartmouth petroglyphs consist of geometric shapes including a triangle, a Christian cross, sailing ships as well as 1800s dates, and names of historically known Mi'kmaq persons. The triangle poses the greatest curiosity as it is an equilateral triangle bisected from top to middle of the base as well as horizontally by two lines. The method of carving the triangle is different from the other obviously metal tool carvings, but its purpose is unknown. *(19)* Although the Lake Kejimkujik and the Medway River petroglyphs have numerous carvings of ships and crosses, there is nothing similar to the equilateral triangle found in North Dartmouth. *(17)*



Archaeology Sites within the Halifax Area

Contact

In 1604 Samuel de Champlain sailed south along the Acadia Atlantic Coast and into the Bay of Fundy where there were favorable soils in the Annapolis Valley to establish permanent settlement, i.e., Port Royal. *(21)* Various sources have different dates as to when Champlain explored Halifax Harbour. Dates given include 1604 during his earliest voyages,*(21)* 1631 during his voyage to England, France and return to New France, *(22)* and 1607 during an exploration of the Atlantic Coast on a sail between Port Royal and Canso.

(23) When Champlain did first pass Halifax Harbour, the only recorded remark was that the Harbour was “a good safe bay”. (21)

Champlain made no mention of the Mi’kmaq that spent the warm months of the year on the harbour shores and the coastline east and west of the harbour. The harbour was known to the Mi’kmaq as “Kjipuktuk” translated as “Great Harbour”. (24) Historical records and accounts refer to the Mi’kmaq name as “Chebooktook” meaning “at the biggest harbour” and later it was referred to as “Chebuctou” which is still in common use today. (21)

Other Mi’kmaq Place Names:

Chebooktook	long harbour	Bedford Basin *(6)*
Chebookt	chief harbour	Halifax Harbour *(34)*
Kjipuktuk	great harbour	Halifax Harbour *(24)*
Gwowaqmicktook	white pine forest	Peninsular Halifax *(6)*
Dwidden	the big passage	Main entrance to harbour *(6)*
El-pay-sok-ticht	leaning towards the sea	McNab’s Island *(6)*
El-pay-gwitck	turned-over like a pot	George’s Island *(6)*
Al-e-sool-a-way-ga-deek	at the place of measles	Fairview *(6)*
Aloosoojawakade	place of measles	Sackville *(25)*
Mesebakum	the constant mocker	Cape Sambro *(25)*
Mesebakunuk	the constant mocker	Cape Sambro *(25)*
Nospadakum	herb mixed with tabacco	Prospect *(25)*
Amagunchech	the little breezy place	Porter’s Lake *(25)*
Pogweg or Pokwek	the smoky lake or dry lake	Pockwock *(25)*
Koolpijwik	the river eddies in rapids	Petpeswick Harbour *(25)*
Mooskudoboogwek	suddenly widening out	Musquodoboit Harbour *(25)*
Tulugadik	camping ground	Oakfield - Grand Lake *(25)*
Wonpaak	still water or white water	Cole Harbour *(25)*
Taboolsimkek	two small branches flowing through sand	Lawrencetown *(25)*
Boonamoogwaddy	tomcod ground	Dartmouth *(25)*
Moolipchugechk	deep chasm or gorge	Herring Cove *(25)*
Nemagakunuk	good fishing place	Ketch Harbour *(25)*

Waegwoltic	end of water	Northwest Arm *(25)*
Wagwoltichk	end of water	Northwest Arm *(25)*

Kjipuktuk is an ice free harbour with a large sheltered basin that attracted European sailors as well as the Mi'kmaq for the harvesting and trading of shellfish and fish. Early European fishermen fished and dryed their catch on the beaches of McNabs Island and the inner harbour coves as early as 1698. *(21)* At the end of the basin was a river and valley (Sackville River) that was a traditional transportation route to the Bay of Fundy. Another transportation route, used to the present day, is from Dartmouth Cove through the chain of lakes to Shubenacadie Grand Lake and the Shubenacadie River. The Mi'kmaq would use these routes to gather at Kjipuktuk for an annual spring feast seven days after the first full moon in May. The French Missionary Father Louis Peter Thury named the annual feast the Feast of St Aspinquid of Agamenticus and exploited it to establish a missionary station at Chebucto; this existed until his death in 1699 when he was buried at present day Point Pleasant. The feast continues to be celebrated in various forms by the Mi'kmaq and non-Mi'kmaq on the shores of the Northwest Arm. *(26)*

The French abandoned the fishing station they established on McNabs Island approximately at the time of Father Louis Peter Thury's death and moved their operations to Port Razoir, which is present day Shelburne. The Mission Father Thurey had established in Chebucto for the Mi'kmaq ended as the French Missionaries could not convince the Mi'kmaq to stay and settle in one location. *(22)*

The next European to visit Chebucto was by Diereville, a French botanist gathering plants for the Royal Gardens. Diereville was met by three Mi'kmaq Chiefs who informed him of their Christianity and brought him to Father Thury's grave. The next visitor was the Governor of New France, Brouillan, who in the summer of 1701 was wind blown into Chebucto on route to Port Royal. He was met by hundreds of Mi'kmaq who expressed their grief at being Christians without a priest. The Mi'kmaq were able to take Brouillan to Port Royal by one of the overland routes of lakes and rivers which revealed the strategic value of Chebucto. *(21)* Beginning in 1705, a priest from Port Royal would take the overland route to Chebucto to join the Mi'kmaq for their annual spring feast and administer Easter mass. Governor Brouillian died before he could exploit the strategic value of Chebucto, and it was not until Port Royal was seized by the English in 1707 that France looked for another strategic port; they sent Engineering Officer, De Labat, to layout the defenses of Chebucto which were very similar to the various batteries existing today that were built during Halifax's long wartime history. The plans de Labat had drawn up were not realized as the 1713 Treaty of Utrecht turned over all of the mainland Acadia to the English and the French turned their attention to Louisbourg. *(21)*

Chebucto's strategic value remained untapped by European powers until the first fall of Louisbourg in 1745. Thus began a series of tragic events that had accumulative impacts on the Mi'kmaq throughout Halifax's history.

The French were determined to retake Louisbourg from the English. In 1746 they gathered a force of over 2,500 regular troops in France and loaded them onto transports under the command of Duc d'Anville. Duc d'Anville was to rendezvous at Chebucto with a French force and fleet and continue on to retake Louisbourg and seize the English fort at Annapolis. The journey was long and typhus broke out among the troops in the crowded conditions of the transports. When they finally arrived in Chebucto, their rendezvous fleet had lost patience and already sailed for France; the harbour was empty. The troops were ill or dying from the spotted rash and high fever, symptoms of typhus bacteria carried by fleas and pestilence aboard the ships. The ill were transported ashore and the dead were dropped to the bottom of the harbour; those that died ashore were hastily buried in the woods along the shore. The expedition was a disaster. D'Anville died suddenly shortly after his arrival, and the second in-command committed an honorable suicide. The remnants of the expedition sailed back to France, but storms would claim more troops in sunken ships before reaching France. *(21)* It is estimated that 1200-1300 of Duc d'Anville's expedition troops died at sea and another 1130 in Chebucto Harbour. *(22)*

Equally tragic for the Mi'kmaq allies was the typhus they carried to their settlements after helping themselves to the dead troops clothing and possessions. An estimated three quarters of the Mi'kmaq of western Acadia died of the disease. *(21)* Kjipuktuk was then known to the Mi'kmaq as "Aloosoolawakade" translated as "the place of the measles"; this would continue to be true as European diseases brought by later Halifax settlers continued to take Mi'kmaq lives. *(27)*

In 1748, the Peace of Aix-la-Chapelle returned the fortress at Louisbourg to the French and the occupying English troops were transported to Annapolis Royal which was the current seat of Government in English Nova Scotia. *(21)* England needed a port and presence on the Atlantic Coast of Nova Scotia and decided to settle at Chebucto

In 1749, the Honourable Edward Cornwallis, Captain General and Governor-in-Chief, set out for Annapolis Royal along with foreign Protestant settlers following in transports. He was then to proceed to Louisbourg with the transports to evacuate the English occupying troops and transport them to Chebucto. *(27)* However, he was wind blown into Chebucto and decided to stay and begin the settlement of Halifax. Cornwallis found some French families on both sides of the harbour upon his arrival but no Mi'kmaq. After surveying the harbour he decided against the harbour plan provided to him at Sandwich Point (Point Pleasant) as being too exposed to Southwest storms. On the other hand, settlement within the Bedford Bay was too far inland for fishermen and was subject to siege by blockade of the Narrows. Cornwallis decided to build the settlement on the side of a hill with a commanding view and with surrounding shores within cannon shot. *(28)*

The fortification of Halifax was a priority with Cornwallis and a necessity against the Mi'kmaq threat of attacks. In addition to the series of walls and Blockhouses surrounding the new town of Halifax, Fort Sackville was completed in the first year on raised land where the Sackville River flows into the Bedford Basin. Manned by Captain Goreham and his Rangers, they guarded and patrolled the main transportation route between Halifax and a post established at Minas on the Bay of Fundy. *(29)*

With the settlement progressing very quickly, Cornwallis began to get the government affairs in order which included meeting with the Chiefs which he found “very peaceable”. He offered the King’s friendship and protection, and in return, the Chiefs were to exchange their oaths to the French King to his English King. They were to leave and return with the other Chiefs to resign the Treaty of 1726. The Chiefs and Deputies returned on August 14, 1749 to meet with the Governor and Council aboard the Beaufort to sign the 1726 Treaty. Present were Chiefs and Deputies from Octpagh, Medochg, Passamaquady and Chinecto. They were asked if they have the authority to sign and agree with the treaty, which they did. *(28)* Of the 13 Indians present, 3 were deputies from the St. John, 1 Chief of Chinecto and 9 others of various tribes, but none appear to be of the Mi’kmaq of Shubenacadie whose territory Cornwallis had settled within. *(31)* The crucial tribes to Cornwallis and the Council were the St. John River and Cape Sable tribes as some members of Council had business interests in Maine and the New England area which was a war zone for the previous 5 years as settlers encroached into Indian lands. A treaty with the Cape Sable tribes would end hostilities at Annapolis Royal. There had been a Scalp Bounty placed on both these tribes by the Governor of Massachusetts in 1744. Representatives of these tribes signed a treaty with Cornwallis on August 15, 1749. *(24)* Cornwallis’ neglected to ever offer to negotiate with the Mi’kmaq the terms to which Halifax could be settled within Mi’kmaq territory. *(30)*

Mi’kmaq and English Hostilities

Much of the early colonial history of this area of the province revolves around the hostilities that existed between the Mi’kmaq and the English that centered on the establishment of Halifax.

The attitude towards the native populations was vastly different between the French and English. The French recognized the Natives as independent allies, not as subjects, and as the sovereign owners of the land. However, the English had deeds based on their own interpretations of treaties that excluded and drove off the Native populations from their traditional territories. *(32)*

To maintain the system of friendliness between the Native populations and the French, an annual giving of practical tools and goods to the Natives occurred during important gatherings or conferences. The English attempted a similar policy, but English punishments for Native wrong doings were too harsh and humiliating for the Natives. Scalp bounties for Native men, women and children issued by the English colonies furthered maintained Native and French friendly relations. *(32)*

The French Mission Sainte Ann was located deep within Mi'kmaq territory on the west bank of Shubenacadie River. It was here where Father Abbe' Jean-Louis LeLoutre provided spiritual services to the Mi'kmaq between 1738 and 1749 and where he incited the Mi'kmaq to fight the English and continue to use the mission as a staging area for Mi'kmaq attacks on Halifax. *(35)* A letter written by LeLoutre in July, 1749 stated that "we cannot do better than to incite the Indians to continue warring on the English". Not completely without a purpose of their own, the Mi'kmaq attacks that followed were a message to Cornwallis that they had the rights to their own territory as well as to hunt and fish freely within them. *(30)*

In 1749, LeLoutre moved the Mission to the isthmus of Chignecto where he and French soldiers, officers and French settlers established a new settlement. His decision to relocate divided the Shubenacadie Mi'kmaq as some wanted to be close to their religious services and some did not want to abandon their traditional territory. Jean Baptist Cope along with some others chose to stay at Shubenacadie; Cope became the prominent elder and leader. *(33)*

Cornwallis was under the impression that the Mi'kmaq of the Shubenacadie Tribe were agreeable to the English presence due to the trade that was occurring with the Mi'kmaq until they suddenly disappeared from the new English settlement. The Mi'kmaq returned in September to begin a series of attacks which lasted 10 years. The first was an attack on an English party constructing a sawmill on the eastern side of the harbour.

A letter from the Shubenacadie Mi'kmaq was translated and delivered to Cornwallis explaining their attachment to Kjipuktuk (Chebucto). However, Cornwallis extended the 1744 Massachusetts Scalp Bounty to include all Mi'kmaq. *(24)* After the attacks at Halifax and a series of attacks at Canso, ships taken by Chignecto Mi'kmaq incited by LeLoutre and the Ilse Royal French, the Scalp Bounty was a more appropriate response in Cornwallis' opinion. To declare war on the Mi'kmaq would give them a status of independent peoples rather than bandits, ruffians and rebels and were to be treated as such. On October 01, 1749 Cornwallis gave orders to all his officers to annoy, distress, take and destroy all Mi'kmaq wherever found including those who assist them. He also offered 10 Guineas for every Mi'kmaq taken or scalp produced to commanding officers at Annapolis, Minas and Halifax. Cornwallis sent out troops to scour the woods around the new town in Halifax for Mi'kmaq and sent more troops to scour the province for Mi'kmaq. *(28)*

The following year of 1750 saw the clearing of George's Island for construction of a Battery to protect the Harbour. In the fall of 1750 the Blockhouse at Dartmouth was completed on a rocky hill northeast of the end of King Street. Manned each night by a dozen militia men and a sergeant, they guarded the entrance to the Shubenacadie system of lakes and rivers that lead into Mi'kmaq held territory and were to provide protection for settlers on that side of the harbour. *(29)*

1751 saw the construction of the Peninsular Blockhouses and the Peninsular Road. The series of 3 Blockhouses connected by a patrol road extended from the Northwest Arm to the Bedford Basin. The North Blockhouse was located on a small hill near the present gate of the Fairview Cemetery. The Middle Blockhouse was located on a small hill north of Bayer's Road and the South Blockhouse was situated just east of the current railway bridge on Chebucto Road. The purpose of the Peninsular Blockhouses was to protect the settlers from Mi'kmaq attacks while they cleared and cultivated the land. *(29)*

The September 30, 1749 Mi'kmaq attack on a Dartmouth sawmill resulted in 4 English dead with decapitation and scalping, 1 carried off and 1 escaping to raise the alarm. A detachment of rangers chased and overtook the Mi'kmaq and killed 3 warriors with 2 being decapitated and 1 scalped. *(31)*

Newly arrived German settlers in 1751 were directed to the Dartmouth side of the harbour as the new town on the Halifax side was not ready to accommodate them. *(34)* In the late spring of 1751, a Mi'kmaq war party estimated to be 60 warriors attacked in the early morning hours and simultaneously surrounded the blockhouse and ran from shelter to shelter causing panic among the settlers who fled and were cut down by the warriors. Shelters were burned, 8 settlers were killed and another 14 were captured. The prisoners were taken along a trail to Lake Charles, Lake William and on to the Shubenacadie River. *(22)* Other Mi'kmaq raids occurred almost daily with an accumulating loss of life during May and June, 1751; St Paul's Anglican Church recorded 34 burials. *(22)*

The settlers were attacked by the Mi'kmaq with such vengeance, death and capturing of prisoners that settlers were reluctant to stay on the Dartmouth side. The Mi'kmaq threat curtailed further attempts to settle the Eastern side of the Harbour due to the lack of protection provided by the blockhouse during the initial attack. *(31)* The remaining settlers amounted to less than a dozen families and required a detachment of soldiers to provide protection. The settlers did little to develop Dartmouth as they feared Mi'kmaq attacks should they work in the woods clearing for settlement and crops.

There was no direct Mi'kmaq attack against the fortified town of Halifax but rather the Mi'kmaq ambushed stragglers who ventured too far from the fortifications. *(31)* The fear instilled by the Mi'kmaq attacks severely hampered further development of Halifax and kept the English confined close to fortifications and prevented them from exploring the interior of the province. *(28)*

The North Blockhouse of the Peninsular Blockhouses came under surprise attack by the Mi'kmaq killing the Guards while they were drinking and playing cards; they were killed. *(20)* This was typical of the Mi'kmaq attacks as they waited for the careless who wandered too far from the fortifications of the town, or who let their guard down. Such was the case when 2 workmen were killed at a small sawmill on the stream flowing out of Chocolate Lake. *(29)*

Cornwallis' superiors being the Lords of Trade and Plantations initially supported Cornwallis' actions to reduce the number of Mi'kmaq, but did advise Cornwallis that based on experience in New England more peaceful resolutions worked better than force with Indians. *(28)* A year later the Board reprimanded Cornwallis for his campaign against the Mi'kmaq. During 1752, Cornwallis attempted to establish trade and peace with Mi'kmaq Chiefs who would allow a system of Truckhouses to be established in their territories. *(33)*

Governor Cornwallis was granted permission to resign as Governor on August 03, 1752 and his successor was Hon. Peregrine T. Hopsin. Cornwallis continued to attend Council Meetings until October 10, when he left the Province. *(31)* In 1752, it was proposed that Governor Hospin make peace with the Mi'kmaq by offering annual gifts in return for their loyalty. This would at least provide an opportunity to discover the trails the Mi'kmaq used during their raids and to establish a fort and truckhouse at the main trail for the purpose of supplying the Mi'kmaq and fortifying the main trail. *(22)*

In September of 1752, Jean Baptist Cope, the Chief of the Shubenacadie Mi'kmaq and sometimes referred to as Major Cope, arrived with terms for peace which were agreed upon with the English. These were dated September 15, 1752. Less than 8 months later Cope was involved in the abduction and ransom of an Englishman. *(31)* A delegation of soldiers left Halifax to meet with Cope and disappeared with the exception of one soldier who was later ransomed back to the English. The returned soldier recounted that Cope had killed all in the delegation with the exception of himself through the intervention of an Acadian couple who also arranged his return. He described how Cope burned his copy of the Treaty and boasted his deception for the purpose of making the English vulnerable to surprise attacks. *(33)* However, Cope's actions may have been taken in retaliation for the killing of Mi'kmaq women and children in a skirmish between English sailors and Mi'kmaq on the Atlantic Coast. *(33)* Hostilities continued between the

Mi'kmaq and the English with sporadic Mi'kmaq attacks occurring along the coast to the Northeast and Southwest of Halifax Harbour which made creating new settlements impractical. *(31)*

On October 25, 1753, Council approved that a blanket be given to each Mi'kmaq as well as provisions for 30 people for 3 weeks to the families of the Beaver Harbour Mi'kmaq while they traveled and stayed in Halifax to ratify a peace treaty. *(22)* A similar offer of provisions for 6 months was made to 90 Mi'kmaq of the Eastern part of the province and a peace treaty was signed November 22. *(22)* It was proposed to the Mi'kmaq and in particular the Shubenacadie Mi'kmaq, that a truckhouse be built on the Shubenacadie River or at any other location of their choosing for Mi'kmaq to exercise their rights of Article 4 of their treaty to hunt, fish and trap and trade for goods at these truckhouses. *(22)* In addition, provisions of bread would be distributed half yearly as well as blankets, tobacco, powder and shot to be distributed every year on the 1st of October. *(22)*

The Mi'kmaq were occupied in helping to build French fortifications at Beausejour and other locations in the Spring of 1754. The French had 3 Mi'kmaq tribes assisting them in their fortifications and committed to side with the French against the English. *(22)* The English took the opportunity during the lull in hostilities to settle some English outports for the fishery. Captain Foyler and a detachment explored the Shubenacadie lakes and river system and found good land and timber. *(22)* Captain Foyler also mapped the location of the Mission Sainte Ann on the west bank of Shubenacadie River where LeLoutre continued to use the mission as a staging area for Mi'kmaq attacks on Halifax. *(35)* The English saw considerable advantage to fortifying the Shubenacadie system to interrupt the Mi'kmaq transportation route and provide security to Dartmouth settlers so that they could properly cultivate their lands. *(22)*

In June of 1754, settlers travelled eastward 11 miles from Halifax to establish Lawrencetown. Under the protection of 200 troops, a number officers, and rangers, the group cleared a road from Dartmouth and set up a picket line and constructed a Blockhouse with mounted cannon and constructed a storehouse. *(22)*

Since the founding of Halifax, the French had incited the Mi'kmaq to maintain a campaign of hostilities against the new English town and could be seen with the Mi'kmaq scouting the town prior to Mi'kmaq attacks. The continuous attacks confined the English to garrison towns and prevented them from clearing land for settlements and cultivation. *(22)*

In October of 1756, French and Mi'kmaq were killing Englishmen at the out-ports by lying in wait in the forest to fire upon work parties and then would disappear into the woods. *(22)*

More Mi'kmaq attacks in 1757 against areas of Eastern Passage and Point Pleasant Park caused the English to consider recalling the settlers and troops from Lawrencetown, in which they eventually did on August 25, 1757. *(22)*

During the secretly held spring Feast of St. Aspinquid at Point Pleasant in 1758, Mi'kmaq Leaders met to try and come to a consensus on negotiating a peace with the English. Jean Baptist Cope and 2 other Mi'kmaq leaders could not agree to begin negotiations and were opposed to making any deals with the English. An argument broke out and Jean Baptist Cope and another dissenting leader were killed by the other Mi'kmaq in a short skirmish that resulted in 17 Mi'kmaq dead. *(36)* Jean Baptist Cope was buried near the same location thought to be Father Abbe Thury's burial site at Point Pleasant Park. *(37)*

News of the fall of Quebec on September 18, 1759 reached the town of Halifax, 11 days after the fact, and the residents celebrated. After 10 years of inciting the Mi'kmaq to hostilities against the English in the province, the French Priest LeLoutre was disowned by the Quebec Bishop and was later captured by the English aboard a ship leaving for France. Father Maillard, who had spent 25 years with the Mi'kmaq convinced the Chiefs to go to Halifax and bury the hatchet with the English. This allowed the English to leave their fortified towns, explore the rest of the territory and bring more settlers into the province. *(22)* However, a final Mi'kmaq attack slowed the English land granting process. This was an attack that killed five soldiers at Fort Clarance, located on the Dartmouth side of the harbour opposite George's Island. The Mi'kmaq were eventually driven back and made a retreat across McNab's Island. There was still some residual apprehension on the English side as to whether the Mi'kmaq would hold the peace. *(22)*

Although the Mi'kmaq were suffering as early as 1758 from years of warfare and disease, the English remained fearful of the Mi'kmaq, particularly with the increasing tensions in the New England Colonies. Both the English and the Mi'kmaq were eager to negotiate a peace treaty, and the Mi'kmaq were still able to negotiate from a position of strength. The treaties of 1760 did not resolve territorial limits, but assured Mi'kmaq access to the natural resources the land had always provided them. *(33)* However, the land provided less over time as they were displaced from traditional territories and the amount of game available declined. *(33)*

With the 1760 series of treaty signings with various chiefs of the Mi'kmaq who had gathered on the coast for the purpose of negotiating peace and trade, the English decided to build Truckhouses at each of the existing forts for the exclusive trade with the Mi'kmaq. The first Truckhouse was built at Fort Clarance in Dartmouth. The Shubenacadie lakes and river system were opened up as a transportation route from Halifax to the Bay of Fundy. *(22)*

Prior to the 1760 treaties the coastal village of Prospect was being settled in, *(48)* followed by Shad Bay sometime around 1764. *(49)*

In 1762, there was an estimated total 1,500 Mi'kmaq men, women and children within mainland Nova Scotia and Cape Breton Island. *(22)* With an increase in tensions in Boston and the Mi'kmaq threat of hostilities diminishing within the province, a decision was made to recall the troops from Fort Cumberland, Annapolis Royal, Fort Frederick, Fort Amherst, St. John and Louisbourg and to concentrate them in Halifax. *(22)*

Michael Franklin was appointed Superintendent of Indian Affairs. He periodically reported and in 1777 reassured Council of the Mi'kmaq tranquility and maintenance of the peace while they were being constantly courted by New England Rebels to take up arms against the English. *(22)* To further ensure that the Mi'kmaq remain neutral in the American Revolution, in 1780 the English required that all tribes retreat from the Americas. *(22)*

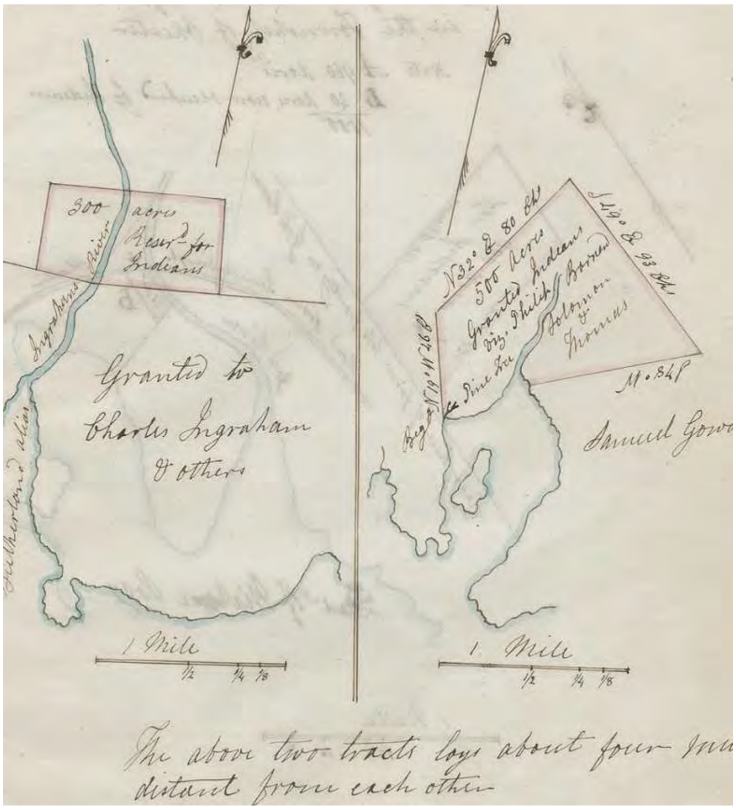
Post Treaties

While Nova Scotia treaties had guaranteed Mi'kmaq access to the province's natural resources, settlers encroached on Mi'kmaq traditional lands. In 1762 the Province issued a proclamation that there was to be no trespassing on lands claimed by the Mi`kmaq until the Crown made a decision on the claims. The proclamation, however, was more of a formality with little enforcement. The government did begin to issue licenses to the Mi'kmaq in 1783 for lands they promised to settle. *(38)*

In the late 1700s the system of Truckhouses went through a series of revisions in financial structure. There were eventual closures as trade with the Mi'kmaq had declined due to mild winters that disrupted traditional hunting and trapping as well as the quality of furs. The Mi'kmaq were encouraged to diversify by manufacturing baskets and tool handles, but this was not enough to prevent Mi'kmaq petitioning for relief supplies. *(38)*

The Office of Superintendent of Indian Affairs was established to manage the peace with the Mi'kmaq and later became a conduit of provisions. As the Mi'kmaq suffered hardships from European diseases and the depletion of fur and food stocks, the British treaty obligations of providing provisions was later considered charity from the Government's perspective. As the Mi'kmaq threat diminished over time, so did the British treaty obligations and provisions were sporadic, or had to be petitioned for by the Mi'kmaq. *(39)*

As a proposed solution to a number problems the Mi'kmaq were experiencing, there were some exceptions to the license issuing system where a grant of 500 acres in St. Margarets Bay was confirmed to Chief Phillip Bernard, Solomon and Taromaugh in 1786. This was the first outright granting of land to Mi’kmaq in the province ceded with full title. *(38)* The Government would later reconsider this practice as it was difficult to convince Mi’kmaq to become farmers and cultivate the land as was required under the land grant system. In 1819 a new system was proposed that lands of 1000 acres be set aside in each county near the areas frequented by the Mi’kmaq and held in trust for their use. *(38)*



Ingram River and Head of St. Margaret’s Bay Survey Plans
(*http://gov.ns.ca/nsarm/virtual/maps/archives.asp?ID=21*)

Mi’kmaq began to return to their traditional areas along Halifax Harbour after the signing of the 1752 Treaty with some Mi’kmaq Chiefs and later Treaties of the 1760s. The arrival of Abbe’ Maillard in Halifax in 1758 also attracted more Mi’kmaq to the harbour and when the seasons signaled their arrivals and departures at the harbour, they camped at locations of Sandy Cove, Dartmouth Cove, Turtle Grove, Tuft’s Cove, Indian Point and at the mouth of the Sackville River. The spring feast in May also brought the Mi’kmaq to the Northwest Arm and Point Pleasant. Although the fear instilled by hostilities with the

Mi'kmaq was very recent in the Halifax people's memories they were quick to accept the presence as well as coming and goings of Mi'kmaq. *(24)*

During the 1800s the Mi'kmaq of Halifax fade from the historical record with the exception of artist's paintings of idealistic Mi'kmaq camps or depictions of Mi'kmaq being present at almost every noteworthy event in Halifax's history.

Historically accurate or not, the Mi'kmaq of Halifax not included in the artist's paintings suffered through Cholera in 1834 and again in 1849 when the Turtle Grove Mi'kmaq suffered the most. The 1849 Smallpox epidemic in Halifax affected the poor as well as the Halifax Mi'kmaq and those who survived were later shunned by Halifax residents. *(24)*

A review of the highly detailed A.F Church, Halifax County Map of 1865 show no indication of Mi'kmaq settlements in areas where Mi'kmaq have been known to occupy or were granted Licenses such as Head of St. Margarets Bay. The shoreline of Turtle Grove has a list of individual names along the shore, but as the names are not legible, it would be difficult to determine if the names belong to known Mi'kmaq. *(40)*

A review of Provincial Land Grant Index sheets do show reserve land at the mouth of the Ingram River as "Indian Reserve", but the 500 acre parcel at Head of St. Margaret's Bay granted to Chief Phillip Bernard and two other Mi'kmaq in 1786 is listed as "Phillip Bernard et. al." rather than an Indian Reserve. *(41)*

Another "Indian Reserve" was located north of Cootes Cove at Sambro with frontage on both Indian Harbour and Sambro Basin approximately 10km east of the Project Site. The Sambro parcel is listed as Abandoned 1919. *(41)*

Provincial Land Grant Index Sheet 55

(*http://www.gov.ns.ca/natr/land/indexmaps/055.pdf*)

The 1902 Department of Indian Affairs Annual Report lists Sambro as a 300 acre (121 hectares) parcel transferred to the Dominion from the Province at Confederation and designated as Sambro I. R. No. 15. The same report lists Ingram's River as a 325 acre (132 hectares) parcel transferred to the Dominion from the Province at confederation and designated Ingram's River I. R. No. 16. *(50)*

A review of a 1900 Department of Indian Affairs census return does not list either Sambro or Ingram's River in the tables, but does list the following Mi'kmaq communities and populations for Halifax County: *(51)*

Sheet Harbour	32
Cow Bay, Cole Harbour (Reserve)	26
Wellington	8
Windsor Junction	23
Emsdale	35

Ingram's also appears in provincial records where there was correspondence between officials as well as from Mi'kmaq concerning trespassing on the Ingram's reserve parcel as well as possible legal actions against 3 individuals who trespass on the Ingram's Reserve. *(52)*

A review of the Indian and Northern Affairs Canada, Status Report on Specific Claims, lists these parcels as "In Negotiations" and "Active Negotiations". The Confederation of Mainland Mi'kmaq (CMM) on behalf of Shubenacadie First Nation and Millbrook First Nation claim that the Ingram River Indian Reserve as well as the Sambro and the Ship Harbour Lake Indian Reserves were subject to an unlawful surrender and sale in 1919. The last recorded entry in the Status Report is December 07, 2009, "Claimant agrees to Negotiate". Millbrook has an active claim concerning Sheet Harbour I. R. No.36 with the last entry at February 21, 2011 "Canada Offered to Negotiate" *(42)*

Provincial Land Grant Index Sheet 57

(*http://www.gov.ns.ca/natr/land/indexmaps/057.pdf*)

Provincial Land Grant Index Sheet 65 shows a 1000 acre parcel on the western shore Shubenacadie Grand Lake listed as "Indian Reserve" although the eastern shore of the lake is most likely where the Mi'kmaq frequented. *(41)*

Provincial Land Grant Index Sheet 66 shows a small strip parcel between Morris Lake and Bissett Lake, in the Cole Harbour area and East of Eastern Passage, listed as "Indian Reserve"; this appears to have been subdivided out of a 900 Acre parcel listed as "John Forsythe et. al." *(41)*

Frank Speck's 1922 map of Nova Scotia Mi'kmaq traditional hunting territories and villages shows Mi'kmaq villages approximately in the same locations as Shubenacadie Grand Lake and Cole Harbour "Indian Reserve" as shown on the Provincial Land Grant Index Sheets. *(43)* These two parcels are currently Shubenacadie I.R.13 and Cole Harbour I.R. 30 and two other Indian Reserves of Beaver Lake I.R. 17 farther east on the West River-Sheet Harbour River and Sheet Harbour I.R. 36 at Sheet Harbour are the only Indian Reservations within Halifax County (HRM) that exist today. There are no known Traditional Hunting Territories within the Study Area at the time of his 1922 publication. *(44)*

Current Reserves within Halifax County and allocated Bands: *(47)(53)*

Beaver Lake No. 17	49.4 hectares	Established in 1867	Millbrook Band
Cole Harbour No. 30	18.6 hectares	Established in 1880	Millbrook Band
Sheet Harbour No. 36	32.7 hectares	Established in 1915	Millbrook Band
Shubenacadie No. 13	412 hectares	Established in 1820	Shubenacadie Band
Wallace Hills No. 14A	54.8 hectares	Established in 2011	Shubenacadie Band

In the early 1900s, the Mi'kmaq settlements in Dartmouth were being encroached upon by settlers and expansion of the town. Mi'kmaq settlements at Red Bridge Pond and Miller's Mountain disappeared. The Mi'kmaq village at Turtle Grove was located where the present day power generating plant is situated. Turtle Grove was 11 acres of rocky soil, summer wigwams and winter shacks and was home to the Mi'kmaq for many generations. The village had 16 families living there in 1917; they made a modest living making and selling baskets, hockey sticks and tool handles. Unable to send their children to Dartmouth schools, they had converted a storage building into a school, hired a principal, and had 14 students in attendance. *(45)*

Turtle Grove also felt the encroachment of the town and Dartmouth residents as they lived under constant threat of eviction. Eventually Turtle Grove was privately sold from beneath them, and the new landowner petitioned the Department of Indian Affairs to remove the Mi'kmaq. After local protests prevented resettlement at a few alternative locations, 95 acres were purchased on Albro Lake and monies were set aside for relocation. The Turtle Grove residents finally had a permanent location where to settle. However, winter was approaching and the relocation was postponed until spring. On December 6 the full force of Halifax Explosion destroyed the Mi'kmaq village killing 8 of the residents and seriously injuring the survivors. The dead were buried in a single grave within a Catholic cemetery; the Turtle Grove residents left for other reserves and never returned. *(45)*

Today, Mi'kmaq have a presence throughout the Halifax area as they are no longer restricted to nor dependent on living on an Indian Reservation or segregated community. However, there is only the Cole Harbour I.R. 30 that remains as an official Mi'kmaq Community within urban HRM.

Summary

Based on the Pre-Contact sites and artifacts found within the Study Area and surrounding region, there has been a long history of early peoples and early Mi'kmaq along the coasts and inland along lakes and river courses.

There has been a long history of Mi'kmaq presence in the Halifax Area during the early years of French and English colonization of the Province. Some of the History was violent and some tragic. However there continues to be a Mi'kmaq presence within both urban and Rural HRM.

There are no known Traditional Hunting Territories at the time of Speck's 1922 publication within the Study Area. However, with the former Sambro Reserve 10km to the east, the Sambro Mi'kmaq may have utilized the area's natural resources.

There are active Land Claims by Mi'kmaq within close proximity of the Project Site and Study Area, but none appear to directly affect the Project Site.

4.4 Mi'kmaq Traditional Use Findings

The traditional use data gathered for this MEKS was drawn from one primary source: the Mi'kmaq individuals who reside in the surrounding Mi'kmaq communities and those who are familiar with or undertake these types of activities. This data was acquired through interviews with informants that allowed the study team to identify the various traditional use activities, resources and areas that are currently or have been used by the Mi'kmaq. Interviewees were asked to identify areas within the Study Area and Project Site where they knew of traditional use that had taken place, or currently in use. These interviews took place in November and December, 2013.

To easily identify the traditional use data findings of this study, the analysis has been categorized into two (2) geographic areas. The first is the Project Site area – the proposed wind turbine development located near Terence Bay River, Nova Scotia.

The second is the Study Area which includes areas that fall within a 5 km radius of the Project Site.

Based on the data that was gathered by the study team, there were no Mi'kmaq traditional use activities occurring within the Project Site. However, it appears there are some traditional Mi'kmaq activities that have occurred, or are occurring, in the various land and water areas throughout the Study Area.

Project Site

The Project Site, as well as locations in the *immediate* vicinity (<50 meters) of the Project Site, will be considered when analyzing traditional use activities.

Fishing

There were no fishing areas identified by informants on the Project Site.

Hunting

There were no hunting areas identified by informants on the Project Site.

Gathering

There were no gathering areas identified by informants on the Project Site.

Study Area

As mentioned previously, the MEKS data is also drawn from the Study Area which encompasses areas within a five (5) kilometer radius from the Project Site boundaries. The purpose of this portion of the study is to portray other land use activities that may have been missed in the Project Site data analysis.

Fishing

Seven (7) trout fishing areas were found to be located in the Terence Bay River, waters from the entrance of Terence Bay around Mackerel Island and Powers Island, Bar Harbour Lake, Ragged Lake, and the northern portion of Whites Lake.

Mackerel was identified by informants in four (4) locations in the Study Area: all in waters from Terence Bay to Long Cove.

Salmon was fished in three (3) areas of the Terence Bay River and Terence Bay.

Other species identified by informants, but to a lesser degree than those mentioned above, include capelin, catfish, mussel, perch, and tuna.

In terms of the timelines reported for these activities, fishing activities predominately occurr in the past with eighty three percent (83%) of the combined Recent Past and Historic Past information (Historic past use represented forty eight percent (48%) of the data gathered, and Recent Past use represented thirty five percent (35%) of the data for this area). Current use fishing areas were present in sixteen percent (16%) of the information.

These fishing areas were primarily used for harvesting purposes. All but one area were used for harvesting purposes. The one other area was a tuna fishing area that was used for recreation.

Hunting

Deer hunting was the only hunting activity that took place in the Study Area by the informants. Informants had identified three (3) deer hunting areas located near Terence Bay River north of Shellbird Lake; near Prospect Bay; and an area from Prospect Bay to Prospect River and near Brookside. One area has been in use by an individual for twenty one years. The other two were noted to have occurred in the historic past.

Gathering

Two gathering sites were noted by informants. One was a blueberry gathering area located around Shad Bay, and the other was an area where White Ash was gathered between Terence Bay River and the Project Site.

All of these gathering areas were utilized in the Historic Past.

Interview Notes

During the interviews, the informants were given a chance to express any specific concerns they may have regarding any development in the area.

A few of the informants expressed concerns regarding the effect the turbines, and their related infrastructure, would have on animal and fish habitats.

4.5 Mi'kmaq Significant Species Process

In order to identify possible project activities which may be of significance to the Mi'kmaq with regards to traditional use of the Study Area, the project team undertakes a number of steps to properly consider the MEK data. This involves three main components: Type of Use, Availability, and Importance.

Type of Use

The first component of analysis is the "Type of Use" of the resource which involves the categorization of the resource. All resources are placed into various general categories regarding the Type of Use**.** The category headings are Medicinal/Ceremonial, Food/Sustenance, and Tool/Art. These general headings are used to ensure further confidentiality with respect to the resources and the area where they are harvested. As well, the total number of instances where a resource harvest has been documented by the study is quantified.

Availability

After the data is considered by the Type of Use, it is considered in accordance with its availability: this involves considering whether the resource is abundant in the Study Area or whether it is rare or scarce. Based on the information that is provided to the team from the ecological knowledge holders and/or written literature sources, the availability of the resource is then measured in regards to other water or land areas that are outside of the Study Area. This measuring is primarily done in the context of the areas adjacent to the Study Area, and if required, other areas throughout the province. By proceeding in this manner, the study can provide an opinion on whether that resource may be **Rare, Scarce** or **Abundant**.

The data is classified in accordance with following:

Rare – only known to be found in a minimum of areas, may also be on the species at risk or endangered plants list;
Common – known to be available in a number of areas; and
Abundant – easily found throughout the Study Area or in other areas in the vicinity.

This allows the study team to identify the potential impact of a resource being destroyed, by the proposed project activities that would affect the traditional use activity being undertaken.

Importance

The final factor the MEKS team considers when attempting to identify the significance of a resource to Mi'kmaq use is whether the resource is of major importance to Mi'kmaq traditional use activities. This can be a somewhat subjective process, as any traditional resource use will be of importance to the individual who is acquiring it, regardless of whether its use is for food or art, or regardless if the resource is scarce or abundant. However, to further identify the importance, the MEKS team also considers the frequency of its use by the Mi'kmaq; whether the resource is commonly used by more than one individual, and finally the actual use itself. These factors support the broad analysis of many issues in formulating an opinion on significance and supports identifying whether the loss of a resource will be a significant issue to future Mi'kmaq traditional use, if it is impacted by the project activities.

4.6 Mi'kmaq Significance Species Findings

This MEKS identified resource and land/water use areas within the Project Site and Study Area that continues to be utilized by the Mi'kmaq people, to varying degrees.

Type of Use

The study identified the following:

TYPE OF USE	NUMBER OF AREAS	NUMBER OF SPECIES
Food/Sustenance	24	11
Medicinal/Ceremonial	2	2
Tools/Art	1	1

Availability

During the information gathering for the Study Area, informants had mentioned fishing for salmon. The Atlantic Salmon is considered endangered in Canada.

Importance

While stated above, it is again worth noting that assigning an importance designation for any activity done by Mi'kmaq can be a subjective process, and that all activities are considered ways of preserving the Mi'kmaq way of life, in some shape or form.

As noted previously, Atlantic Salmon is considered an endangered species in Canada; the Mi'kmaq still rely on this species for sustenance and cultural ceremonies and disturbances to their habitats could have an impact on Mi'kmaq use.

Deer hunting was an important part of early Aboriginal life as deer provided food, clothing, materials for tools, shelter, and ceremonial purposes, all of which are still valued and highly regarded by the Mi'kmaq.

While common throughout Nova Scotia, trout and mackerel fishing were activities noted during the interview process as occurring historically through to the present. Based on the number of areas reported by informants, trout and mackerel fishing are important activities undertaken by the Mi'kmaq within the area that could be impacted by any effects to trout habitats.

5.0 CONCLUSIONS AND RECOMMENDATIONS

This Mi'kmaq Ecological Knowledge Study has gathered, documented and analyzed the traditional use activities that have been occurring in the Project Site and Study Area by undertaking interviews with individuals who practice traditional use, or know of traditional use activities within these areas and reside in the nearby Mi'kmaq communities.

The information gathered was considered in regards to species, location, use, availability and frequency of use to further understand the traditional use relationship that the Mi'kmaq maintain within the Project Site and Study Area.

Project Site

Based on the data collected during the interview process, no Mi'kmaq traditional use activities reported on the property, historically or currently.

Study Area

Based on the data documentation and analysis, it was concluded that the Mi'kmaq have historically undertaken traditional use activities in the Study Area, and that this practice continues to occur today. These activities primarily involve the harvesting of fish, but also include harvesting of animal, plant, and tree species; all of which occur in varying locations throughout the Study Area and at varying times of the year.

Mackerel and **trout** were found to be the most fished species in the Study Area. **Deer** was the only hunted species within the Study Area. With the small number of gathering areas identified, it is difficult to categorize the area as a particular gathering area type.

RECOMMENDATION # 1

The Terence Bay MEKS has not identified Mi'kmaq Traditional Use Activities occurring in the Project Site, but it has identified use in various locations throughout the Study Area. Based on the information gathered and presented in this report, there is some potential this project could affect Mi'kmaq traditional use in the proposed areas, specifically trout and mackerel fishing in the Study Area. Although it is quite possible the effects of the project could be minimal, it is recommended that the proponent communicate with the Assembly of Nova Scotia Mi'kmaq Chiefs to discuss future steps, if required, with regards to Mi'kmaq use in the area.

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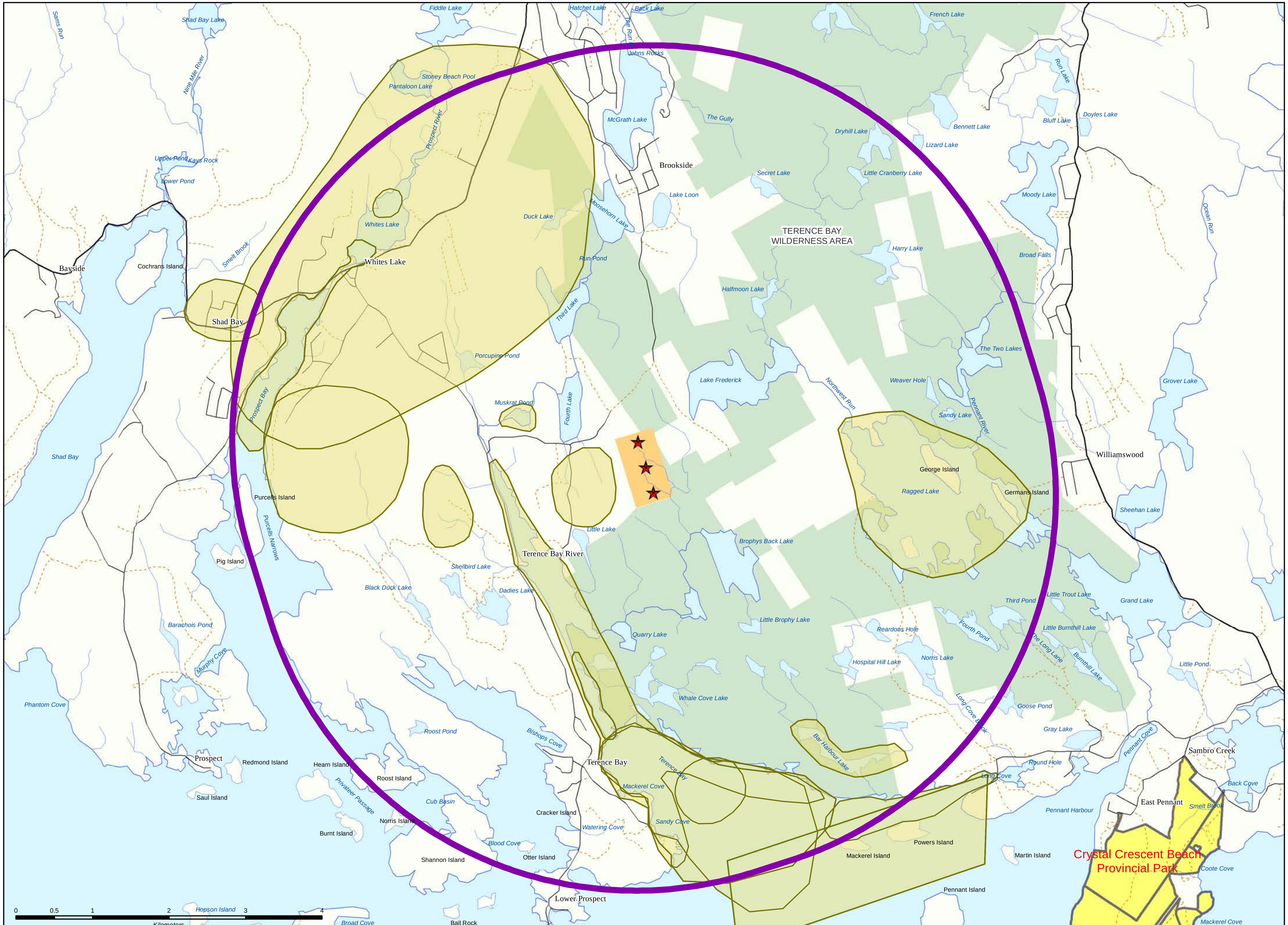
APPENDICES

Map A

Mi’kmaq Traditional and Current Use Areas



Terrence Bay MEKS

Mi'kmaq Traditional and Current Use Areas

Legend

- Proposed Turbine Locations
- Study Area
- Project Site
- Traditional Use Areas
- County Border
- Highway
- Trunk Road
- Collector Road
- Local Road
- Loose Surface/Cart Track
- Rivers

Disclaimer

This map is a graphical representation of Mi'kmaq ecological knowledge gathered throughout the study, and should not be used for navigation purposes. Features presented may not accurately represent actual topographical or proposed features.

The Mi'kmaq ecological knowledge data presented is a sampling of knowledge held by those interviewed and should not be interpreted as an absolute measure of Mi'kmaq ecological knowledge and land use.

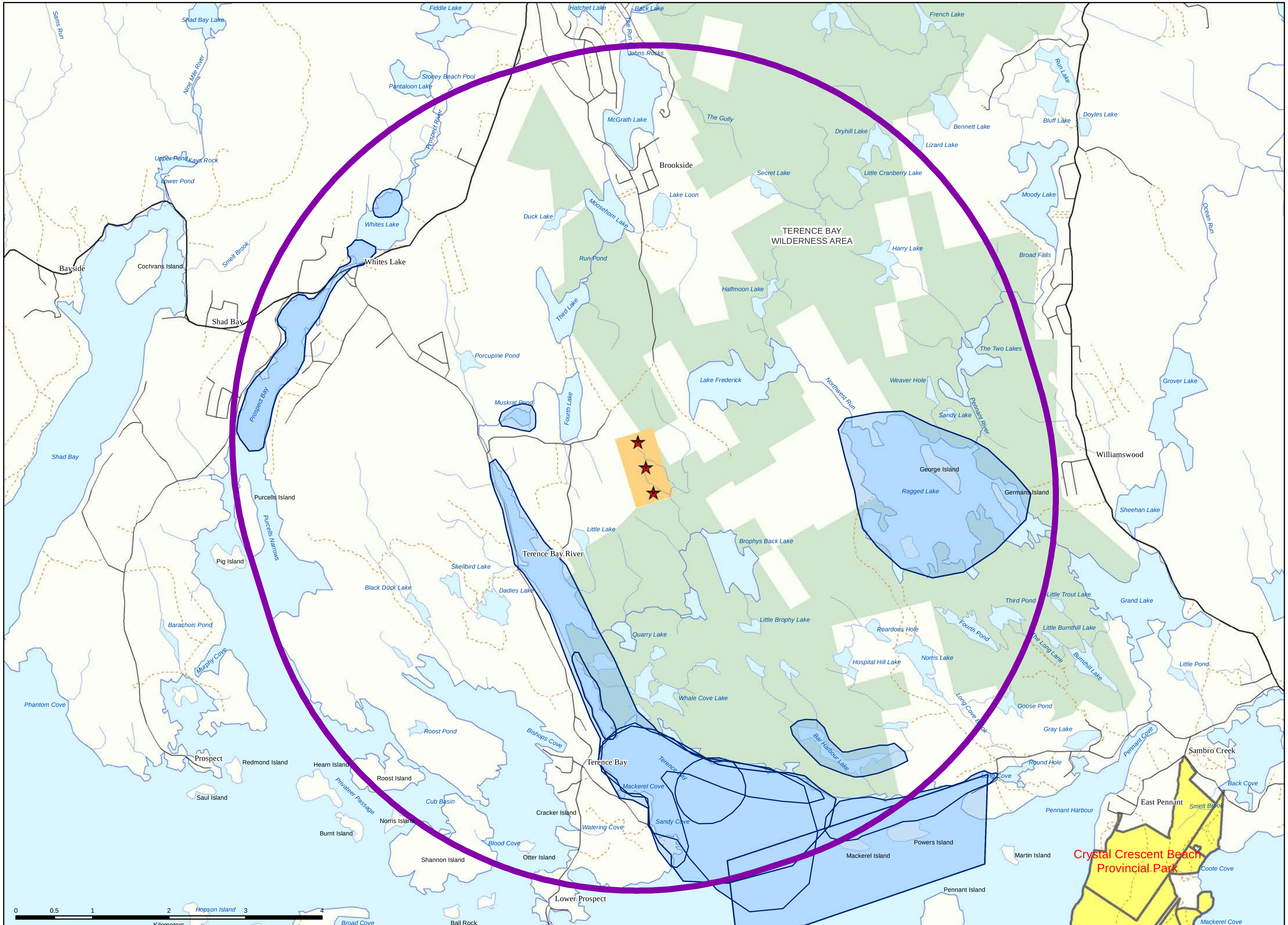
Datum: UTM NAD83 Zone 20
Scale: 1:45,000

Version: 1
19 Dec 2013

Membertou
GEOMATICS SOLUTIONS

Map B

Mi’kmaq Traditional and Current Fishing Areas



Terrence Bay MEKS

Mi'kmaq Traditional and Current Fishing Areas

Legend

- Proposed Turbine Locations
- Study Area
- Project Site
- Fishing Areas
- County Border
- Highway
- Trunk Road
- Collector Road
- Local Road
- Loose Surface/Cart Track
- Rivers

Disclaimer

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The Mi'kmaq ecological knowledge data presented is a sampling of knowledge held by those interviewed and should not be interpreted as an absolute measure of Mi'kmaq ecological knowledge and land use.

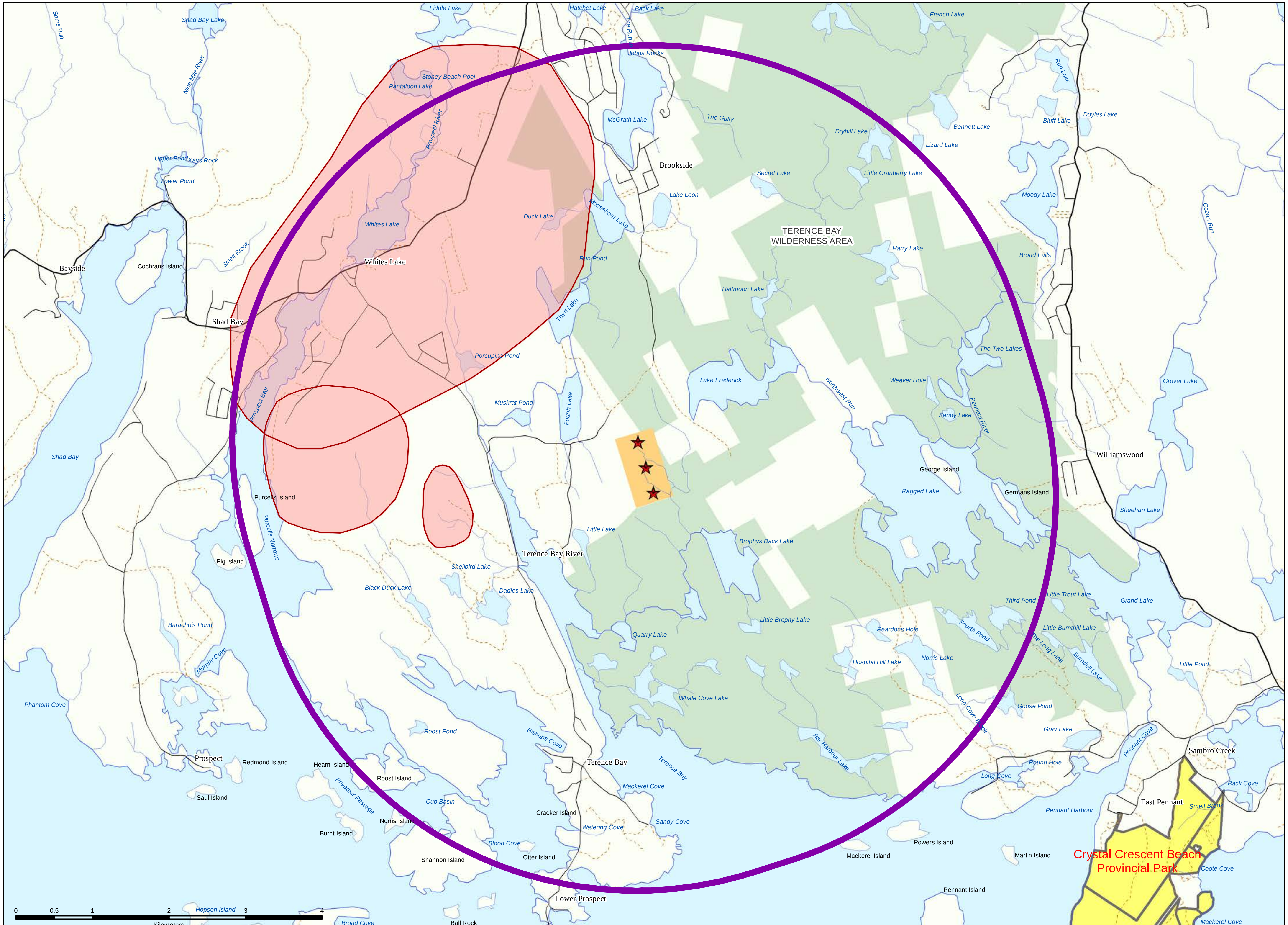
Datum: UTM NAD83 Zone 20
Scale: 1:45,000

Version: 1
19 Dec 2013

Membertou
GEOMATICS SOLUTIONS

Map C

Mi’kmaq Traditional and Current Hunting Areas



Terrence Bay MEKS

Mi'kmaq Traditional and Current Hunting Areas

Legend

- Proposed Turbine Locations
- Study Area
- Project Site
- Hunting Areas
- County Border
- Highway
- Trunk Road
- Collector Road
- Local Road
- Loose Surface/Cart Track
- Rivers

Disclaimer

This map is a graphical representation of Mi'kmaq ecological knowledge gathered throughout the study, and should not be used for navigation purposes. Features presented may not accurately represent actual topographical or proposed features.

The Mi'kmaq ecological knowledge data presented is a sampling of knowledge held by those interviewed and should not be interpreted as an absolute measure of Mi'kmaq ecological knowledge and land use.

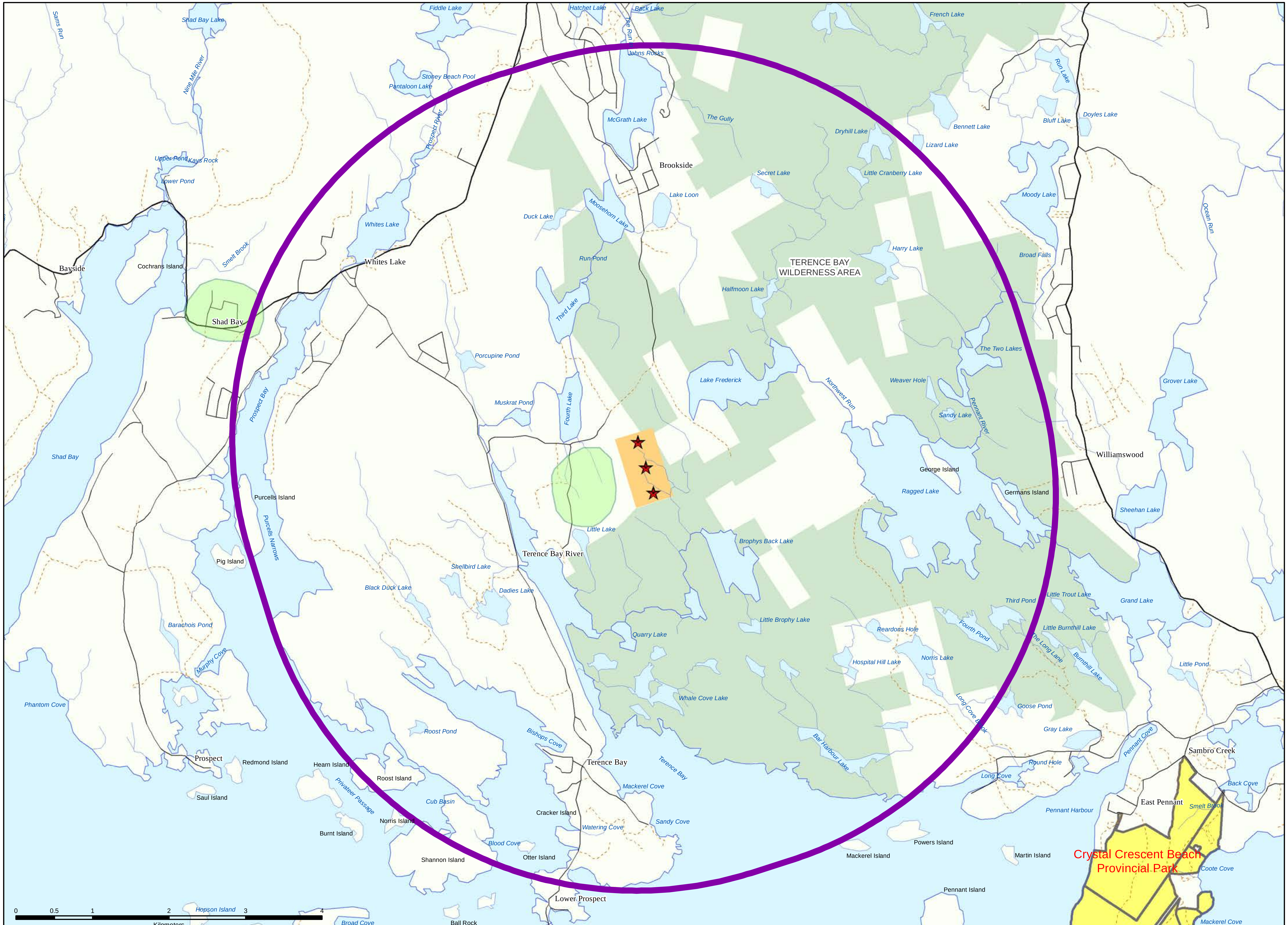
Datum: UTM NAD83 Zone 20
Scale: 1:45,000

Version: 1
19 Dec 2013

Membertou
GEOMATICS SOLUTIONS

Map D

Mi’kmaq Traditional and Current Gathering Areas



Terrence Bay MEKS

Mi'kmaq Traditional and Current Gathering Areas

Legend

- Proposed Turbine Locations
- Study Area
- Project Site
- Gathering Areas
- County Border
- Highway
- Trunk Road
- Collector Road
- Local Road
- Loose Surface/Cart Track
- Rivers

Disclaimer

This map is a graphical representation of Mi'kmaq ecological knowledge gathered throughout the study, and should not be used for navigation purposes. Features presented may not accurately represent actual topographical or proposed features.

The Mi'kmaq ecological knowledge data presented is a sampling of knowledge held by those interviewed and should not be interpreted as an absolute measure of Mi'kmaq ecological knowledge and land use.

Datum: UTM NAD83 Zone 20
Scale: 1:45,000

Version: 1
19 Dec 2013

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GEOMATICS SOLUTIONS

APPENDIX L

Noise Study

Sound Analysis

A sound analysis was completed using WindPro 2.9.207 which provides a comprehensive suite of wind farm design and modeling software. The sound model is based on the ISO 9613-2 – Attenuation of sound during propagation outdoors, Part 2. This international standard provides a conservative estimate of sound propagation and subsequent environmental attenuation as a result of ground porosity, atmospheric attenuation and geometric spreading.

Ground attenuation is considered and uses the alternative case described in the ISO-9613-2 standard. This method uses the surface shape of the terrain to determine the sound dampening characteristic between the turbine hub and the receiver. The terrain is considered to be a bare earth model with no forest, vegetation or buildings. The terrain model was developed from 5 m contour data obtained from the Nova Scotia Geomatics Centre.

The A-weighted sound pressure levels are modeled and represent the range of frequencies that are audible to the human ear. Noise emission data were obtained from the turbine manufacturer and summarize test results obtained from field measurements for a variety of wind speeds. One third octave band data were provided and used as model inputs. The highest sound pressure levels occur at a wind speed of 7 m/s and therefore used in the analysis. The following turbine parameters were used:

Table 1: Turbine Specifications Used for Sound Modeling.

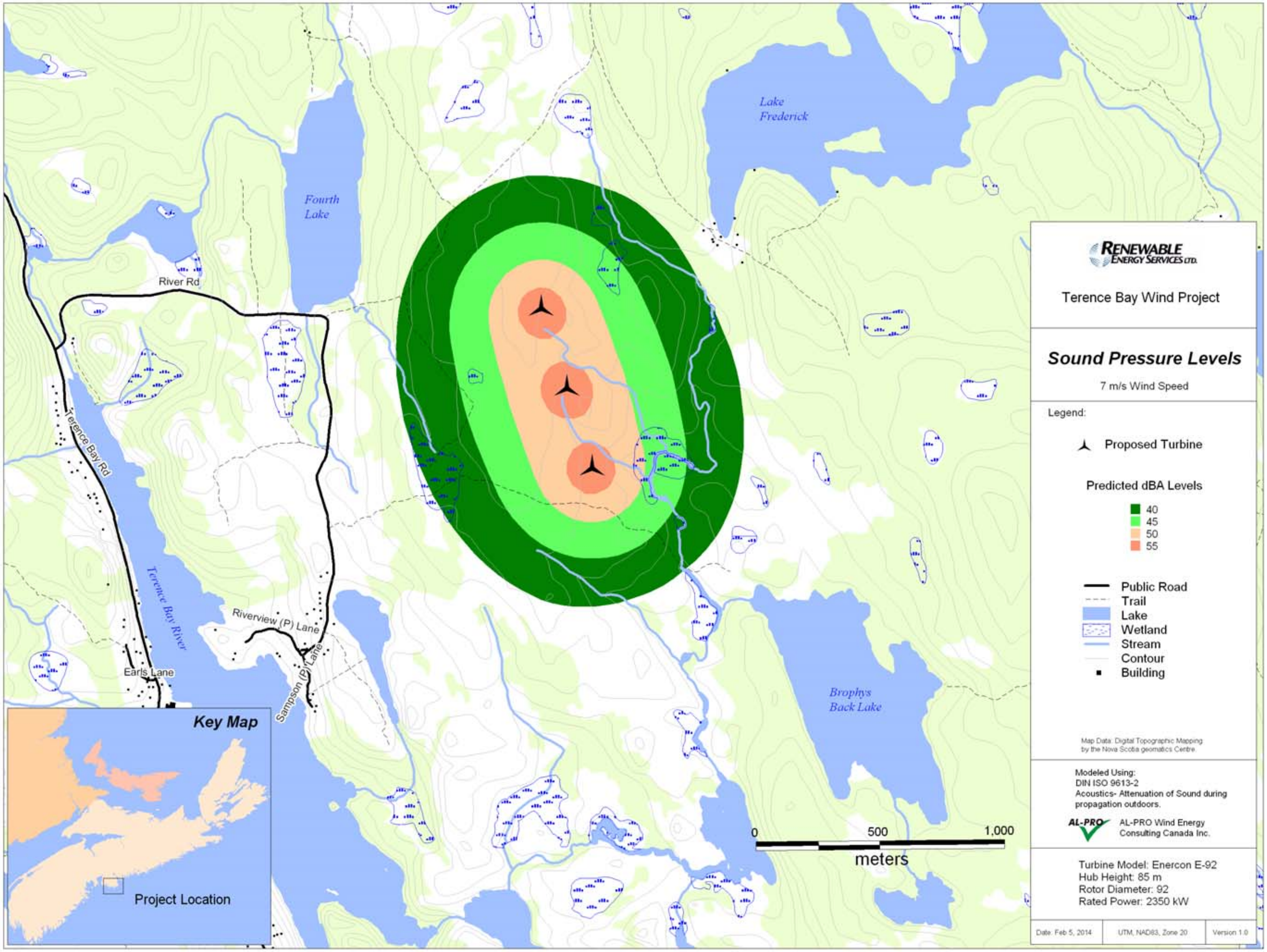
Description	Specification
Manufacturer	Enercon
Model	E-92
Hub Height	85 m
Rotor Diameter	92 m
Operation Mode	Full Power
Rated Power Output	2,350 kW
Maximum Sound Level (7 m/s)	105.4 dBA

A conservative and standardized approach has been incorporated into the analysis which is based on modeling individual sound pressure levels at all buildings located within 2 km of the proposed wind turbines. A total of 94 receptors where included in the analysis and the results are summarized in Appendix XX.

The current sound guideline for wind farms in Nova Scotia is based on a threshold level of 40 dBA. Modeled sound pressure levels should no exceed 40 dBA at residential receptors which include homes, camps, cottages schools and hospitals.

All the receptors within 2 km of the proposed wind farm had predicted sound levels that are below the 40 dBA threshold.

The results presented in the attached map show that the predicted sound pressure levels for the proposed Terence Bay Wind Project meet the current NSE guidelines.



Lake Frederick
Fourth Lake
River Rd
Terence Bay Rd
Terence Bay River
Riverview (P) Lane
Sampson (P) Lane
Earls Lane
Brophys Back Lake
Key Map
Project Location
0
500
1,000
meters
RENEWABLE ENERGY SERVICES LTD.
Terence Bay Wind Project
Sound Pressure Levels
7 m/s Wind Speed
Legend:
Proposed Turbine
Predicted dBA Levels
40
45
50
55
Public Road
Trail
Lake
Wetland
Stream
Contour
Building
Map Data: Digital Topographic Mapping by the Nova Scotia geomatics Centre
Modeled Using:
DIN ISO 9613-2
Acoustics- Attenuation of Sound during propagation outdoors.
AL-PRO Wind Energy Consulting Canada Inc.
Turbine Model: Enercon E-92
Hub Height: 85 m
Rotor Diameter: 92
Rated Power: 2350 kW
Date: Feb 5, 2014
UTM, NAD83, Zone 20
Version 1.0

Project:
738 Terence Bay Wind Project

Description:
3 Turbine Wind project
Haliafx County, Nova Scotia

Printed/Page
2/6/2014 9:44 AM / 1

Licensed user:
AL-PRO GmbH & Co.KG
Dorfstraße 100
DE-26532 Großheide
+49 (0) 4936 6986-0
Kirk Schmidt / kirk.schmidt@al-pro.ca

Calculated:
2/6/2014 8:43 AM/2.9.207

DECIBEL - Main Result

Calculation: Measured Sound 95% or Loudest

Noise calculation model:
ISO 9613-2 General
Wind speed:
Loudest up to 95% rated power
Ground attenuation:
Alternative
Meteorological coefficient, C0:
0.0 dB
Type of demand in calculation:
1: WTG noise is compared to demand (DK, DE, SE, NL etc.)
Noise values in calculation:
All noise values are mean values (Lwa) (Normal)
Pure tones:
Pure and Impulse tone penalty are added to WTG source noise
Height above ground level, when no value in NSA object:
2.0 m Allow override of model height with height from NSA object
Deviation from "official" noise demands. Negative is more restrictive, positive is less restrictive.:
0.0 dB(A)

Scale 1:75,000
New WTG
Noise sensitive area

WTGs

	UTM (north)-NAD83 (US+CA) Zone: 20				WTG type						Noise data						
	East	North	Z [m]	Row data/Description	Valid	Manufact.	Type-generator	Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Creator	Name	Wind speed [m/s]	Status	LwA,ref [dB(A)]	Pure tones	
1	443,319	4,928,564	65.0	ENERCON E-92 2,3 MW 2300 ...	Yes	ENERCON	E-92 2,3 MW-2,300	2,300	92.0	85.0	USER	Extract of test report M111 164/02	7.0	From other hub height	105.4	0 dB	f
2	443,419	4,928,241	60.0	ENERCON E-92 2,3 MW 2300 ...	Yes	ENERCON	E-92 2,3 MW-2,300	2,300	92.0	85.0	USER	Extract of test report M111 164/02	7.0	From other hub height	105.4	0 dB	f
3	443,518	4,927,919	51.9	ENERCON E-92 2,3 MW 2300 ...	Yes	ENERCON	E-92 2,3 MW-2,300	2,300	92.0	85.0	USER	Extract of test report M111 164/02	7.0	From other hub height	105.4	0 dB	f

f) From other hub height

Calculation Results

Sound Level

Noise sensitive area		UTM (north)-NAD83 (US+CA) Zone: 20				Demands	Sound Level		Demands fulfilled ?
No.	Name	East	North	Z [m]	Imission height [m]	Noise [dB(A)]	From WTGs [dB(A)]	Distance to noise demand [m]	Noise
A	Noise sensitive point: (1)	441,342	4,928,282	11.8	2.0	40.0	26.9	1,390	Yes
B	Noise sensitive point: (2)	441,360	4,928,213	11.7	2.0	40.0	27.0	1,376	Yes
C	Noise sensitive point: (3)	441,354	4,928,254	10.4	2.0	40.0	26.9	1,380	Yes
D	Noise sensitive point: (4)	441,361	4,928,190	11.9	2.0	40.0	27.0	1,377	Yes
E	Noise sensitive point: (5)	441,368	4,928,160	11.2	2.0	40.0	27.0	1,372	Yes
F	Noise sensitive point: (6)	441,386	4,928,069	7.1	2.0	40.0	26.8	1,365	Yes
G	Noise sensitive point: (7)	441,410	4,927,971	9.6	2.0	40.0	26.7	1,356	Yes
H	Noise sensitive point: (8)	441,423	4,928,186	5.0	2.0	40.0	27.1	1,315	Yes
I	Noise sensitive point: (9)	441,418	4,928,151	5.6	2.0	40.0	27.1	1,324	Yes
J	Noise sensitive point: (10)	441,427	4,928,451	9.9	2.0	40.0	26.6	1,304	Yes
K	Noise sensitive point: (11)	441,431	4,928,469	11.5	2.0	40.0	26.6	1,300	Yes
L	Noise sensitive point: (12)	441,443	4,927,938	10.1	2.0	40.0	26.8	1,329	Yes
M	Noise sensitive point: (13)	441,456	4,927,969	7.7	2.0	40.0	26.7	1,311	Yes
N	Noise sensitive point: (14)	441,475	4,927,909	9.0	2.0	40.0	26.7	1,303	Yes
O	Noise sensitive point: (15)	441,510	4,927,843	9.2	2.0	40.0	26.9	1,282	Yes
P	Noise sensitive point: (16)	441,518	4,927,828	9.5	2.0	40.0	26.9	1,278	Yes
Q	Noise sensitive point: (17)	441,521	4,927,806	11.0	2.0	40.0	27.3	1,280	Yes
R	Noise sensitive point: (18)	441,533	4,927,774	11.3	2.0	40.0	27.6	1,277	Yes
S	Noise sensitive point: (19)	441,544	4,927,700	18.4	2.0	40.0	27.6	1,287	Yes
T	Noise sensitive point: (20)	443,967	4,928,886	58.3	2.0	40.0	38.2	114	Yes
U	Noise sensitive point: (21)	444,008	4,928,846	55.6	2.0	40.0	38.1	127	Yes
V	Noise sensitive point: (22)	444,013	4,928,835	55.1	2.0	40.0	38.1	126	Yes
W	Noise sensitive point: (23)	444,017	4,928,910	55.0	2.0	40.0	37.4	169	Yes
X	Noise sensitive point: (24)	444,030	4,928,822	55.0	2.0	40.0	38.0	134	Yes

To be continued on next page...

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Kirk Schmidt / kirk.schmidt@al-pro.ca

Calculated:
2/6/2014 8:43 AM/2.9.207

DECIBEL - Main Result

Calculation: Measured Sound 95% or Loudest

...continued from previous page

Noise sensitive area		UTM (north)-NAD83 (US+CA) Zone: 20				Demands	Sound Level		Demands fulfilled ?
No.	Name	East	North	Z	Imission height	Noise	From WTGs	Distance to noise demand	Noise
				[m]	[m]	[dB(A)]	[dB(A)]	[m]	
Y	Noise sensitive point: (25)	444,032	4,928,865	55.0	2.0	40.0	37.6	158	Yes
Z	Noise sensitive point: (26)	444,094	4,928,931	55.0	2.0	40.0	36.4	245	Yes
AA	Noise sensitive point: (27)	444,108	4,928,823	57.2	2.0	40.0	37.1	203	Yes
AB	Noise sensitive point: (28)	444,102	4,928,866	55.8	2.0	40.0	36.9	218	Yes
AC	Noise sensitive point: (29)	444,128	4,928,752	58.3	2.0	40.0	37.4	188	Yes
AD	Noise sensitive point: (30)	444,176	4,929,127	55.0	2.0	40.0	34.2	424	Yes
AE	Noise sensitive point: (31)	444,513	4,929,032	55.0	2.0	40.0	31.6	659	Yes
AF	Noise sensitive point: (32)	441,623	4,927,307	25.0	2.0	40.0	27.3	1,352	Yes
AG	Noise sensitive point: (33)	441,625	4,927,335	25.0	2.0	40.0	27.4	1,339	Yes
AH	Noise sensitive point: (34)	441,666	4,927,258	15.6	2.0	40.0	27.3	1,335	Yes
AI	Noise sensitive point: (35)	441,673	4,927,207	14.3	2.0	40.0	27.2	1,351	Yes
AJ	Noise sensitive point: (36)	441,677	4,927,453	5.0	2.0	40.0	27.8	1,244	Yes
AK	Noise sensitive point: (37)	441,685	4,927,402	5.0	2.0	40.0	27.7	1,256	Yes
AL	Noise sensitive point: (38)	441,689	4,927,133	13.7	2.0	40.0	27.0	1,372	Yes
AM	Noise sensitive point: (39)	441,690	4,927,202	11.9	2.0	40.0	27.2	1,338	Yes
AN	Noise sensitive point: (40)	441,697	4,927,112	12.9	2.0	40.0	27.0	1,375	Yes
AO	Noise sensitive point: (41)	441,699	4,927,161	11.7	2.0	40.0	27.2	1,350	Yes
AP	Noise sensitive point: (42)	441,709	4,927,135	11.4	2.0	40.0	27.1	1,353	Yes
AQ	Noise sensitive point: (43)	441,713	4,927,266	5.0	2.0	40.0	27.5	1,289	Yes
AR	Noise sensitive point: (44)	441,716	4,927,085	11.1	2.0	40.0	27.0	1,372	Yes
AS	Noise sensitive point: (45)	441,721	4,927,101	10.5	2.0	40.0	27.1	1,359	Yes
AT	Noise sensitive point: (46)	441,723	4,927,064	10.3	2.0	40.0	27.0	1,377	Yes
AU	Noise sensitive point: (47)	441,731	4,927,226	5.0	2.0	40.0	27.5	1,291	Yes
AV	Noise sensitive point: (48)	441,740	4,927,063	8.9	2.0	40.0	27.0	1,363	Yes
AW	Noise sensitive point: (49)	441,764	4,927,103	5.7	2.0	40.0	27.3	1,321	Yes
AX	Noise sensitive point: (50)	441,776	4,927,073	5.0	2.0	40.0	27.2	1,327	Yes
AY	Noise sensitive point: (51)	441,808	4,927,068	5.0	2.0	40.0	27.3	1,302	Yes
AZ	Noise sensitive point: (52)	441,810	4,926,889	5.0	2.0	40.0	26.7	1,399	Yes
BA	Noise sensitive point: (53)	441,836	4,926,840	7.5	2.0	40.0	26.7	1,406	Yes
BB	Noise sensitive point: (54)	441,853	4,926,890	5.0	2.0	40.0	26.9	1,363	Yes
BC	Noise sensitive point: (55)	441,859	4,926,867	5.0	2.0	40.0	26.9	1,372	Yes
BD	Noise sensitive point: (56)	441,871	4,926,806	6.1	2.0	40.0	26.7	1,399	Yes
BE	Noise sensitive point: (57)	441,876	4,926,840	5.0	2.0	40.0	26.8	1,375	Yes
BF	Noise sensitive point: (58)	441,886	4,926,828	5.0	2.0	40.0	26.8	1,374	Yes
BG	Noise sensitive point: (59)	441,920	4,926,755	5.4	2.0	40.0	26.7	1,393	Yes
BH	Noise sensitive point: (60)	441,965	4,926,710	5.1	2.0	40.0	26.7	1,387	Yes
BI	Noise sensitive point: (61)	441,992	4,927,293	6.2	2.0	40.0	29.1	1,029	Yes
BJ	Noise sensitive point: (62)	442,064	4,927,172	5.4	2.0	40.0	29.0	1,029	Yes
BK	Noise sensitive point: (63)	442,072	4,927,196	6.5	2.0	40.0	29.2	1,010	Yes
BL	Noise sensitive point: (64)	442,094	4,926,519	5.3	2.0	40.0	26.4	1,425	Yes
BM	Noise sensitive point: (65)	442,180	4,927,344	7.4	2.0	40.0	30.4	841	Yes
BN	Noise sensitive point: (66)	442,241	4,927,194	5.0	2.0	40.0	30.1	871	Yes
BO	Noise sensitive point: (67)	442,246	4,927,357	11.5	2.0	40.0	30.7	777	Yes
BP	Noise sensitive point: (68)	442,311	4,927,147	7.8	2.0	40.0	29.6	843	Yes
BQ	Noise sensitive point: (69)	442,325	4,927,210	13.8	2.0	40.0	30.7	793	Yes
BR	Noise sensitive point: (70)	442,329	4,927,140	9.7	2.0	40.0	29.6	833	Yes
BS	Noise sensitive point: (71)	442,353	4,927,233	17.6	2.0	40.0	31.0	757	Yes
BT	Noise sensitive point: (72)	442,361	4,927,212	18.1	2.0	40.0	31.0	763	Yes
BU	Noise sensitive point: (73)	442,362	4,927,353	20.7	2.0	40.0	31.7	681	Yes
BV	Noise sensitive point: (74)	442,374	4,927,006	8.8	2.0	40.0	29.2	884	Yes
BW	Noise sensitive point: (75)	442,380	4,927,148	17.1	2.0	40.0	29.9	788	Yes
BX	Noise sensitive point: (76)	442,382	4,927,198	20.0	2.0	40.0	31.0	755	Yes
BY	Noise sensitive point: (77)	442,383	4,927,029	12.2	2.0	40.0	29.3	862	Yes
BZ	Noise sensitive point: (78)	442,391	4,927,275	21.2	2.0	40.0	31.5	701	Yes

To be continued on next page...

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2/6/2014 8:43 AM/2.9.207

DECIBEL - Main Result

Calculation: Measured Sound 95% or Loudest

...continued from previous page

Noise sensitive area		UTM (north)-NAD83 (US+CA) Zone: 20				Demands	Sound Level		Demands fulfilled ?
No.	Name	East	North	Z	Imission height	Noise	From WTGs	Distance to noise demand	Noise
				[m]	[m]	[dB(A)]	[dB(A)]	[m]	
CA	Noise sensitive point: (79)	442,392	4,926,960	9.5	2.0	40.0	29.0	903	Yes
CB	Noise sensitive point: (80)	442,396	4,927,195	21.7	2.0	40.0	31.1	746	Yes
CC	Noise sensitive point: (81)	442,397	4,926,981	11.2	2.0	40.0	29.2	885	Yes
CD	Noise sensitive point: (82)	442,400	4,927,313	22.3	2.0	40.0	31.8	672	Yes
CE	Noise sensitive point: (83)	442,405	4,927,285	22.6	2.0	40.0	31.7	684	Yes
CF	Noise sensitive point: (84)	442,414	4,927,438	27.4	2.0	40.0	32.6	592	Yes
CG	Noise sensitive point: (85)	442,416	4,927,415	26.3	2.0	40.0	32.4	602	Yes
CH	Noise sensitive point: (86)	442,416	4,927,394	25.3	2.0	40.0	32.3	613	Yes
CI	Noise sensitive point: (87)	442,416	4,927,366	24.4	2.0	40.0	32.2	629	Yes
CJ	Noise sensitive point: (88)	442,419	4,927,334	24.1	2.0	40.0	32.0	645	Yes
CK	Noise sensitive point: (89)	442,420	4,927,503	31.3	2.0	40.0	33.0	553	Yes
CL	Noise sensitive point: (90)	442,431	4,927,189	25.7	2.0	40.0	31.3	722	Yes
CM	Noise sensitive point: (91)	442,445	4,927,518	32.5	2.0	40.0	33.3	524	Yes
CN	Noise sensitive point: (92)	442,445	4,927,207	27.2	2.0	40.0	31.5	700	Yes
CO	Noise sensitive point: (93)	442,470	4,927,312	27.9	2.0	40.0	32.3	616	Yes
CP	Noise sensitive point: (94)	441,809	4,926,981	5.0	2.0	40.0	27.0	1,347	Yes

Distances (m)

	WTG		
NSA	1	2	3
A	1997	2077	2206
B	1990	2059	2178
C	1989	2065	2190
D	1993	2059	2174
E	1992	2053	2163
F	1995	2040	2137
G	1999	2027	2109
H	1933	1997	2112
I	1945	2003	2113
J	1895	2003	2158
K	1890	2001	2158
L	1978	1999	2075
M	1956	1982	2063
N	1957	1972	2043
O	1947	1950	2009
P	1946	1945	2002
Q	1951	1947	2000
R	1953	1943	1990
S	1974	1951	1986
T	724	846	1066
U	744	844	1049
V	745	840	1041
W	779	897	1110
X	756	843	1038
Y	774	875	1077
Z	858	965	1164
AA	830	902	1079
AB	839	926	1113
AC	831	874	1032
AD	1025	1165	1376
AE	1282	1350	1493
AF	2111	2024	1991
AG	2093	2010	1981

To be continued on next page...

Project:
738 Terence Bay Wind Project

Description:
3 Turbine Wind project
Haliafx County, Nova Scotia

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DECIBEL - Main Result

Calculation: Measured Sound 95% or Loudest

...continued from previous page

	WTG		
NSA	1	2	3
AH	2107	2010	1966
AI	2133	2029	1978
AJ	1983	1912	1899
AK	2005	1926	1905
AL	2169	2054	1991
AM	2123	2017	1964
AN	2177	2059	1992
AO	2143	2031	1971
AP	2153	2037	1972
AQ	2065	1965	1919
AR	2181	2058	1986
AS	2167	2045	1974
AT	2190	2064	1988
AU	2077	1970	1917
AV	2179	2051	1973
AW	2134	2008	1935
AX	2146	2016	1937
AY	2126	1993	1910
AZ	2254	2102	1995
BA	2274	2114	1998
BB	2225	2068	1957
BC	2239	2079	1964
BD	2278	2111	1988
BE	2248	2084	1965
BF	2251	2085	1963
BG	2287	2111	1977
BH	2296	2111	1968
BI	1837	1713	1649
BJ	1874	1726	1635
BK	1851	1705	1617
BL	2384	2173	1997
BM	1669	1530	1456
BN	1743	1576	1468
BO	1615	1469	1391
BP	1739	1557	1433
BQ	1680	1503	1388
BR	1734	1549	1421
BS	1645	1467	1352
BT	1657	1476	1356
BU	1543	1381	1287
BV	1822	1618	1464
BW	1699	1508	1375
BX	1656	1471	1345
BY	1798	1594	1442
BZ	1588	1411	1298
CA	1853	1642	1479
CB	1651	1463	1335
CC	1832	1622	1462
CD	1552	1378	1272
CE	1572	1394	1281
CF	1445	1286	1204
CG	1461	1299	1212
CH	1478	1313	1221
CI	1500	1331	1233
CJ	1524	1350	1245
CK	1391	1242	1174

To be continued on next page...

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DECIBEL - Main Result

Calculation: Measured Sound 95% or Loudest

...continued from previous page

	WTG		
NSA	1	2	3
CL	1637	1443	1309
CM	1363	1213	1145
CN	1614	1421	1288
CO	1513	1328	1211
CP	2188	2044	1949

Project:
738 Terence Bay Wind Project

Description:
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Calculated:
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DECIBEL - Detailed results

Calculation: Measured Sound 95% or Loudest**Noise calculation model:** ISO 9613-2 General 10.0 m/s

Assumptions

Calculated L(DW) = LWA,ref + K + Dc - (Adiv + Aatm + Agr + Abar + Amisc) - Cmet
(when calculated with ground attenuation, then Dc = Domega)

LWA,ref:	Sound pressure level at WTG
K:	Pure tone
Dc:	Directivity correction
Adiv:	the attenuation due to geometrical divergence
Aatm:	the attenuation due to atmospheric absorption
Agr:	the attenuation due to ground effect
Abar:	the attenuation due to a barrier
Amisc:	the attenuation due to miscellaneous other effects
Cmet:	Meteorological correction

Calculation Results

Noise sensitive area: A Noise sensitive point: (1)

WTG					Loudest up to 95% rated power									
No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	1,997	2,002	45.1	Yes	**22.70**	105.4	3.01	77.03	4.63	4.03	0.00	0.00	85.69	0.00
2	2,077	2,082	41.2	Yes	**22.15**	105.4	3.01	77.37	4.75	4.12	0.00	0.00	86.24	0.00
3	2,206	2,209	36.2	Yes	**21.32**	105.4	3.01	77.89	4.94	4.24	0.00	0.00	87.07	0.00

Sum 26.86

Noise sensitive area: B Noise sensitive point: (2)

WTG					Loudest up to 95% rated power									
No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	1,990	1,995	44.9	Yes	**22.74**	105.4	3.01	77.00	4.62	4.03	0.00	0.00	85.65	0.00
2	2,059	2,063	40.6	Yes	**22.25**	105.4	3.01	77.29	4.72	4.13	0.00	0.00	86.14	0.00
3	2,178	2,181	35.1	Yes	**21.46**	105.4	3.01	77.77	4.90	4.25	0.00	0.00	86.93	0.00

Sum 26.95

Noise sensitive area: C Noise sensitive point: (3)

WTG					Loudest up to 95% rated power									
No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	1,989	1,994	44.6	Yes	**22.74**	105.4	3.01	76.99	4.62	4.03	0.00	0.00	85.65	0.00
2	2,065	2,069	40.5	Yes	**22.21**	105.4	3.01	77.32	4.73	4.13	0.00	0.00	86.18	0.00
3	2,190	2,193	35.4	Yes	**21.40**	105.4	3.01	77.82	4.92	4.25	0.00	0.00	86.99	0.00

Sum 26.92

Noise sensitive area: D Noise sensitive point: (4)

WTG					Loudest up to 95% rated power									
No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	1,993	1,998	44.9	Yes	**22.72**	105.4	3.01	77.01	4.62	4.03	0.00	0.00	85.67	0.00
2	2,059	2,063	40.4	Yes	**22.24**	105.4	3.01	77.29	4.72	4.13	0.00	0.00	86.14	0.00
3	2,174	2,177	35.0	Yes	**21.48**	105.4	3.01	77.76	4.90	4.25	0.00	0.00	86.90	0.00

Sum 26.95

Project:
738 Terence Bay Wind Project

Description:
3 Turbine Wind project
Haliafx County, Nova Scotia

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Calculated:
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DECIBEL - Detailed results

Calculation: Measured Sound 95% or Loudest **Noise calculation model:** ISO 9613-2 General 10.0 m/s

Noise sensitive area: E Noise sensitive point: (5)

WTG No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Loudest up to 95% rated power: Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	1,992	1,997	43.9	Yes	**22.71**	105.4	3.01	77.01	4.62	4.05	0.00	0.00	85.68	0.00
2	2,053	2,057	39.2	Yes	**22.26**	105.4	3.01	77.26	4.71	4.15	0.00	0.00	86.13	0.00
3	2,163	2,167	34.2	Yes	**21.53**	105.4	3.01	77.72	4.88	4.26	0.00	0.00	86.86	0.00

Sum 26.97

Noise sensitive area: F Noise sensitive point: (6)

WTG No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Loudest up to 95% rated power: Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	1,995	2,000	40.1	Yes	**22.63**	105.4	3.01	77.02	4.63	4.11	0.00	0.00	85.76	0.00
2	2,040	2,045	36.2	Yes	**22.29**	105.4	3.01	77.21	4.70	4.19	0.00	0.00	86.10	0.00
3	2,137	2,141	32.3	No	**21.13**	105.4	3.01	77.61	4.84	4.80	0.00	0.00	87.25	0.00

Sum 26.83

Noise sensitive area: G Noise sensitive point: (7)

WTG No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Loudest up to 95% rated power: Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	1,999	2,004	40.1	Yes	**22.60**	105.4	3.01	77.04	4.63	4.11	0.00	0.00	85.78	0.00
2	2,027	2,031	37.6	No	**21.76**	105.4	3.01	77.16	4.68	4.80	0.00	0.00	86.63	0.00
3	2,109	2,112	34.4	No	**21.29**	105.4	3.01	77.50	4.80	4.80	0.00	0.00	87.09	0.00

Sum 26.69

Noise sensitive area: H Noise sensitive point: (8)

WTG No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Loudest up to 95% rated power: Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	1,933	1,939	40.5	Yes	**23.02**	105.4	3.01	76.75	4.53	4.08	0.00	0.00	85.37	0.00
2	1,997	2,002	35.9	Yes	**22.55**	105.4	3.01	77.03	4.63	4.18	0.00	0.00	85.84	0.00
3	2,112	2,116	30.7	No	**21.27**	105.4	3.01	77.51	4.80	4.80	0.00	0.00	87.11	0.00

Sum 27.11

Noise sensitive area: I Noise sensitive point: (9)

WTG No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Loudest up to 95% rated power: Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	1,945	1,951	40.0	Yes	**22.94**	105.4	3.01	76.80	4.55	4.10	0.00	0.00	85.45	0.00
2	2,003	2,008	35.5	Yes	**22.50**	105.4	3.01	77.05	4.64	4.19	0.00	0.00	85.89	0.00
3	2,113	2,117	30.7	No	**21.27**	105.4	3.01	77.51	4.81	4.80	0.00	0.00	87.12	0.00

Sum 27.06

Noise sensitive area: J Noise sensitive point: (10)

WTG No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Loudest up to 95% rated power: Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	1,895	1,900	41.1	No	**22.54**	105.4	3.01	76.58	4.47	4.80	0.00	0.00	85.85	0.00
2	2,003	2,007	37.8	No	**21.90**	105.4	3.01	77.05	4.64	4.80	0.00	0.00	86.49	0.00
3	2,158	2,161	32.5	No	**21.02**	105.4	3.01	77.69	4.87	4.80	0.00	0.00	87.37	0.00

Sum 26.63

Project:
738 Terence Bay Wind Project

Description:
3 Turbine Wind project
Haliafx County, Nova Scotia

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DECIBEL - Detailed results

Calculation: Measured Sound 95% or Loudest **Noise calculation model:** ISO 9613-2 General 10.0 m/s

Noise sensitive area: K Noise sensitive point: (11)

WTG					Loudest up to 95% rated power										
No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	1,890	1,895	41.5	No	**22.57**	105.4	3.01	76.55	4.46	4.80	0.00	0.00	85.82	0.00
2	2,001	2,005	38.2	No	**21.91**	105.4	3.01	77.04	4.64	4.80	0.00	0.00	86.48	0.00
3	2,158	2,162	32.9	No	**21.02**	105.4	3.01	77.70	4.87	4.80	0.00	0.00	87.37	0.00

Sum 26.65

Noise sensitive area: L Noise sensitive point: (12)

WTG					Loudest up to 95% rated power									
No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	1,978	1,982	39.8	Yes	**22.73**	105.4	3.01	76.94	4.60	4.11	0.00	0.00	85.66	0.00
2	1,999	2,004	37.8	No	**21.92**	105.4	3.01	77.04	4.63	4.80	0.00	0.00	86.47	0.00
3	2,075	2,079	34.5	No	**21.48**	105.4	3.01	77.36	4.75	4.80	0.00	0.00	86.90	0.00

Sum 26.85

Noise sensitive area: M Noise sensitive point: (13)

WTG					Loudest up to 95% rated power									
No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	1,956	1,961	38.1	No	**22.17**	105.4	3.01	76.85	4.57	4.80	0.00	0.00	86.21	0.00
2	1,982	1,986	35.8	No	**22.02**	105.4	3.01	76.96	4.61	4.80	0.00	0.00	86.37	0.00
3	2,063	2,067	32.6	No	**21.55**	105.4	3.01	77.30	4.73	4.80	0.00	0.00	86.83	0.00

Sum 26.69

Noise sensitive area: N Noise sensitive point: (14)

WTG					Loudest up to 95% rated power									
No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	1,957	1,962	38.9	No	**22.17**	105.4	3.01	76.85	4.57	4.80	0.00	0.00	86.22	0.00
2	1,972	1,977	37.2	No	**22.08**	105.4	3.01	76.92	4.59	4.80	0.00	0.00	86.31	0.00
3	2,043	2,047	33.7	No	**21.67**	105.4	3.01	77.22	4.70	4.80	0.00	0.00	86.72	0.00

Sum 26.75

Noise sensitive area: O Noise sensitive point: (15)

WTG					Loudest up to 95% rated power									
No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	1,947	1,952	38.6	No	**22.22**	105.4	3.01	76.81	4.55	4.80	0.00	0.00	86.16	0.00
2	1,950	1,955	37.2	No	**22.21**	105.4	3.01	76.82	4.56	4.80	0.00	0.00	86.18	0.00
3	2,009	2,013	33.6	No	**21.86**	105.4	3.01	77.08	4.65	4.80	0.00	0.00	86.53	0.00

Sum 26.87

Noise sensitive area: P Noise sensitive point: (16)

WTG					Loudest up to 95% rated power									
No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	1,946	1,951	38.4	No	**22.23**	105.4	3.01	76.80	4.55	4.80	0.00	0.00	86.15	0.00
2	1,945	1,950	37.0	No	**22.24**	105.4	3.01	76.80	4.55	4.80	0.00	0.00	86.15	0.00
3	2,002	2,006	33.4	No	**21.90**	105.4	3.01	77.05	4.64	4.80	0.00	0.00	86.48	0.00

Sum 26.90

Project:
738 Terence Bay Wind Project

Description:
3 Turbine Wind project
Haliafx County, Nova Scotia

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2/6/2014 9:44 AM / 9

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DECIBEL - Detailed results

Calculation: Measured Sound 95% or Loudest**Noise calculation model:** ISO 9613-2 General 10.0 m/s

Noise sensitive area: Q Noise sensitive point: (17)

WTG					Loudest up to 95% rated power									
No.	Distance	Sound distance	Mean height	Visible	Calculated	LwA,ref	Dc	Adiv	Aatm	Agr	Abar	Amisc	A	Cmet
	[m]	[m]	[m]		[dB(A)]	[dB(A)]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]
1	1,951	1,956	39.4	No	**22.20**	105.4	3.01	76.83	4.56	4.80	0.00	0.00	86.19	0.00
2	1,947	1,952	38.0	Yes	**22.89**	105.4	3.01	76.81	4.55	4.13	0.00	0.00	85.49	0.00
3	2,000	2,004	34.4	Yes	**22.50**	105.4	3.01	77.04	4.63	4.21	0.00	0.00	85.88	0.00

Sum 27.31

Noise sensitive area: R Noise sensitive point: (18)

WTG					Loudest up to 95% rated power									
No.	Distance	Sound distance	Mean height	Visible	Calculated	LwA,ref	Dc	Adiv	Aatm	Agr	Abar	Amisc	A	Cmet
	[m]	[m]	[m]		[dB(A)]	[dB(A)]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]
1	1,953	1,958	40.1	Yes	**22.89**	105.4	3.01	76.83	4.56	4.10	0.00	0.00	85.49	0.00
2	1,943	1,947	38.8	Yes	**22.94**	105.4	3.01	76.79	4.54	4.12	0.00	0.00	85.45	0.00
3	1,990	1,994	35.2	Yes	**22.58**	105.4	3.01	76.99	4.62	4.19	0.00	0.00	85.81	0.00

Sum 27.58

Noise sensitive area: S Noise sensitive point: (19)

WTG					Loudest up to 95% rated power									
No.	Distance	Sound distance	Mean height	Visible	Calculated	LwA,ref	Dc	Adiv	Aatm	Agr	Abar	Amisc	A	Cmet
	[m]	[m]	[m]		[dB(A)]	[dB(A)]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]
1	1,974	1,978	43.9	Yes	**22.83**	105.4	3.01	76.93	4.59	4.04	0.00	0.00	85.56	0.00
2	1,951	1,955	42.4	Yes	**22.95**	105.4	3.01	76.82	4.56	4.06	0.00	0.00	85.44	0.00
3	1,986	1,989	39.1	Yes	**22.68**	105.4	3.01	76.97	4.61	4.13	0.00	0.00	85.71	0.00

Sum 27.59

Noise sensitive area: T Noise sensitive point: (20)

WTG					Loudest up to 95% rated power									
No.	Distance	Sound distance	Mean height	Visible	Calculated	LwA,ref	Dc	Adiv	Aatm	Agr	Abar	Amisc	A	Cmet
	[m]	[m]	[m]		[dB(A)]	[dB(A)]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]
1	724	729	46.9	Yes	**35.33**	105.4	3.01	68.26	2.24	2.56	0.00	0.00	73.05	0.00
2	846	851	44.1	Yes	**33.28**	105.4	3.01	69.59	2.51	3.00	0.00	0.00	75.11	0.00
3	1,066	1,069	44.0	Yes	**30.45**	105.4	3.01	71.58	2.98	3.38	0.00	0.00	77.93	0.00

Sum 38.23

Noise sensitive area: U Noise sensitive point: (21)

WTG					Loudest up to 95% rated power									
No.	Distance	Sound distance	Mean height	Visible	Calculated	LwA,ref	Dc	Adiv	Aatm	Agr	Abar	Amisc	A	Cmet
	[m]	[m]	[m]		[dB(A)]	[dB(A)]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]
1	744	750	45.8	Yes	**34.92**	105.4	3.01	68.50	2.29	2.68	0.00	0.00	73.47	0.00
2	844	849	43.7	Yes	**33.28**	105.4	3.01	69.58	2.51	3.01	0.00	0.00	75.10	0.00
3	1,049	1,052	43.7	Yes	**30.64**	105.4	3.01	71.44	2.94	3.36	0.00	0.00	77.74	0.00

Sum 38.06

Noise sensitive area: V Noise sensitive point: (22)

WTG					Loudest up to 95% rated power									
No.	Distance	Sound distance	Mean height	Visible	Calculated	LwA,ref	Dc	Adiv	Aatm	Agr	Abar	Amisc	A	Cmet
	[m]	[m]	[m]		[dB(A)]	[dB(A)]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]
1	745	751	45.7	Yes	**34.90**	105.4	3.01	68.51	2.29	2.68	0.00	0.00	73.48	0.00
2	840	845	43.8	Yes	**33.35**	105.4	3.01	69.53	2.50	3.00	0.00	0.00	75.04	0.00
3	1,041	1,044	43.8	Yes	**30.73**	105.4	3.01	71.38	2.93	3.35	0.00	0.00	77.65	0.00

Sum 38.09

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DECIBEL - Detailed results

Calculation: Measured Sound 95% or Loudest **Noise calculation model:** ISO 9613-2 General 10.0 m/s

Noise sensitive area: W Noise sensitive point: (23)

WTG					Loudest up to 95% rated power									
No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	779	785	45.6	Yes	**34.35**	105.4	3.01	68.89	2.37	2.78	0.00	0.00	74.04	0.00
2	897	902	43.1	Yes	**32.52**	105.4	3.01	70.10	2.63	3.14	0.00	0.00	75.87	0.00
3	1,110	1,112	43.1	Yes	**29.93**	105.4	3.01	71.93	3.07	3.46	0.00	0.00	78.45	0.00

Sum 37.40

Noise sensitive area: X Noise sensitive point: (24)

WTG					Loudest up to 95% rated power									
No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	756	762	45.6	Yes	**34.71**	105.4	3.01	68.64	2.31	2.72	0.00	0.00	73.67	0.00
2	843	848	44.0	Yes	**33.31**	105.4	3.01	69.57	2.51	3.00	0.00	0.00	75.07	0.00
3	1,038	1,041	44.1	Yes	**30.78**	105.4	3.01	71.35	2.92	3.34	0.00	0.00	77.61	0.00

Sum 37.99

Noise sensitive area: Y Noise sensitive point: (25)

WTG					Loudest up to 95% rated power									
No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	774	779	45.7	Yes	**34.43**	105.4	3.01	68.84	2.35	2.76	0.00	0.00	73.95	0.00
2	875	879	43.7	Yes	**32.85**	105.4	3.01	69.88	2.58	3.08	0.00	0.00	75.54	0.00
3	1,077	1,080	43.7	Yes	**30.32**	105.4	3.01	71.67	3.00	3.40	0.00	0.00	78.07	0.00

Sum 37.62

Noise sensitive area: Z Noise sensitive point: (26)

WTG					Loudest up to 95% rated power									
No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	858	863	45.9	Yes	**33.18**	105.4	3.01	69.72	2.54	2.95	0.00	0.00	75.21	0.00
2	965	969	43.8	Yes	**31.65**	105.4	3.01	70.73	2.77	3.23	0.00	0.00	76.74	0.00
3	1,164	1,167	43.8	Yes	**29.36**	105.4	3.01	72.34	3.18	3.50	0.00	0.00	79.02	0.00

Sum 36.44

Noise sensitive area: AA Noise sensitive point: (27)

WTG					Loudest up to 95% rated power									
No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	830	835	46.9	Yes	**33.62**	105.4	3.01	69.44	2.48	2.85	0.00	0.00	74.77	0.00
2	902	906	45.7	Yes	**32.56**	105.4	3.01	70.14	2.64	3.05	0.00	0.00	75.83	0.00
3	1,079	1,082	45.9	Yes	**30.36**	105.4	3.01	71.69	3.01	3.34	0.00	0.00	78.03	0.00

Sum 37.15

Noise sensitive area: AB Noise sensitive point: (28)

WTG					Loudest up to 95% rated power									
No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	839	844	46.1	Yes	**33.45**	105.4	3.01	69.53	2.50	2.90	0.00	0.00	74.94	0.00
2	926	930	44.5	Yes	**32.19**	105.4	3.01	70.37	2.69	3.14	0.00	0.00	76.20	0.00
3	1,113	1,115	44.5	Yes	**29.94**	105.4	3.01	71.95	3.07	3.42	0.00	0.00	78.44	0.00

Sum 36.86

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DECIBEL - Detailed results

Calculation: Measured Sound 95% or Loudest **Noise calculation model:** ISO 9613-2 General 10.0 m/s

Noise sensitive area: AC Noise sensitive point: (29)

WTG — **Loudest up to 95% rated power**

No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	831	835	47.3	Yes	**33.63**	105.4	3.01	69.44	2.48	2.83	0.00	0.00	74.75	0.00
2	874	878	46.8	Yes	**32.99**	105.4	3.01	69.87	2.58	2.95	0.00	0.00	75.40	0.00
3	1,032	1,035	47.0	Yes	**30.95**	105.4	3.01	71.30	2.91	3.23	0.00	0.00	77.44	0.00

Sum 37.44

Noise sensitive area: AD Noise sensitive point: (30)

WTG — **Loudest up to 95% rated power**

No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	1,025	1,030	45.6	Yes	**30.97**	105.4	3.01	71.25	2.90	3.27	0.00	0.00	77.42	0.00
2	1,165	1,169	43.6	Yes	**29.34**	105.4	3.01	72.35	3.18	3.51	0.00	0.00	79.05	0.00
3	1,376	1,378	43.3	Yes	**27.31**	105.4	3.01	73.78	3.58	3.72	0.00	0.00	81.08	0.00

Sum 34.23

Noise sensitive area: AE Noise sensitive point: (31)

WTG — **Loudest up to 95% rated power**

No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	1,282	1,286	44.2	Yes	**28.18**	105.4	3.01	73.18	3.41	3.61	0.00	0.00	80.20	0.00
2	1,350	1,353	41.6	No	**26.43**	105.4	3.01	73.63	3.53	4.80	0.00	0.00	81.96	0.00
3	1,493	1,495	40.7	No	**25.30**	105.4	3.01	74.49	3.79	4.80	0.00	0.00	83.08	0.00

Sum 31.57

Noise sensitive area: AF Noise sensitive point: (32)

WTG — **Loudest up to 95% rated power**

No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	2,111	2,115	50.3	Yes	**22.10**	105.4	3.01	77.50	4.80	3.98	0.00	0.00	86.29	0.00
2	2,024	2,028	49.7	Yes	**22.62**	105.4	3.01	77.14	4.67	3.96	0.00	0.00	85.77	0.00
3	1,991	1,994	47.6	Yes	**22.79**	105.4	3.01	77.00	4.62	3.98	0.00	0.00	85.60	0.00

Sum 27.28

Noise sensitive area: AG Noise sensitive point: (33)

WTG — **Loudest up to 95% rated power**

No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	2,093	2,096	50.3	Yes	**22.20**	105.4	3.01	77.43	4.78	3.98	0.00	0.00	86.18	0.00
2	2,010	2,013	49.7	Yes	**22.71**	105.4	3.01	77.08	4.65	3.95	0.00	0.00	85.68	0.00
3	1,981	1,984	47.6	Yes	**22.86**	105.4	3.01	76.95	4.60	3.98	0.00	0.00	85.53	0.00

Sum 27.37

Noise sensitive area: AH Noise sensitive point: (34)

WTG — **Loudest up to 95% rated power**

No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	2,107	2,111	45.9	Yes	**22.05**	105.4	3.01	77.49	4.80	4.05	0.00	0.00	86.34	0.00
2	2,010	2,014	45.0	Yes	**22.62**	105.4	3.01	77.08	4.65	4.03	0.00	0.00	85.76	0.00
3	1,966	1,970	42.7	Yes	**22.86**	105.4	3.01	76.89	4.58	4.06	0.00	0.00	85.53	0.00

Sum 27.29

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Calculation: Measured Sound 95% or Loudest **Noise calculation model:** ISO 9613-2 General 10.0 m/s

Noise sensitive area: AI Noise sensitive point: (35)

WTG No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Loudest up to 95% rated power Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	2,133	2,137	46.5	Yes	**21.90**	105.4	3.01	77.60	4.84	4.05	0.00	0.00	86.49	0.00
2	2,029	2,033	45.5	Yes	**22.51**	105.4	3.01	77.16	4.68	4.03	0.00	0.00	85.88	0.00
3	1,978	1,981	42.9	Yes	**22.79**	105.4	3.01	76.94	4.60	4.06	0.00	0.00	85.59	0.00

Sum 27.19

Noise sensitive area: AJ Noise sensitive point: (36)

WTG No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Loudest up to 95% rated power Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	1,983	1,988	38.4	Yes	**22.67**	105.4	3.01	76.97	4.61	4.14	0.00	0.00	85.71	0.00
2	1,912	1,917	37.5	Yes	**23.11**	105.4	3.01	76.65	4.50	4.13	0.00	0.00	85.28	0.00
3	1,899	1,903	35.2	Yes	**23.16**	105.4	3.01	76.59	4.48	4.17	0.00	0.00	85.23	0.00

Sum 27.76

Noise sensitive area: AK Noise sensitive point: (37)

WTG No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Loudest up to 95% rated power Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	2,005	2,010	39.0	Yes	**22.55**	105.4	3.01	77.06	4.64	4.13	0.00	0.00	85.84	0.00
2	1,926	1,931	38.4	Yes	**23.03**	105.4	3.01	76.72	4.52	4.12	0.00	0.00	85.35	0.00
3	1,905	1,909	36.1	Yes	**23.14**	105.4	3.01	76.62	4.48	4.15	0.00	0.00	85.25	0.00

Sum 27.68

Noise sensitive area: AL Noise sensitive point: (38)

WTG No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Loudest up to 95% rated power Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	2,169	2,173	46.8	Yes	**21.69**	105.4	3.01	77.74	4.89	4.06	0.00	0.00	86.69	0.00
2	2,054	2,058	45.4	Yes	**22.35**	105.4	3.01	77.27	4.72	4.04	0.00	0.00	86.03	0.00
3	1,991	1,994	42.6	Yes	**22.70**	105.4	3.01	77.00	4.62	4.07	0.00	0.00	85.68	0.00

Sum 27.04

Noise sensitive area: AM Noise sensitive point: (39)

WTG No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Loudest up to 95% rated power Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	2,123	2,128	45.2	Yes	**21.94**	105.4	3.01	77.56	4.82	4.07	0.00	0.00	86.45	0.00
2	2,017	2,021	44.1	Yes	**22.56**	105.4	3.01	77.11	4.66	4.05	0.00	0.00	85.83	0.00
3	1,964	1,967	41.5	Yes	**22.86**	105.4	3.01	76.88	4.58	4.08	0.00	0.00	85.53	0.00

Sum 27.24

Noise sensitive area: AN Noise sensitive point: (40)

WTG No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Loudest up to 95% rated power Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	2,177	2,181	46.5	Yes	**21.64**	105.4	3.01	77.77	4.90	4.07	0.00	0.00	86.75	0.00
2	2,059	2,063	44.8	Yes	**22.32**	105.4	3.01	77.29	4.72	4.06	0.00	0.00	86.07	0.00
3	1,992	1,996	42.1	Yes	**22.69**	105.4	3.01	77.00	4.62	4.08	0.00	0.00	85.70	0.00

Sum 27.01

Project:
738 Terence Bay Wind Project

Description:
3 Turbine Wind project
Haliafx County, Nova Scotia

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Calculated:
2/6/2014 8:43 AM/2.9.207

DECIBEL - Detailed results

Calculation: Measured Sound 95% or Loudest **Noise calculation model:** ISO 9613-2 General 10.0 m/s

Noise sensitive area: AO Noise sensitive point: (41)

WTG No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Loudest up to 95% rated power Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	2,143	2,147	45.5	Yes	**21.82**	105.4	3.01	77.64	4.85	4.07	0.00	0.00	86.56	0.00
2	2,031	2,035	44.1	Yes	**22.48**	105.4	3.01	77.17	4.68	4.06	0.00	0.00	85.91	0.00
3	1,971	1,974	41.4	Yes	**22.81**	105.4	3.01	76.91	4.59	4.08	0.00	0.00	85.58	0.00

Sum 27.16

Noise sensitive area: AP Noise sensitive point: (42)

WTG No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Loudest up to 95% rated power Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	2,153	2,157	45.6	Yes	**21.77**	105.4	3.01	77.68	4.87	4.08	0.00	0.00	86.62	0.00
2	2,037	2,041	44.0	Yes	**22.44**	105.4	3.01	77.20	4.69	4.06	0.00	0.00	85.95	0.00
3	1,972	1,975	41.3	Yes	**22.80**	105.4	3.01	76.91	4.59	4.08	0.00	0.00	85.59	0.00

Sum 27.13

Noise sensitive area: AQ Noise sensitive point: (43)

WTG No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Loudest up to 95% rated power Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	2,065	2,070	40.7	Yes	**22.21**	105.4	3.01	77.32	4.73	4.13	0.00	0.00	86.18	0.00
2	1,965	1,970	39.7	Yes	**22.81**	105.4	3.01	76.89	4.58	4.11	0.00	0.00	85.58	0.00
3	1,919	1,924	37.3	Yes	**23.06**	105.4	3.01	76.68	4.51	4.13	0.00	0.00	85.33	0.00

Sum 27.48

Noise sensitive area: AR Noise sensitive point: (44)

WTG No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Loudest up to 95% rated power Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	2,181	2,185	45.6	Yes	**21.60**	105.4	3.01	77.79	4.91	4.08	0.00	0.00	86.78	0.00
2	2,058	2,063	43.7	Yes	**22.30**	105.4	3.01	77.29	4.72	4.07	0.00	0.00	86.08	0.00
3	1,986	1,990	41.4	Yes	**22.71**	105.4	3.01	76.97	4.61	4.09	0.00	0.00	85.67	0.00

Sum 27.00

Noise sensitive area: AS Noise sensitive point: (45)

WTG No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Loudest up to 95% rated power Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	2,167	2,171	45.4	Yes	**21.68**	105.4	3.01	77.73	4.89	4.08	0.00	0.00	86.70	0.00
2	2,045	2,049	43.6	Yes	**22.38**	105.4	3.01	77.23	4.70	4.07	0.00	0.00	86.01	0.00
3	1,974	1,978	41.1	Yes	**22.78**	105.4	3.01	76.93	4.59	4.09	0.00	0.00	85.61	0.00

Sum 27.08

Noise sensitive area: AT Noise sensitive point: (46)

WTG No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Loudest up to 95% rated power Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	2,190	2,195	45.6	Yes	**21.55**	105.4	3.01	77.83	4.92	4.09	0.00	0.00	86.84	0.00
2	2,064	2,069	43.5	Yes	**22.26**	105.4	3.01	77.31	4.73	4.08	0.00	0.00	86.12	0.00
3	1,988	1,992	41.4	Yes	**22.70**	105.4	3.01	76.99	4.61	4.09	0.00	0.00	85.69	0.00

Sum 26.97

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Calculated:
2/6/2014 8:43 AM/2.9.207

DECIBEL - Detailed results

Calculation: Measured Sound 95% or Loudest**Noise calculation model:** ISO 9613-2 General 10.0 m/s

Noise sensitive area: AU Noise sensitive point: (47)

WTG					Loudest up to 95% rated power									
No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	2,077	2,081	41.1	Yes	**22.14**	105.4	3.01	77.37	4.75	4.12	0.00	0.00	86.24	0.00
2	1,970	1,974	39.9	Yes	**22.78**	105.4	3.01	76.91	4.59	4.11	0.00	0.00	85.60	0.00
3	1,917	1,921	37.4	Yes	**23.08**	105.4	3.01	76.67	4.50	4.13	0.00	0.00	85.31	0.00

Sum 27.46

Noise sensitive area: AV Noise sensitive point: (48)

WTG					Loudest up to 95% rated power									
No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	2,179	2,183	44.5	Yes	**21.60**	105.4	3.01	77.78	4.90	4.10	0.00	0.00	86.79	0.00
2	2,051	2,055	42.5	Yes	**22.33**	105.4	3.01	77.26	4.71	4.09	0.00	0.00	86.06	0.00
3	1,973	1,977	40.5	Yes	**22.78**	105.4	3.01	76.92	4.59	4.10	0.00	0.00	85.61	0.00

Sum 27.03

Noise sensitive area: AW Noise sensitive point: (49)

WTG					Loudest up to 95% rated power									
No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	2,134	2,138	42.8	Yes	**21.83**	105.4	3.01	77.60	4.84	4.11	0.00	0.00	86.55	0.00
2	2,008	2,013	40.8	Yes	**22.56**	105.4	3.01	77.08	4.65	4.10	0.00	0.00	85.83	0.00
3	1,935	1,939	38.5	Yes	**22.99**	105.4	3.01	76.75	4.53	4.12	0.00	0.00	85.40	0.00

Sum 27.26

Noise sensitive area: AX Noise sensitive point: (50)

WTG					Loudest up to 95% rated power									
No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	2,146	2,150	42.0	Yes	**21.75**	105.4	3.01	77.65	4.86	4.13	0.00	0.00	86.64	0.00
2	2,016	2,021	40.0	Yes	**22.50**	105.4	3.01	77.11	4.66	4.12	0.00	0.00	85.89	0.00
3	1,937	1,941	38.1	Yes	**22.97**	105.4	3.01	76.76	4.53	4.13	0.00	0.00	85.42	0.00

Sum 27.20

Noise sensitive area: AY Noise sensitive point: (51)

WTG					Loudest up to 95% rated power									
No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	2,126	2,131	41.5	Yes	**21.86**	105.4	3.01	77.57	4.83	4.13	0.00	0.00	86.53	0.00
2	1,993	1,998	39.6	Yes	**22.63**	105.4	3.01	77.01	4.62	4.12	0.00	0.00	85.75	0.00
3	1,910	1,914	37.8	Yes	**23.13**	105.4	3.01	76.64	4.49	4.12	0.00	0.00	85.26	0.00

Sum 27.34

Noise sensitive area: AZ Noise sensitive point: (52)

WTG					Loudest up to 95% rated power									
No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	2,254	2,259	42.2	Yes	**21.13**	105.4	3.01	78.08	5.02	4.16	0.00	0.00	87.25	0.00
2	2,102	2,106	41.3	Yes	**22.00**	105.4	3.01	77.47	4.79	4.13	0.00	0.00	86.39	0.00
3	1,995	1,999	39.1	Yes	**22.62**	105.4	3.01	77.02	4.63	4.13	0.00	0.00	85.77	0.00

Sum 26.73

Project:
738 Terence Bay Wind Project

Description:
3 Turbine Wind project
Haliafx County, Nova Scotia

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DECIBEL - Detailed results

Calculation: Measured Sound 95% or Loudest **Noise calculation model:** ISO 9613-2 General 10.0 m/s

Noise sensitive area: BA Noise sensitive point: (53)

WTG — **Loudest up to 95% rated power**

No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	2,274	2,278	43.2	Yes	**21.04**	105.4	3.01	78.15	5.04	4.15	0.00	0.00	87.35	0.00
2	2,114	2,118	42.5	Yes	**21.95**	105.4	3.01	77.52	4.81	4.11	0.00	0.00	86.44	0.00
3	1,998	2,002	40.0	Yes	**22.61**	105.4	3.01	77.03	4.63	4.11	0.00	0.00	85.78	0.00

Sum 26.68

Noise sensitive area: BB Noise sensitive point: (54)

WTG — **Loudest up to 95% rated power**

No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	2,225	2,230	41.6	Yes	**21.29**	105.4	3.01	77.97	4.97	4.16	0.00	0.00	87.10	0.00
2	2,068	2,073	40.8	Yes	**22.19**	105.4	3.01	77.33	4.74	4.12	0.00	0.00	86.19	0.00
3	1,957	1,962	38.6	Yes	**22.84**	105.4	3.01	76.85	4.57	4.13	0.00	0.00	85.54	0.00

Sum 26.92

Noise sensitive area: BC Noise sensitive point: (55)

WTG — **Loudest up to 95% rated power**

No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	2,239	2,243	41.6	Yes	**21.21**	105.4	3.01	78.02	4.99	4.17	0.00	0.00	87.18	0.00
2	2,079	2,083	40.9	Yes	**22.13**	105.4	3.01	77.38	4.76	4.13	0.00	0.00	86.26	0.00
3	1,964	1,969	38.5	Yes	**22.80**	105.4	3.01	76.88	4.58	4.13	0.00	0.00	85.59	0.00

Sum 26.87

Noise sensitive area: BD Noise sensitive point: (56)

WTG — **Loudest up to 95% rated power**

No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	2,278	2,282	42.4	Yes	**21.01**	105.4	3.01	78.17	5.05	4.16	0.00	0.00	87.38	0.00
2	2,111	2,115	41.8	Yes	**21.95**	105.4	3.01	77.51	4.80	4.12	0.00	0.00	86.43	0.00
3	1,988	1,992	39.1	Yes	**22.66**	105.4	3.01	76.99	4.61	4.13	0.00	0.00	85.73	0.00

Sum 26.70

Noise sensitive area: BE Noise sensitive point: (57)

WTG — **Loudest up to 95% rated power**

No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	2,248	2,253	41.5	Yes	**21.16**	105.4	3.01	78.05	5.01	4.17	0.00	0.00	87.23	0.00
2	2,084	2,089	41.0	Yes	**22.10**	105.4	3.01	77.40	4.76	4.13	0.00	0.00	86.29	0.00
3	1,965	1,969	38.4	Yes	**22.79**	105.4	3.01	76.89	4.58	4.13	0.00	0.00	85.60	0.00

Sum 26.84

Noise sensitive area: BF Noise sensitive point: (58)

WTG — **Loudest up to 95% rated power**

No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	2,251	2,256	41.5	Yes	**21.14**	105.4	3.01	78.07	5.01	4.17	0.00	0.00	87.25	0.00
2	2,085	2,089	40.9	Yes	**22.09**	105.4	3.01	77.40	4.76	4.13	0.00	0.00	86.29	0.00
3	1,963	1,967	38.3	Yes	**22.80**	105.4	3.01	76.88	4.58	4.13	0.00	0.00	85.59	0.00

Sum 26.84

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DECIBEL - Detailed results

Calculation: Measured Sound 95% or Loudest**Noise calculation model:** ISO 9613-2 General 10.0 m/s

Noise sensitive area: BG Noise sensitive point: (59)

WTG — **Loudest up to 95% rated power**

No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	2,287	2,291	42.2	Yes	**20.95**	105.4	3.01	78.20	5.06	4.17	0.00	0.00	87.43	0.00
2	2,111	2,115	41.4	Yes	**21.95**	105.4	3.01	77.51	4.80	4.13	0.00	0.00	86.44	0.00
3	1,977	1,981	38.5	Yes	**22.72**	105.4	3.01	76.94	4.60	4.13	0.00	0.00	85.67	0.00

Sum 26.70

Noise sensitive area: BH Noise sensitive point: (60)

WTG — **Loudest up to 95% rated power**

No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	2,296	2,300	42.0	Yes	**20.90**	105.4	3.01	78.24	5.08	4.18	0.00	0.00	87.49	0.00
2	2,111	2,116	40.9	Yes	**21.94**	105.4	3.01	77.51	4.80	4.14	0.00	0.00	86.45	0.00
3	1,968	1,972	38.1	Yes	**22.77**	105.4	3.01	76.90	4.58	4.14	0.00	0.00	85.62	0.00

Sum 26.70

Noise sensitive area: BI Noise sensitive point: (61)

WTG — **Loudest up to 95% rated power**

No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	1,837	1,843	37.8	Yes	**23.60**	105.4	3.01	76.31	4.38	4.10	0.00	0.00	84.78	0.00
2	1,713	1,719	36.0	Yes	**24.43**	105.4	3.01	75.70	4.17	4.08	0.00	0.00	83.96	0.00
3	1,649	1,654	33.5	Yes	**24.84**	105.4	3.01	75.37	4.07	4.10	0.00	0.00	83.54	0.00

Sum 29.09

Noise sensitive area: BJ Noise sensitive point: (62)

WTG — **Loudest up to 95% rated power**

No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	1,874	1,880	36.2	Yes	**23.33**	105.4	3.01	76.48	4.44	4.14	0.00	0.00	85.06	0.00
2	1,726	1,731	35.1	Yes	**24.32**	105.4	3.01	75.77	4.20	4.10	0.00	0.00	84.07	0.00
3	1,635	1,640	33.4	Yes	**24.95**	105.4	3.01	75.30	4.04	4.10	0.00	0.00	83.44	0.00

Sum 29.02

Noise sensitive area: BK Noise sensitive point: (63)

WTG — **Loudest up to 95% rated power**

No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	1,851	1,856	36.6	Yes	**23.49**	105.4	3.01	76.37	4.40	4.12	0.00	0.00	84.90	0.00
2	1,705	1,710	35.3	Yes	**24.47**	105.4	3.01	75.66	4.16	4.09	0.00	0.00	83.91	0.00
3	1,617	1,622	33.5	Yes	**25.09**	105.4	3.01	75.20	4.01	4.09	0.00	0.00	83.30	0.00

Sum 29.17

Noise sensitive area: BL Noise sensitive point: (64)

WTG — **Loudest up to 95% rated power**

No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	2,384	2,388	41.2	Yes	**20.41**	105.4	3.01	78.56	5.20	4.21	0.00	0.00	87.97	0.00
2	2,173	2,177	40.0	Yes	**21.56**	105.4	3.01	77.76	4.90	4.17	0.00	0.00	86.82	0.00
3	1,997	2,001	37.7	Yes	**22.58**	105.4	3.01	77.03	4.63	4.15	0.00	0.00	85.81	0.00

Sum 26.38

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Calculated:
2/6/2014 8:43 AM/2.9.207

DECIBEL - Detailed results

Calculation: Measured Sound 95% or Loudest **Noise calculation model:** ISO 9613-2 General 10.0 m/s

Noise sensitive area: BM Noise sensitive point: (65)

WTG No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Loudest up to 95% rated power Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	1,669	1,675	33.2	Yes	**24.69**	105.4	3.01	75.48	4.10	4.12	0.00	0.00	83.70	0.00
2	1,530	1,536	31.7	Yes	**25.71**	105.4	3.01	74.73	3.86	4.09	0.00	0.00	82.68	0.00
3	1,456	1,462	29.5	Yes	**26.25**	105.4	3.01	74.30	3.73	4.10	0.00	0.00	82.13	0.00

Sum 30.37

Noise sensitive area: BN Noise sensitive point: (66)

WTG No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Loudest up to 95% rated power Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	1,743	1,749	32.1	Yes	**24.14**	105.4	3.01	75.86	4.23	4.17	0.00	0.00	84.25	0.00
2	1,576	1,582	31.6	Yes	**25.35**	105.4	3.01	74.98	3.94	4.11	0.00	0.00	83.04	0.00
3	1,468	1,474	29.4	Yes	**26.15**	105.4	3.01	74.37	3.75	4.11	0.00	0.00	82.24	0.00

Sum 30.06

Noise sensitive area: BO Noise sensitive point: (67)

WTG No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Loudest up to 95% rated power Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	1,615	1,621	33.3	No	**24.38**	105.4	3.01	75.19	4.01	4.80	0.00	0.00	84.00	0.00
2	1,469	1,475	32.2	Yes	**26.21**	105.4	3.01	74.37	3.75	4.05	0.00	0.00	82.18	0.00
3	1,391	1,396	30.0	Yes	**26.82**	105.4	3.01	73.90	3.61	4.06	0.00	0.00	81.57	0.00

Sum 30.69

Noise sensitive area: BP Noise sensitive point: (68)

WTG No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Loudest up to 95% rated power Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	1,739	1,745	32.6	No	**23.54**	105.4	3.01	75.83	4.22	4.80	0.00	0.00	84.85	0.00
2	1,557	1,563	31.8	No	**24.80**	105.4	3.01	74.88	3.91	4.80	0.00	0.00	83.59	0.00
3	1,433	1,438	29.5	No	**25.74**	105.4	3.01	74.16	3.69	4.80	0.00	0.00	82.65	0.00

Sum 29.56

Noise sensitive area: BQ Noise sensitive point: (69)

WTG No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Loudest up to 95% rated power Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	1,680	1,685	34.4	Yes	**24.64**	105.4	3.01	75.53	4.12	4.10	0.00	0.00	83.75	0.00
2	1,503	1,509	33.7	Yes	**25.97**	105.4	3.01	74.57	3.81	4.03	0.00	0.00	82.42	0.00
3	1,388	1,393	31.5	Yes	**26.88**	105.4	3.01	73.88	3.61	4.02	0.00	0.00	81.51	0.00

Sum 30.70

Noise sensitive area: BR Noise sensitive point: (70)

WTG No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Loudest up to 95% rated power Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	1,734	1,740	33.2	No	**23.57**	105.4	3.01	75.81	4.21	4.80	0.00	0.00	84.82	0.00
2	1,549	1,555	32.4	No	**24.86**	105.4	3.01	74.83	3.90	4.80	0.00	0.00	83.53	0.00
3	1,421	1,427	30.1	No	**25.83**	105.4	3.01	74.09	3.67	4.80	0.00	0.00	82.56	0.00

Sum 29.62

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Calculated:
2/6/2014 8:43 AM/2.9.207

DECIBEL - Detailed results

Calculation: Measured Sound 95% or Loudest **Noise calculation model:** ISO 9613-2 General 10.0 m/s

Noise sensitive area: BS Noise sensitive point: (71)

WTG No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Loudest up to 95% rated power Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	1,645	1,650	35.7	Yes	**24.92**	105.4	3.01	75.35	4.06	4.06	0.00	0.00	83.46	0.00
2	1,467	1,472	35.0	Yes	**26.29**	105.4	3.01	74.36	3.75	3.98	0.00	0.00	82.09	0.00
3	1,352	1,357	32.8	Yes	**27.23**	105.4	3.01	73.65	3.54	3.97	0.00	0.00	81.16	0.00

Sum 31.02

Noise sensitive area: BT Noise sensitive point: (72)

WTG No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Loudest up to 95% rated power Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	1,657	1,662	36.0	Yes	**24.84**	105.4	3.01	75.41	4.08	4.06	0.00	0.00	83.55	0.00
2	1,476	1,481	35.2	Yes	**26.23**	105.4	3.01	74.41	3.77	3.98	0.00	0.00	82.16	0.00
3	1,356	1,361	33.1	Yes	**27.20**	105.4	3.01	73.68	3.55	3.96	0.00	0.00	81.19	0.00

Sum 30.97

Noise sensitive area: BU Noise sensitive point: (73)

WTG No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Loudest up to 95% rated power Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	1,543	1,549	35.5	Yes	**25.69**	105.4	3.01	74.80	3.88	4.01	0.00	0.00	82.70	0.00
2	1,381	1,386	34.7	Yes	**27.02**	105.4	3.01	73.83	3.59	3.94	0.00	0.00	81.37	0.00
3	1,287	1,292	32.8	Yes	**27.82**	105.4	3.01	73.23	3.42	3.92	0.00	0.00	80.57	0.00

Sum 31.70

Noise sensitive area: BV Noise sensitive point: (74)

WTG No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Loudest up to 95% rated power Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	1,822	1,828	32.8	No	**23.00**	105.4	3.01	76.24	4.35	4.80	0.00	0.00	85.39	0.00
2	1,618	1,623	32.2	No	**24.36**	105.4	3.01	75.21	4.01	4.80	0.00	0.00	84.02	0.00
3	1,464	1,469	29.5	No	**25.50**	105.4	3.01	74.34	3.74	4.80	0.00	0.00	82.88	0.00

Sum 29.18

Noise sensitive area: BW Noise sensitive point: (75)

WTG No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Loudest up to 95% rated power Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	1,699	1,704	35.6	No	**23.81**	105.4	3.01	75.63	4.15	4.80	0.00	0.00	84.58	0.00
2	1,508	1,513	34.9	No	**25.17**	105.4	3.01	74.60	3.82	4.80	0.00	0.00	83.22	0.00
3	1,375	1,380	32.6	No	**26.21**	105.4	3.01	73.80	3.58	4.80	0.00	0.00	82.18	0.00

Sum 29.94

Noise sensitive area: BX Noise sensitive point: (76)

WTG No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Loudest up to 95% rated power Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	1,656	1,661	36.6	Yes	**24.85**	105.4	3.01	75.41	4.08	4.04	0.00	0.00	83.53	0.00
2	1,471	1,476	35.8	Yes	**26.28**	105.4	3.01	74.38	3.76	3.96	0.00	0.00	82.10	0.00
3	1,345	1,350	33.6	Yes	**27.31**	105.4	3.01	73.61	3.53	3.94	0.00	0.00	81.08	0.00

Sum 31.03

Project:
738 Terence Bay Wind Project
Description:
3 Turbine Wind project
Haliafx County, Nova Scotia
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2/6/2014 8:43 AM/2.9.207

DECIBEL - Detailed results

Calculation: Measured Sound 95% or Loudest**Noise calculation model:** ISO 9613-2 General 10.0 m/s

Noise sensitive area: BY Noise sensitive point: (77)

WTG — **Loudest up to 95% rated power**

No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	1,798	1,803	34.0	No	**23.15**	105.4	3.01	76.12	4.31	4.80	0.00	0.00	85.23	0.00
2	1,594	1,600	33.4	No	**24.53**	105.4	3.01	75.08	3.97	4.80	0.00	0.00	83.85	0.00
3	1,442	1,448	30.7	No	**25.67**	105.4	3.01	74.21	3.70	4.80	0.00	0.00	82.72	0.00

Sum 29.34

Noise sensitive area: BZ Noise sensitive point: (78)

WTG — **Loudest up to 95% rated power**

No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	1,588	1,593	36.4	Yes	**25.36**	105.4	3.01	75.05	3.96	4.01	0.00	0.00	83.02	0.00
2	1,411	1,416	35.8	Yes	**26.79**	105.4	3.01	74.02	3.65	3.93	0.00	0.00	81.60	0.00
3	1,298	1,303	33.7	Yes	**27.74**	105.4	3.01	73.30	3.44	3.91	0.00	0.00	80.65	0.00

Sum 31.51

Noise sensitive area: CA Noise sensitive point: (79)

WTG — **Loudest up to 95% rated power**

No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	1,853	1,858	33.2	No	**22.80**	105.4	3.01	76.38	4.40	4.80	0.00	0.00	85.58	0.00
2	1,642	1,647	32.4	No	**24.20**	105.4	3.01	75.34	4.05	4.80	0.00	0.00	84.19	0.00
3	1,479	1,484	29.9	No	**25.38**	105.4	3.01	74.43	3.77	4.80	0.00	0.00	83.00	0.00

Sum 29.03

Noise sensitive area: CB Noise sensitive point: (80)

WTG — **Loudest up to 95% rated power**

No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	1,651	1,656	37.3	Yes	**24.91**	105.4	3.01	75.38	4.07	4.03	0.00	0.00	83.48	0.00
2	1,463	1,468	36.6	Yes	**26.37**	105.4	3.01	74.34	3.74	3.94	0.00	0.00	82.02	0.00
3	1,335	1,340	34.4	Yes	**27.42**	105.4	3.01	73.54	3.51	3.92	0.00	0.00	80.97	0.00

Sum 31.12

Noise sensitive area: CC Noise sensitive point: (81)

WTG — **Loudest up to 95% rated power**

No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	1,832	1,837	34.1	No	**22.94**	105.4	3.01	76.28	4.37	4.80	0.00	0.00	85.45	0.00
2	1,622	1,628	33.4	No	**24.33**	105.4	3.01	75.23	4.02	4.80	0.00	0.00	84.05	0.00
3	1,462	1,467	30.9	No	**25.52**	105.4	3.01	74.33	3.74	4.80	0.00	0.00	82.87	0.00

Sum 29.16

Noise sensitive area: CD Noise sensitive point: (82)

WTG — **Loudest up to 95% rated power**

No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	1,552	1,557	36.5	Yes	**25.64**	105.4	3.01	74.85	3.90	4.00	0.00	0.00	82.74	0.00
2	1,378	1,384	35.8	Yes	**27.07**	105.4	3.01	73.82	3.59	3.91	0.00	0.00	81.32	0.00
3	1,272	1,277	33.7	Yes	**27.99**	105.4	3.01	73.12	3.39	3.89	0.00	0.00	80.40	0.00

Sum 31.78

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DECIBEL - Detailed results

Calculation: Measured Sound 95% or Loudest **Noise calculation model:** ISO 9613-2 General 10.0 m/s

Noise sensitive area: CE Noise sensitive point: (83)

WTG No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Loudest up to 95% rated power Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	1,572	1,577	36.7	Yes	**25.50**	105.4	3.01	74.96	3.93	4.00	0.00	0.00	82.89	0.00
2	1,394	1,399	36.0	Yes	**26.94**	105.4	3.01	73.92	3.62	3.91	0.00	0.00	81.45	0.00
3	1,281	1,286	33.9	Yes	**27.91**	105.4	3.01	73.18	3.41	3.89	0.00	0.00	80.48	0.00

Sum 31.66

Noise sensitive area: CF Noise sensitive point: (84)

WTG No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Loudest up to 95% rated power Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	1,445	1,450	37.1	Yes	**26.53**	105.4	3.01	74.23	3.71	3.92	0.00	0.00	81.85	0.00
2	1,286	1,292	36.1	Yes	**27.91**	105.4	3.01	73.22	3.42	3.84	0.00	0.00	80.48	0.00
3	1,204	1,209	33.8	Yes	**28.64**	105.4	3.01	72.65	3.26	3.84	0.00	0.00	79.74	0.00

Sum 32.55

Noise sensitive area: CG Noise sensitive point: (85)

WTG No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Loudest up to 95% rated power Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	1,461	1,466	36.9	Yes	**26.39**	105.4	3.01	74.33	3.74	3.93	0.00	0.00	82.00	0.00
2	1,299	1,305	36.0	Yes	**27.79**	105.4	3.01	73.31	3.44	3.85	0.00	0.00	80.60	0.00
3	1,212	1,217	33.9	Yes	**28.57**	105.4	3.01	72.70	3.27	3.84	0.00	0.00	79.82	0.00

Sum 32.44

Noise sensitive area: CH Noise sensitive point: (86)

WTG No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Loudest up to 95% rated power Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	1,478	1,483	36.7	Yes	**26.25**	105.4	3.01	74.42	3.77	3.95	0.00	0.00	82.14	0.00
2	1,313	1,318	35.8	Yes	**27.66**	105.4	3.01	73.40	3.47	3.86	0.00	0.00	80.73	0.00
3	1,221	1,226	33.8	Yes	**28.48**	105.4	3.01	72.77	3.29	3.85	0.00	0.00	79.91	0.00

Sum 32.33

Noise sensitive area: CI Noise sensitive point: (87)

WTG No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Loudest up to 95% rated power Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	1,500	1,505	36.6	Yes	**26.06**	105.4	3.01	74.55	3.81	3.96	0.00	0.00	82.32	0.00
2	1,331	1,336	35.8	Yes	**27.49**	105.4	3.01	73.52	3.50	3.88	0.00	0.00	80.89	0.00
3	1,233	1,238	33.9	Yes	**28.36**	105.4	3.01	72.85	3.31	3.86	0.00	0.00	80.02	0.00

Sum 32.18

Noise sensitive area: CJ Noise sensitive point: (88)

WTG No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Loudest up to 95% rated power Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	1,524	1,529	36.8	Yes	**25.88**	105.4	3.01	74.69	3.85	3.97	0.00	0.00	82.51	0.00
2	1,350	1,355	36.2	Yes	**27.33**	105.4	3.01	73.64	3.54	3.88	0.00	0.00	81.06	0.00
3	1,245	1,250	34.1	Yes	**28.25**	105.4	3.01	72.94	3.34	3.86	0.00	0.00	80.13	0.00

Sum 32.03

Project:
738 Terence Bay Wind Project

Description:
3 Turbine Wind project
Haliafx County, Nova Scotia

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Calculated:
2/6/2014 8:43 AM/2.9.207

DECIBEL - Detailed results

Calculation: Measured Sound 95% or Loudest**Noise calculation model:** ISO 9613-2 General 10.0 m/s

Noise sensitive area: CK Noise sensitive point: (89)

WTG					Loudest up to 95% rated power										
No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	1,391	1,396	38.1	Yes	**27.02**	105.4	3.01	73.90	3.61	3.86	0.00	0.00	81.36	0.00
2	1,242	1,247	37.1	Yes	**28.36**	105.4	3.01	72.92	3.33	3.78	0.00	0.00	80.03	0.00
3	1,174	1,179	34.6	Yes	**28.97**	105.4	3.01	72.43	3.20	3.79	0.00	0.00	79.41	0.00

Sum 32.96

Noise sensitive area: CL Noise sensitive point: (90)

WTG					Loudest up to 95% rated power									
No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	1,637	1,641	38.5	Yes	**25.04**	105.4	3.01	75.30	4.04	3.99	0.00	0.00	83.34	0.00
2	1,443	1,448	37.9	Yes	**26.57**	105.4	3.01	74.22	3.71	3.90	0.00	0.00	81.82	0.00
3	1,309	1,314	35.6	Yes	**27.69**	105.4	3.01	73.37	3.46	3.87	0.00	0.00	80.70	0.00

Sum 31.34

Noise sensitive area: CM Noise sensitive point: (91)

WTG					Loudest up to 95% rated power									
No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	1,363	1,368	38.5	Yes	**27.27**	105.4	3.01	73.72	3.56	3.83	0.00	0.00	81.11	0.00
2	1,213	1,218	37.4	Yes	**28.66**	105.4	3.01	72.71	3.28	3.74	0.00	0.00	79.73	0.00
3	1,145	1,150	34.9	Yes	**29.28**	105.4	3.01	72.21	3.14	3.75	0.00	0.00	79.11	0.00

Sum 33.25

Noise sensitive area: CN Noise sensitive point: (92)

WTG					Loudest up to 95% rated power									
No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	1,614	1,619	38.7	Yes	**25.22**	105.4	3.01	75.18	4.01	3.98	0.00	0.00	83.17	0.00
2	1,421	1,425	38.1	Yes	**26.77**	105.4	3.01	74.08	3.66	3.88	0.00	0.00	81.62	0.00
3	1,288	1,292	35.9	Yes	**27.90**	105.4	3.01	73.23	3.42	3.84	0.00	0.00	80.49	0.00

Sum 31.53

Noise sensitive area: CO Noise sensitive point: (93)

WTG					Loudest up to 95% rated power									
No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	1,513	1,517	38.2	Yes	**26.00**	105.4	3.01	74.62	3.83	3.93	0.00	0.00	82.39	0.00
2	1,328	1,333	37.5	Yes	**27.56**	105.4	3.01	73.50	3.49	3.83	0.00	0.00	80.82	0.00
3	1,211	1,216	35.5	Yes	**28.62**	105.4	3.01	72.70	3.27	3.79	0.00	0.00	79.76	0.00

Sum 32.30

Noise sensitive area: CP Noise sensitive point: (94)

WTG					Loudest up to 95% rated power									
No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	2,188	2,192	41.9	Yes	**21.50**	105.4	3.01	77.82	4.92	4.15	0.00	0.00	86.88	0.00
2	2,044	2,049	40.4	Yes	**22.33**	105.4	3.01	77.23	4.70	4.12	0.00	0.00	86.06	0.00
3	1,949	1,954	38.6	Yes	**22.89**	105.4	3.01	76.82	4.56	4.12	0.00	0.00	85.50	0.00

Sum 27.05

Project:
738 Terence Bay Wind Project

Description:
3 Turbine Wind project
Haliafx County, Nova Scotia

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Calculated:
2/6/2014 8:43 AM/2.9.207

DECIBEL - Assumptions for noise calculation

Calculation: Measured Sound 95% or Loudest**Noise calculation model:** ISO 9613-2 General 10.0 m/s

Noise calculation model:
ISO 9613-2 General
Wind speed:
Loudest up to 95% rated power
Ground attenuation:
Alternative
Meteorological coefficient, C0:
0.0 dB
Type of demand in calculation:
1: WTG noise is compared to demand (DK, DE, SE, NL etc.)
Noise values in calculation:
All noise values are mean values (Lwa) (Normal)
Pure tones:
Pure and Impulse tone penalty are added to WTG source noise
Height above ground level, when no value in NSA object:
2.0 m Allow override of model height with height from NSA object
Deviation from "official" noise demands. Negative is more restrictive, positive is less restrictive.:
0.0 dB(A)
Octave data required
Air absorption

63	125	250	500	1,000	2,000	4,000	8,000
[db/km]	[db/km]	[db/km]	[db/km]	[db/km]	[db/km]	[db/km]	[db/km]
0.1	0.4	1.0	1.9	3.7	9.7	32.8	117.0

WTG: ENERCON E-92 2,3 MW 2300 92.0 !-!
Noise: Extract of test report M111 164/02

Source	Source/Date	Creator	Edited
Muller-BBM	10/28/2013	USER	1/28/2014 3:54 PM

Measured Results provided by Enercon

Status	Hub height	Wind speed	LwA,ref	Pure tones	Octave data 63	125	250	500	1000	2000	4000	8000
	[m]	[m/s]	[dB(A)]		[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]
From other hub height	85.0	7.0	105.4	No	87.4	95.8	96.5	99.0	100.4	97.2	91.3	81.0

NSA: Noise sensitive point: (1)-A
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (2)-B
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (3)-C
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

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DECIBEL - Assumptions for noise calculation

Calculation: Measured Sound 95% or Loudest**Noise calculation model:** ISO 9613-2 General 10.0 m/s

NSA: Noise sensitive point: (4)-D
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (5)-E
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (6)-F
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (7)-G
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (8)-H
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (9)-I
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (10)-J
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (11)-K
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

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DECIBEL - Assumptions for noise calculation

Calculation: Measured Sound 95% or Loudest**Noise calculation model:** ISO 9613-2 General 10.0 m/s

NSA: Noise sensitive point: (12)-L
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (13)-M
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (14)-N
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (15)-O
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (16)-P
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (17)-Q
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (18)-R
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (19)-S
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

Project:
738 Terence Bay Wind Project

Description:
3 Turbine Wind project
Haliafx County, Nova Scotia

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DECIBEL - Assumptions for noise calculation

Calculation: Measured Sound 95% or Loudest**Noise calculation model:** ISO 9613-2 General 10.0 m/s

NSA: Noise sensitive point: (20)-T
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (21)-U
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (22)-V
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (23)-W
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (24)-X
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (25)-Y
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (26)-Z
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (27)-AA
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

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DECIBEL - Assumptions for noise calculation

Calculation: Measured Sound 95% or Loudest**Noise calculation model:** ISO 9613-2 General 10.0 m/s

NSA: Noise sensitive point: (28)-AB
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (29)-AC
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (30)-AD
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (31)-AE
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (32)-AF
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (33)-AG
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (34)-AH
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (35)-AI
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

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DECIBEL - Assumptions for noise calculation

Calculation: Measured Sound 95% or Loudest**Noise calculation model:** ISO 9613-2 General 10.0 m/s

NSA: Noise sensitive point: (36)-AJ
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (37)-AK
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (38)-AL
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (39)-AM
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (40)-AN
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (41)-AO
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (42)-AP
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (43)-AQ
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

Project:
738 Terence Bay Wind Project

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DECIBEL - Assumptions for noise calculation

Calculation: Measured Sound 95% or Loudest**Noise calculation model:** ISO 9613-2 General 10.0 m/s

NSA: Noise sensitive point: (44)-AR
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (45)-AS
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (46)-AT
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (47)-AU
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (48)-AV
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (49)-AW
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (50)-AX
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (51)-AY
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

Project:
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DECIBEL - Assumptions for noise calculation

Calculation: Measured Sound 95% or Loudest**Noise calculation model:** ISO 9613-2 General 10.0 m/s

NSA: Noise sensitive point: (52)-AZ
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (53)-BA
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (54)-BB
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (55)-BC
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (56)-BD
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (57)-BE
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (58)-BF
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (59)-BG
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

Project:
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DECIBEL - Assumptions for noise calculation

Calculation: Measured Sound 95% or Loudest**Noise calculation model:** ISO 9613-2 General 10.0 m/s

NSA: Noise sensitive point: (60)-BH
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (61)-BI
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (62)-BJ
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (63)-BK
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (64)-BL
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (65)-BM
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (66)-BN
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (67)-BO
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

Project:
738 Terence Bay Wind Project

Description:
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DECIBEL - Assumptions for noise calculation

Calculation: Measured Sound 95% or Loudest**Noise calculation model:** ISO 9613-2 General 10.0 m/s

NSA: Noise sensitive point: (68)-BP
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (69)-BQ
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (70)-BR
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (71)-BS
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (72)-BT
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (73)-BU
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (74)-BV
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (75)-BW
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

Project:
738 Terence Bay Wind Project

Description:
3 Turbine Wind project
Haliafx County, Nova Scotia

Licensed user:
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Kirk Schmidt / kirk.schmidt@al-pro.ca

Calculated:
2/6/2014 8:43 AM/2.9.207

DECIBEL - Assumptions for noise calculation

Calculation: Measured Sound 95% or Loudest**Noise calculation model:** ISO 9613-2 General 10.0 m/s

NSA: Noise sensitive point: (76)-BX
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (77)-BY
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (78)-BZ
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (79)-CA
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (80)-CB
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (81)-CC
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (82)-CD
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (83)-CE
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

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DECIBEL - Assumptions for noise calculation

Calculation: Measured Sound 95% or Loudest**Noise calculation model:** ISO 9613-2 General 10.0 m/s

NSA: Noise sensitive point: (84)-CF
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (85)-CG
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (86)-CH
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (87)-CI
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (88)-CJ
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (89)-CK
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (90)-CL
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (91)-CM
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

Project:
738 Terence Bay Wind Project

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Calculated:
2/6/2014 8:43 AM/2.9.207

DECIBEL - Assumptions for noise calculation

Calculation: Measured Sound 95% or Loudest**Noise calculation model:** ISO 9613-2 General 10.0 m/s

NSA: Noise sensitive point: (92)-CN
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (93)-CO
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

NSA: Noise sensitive point: (94)-CP
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40.0 dB(A)
Distance demand:

Project:
738 Terence Bay Wind Project

Description:
3 Turbine Wind project
Haliafx County, Nova Scotia

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2/6/2014 9:44 AM / 35

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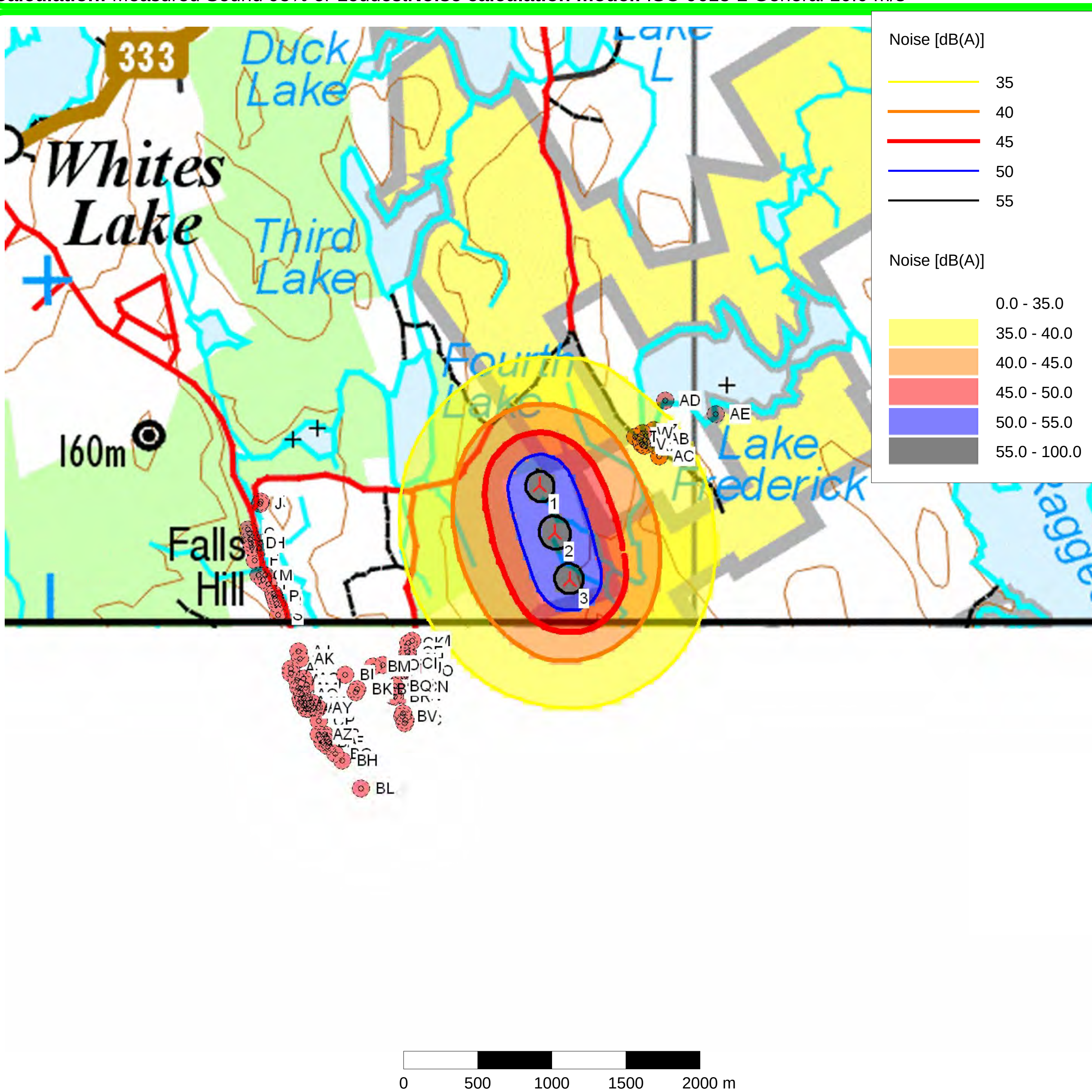
Calculated:
2/6/2014 8:43 AM/2.9.207

DECIBEL - Map Loudest up to 95% rated power

Calculation: Measured Sound 95% or Loudest**Noise calculation model:** ISO 9613-2 General 10.0 m/s



Map: Page 67 , Print scale 1:40,000, Map center UTM (north)-NAD83 (US+CA) Zone: 20 East: 443,418 North: 4,928,242

New WTG   Noise sensitive area

Noise calculation model: ISO 9613-2 General. Wind speed: Loudest up to 95% rated power
Height above sea level from active line object

APPENDIX M

Shadow Flicker Analysis

Shadow Flicker Analysis

A shadow flicker analysis was completed using WindPro 2.9.207 which provides a comprehensive suite of wind farm design and modeling software. The shadow flicker analysis was based on a worst case scenario which assumes that:

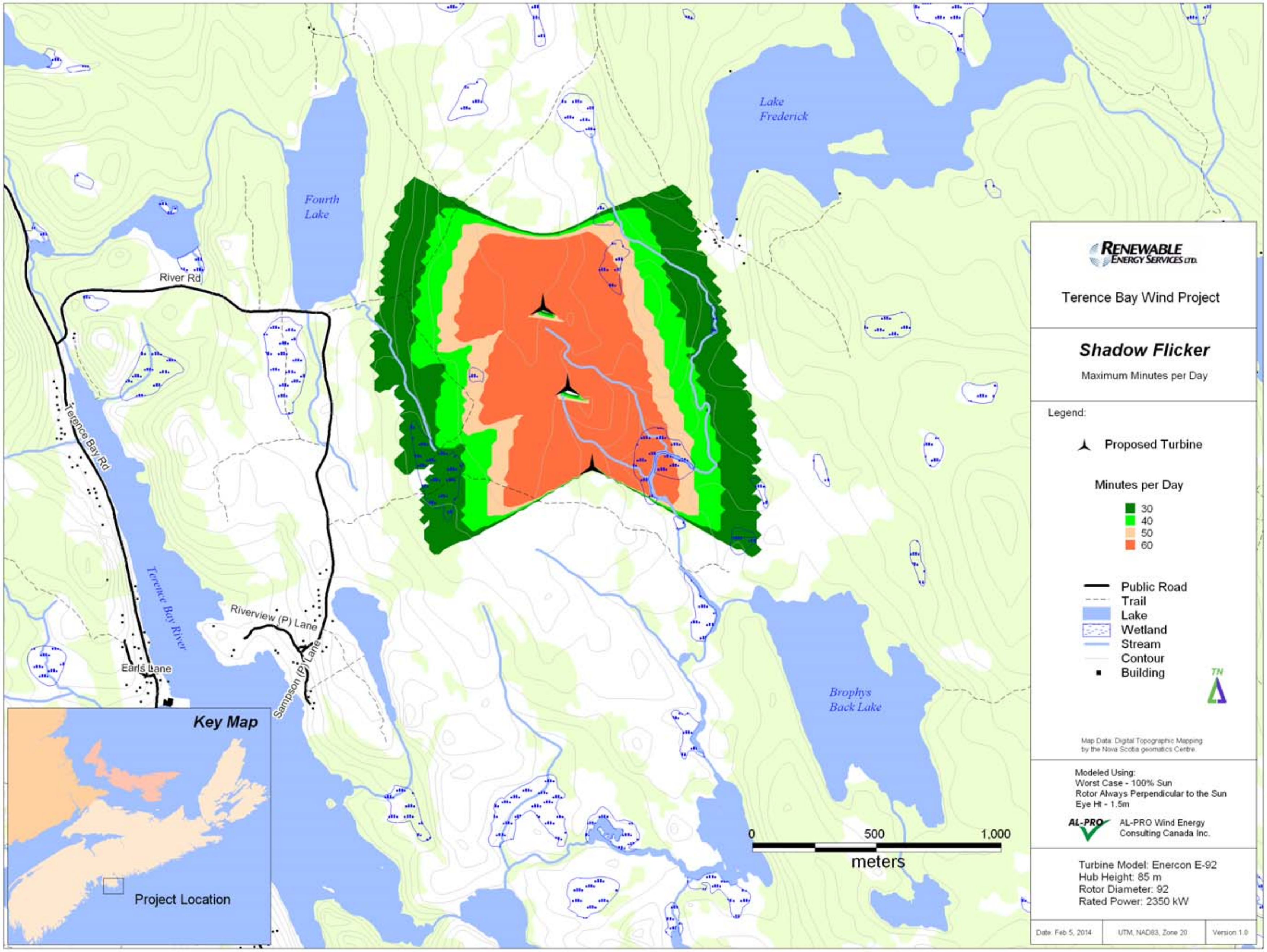
- The sun shines 100% of the time when it is above the horizon;
- The turbine rotor is always perpendicular to the sun;
- Shadow flicker starts as the sun moves above 3 degrees of the horizon;
- The shadows dissipate at a maximum distance from the blade as a result of atmospheric conditions and light diffusion, and;
- The rotor blades are always spinning.

The total length of the shadow influence in the atmosphere is calculated from the physical dimensions of the turbine blade. In this analysis, the maximum shadow distance for the E-92 was calculated to be 1,517 m.

In most jurisdictions, a maximum of 30 hours of shadow flicker per year and a maximum of 30 minutes per day are the threshold parameters used to define the acceptable level of flicker from wind projects. A preliminary analysis was run to identify buildings that may be impacted by shadow flicker. All buildings that were potentially impacted were included as shadow receptors in the model. All buildings were considered to be habitable with one window that is perpendicular to the turbines.

Two maps were prepared to show the impact areas for the Maximum Minutes per Day and the total Hours per Year. There are two buildings that are expected to receive more than 30 hours per year and one that will receive 30 min per day (Appendix xx) in the worst case scenario. As these results are based on conservative model inputs, the actual level of impact will be much less as sunshine, wind conditions and turbine availability will all reduce the impacts when compared to the worst case scenario.

For example, the 20 year Canadian Climate Normals at Halifax Stanfield International Airport (40 km from site) show that clouds that cover between 8 and 10 tenths of the sky occur for 5,090 hrs per year or 55% of the year. The high incidence of cloud cover in the region will significantly reduce the actual levels of shadow flicker experienced at the various receptors when compared to the worst case scenario modeled here.



Renewable Energy Services Ltd.
Terence Bay Wind Project
Shadow Flicker
Maximum Minutes per Day
Legend:
Proposed Turbine
Minutes per Day
30
40
50
60
Public Road
Trail
Lake
Wetland
Stream
Contour
Building
TN
Map Data: Digital Topographic Mapping by the Nova Scotia geomatics Centre
Modeled Using:
Worst Case - 100% Sun
Rotor Always Perpendicular to the Sun
Eye Ht - 1.5m
AL-PRO
AL-PRO Wind Energy Consulting Canada Inc.
Turbine Model: Enercon E-92
Hub Height: 85 m
Rotor Diameter: 92
Rated Power: 2350 kW
Date: Feb 5, 2014
UTM, NAD83, Zone 20
Version 1.0
0
500
1,000
meters
Key Map
Project Location
Lake Frederick
Fourth Lake
Brophys Back Lake
Terence Bay River
River Rd
Terence Bay Rd
Riverview (P) Lane
Sampson (P) Lane
Earls Lane

SHADOW - Main Result

Calculation: Medium Worst

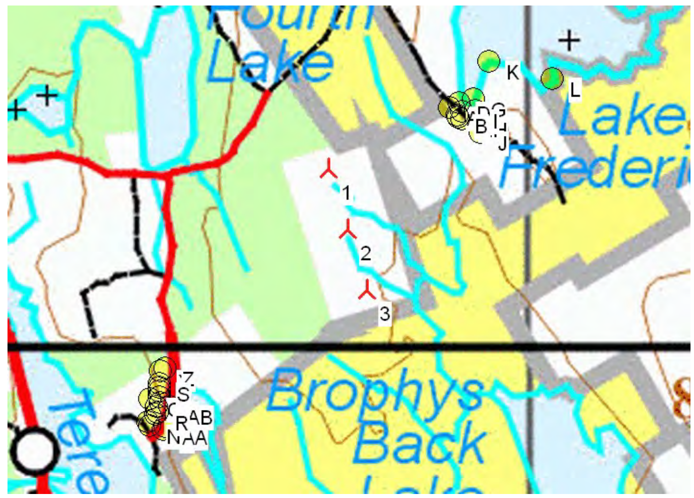
Assumptions for shadow calculations

Maximum distance for influence
Calculate only when more than 20 % of sun is covered by the blade
Please look in WTG table

Minimum sun height over horizon for influence	3 °
Day step for calculation	1 days
Time step for calculation	1 minutes

The calculated times are "worst case" given by the following assumptions:
The sun is shining all the day, from sunrise to sunset
The rotor plane is always perpendicular to the line from the WTG to the sun
The WTG is always operating

A ZVI (Zones of Visual Influence) calculation is performed before flicker calculation so non visible WTG do not contribute to calculated flicker values. A WTG will be visible if it is visible from any part of the receiver window. The ZVI calculation is based on the following assumptions:
Height contours used: Height Contours: TB Contour.wpo (1)
Obstacles used in calculation
Eye height: 1.5 m
Grid resolution: 10.0 m



Scale 1:40,000
New WTG Shadow receptor

WTGs

	UTM (north)-NAD83 (US+CA) Zone: 20				WTG type						Shadow data	
	East	North	Z	Row data/Description	Valid	Manufact.	Type-generator	Power, rated	Rotor diameter	Hub height	Calculation distance	RPM
			[m]					[kW]	[m]	[m]	[m]	[RPM]
1	443,319	4,928,564	65.0	ENERCON E-92 2,3 MW 2300 92....	Yes	ENERCON	E-92 2,3 MW-2,300	2,300	92.0	85.0	1,517	16.0
2	443,419	4,928,241	60.0	ENERCON E-92 2,3 MW 2300 92....	Yes	ENERCON	E-92 2,3 MW-2,300	2,300	92.0	85.0	1,517	16.0
3	443,518	4,927,919	51.9	ENERCON E-92 2,3 MW 2300 92....	Yes	ENERCON	E-92 2,3 MW-2,300	2,300	92.0	85.0	1,517	16.0

Shadow receptor-Input

	UTM (north)-NAD83 (US+CA) Zone: 20								
No.	East	North	Z	Width	Height	Height a.g.l.	Degrees from south cw	Slope of window	Direction mode
			[m]	[m]	[m]	[m]	[°]	[°]	
A	443,967	4,928,886	58.3	1.0	1.0	1.5	0.0	90.0	"Green house mode"
B	444,008	4,928,846	55.6	1.0	1.0	1.5	0.0	90.0	"Green house mode"
C	444,013	4,928,835	55.1	1.0	1.0	1.5	0.0	90.0	"Green house mode"
D	444,017	4,928,910	55.0	1.0	1.0	1.5	0.0	90.0	"Green house mode"
E	444,030	4,928,822	55.0	1.0	1.0	1.5	0.0	90.0	"Green house mode"
F	444,032	4,928,865	55.0	1.0	1.0	1.5	0.0	90.0	"Green house mode"
G	444,094	4,928,931	55.0	1.0	1.0	1.5	0.0	90.0	"Green house mode"
H	444,108	4,928,823	57.2	1.0	1.0	1.5	0.0	90.0	"Green house mode"
I	444,102	4,928,866	55.8	1.0	1.0	1.5	0.0	90.0	"Green house mode"
J	444,128	4,928,752	58.3	1.0	1.0	1.5	0.0	90.0	"Green house mode"
K	444,176	4,929,127	55.0	1.0	1.0	1.5	0.0	90.0	"Green house mode"
L	444,513	4,929,032	55.0	1.0	1.0	1.5	0.0	90.0	"Green house mode"
M	442,353	4,927,233	17.6	1.0	1.0	1.5	0.0	90.0	"Green house mode"
N	442,361	4,927,212	18.1	1.0	1.0	1.5	0.0	90.0	"Green house mode"
O	442,362	4,927,353	20.7	1.0	1.0	1.5	0.0	90.0	"Green house mode"
P	442,391	4,927,275	21.2	1.0	1.0	1.5	0.0	90.0	"Green house mode"
Q	442,400	4,927,313	22.3	1.0	1.0	1.5	0.0	90.0	"Green house mode"
R	442,405	4,927,285	22.6	1.0	1.0	1.5	0.0	90.0	"Green house mode"
S	442,414	4,927,438	27.4	1.0	1.0	1.5	0.0	90.0	"Green house mode"
T	442,416	4,927,415	26.3	1.0	1.0	1.5	0.0	90.0	"Green house mode"
U	442,416	4,927,394	25.3	1.0	1.0	1.5	0.0	90.0	"Green house mode"

To be continued on next page...

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Kirk Schmidt / kirk.schmidt@al-pro.ca

Calculated:
2/7/2014 9:10 AM/2.9.207

SHADOW - Main Result

Calculation: Medium Worst

...continued from previous page

UTM (north)-NAD83 (US+CA) Zone: 20

No.	East	North	Z [m]	Width [m]	Height [m]	Height a.g.l. [m]	Degrees from south cw [°]	Slope of window [°]	Direction mode
V	442,416	4,927,366	24.4	1.0	1.0	1.5	0.0	90.0	"Green house mode"
W	442,419	4,927,334	24.1	1.0	1.0	1.5	0.0	90.0	"Green house mode"
X	442,420	4,927,503	31.3	1.0	1.0	1.5	0.0	90.0	"Green house mode"
Y	442,431	4,927,189	25.7	1.0	1.0	1.5	0.0	90.0	"Green house mode"
Z	442,445	4,927,518	32.5	1.0	1.0	1.5	0.0	90.0	"Green house mode"
AA	442,445	4,927,207	27.2	1.0	1.0	1.5	0.0	90.0	"Green house mode"
AB	442,470	4,927,312	27.9	1.0	1.0	1.5	0.0	90.0	"Green house mode"

Calculation Results

Shadow receptor

Shadow, worst case

No.	Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]
A	17:30	45	0:30
B	18:59	61	0:29
C	22:55	70	0:29
D	15:01	41	0:28
E	28:18	81	0:28
F	17:15	59	0:28
G	12:31	38	0:26
H	32:41	91	0:26
I	24:16	76	0:26
J	34:14	113	0:26
K	12:19	48	0:22
L	13:21	82	0:17
M	1:11	14	0:06
N	0:00	0	0:00
O	16:05	62	0:18
P	5:10	29	0:13
Q	10:43	43	0:18
R	5:41	30	0:14
S	12:12	51	0:19
T	15:59	72	0:19
U	17:28	66	0:19
V	16:12	58	0:19
W	12:28	48	0:19
X	9:31	39	0:20
Y	0:00	0	0:00
Z	9:49	39	0:20
AA	0:00	0	0:00
AB	4:24	27	0:12

Total amount of flickering on the shadow receptors caused by each WTG

No.	Name	Worst case [h/year]	Expected [h/year]
1	ENERCON E-92 2,3 MW 2300 92.0 !-! hub: 85.0 m (TOT: 131.0 m) (1)	60:07	
2	ENERCON E-92 2,3 MW 2300 92.0 !-! hub: 85.0 m (TOT: 131.0 m) (2)	47:37	
3	ENERCON E-92 2,3 MW 2300 92.0 !-! hub: 85.0 m (TOT: 131.0 m) (3)	38:39	

Project:
738 Terence Bay Wind Project

Description:
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Haliafx County, Nova Scotia

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+49 (0) 4936 6986-0
Kirk Schmidt / kirk.schmidt@al-pro.ca

Calculated:
2/7/2014 9:10 AM/2.9.207

SHADOW - Calendar

Calculation: Medium Worst**Shadow receptor:** A - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (2)

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:
The sun is shining all the day, from sunrise to sunset
The rotor plane is always perpendicular to the line from the WTG to the sun
The WTG is always operating

	January	February			March	April	May	June	July	August	September	October			November			December
1	07:52	07:35		16:46 (1)	06:54	06:58	06:07	05:34	05:34	06:01	06:37	07:12			06:52		16:06 (1)	07:31
	16:46	17:23	7	16:53 (1)	18:02	19:42	20:19	20:52	21:04	20:42	19:53	18:57			17:06	29	16:35 (1)	16:37
2	07:52	07:34		16:43 (1)	06:52	06:56	06:06	05:34	05:34	06:02	06:38	07:13			06:53		16:06 (1)	07:32
	16:47	17:25	13	16:56 (1)	18:04	19:43	20:20	20:53	21:04	20:40	19:51	18:56			17:04	28	16:34 (1)	16:37
3	07:52	07:33		16:41 (1)	06:51	06:54	06:04	05:33	05:35	06:03	06:39	07:15			06:55		16:07 (1)	07:33
	16:47	17:26	17	16:58 (1)	18:05	19:44	20:21	20:54	21:04	20:39	19:50	18:54			17:03	27	16:34 (1)	16:37
4	07:52	07:31		16:40 (1)	06:49	06:52	06:03	05:33	05:36	06:04	06:40	07:16			06:56		16:07 (1)	07:34
	16:48	17:28	20	17:00 (1)	18:06	19:46	20:23	20:55	21:04	20:38	19:48	18:52			17:01	26	16:33 (1)	16:36
5	07:52	07:30		16:39 (1)	06:47	06:51	06:01	05:32	05:36	06:06	06:42	07:17			06:57		16:07 (1)	07:35
	16:49	17:29	23	17:02 (1)	18:08	19:47	20:24	20:56	21:03	20:36	19:46	18:50			17:00	25	16:32 (1)	16:36
6	07:52	07:29		16:37 (1)	06:45	06:49	06:00	05:32	05:37	06:07	06:43	07:18			06:59		16:09 (1)	07:36
	16:50	17:31	25	17:02 (1)	18:09	19:48	20:25	20:56	21:03	20:35	19:44	18:48			16:59	23	16:32 (1)	16:36
7	07:52	07:28		16:37 (1)	06:44	06:47	05:59	05:31	05:38	06:08	06:44	07:20			07:00		16:10 (1)	07:37
	16:51	17:32	27	17:04 (1)	18:10	19:49	20:26	20:57	21:03	20:34	19:42	18:46			16:58	20	16:30 (1)	16:36
8	07:52	07:26		16:37 (1)	07:42	06:45	05:57	05:31	05:38	06:09	06:45	07:21			07:01		16:12 (1)	07:38
	16:53	17:33	28	17:05 (1)	19:12	19:51	20:27	20:58	21:02	20:32	19:40	18:45			16:56	17	16:29 (1)	16:35
9	07:51	07:25		16:36 (1)	07:40	06:43	05:56	05:31	05:39	06:10	06:46	07:22			07:03		16:14 (1)	07:39
	16:54	17:35	29	17:05 (1)	19:13	19:52	20:28	20:58	21:02	20:31	19:39	18:43			16:55	13	16:27 (1)	16:35
10	07:51	07:24		16:36 (1)	07:38	06:42	05:55	05:31	05:40	06:11	06:47	07:23			07:04		16:18 (1)	07:40
	16:55	17:36	29	17:05 (1)	19:14	19:53	20:30	20:59	21:01	20:29	19:37	18:41			16:54	6	16:24 (1)	16:35
11	07:51	07:22		16:35 (1)	07:36	06:40	05:53	05:30	05:41	06:12	06:49	07:24			07:05			07:41
	16:56	17:38	30	17:05 (1)	19:15	19:54	20:31	21:00	21:01	20:28	19:35	18:39			16:53			16:35
12	07:50	07:21		16:36 (1)	07:35	06:38	05:52	05:30	05:41	06:14	06:50	07:26			07:07			07:42
	16:57	17:39	30	17:06 (1)	19:17	19:55	20:32	21:00	21:00	20:26	19:33	18:38			16:52			16:35
13	07:50	07:20		16:36 (1)	07:33	06:36	05:51	05:30	05:42	06:15	06:51	07:27			07:08			07:43
	16:58	17:40	30	17:06 (1)	19:18	19:57	20:33	21:00	21:00	20:25	19:31	18:36			16:51			16:36
14	07:49	07:18		16:36 (1)	07:31	06:35	05:50	05:30	05:43	06:16	06:52	07:28			07:09			07:44
	16:59	17:42	30	17:06 (1)	19:19	19:58	20:34	21:01	20:59	20:23	19:29	18:34			16:50			16:36
15	07:49	07:17		16:37 (1)	07:29	06:33	05:49	05:30	05:44	06:17	06:53	07:30			07:11			07:44
	17:01	17:43	29	17:06 (1)	19:21	19:59	20:35	21:01	20:58	20:22	19:27	18:32			16:49			16:36
16	07:48	07:15		16:37 (1)	07:27	06:31	05:48	05:30	05:45	06:18	06:54	07:31			07:12			07:45
	17:02	17:45	28	17:05 (1)	19:22	20:00	20:37	21:02	20:57	20:20	19:26	18:31			16:48			16:36
17	07:48	07:14		16:37 (1)	07:26	06:29	05:46	05:30	05:46	06:19	06:56	07:32			07:13			07:46
	17:03	17:46	27	17:04 (1)	19:23	20:02	20:38	21:02	20:57	20:19	19:24	18:29			16:47			16:36
18	07:47	07:12		16:38 (1)	07:24	06:28	05:45	05:30	05:47	06:21	06:57	07:33			07:15			07:47
	17:04	17:47	26	17:04 (1)	19:24	20:03	20:39	21:02	20:56	20:17	19:22	18:27			16:46			16:37
19	07:47	07:11		16:39 (1)	07:22	06:26	05:44	05:30	05:48	06:22	06:58	07:35		17:18 (1)	07:16			07:47
	17:06	17:49	23	17:02 (1)	19:26	20:04	20:40	21:03	20:55	20:16	19:20	18:26	6	17:24 (1)	16:45			16:37
20	07:46	07:09		16:41 (1)	07:20	06:24	05:43	05:30	05:49	06:23	06:59	07:36		17:15 (1)	07:17			07:48
	17:07	17:50	20	17:01 (1)	19:27	20:05	20:41	21:03	20:54	20:14	19:18	18:24	14	17:29 (1)	16:44			16:37
21	07:45	07:07		16:42 (1)	07:18	06:23	05:42	05:30	05:50	06:24	07:00	07:37		17:12 (1)	07:19			07:48
	17:08	17:51	17	16:59 (1)	19:28	20:07	20:42	21:03	20:53	20:12	19:16	18:22	18	17:30 (1)	16:43			16:38
22	07:44	07:06		16:44 (1)	07:16	06:21	05:41	05:31	05:51	06:25	07:01	07:39		17:11 (1)	07:20			07:49
	17:10	17:53	12	16:56 (1)	19:29	20:08	20:43	21:04	20:52	20:11	19:14	18:21	21	17:32 (1)	16:42			16:38
23	07:44	07:04			07:14	06:19	05:41	05:31	05:52	06:26	07:03	07:40		17:09 (1)	07:21			07:49
	17:11	17:54			19:31	20:09	20:44	21:04	20:51	20:09	19:12	18:19	24	17:33 (1)	16:42			16:39
24	07:43	07:03			07:13	06:18	05:40	05:31	05:53	06:28	07:04	07:41		17:07 (1)	07:22			07:50
	17:12	17:56			19:32	20:10	20:45	21:04	20:50	20:07	19:11	18:17	26	17:33 (1)	16:41			16:40
25	07:42	07:01			07:11	06:16	05:39	05:31	05:54	06:29	07:05	07:42		17:07 (1)	07:24			07:50
	17:14	17:57			19:33	20:12	20:46	21:04	20:49	20:06	19:09	18:16	28	17:35 (1)	16:40			16:40
26	07:41	06:59			07:09	06:15	05:38	05:32	05:55	06:30	07:06	07:44		17:06 (1)	07:25			07:51
	17:15	17:58			19:34	20:13	20:47	21:04	20:48	20:04	19:07	18:14	29	17:35 (1)	16:40			16:41
27	07:40	06:58			07:07	06:13	05:37	05:32	05:56	06:31	07:07	07:45		17:06 (1)	07:26			07:51
	17:17	18:00			19:36	20:14	20:48	21:04	20:47	20:02	19:05	18:13	30	17:36 (1)	16:39			16:41
28	07:39	06:56			07:05	06:11	05:37	05:32	05:57	06:32	07:09	07:46		17:05 (1)	07:27			07:51
	17:18	18:01			19:37	20:15	20:49	21:04	20:46	20:00	19:03	18:11	30	17:35 (1)	16:39			16:42
29	07:38				07:03	06:10	05:36	05:33	05:58	06:33	07:10	07:48		17:05 (1)	07:29			07:51
	17:19				19:38	20:16	20:50	21:04	20:45	19:59	19:01	18:10	30	17:35 (1)	16:38			16:43
30	07:37				07:02	06:08	05:35	05:33	05:59	06:35	07:11	07:49		17:05 (1)	07:30			07:52
	17:21				19:39	20:18	20:51	21:04	20:44	19:57	18:59	18:08	30	17:35 (1)	16:38			16:44
31	07:36				07:00		05:35		06:00	06:36		07:50		17:05 (1)				07:52
	17:22				19:41		20:52		20:43	19:55		18:07	30	17:35 (1)				16:45
Potential sun hours	287	292			369	404	458	465	470	435	376	341			289			276
Total, worst case			520										316			214		

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
738 Terence Bay Wind Project

Description:
3 Turbine Wind project
Haliafx County, Nova Scotia

Printed/Page
2/7/2014 9:14 AM / 4

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Calculated:
2/7/2014 9:10 AM/2.9.207

SHADOW - Calendar

Calculation: Medium Worst**Shadow receptor:** B - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (3)

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:
The sun is shining all the day, from sunrise to sunset
The rotor plane is always perpendicular to the line from the WTG to the sun
The WTG is always operating

	January			February			March			April	May	June	July	August	September	October			November	December		
1	07:52		15:36 (2)	07:35			06:54		16:57 (1)	06:58	06:07	05:34	05:34	06:01	06:37	07:12			06:52	07:31		
	16:46	2	15:38 (2)	17:23			18:02	12	17:09 (1)	19:42	20:19	20:52	21:04	20:42	19:53	18:57			17:06	16:37		
2	07:52			07:34			06:52			06:56	06:06	05:34	05:34	06:02	06:38	07:13			06:53	07:32		
	16:47			17:25			18:04			19:43	20:20	20:53	21:04	20:40	19:51	18:56			17:04	16:37		
3	07:52			07:33			06:51			06:54	06:04	05:33	05:35	06:03	06:39	07:15			06:55	07:33		
	16:47			17:26			18:05			19:44	20:21	20:54	21:04	20:39	19:50	18:54			17:03	16:37		
4	07:52			07:31			06:49			06:52	06:03	05:33	05:36	06:04	06:40	07:16			06:56	07:34		
	16:48			17:28			18:06			19:46	20:23	20:55	21:04	20:38	19:48	18:52			17:01	16:36		
5	07:52			07:30			06:47			06:51	06:01	05:32	05:36	06:06	06:42	07:17			06:57	07:35		
	16:49			17:29			18:08			19:47	20:24	20:56	21:03	20:36	19:46	18:50			17:00	16:36		
6	07:52			07:29			06:45			06:49	06:00	05:32	05:37	06:07	06:43	07:18			06:59	07:36		
	16:50			17:31			18:09			19:48	20:25	20:56	21:03	20:35	19:44	18:48			16:59	16:36		
7	07:52			07:28			06:44			06:47	05:59	05:31	05:38	06:08	06:44	07:20			07:00	07:37		
	16:51			17:32			18:10			19:49	20:26	20:57	21:03	20:34	19:42	18:46			16:58	16:36		
8	07:52			07:26			07:42			06:45	05:57	05:31	05:38	06:09	06:45	07:21			07:01	07:38		
	16:53			17:33			19:12			19:51	20:27	20:58	21:02	20:32	19:40	18:45			16:56	16:35		
9	07:51			07:25			07:40			06:43	05:56	05:31	05:39	06:10	06:46	07:22			07:03	07:39		
	16:54			17:35			19:13			19:52	20:28	20:58	21:02	20:31	19:39	18:43			16:55	16:35		
10	07:51			07:24		17:03 (1)	07:38			06:42	05:55	05:31	05:40	06:11	06:47	07:23			07:04	07:40		
	16:55			17:36	1	17:04 (1)	19:14			19:53	20:30	20:59	21:01	20:29	19:37	18:41			16:54	16:35		
11	07:51			07:22		16:57 (1)	07:36			06:40	05:53	05:30	05:41	06:12	06:49	07:24			07:05	07:41		
	16:56			17:38	12	17:09 (1)	19:15			19:54	20:31	21:00	21:01	20:28	19:35	18:39			16:53	16:35		
12	07:50			07:21		16:55 (1)	07:35			06:38	05:52	05:30	05:41	06:14	06:50	07:26		17:32 (1)	07:07	07:42		15:26 (2)
	16:57			17:39	17	17:12 (1)	19:17			19:55	20:32	21:00	21:00	20:26	19:33	18:38	7	17:39 (1)	16:52	16:35	6	15:32 (2)
13	07:50			07:19		16:54 (1)	07:33			06:36	05:51	05:30	05:42	06:15	06:51	07:27		17:28 (1)	07:08	07:43		15:24 (2)
	16:58			17:40	20	17:14 (1)	19:18			19:57	20:33	21:00	21:00	20:25	19:31	18:36	14	17:42 (1)	16:51	16:36	8	15:32 (2)
14	07:49			07:18		16:52 (1)	07:31			06:35	05:50	05:30	05:43	06:16	06:52	07:28		17:26 (1)	07:09	07:44		15:24 (2)
	16:59			17:42	23	17:15 (1)	19:19			19:58	20:34	21:01	20:59	20:23	19:29	18:34	19	17:45 (1)	16:50	16:36	10	15:34 (2)
15	07:49			07:17		16:51 (1)	07:29			06:33	05:49	05:30	05:44	06:17	06:53	07:30		17:24 (1)	07:11	07:44		15:24 (2)
	17:01			17:43	25	17:16 (1)	19:21			19:59	20:35	21:01	20:58	20:22	19:27	18:32	22	17:46 (1)	16:49	16:36	11	15:35 (2)
16	07:48			07:15		16:50 (1)	07:27			06:31	05:48	05:30	05:45	06:18	06:54	07:31		17:22 (1)	07:12	07:45		15:24 (2)
	17:02			17:45	26	17:16 (1)	19:22			20:00	20:37	21:02	20:57	20:20	19:26	18:31	24	17:46 (1)	16:48	16:36	12	15:36 (2)
17	07:48			07:14		16:49 (1)	07:26			06:29	05:46	05:30	05:46	06:19	06:56	07:32		17:22 (1)	07:13	07:46		15:24 (2)
	17:03			17:46	28	17:17 (1)	19:23			20:02	20:38	21:02	20:57	20:19	19:24	18:29	26	17:48 (1)	16:47	16:36	12	15:36 (2)
18	07:47			07:12		16:49 (1)	07:24			06:28	05:45	05:30	05:47	06:21	06:57	07:33		17:21 (1)	07:15	07:47		15:24 (2)
	17:04			17:47	28	17:17 (1)	19:24			20:03	20:39	21:02	20:56	20:17	19:22	18:27	27	17:48 (1)	16:46	16:37	13	15:37 (2)
19	07:47			07:11		16:49 (1)	07:22			06:26	05:44	05:30	05:48	06:22	06:58	07:35		17:20 (1)	07:16	07:47		15:25 (2)
	17:06			17:49	28	17:17 (1)	19:26			20:04	20:40	21:03	20:55	20:16	19:20	18:26	28	17:48 (1)	16:45	16:37	14	15:39 (2)
20	07:46			07:09		16:49 (1)	07:20			06:24	05:43	05:30	05:49	06:23	06:59	07:36		17:20 (1)	07:17	07:48		15:25 (2)
	17:07			17:50	29	17:18 (1)	19:27			20:05	20:41	21:03	20:54	20:14	19:18	18:24	28	17:48 (1)	16:44	16:37	14	15:39 (2)
21	07:45			07:07		16:49 (1)	07:18			06:23	05:42	05:30	05:50	06:24	07:00	07:37		17:19 (1)	07:19	07:48		15:25 (2)
	17:08			17:51	28	17:17 (1)	19:28			20:07	20:42	21:03	20:53	20:12	19:16	18:22	29	17:48 (1)	16:43	16:38	15	15:40 (2)
22	07:44			07:06		16:48 (1)	07:16			06:21	05:41	05:31	05:51	06:25	07:01	07:39		17:20 (1)	07:20	07:49		15:25 (2)
	17:10			17:53	29	17:17 (1)	19:29			20:08	20:43	21:04	20:52	20:11	19:14	18:21	28	17:48 (1)	16:42	16:38	15	15:40 (2)
23	07:44			07:04		16:49 (1)	07:14			06:19	05:41	05:31	05:52	06:26	07:03	07:40		17:19 (1)	07:21	07:49		15:27 (2)
	17:11			17:54	28	17:17 (1)	19:31			20:09	20:44	21:04	20:51	20:09	19:12	18:19	29	17:48 (1)	16:42	16:39	14	15:41 (2)
24	07:43			07:03		16:49 (1)	07:13			06:18	05:40	05:31	05:53	06:28	07:04	07:41		17:19 (1)	07:22	07:50		15:27 (2)
	17:12			17:56	27	17:16 (1)	19:32			20:10	20:45	21:04	20:50	20:07	19:11	18:17	28	17:47 (1)	16:41	16:40	14	15:41 (2)
25	07:42			07:01		16:50 (1)	07:11			06:16	05:39	05:31	05:54	06:29	07:05	07:42		17:20 (1)	07:24	07:50		15:27 (2)
	17:14			17:57	25	17:15 (1)	19:33			20:12	20:46	21:04	20:49	20:06	19:09	18:16	27	17:47 (1)	16:40	16:40	13	15:40 (2)
26	07:41			06:59		16:51 (1)	07:09			06:15	05:38	05:32	05:55	06:30	07:06	07:44		17:20 (1)	07:25	07:51		15:28 (2)
	17:15			17:58	23	17:14 (1)	19:34			20:13	20:47	21:04	20:48	20:04	19:07	18:14	26	17:46 (1)	16:40	16:41	13	15:41 (2)
27	07:40			06:58		16:52 (1)	07:07			06:13	05:37	05:32	05:56	06:31	07:07	07:45		17:20 (1)	07:26	07:51		15:29 (2)
	17:17			18:00	21	17:13 (1)	19:36			20:14	20:48	21:04	20:47	20:02	19:05	18:13	25	17:45 (1)	16:39	16:41	12	15:41 (2)
28	07:39			06:56		16:53 (1)	07:05			06:11	05:37	05:32	05:57	06:32	07:09	07:46		17:22 (1)	07:27	07:51		15:30 (2)
	17:18			18:01	18	17:11 (1)	19:37			20:15	20:49	21:04	20:46	20:00	19:03	18:11	22	17:44 (1)	16:39	16:42	11	15:41 (2)
29	07:38						07:03			06:10	05:36	05:33	05:58	06:33	07:10	07:48		17:23 (1)	07:29	07:51		15:30 (2)
	17:19						19:38			20:16	20:50	21:04	20:45	19:59	19:01	18:10	19	17:42 (1)	16:38	16:43	11	15:41 (2)
30	07:37						07:02			06:08	05:35	05:33	05:59	06:35	07:11	07:49		17:25 (1)	07:30	07:52		15:32 (2)
	17:21						19:39			20:18	20:51	21:04	20:44	19:57	18:59	18:08	16	17:41 (1)	16:38	16:44	9	15:41 (2)
31	07:36						07:00				05:35		06:00	06:36		07:50		17:27 (1)		07:52		15:33 (2)
	17:22						19:41				20:52		20:43	19:55		18:07	11	17:38 (1)		16:45	7	15:40 (2)
Potential sun hours	287			292			369			404	458	465	470	435	376	341			289	276		
Total, worst case		2			436			12									455				234	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
738 Terence Bay Wind Project

Description:
3 Turbine Wind project
Haliafx County, Nova Scotia

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2/7/2014 9:14 AM / 5

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Calculated:
2/7/2014 9:10 AM/2.9.207

SHADOW - Calendar

Calculation: Medium Worst**Shadow receptor:** C - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (4)

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:
The sun is shining all the day, from sunrise to sunset
The rotor plane is always perpendicular to the line from the WTG to the sun
The WTG is always operating

	January			February			March			April	May	June	July	August	September	October			November	December		
1	07:52		15:32 (2)	07:35			06:54		16:56 (1)	06:58	06:07	05:34	05:34	06:01	06:37	07:12			06:52	07:31		
	16:46	15	15:47 (2)	17:23			18:02	19	17:15 (1)	19:42	20:19	20:52	21:04	20:42	19:53	18:57			17:06	16:37		
2	07:52		15:33 (2)	07:34			06:52		16:57 (1)	06:56	06:06	05:34	05:34	06:02	06:38	07:13			06:53	07:32		
	16:47	14	15:47 (2)	17:25			18:04	16	17:13 (1)	19:43	20:20	20:53	21:04	20:40	19:51	18:56			17:04	16:37		
3	07:52		15:35 (2)	07:33			06:51		17:00 (1)	06:54	06:04	05:33	05:35	06:03	06:39	07:15			06:55	07:33		
	16:47	12	15:47 (2)	17:26			18:05	9	17:09 (1)	19:44	20:21	20:54	21:04	20:39	19:50	18:54			17:03	16:37		
4	07:52		15:36 (2)	07:31			06:49			06:52	06:03	05:33	05:36	06:04	06:40	07:16			06:56	07:34		
	16:48	10	15:46 (2)	17:28			18:06			19:46	20:23	20:55	21:04	20:38	19:48	18:52			17:01	16:36		
5	07:52		15:38 (2)	07:30			06:47			06:51	06:01	05:32	05:36	06:06	06:42	07:17			06:57	07:35		
	16:49	7	15:45 (2)	17:29			18:08			19:47	20:24	20:56	21:03	20:36	19:46	18:50			17:00	16:36		
6	07:52			07:29			06:45			06:49	06:00	05:32	05:37	06:07	06:43	07:18			06:59	07:36		
	16:50			17:31			18:09			19:48	20:25	20:56	21:03	20:35	19:44	18:48			16:59	16:36		
7	07:52			07:28			06:44			06:47	05:59	05:31	05:38	06:08	06:44	07:20			07:00	07:37		15:25 (2)
	16:51			17:32			18:10			19:49	20:26	20:57	21:03	20:34	19:42	18:46			16:58	16:36	7	15:32 (2)
8	07:52			07:26			07:42			06:45	05:57	05:31	05:38	06:09	06:45	07:21			07:01	07:38		15:24 (2)
	16:53			17:33			19:12			19:51	20:27	20:58	21:02	20:32	19:40	18:45			16:56	16:35	10	15:34 (2)
9	07:51			07:25			07:40			06:43	05:56	05:31	05:39	06:10	06:46	07:22			07:03	07:39		15:24 (2)
	16:54			17:35			19:13			19:52	20:28	20:58	21:02	20:31	19:39	18:43			16:55	16:35	12	15:36 (2)
10	07:51			07:24			07:38			06:42	05:55	05:31	05:40	06:11	06:47	07:23		17:38 (1)	07:04	07:40		15:23 (2)
	16:55			17:36			19:14			19:53	20:30	20:59	21:01	20:29	19:37	18:41	2	17:40 (1)	16:54	16:35	14	15:37 (2)
11	07:51			07:22			07:36			06:40	05:53	05:30	05:41	06:12	06:49	07:24		17:32 (1)	07:05	07:41		15:23 (2)
	16:56			17:38			19:15			19:54	20:31	21:00	21:01	20:28	19:35	18:39	13	17:45 (1)	16:53	16:35	15	15:38 (2)
12	07:50			07:21		17:05 (1)	07:35			06:38	05:52	05:30	05:41	06:14	06:50	07:26		17:29 (1)	07:07	07:42		15:23 (2)
	16:57			17:39	2	17:07 (1)	19:17			19:55	20:32	21:00	21:00	20:26	19:33	18:38	18	17:47 (1)	16:52	16:35	16	15:39 (2)
13	07:50			07:19		17:00 (1)	07:33			06:36	05:51	05:30	05:42	06:15	06:51	07:27		17:27 (1)	07:08	07:43		15:22 (2)
	16:58			17:40	13	17:13 (1)	19:18			19:57	20:33	21:00	21:00	20:25	19:31	18:36	21	17:48 (1)	16:51	16:36	17	15:39 (2)
14	07:49			07:18		16:57 (1)	07:31			06:35	05:50	05:30	05:43	06:16	06:52	07:28		17:26 (1)	07:09	07:44		15:23 (2)
	16:59			17:42	18	17:15 (1)	19:19			19:58	20:34	21:01	20:59	20:23	19:29	18:34	24	17:50 (1)	16:50	16:36	17	15:40 (2)
15	07:49			07:17		16:56 (1)	07:29			06:33	05:49	05:30	05:44	06:17	06:53	07:30		17:25 (1)	07:11	07:44		15:23 (2)
	17:01			17:43	21	17:17 (1)	19:21			19:59	20:35	21:01	20:58	20:22	19:27	18:32	25	17:50 (1)	16:49	16:36	18	15:41 (2)
16	07:48			07:15		16:55 (1)	07:27			06:31	05:48	05:30	05:45	06:18	06:54	07:31		17:24 (1)	07:12	07:45		15:24 (2)
	17:02			17:45	22	17:17 (1)	19:22			20:00	20:37	21:02	20:57	20:20	19:26	18:31	26	17:50 (1)	16:48	16:36	18	15:42 (2)
17	07:48			07:14		16:53 (1)	07:26			06:29	05:46	05:30	05:46	06:19	06:56	07:32		17:23 (1)	07:13	07:46		15:23 (2)
	17:03			17:46	25	17:18 (1)	19:23			20:02	20:38	21:02	20:57	20:19	19:24	18:29	28	17:51 (1)	16:47	16:36	19	15:42 (2)
18	07:47			07:12		16:53 (1)	07:24			06:28	05:45	05:30	05:47	06:21	06:57	07:33		17:23 (1)	07:15	07:47		15:24 (2)
	17:04			17:47	26	17:19 (1)	19:24			20:03	20:39	21:02	20:56	20:17	19:22	18:27	28	17:51 (1)	16:46	16:37	19	15:43 (2)
19	07:47			07:11		16:52 (1)	07:22			06:26	05:44	05:30	05:48	06:22	06:58	07:35		17:22 (1)	07:16	07:47		15:25 (2)
	17:06			17:49	27	17:19 (1)	19:26			20:04	20:40	21:03	20:55	20:16	19:20	18:26	29	17:51 (1)	16:45	16:37	19	15:44 (2)
20	07:46			07:09		16:52 (1)	07:20			06:24	05:43	05:30	05:49	06:23	06:59	07:36		17:22 (1)	07:17	07:48		15:24 (2)
	17:07			17:50	28	17:20 (1)	19:27			20:05	20:41	21:03	20:54	20:14	19:18	18:24	29	17:51 (1)	16:44	16:37	20	15:44 (2)
21	07:45			07:07		16:51 (1)	07:18			06:23	05:42	05:30	05:50	06:24	07:00	07:37		17:22 (1)	07:19	07:48		15:25 (2)
	17:08			17:51	29	17:20 (1)	19:28			20:07	20:42	21:03	20:53	20:12	19:16	18:22	29	17:51 (1)	16:43	16:38	20	15:45 (2)
22	07:44			07:06		16:51 (1)	07:16			06:21	05:41	05:31	05:51	06:25	07:01	07:39		17:23 (1)	07:20	07:49		15:25 (2)
	17:10			17:53	29	17:20 (1)	19:29			20:08	20:43	21:04	20:52	20:11	19:14	18:21	28	17:51 (1)	16:42	16:38	20	15:45 (2)
23	07:44			07:04		16:51 (1)	07:14			06:19	05:41	05:31	05:52	06:26	07:03	07:40		17:23 (1)	07:21	07:49		15:26 (2)
	17:11			17:54	29	17:20 (1)	19:31			20:09	20:44	21:04	20:51	20:09	19:12	18:19	27	17:50 (1)	16:42	16:39	20	15:46 (2)
24	07:43			07:03		16:51 (1)	07:13			06:18	05:40	05:31	05:53	06:28	07:04	07:41		17:23 (1)	07:22	07:50		15:26 (2)
	17:12			17:56	28	17:19 (1)	19:32			20:10	20:45	21:04	20:50	20:07	19:11	18:17	26	17:49 (1)	16:41	16:40	20	15:46 (2)
25	07:42			07:01		16:51 (1)	07:11			06:16	05:39	05:31	05:54	06:29	07:05	07:42		17:24 (1)	07:24	07:50		15:27 (2)
	17:14			17:57	28	17:19 (1)	19:33			20:12	20:46	21:04	20:49	20:06	19:09	18:16	24	17:48 (1)	16:40	16:40	19	15:46 (2)
26	07:41			06:59		16:52 (1)	07:09			06:15	05:38	05:32	05:55	06:30	07:06	07:44		17:24 (1)	07:25	07:51		15:28 (2)
	17:15			17:58	27	17:19 (1)	19:34			20:13	20:47	21:04	20:48	20:04	19:07	18:14	23	17:47 (1)	16:40	16:41	19	15:47 (2)
27	07:40			06:58		16:53 (1)	07:07			06:13	05:37	05:32	05:56	06:31	07:07	07:45		17:25 (1)	07:26	07:51		15:28 (2)
	17:17			18:00	24	17:17 (1)	19:36			20:14	20:48	21:04	20:47	20:02	19:05	18:13	20	17:45 (1)	16:39	16:41	19	15:47 (2)
28	07:39			06:56		16:53 (1)	07:05			06:11	05:37	05:32	05:57	06:32	07:09	07:46		17:28 (1)	07:27	07:51		15:29 (2)
	17:18			18:01	23	17:16 (1)	19:37			20:15	20:49	21:04	20:46	20:00	19:03	18:11	16	17:44 (1)	16:39	16:42	18	15:47 (2)
29	07:38						07:03			06:10	05:36	05:33	05:58	06:33	07:10	07:48		17:30 (1)	07:29	07:51		15:29 (2)
	17:19						19:38			20:16	20:50	21:04	20:45	19:59	19:01	18:10	11	17:41 (1)	16:38	16:43	18	15:47 (2)
30	07:37						07:02			06:08	05:35	05:33	05:59	06:35	07:11	07:49			07:30	07:52		15:30 (2)
	17:21						19:39			20:18	20:51	21:04	20:44	19:57	18:59	18:08			16:38	16:44	17	15:47 (2)
31	07:36						07:00				05:35		06:00	06:36		07:50				07:52		15:31 (2)
	17:22						19:41				20:52		20:43	19:55		18:07				16:45	16	15:47 (2)
Potential sun hours	287			292			369			404	458	465	470	435	376	341			289	276		
Total, worst case		58			399			44									447				427	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
738 Terence Bay Wind Project

Description:
3 Turbine Wind project
Haliafx County, Nova Scotia

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2/7/2014 9:14 AM / 6

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Calculated:
2/7/2014 9:10 AM/2.9.207

SHADOW - Calendar

Calculation: Medium Worst**Shadow receptor:** D - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (5)

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:
The sun is shining all the day, from sunrise to sunset
The rotor plane is always perpendicular to the line from the WTG to the sun
The WTG is always operating

	January	February			March	April	May	June	July	August	September	October			November			December
1	07:52	07:35			06:54	06:58	06:07	05:34	05:34	06:01	06:37	07:12			06:52		16:08 (1)	07:31
	16:46	17:23			18:02	19:42	20:19	20:52	21:04	20:42	19:53	18:57			17:06	27	16:35 (1)	16:37
2	07:52	07:34		16:45 (1)	06:52	06:56	06:06	05:34	05:34	06:02	06:38	07:13			06:53		16:07 (1)	07:32
	16:47	17:25	11	16:56 (1)	18:04	19:43	20:20	20:53	21:04	20:40	19:51	18:56			17:04	27	16:34 (1)	16:37
3	07:52	07:33		16:43 (1)	06:51	06:54	06:04	05:33	05:35	06:03	06:39	07:15			06:55		16:09 (1)	07:33
	16:47	17:26	15	16:58 (1)	18:05	19:44	20:21	20:54	21:04	20:39	19:50	18:54			17:03	25	16:34 (1)	16:37
4	07:52	07:31		16:42 (1)	06:49	06:52	06:03	05:33	05:36	06:04	06:40	07:16			06:56		16:09 (1)	07:34
	16:48	17:28	18	17:00 (1)	18:06	19:46	20:23	20:55	21:04	20:38	19:48	18:52			17:01	24	16:33 (1)	16:36
5	07:52	07:30		16:41 (1)	06:47	06:51	06:01	05:32	05:36	06:06	06:42	07:17			06:57		16:09 (1)	07:35
	16:49	17:29	21	17:02 (1)	18:08	19:47	20:24	20:56	21:03	20:36	19:46	18:50			17:00	23	16:32 (1)	16:36
6	07:52	07:29		16:39 (1)	06:45	06:49	06:00	05:32	05:37	06:07	06:43	07:18			06:59		16:11 (1)	07:36
	16:50	17:31	23	17:02 (1)	18:09	19:48	20:25	20:56	21:03	20:35	19:44	18:48			16:59	21	16:32 (1)	16:36
7	07:52	07:28		16:39 (1)	06:44	06:47	05:59	05:31	05:38	06:08	06:44	07:20			07:00		16:12 (1)	07:37
	16:51	17:32	25	17:04 (1)	18:10	19:49	20:26	20:57	21:03	20:34	19:42	18:46			16:58	18	16:30 (1)	16:36
8	07:52	07:26		16:39 (1)	07:42	06:45	05:57	05:31	05:38	06:09	06:45	07:21			07:01		16:14 (1)	07:38
	16:53	17:33	26	17:05 (1)	19:12	19:51	20:27	20:58	21:02	20:32	19:40	18:45			16:56	15	16:29 (1)	16:35
9	07:51	07:25		16:38 (1)	07:40	06:43	05:56	05:31	05:39	06:10	06:46	07:22			07:03		16:16 (1)	07:39
	16:54	17:35	27	17:05 (1)	19:13	19:52	20:28	20:58	21:02	20:31	19:39	18:43			16:55	10	16:26 (1)	16:35
10	07:51	07:24		16:38 (1)	07:38	06:42	05:55	05:31	05:40	06:11	06:47	07:23			07:04			07:40
	16:55	17:36	27	17:05 (1)	19:14	19:53	20:30	20:59	21:01	20:29	19:37	18:41			16:54			16:35
11	07:51	07:22		16:37 (1)	07:36	06:40	05:53	05:30	05:41	06:12	06:49	07:24			07:05			07:41
	16:56	17:38	28	17:05 (1)	19:15	19:54	20:31	21:00	21:01	20:28	19:35	18:39			16:53			16:35
12	07:50	07:21		16:38 (1)	07:35	06:38	05:52	05:30	05:41	06:14	06:50	07:26			07:07			07:42
	16:57	17:39	28	17:06 (1)	19:17	19:55	20:32	21:00	21:00	20:26	19:33	18:38			16:52			16:35
13	07:50	07:19		16:38 (1)	07:33	06:36	05:51	05:30	05:42	06:15	06:51	07:27			07:08			07:43
	16:58	17:40	28	17:06 (1)	19:18	19:57	20:33	21:00	21:00	20:25	19:31	18:36			16:51			16:36
14	07:49	07:18		16:38 (1)	07:31	06:35	05:50	05:30	05:43	06:16	06:52	07:28			07:09			07:44
	16:59	17:42	27	17:05 (1)	19:19	19:58	20:34	21:01	20:59	20:23	19:29	18:34			16:50			16:36
15	07:49	07:17		16:39 (1)	07:29	06:33	05:49	05:30	05:44	06:17	06:53	07:30			07:11			07:44
	17:01	17:43	26	17:05 (1)	19:21	19:59	20:35	21:01	20:58	20:22	19:27	18:32			16:49			16:36
16	07:48	07:15		16:39 (1)	07:27	06:31	05:48	05:30	05:45	06:18	06:54	07:31			07:12			07:45
	17:02	17:45	25	17:04 (1)	19:22	20:00	20:37	21:02	20:57	20:20	19:26	18:31			16:48			16:36
17	07:48	07:14		16:39 (1)	07:26	06:29	05:46	05:30	05:46	06:19	06:56	07:32			07:13			07:46
	17:03	17:46	24	17:03 (1)	19:23	20:02	20:38	21:02	20:57	20:19	19:24	18:29			16:47			16:36
18	07:47	07:12		16:41 (1)	07:24	06:28	05:45	05:30	05:47	06:21	06:57	07:33			07:15			07:47
	17:04	17:47	22	17:03 (1)	19:24	20:03	20:39	21:02	20:56	20:17	19:22	18:27			16:46			16:37
19	07:47	07:11		16:42 (1)	07:22	06:26	05:44	05:30	05:48	06:22	06:58	07:35			07:16			07:47
	17:06	17:49	19	17:01 (1)	19:26	20:04	20:40	21:03	20:55	20:16	19:20	18:26			16:45			16:37
20	07:46	07:09		16:44 (1)	07:20	06:24	05:43	05:30	05:49	06:23	06:59	07:36		17:21 (1)	07:17			07:48
	17:07	17:50	16	17:00 (1)	19:27	20:05	20:41	21:03	20:54	20:14	19:18	18:24	3	17:24 (1)	16:44			16:37
21	07:45	07:07		16:46 (1)	07:18	06:23	05:42	05:30	05:50	06:24	07:00	07:37		17:16 (1)	07:19			07:48
	17:08	17:51	11	16:57 (1)	19:28	20:07	20:42	21:03	20:53	20:12	19:16	18:22	12	17:28 (1)	16:43			16:38
22	07:44	07:06			07:16	06:21	05:41	05:31	05:51	06:25	07:01	07:39		17:14 (1)	07:20			07:49
	17:10	17:53			19:29	20:08	20:43	21:04	20:52	20:11	19:14	18:21	17	17:31 (1)	16:42			16:38
23	07:44	07:04			07:14	06:19	05:41	05:31	05:52	06:26	07:03	07:40		17:12 (1)	07:21			07:49
	17:11	17:54			19:31	20:09	20:44	21:04	20:51	20:09	19:12	18:19	20	17:32 (1)	16:42			16:39
24	07:43	07:03			07:13	06:18	05:40	05:31	05:53	06:28	07:04	07:41		17:10 (1)	07:22			07:50
	17:12	17:56			19:32	20:10	20:45	21:04	20:50	20:07	19:11	18:17	23	17:33 (1)	16:41			16:40
25	07:42	07:01			07:11	06:16	05:39	05:31	05:54	06:29	07:05	07:42		17:10 (1)	07:24			07:50
	17:14	17:57			19:33	20:12	20:46	21:04	20:49	20:06	19:09	18:16	24	17:34 (1)	16:40			16:40
26	07:41	06:59			07:09	06:15	05:38	05:32	05:55	06:30	07:06	07:44		17:08 (1)	07:25			07:51
	17:15	17:58			19:34	20:13	20:47	21:04	20:48	20:04	19:07	18:14	26	17:34 (1)	16:40			16:41
27	07:40	06:58			07:07	06:13	05:37	05:32	05:56	06:31	07:07	07:45		17:07 (1)	07:26			07:51
	17:17	18:00			19:36	20:14	20:48	21:04	20:47	20:02	19:05	18:13	27	17:34 (1)	16:39			16:41
28	07:39	06:56			07:05	06:11	05:37	05:32	05:57	06:32	07:09	07:46		17:07 (1)	07:27			07:51
	17:18	18:01			19:37	20:15	20:49	21:04	20:46	20:00	19:03	18:11	28	17:35 (1)	16:39			16:42
29	07:38				07:03	06:10	05:36	05:33	05:58	06:33	07:10	07:48		17:07 (1)	07:29			07:51
	17:19				19:38	20:16	20:50	21:04	20:45	19:59	19:01	18:10	28	17:35 (1)	16:38			16:43
30	07:37				07:02	06:08	05:35	05:33	05:59	06:35	07:11	07:49		17:07 (1)	07:30			07:52
	17:21				19:39	20:18	20:51	21:04	20:44	19:57	18:59	18:08	28	17:35 (1)	16:38			16:44
31	07:36				07:00		05:35		06:00	06:36		07:50		17:07 (1)				07:52
	17:22				19:41		20:52		20:43	19:55		18:07	28	17:35 (1)				16:45
Potential sun hours	287	292			369	404	458	465	470	435	376	341			289			276
Total, worst case			447										264			190		

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
738 Terence Bay Wind Project

Description:
3 Turbine Wind project
Haliafx County, Nova Scotia

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Calculated:
2/7/2014 9:10 AM/2.9.207

SHADOW - Calendar

Calculation: Medium Worst**Shadow receptor:** E - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (6)

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:
The sun is shining all the day, from sunrise to sunset
The rotor plane is always perpendicular to the line from the WTG to the sun
The WTG is always operating

	January			February			March			April	May	June	July	August	September	October			November	December		
1	07:52		15:34 (2)	07:35			06:54		16:57 (1)	06:58	06:07	05:34	05:34	06:01	06:37	07:12			06:52	07:31		15:29 (2)
	16:46	22	15:56 (2)	17:23			18:02	25	17:22 (1)	19:42	20:19	20:52	21:04	20:42	19:53	18:57			17:06	16:37	5	15:34 (2)
2	07:52		15:34 (2)	07:34			06:52		16:58 (1)	06:56	06:06	05:34	05:34	06:02	06:38	07:13			06:53	07:32		15:27 (2)
	16:47	22	15:56 (2)	17:25			18:04	22	17:20 (1)	19:43	20:20	20:53	21:04	20:40	19:51	18:56			17:04	16:37	10	15:37 (2)
3	07:52		15:35 (2)	07:33			06:51		16:59 (1)	06:54	06:04	05:33	05:35	06:03	06:39	07:15			06:55	07:33		15:26 (2)
	16:47	21	15:56 (2)	17:26			18:05	20	17:19 (1)	19:44	20:21	20:54	21:04	20:39	19:50	18:54			17:03	16:37	13	15:39 (2)
4	07:52		15:36 (2)	07:31			06:49		17:00 (1)	06:52	06:03	05:33	05:36	06:04	06:40	07:16			06:56	07:34		15:26 (2)
	16:48	20	15:56 (2)	17:28			18:06	16	17:16 (1)	19:46	20:23	20:55	21:04	20:38	19:48	18:52			17:01	16:36	15	15:41 (2)
5	07:52		15:37 (2)	07:30			06:47		17:04 (1)	06:51	06:01	05:32	05:36	06:06	06:42	07:17			06:57	07:35		15:25 (2)
	16:49	19	15:56 (2)	17:29			18:08	10	17:14 (1)	19:47	20:24	20:56	21:03	20:36	19:46	18:50			17:00	16:36	17	15:42 (2)
6	07:52		15:39 (2)	07:29			06:45			06:49	06:00	05:32	05:37	06:07	06:43	07:18			06:59	07:36		15:25 (2)
	16:50	18	15:57 (2)	17:31			18:09			19:48	20:25	20:56	21:03	20:35	19:44	18:48			16:59	16:36	18	15:43 (2)
7	07:52		15:40 (2)	07:28			06:44			06:47	05:59	05:31	05:38	06:08	06:44	07:20			07:00	07:37		15:25 (2)
	16:51	17	15:57 (2)	17:32			18:10			19:49	20:26	20:57	21:03	20:34	19:42	18:46			16:58	16:36	19	15:44 (2)
8	07:52		15:41 (2)	07:26			07:42			06:45	05:57	05:31	05:38	06:09	06:45	07:21		17:41 (1)	07:01	07:38		15:24 (2)
	16:53	15	15:56 (2)	17:33			19:12			19:51	20:27	20:58	21:02	20:32	19:40	18:45	5	17:46 (1)	16:56	16:35	20	15:44 (2)
9	07:51		15:42 (2)	07:25			07:40			06:43	05:56	05:31	05:39	06:10	06:46	07:22		17:37 (1)	07:03	07:39		15:24 (2)
	16:54	13	15:55 (2)	17:35			19:13			19:52	20:28	20:58	21:02	20:31	19:39	18:43	13	17:50 (1)	16:55	16:35	21	15:45 (2)
10	07:51		15:44 (2)	07:24			07:38			06:42	05:55	05:31	05:40	06:11	06:47	07:23		17:35 (1)	07:04	07:40		15:25 (2)
	16:55	11	15:55 (2)	17:36			19:14			19:53	20:30	20:59	21:01	20:29	19:37	18:41	18	17:53 (1)	16:54	16:35	21	15:46 (2)
11	07:51		15:46 (2)	07:22			07:36			06:40	05:53	05:30	05:41	06:12	06:49	07:24		17:33 (1)	07:05	07:41		15:25 (2)
	16:56	7	15:53 (2)	17:38			19:15			19:54	20:31	21:00	21:01	20:28	19:35	18:39	21	17:54 (1)	16:53	16:35	22	15:47 (2)
12	07:50			07:21			07:35			06:38	05:52	05:30	05:41	06:14	06:50	07:26		17:31 (1)	07:07	07:42		15:25 (2)
	16:57			17:39			19:17			19:55	20:32	21:00	21:00	20:26	19:33	18:38	23	17:54 (1)	16:52	16:35	23	15:48 (2)
13	07:50			07:19			07:33			06:36	05:51	05:30	05:42	06:15	06:51	07:27		17:29 (1)	07:08	07:43		15:24 (2)
	16:58			17:40			19:18			19:57	20:33	21:00	21:00	20:25	19:31	18:36	26	17:55 (1)	16:51	16:36	23	15:47 (2)
14	07:49			07:18			07:31			06:35	05:50	05:30	05:43	06:16	06:52	07:28		17:29 (1)	07:09	07:44		15:25 (2)
	16:59			17:42			19:19			19:58	20:34	21:01	20:59	20:23	19:29	18:34	27	17:56 (1)	16:50	16:36	23	15:48 (2)
15	07:49			07:17		17:07 (1)	07:29			06:33	05:49	05:30	05:44	06:17	06:53	07:30		17:28 (1)	07:11	07:44		15:25 (2)
	17:01			17:43	8	17:15 (1)	19:21			19:59	20:35	21:01	20:58	20:22	19:27	18:32	28	17:56 (1)	16:49	16:36	24	15:49 (2)
16	07:48			07:15		17:03 (1)	07:27			06:31	05:48	05:30	05:45	06:18	06:54	07:31		17:27 (1)	07:12	07:45		15:26 (2)
	17:02			17:45	14	17:17 (1)	19:22			20:00	20:37	21:02	20:57	20:20	19:26	18:31	28	17:55 (1)	16:48	16:36	24	15:50 (2)
17	07:48			07:14		17:01 (1)	07:26			06:29	05:46	05:30	05:46	06:19	06:56	07:32		17:28 (1)	07:13	07:46		15:26 (2)
	17:03			17:46	18	17:19 (1)	19:23			20:02	20:38	21:02	20:57	20:19	19:24	18:29	28	17:56 (1)	16:47	16:36	24	15:50 (2)
18	07:47			07:12		17:00 (1)	07:24			06:28	05:45	05:30	05:47	06:21	06:57	07:33		17:27 (1)	07:15	07:47		15:26 (2)
	17:04			17:47	21	17:21 (1)	19:24			20:03	20:39	21:02	20:56	20:17	19:22	18:27	28	17:55 (1)	16:46	16:37	25	15:51 (2)
19	07:47			07:11		16:58 (1)	07:22			06:26	05:44	05:30	05:48	06:22	06:58	07:35		17:27 (1)	07:16	07:47		15:27 (2)
	17:06			17:49	24	17:22 (1)	19:26			20:04	20:40	21:03	20:55	20:16	19:20	18:26	28	17:55 (1)	16:45	16:37	25	15:52 (2)
20	07:46			07:09		16:58 (1)	07:20			06:24	05:43	05:30	05:49	06:23	06:59	07:36		17:27 (1)	07:17	07:48		15:27 (2)
	17:07			17:50	25	17:23 (1)	19:27			20:05	20:41	21:03	20:54	20:14	19:18	18:24	28	17:55 (1)	16:44	16:37	25	15:52 (2)
21	07:45			07:07		16:57 (1)	07:18			06:23	05:42	05:30	05:50	06:24	07:00	07:37		17:27 (1)	07:19	07:48		15:28 (2)
	17:08			17:51	26	17:23 (1)	19:28			20:07	20:42	21:03	20:53	20:12	19:16	18:22	27	17:54 (1)	16:43	16:38	25	15:53 (2)
22	07:44			07:06		16:56 (1)	07:16			06:21	05:41	05:31	05:51	06:25	07:01	07:39		17:29 (1)	07:20	07:49		15:28 (2)
	17:10			17:53	27	17:23 (1)	19:29			20:08	20:43	21:04	20:52	20:11	19:14	18:21	24	17:53 (1)	16:42	16:38	25	15:53 (2)
23	07:44			07:04		16:56 (1)	07:14			06:19	05:41	05:31	05:52	06:26	07:03	07:40		17:29 (1)	07:21	07:49		15:29 (2)
	17:11			17:54	28	17:24 (1)	19:31			20:09	20:44	21:04	20:51	20:09	19:12	18:19	23	17:52 (1)	16:42	16:39	25	15:54 (2)
24	07:43			07:03		16:56 (1)	07:13			06:18	05:40	05:31	05:53	06:28	07:04	07:41		17:30 (1)	07:22	07:50		15:29 (2)
	17:12			17:56	28	17:24 (1)	19:32			20:10	20:45	21:04	20:50	20:07	19:11	18:17	20	17:50 (1)	16:41	16:40	25	15:54 (2)
25	07:42			07:01		16:55 (1)	07:11			06:16	05:39	05:31	05:54	06:29	07:05	07:42		17:32 (1)	07:24	07:50		15:29 (2)
	17:14			17:57	28	17:23 (1)	19:33			20:12	20:46	21:04	20:49	20:06	19:09	18:16	17	17:49 (1)	16:40	16:40	25	15:54 (2)
26	07:41			06:59		16:56 (1)	07:09			06:15	05:38	05:32	05:55	06:30	07:06	07:44		17:34 (1)	07:25	07:51		15:31 (2)
	17:15			17:58	28	17:24 (1)	19:34			20:13	20:47	21:04	20:48	20:04	19:07	18:14	12	17:46 (1)	16:40	16:41	24	15:55 (2)
27	07:40			06:58		16:56 (1)	07:07			06:13	05:37	05:32	05:56	06:31	07:07	07:45		17:37 (1)	07:26	07:51		15:31 (2)
	17:17			18:00	27	17:23 (1)	19:36			20:14	20:48	21:04	20:47	20:02	19:05	18:13	5	17:42 (1)	16:39	16:41	24	15:55 (2)
28	07:39			06:56		16:56 (1)	07:05			06:11	05:37	05:32	05:57	06:32	07:09	07:46			07:27	07:51		15:31 (2)
	17:18			18:01	26	17:22 (1)	19:37			20:15	20:49	21:04	20:46	20:00	19:03	18:11			16:39	16:42	24	15:55 (2)
29	07:38						07:03			06:10	05:36	05:33	05:58	06:33	07:10	07:48			07:29	07:51		15:32 (2)
	17:19						19:38			20:16	20:50	21:04	20:45	19:59	19:01	18:10			16:38	16:43	23	15:55 (2)
30	07:37						07:02			06:08	05:35	05:33	05:59	06:35	07:11	07:49			07:30	07:52		15:32 (2)
	17:21						19:39			20:18	20:51	21:04	20:44	19:57	18:59	18:08			16:38	16:44	23	15:55 (2)
31	07:36						07:00				05:35		06:00	06:36		07:50				07:52		15:33 (2)
	17:22						19:41				20:52		20:43	19:55		18:07				16:45	23	15:56 (2)
Potential sun hours	287			292			369			404	458	465	470	435	376	341			289	276		
Total, worst case		185			328			93									429				663	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
738 Terence Bay Wind Project

Description:
3 Turbine Wind project
Haliafx County, Nova Scotia

Printed/Page
2/7/2014 9:14 AM / 8

Licensed user:
AL-PRO GmbH & Co.KG
Dorfstraße 100
DE-26532 Großheide
+49 (0) 4936 6986-0
Kirk Schmidt / kirk.schmidt@al-pro.ca

Calculated:
2/7/2014 9:10 AM/2.9.207

SHADOW - Calendar

Calculation: Medium Worst**Shadow receptor:** F - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (7)

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:
- The sun is shining all the day, from sunrise to sunset
- The rotor plane is always perpendicular to the line from the WTG to the sun
- The WTG is always operating

	January	February			March	April	May	June	July	August	September	October			November			December		
1	07:52	07:35			06:54	06:58	06:07	05:34	05:34	06:01	06:37	07:12			06:52		16:25 (1)	07:31		
	16:46	17:23			18:02	19:42	20:19	20:52	21:04	20:42	19:53	18:57			17:06	13	16:38 (1)	16:37		
2	07:52	07:34			06:52	06:56	06:06	05:34	05:34	06:02	06:38	07:13			06:53		16:28 (1)	07:32		
	16:47	17:25			18:04	19:43	20:20	20:53	21:04	20:40	19:51	18:56			17:04	6	16:34 (1)	16:37		
3	07:52	07:33			06:51	06:54	06:04	05:33	05:35	06:03	06:39	07:15			06:55			07:33		
	16:47	17:26			18:05	19:44	20:21	20:54	21:04	20:39	19:50	18:54			17:03			16:37		
4	07:52	07:31			06:49	06:52	06:03	05:33	05:36	06:04	06:40	07:16			06:56			07:34		
	16:48	17:28			18:06	19:46	20:23	20:55	21:04	20:38	19:48	18:52			17:01			16:36		
5	07:52	07:30			06:47	06:51	06:01	05:32	05:36	06:06	06:42	07:17			06:57			07:35		
	16:49	17:29			18:08	19:47	20:24	20:56	21:03	20:36	19:46	18:50			17:00			16:36		
6	07:52	07:29			06:45	06:49	06:00	05:32	05:37	06:07	06:43	07:18			06:59			07:36		
	16:50	17:31			18:09	19:48	20:25	20:56	21:03	20:35	19:44	18:48			16:59			16:36		
7	07:52	07:28			06:44	06:47	05:59	05:31	05:38	06:08	06:44	07:20			07:00			07:37		
	16:51	17:32			18:10	19:49	20:26	20:57	21:03	20:34	19:42	18:46			16:58			16:36		
8	07:52	07:26			07:42	06:45	05:57	05:31	05:38	06:09	06:45	07:21			07:01			07:38		
	16:53	17:33			19:12	19:51	20:27	20:58	21:02	20:32	19:40	18:45			16:56			16:35		
9	07:51	07:25		16:58 (1)	07:40	06:43	05:56	05:31	05:39	06:10	06:46	07:22			07:03			07:39		
	16:54	17:35	7	17:05 (1)	19:13	19:52	20:28	20:58	21:02	20:31	19:39	18:43			16:55			16:35		
10	07:51	07:24		16:55 (1)	07:38	06:42	05:55	05:31	05:40	06:11	06:47	07:23			07:04			07:40		
	16:55	17:36	14	17:09 (1)	19:14	19:53	20:30	20:59	21:01	20:29	19:37	18:41			16:54			16:35		
11	07:51	07:22		16:53 (1)	07:36	06:40	05:53	05:30	05:41	06:12	06:49	07:24			07:05			07:41		
	16:56	17:38	17	17:10 (1)	19:15	19:54	20:31	21:00	21:01	20:28	19:35	18:39			16:53			16:35		
12	07:50	07:21		16:52 (1)	07:35	06:38	05:52	05:30	05:41	06:14	06:50	07:26			07:07			07:42		
	16:57	17:39	20	17:12 (1)	19:17	19:55	20:32	21:00	21:00	20:26	19:33	18:38			16:52			16:35		
13	07:50	07:19		16:51 (1)	07:33	06:36	05:51	05:30	05:42	06:15	06:51	07:27			07:08			07:43		15:27 (2)
	16:58	17:40	23	17:14 (1)	19:18	19:57	20:33	21:00	21:00	20:25	19:31	18:36			16:51			16:36	5	15:32 (2)
14	07:49	07:18		16:50 (1)	07:31	06:35	05:50	05:30	05:43	06:16	06:52	07:28		17:30 (1)	07:09			07:44		15:27 (2)
	16:59	17:42	24	17:14 (1)	19:19	19:58	20:34	21:01	20:59	20:23	19:29	18:34	8	17:38 (1)	16:50			16:36	7	15:34 (2)
15	07:49	07:17		16:50 (1)	07:29	06:33	05:49	05:30	05:44	06:17	06:53	07:30		17:26 (1)	07:11			07:44		15:26 (2)
	17:01	17:43	25	17:15 (1)	19:21	19:59	20:35	21:01	20:58	20:22	19:27	18:32	15	17:41 (1)	16:49			16:36	9	15:35 (2)
16	07:48	07:15		16:49 (1)	07:27	06:31	05:48	05:30	05:45	06:18	06:54	07:31		17:24 (1)	07:12			07:45		15:27 (2)
	17:02	17:45	26	17:15 (1)	19:22	20:00	20:37	21:02	20:57	20:20	19:26	18:31	18	17:42 (1)	16:48			16:36	10	15:37 (2)
17	07:48	07:14		16:48 (1)	07:26	06:29	05:46	05:30	05:46	06:19	06:56	07:32		17:23 (1)	07:13			07:46		15:26 (2)
	17:03	17:46	27	17:15 (1)	19:23	20:02	20:38	21:02	20:57	20:19	19:24	18:29	21	17:44 (1)	16:47			16:36	11	15:37 (2)
18	07:47	07:12		16:48 (1)	07:24	06:28	05:45	05:30	05:47	06:21	06:57	07:33		17:21 (1)	07:15			07:47		15:26 (2)
	17:04	17:47	28	17:16 (1)	19:24	20:03	20:39	21:02	20:56	20:17	19:22	18:27	24	17:45 (1)	16:46			16:37	12	15:38 (2)
19	07:47	07:11		16:48 (1)	07:22	06:26	05:44	05:30	05:48	06:22	06:58	07:35		17:20 (1)	07:16			07:47		15:27 (2)
	17:06	17:49	28	17:16 (1)	19:26	20:04	20:40	21:03	20:55	20:16	19:20	18:26	25	17:45 (1)	16:45			16:37	12	15:39 (2)
20	07:46	07:09		16:48 (1)	07:20	06:24	05:43	05:30	05:49	06:23	06:59	07:36		17:20 (1)	07:17			07:48		15:27 (2)
	17:07	17:50	28	17:16 (1)	19:27	20:05	20:41	21:03	20:54	20:14	19:18	18:24	26	17:46 (1)	16:44			16:37	12	15:39 (2)
21	07:45	07:07		16:48 (1)	07:18	06:23	05:42	05:30	05:50	06:24	07:00	07:37		17:19 (1)	07:19			07:48		15:28 (2)
	17:08	17:51	27	17:15 (1)	19:28	20:07	20:42	21:03	20:53	20:12	19:16	18:22	27	17:46 (1)	16:43			16:38	12	15:40 (2)
22	07:44	07:06		16:48 (1)	07:16	06:21	05:41	05:31	05:51	06:25	07:01	07:39		17:19 (1)	07:20			07:49		15:28 (2)
	17:10	17:53	26	17:14 (1)	19:29	20:08	20:43	21:04	20:52	20:11	19:14	18:21	28	17:47 (1)	16:42			16:38	12	15:40 (2)
23	07:44	07:04		16:50 (1)	07:14	06:19	05:41	05:31	05:52	06:26	07:03	07:40		17:18 (1)	07:21			07:49		15:29 (2)
	17:11	17:54	24	17:14 (1)	19:31	20:09	20:44	21:04	20:51	20:09	19:12	18:19	28	17:46 (1)	16:42			16:39	12	15:41 (2)
24	07:43	07:03		16:50 (1)	07:13	06:18	05:40	05:31	05:53	06:28	07:04	07:41		17:18 (1)	07:22			07:50		15:29 (2)
	17:12	17:56	23	17:13 (1)	19:32	20:10	20:45	21:04	20:50	20:07	19:11	18:17	28	17:46 (1)	16:41			16:40	12	15:41 (2)
25	07:42	07:01		16:51 (1)	07:11	06:16	05:39	05:31	05:54	06:29	07:05	07:42		17:18 (1)	07:24			07:50		15:29 (2)
	17:14	17:57	20	17:11 (1)	19:33	20:12	20:46	21:04	20:49	20:06	19:09	18:16	28	17:46 (1)	16:40			16:40	12	15:41 (2)
26	07:41	06:59		16:53 (1)	07:09	06:15	05:38	05:32	05:55	06:30	07:06	07:44		17:18 (1)	07:25			07:51		15:31 (2)
	17:15	17:58	17	17:10 (1)	19:34	20:13	20:47	21:04	20:48	20:04	19:07	18:14	27	17:45 (1)	16:40			16:41	11	15:42 (2)
27	07:40	06:58		16:55 (1)	07:07	06:13	05:37	05:32	05:56	06:31	07:07	07:45		17:18 (1)	07:26			07:51		15:31 (2)
	17:17	18:00	13	17:08 (1)	19:36	20:14	20:48	21:04	20:47	20:02	19:05	18:13	26	17:44 (1)	16:39			16:41	11	15:42 (2)
28	07:39	06:56		17:00 (1)	07:05	06:11	05:37	05:32	05:57	06:32	07:09	07:46		17:20 (1)	07:27			07:51		15:32 (2)
	17:18	18:01	2	17:02 (1)	19:37	20:15	20:49	21:04	20:46	20:00	19:03	18:11	24	17:44 (1)	16:39			16:42	9	15:41 (2)
29	07:38				07:03	06:10	05:36	05:33	05:58	06:33	07:10	07:48		17:20 (1)	07:29			07:51		15:33 (2)
	17:19				19:38	20:16	20:50	21:04	20:45	19:59	19:01	18:10	22	17:42 (1)	16:38			16:43	8	15:41 (2)
30	07:37				07:02	06:08	05:35	05:33	05:59	06:35	07:11	07:49		17:22 (1)	07:30			07:52		15:34 (2)
	17:21				19:39	20:18	20:51	21:04	20:44	19:57	18:59	18:08	20	17:42 (1)	16:38			16:44	6	15:40 (2)
31	07:36				07:00		05:35		06:00	06:36		07:50		17:23 (1)				07:52		15:37 (2)
	17:22				19:41		20:52		20:43	19:55		18:07	17	17:40 (1)				16:45	2	15:39 (2)
Potential sun hours	287	292			369	404	458	465	470	435	376	341			289			276		
Total, worst case			419										412			19			185	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

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Kirk Schmidt / kirk.schmidt@al-pro.ca

Calculated:
2/7/2014 9:10 AM/2.9.207

SHADOW - Calendar

Calculation: Medium Worst**Shadow receptor:** G - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (8)

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:
The sun is shining all the day, from sunrise to sunset
The rotor plane is always perpendicular to the line from the WTG to the sun
The WTG is always operating

	January	February			March	April	May	June	July	August	September	October			November			December
1	07:52	07:35			06:54	06:58	06:07	05:34	05:34	06:01	06:37	07:12			06:52		16:14 (1)	07:31
	16:46	17:23			18:02	19:42	20:19	20:52	21:04	20:42	19:53	18:57			17:06	24	16:38 (1)	16:37
2	07:52	07:34			06:52	06:56	06:05	05:34	05:34	06:02	06:38	07:13			06:53		16:14 (1)	07:32
	16:47	17:25			18:04	19:43	20:20	20:53	21:04	20:40	19:51	18:56			17:04	23	16:37 (1)	16:37
3	07:52	07:33		16:53 (1)	06:51	06:54	06:04	05:33	05:35	06:03	06:39	07:15			06:55		16:15 (1)	07:33
	16:47	17:26	5	16:58 (1)	18:05	19:44	20:21	20:54	21:04	20:39	19:50	18:54			17:03	22	16:37 (1)	16:36
4	07:52	07:31		16:50 (1)	06:49	06:52	06:03	05:33	05:36	06:04	06:40	07:16			06:56		16:16 (1)	07:34
	16:48	17:28	12	17:02 (1)	18:06	19:46	20:23	20:55	21:04	20:38	19:48	18:52			17:01	20	16:36 (1)	16:36
5	07:52	07:30		16:48 (1)	06:47	06:51	06:01	05:32	05:36	06:06	06:42	07:17			06:57		16:16 (1)	07:35
	16:49	17:29	16	17:04 (1)	18:08	19:47	20:24	20:56	21:03	20:36	19:46	18:50			17:00	18	16:34 (1)	16:36
6	07:52	07:29		16:46 (1)	06:45	06:49	06:00	05:32	05:37	06:07	06:43	07:18			06:59		16:18 (1)	07:36
	16:50	17:31	19	17:05 (1)	18:09	19:48	20:25	20:56	21:03	20:35	19:44	18:48			16:59	16	16:34 (1)	16:36
7	07:52	07:28		16:46 (1)	06:44	06:47	05:59	05:31	05:38	06:08	06:44	07:20			07:00		16:20 (1)	07:37
	16:51	17:32	20	17:06 (1)	18:10	19:49	20:26	20:57	21:03	20:34	19:42	18:46			16:58	11	16:31 (1)	16:36
8	07:52	07:26		16:45 (1)	07:42	06:45	05:57	05:31	05:38	06:09	06:45	07:21			07:01		16:24 (1)	07:38
	16:53	17:33	23	17:08 (1)	19:12	19:51	20:27	20:58	21:02	20:32	19:40	18:45			16:56	4	16:28 (1)	16:35
9	07:51	07:25		16:44 (1)	07:40	06:43	05:56	05:31	05:39	06:10	06:46	07:22			07:03			07:39
	16:54	17:35	24	17:08 (1)	19:13	19:52	20:28	20:58	21:02	20:31	19:39	18:43			16:55			16:35
10	07:51	07:24		16:44 (1)	07:38	06:42	05:55	05:31	05:40	06:11	06:47	07:23			07:04			07:40
	16:55	17:36	25	17:09 (1)	19:14	19:53	20:30	20:59	21:01	20:29	19:37	18:41			16:54			16:35
11	07:51	07:22		16:43 (1)	07:36	06:40	05:53	05:30	05:41	06:12	06:49	07:24			07:05			07:41
	16:56	17:38	25	17:08 (1)	19:15	19:54	20:31	21:00	21:01	20:28	19:35	18:39			16:53			16:35
12	07:50	07:21		16:44 (1)	07:35	06:38	05:52	05:30	05:41	06:14	06:50	07:26			07:07			07:42
	16:57	17:39	25	17:09 (1)	19:17	19:55	20:32	21:00	21:00	20:26	19:33	18:38			16:52			16:35
13	07:50	07:19		16:44 (1)	07:33	06:36	05:51	05:30	05:42	06:15	06:51	07:27			07:08			07:43
	16:58	17:40	26	17:10 (1)	19:18	19:57	20:33	21:00	21:00	20:25	19:31	18:36			16:51			16:36
14	07:49	07:18		16:44 (1)	07:31	06:35	05:50	05:30	05:43	06:16	06:52	07:28			07:09			07:44
	16:59	17:42	25	17:09 (1)	19:19	19:58	20:34	21:01	20:59	20:23	19:29	18:34			16:50			16:36
15	07:49	07:17		16:45 (1)	07:29	06:33	05:49	05:30	05:44	06:17	06:53	07:29			07:11			07:44
	17:01	17:43	24	17:09 (1)	19:21	19:59	20:35	21:01	20:58	20:22	19:27	18:32			16:49			16:36
16	07:48	07:15		16:45 (1)	07:27	06:31	05:48	05:30	05:45	06:18	06:54	07:31			07:12			07:45
	17:02	17:45	23	17:08 (1)	19:22	20:00	20:37	21:02	20:57	20:20	19:26	18:31			16:48			16:36
17	07:48	07:14		16:45 (1)	07:26	06:29	05:46	05:30	05:46	06:19	06:56	07:32			07:13			07:46
	17:03	17:46	22	17:07 (1)	19:23	20:02	20:38	21:02	20:57	20:19	19:24	18:29			16:47			16:36
18	07:47	07:12		16:46 (1)	07:24	06:28	05:45	05:30	05:47	06:21	06:57	07:33			07:15			07:47
	17:04	17:47	21	17:07 (1)	19:24	20:03	20:39	21:02	20:56	20:17	19:22	18:27			16:46			16:37
19	07:47	07:11		16:47 (1)	07:22	06:26	05:44	05:30	05:48	06:22	06:58	07:35			07:16			07:47
	17:06	17:49	18	17:05 (1)	19:26	20:04	20:40	21:03	20:55	20:16	19:20	18:26			16:45			16:37
20	07:46	07:09		16:50 (1)	07:20	06:24	05:43	05:30	05:49	06:23	06:59	07:36			07:17			07:48
	17:07	17:50	14	17:04 (1)	19:27	20:05	20:41	21:03	20:54	20:14	19:18	18:24			16:44			16:37
21	07:45	07:07		16:52 (1)	07:18	06:23	05:42	05:30	05:50	06:24	07:00	07:37		17:22 (1)	07:19			07:48
	17:08	17:51	8	17:00 (1)	19:28	20:07	20:42	21:03	20:53	20:12	19:16	18:22	10	17:32 (1)	16:43			16:38
22	07:44	07:06			07:16	06:21	05:41	05:31	05:51	06:25	07:01	07:39		17:20 (1)	07:20			07:49
	17:10	17:53			19:29	20:08	20:43	21:04	20:52	20:11	19:14	18:21	15	17:35 (1)	16:42			16:38
23	07:44	07:04			07:14	06:19	05:41	05:31	05:52	06:26	07:03	07:40		17:17 (1)	07:21			07:49
	17:11	17:54			19:31	20:09	20:44	21:04	20:51	20:09	19:12	18:19	19	17:36 (1)	16:42			16:39
24	07:43	07:03			07:13	06:18	05:40	05:31	05:53	06:28	07:04	07:41		17:16 (1)	07:22			07:50
	17:12	17:56			19:32	20:10	20:45	21:04	20:50	20:07	19:11	18:17	20	17:36 (1)	16:41			16:40
25	07:42	07:01			07:11	06:16	05:39	05:31	05:54	06:29	07:05	07:42		17:15 (1)	07:24			07:50
	17:14	17:57			19:33	20:12	20:46	21:04	20:49	20:06	19:09	18:16	23	17:38 (1)	16:40			16:40
26	07:41	06:59			07:09	06:15	05:38	05:32	05:55	06:30	07:06	07:44		17:14 (1)	07:25			07:51
	17:15	17:58			19:34	20:13	20:47	21:04	20:48	20:04	19:07	18:14	24	17:38 (1)	16:40			16:41
27	07:40	06:58			07:07	06:13	05:37	05:32	05:56	06:31	07:07	07:45		17:13 (1)	07:26			07:51
	17:17	18:00			19:36	20:14	20:48	21:04	20:47	20:02	19:05	18:13	25	17:38 (1)	16:39			16:41
28	07:39	06:56			07:05	06:11	05:37	05:32	05:57	06:32	07:09	07:46		17:13 (1)	07:27			07:51
	17:18	18:01			19:37	20:15	20:49	21:04	20:46	20:00	19:03	18:11	26	17:39 (1)	16:39			16:42
29	07:38				07:03	06:10	05:36	05:33	05:58	06:33	07:10	07:48		17:13 (1)	07:29			07:51
	17:19				19:38	20:16	20:50	21:04	20:45	19:59	19:01	18:10	25	17:38 (1)	16:38			16:43
30	07:37				07:02	06:08	05:35	05:33	05:59	06:35	07:11	07:49		17:13 (1)	07:30			07:52
	17:21				19:39	20:18	20:51	21:04	20:44	19:57	18:59	18:08	26	17:39 (1)	16:38			16:44
31	07:36				07:00		05:35		06:00	06:36		07:50		17:13 (1)				07:52
	17:22				19:41		20:52		20:43	19:55		18:07	25	17:38 (1)				16:45
Potential sun hours	287	292			369	404	458	465	470	435	376	341			289			276
Total, worst case			375										238			138		

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
738 Terence Bay Wind Project

Description:
3 Turbine Wind project
Haliafx County, Nova Scotia

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+49 (0) 4936 6986-0
Kirk Schmidt / kirk.schmidt@al-pro.ca

Calculated:
2/7/2014 9:10 AM/2.9.207

SHADOW - Calendar

Calculation: Medium Worst**Shadow receptor:** H - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (9)

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:
The sun is shining all the day, from sunrise to sunset
The rotor plane is always perpendicular to the line from the WTG to the sun
The WTG is always operating

	January			February			March			April	May	June
1	07:52		15:45 (2)	07:35			06:54		17:05 (1)	06:58	06:07	05:34
	16:46	26	16:11 (2)	17:23			18:02	24	17:29 (1)	19:42	20:19	20:52
2	07:52		15:46 (2)	07:34			06:52		17:05 (1)	06:56	06:06	05:34
	16:47	25	16:11 (2)	17:25			18:04	23	17:28 (1)	19:43	20:20	20:53
3	07:52		15:46 (2)	07:33			06:51		17:06 (1)	06:54	06:04	05:33
	16:47	26	16:12 (2)	17:26			18:05	21	17:27 (1)	19:44	20:21	20:54
4	07:52		15:47 (2)	07:31			06:49		17:07 (1)	06:52	06:03	05:33
	16:48	25	16:12 (2)	17:28			18:06	18	17:25 (1)	19:46	20:22	20:55
5	07:52		15:48 (2)	07:30			06:47		17:09 (1)	06:51	06:01	05:32
	16:49	25	16:13 (2)	17:29			18:08	15	17:24 (1)	19:47	20:24	20:56
6	07:52		15:49 (2)	07:29			06:45		17:12 (1)	06:49	06:00	05:32
	16:50	24	16:13 (2)	17:31			18:09	8	17:20 (1)	19:48	20:25	20:56
7	07:52		15:49 (2)	07:28			06:44			06:47	05:59	05:31
	16:51	25	16:14 (2)	17:32			18:10			19:49	20:26	20:57
8	07:52		15:49 (2)	07:26			07:42			06:45	05:57	05:31
	16:53	24	16:13 (2)	17:33			19:12			19:51	20:27	20:58
9	07:51		15:50 (2)	07:25			07:40			06:43	05:56	05:31
	16:54	24	16:14 (2)	17:35			19:13			19:52	20:28	20:58
10	07:51		15:52 (2)	07:24			07:38			06:42	05:55	05:31
	16:55	22	16:14 (2)	17:36			19:14			19:53	20:30	20:59
11	07:51		15:52 (2)	07:22			07:36			06:40	05:53	05:30
	16:56	21	16:13 (2)	17:38			19:15			19:54	20:31	21:00
12	07:50		15:53 (2)	07:21			07:35			06:38	05:52	05:30
	16:57	21	16:14 (2)	17:39			19:17			19:55	20:32	21:00
13	07:50		15:54 (2)	07:19			07:33			06:36	05:51	05:30
	16:58	19	16:13 (2)	17:40			19:18			19:57	20:33	21:00
14	07:49		15:55 (2)	07:18			07:31			06:35	05:50	05:30
	16:59	18	16:13 (2)	17:42			19:19			19:58	20:34	21:01
15	07:49		15:56 (2)	07:17			07:29			06:33	05:49	05:30
	17:01	16	16:12 (2)	17:43			19:21			19:59	20:35	21:01
16	07:48		15:57 (2)	07:15			07:27			06:31	05:48	05:30
	17:02	14	16:11 (2)	17:45			19:22			20:00	20:37	21:02
17	07:48		15:59 (2)	07:14			07:26			06:29	05:46	05:30
	17:03	12	16:11 (2)	17:46			19:23			20:02	20:38	21:02
18	07:47		16:02 (2)	07:12		17:13 (1)	07:24			06:28	05:45	05:30
	17:04	7	16:09 (2)	17:47	10	17:23 (1)	19:24			20:03	20:39	21:02
19	07:47			07:11		17:10 (1)	07:22			06:26	05:44	05:30
	17:06			17:49	15	17:25 (1)	19:26			20:04	20:40	21:03
20	07:46			07:09		17:09 (1)	07:20			06:24	05:43	05:30
	17:07			17:50	18	17:27 (1)	19:27			20:05	20:41	21:03
21	07:45			07:07		17:07 (1)	07:18			06:23	05:42	05:30
	17:08			17:51	21	17:28 (1)	19:28			20:07	20:42	21:03
22	07:44			07:06		17:06 (1)	07:16			06:21	05:41	05:31
	17:10			17:53	22	17:28 (1)	19:29			20:08	20:43	21:04
23	07:44			07:04		17:05 (1)	07:14			06:19	05:41	05:31
	17:11			17:54	25	17:30 (1)	19:31			20:09	20:44	21:04
24	07:43			07:03		17:05 (1)	07:13			06:18	05:40	05:31
	17:12			17:56	25	17:30 (1)	19:32			20:10	20:45	21:04
25	07:42			07:01		17:04 (1)	07:11			06:16	05:39	05:31
	17:14			17:57	25	17:29 (1)	19:33			20:12	20:46	21:04
26	07:41			06:59		17:04 (1)	07:09			06:15	05:38	05:32
	17:15			17:58	26	17:30 (1)	19:34			20:13	20:47	21:04
27	07:40			06:58		17:04 (1)	07:07			06:13	05:37	05:32
	17:17			18:00	26	17:30 (1)	19:36			20:14	20:48	21:04
28	07:39			06:56		17:04 (1)	07:05			06:11	05:37	05:32
	17:18			18:01	25	17:29 (1)	19:37			20:15	20:49	21:04
29	07:38						07:03			06:10	05:36	05:33
	17:19						19:38			20:16	20:50	21:04
30	07:37						07:02			06:08	05:35	05:33
	17:21						19:39			20:18	20:51	21:04
31	07:36						07:00				05:35	
	17:22						19:41				20:52	
Potential sun hours	287			292			369			404	458	465
Total, worst case		374			238			109				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
738 Terence Bay Wind Project

Description:
3 Turbine Wind project
Haliafx County, Nova Scotia

Printed/Page
2/7/2014 9:14 AM / 11

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Calculated:
2/7/2014 9:10 AM/2.9.207

SHADOW - Calendar

Calculation: Medium Worst**Shadow receptor:** H - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (9)

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:
The sun is shining all the day, from sunrise to sunset
The rotor plane is always perpendicular to the line from the WTG to the sun
The WTG is always operating

	July	August	September	October			November			December		
1	05:34	06:01	06:37	07:12			06:52			07:31		15:34 (2)
	21:04	20:42	19:53	18:57			17:06			16:37	21	15:55 (2)
2	05:34	06:02	06:38	07:13			06:53			07:32		15:34 (2)
	21:04	20:40	19:51	18:56			17:04			16:37	22	15:56 (2)
3	05:35	06:03	06:39	07:15			06:54			07:33		15:34 (2)
	21:04	20:39	19:50	18:54			17:03			16:37	24	15:58 (2)
4	05:36	06:04	06:40	07:16			06:56			07:34		15:34 (2)
	21:04	20:38	19:48	18:52			17:01			16:36	24	15:58 (2)
5	05:36	06:06	06:42	07:17			06:57			07:35		15:35 (2)
	21:03	20:36	19:46	18:50			17:00			16:36	24	15:59 (2)
6	05:37	06:07	06:43	07:18			06:59			07:36		15:35 (2)
	21:03	20:35	19:44	18:48			16:59			16:36	24	15:59 (2)
7	05:38	06:08	06:44	07:20		17:51 (1)	07:00			07:37		15:35 (2)
	21:03	20:34	19:42	18:46	1	17:52 (1)	16:58			16:36	25	16:00 (2)
8	05:38	06:09	06:45	07:21		17:45 (1)	07:01			07:38		15:35 (2)
	21:02	20:32	19:40	18:45	12	17:57 (1)	16:56			16:35	25	16:00 (2)
9	05:39	06:10	06:46	07:22		17:42 (1)	07:03			07:39		15:35 (2)
	21:02	20:31	19:39	18:43	17	17:59 (1)	16:55			16:35	26	16:01 (2)
10	05:40	06:11	06:47	07:23		17:41 (1)	07:04			07:40		15:36 (2)
	21:01	20:29	19:37	18:41	20	18:01 (1)	16:54			16:35	25	16:01 (2)
11	05:41	06:12	06:49	07:24		17:39 (1)	07:05			07:41		15:36 (2)
	21:01	20:28	19:35	18:39	22	18:01 (1)	16:53			16:35	26	16:02 (2)
12	05:41	06:14	06:50	07:26		17:38 (1)	07:07			07:42		15:37 (2)
	21:00	20:26	19:33	18:38	24	18:02 (1)	16:52			16:35	25	16:02 (2)
13	05:42	06:15	06:51	07:27		17:37 (1)	07:08			07:43		15:36 (2)
	21:00	20:25	19:31	18:36	25	18:02 (1)	16:51			16:36	26	16:02 (2)
14	05:43	06:16	06:52	07:28		17:37 (1)	07:09			07:44		15:37 (2)
	20:59	20:23	19:29	18:34	25	18:02 (1)	16:50			16:36	26	16:03 (2)
15	05:44	06:17	06:53	07:29		17:36 (1)	07:11			07:44		15:38 (2)
	20:58	20:22	19:27	18:32	26	18:02 (1)	16:49			16:36	25	16:03 (2)
16	05:45	06:18	06:54	07:31		17:36 (1)	07:12			07:45		15:38 (2)
	20:57	20:20	19:26	18:31	26	18:02 (1)	16:48			16:36	26	16:04 (2)
17	05:46	06:19	06:56	07:32		17:36 (1)	07:13			07:46		15:38 (2)
	20:57	20:19	19:24	18:29	26	18:02 (1)	16:47			16:36	26	16:04 (2)
18	05:47	06:21	06:57	07:33		17:36 (1)	07:15			07:47		15:39 (2)
	20:56	20:17	19:22	18:27	25	18:01 (1)	16:46			16:37	26	16:05 (2)
19	05:48	06:22	06:58	07:35		17:36 (1)	07:16			07:47		15:40 (2)
	20:55	20:16	19:20	18:26	24	18:00 (1)	16:45			16:37	26	16:06 (2)
20	05:49	06:23	06:59	07:36		17:37 (1)	07:17			07:48		15:40 (2)
	20:54	20:14	19:18	18:24	23	18:00 (1)	16:44			16:37	26	16:06 (2)
21	05:50	06:24	07:00	07:37		17:38 (1)	07:19			07:48		15:41 (2)
	20:53	20:12	19:16	18:22	20	17:58 (1)	16:43			16:38	25	16:06 (2)
22	05:51	06:25	07:01	07:39		17:40 (1)	07:20			07:49		15:41 (2)
	20:52	20:11	19:14	18:21	17	17:57 (1)	16:42			16:38	25	16:06 (2)
23	05:52	06:26	07:03	07:40		17:41 (1)	07:21			07:49		15:42 (2)
	20:51	20:09	19:12	18:19	14	17:55 (1)	16:42			16:39	26	16:08 (2)
24	05:53	06:28	07:04	07:41		17:44 (1)	07:22		15:39 (2)	07:50		15:42 (2)
	20:50	20:07	19:11	18:17	7	17:51 (1)	16:41	7	15:46 (2)	16:40	26	16:08 (2)
25	05:54	06:29	07:05	07:42			07:24		15:38 (2)	07:50		15:42 (2)
	20:49	20:06	19:09	18:16			16:40	11	15:49 (2)	16:40	26	16:08 (2)
26	05:55	06:30	07:06	07:44			07:25		15:36 (2)	07:51		15:43 (2)
	20:48	20:04	19:07	18:14			16:40	14	15:50 (2)	16:41	26	16:09 (2)
27	05:56	06:31	07:07	07:45			07:26		15:35 (2)	07:51		15:43 (2)
	20:47	20:02	19:05	18:13			16:39	16	15:51 (2)	16:41	26	16:09 (2)
28	05:57	06:32	07:09	07:46			07:27		15:35 (2)	07:51		15:44 (2)
	20:46	20:00	19:03	18:11			16:39	18	15:53 (2)	16:42	25	16:09 (2)
29	05:58	06:33	07:10	07:48			07:29		15:35 (2)	07:51		15:44 (2)
	20:45	19:59	19:01	18:10			16:38	19	15:54 (2)	16:43	26	16:10 (2)
30	05:59	06:35	07:11	07:49			07:30		15:34 (2)	07:52		15:44 (2)
	20:44	19:57	18:59	18:08			16:38	21	15:55 (2)	16:44	26	16:10 (2)
31	06:00	06:36		07:50						07:52		15:45 (2)
	20:43	19:55		18:07						16:45	25	16:10 (2)
Potential sun hours	470	435	376	341			289			276		
Total, worst case					354			106			780	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

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Calculated:
2/7/2014 9:10 AM/2.9.207

SHADOW - Calendar

Calculation: Medium Worst**Shadow receptor:** I - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (10)

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:

The sun is shining all the day, from sunrise to sunset
The rotor plane is always perpendicular to the line from the WTG to the sun
The WTG is always operating

Day	January			February			March			April	May	June	July	August	September	October			November	December		
1	07:52		15:40 (2)	07:35			06:54		17:05 (1)	06:58	06:07	05:34	05:34	06:01	06:37	07:12			06:52	07:31		
	16:46	20	16:00 (2)	17:23			18:02	7	17:12 (1)	19:42	20:19	20:52	21:04	20:42	19:53	18:57			17:06	16:37		
2	07:52		15:41 (2)	07:34			06:52			06:56	06:06	05:34	05:34	06:02	06:38	07:13			06:53	07:32		15:34 (2)
	16:47	19	16:00 (2)	17:25			18:04			19:43	20:20	20:53	21:04	20:40	19:51	18:56			17:04	16:37	6	15:40 (2)
3	07:52		15:42 (2)	07:33			06:51			06:54	06:04	05:33	05:35	06:03	06:39	07:15			06:54	07:33		15:33 (2)
	16:47	19	16:01 (2)	17:26			18:05			19:44	20:21	20:54	21:04	20:39	19:50	18:54			17:03	16:36	10	15:43 (2)
4	07:52		15:43 (2)	07:31			06:49			06:52	06:03	05:33	05:36	06:04	06:40	07:16			06:56	07:34		15:32 (2)
	16:48	18	16:01 (2)	17:28			18:06			19:46	20:22	20:55	21:04	20:38	19:48	18:52			17:01	16:36	13	15:45 (2)
5	07:52		15:44 (2)	07:30			06:47			06:51	06:01	05:32	05:36	06:06	06:42	07:17			06:57	07:35		15:32 (2)
	16:49	17	16:01 (2)	17:29			18:08			19:47	20:24	20:56	21:03	20:36	19:46	18:50			17:00	16:36	14	15:46 (2)
6	07:52		15:45 (2)	07:29			06:45			06:49	06:00	05:32	05:37	06:07	06:43	07:18			06:59	07:36		15:31 (2)
	16:50	16	16:01 (2)	17:31			18:09			19:48	20:25	20:56	21:03	20:35	19:44	18:48			16:59	16:36	16	15:47 (2)
7	07:52		15:47 (2)	07:28			06:44			06:47	05:59	05:31	05:38	06:08	06:44	07:20			07:00	07:37		15:31 (2)
	16:51	14	16:01 (2)	17:32			18:10			19:49	20:26	20:57	21:03	20:34	19:42	18:46			16:58	16:36	17	15:48 (2)
8	07:52		15:47 (2)	07:26			07:42			06:45	05:57	05:31	05:38	06:09	06:45	07:21			07:01	07:38		15:31 (2)
	16:53	13	16:00 (2)	17:33			19:12			19:51	20:27	20:58	21:02	20:32	19:40	18:45			16:56	16:35	18	15:49 (2)
9	07:51		15:49 (2)	07:25			07:40			06:43	05:56	05:31	05:39	06:10	06:46	07:22			07:03	07:39		15:31 (2)
	16:54	10	15:59 (2)	17:35			19:13			19:52	20:28	20:58	21:02	20:31	19:39	18:43			16:55	16:35	19	15:50 (2)
10	07:51		15:52 (2)	07:24			07:38			06:42	05:55	05:31	05:40	06:11	06:47	07:23			07:04	07:40		15:31 (2)
	16:55	6	15:58 (2)	17:36			19:14			19:53	20:30	20:59	21:01	20:29	19:37	18:41			16:54	16:35	19	15:50 (2)
11	07:51			07:22			07:36			06:40	05:53	05:30	05:41	06:12	06:49	07:24			07:05	07:41		15:31 (2)
	16:56			17:38			19:15			19:54	20:31	21:00	21:01	20:28	19:35	18:39			16:53	16:35	20	15:51 (2)
12	07:50			07:21		17:06 (1)	07:35			06:38	05:52	05:30	05:41	06:14	06:50	07:26			07:07	07:42		15:32 (2)
	16:57			17:39	6	17:12 (1)	19:17			19:55	20:32	21:00	21:00	20:26	19:33	18:38			16:52	16:35	20	15:52 (2)
13	07:50			07:19		17:03 (1)	07:33			06:36	05:51	05:30	05:42	06:15	06:51	07:27		17:35 (1)	07:08	07:43		15:31 (2)
	16:58			17:40	13	17:16 (1)	19:18			19:57	20:33	21:00	21:00	20:25	19:31	18:36	11	17:46 (1)	16:51	16:36	21	15:52 (2)
14	07:49			07:18		17:01 (1)	07:31			06:35	05:50	05:30	05:43	06:16	06:52	07:28		17:33 (1)	07:09	07:44		15:31 (2)
	16:59			17:42	16	17:17 (1)	19:19			19:58	20:34	21:01	20:59	20:23	19:29	18:34	16	17:49 (1)	16:50	16:36	22	15:53 (2)
15	07:49			07:17		17:00 (1)	07:29			06:33	05:49	05:30	05:44	06:17	06:53	07:29		17:31 (1)	07:11	07:44		15:32 (2)
	17:01			17:43	19	17:19 (1)	19:21			19:59	20:35	21:01	20:58	20:22	19:27	18:32	19	17:50 (1)	16:49	16:36	22	15:54 (2)
16	07:48			07:15		16:58 (1)	07:27			06:31	05:48	05:30	05:45	06:18	06:54	07:31		17:29 (1)	07:12	07:45		15:32 (2)
	17:02			17:45	22	17:20 (1)	19:22			20:00	20:37	21:02	20:57	20:20	19:26	18:31	22	17:51 (1)	16:48	16:36	22	15:54 (2)
17	07:48			07:14		16:57 (1)	07:26			06:29	05:46	05:30	05:46	06:19	06:56	07:32		17:29 (1)	07:13	07:46		15:32 (2)
	17:03			17:46	23	17:20 (1)	19:23			20:02	20:38	21:02	20:57	20:19	19:24	18:29	23	17:52 (1)	16:47	16:36	22	15:54 (2)
18	07:47			07:12		16:57 (1)	07:24			06:28	05:45	05:30	05:47	06:21	06:57	07:33		17:28 (1)	07:15	07:47		15:33 (2)
	17:04			17:47	24	17:21 (1)	19:24			20:03	20:39	21:02	20:56	20:17	19:22	18:27	24	17:52 (1)	16:46	16:37	22	15:55 (2)
19	07:47			07:11		16:56 (1)	07:22			06:26	05:44	05:30	05:48	06:22	06:58	07:35		17:27 (1)	07:16	07:47		15:34 (2)
	17:06			17:49	25	17:21 (1)	19:26			20:04	20:40	21:03	20:55	20:16	19:20	18:26	25	17:52 (1)	16:45	16:37	22	15:56 (2)
20	07:46			07:09		16:56 (1)	07:20			06:24	05:43	05:30	05:49	06:23	06:59	07:36		17:27 (1)	07:17	07:48		15:34 (2)
	17:07			17:50	26	17:22 (1)	19:27			20:05	20:41	21:03	20:54	20:14	19:18	18:24	26	17:53 (1)	16:44	16:37	22	15:56 (2)
21	07:45			07:07		16:56 (1)	07:18			06:23	05:42	05:30	05:50	06:24	07:00	07:37		17:26 (1)	07:19	07:48		15:34 (2)
	17:08			17:51	26	17:22 (1)	19:28			20:07	20:42	21:03	20:53	20:12	19:16	18:22	26	17:52 (1)	16:43	16:38	23	15:57 (2)
22	07:44			07:06		16:56 (1)	07:16			06:21	05:41	05:31	05:51	06:25	07:01	07:39		17:27 (1)	07:20	07:49		15:34 (2)
	17:10			17:53	25	17:21 (1)	19:29			20:08	20:43	21:04	20:52	20:11	19:14	18:21	25	17:52 (1)	16:42	16:38	23	15:57 (2)
23	07:44			07:04		16:56 (1)	07:14			06:19	05:41	05:31	05:52	06:26	07:03	07:40		17:27 (1)	07:21	07:49		15:36 (2)
	17:11			17:54	25	17:21 (1)	19:31			20:09	20:44	21:04	20:51	20:09	19:12	18:19	25	17:52 (1)	16:42	16:39	22	15:58 (2)
24	07:43			07:03		16:56 (1)	07:13			06:18	05:40	05:31	05:53	06:28	07:04	07:41		17:27 (1)	07:22	07:50		15:36 (2)
	17:12			17:56	24	17:20 (1)	19:32			20:10	20:45	21:04	20:50	20:07	19:11	18:17	24	17:51 (1)	16:41	16:40	22	15:58 (2)
25	07:42			07:01		16:57 (1)	07:11			06:16	05:39	05:31	05:54	06:29	07:05	07:42		17:28 (1)	07:24	07:50		15:36 (2)
	17:14			17:57	22	17:19 (1)	19:33			20:12	20:46	21:04	20:49	20:06	19:09	18:16	23	17:51 (1)	16:40	16:40	22	15:58 (2)
26	07:41			06:59		16:58 (1)	07:09			06:15	05:38	05:32	05:55	06:30	07:06	07:44		17:28 (1)	07:25	07:51		15:37 (2)
	17:15			17:58	21	17:19 (1)	19:34			20:13	20:47	21:04	20:48	20:04	19:07	18:14	21	17:49 (1)	16:40	16:41	22	15:59 (2)
27	07:40			06:58		16:59 (1)	07:07			06:13	05:37	05:32	05:56	06:31	07:07	07:45		17:29 (1)	07:26	07:51		15:37 (2)
	17:17			18:00	18	17:17 (1)	19:36			20:14	20:48	21:04	20:47	20:02	19:05	18:13	19	17:48 (1)	16:39	16:41	22	15:59 (2)
28	07:39			06:56		17:01 (1)	07:05			06:11	05:37	05:32	05:57	06:32	07:09	07:46		17:31 (1)	07:27	07:51		15:38 (2)
	17:18			18:01	14	17:15 (1)	19:37			20:15	20:49	21:04	20:46	20:00	19:03	18:11	16	17:47 (1)	16:39	16:42	21	15:59 (2)
29	07:38						07:03			06:10	05:36	05:33	05:58	06:33	07:10	07:48		17:32 (1)	07:29	07:51		15:38 (2)
	17:19						19:38			20:16	20:50	21:04	20:45	19:59	19:01	18:10	12	17:44 (1)	16:38	16:43	22	16:00 (2)
30	07:37						07:02			06:08	05:35	05:33	05:59	06:35	07:11	07:49		17:37 (1)	07:30	07:52		15:39 (2)
	17:21						19:39			20:18	20:51	21:04	20:44	19:57	18:59	18:08	3	17:40 (1)	16:38	16:44	21	16:00 (2)
31	07:36						07:00				05:35		06:00	06:36		07:50				07:52		15:39 (2)
	17:22						19:41				20:52		20:43	19:55		18:07				16:45	21	16:00 (2)
Potential sun hours	287			292			369			404	458	465	470	435	376	341			289	276		
Total, worst case		152			349			7									360				588	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

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Calculated:
2/7/2014 9:10 AM/2.9.207

SHADOW - Calendar

Calculation: Medium Worst**Shadow receptor:** J - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (11)

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:
The sun is shining all the day, from sunrise to sunset
The rotor plane is always perpendicular to the line from the WTG to the sun
The WTG is always operating

Day	January			February			March			April	May	June
1	07:52		16:05 (2)	07:35			06:54		17:23 (1)	06:58	06:07	05:34
	16:46	12	16:17 (2)	17:23			18:02	17	17:40 (1)	19:42	20:19	20:52
2	07:52		16:05 (2)	07:34			06:52		17:21 (1)	06:56	06:06	05:34
	16:47	13	16:18 (2)	17:25			18:04	20	17:41 (1)	19:43	20:20	20:53
3	07:52		16:05 (2)	07:33			06:51		17:20 (1)	06:54	06:04	05:33
	16:47	14	16:19 (2)	17:26			18:05	22	17:42 (1)	19:44	20:21	20:54
4	07:52		16:05 (2)	07:31			06:49		17:19 (1)	06:52	06:03	05:33
	16:48	15	16:20 (2)	17:28			18:06	23	17:42 (1)	19:46	20:22	20:55
5	07:52		16:05 (2)	07:30			06:47		17:19 (1)	06:51	06:01	05:32
	16:49	16	16:21 (2)	17:29			18:08	25	17:44 (1)	19:47	20:24	20:56
6	07:52		16:05 (2)	07:29			06:45		17:18 (1)	06:49	06:00	05:32
	16:50	18	16:23 (2)	17:31			18:09	25	17:43 (1)	19:48	20:25	20:56
7	07:52		16:06 (2)	07:28			06:44		17:17 (1)	06:47	05:59	05:31
	16:51	18	16:24 (2)	17:32			18:10	26	17:43 (1)	19:49	20:26	20:57
8	07:51		16:05 (2)	07:26			07:42		18:17 (1)	06:45	05:57	05:31
	16:53	19	16:24 (2)	17:33			19:12	26	18:43 (1)	19:51	20:27	20:58
9	07:51		16:05 (2)	07:25			07:40		18:17 (1)	06:43	05:56	05:31
	16:54	21	16:26 (2)	17:35			19:13	25	18:42 (1)	19:52	20:28	20:58
10	07:51		16:06 (2)	07:24			07:38		18:17 (1)	06:42	05:55	05:31
	16:55	21	16:27 (2)	17:36			19:14	24	18:41 (1)	19:53	20:30	20:59
11	07:51		16:05 (2)	07:22			07:36		18:18 (1)	06:40	05:53	05:30
	16:56	23	16:28 (2)	17:38			19:15	23	18:41 (1)	19:54	20:31	21:00
12	07:50		16:06 (2)	07:21			07:35		18:19 (1)	06:38	05:52	05:30
	16:57	24	16:30 (2)	17:39			19:17	20	18:39 (1)	19:55	20:32	21:00
13	07:50		16:06 (2)	07:19			07:33		18:20 (1)	06:36	05:51	05:30
	16:58	24	16:30 (2)	17:40			19:18	18	18:38 (1)	19:57	20:33	21:00
14	07:49		16:06 (2)	07:18			07:31		18:22 (1)	06:35	05:50	05:30
	16:59	26	16:32 (2)	17:42			19:19	13	18:35 (1)	19:58	20:34	21:01
15	07:49		16:06 (2)	07:17			07:29		18:25 (1)	06:33	05:49	05:30
	17:01	26	16:32 (2)	17:43			19:21	6	18:31 (1)	19:59	20:35	21:01
16	07:48		16:06 (2)	07:15			07:27			06:31	05:48	05:30
	17:02	26	16:32 (2)	17:45			19:22			20:00	20:37	21:02
17	07:48		16:07 (2)	07:14			07:26			06:29	05:46	05:30
	17:03	26	16:33 (2)	17:46			19:23			20:02	20:38	21:02
18	07:47		16:07 (2)	07:12			07:24			06:28	05:45	05:30
	17:04	26	16:33 (2)	17:47			19:24			20:03	20:39	21:02
19	07:47		16:07 (2)	07:11			07:22			06:26	05:44	05:30
	17:06	26	16:33 (2)	17:49			19:26			20:04	20:40	21:03
20	07:46		16:08 (2)	07:09			07:20			06:24	05:43	05:30
	17:07	26	16:34 (2)	17:50			19:27			20:05	20:41	21:03
21	07:45		16:09 (2)	07:07			07:18			06:23	05:42	05:30
	17:08	25	16:34 (2)	17:51			19:28			20:07	20:42	21:03
22	07:44		16:09 (2)	07:06			07:16			06:21	05:41	05:31
	17:10	25	16:34 (2)	17:53			19:29			20:08	20:43	21:04
23	07:44		16:10 (2)	07:04			07:14			06:19	05:41	05:31
	17:11	23	16:33 (2)	17:54			19:31			20:09	20:44	21:04
24	07:43		16:10 (2)	07:03			07:13			06:18	05:40	05:31
	17:12	23	16:33 (2)	17:56			19:32			20:10	20:45	21:04
25	07:42		16:11 (2)	07:01			07:11			06:16	05:39	05:31
	17:14	22	16:33 (2)	17:57			19:33			20:11	20:46	21:04
26	07:41		16:12 (2)	06:59			07:09			06:15	05:38	05:32
	17:15	20	16:32 (2)	17:58			19:34			20:13	20:47	21:04
27	07:40		16:14 (2)	06:58		17:29 (1)	07:07			06:13	05:37	05:32
	17:17	17	16:31 (2)	18:00	5	17:34 (1)	19:36			20:14	20:48	21:04
28	07:39		16:15 (2)	06:56		17:25 (1)	07:05			06:11	05:37	05:32
	17:18	15	16:30 (2)	18:01	13	17:38 (1)	19:37			20:15	20:49	21:04
29	07:38		16:17 (2)				07:03			06:10	05:36	05:33
	17:19	12	16:29 (2)				19:38			20:16	20:50	21:04
30	07:37		16:21 (2)				07:02			06:08	05:35	05:33
	17:21	5	16:26 (2)				19:39			20:18	20:51	21:04
31	07:36						07:00				05:35	
	17:22						19:41				20:52	
Potential sun hours	287			292			369			404	458	465
Total, worst case		607			18			313				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

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Calculated:
2/7/2014 9:10 AM/2.9.207

SHADOW - Calendar

Calculation: Medium Worst**Shadow receptor:** J - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (11)

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:
The sun is shining all the day, from sunrise to sunset
The rotor plane is always perpendicular to the line from the WTG to the sun
The WTG is always operating

Day	July	August	September	Min	Flicker	October	Min	Flicker	November	Min	Flicker	December	Min	Flicker
1	05:34	06:01	06:37			07:12		17:58 (1)	06:52			07:31		15:47 (2)
	21:04	20:42	19:53			18:57	20	18:18 (1)	17:06			16:37	23	16:10 (2)
2	05:34	06:02	06:38			07:13		17:57 (1)	06:53			07:32		15:48 (2)
	21:04	20:40	19:51			18:56	22	18:19 (1)	17:04			16:37	21	16:09 (2)
3	05:35	06:03	06:39			07:15		17:56 (1)	06:54			07:33		15:49 (2)
	21:04	20:39	19:50			18:54	23	18:19 (1)	17:03			16:37	21	16:10 (2)
4	05:36	06:04	06:40			07:16		17:55 (1)	06:56			07:34		15:50 (2)
	21:04	20:38	19:48			18:52	24	18:19 (1)	17:01			16:36	19	16:09 (2)
5	05:36	06:06	06:42			07:17		17:54 (1)	06:57			07:35		15:51 (2)
	21:03	20:36	19:46			18:50	25	18:19 (1)	17:00			16:36	18	16:09 (2)
6	05:37	06:07	06:43			07:18		17:53 (1)	06:59			07:36		15:51 (2)
	21:03	20:35	19:44			18:48	26	18:19 (1)	16:59			16:36	18	16:09 (2)
7	05:38	06:08	06:44			07:20		17:54 (1)	07:00			07:37		15:52 (2)
	21:03	20:34	19:42			18:46	25	18:19 (1)	16:58			16:36	16	16:08 (2)
8	05:38	06:09	06:45			07:21		17:53 (1)	07:01			07:38		15:53 (2)
	21:02	20:32	19:40			18:45	26	18:19 (1)	16:56			16:35	15	16:08 (2)
9	05:39	06:10	06:46			07:22		17:53 (1)	07:03			07:39		15:54 (2)
	21:02	20:31	19:39			18:43	25	18:18 (1)	16:55			16:35	14	16:08 (2)
10	05:40	06:11	06:47			07:23		17:54 (1)	07:04			07:40		15:55 (2)
	21:01	20:29	19:37			18:41	23	18:17 (1)	16:54			16:35	13	16:08 (2)
11	05:41	06:12	06:49			07:24		17:55 (1)	07:05			07:41		15:56 (2)
	21:01	20:28	19:35			18:39	21	18:16 (1)	16:53			16:35	12	16:08 (2)
12	05:41	06:14	06:50			07:26		17:55 (1)	07:07		15:52 (2)	07:42		15:57 (2)
	21:00	20:26	19:33			18:38	19	18:14 (1)	16:52	6	15:58 (2)	16:35	11	16:08 (2)
13	05:42	06:15	06:51			07:27		17:56 (1)	07:08		15:49 (2)	07:43		15:57 (2)
	21:00	20:25	19:31			18:36	15	18:11 (1)	16:51	12	16:01 (2)	16:36	10	16:07 (2)
14	05:43	06:16	06:52			07:28		17:59 (1)	07:09		15:47 (2)	07:44		15:58 (2)
	20:59	20:23	19:29			18:34	11	18:10 (1)	16:50	15	16:02 (2)	16:36	10	16:08 (2)
15	05:44	06:17	06:53			07:29			07:11		15:46 (2)	07:44		15:59 (2)
	20:58	20:22	19:27			18:32			16:49	18	16:04 (2)	16:36	9	16:08 (2)
16	05:45	06:18	06:54			07:31			07:12		15:45 (2)	07:45		16:00 (2)
	20:57	20:20	19:26			18:31			16:48	20	16:05 (2)	16:36	9	16:09 (2)
17	05:46	06:19	06:56			07:32			07:13		15:45 (2)	07:46		16:00 (2)
	20:57	20:19	19:24			18:29			16:47	22	16:07 (2)	16:36	8	16:08 (2)
18	05:47	06:21	06:57			07:33			07:15		15:44 (2)	07:47		16:01 (2)
	20:56	20:17	19:22			18:27			16:46	23	16:07 (2)	16:37	8	16:09 (2)
19	05:48	06:22	06:58			07:35			07:16		15:45 (2)	07:47		16:02 (2)
	20:55	20:16	19:20			18:26			16:45	23	16:08 (2)	16:37	8	16:10 (2)
20	05:49	06:23	06:59			07:36			07:17		15:44 (2)	07:48		16:02 (2)
	20:54	20:14	19:18			18:24			16:44	25	16:09 (2)	16:37	7	16:09 (2)
21	05:50	06:24	07:00			07:37			07:19		15:44 (2)	07:48		16:03 (2)
	20:53	20:12	19:16			18:22			16:43	25	16:09 (2)	16:38	7	16:10 (2)
22	05:51	06:25	07:01			07:39			07:20		15:44 (2)	07:49		16:03 (2)
	20:52	20:11	19:14			18:21			16:42	26	16:10 (2)	16:38	7	16:10 (2)
23	05:52	06:26	07:03			07:40			07:21		15:44 (2)	07:49		16:04 (2)
	20:51	20:09	19:12			18:19			16:42	26	16:10 (2)	16:39	7	16:11 (2)
24	05:53	06:28	07:04			07:41			07:22		15:44 (2)	07:50		16:04 (2)
	20:50	20:07	19:11			18:17			16:41	26	16:10 (2)	16:40	7	16:11 (2)
25	05:54	06:29	07:05			07:42			07:24		15:45 (2)	07:50		16:04 (2)
	20:49	20:06	19:09			18:16			16:40	26	16:11 (2)	16:40	8	16:12 (2)
26	05:55	06:30	07:06			07:44			07:25		15:45 (2)	07:51		16:05 (2)
	20:48	20:04	19:07			18:14			16:40	26	16:11 (2)	16:41	8	16:13 (2)
27	05:56	06:31	07:07			07:45			07:26		15:45 (2)	07:51		16:05 (2)
	20:47	20:02	19:05			18:13			16:39	26	16:11 (2)	16:41	8	16:13 (2)
28	05:57	06:32	07:09			07:46			07:27		15:46 (2)	07:51		16:05 (2)
	20:46	20:00	19:03			18:11			16:39	26	16:12 (2)	16:42	9	16:14 (2)
29	05:58	06:33	07:10		18:03 (1)	07:48			07:29		15:47 (2)	07:51		16:05 (2)
	20:45	19:59	19:01	12	18:15 (1)	18:10			16:38	25	16:12 (2)	16:43	10	16:15 (2)
30	05:59	06:35	07:11		18:00 (1)	07:49			07:30		15:47 (2)	07:52		16:05 (2)
	20:44	19:57	18:59	17	18:17 (1)	18:08			16:38	24	16:11 (2)	16:44	10	16:15 (2)
31	06:00	06:36				07:50						07:52		16:05 (2)
	20:43	19:55				18:07						16:45	11	16:16 (2)
Potential sun hours	470	435	376			341			289			276		
Total, worst case				29			305			420			362	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
738 Terence Bay Wind Project

Description:
3 Turbine Wind project
Haliafx County, Nova Scotia

Printed/Page
2/7/2014 9:14 AM / 15

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Calculated:
2/7/2014 9:10 AM/2.9.207

SHADOW - Calendar

Calculation: Medium Worst**Shadow receptor:** K - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (12)

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:
The sun is shining all the day, from sunrise to sunset
The rotor plane is always perpendicular to the line from the WTG to the sun
The WTG is always operating

Day	January			February			March	April	May	June	July	August	September	October	November			December		
1	07:52			07:35		16:28 (1)	06:54	06:58	06:07	05:34	05:34	06:01	06:37	07:12	06:52			07:31		16:05 (1)
	16:46			17:23	10	16:38 (1)	18:02	19:42	20:19	20:52	21:04	20:42	19:53	18:57	17:06			16:37	5	16:10 (1)
2	07:52			07:34		16:31 (1)	06:52	06:56	06:05	05:34	05:34	06:02	06:38	07:13	06:53			07:32		16:07 (1)
	16:47			17:25	3	16:34 (1)	18:04	19:43	20:20	20:53	21:04	20:40	19:51	18:56	17:04			16:37	2	16:09 (1)
3	07:52			07:33			06:51	06:54	06:04	05:33	05:35	06:03	06:39	07:15	06:55			07:33		
	16:47			17:26			18:05	19:44	20:21	20:54	21:04	20:39	19:50	18:54	17:03			16:36		
4	07:52			07:31			06:49	06:52	06:03	05:33	05:36	06:04	06:40	07:16	06:56			07:34		
	16:48			17:28			18:06	19:46	20:23	20:55	21:04	20:38	19:48	18:52	17:01			16:36		
5	07:52			07:30			06:47	06:51	06:01	05:32	05:36	06:06	06:42	07:17	06:57			07:35		
	16:49			17:29			18:08	19:47	20:24	20:56	21:03	20:36	19:46	18:50	17:00			16:36		
6	07:52			07:29			06:45	06:49	06:00	05:32	05:37	06:07	06:43	07:18	06:59			07:36		
	16:50			17:31			18:09	19:48	20:25	20:56	21:03	20:35	19:44	18:48	16:59			16:36		
7	07:52			07:28			06:44	06:47	05:59	05:31	05:38	06:08	06:44	07:20	07:00			07:37		
	16:51			17:32			18:10	19:49	20:26	20:57	21:03	20:34	19:42	18:46	16:58			16:36		
8	07:52			07:26			07:42	06:45	05:57	05:31	05:38	06:09	06:45	07:21	07:01			07:38		
	16:53			17:33			19:12	19:51	20:27	20:58	21:02	20:32	19:40	18:45	16:56			16:35		
9	07:51			07:25			07:40	06:43	05:56	05:31	05:39	06:10	06:46	07:22	07:03		16:01 (1)	07:39		
	16:54			17:35			19:13	19:52	20:28	20:58	21:02	20:31	19:39	18:43	16:55	5	16:06 (1)	16:35		
10	07:51		16:26 (1)	07:24			07:38	06:42	05:55	05:30	05:40	06:11	06:47	07:23	07:04		15:59 (1)	07:40		
	16:55	1	16:27 (1)	17:36			19:14	19:53	20:30	20:59	21:01	20:29	19:37	18:41	16:54	11	16:10 (1)	16:35		
11	07:51		16:23 (1)	07:22			07:36	06:40	05:53	05:30	05:41	06:12	06:49	07:24	07:05		15:57 (1)	07:41		
	16:56	5	16:28 (1)	17:38			19:15	19:54	20:31	21:00	21:01	20:28	19:35	18:39	16:53	14	16:11 (1)	16:35		
12	07:50		16:22 (1)	07:21			07:35	06:38	05:52	05:30	05:41	06:14	06:50	07:26	07:07		15:56 (1)	07:42		
	16:57	8	16:30 (1)	17:39			19:17	19:55	20:32	21:00	21:00	20:26	19:33	18:38	16:52	17	16:13 (1)	16:35		
13	07:50		16:21 (1)	07:19			07:33	06:36	05:51	05:30	05:42	06:15	06:51	07:27	07:08		15:55 (1)	07:43		
	16:58	9	16:30 (1)	17:40			19:18	19:57	20:33	21:00	21:00	20:25	19:31	18:36	16:51	18	16:13 (1)	16:36		
14	07:49		16:21 (1)	07:18			07:31	06:35	05:50	05:30	05:43	06:16	06:52	07:28	07:09		15:54 (1)	07:44		
	16:59	11	16:32 (1)	17:42			19:19	19:58	20:34	21:01	20:59	20:23	19:29	18:34	16:50	20	16:14 (1)	16:36		
15	07:49		16:20 (1)	07:17			07:29	06:33	05:49	05:30	05:44	06:17	06:53	07:29	07:11		15:54 (1)	07:44		
	17:01	13	16:33 (1)	17:43			19:21	19:59	20:35	21:01	20:58	20:22	19:27	18:32	16:49	21	16:15 (1)	16:36		
16	07:48		16:20 (1)	07:15			07:27	06:31	05:48	05:30	05:45	06:18	06:54	07:31	07:12		15:54 (1)	07:45		
	17:02	15	16:35 (1)	17:45			19:22	20:00	20:37	21:02	20:57	20:20	19:26	18:31	16:48	21	16:15 (1)	16:36		
17	07:48		16:20 (1)	07:14			07:26	06:29	05:46	05:30	05:46	06:19	06:56	07:32	07:13		15:54 (1)	07:46		
	17:03	16	16:36 (1)	17:46			19:23	20:02	20:38	21:02	20:57	20:19	19:24	18:29	16:47	22	16:16 (1)	16:36		
18	07:47		16:19 (1)	07:12			07:24	06:28	05:45	05:30	05:47	06:21	06:57	07:33	07:15		15:54 (1)	07:47		
	17:04	18	16:37 (1)	17:47			19:24	20:03	20:39	21:02	20:56	20:17	19:22	18:27	16:46	22	16:16 (1)	16:37		
19	07:47		16:19 (1)	07:11			07:22	06:26	05:44	05:30	05:48	06:22	06:58	07:35	07:16		15:55 (1)	07:47		
	17:06	19	16:38 (1)	17:49			19:26	20:04	20:40	21:03	20:55	20:16	19:20	18:26	16:45	22	16:17 (1)	16:37		
20	07:46		16:20 (1)	07:09			07:20	06:24	05:43	05:30	05:49	06:23	06:59	07:36	07:17		15:55 (1)	07:48		
	17:07	20	16:40 (1)	17:50			19:27	20:05	20:41	21:03	20:54	20:14	19:18	18:24	16:44	21	16:16 (1)	16:37		
21	07:45		16:20 (1)	07:07			07:18	06:23	05:42	05:30	05:50	06:24	07:00	07:37	07:19		15:55 (1)	07:48		
	17:08	21	16:41 (1)	17:51			19:28	20:07	20:42	21:03	20:53	20:12	19:16	18:22	16:43	21	16:16 (1)	16:38		
22	07:44		16:20 (1)	07:06			07:16	06:21	05:41	05:30	05:51	06:25	07:01	07:39	07:20		15:56 (1)	07:49		
	17:10	21	16:41 (1)	17:53			19:29	20:08	20:43	21:04	20:52	20:11	19:14	18:21	16:42	20	16:16 (1)	16:38		
23	07:44		16:20 (1)	07:04			07:14	06:19	05:41	05:31	05:52	06:26	07:03	07:40	07:21		15:56 (1)	07:49		
	17:11	22	16:42 (1)	17:54			19:31	20:09	20:44	21:04	20:51	20:09	19:12	18:19	16:42	19	16:15 (1)	16:39		
24	07:43		16:20 (1)	07:03			07:13	06:18	05:40	05:31	05:53	06:28	07:04	07:41	07:22		15:56 (1)	07:50		
	17:12	22	16:42 (1)	17:56			19:32	20:10	20:45	21:04	20:50	20:07	19:11	18:17	16:41	18	16:14 (1)	16:39		
25	07:42		16:20 (1)	07:01			07:11	06:16	05:39	05:31	05:54	06:29	07:05	07:42	07:24		15:58 (1)	07:50		
	17:14	22	16:42 (1)	17:57			19:33	20:12	20:46	21:04	20:49	20:06	19:09	18:16	16:40	16	16:14 (1)	16:40		
26	07:41		16:21 (1)	06:59			07:09	06:15	05:38	05:32	05:55	06:30	07:06	07:44	07:25		15:58 (1)	07:51		
	17:15	21	16:42 (1)	17:58			19:34	20:13	20:47	21:04	20:48	20:04	19:07	18:14	16:40	15	16:13 (1)	16:41		
27	07:40		16:21 (1)	06:58			07:07	06:13	05:37	05:32	05:56	06:31	07:07	07:45	07:26		15:59 (1)	07:51		
	17:17	21	16:42 (1)	18:00			19:36	20:14	20:48	21:04	20:47	20:02	19:05	18:13	16:39	13	16:12 (1)	16:41		
28	07:39		16:22 (1)	06:56			07:05	06:11	05:37	05:32	05:57	06:32	07:09	07:46	07:27		16:01 (1)	07:51		
	17:18	20	16:42 (1)	18:01			19:37	20:15	20:49	21:04	20:46	20:00	19:03	18:11	16:39	11	16:12 (1)	16:42		
29	07:38		16:23 (1)				07:03	06:10	05:36	05:33	05:58	06:33	07:10	07:48	07:29		16:02 (1)	07:51		
	17:19	18	16:41 (1)				19:38	20:16	20:50	21:04	20:45	19:59	19:01	18:10	16:38	10	16:12 (1)	16:43		
30	07:37		16:24 (1)				07:02	06:08	05:35	05:33	05:59	06:35	07:11	07:49	07:30		16:03 (1)	07:52		
	17:21	17	16:41 (1)				19:39	20:18	20:51	21:04	20:44	19:57	18:59	18:08	16:38	8	16:11 (1)	16:44		
31	07:36		16:26 (1)				07:00		05:35		06:00	06:36		07:50				07:52		
	17:22	14	16:40 (1)				19:41		20:52		20:43	19:55		18:07				16:45		
Potential sun hours	287			292			369	404	458	465	470	435	376	341	289			276		
Total, worst case		354			13											365			7	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
738 Terence Bay Wind Project

Description:
3 Turbine Wind project
Haliafx County, Nova Scotia

Printed/Page
2/7/2014 9:14 AM / 16

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Calculated:
2/7/2014 9:10 AM/2.9.207

SHADOW - Calendar

Calculation: Medium Worst**Shadow receptor:** L - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (13)

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:
- The sun is shining all the day, from sunrise to sunset
- The rotor plane is always perpendicular to the line from the WTG to the sun
- The WTG is always operating

	January			February			March	April	May	June	July	August	September	October			November			December		
1	07:52		16:10 (2)	07:35			06:54	06:58	06:07	05:34	05:34	06:01	06:37	07:12			06:52			07:31		15:55 (2)
	16:46	7	16:17 (2)	17:23			18:02	19:42	20:19	20:52	21:04	20:42	19:53	18:57			17:06			16:37	15	16:10 (2)
2	07:52		16:10 (2)	07:34			06:52	06:56	06:05	05:33	05:34	06:02	06:38	07:13			06:53			07:32		15:56 (2)
	16:47	8	16:18 (2)	17:25			18:04	19:43	20:20	20:53	21:04	20:40	19:51	18:56			17:04			16:37	13	16:09 (2)
3	07:52		16:10 (2)	07:33			06:51	06:54	06:04	05:33	05:35	06:03	06:39	07:15			06:54			07:33		15:57 (2)
	16:47	9	16:19 (2)	17:26			18:05	19:44	20:21	20:54	21:04	20:39	19:50	18:54			17:03			16:36	13	16:10 (2)
4	07:52		16:11 (2)	07:31			06:49	06:52	06:03	05:33	05:36	06:04	06:40	07:16			06:56			07:34		15:57 (2)
	16:48	9	16:20 (2)	17:28			18:06	19:46	20:22	20:55	21:04	20:38	19:48	18:52			17:01			16:36	12	16:09 (2)
5	07:52		16:11 (2)	07:30			06:47	06:51	06:01	05:32	05:36	06:06	06:42	07:17			06:57			07:35		15:57 (2)
	16:49	10	16:21 (2)	17:29			18:08	19:47	20:24	20:56	21:03	20:36	19:46	18:50			17:00			16:36	12	16:09 (2)
6	07:52		16:12 (2)	07:29			06:45	06:49	06:00	05:32	05:37	06:07	06:43	07:18			06:59			07:36		15:58 (2)
	16:50	11	16:23 (2)	17:31			18:09	19:48	20:25	20:56	21:03	20:35	19:44	18:48			16:59			16:36	11	16:09 (2)
7	07:52		16:12 (2)	07:28			06:44	06:47	05:58	05:31	05:38	06:08	06:44	07:19			07:00			07:37		15:58 (2)
	16:51	12	16:24 (2)	17:32			18:10	19:49	20:26	20:57	21:03	20:34	19:42	18:46			16:58			16:36	10	16:08 (2)
8	07:51		16:12 (2)	07:26			07:42	06:45	05:57	05:31	05:38	06:09	06:45	07:21			07:01			07:38		15:59 (2)
	16:53	12	16:24 (2)	17:33			19:12	19:50	20:27	20:58	21:02	20:32	19:40	18:45			16:56			16:35	9	16:08 (2)
9	07:51		16:13 (2)	07:25			07:40	06:43	05:56	05:31	05:39	06:10	06:46	07:22			07:03			07:39		15:59 (2)
	16:54	13	16:26 (2)	17:35			19:13	19:52	20:28	20:58	21:02	20:31	19:39	18:43			16:55			16:35	9	16:08 (2)
10	07:51		16:14 (2)	07:24		17:11 (1)	07:38	06:42	05:55	05:30	05:40	06:11	06:47	07:23			07:04			07:40		16:00 (2)
	16:55	13	16:27 (2)	17:36	1	17:12 (1)	19:14	19:53	20:30	20:59	21:01	20:29	19:37	18:41			16:54			16:35	8	16:08 (2)
11	07:51		16:13 (2)	07:22		17:08 (1)	07:36	06:40	05:53	05:30	05:41	06:12	06:49	07:24			07:05			07:41		16:01 (2)
	16:56	15	16:28 (2)	17:38	5	17:13 (1)	19:15	19:54	20:31	21:00	21:01	20:28	19:35	18:39			16:53			16:35	7	16:08 (2)
12	07:50		16:14 (2)	07:21		17:07 (1)	07:35	06:38	05:52	05:30	05:41	06:14	06:50	07:26			07:07			07:42		16:02 (2)
	16:57	16	16:30 (2)	17:39	8	17:15 (1)	19:17	19:55	20:32	21:00	21:00	20:26	19:33	18:38			16:52			16:35	6	16:08 (2)
13	07:50		16:15 (2)	07:19		17:07 (1)	07:33	06:36	05:51	05:30	05:42	06:15	06:51	07:27			07:08			07:43		16:01 (2)
	16:58	15	16:30 (2)	17:40	9	17:16 (1)	19:18	19:57	20:33	21:00	21:00	20:25	19:31	18:36			16:51			16:36	6	16:07 (2)
14	07:49		16:16 (2)	07:18		17:06 (1)	07:31	06:34	05:50	05:30	05:43	06:16	06:52	07:28			07:09			07:44		16:02 (2)
	16:59	15	16:31 (2)	17:42	11	17:17 (1)	19:19	19:58	20:34	21:01	20:59	20:23	19:29	18:34			16:50			16:36	6	16:08 (2)
15	07:49		16:16 (2)	07:17		17:06 (1)	07:29	06:33	05:49	05:30	05:44	06:17	06:53	07:29			07:11			07:44		16:03 (2)
	17:01	15	16:31 (2)	17:43	14	17:20 (1)	19:21	19:59	20:35	21:01	20:58	20:22	19:27	18:32			16:49			16:36	5	16:08 (2)
16	07:48		16:17 (2)	07:15		17:05 (1)	07:27	06:31	05:47	05:30	05:45	06:18	06:54	07:31			07:12			07:45		16:04 (2)
	17:02	13	16:30 (2)	17:45	16	17:21 (1)	19:22	20:00	20:37	21:02	20:57	20:20	19:26	18:31			16:48			16:36	5	16:09 (2)
17	07:48		16:18 (2)	07:14		17:05 (1)	07:26	06:29	05:46	05:30	05:46	06:19	06:56	07:32			07:13			07:46		16:04 (2)
	17:03	13	16:31 (2)	17:46	17	17:22 (1)	19:23	20:02	20:38	21:02	20:57	20:19	19:24	18:29			16:47			16:36	4	16:08 (2)
18	07:47		16:19 (2)	07:12		17:06 (1)	07:24	06:28	05:45	05:30	05:47	06:21	06:57	07:33			07:15			07:47		16:05 (2)
	17:04	11	16:30 (2)	17:47	16	17:22 (1)	19:24	20:03	20:39	21:02	20:56	20:17	19:22	18:27			16:46			16:37	4	16:09 (2)
19	07:47		16:21 (2)	07:10		17:06 (1)	07:22	06:26	05:44	05:30	05:48	06:22	06:58	07:35			07:16			07:47		16:06 (2)
	17:06	7	16:28 (2)	17:49	15	17:21 (1)	19:26	20:04	20:40	21:03	20:55	20:16	19:20	18:26			16:45			16:37	3	16:09 (2)
20	07:46			07:09		17:08 (1)	07:20	06:24	05:43	05:30	05:49	06:23	06:59	07:36		17:44 (1)	07:17			07:48		16:06 (2)
	17:07			17:50	12	17:20 (1)	19:27	20:05	20:41	21:03	20:54	20:14	19:18	18:24	2	17:46 (1)	16:44			16:37	3	16:09 (2)
21	07:45			07:07		17:10 (1)	07:18	06:23	05:42	05:30	05:49	06:24	07:00	07:37		17:39 (1)	07:19			07:48		16:07 (2)
	17:08			17:51	8	17:18 (1)	19:28	20:07	20:42	21:03	20:53	20:12	19:16	18:22	10	17:49 (1)	16:43			16:38	3	16:10 (2)
22	07:44			07:06			07:16	06:21	05:41	05:30	05:50	06:25	07:01	07:38		17:37 (1)	07:20			07:49		16:07 (2)
	17:10			17:53			19:29	20:08	20:43	21:04	20:52	20:11	19:14	18:21	13	17:50 (1)	16:42			16:38	3	16:10 (2)
23	07:44			07:04			07:14	06:19	05:41	05:31	05:51	06:26	07:03	07:40		17:37 (1)	07:21		15:58 (2)	07:49		16:08 (2)
	17:11			17:54			19:31	20:09	20:44	21:04	20:51	20:09	19:12	18:19	15	17:52 (1)	16:42	7	16:05 (2)	16:39	3	16:11 (2)
24	07:43			07:02			07:13	06:18	05:40	05:31	05:53	06:28	07:04	07:41		17:36 (1)	07:22		15:56 (2)	07:50		16:08 (2)
	17:12			17:56			19:32	20:10	20:45	21:04	20:50	20:07	19:10	18:17	16	17:52 (1)	16:41	11	16:07 (2)	16:39	3	16:11 (2)
25	07:42			07:01			07:11	06:16	05:39	05:31	05:54	06:29	07:05	07:42		17:36 (1)	07:24		15:56 (2)	07:50		16:08 (2)
	17:14			17:57			19:33	20:11	20:46	21:04	20:49	20:06	19:09	18:16	16	17:52 (1)	16:40	13	16:09 (2)	16:40	4	16:12 (2)
26	07:41			06:59			07:09	06:15	05:38	05:32	05:55	06:30	07:06	07:44		17:35 (1)	07:25		15:56 (2)	07:51		16:09 (2)
	17:15			17:58			19:34	20:13	20:47	21:04	20:48	20:04	19:07	18:14	15	17:50 (1)	16:40	13	16:09 (2)	16:41	4	16:13 (2)
27	07:40			06:57			07:07	06:13	05:37	05:32	05:56	06:31	07:07	07:45		17:35 (1)	07:26		15:55 (2)	07:51		16:09 (2)
	17:16			18:00			19:36	20:14	20:48	21:04	20:47	20:02	19:05	18:13	13	17:48 (1)	16:39	15	16:10 (2)	16:41	4	16:13 (2)
28	07:39			06:56			07:05	06:11	05:37	05:32	05:57	06:32	07:09	07:46		17:36 (1)	07:27		15:56 (2)	07:51		16:09 (2)
	17:18			18:01			19:37	20:15	20:49	21:04	20:46	20:00	19:03	18:11	11	17:47 (1)	16:39	15	16:11 (2)	16:42	5	16:14 (2)
29	07:38						07:03	06:10	05:36	05:33	05:58	06:33	07:10	07:48		17:36 (1)	07:29		15:56 (2)	07:51		16:09 (2)
	17:19						19:38	20:16	20:50	21:04	20:45	19:59	19:01	18:10	9	17:45 (1)	16:38	16	16:12 (2)	16:43	5	16:14 (2)
30	07:37						07:01	06:08	05:35	05:33	05:59	06:35	07:11	07:49		17:37 (1)	07:30		15:55 (2)	07:52		16:09 (2)
	17:21						19:39	20:18	20:51	21:04	20:44	19:57	18:59	18:08	7	17:44 (1)	16:38	16	16:11 (2)	16:44	6	16:15 (2)
31	07:36						07:00		05:35		06:00	06:36		07:50		17:38 (1)				07:52		16:09 (2)
	17:22						19:41		20:52		20:43	19:55		18:07	4	17:42 (1)				16:44	7	16:16 (2)
Potential sun hours	287			292			369	404	458	465	470	435	376	341			289			276		
Total, worst case		224			132										131			106			208	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
738 Terence Bay Wind Project

Description:
3 Turbine Wind project
Haliafx County, Nova Scotia

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2/7/2014 9:14 AM / 17

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Calculated:
2/7/2014 9:10 AM/2.9.207

SHADOW - Calendar

Calculation: Medium Worst**Shadow receptor:** M - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (14)

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:
The sun is shining all the day, from sunrise to sunset
The rotor plane is always perpendicular to the line from the WTG to the sun
The WTG is always operating

	January	February	March	April	May	June			July	August	September	October	November	December
1	07:52	07:35	06:54	06:58	06:07	05:34			05:34	06:01	06:37	07:12	06:52	07:31
	16:46	17:24	18:02	19:42	20:19	20:53			21:04	20:42	19:53	18:58	17:06	16:37
2	07:52	07:34	06:52	06:56	06:06	05:34			05:35	06:02	06:38	07:13	06:53	07:32
	16:47	17:25	18:04	19:43	20:20	20:53			21:04	20:40	19:52	18:56	17:04	16:37
3	07:52	07:33	06:51	06:54	06:04	05:33			05:35	06:03	06:39	07:15	06:55	07:33
	16:48	17:26	18:05	19:44	20:21	20:54			21:04	20:39	19:50	18:54	17:03	16:37
4	07:52	07:31	06:49	06:52	06:03	05:33			05:36	06:05	06:41	07:16	06:56	07:34
	16:49	17:28	18:06	19:46	20:23	20:55			21:04	20:38	19:48	18:52	17:02	16:36
5	07:52	07:30	06:47	06:51	06:01	05:32			05:36	06:06	06:42	07:17	06:57	07:35
	16:50	17:29	18:08	19:47	20:24	20:56			21:03	20:36	19:46	18:50	17:00	16:36
6	07:52	07:29	06:45	06:49	06:00	05:32			05:37	06:07	06:43	07:18	06:59	07:36
	16:51	17:31	18:09	19:48	20:25	20:56			21:03	20:35	19:44	18:48	16:59	16:36
7	07:52	07:28	06:44	06:47	05:59	05:32			05:38	06:08	06:44	07:20	07:00	07:37
	16:52	17:32	18:10	19:49	20:26	20:57			21:03	20:34	19:42	18:47	16:58	16:36
8	07:52	07:26	07:42	06:45	05:57	05:31			05:38	06:09	06:45	07:21	07:01	07:38
	16:53	17:33	19:12	19:51	20:27	20:58			21:02	20:32	19:41	18:45	16:56	16:36
9	07:51	07:25	07:40	06:43	05:56	05:31			05:39	06:10	06:46	07:22	07:03	07:39
	16:54	17:35	19:13	19:52	20:29	20:58			21:02	20:31	19:39	18:43	16:55	16:36
10	07:51	07:24	07:38	06:42	05:55	05:31			05:40	06:11	06:48	07:23	07:04	07:40
	16:55	17:36	19:14	19:53	20:30	20:59			21:02	20:29	19:37	18:41	16:54	16:36
11	07:51	07:22	07:37	06:40	05:53	05:30			05:41	06:13	06:49	07:25	07:05	07:41
	16:56	17:38	19:16	19:54	20:31	21:00			21:01	20:28	19:35	18:39	16:53	16:36
12	07:50	07:21	07:35	06:38	05:52	05:30			05:42	06:14	06:50	07:26	07:07	07:42
	16:57	17:39	19:17	19:56	20:32	21:00			21:01	20:27	19:33	18:38	16:52	16:36
13	07:50	07:20	07:33	06:36	05:51	05:30			05:42	06:15	06:51	07:27	07:08	07:43
	16:58	17:41	19:18	19:57	20:33	21:00			21:00	20:25	19:31	18:36	16:51	16:36
14	07:49	07:18	07:31	06:35	05:50	05:30			05:43	06:16	06:52	07:28	07:09	07:44
	17:00	17:42	19:19	19:58	20:34	21:01			20:59	20:24	19:29	18:34	16:50	16:36
15	07:49	07:17	07:29	06:33	05:49	05:30		05:56 (3)	05:44	06:17	06:53	07:30	07:11	07:44
	17:01	17:43	19:21	19:59	20:35	21:01	3	05:59 (3)	20:58	20:22	19:28	18:32	16:49	16:36
16	07:48	07:15	07:27	06:31	05:48	05:30		05:55 (3)	05:45	06:18	06:55	07:31	07:12	07:45
	17:02	17:45	19:22	20:00	20:37	21:02	5	06:00 (3)	20:57	20:20	19:26	18:31	16:48	16:36
17	07:48	07:14	07:26	06:29	05:47	05:30		05:55 (3)	05:46	06:20	06:56	07:32	07:13	07:46
	17:03	17:46	19:23	20:02	20:38	21:02	6	06:01 (3)	20:57	20:19	19:24	18:29	16:47	16:37
18	07:47	07:12	07:24	06:28	05:46	05:30		05:55 (3)	05:47	06:21	06:57	07:33	07:15	07:47
	17:05	17:47	19:24	20:03	20:39	21:02	6	06:01 (3)	20:56	20:17	19:22	18:27	16:46	16:37
19	07:47	07:11	07:22	06:26	05:44	05:30		05:55 (3)	05:48	06:22	06:58	07:35	07:16	07:47
	17:06	17:49	19:26	20:04	20:40	21:03	6	06:01 (3)	20:55	20:16	19:20	18:26	16:45	16:37
20	07:46	07:09	07:20	06:24	05:44	05:30		05:56 (3)	05:49	06:23	06:59	07:36	07:17	07:48
	17:07	17:50	19:27	20:05	20:41	21:03	6	06:02 (3)	20:54	20:14	19:18	18:24	16:44	16:38
21	07:45	07:07	07:18	06:23	05:43	05:30		05:56 (3)	05:50	06:24	07:00	07:37	07:19	07:48
	17:09	17:52	19:28	20:07	20:42	21:03	6	06:02 (3)	20:53	20:12	19:16	18:22	16:43	16:38
22	07:44	07:06	07:16	06:21	05:42	05:31		05:56 (3)	05:51	06:25	07:02	07:39	07:20	07:49
	17:10	17:53	19:29	20:08	20:43	21:04	6	06:02 (3)	20:52	20:11	19:14	18:21	16:43	16:39
23	07:44	07:04	07:15	06:19	05:41	05:31		05:56 (3)	05:52	06:27	07:03	07:40	07:21	07:49
	17:11	17:54	19:31	20:09	20:44	21:04	6	06:02 (3)	20:51	20:09	19:12	18:19	16:42	16:39
24	07:43	07:03	07:13	06:18	05:40	05:31		05:56 (3)	05:53	06:28	07:04	07:41	07:22	07:50
	17:13	17:56	19:32	20:10	20:45	21:04	6	06:02 (3)	20:50	20:07	19:11	18:18	16:41	16:40
25	07:42	07:01	07:11	06:16	05:39	05:31		05:57 (3)	05:54	06:29	07:05	07:43	07:24	07:50
	17:14	17:57	19:33	20:12	20:46	21:04	6	06:03 (3)	20:49	20:06	19:09	18:16	16:40	16:40
26	07:41	06:59	07:09	06:15	05:38	05:32		05:57 (3)	05:55	06:30	07:06	07:44	07:25	07:51
	17:15	17:58	19:34	20:13	20:47	21:04	5	06:02 (3)	20:48	20:04	19:07	18:14	16:40	16:41
27	07:40	06:58	07:07	06:13	05:37	05:32		05:59 (3)	05:56	06:31	07:07	07:45	07:26	07:51
	17:17	18:00	19:36	20:14	20:48	21:04	3	06:02 (3)	20:47	20:02	19:05	18:13	16:39	16:42
28	07:39	06:56	07:05	06:12	05:37	05:33		06:00 (3)	05:57	06:32	07:09	07:46	07:27	07:51
	17:18	18:01	19:37	20:15	20:49	21:04	1	06:01 (3)	20:46	20:00	19:03	18:11	16:39	16:42
29	07:38		07:03	06:10	05:36	05:33			05:58	06:34	07:10	07:48	07:29	07:51
	17:19		19:38	20:16	20:50	21:04			20:45	19:59	19:01	18:10	16:38	16:43
30	07:37		07:02	06:09	05:35	05:34			05:59	06:35	07:11	07:49	07:30	07:52
	17:21		19:39	20:18	20:51	21:04			20:44	19:57	18:59	18:09	16:38	16:44
31	07:36		07:00		05:35				06:00	06:36		07:51		07:52
	17:22		19:41		20:52				20:43	19:55		18:07		16:45
Potential sun hours	287	292	369	404	458	465			470	435	376	341	289	276
Total, worst case							71							

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
738 Terence Bay Wind Project

Description:
3 Turbine Wind project
Haliafx County, Nova Scotia

Licensed user:
AL-PRO GmbH & Co.KG
Dorfstraße 100
DE-26532 Großheide
+49 (0) 4936 6986-0
Kirk Schmidt / kirk.schmidt@al-pro.ca

Calculated:
2/7/2014 9:10 AM/2.9.207

SHADOW - Calendar

Calculation: Medium Worst**Shadow receptor:** N - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (15)

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:
The sun is shining all the day, from sunrise to sunset
The rotor plane is always perpendicular to the line from the WTG to the sun
The WTG is always operating

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:52	07:35	06:54	06:58	06:07	05:34	05:34	06:01	06:37	07:12	06:52	07:31
	16:46	17:24	18:02	19:42	20:19	20:53	21:04	20:42	19:53	18:58	17:06	16:37
2	07:52	07:34	06:52	06:56	06:06	05:34	05:35	06:02	06:38	07:13	06:53	07:32
	16:47	17:25	18:04	19:43	20:20	20:53	21:04	20:40	19:52	18:56	17:04	16:37
3	07:52	07:33	06:51	06:54	06:04	05:33	05:35	06:03	06:39	07:15	06:55	07:33
	16:48	17:26	18:05	19:44	20:21	20:54	21:04	20:39	19:50	18:54	17:03	16:37
4	07:52	07:31	06:49	06:52	06:03	05:33	05:36	06:05	06:41	07:16	06:56	07:34
	16:49	17:28	18:06	19:46	20:23	20:55	21:04	20:38	19:48	18:52	17:02	16:36
5	07:52	07:30	06:47	06:51	06:01	05:32	05:36	06:06	06:42	07:17	06:57	07:35
	16:50	17:29	18:08	19:47	20:24	20:56	21:03	20:36	19:46	18:50	17:00	16:36
6	07:52	07:29	06:45	06:49	06:00	05:32	05:37	06:07	06:43	07:18	06:59	07:36
	16:51	17:31	18:09	19:48	20:25	20:56	21:03	20:35	19:44	18:48	16:59	16:36
7	07:52	07:28	06:44	06:47	05:59	05:32	05:38	06:08	06:44	07:20	07:00	07:37
	16:52	17:32	18:10	19:49	20:26	20:57	21:03	20:34	19:42	18:47	16:58	16:36
8	07:52	07:26	07:42	06:45	05:57	05:31	05:38	06:09	06:45	07:21	07:01	07:38
	16:53	17:33	19:12	19:51	20:27	20:58	21:02	20:32	19:41	18:45	16:56	16:36
9	07:51	07:25	07:40	06:43	05:56	05:31	05:39	06:10	06:46	07:22	07:03	07:39
	16:54	17:35	19:13	19:52	20:29	20:58	21:02	20:31	19:39	18:43	16:55	16:36
10	07:51	07:24	07:38	06:42	05:55	05:31	05:40	06:11	06:48	07:23	07:04	07:40
	16:55	17:36	19:14	19:53	20:30	20:59	21:02	20:29	19:37	18:41	16:54	16:36
11	07:51	07:22	07:37	06:40	05:53	05:30	05:41	06:13	06:49	07:25	07:05	07:41
	16:56	17:38	19:16	19:54	20:31	21:00	21:01	20:28	19:35	18:39	16:53	16:36
12	07:50	07:21	07:35	06:38	05:52	05:30	05:42	06:14	06:50	07:26	07:07	07:42
	16:57	17:39	19:17	19:56	20:32	21:00	21:01	20:27	19:33	18:38	16:52	16:36
13	07:50	07:20	07:33	06:36	05:51	05:30	05:42	06:15	06:51	07:27	07:08	07:43
	16:58	17:41	19:18	19:57	20:33	21:00	21:00	20:25	19:31	18:36	16:51	16:36
14	07:49	07:18	07:31	06:35	05:50	05:30	05:43	06:16	06:52	07:28	07:09	07:44
	17:00	17:42	19:19	19:58	20:34	21:01	20:59	20:24	19:29	18:34	16:50	16:36
15	07:49	07:17	07:29	06:33	05:49	05:30	05:44	06:17	06:53	07:30	07:11	07:44
	17:01	17:43	19:21	19:59	20:35	21:01	20:58	20:22	19:28	18:32	16:49	16:36
16	07:48	07:15	07:27	06:31	05:48	05:30	05:45	06:18	06:55	07:31	07:12	07:45
	17:02	17:45	19:22	20:00	20:37	21:02	20:57	20:20	19:26	18:31	16:48	16:36
17	07:48	07:14	07:26	06:29	05:47	05:30	05:46	06:20	06:56	07:32	07:13	07:46
	17:03	17:46	19:23	20:02	20:38	21:02	20:57	20:19	19:24	18:29	16:47	16:37
18	07:47	07:12	07:24	06:28	05:46	05:30	05:47	06:21	06:57	07:33	07:15	07:47
	17:05	17:47	19:24	20:03	20:39	21:02	20:56	20:17	19:22	18:27	16:46	16:37
19	07:47	07:11	07:22	06:26	05:44	05:30	05:48	06:22	06:58	07:35	07:16	07:47
	17:06	17:49	19:26	20:04	20:40	21:03	20:55	20:16	19:20	18:26	16:45	16:37
20	07:46	07:09	07:20	06:24	05:44	05:30	05:49	06:23	06:59	07:36	07:17	07:48
	17:07	17:50	19:27	20:05	20:41	21:03	20:54	20:14	19:18	18:24	16:44	16:38
21	07:45	07:07	07:18	06:23	05:43	05:30	05:50	06:24	07:00	07:37	07:19	07:48
	17:09	17:52	19:28	20:07	20:42	21:03	20:53	20:12	19:16	18:22	16:43	16:38
22	07:44	07:06	07:16	06:21	05:42	05:31	05:51	06:25	07:02	07:39	07:20	07:49
	17:10	17:53	19:29	20:08	20:43	21:04	20:52	20:11	19:14	18:21	16:43	16:39
23	07:44	07:04	07:15	06:19	05:41	05:31	05:52	06:27	07:03	07:40	07:21	07:49
	17:11	17:54	19:31	20:09	20:44	21:04	20:51	20:09	19:12	18:19	16:42	16:39
24	07:43	07:03	07:13	06:18	05:40	05:31	05:53	06:28	07:04	07:41	07:22	07:50
	17:13	17:56	19:32	20:10	20:45	21:04	20:50	20:07	19:11	18:18	16:41	16:40
25	07:42	07:01	07:11	06:16	05:39	05:31	05:54	06:29	07:05	07:43	07:24	07:50
	17:14	17:57	19:33	20:12	20:46	21:04	20:49	20:06	19:09	18:16	16:40	16:40
26	07:41	06:59	07:09	06:15	05:38	05:32	05:55	06:30	07:06	07:44	07:25	07:51
	17:15	17:58	19:34	20:13	20:47	21:04	20:48	20:04	19:07	18:14	16:40	16:41
27	07:40	06:58	07:07	06:13	05:37	05:32	05:56	06:31	07:07	07:45	07:26	07:51
	17:17	18:00	19:36	20:14	20:48	21:04	20:47	20:02	19:05	18:13	16:39	16:42
28	07:39	06:56	07:05	06:12	05:37	05:33	05:57	06:32	07:09	07:46	07:27	07:51
	17:18	18:01	19:37	20:15	20:49	21:04	20:46	20:00	19:03	18:11	16:39	16:42
29	07:38		07:03	06:10	05:36	05:33	05:58	06:34	07:10	07:48	07:29	07:51
	17:19		19:38	20:16	20:50	21:04	20:45	19:59	19:01	18:10	16:38	16:43
30	07:37		07:02	06:09	05:35	05:34	05:59	06:35	07:11	07:49	07:30	07:52
	17:21		19:39	20:18	20:51	21:04	20:44	19:57	18:59	18:09	16:38	16:44
31	07:36		07:00		05:35		06:00	06:36		07:51		07:52
	17:22		19:41		20:52		20:43	19:55		18:07		16:45
Potential sun hours	287	292	369	404	458	465	470	435	376	341	289	276
Total, worst case												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
738 Terence Bay Wind Project

Description:
3 Turbine Wind project
Haliafx County, Nova Scotia

Printed/Page
2/7/2014 9:14 AM / 19

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DE-26532 Großheide
+49 (0) 4936 6986-0
Kirk Schmidt / kirk.schmidt@al-pro.ca

Calculated:
2/7/2014 9:10 AM/2.9.207

SHADOW - Calendar

Calculation: Medium Worst**Shadow receptor:** O - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (16)

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:
The sun is shining all the day, from sunrise to sunset
The rotor plane is always perpendicular to the line from the WTG to the sun
The WTG is always operating

	January	February	March	April	May			June			July			August	September	October	November	December
1	07:52	07:35	06:54	06:58	06:07			05:34		06:00 (3)	05:34		06:07 (3)	06:01	06:37	07:12	06:52	07:31
	16:46	17:24	18:02	19:42	20:19			20:53	18	06:18 (3)	21:04	16	06:23 (3)	20:42	19:53	18:58	17:06	16:37
2	07:52	07:34	06:52	06:56	06:06			05:34		06:00 (3)	05:35		06:07 (3)	06:02	06:38	07:13	06:53	07:32
	16:47	17:25	18:04	19:43	20:20			20:53	18	06:18 (3)	21:04	17	06:24 (3)	20:40	19:52	18:56	17:04	16:37
3	07:52	07:33	06:51	06:54	06:04			05:33		06:01 (3)	05:35		06:08 (3)	06:03	06:39	07:15	06:55	07:33
	16:48	17:26	18:05	19:44	20:21			20:54	18	06:19 (3)	21:04	17	06:25 (3)	20:39	19:50	18:54	17:03	16:37
4	07:52	07:31	06:49	06:52	06:03			05:33		06:01 (3)	05:36		06:07 (3)	06:05	06:41	07:16	06:56	07:34
	16:49	17:28	18:06	19:46	20:23			20:55	17	06:18 (3)	21:04	17	06:24 (3)	20:38	19:48	18:52	17:02	16:36
5	07:52	07:30	06:47	06:51	06:01			05:32		06:01 (3)	05:36		06:08 (3)	06:06	06:42	07:17	06:57	07:35
	16:50	17:29	18:08	19:47	20:24			20:56	18	06:19 (3)	21:03	17	06:25 (3)	20:36	19:46	18:50	17:00	16:36
6	07:52	07:29	06:46	06:49	06:00			05:32		06:01 (3)	05:37		06:07 (3)	06:07	06:43	07:18	06:59	07:36
	16:51	17:31	18:09	19:48	20:25			20:56	17	06:18 (3)	21:03	18	06:25 (3)	20:35	19:44	18:48	16:59	16:36
7	07:52	07:28	06:44	06:47	05:59			05:31		06:01 (3)	05:38		06:07 (3)	06:08	06:44	07:20	07:00	07:37
	16:52	17:32	18:10	19:49	20:26			20:57	18	06:19 (3)	21:03	18	06:25 (3)	20:34	19:42	18:47	16:58	16:36
8	07:52	07:26	07:42	06:45	05:57			05:31		06:02 (3)	05:38		06:08 (3)	06:09	06:45	07:21	07:01	07:38
	16:53	17:33	19:12	19:51	20:27			20:58	17	06:19 (3)	21:02	18	06:26 (3)	20:32	19:41	18:45	16:56	16:36
9	07:51	07:25	07:40	06:43	05:56			05:31		06:02 (3)	05:39		06:07 (3)	06:10	06:46	07:22	07:03	07:39
	16:54	17:35	19:13	19:52	20:29			20:58	17	06:19 (3)	21:02	18	06:25 (3)	20:31	19:39	18:43	16:55	16:36
10	07:51	07:24	07:38	06:42	05:55			05:31		06:02 (3)	05:40		06:08 (3)	06:11	06:48	07:23	07:04	07:40
	16:55	17:36	19:14	19:53	20:30			20:59	17	06:19 (3)	21:02	18	06:26 (3)	20:29	19:37	18:41	16:54	16:36
11	07:51	07:22	07:37	06:40	05:53			05:30		06:02 (3)	05:41		06:08 (3)	06:13	06:49	07:25	07:05	07:41
	16:56	17:38	19:16	19:54	20:31			21:00	17	06:19 (3)	21:01	18	06:26 (3)	20:28	19:35	18:39	16:53	16:36
12	07:50	07:21	07:35	06:38	05:52			05:30		06:03 (3)	05:42		06:09 (3)	06:14	06:50	07:26	07:07	07:42
	16:57	17:39	19:17	19:56	20:32			21:00	16	06:19 (3)	21:01	17	06:26 (3)	20:27	19:33	18:38	16:52	16:36
13	07:50	07:20	07:33	06:36	05:51			05:30		06:03 (3)	05:42		06:09 (3)	06:15	06:51	07:27	07:08	07:43
	16:58	17:41	19:18	19:57	20:33			21:00	16	06:19 (3)	21:00	17	06:26 (3)	20:25	19:31	18:36	16:51	16:36
14	07:49	07:18	07:31	06:35	05:50			05:30		06:04 (3)	05:43		06:09 (3)	06:16	06:52	07:28	07:09	07:44
	17:00	17:42	19:19	19:58	20:34			21:01	15	06:19 (3)	20:59	17	06:26 (3)	20:24	19:29	18:34	16:50	16:36
15	07:49	07:17	07:29	06:33	05:49			05:30		06:04 (3)	05:44		06:09 (3)	06:17	06:53	07:30	07:11	07:44
	17:01	17:43	19:21	19:59	20:35			21:01	16	06:20 (3)	20:58	17	06:26 (3)	20:22	19:28	18:32	16:49	16:36
16	07:48	07:15	07:27	06:31	05:48			05:30		06:04 (3)	05:45		06:10 (3)	06:18	06:55	07:31	07:12	07:45
	17:02	17:45	19:22	20:00	20:37			21:02	16	06:20 (3)	20:57	16	06:26 (3)	20:20	19:26	18:31	16:48	16:36
17	07:48	07:14	07:26	06:29	05:47			05:30		06:04 (3)	05:46		06:10 (3)	06:20	06:56	07:32	07:13	07:46
	17:03	17:46	19:23	20:02	20:38			21:02	16	06:20 (3)	20:57	15	06:25 (3)	20:19	19:24	18:29	16:47	16:37
18	07:47	07:12	07:24	06:28	05:46			05:30		06:05 (3)	05:47		06:11 (3)	06:21	06:57	07:33	07:15	07:47
	17:05	17:47	19:24	20:03	20:39			21:02	15	06:20 (3)	20:56	14	06:25 (3)	20:17	19:22	18:27	16:46	16:37
19	07:47	07:11	07:22	06:26	05:44			05:30		06:05 (3)	05:48		06:12 (3)	06:22	06:58	07:35	07:16	07:47
	17:06	17:49	19:26	20:04	20:40			21:03	15	06:20 (3)	20:55	12	06:24 (3)	20:16	19:20	18:26	16:45	16:37
20	07:46	07:09	07:20	06:24	05:43			05:30		06:06 (3)	05:49		06:13 (3)	06:23	06:59	07:36	07:17	07:48
	17:07	17:50	19:27	20:05	20:41			21:03	15	06:21 (3)	20:54	11	06:24 (3)	20:14	19:18	18:24	16:44	16:38
21	07:45	07:07	07:18	06:23	05:43			05:30		06:06 (3)	05:50		06:15 (3)	06:24	07:00	07:37	07:19	07:48
	17:09	17:52	19:28	20:07	20:42			21:03	15	06:21 (3)	20:53	7	06:22 (3)	20:12	19:16	18:22	16:43	16:38
22	07:44	07:06	07:16	06:21	05:42		06:05 (3)	05:31		06:06 (3)	05:51		06:17 (3)	06:25	07:02	07:39	07:20	07:49
	17:10	17:53	19:29	20:08	20:43	6	06:11 (3)	21:04	15	06:21 (3)	20:52	3	06:20 (3)	20:11	19:14	18:21	16:43	16:39
23	07:44	07:04	07:15	06:19	05:41		06:03 (3)	05:31		06:06 (3)	05:52			06:27	07:03	07:40	07:21	07:49
	17:11	17:54	19:31	20:09	20:44	10	06:13 (3)	21:04	15	06:21 (3)	20:51			20:09	19:12	18:19	16:42	16:39
24	07:43	07:03	07:13	06:18	05:40		06:02 (3)	05:31		06:06 (3)	05:53			06:28	07:04	07:41	07:22	07:50
	17:13	17:56	19:32	20:10	20:45	12	06:14 (3)	21:04	15	06:21 (3)	20:50			20:07	19:11	18:18	16:41	16:40
25	07:42	07:01	07:11	06:16	05:39		06:02 (3)	05:31		06:06 (3)	05:54			06:29	07:05	07:43	07:24	07:50
	17:14	17:57	19:33	20:12	20:46	13	06:15 (3)	21:04	16	06:22 (3)	20:49			20:06	19:09	18:16	16:40	16:40
26	07:41	06:59	07:09	06:15	05:38		06:01 (3)	05:32		06:06 (3)	05:55			06:30	07:06	07:44	07:25	07:51
	17:15	17:58	19:34	20:13	20:47	15	06:16 (3)	21:04	16	06:22 (3)	20:48			20:04	19:07	18:14	16:40	16:41
27	07:40	06:58	07:07	06:13	05:37		06:01 (3)	05:32		06:07 (3)	05:56			06:31	07:07	07:45	07:26	07:51
	17:17	18:00	19:36	20:14	20:48	15	06:16 (3)	21:04	16	06:23 (3)	20:47			20:02	19:05	18:13	16:39	16:42
28	07:39	06:56	07:05	06:12	05:37		06:01 (3)	05:33		06:07 (3)	05:57			06:32	07:09	07:46	07:27	07:51
	17:18	18:01	19:37	20:15	20:49	16	06:17 (3)	21:04	16	06:23 (3)	20:46			20:00	19:03	18:11	16:39	16:42
29	07:38		07:03	06:10	05:36		06:00 (3)	05:33		06:06 (3)	05:58			06:34	07:10	07:48	07:29	07:51
	17:19		19:38	20:16	20:50	17	06:17 (3)	21:04	16	06:22 (3)	20:45			19:59	19:01	18:10	16:38	16:43
30	07:37		07:02	06:09	05:35		06:00 (3)	05:34		06:07 (3)	05:59			06:35	07:11	07:49	07:30	07:52
	17:21		19:39	20:18	20:51	17	06:17 (3)	21:04	16	06:23 (3)	20:44			19:57	18:59	18:09	16:38	16:44
31	07:36		07:00		05:35		06:00 (3)				06:00			06:36		07:51		07:52
	17:22		19:41		20:52	18	06:18 (3)				20:43			19:55		18:07		16:45
Potential sun hours	287	292	369	404	458			465			470			435	376	341	289	276
Total, worst case						139			488			338						

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
738 Terence Bay Wind Project

Description:
3 Turbine Wind project
Haliafx County, Nova Scotia

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2/7/2014 9:14 AM / 20

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Calculated:
2/7/2014 9:10 AM/2.9.207

SHADOW - Calendar

Calculation: Medium Worst**Shadow receptor:** P - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (17)

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:
The sun is shining all the day, from sunrise to sunset
The rotor plane is always perpendicular to the line from the WTG to the sun
The WTG is always operating

	January	February	March	April	May	June			July			August	September	October	November	December
1	07:52	07:35	06:54	06:58	06:07	05:34			05:34		05:58 (3)	06:01	06:37	07:12	06:52	07:31
	16:46	17:24	18:02	19:42	20:19	20:53			21:04	10	06:08 (3)	20:42	19:53	18:58	17:06	16:37
2	07:52	07:34	06:52	06:56	06:06	05:34			05:35		05:59 (3)	06:02	06:38	07:13	06:53	07:32
	16:47	17:25	18:04	19:43	20:20	20:53			21:04	9	06:08 (3)	20:40	19:52	18:56	17:04	16:37
3	07:52	07:33	06:51	06:54	06:04	05:33			05:35		06:00 (3)	06:03	06:39	07:15	06:55	07:33
	16:48	17:26	18:05	19:44	20:21	20:54			21:04	9	06:09 (3)	20:39	19:50	18:54	17:03	16:37
4	07:52	07:31	06:49	06:52	06:03	05:33			05:36		06:01 (3)	06:05	06:41	07:16	06:56	07:34
	16:49	17:28	18:06	19:46	20:23	20:55			21:04	6	06:07 (3)	20:38	19:48	18:52	17:02	16:36
5	07:52	07:30	06:47	06:51	06:01	05:32			05:36		06:02 (3)	06:06	06:42	07:17	06:57	07:35
	16:50	17:29	18:08	19:47	20:24	20:56			21:03	5	06:07 (3)	20:36	19:46	18:50	17:00	16:36
6	07:52	07:29	06:45	06:49	06:00	05:32			05:37			06:07	06:43	07:18	06:59	07:36
	16:51	17:31	18:09	19:48	20:25	20:56			21:03			20:35	19:44	18:48	16:59	16:36
7	07:52	07:28	06:44	06:47	05:59	05:31		05:57 (3)	05:38			06:08	06:44	07:20	07:00	07:37
	16:52	17:32	18:10	19:49	20:26	20:57	3	06:00 (3)	21:03			20:34	19:42	18:47	16:58	16:36
8	07:52	07:26	07:42	06:45	05:57	05:31		05:56 (3)	05:38			06:09	06:45	07:21	07:01	07:38
	16:53	17:33	19:12	19:51	20:27	20:58	6	06:02 (3)	21:02			20:32	19:41	18:45	16:56	16:36
9	07:51	07:25	07:40	06:43	05:56	05:31		05:55 (3)	05:39			06:10	06:46	07:22	07:03	07:39
	16:54	17:35	19:13	19:52	20:29	20:58	8	06:03 (3)	21:02			20:31	19:39	18:43	16:55	16:36
10	07:51	07:24	07:38	06:42	05:55	05:31		05:54 (3)	05:40			06:11	06:48	07:23	07:04	07:40
	16:55	17:36	19:14	19:53	20:30	20:59	9	06:03 (3)	21:02			20:29	19:37	18:41	16:54	16:36
11	07:51	07:22	07:37	06:40	05:53	05:30		05:54 (3)	05:41			06:13	06:49	07:25	07:05	07:41
	16:56	17:38	19:16	19:54	20:31	21:00	10	06:04 (3)	21:01			20:28	19:35	18:39	16:53	16:36
12	07:50	07:21	07:35	06:38	05:52	05:30		05:54 (3)	05:42			06:14	06:50	07:26	07:07	07:42
	16:57	17:39	19:17	19:56	20:32	21:00	11	06:05 (3)	21:01			20:27	19:33	18:38	16:52	16:36
13	07:50	07:20	07:33	06:36	05:51	05:30		05:54 (3)	05:42			06:15	06:51	07:27	07:08	07:43
	16:58	17:41	19:18	19:57	20:33	21:00	11	06:05 (3)	21:00			20:25	19:31	18:36	16:51	16:36
14	07:49	07:18	07:31	06:35	05:50	05:30		05:54 (3)	05:43			06:16	06:52	07:28	07:09	07:44
	17:00	17:42	19:19	19:58	20:34	21:01	12	06:06 (3)	20:59			20:24	19:29	18:34	16:50	16:36
15	07:49	07:17	07:29	06:33	05:49	05:30		05:54 (3)	05:44			06:17	06:53	07:30	07:11	07:44
	17:01	17:43	19:21	19:59	20:35	21:01	12	06:06 (3)	20:58			20:22	19:28	18:32	16:49	16:36
16	07:48	07:15	07:27	06:31	05:48	05:30		05:54 (3)	05:45			06:18	06:55	07:31	07:12	07:45
	17:02	17:45	19:22	20:00	20:37	21:02	13	06:07 (3)	20:57			20:20	19:26	18:31	16:48	16:36
17	07:48	07:14	07:26	06:29	05:47	05:30		05:54 (3)	05:46			06:20	06:56	07:32	07:13	07:46
	17:03	17:46	19:23	20:02	20:38	21:02	13	06:07 (3)	20:57			20:19	19:24	18:29	16:47	16:37
18	07:47	07:12	07:24	06:28	05:46	05:30		05:54 (3)	05:47			06:21	06:57	07:33	07:15	07:47
	17:05	17:47	19:24	20:03	20:39	21:02	13	06:07 (3)	20:56			20:17	19:22	18:27	16:46	16:37
19	07:47	07:11	07:22	06:26	05:44	05:30		05:54 (3)	05:48			06:22	06:58	07:35	07:16	07:47
	17:06	17:49	19:26	20:04	20:40	21:03	13	06:07 (3)	20:55			20:16	19:20	18:26	16:45	16:37
20	07:46	07:09	07:20	06:24	05:43	05:30		05:55 (3)	05:49			06:23	06:59	07:36	07:17	07:48
	17:07	17:50	19:27	20:05	20:41	21:03	13	06:08 (3)	20:54			20:14	19:18	18:24	16:44	16:38
21	07:45	07:07	07:18	06:23	05:43	05:30		05:55 (3)	05:50			06:24	07:00	07:37	07:19	07:48
	17:09	17:52	19:28	20:07	20:42	21:03	13	06:08 (3)	20:53			20:12	19:16	18:22	16:43	16:38
22	07:44	07:06	07:16	06:21	05:42	05:31		05:55 (3)	05:51			06:25	07:02	07:39	07:20	07:49
	17:10	17:53	19:29	20:08	20:43	21:04	13	06:08 (3)	20:52			20:11	19:14	18:21	16:43	16:39
23	07:44	07:04	07:15	06:19	05:41	05:31		05:55 (3)	05:52			06:27	07:03	07:40	07:21	07:49
	17:11	17:54	19:31	20:09	20:44	21:04	13	06:08 (3)	20:51			20:09	19:12	18:19	16:42	16:39
24	07:43	07:03	07:13	06:18	05:40	05:31		05:55 (3)	05:53			06:28	07:04	07:41	07:22	07:50
	17:13	17:56	19:32	20:10	20:45	21:04	13	06:08 (3)	20:50			20:07	19:11	18:18	16:41	16:40
25	07:42	07:01	07:11	06:16	05:39	05:31		05:56 (3)	05:54			06:29	07:05	07:43	07:24	07:50
	17:14	17:57	19:33	20:12	20:46	21:04	13	06:09 (3)	20:49			20:06	19:09	18:16	16:40	16:40
26	07:41	06:59	07:09	06:15	05:38	05:32		05:56 (3)	05:55			06:30	07:06	07:44	07:25	07:51
	17:15	17:58	19:34	20:13	20:47	21:04	13	06:09 (3)	20:48			20:04	19:07	18:14	16:40	16:41
27	07:40	06:58	07:07	06:13	05:37	05:32		05:57 (3)	05:56			06:31	07:07	07:45	07:26	07:51
	17:17	18:00	19:36	20:14	20:48	21:04	12	06:09 (3)	20:47			20:02	19:05	18:13	16:39	16:42
28	07:39	06:56	07:05	06:12	05:37	05:33		05:57 (3)	05:57			06:32	07:09	07:46	07:27	07:51
	17:18	18:01	19:37	20:15	20:49	21:04	12	06:09 (3)	20:46			20:00	19:03	18:11	16:39	16:42
29	07:38		07:03	06:10	05:36	05:33		05:57 (3)	05:58			06:34	07:10	07:48	07:29	07:51
	17:19		19:38	20:16	20:50	21:04	11	06:08 (3)	20:45			19:59	19:01	18:10	16:38	16:43
30	07:37		07:02	06:09	05:35	05:34		05:58 (3)	05:59			06:35	07:11	07:49	07:30	07:52
	17:21		19:39	20:18	20:51	21:04	11	06:09 (3)	20:44			19:57	18:59	18:09	16:38	16:44
31	07:36		07:00		05:35				06:00			06:36		07:51		07:52
	17:22		19:41		20:52				20:43			19:55		18:07		16:45
Potential sun hours	287	292	369	404	458	465			470			435	376	341	289	276
Total, worst case							271			39						

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
738 Terence Bay Wind Project

Description:
3 Turbine Wind project
Haliafx County, Nova Scotia

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2/7/2014 9:14 AM / 21

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Calculated:
2/7/2014 9:10 AM/2.9.207

SHADOW - Calendar

Calculation: Medium Worst**Shadow receptor:** Q - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (18)

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:
The sun is shining all the day, from sunrise to sunset
The rotor plane is always perpendicular to the line from the WTG to the sun
The WTG is always operating

	January	February	March	April	May			June			July			August	September	October	November	December
1	07:52	07:35	06:54	06:58	06:07			05:34		05:57 (3)	05:34		05:59 (3)	06:01	06:37	07:12	06:52	07:31
	16:46	17:24	18:02	19:42	20:19			20:53	8	06:05 (3)	21:04	17	06:16 (3)	20:42	19:53	18:58	17:06	16:37
2	07:52	07:34	06:52	06:56	06:06			05:34		05:57 (3)	05:35		06:00 (3)	06:02	06:38	07:13	06:53	07:32
	16:47	17:25	18:04	19:43	20:20			20:53	10	06:07 (3)	21:04	16	06:16 (3)	20:40	19:52	18:56	17:04	16:37
3	07:52	07:33	06:51	06:54	06:04			05:33		05:57 (3)	05:35		06:01 (3)	06:03	06:39	07:15	06:55	07:33
	16:48	17:26	18:05	19:44	20:21			20:54	11	06:08 (3)	21:04	16	06:17 (3)	20:39	19:50	18:54	17:03	16:37
4	07:52	07:31	06:49	06:52	06:03			05:33		05:56 (3)	05:36		06:00 (3)	06:05	06:41	07:16	06:56	07:34
	16:49	17:28	18:06	19:46	20:23			20:55	12	06:08 (3)	21:04	16	06:16 (3)	20:38	19:48	18:52	17:02	16:36
5	07:52	07:30	06:47	06:51	06:01			05:32		05:56 (3)	05:36		06:01 (3)	06:06	06:42	07:17	06:57	07:35
	16:50	17:29	18:08	19:47	20:24			20:56	13	06:09 (3)	21:03	15	06:16 (3)	20:36	19:46	18:50	17:00	16:36
6	07:52	07:29	06:45	06:49	06:00			05:32		05:55 (3)	05:37		06:01 (3)	06:07	06:43	07:18	06:59	07:36
	16:51	17:31	18:09	19:48	20:25			20:56	14	06:09 (3)	21:03	15	06:16 (3)	20:35	19:44	18:48	16:59	16:36
7	07:52	07:28	06:44	06:47	05:59			05:31		05:55 (3)	05:38		06:02 (3)	06:08	06:44	07:20	07:00	07:37
	16:52	17:32	18:10	19:49	20:26			20:57	15	06:10 (3)	21:03	14	06:16 (3)	20:34	19:42	18:47	16:58	16:36
8	07:52	07:26	07:42	06:45	05:57			05:31		05:55 (3)	05:38		06:03 (3)	06:09	06:45	07:21	07:01	07:38
	16:53	17:33	19:12	19:51	20:27			20:58	16	06:11 (3)	21:02	13	06:16 (3)	20:32	19:41	18:45	16:56	16:36
9	07:51	07:25	07:40	06:43	05:56			05:31		05:55 (3)	05:39		06:03 (3)	06:10	06:46	07:22	07:03	07:39
	16:54	17:35	19:13	19:52	20:29			20:58	16	06:11 (3)	21:02	12	06:15 (3)	20:31	19:39	18:43	16:55	16:36
10	07:51	07:24	07:38	06:42	05:55			05:31		05:55 (3)	05:40		06:04 (3)	06:11	06:48	07:23	07:04	07:40
	16:55	17:36	19:14	19:53	20:30			20:59	16	06:11 (3)	21:02	10	06:14 (3)	20:29	19:37	18:41	16:54	16:36
11	07:51	07:22	07:37	06:40	05:53			05:30		05:55 (3)	05:41		06:05 (3)	06:13	06:49	07:25	07:05	07:41
	16:56	17:38	19:16	19:54	20:31			21:00	16	06:11 (3)	21:01	9	06:14 (3)	20:28	19:35	18:39	16:53	16:36
12	07:50	07:21	07:35	06:38	05:52			05:30		05:55 (3)	05:42		06:07 (3)	06:14	06:50	07:26	07:07	07:42
	16:57	17:39	19:17	19:56	20:32			21:00	17	06:12 (3)	21:01	6	06:13 (3)	20:27	19:33	18:38	16:52	16:36
13	07:50	07:20	07:33	06:36	05:51			05:30		05:55 (3)	05:42			06:15	06:51	07:27	07:08	07:43
	16:58	17:41	19:18	19:57	20:33			21:00	17	06:12 (3)	21:00			20:25	19:31	18:36	16:51	16:36
14	07:49	07:18	07:31	06:35	05:50			05:30		05:55 (3)	05:43			06:16	06:52	07:28	07:09	07:44
	17:00	17:42	19:19	19:58	20:34			21:01	18	06:13 (3)	20:59			20:24	19:29	18:34	16:50	16:36
15	07:49	07:17	07:29	06:33	05:49			05:30		05:56 (3)	05:44			06:17	06:53	07:30	07:11	07:44
	17:01	17:43	19:21	19:59	20:35			21:01	17	06:13 (3)	20:58			20:22	19:28	18:32	16:49	16:36
16	07:48	07:15	07:27	06:31	05:48			05:30		05:56 (3)	05:45			06:18	06:55	07:31	07:12	07:45
	17:02	17:45	19:22	20:00	20:37			21:02	17	06:13 (3)	20:57			20:20	19:26	18:31	16:48	16:36
17	07:48	07:14	07:26	06:29	05:47			05:30		05:56 (3)	05:46			06:20	06:56	07:32	07:13	07:46
	17:03	17:46	19:23	20:02	20:38			21:02	17	06:13 (3)	20:57			20:19	19:24	18:29	16:47	16:37
18	07:47	07:12	07:24	06:28	05:46			05:30		05:56 (3)	05:47			06:21	06:57	07:33	07:15	07:47
	17:05	17:47	19:24	20:03	20:39			21:02	18	06:14 (3)	20:56			20:17	19:22	18:27	16:46	16:37
19	07:47	07:11	07:22	06:26	05:44			05:30		05:56 (3)	05:48			06:22	06:58	07:35	07:16	07:47
	17:06	17:49	19:26	20:04	20:40			21:03	18	06:14 (3)	20:55			20:16	19:20	18:26	16:45	16:37
20	07:46	07:09	07:20	06:24	05:43			05:30		05:57 (3)	05:49			06:23	06:59	07:36	07:17	07:48
	17:07	17:50	19:27	20:05	20:41			21:03	18	06:15 (3)	20:54			20:14	19:18	18:24	16:44	16:38
21	07:45	07:07	07:18	06:23	05:43			05:30		05:57 (3)	05:50			06:24	07:00	07:37	07:19	07:48
	17:09	17:52	19:28	20:07	20:42			21:03	18	06:15 (3)	20:53			20:12	19:16	18:22	16:43	16:38
22	07:44	07:06	07:16	06:21	05:42			05:31		05:57 (3)	05:51			06:25	07:02	07:39	07:20	07:49
	17:10	17:53	19:29	20:08	20:43			21:04	18	06:15 (3)	20:52			20:11	19:14	18:21	16:43	16:39
23	07:44	07:04	07:15	06:19	05:41			05:31		05:57 (3)	05:52			06:27	07:03	07:40	07:21	07:49
	17:11	17:54	19:31	20:09	20:44			21:04	18	06:15 (3)	20:51			20:09	19:12	18:19	16:42	16:39
24	07:43	07:03	07:13	06:18	05:40			05:31		05:57 (3)	05:53			06:28	07:04	07:41	07:22	07:50
	17:13	17:56	19:32	20:10	20:45			21:04	18	06:15 (3)	20:50			20:07	19:11	18:18	16:41	16:40
25	07:42	07:01	07:11	06:16	05:39			05:31		05:58 (3)	05:54			06:29	07:05	07:43	07:24	07:50
	17:14	17:57	19:33	20:12	20:46			21:04	17	06:15 (3)	20:49			20:06	19:09	18:16	16:40	16:40
26	07:41	06:59	07:09	06:15	05:38			05:32		05:58 (3)	05:55			06:30	07:06	07:44	07:25	07:51
	17:15	17:58	19:34	20:13	20:47			21:04	17	06:15 (3)	20:48			20:04	19:07	18:14	16:40	16:41
27	07:40	06:58	07:07	06:13	05:37			05:32		05:59 (3)	05:56			06:31	07:07	07:45	07:26	07:51
	17:17	18:00	19:36	20:14	20:48			21:04	17	06:16 (3)	20:47			20:02	19:05	18:13	16:39	16:42
28	07:39	06:56	07:05	06:12	05:37			05:33		05:58 (3)	05:57			06:32	07:09	07:46	07:27	07:51
	17:18	18:01	19:37	20:15	20:49			21:04	18	06:16 (3)	20:46			20:00	19:03	18:11	16:39	16:42
29	07:38		07:03	06:10	05:36			05:33		05:58 (3)	05:58			06:34	07:10	07:48	07:29	07:51
	17:19		19:38	20:16	20:50			21:04	17	06:15 (3)	20:45			19:59	19:01	18:10	16:38	16:43
30	07:37		07:02	06:09	05:35			05:34		05:59 (3)	05:59			06:35	07:11	07:49	07:30	07:52
	17:21		19:39	20:18	20:51			21:04	17	06:16 (3)	20:44			19:57	18:59	18:09	16:38	16:44
31	07:36		07:00		05:35		05:59 (3)				06:00			06:36		07:51		07:52
	17:22		19:41		20:52	5	06:04 (3)				20:43			19:55		18:07		16:45
Potential sun hours	287	292	369	404	458			465			470			435	376	341	289	276
Total, worst case						5			479			159						

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

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SHADOW - Calendar

Calculation: Medium Worst**Shadow receptor:** R - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (19)

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:
The sun is shining all the day, from sunrise to sunset
The rotor plane is always perpendicular to the line from the WTG to the sun
The WTG is always operating

	January	February	March	April	May	June			July			August	September	October	November	December
1	07:52	07:35	06:54	06:58	06:07	05:34			05:34		05:58 (3)	06:01	06:37	07:12	06:52	07:31
	16:46	17:24	18:02	19:42	20:19	20:53			21:04	11	06:09 (3)	20:42	19:53	18:58	17:06	16:37
2	07:52	07:34	06:52	06:56	06:06	05:34			05:35		05:59 (3)	06:02	06:38	07:13	06:53	07:32
	16:47	17:25	18:04	19:43	20:20	20:53			21:04	10	06:09 (3)	20:40	19:52	18:56	17:04	16:37
3	07:52	07:33	06:51	06:54	06:04	05:33			05:35		06:00 (3)	06:03	06:39	07:15	06:55	07:33
	16:48	17:26	18:05	19:44	20:21	20:54			21:04	9	06:09 (3)	20:39	19:50	18:54	17:03	16:37
4	07:52	07:31	06:49	06:52	06:03	05:33			05:36		06:00 (3)	06:05	06:41	07:16	06:56	07:34
	16:49	17:28	18:06	19:46	20:23	20:55			21:04	8	06:08 (3)	20:38	19:48	18:52	17:02	16:36
5	07:52	07:30	06:47	06:51	06:01	05:32			05:36		06:01 (3)	06:06	06:42	07:17	06:57	07:35
	16:50	17:29	18:08	19:47	20:24	20:56			21:03	7	06:08 (3)	20:36	19:46	18:50	17:00	16:36
6	07:52	07:29	06:45	06:49	06:00	05:32			05:37		06:02 (3)	06:07	06:43	07:18	06:59	07:36
	16:51	17:31	18:09	19:48	20:25	20:56			21:03	4	06:06 (3)	20:35	19:44	18:48	16:59	16:36
7	07:52	07:28	06:44	06:47	05:59	05:31		05:56 (3)	05:38			06:08	06:44	07:20	07:00	07:37
	16:52	17:32	18:10	19:49	20:26	20:57	5	06:01 (3)	21:03			20:34	19:42	18:47	16:58	16:36
8	07:52	07:26	07:42	06:45	05:57	05:31		05:55 (3)	05:38			06:09	06:45	07:21	07:01	07:38
	16:53	17:33	19:12	19:51	20:27	20:58	8	06:03 (3)	21:02			20:32	19:41	18:45	16:56	16:36
9	07:51	07:25	07:40	06:43	05:56	05:31		05:55 (3)	05:39			06:10	06:46	07:22	07:03	07:39
	16:54	17:35	19:13	19:52	20:29	20:58	9	06:04 (3)	21:02			20:31	19:39	18:43	16:55	16:36
10	07:51	07:24	07:38	06:42	05:55	05:31		05:54 (3)	05:40			06:11	06:48	07:23	07:04	07:40
	16:55	17:36	19:14	19:53	20:30	20:59	10	06:04 (3)	21:02			20:29	19:37	18:41	16:54	16:36
11	07:51	07:22	07:37	06:40	05:53	05:30		05:54 (3)	05:41			06:13	06:49	07:25	07:05	07:41
	16:56	17:38	19:16	19:54	20:31	21:00	11	06:05 (3)	21:01			20:28	19:35	18:39	16:53	16:36
12	07:50	07:21	07:35	06:38	05:52	05:30		05:54 (3)	05:42			06:14	06:50	07:26	07:07	07:42
	16:57	17:39	19:17	19:56	20:32	21:00	11	06:05 (3)	21:01			20:27	19:33	18:38	16:52	16:36
13	07:50	07:20	07:33	06:36	05:51	05:30		05:54 (3)	05:42			06:15	06:51	07:27	07:08	07:43
	16:58	17:41	19:18	19:57	20:33	21:00	12	06:06 (3)	21:00			20:25	19:31	18:36	16:51	16:36
14	07:49	07:18	07:31	06:35	05:50	05:30		05:54 (3)	05:43			06:16	06:52	07:28	07:09	07:44
	17:00	17:42	19:19	19:58	20:34	21:01	12	06:06 (3)	20:59			20:24	19:29	18:34	16:50	16:36
15	07:49	07:17	07:29	06:33	05:49	05:30		05:54 (3)	05:44			06:17	06:53	07:30	07:11	07:44
	17:01	17:43	19:21	19:59	20:35	21:01	13	06:07 (3)	20:58			20:22	19:28	18:32	16:49	16:36
16	07:48	07:15	07:27	06:31	05:48	05:30		05:54 (3)	05:45			06:18	06:55	07:31	07:12	07:45
	17:02	17:45	19:22	20:00	20:37	21:02	13	06:07 (3)	20:57			20:20	19:26	18:31	16:48	16:36
17	07:48	07:14	07:26	06:29	05:47	05:30		05:54 (3)	05:46			06:20	06:56	07:32	07:13	07:46
	17:03	17:46	19:23	20:02	20:38	21:02	13	06:07 (3)	20:57			20:19	19:24	18:29	16:47	16:37
18	07:47	07:12	07:24	06:28	05:46	05:30		05:54 (3)	05:47			06:21	06:57	07:33	07:15	07:47
	17:05	17:47	19:24	20:03	20:39	21:02	14	06:08 (3)	20:56			20:17	19:22	18:27	16:46	16:37
19	07:47	07:11	07:22	06:26	05:44	05:30		05:54 (3)	05:48			06:22	06:58	07:35	07:16	07:47
	17:06	17:49	19:26	20:04	20:40	21:03	14	06:08 (3)	20:55			20:16	19:20	18:26	16:45	16:37
20	07:46	07:09	07:20	06:24	05:43	05:30		05:55 (3)	05:49			06:23	06:59	07:36	07:17	07:48
	17:07	17:50	19:27	20:05	20:41	21:03	14	06:09 (3)	20:54			20:14	19:18	18:24	16:44	16:38
21	07:45	07:07	07:18	06:23	05:43	05:30		05:55 (3)	05:50			06:24	07:00	07:37	07:19	07:48
	17:09	17:52	19:28	20:07	20:42	21:03	14	06:09 (3)	20:53			20:12	19:16	18:22	16:43	16:38
22	07:44	07:06	07:16	06:21	05:42	05:31		05:55 (3)	05:51			06:25	07:02	07:39	07:20	07:49
	17:10	17:53	19:29	20:08	20:43	21:04	14	06:09 (3)	20:52			20:11	19:14	18:21	16:43	16:39
23	07:44	07:04	07:15	06:19	05:41	05:31		05:55 (3)	05:52			06:27	07:03	07:40	07:21	07:49
	17:11	17:54	19:31	20:09	20:44	21:04	14	06:09 (3)	20:51			20:09	19:12	18:19	16:42	16:39
24	07:43	07:03	07:13	06:18	05:40	05:31		05:55 (3)	05:53			06:28	07:04	07:41	07:22	07:50
	17:13	17:56	19:32	20:10	20:45	21:04	14	06:09 (3)	20:50			20:07	19:11	18:18	16:41	16:40
25	07:42	07:01	07:11	06:16	05:39	05:31		05:56 (3)	05:54			06:29	07:05	07:43	07:24	07:50
	17:14	17:57	19:33	20:12	20:46	21:04	14	06:10 (3)	20:49			20:06	19:09	18:16	16:40	16:40
26	07:41	06:59	07:09	06:15	05:38	05:32		05:56 (3)	05:55			06:30	07:06	07:44	07:25	07:51
	17:15	17:58	19:34	20:13	20:47	21:04	13	06:09 (3)	20:48			20:04	19:07	18:14	16:40	16:41
27	07:40	06:58	07:07	06:13	05:37	05:32		05:57 (3)	05:56			06:31	07:07	07:45	07:26	07:51
	17:17	18:00	19:36	20:14	20:48	21:04	13	06:10 (3)	20:47			20:02	19:05	18:13	16:39	16:42
28	07:39	06:56	07:05	06:12	05:37	05:33		05:57 (3)	05:57			06:32	07:09	07:46	07:27	07:51
	17:18	18:01	19:37	20:15	20:49	21:04	13	06:10 (3)	20:46			20:00	19:03	18:11	16:39	16:42
29	07:38		07:03	06:10	05:36	05:33		05:57 (3)	05:58			06:34	07:10	07:48	07:29	07:51
	17:19		19:38	20:16	20:50	21:04	12	06:09 (3)	20:45			19:59	19:01	18:10	16:38	16:43
30	07:37		07:02	06:09	05:35	05:34		05:58 (3)	05:59			06:35	07:11	07:49	07:30	07:52
	17:21		19:39	20:18	20:51	21:04	12	06:10 (3)	20:44			19:57	18:59	18:09	16:38	16:44
31	07:36		07:00		05:35				06:00			06:36		07:51		07:52
	17:22		19:41		20:52				20:43			19:55		18:07		16:45
Potential sun hours	287	292	369	404	458	465			470			435	376	341	289	276
Total, worst case							292			49						

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
738 Terence Bay Wind Project

Description:
3 Turbine Wind project
Haliafx County, Nova Scotia

Printed/Page
2/7/2014 9:14 AM / 23

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Calculated:
2/7/2014 9:10 AM/2.9.207

SHADOW - Calendar

Calculation: Medium Worst**Shadow receptor:** S - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (20)

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:

The sun is shining all the day, from sunrise to sunset

The rotor plane is always perpendicular to the line from the WTG to the sun

The WTG is always operating

	January	February	March	April	May			June			July			August	September	October	November	December
1	07:52	07:35	06:54	06:58	06:07			05:34		06:10 (3)	05:34			06:01	06:37	07:12	06:52	07:31
	16:46	17:24	18:02	19:42	20:19			20:53	14	06:24 (3)	21:04			20:42	19:53	18:58	17:06	16:37
2	07:52	07:34	06:52	06:56	06:06			05:34		06:11 (3)	05:35			06:02	06:38	07:13	06:53	07:32
	16:47	17:25	18:04	19:43	20:20			20:53	13	06:24 (3)	21:04			20:40	19:52	18:56	17:04	16:37
3	07:52	07:33	06:51	06:54	06:04			05:33		06:12 (3)	05:35			06:03	06:39	07:15	06:55	07:33
	16:48	17:26	18:05	19:44	20:21			20:54	12	06:24 (3)	21:04			20:39	19:50	18:54	17:03	16:37
4	07:52	07:31	06:49	06:52	06:03			05:33		06:12 (3)	05:36			06:05	06:41	07:16	06:56	07:34
	16:49	17:28	18:06	19:46	20:23			20:55	11	06:23 (3)	21:04			20:38	19:48	18:52	17:02	16:36
5	07:52	07:30	06:47	06:51	06:01			05:32		06:14 (3)	05:36		06:23 (3)	06:06	06:42	07:17	06:57	07:35
	16:50	17:29	18:08	19:47	20:24			20:56	8	06:22 (3)	21:03	2	06:25 (3)	20:36	19:46	18:50	17:00	16:36
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	16:51	17:31	18:09	19:48	20:25			20:56	7	06:21 (3)	21:03	6	06:27 (3)	20:35	19:44	18:48	16:59	16:36
7	07:52	07:28	06:44	06:47	05:59			05:31		06:16 (3)	05:38		06:20 (3)	06:08	06:44	07:20	07:00	07:37
	16:52	17:32	18:10	19:49	20:26			20:57	4	06:20 (3)	21:03	8	06:28 (3)	20:34	19:42	18:47	16:58	16:36
8	07:52	07:26	07:42	06:45	05:57			05:31			05:38		06:20 (3)	06:09	06:45	07:21	07:01	07:38
	16:53	17:33	19:12	19:51	20:27			20:58			21:02	10	06:30 (3)	20:32	19:41	18:45	16:56	16:36
9	07:51	07:25	07:40	06:43	05:56			05:31			05:39		06:19 (3)	06:10	06:46	07:22	07:03	07:39
	16:54	17:35	19:13	19:52	20:29			20:58			21:02	11	06:30 (3)	20:31	19:39	18:43	16:55	16:36
10	07:51	07:24	07:38	06:42	05:55			05:31			05:40		06:18 (3)	06:11	06:48	07:23	07:04	07:40
	16:55	17:36	19:14	19:53	20:30			20:59			21:02	13	06:31 (3)	20:29	19:37	18:41	16:54	16:36
11	07:51	07:22	07:37	06:40	05:53			05:30			05:41		06:18 (3)	06:13	06:49	07:25	07:05	07:41
	16:56	17:38	19:16	19:54	20:31			21:00			21:01	14	06:32 (3)	20:28	19:35	18:39	16:53	16:36
12	07:50	07:21	07:35	06:38	05:52			05:30			05:42		06:18 (3)	06:14	06:50	07:26	07:07	07:42
	16:57	17:39	19:17	19:56	20:32			21:00			21:01	15	06:33 (3)	20:27	19:33	18:38	16:52	16:36
13	07:50	07:20	07:33	06:36	05:51			05:30			05:42		06:18 (3)	06:15	06:51	07:27	07:08	07:43
	16:58	17:41	19:18	19:57	20:33			21:00			21:00	15	06:33 (3)	20:25	19:31	18:36	16:51	16:36
14	07:49	07:18	07:31	06:35	05:50		06:12 (3)	05:30			05:43		06:17 (3)	06:16	06:52	07:28	07:09	07:44
	17:00	17:42	19:19	19:58	20:34	8	06:20 (3)	21:01			20:59	16	06:33 (3)	20:24	19:29	18:34	16:50	16:36
15	07:49	07:17	07:29	06:33	05:49		06:11 (3)	05:30			05:44		06:17 (3)	06:17	06:53	07:30	07:11	07:44
	17:01	17:43	19:21	19:59	20:35	11	06:22 (3)	21:01			20:58	17	06:34 (3)	20:22	19:28	18:32	16:49	16:36
16	07:48	07:15	07:27	06:31	05:48		06:10 (3)	05:30			05:45		06:17 (3)	06:18	06:55	07:31	07:12	07:45
	17:02	17:45	19:22	20:00	20:37	13	06:23 (3)	21:02			20:57	17	06:34 (3)	20:20	19:26	18:31	16:48	16:36
17	07:48	07:14	07:26	06:29	05:47		06:09 (3)	05:30			05:46		06:17 (3)	06:20	06:56	07:32	07:13	07:46
	17:03	17:46	19:23	20:02	20:38	15	06:24 (3)	21:02			20:57	18	06:35 (3)	20:19	19:24	18:29	16:47	16:37
18	07:47	07:12	07:24	06:28	05:46		06:08 (3)	05:30			05:47		06:17 (3)	06:21	06:57	07:33	07:15	07:47
	17:05	17:47	19:24	20:03	20:39	17	06:25 (3)	21:02			20:56	18	06:35 (3)	20:17	19:22	18:27	16:46	16:37
19	07:47	07:11	07:22	06:26	05:44		06:08 (3)	05:30			05:48		06:17 (3)	06:22	06:58	07:35	07:16	07:47
	17:06	17:49	19:26	20:04	20:40	17	06:25 (3)	21:03			20:55	19	06:36 (3)	20:16	19:20	18:26	16:45	16:37
20	07:46	07:09	07:20	06:24	05:43		06:07 (3)	05:30			05:49		06:17 (3)	06:23	06:59	07:36	07:17	07:48
	17:07	17:50	19:27	20:05	20:41	18	06:25 (3)	21:03			20:54	19	06:36 (3)	20:14	19:18	18:24	16:44	16:38
21	07:45	07:07	07:18	06:23	05:43		06:07 (3)	05:30			05:50		06:17 (3)	06:24	07:00	07:37	07:19	07:48
	17:09	17:52	19:28	20:07	20:42	18	06:25 (3)	21:03			20:53	19	06:36 (3)	20:12	19:16	18:22	16:43	16:38
22	07:44	07:06	07:16	06:21	05:42		06:07 (3)	05:31			05:51		06:17 (3)	06:25	07:02	07:39	07:20	07:49
	17:10	17:53	19:29	20:08	20:43	18	06:25 (3)	21:04			20:52	19	06:36 (3)	20:11	19:14	18:21	16:43	16:39
23	07:44	07:04	07:15	06:19	05:41		06:06 (3)	05:31			05:52		06:18 (3)	06:27	07:03	07:40	07:21	07:49
	17:11	17:54	19:31	20:09	20:44	19	06:25 (3)	21:04			20:51	18	06:36 (3)	20:09	19:12	18:19	16:42	16:39
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	17:13	17:56	19:32	20:10	20:45	19	06:25 (3)	21:04			20:50	18	06:36 (3)	20:07	19:11	18:18	16:41	16:40
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	17:14	17:57	19:33	20:12	20:46	19	06:26 (3)	21:04			20:49	17	06:35 (3)	20:06	19:09	18:16	16:40	16:40
26	07:41	06:59	07:09	06:15	05:38		06:07 (3)	05:32			05:55		06:19 (3)	06:30	07:06	07:44	07:25	07:51
	17:15	17:58	19:34	20:13	20:47	19	06:26 (3)	21:04			20:48	16	06:35 (3)	20:04	19:07	18:14	16:40	16:41
27	07:40	06:58	07:07	06:13	05:37		06:07 (3)	05:32			05:56		06:20 (3)	06:31	07:07	07:45	07:26	07:51
	17:17	18:00	19:36	20:14	20:48	18	06:25 (3)	21:04			20:47	14	06:34 (3)	20:02	19:05	18:13	16:39	16:42
28	07:39	06:56	07:05	06:12	05:37		06:08 (3)	05:33			05:57		06:21 (3)	06:32	07:09	07:46	07:27	07:51
	17:18	18:01	19:37	20:15	20:49	18	06:26 (3)	21:04			20:46	12	06:33 (3)	20:00	19:03	18:11	16:39	16:42
29	07:38		07:03	06:10	05:36		06:08 (3)	05:33			05:58		06:22 (3)	06:34	07:10	07:48	07:29	07:51
	17:19		19:38	20:16	20:50	17	06:25 (3)	21:04			20:45	10	06:32 (3)	19:59	19:01	18:10	16:38	16:43
30	07:37		07:02	06:09	05:35		06:08 (3)	05:34			05:59		06:24 (3)	06:35	07:11	07:49	07:30	07:52
	17:21		19:39	20:18	20:51	16	06:24 (3)	21:04			20:44	6	06:30 (3)	19:57	18:59	18:09	16:38	16:44
31	07:36		07:00		05:35		06:09 (3)				06:00			06:36		07:51		07:52
	17:22		19:41		20:52	16	06:25 (3)				20:43			19:55		18:07		16:45
Potential sun hours	287	292	369	404	458			465			470			435	376	341	289	276
Total, worst case						296			69			367						

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
738 Terence Bay Wind Project

Description:
3 Turbine Wind project
Haliafx County, Nova Scotia

Printed/Page
2/7/2014 9:14 AM / 24

Licensed user:
AL-PRO GmbH & Co.KG
Dorfstraße 100
DE-26532 Großheide
+49 (0) 4936 6986-0
Kirk Schmidt / kirk.schmidt@al-pro.ca

Calculated:
2/7/2014 9:10 AM/2.9.207

SHADOW - Calendar

Calculation: Medium Worst**Shadow receptor:** T - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (21)

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:
The sun is shining all the day, from sunrise to sunset
The rotor plane is always perpendicular to the line from the WTG to the sun
The WTG is always operating

	January	February	March	April	May			June			July			August	September	October	November	December
1	07:52	07:35	06:54	06:58	06:07			05:34		06:05 (3)	05:34		06:14 (3)	06:01	06:37	07:12	06:52	07:31
	16:46	17:24	18:02	19:42	20:19			20:53	17	06:22 (3)	21:04	11	06:25 (3)	20:42	19:53	18:58	17:06	16:37
2	07:52	07:34	06:52	06:56	06:06			05:34		06:06 (3)	05:35		06:14 (3)	06:02	06:38	07:13	06:53	07:32
	16:47	17:25	18:04	19:43	20:20			20:53	17	06:23 (3)	21:04	12	06:26 (3)	20:40	19:52	18:56	17:04	16:37
3	07:52	07:33	06:51	06:54	06:04			05:33		06:06 (3)	05:35		06:15 (3)	06:03	06:39	07:15	06:55	07:33
	16:48	17:26	18:05	19:44	20:21			20:54	17	06:23 (3)	21:04	12	06:27 (3)	20:39	19:50	18:54	17:03	16:37
4	07:52	07:31	06:49	06:52	06:03			05:33		06:06 (3)	05:36		06:14 (3)	06:05	06:41	07:16	06:56	07:34
	16:49	17:28	18:06	19:46	20:23			20:55	16	06:22 (3)	21:04	13	06:27 (3)	20:38	19:48	18:52	17:02	16:36
5	07:52	07:30	06:47	06:51	06:01			05:32		06:07 (3)	05:36		06:14 (3)	06:06	06:42	07:17	06:57	07:35
	16:50	17:29	18:08	19:47	20:24			20:56	16	06:23 (3)	21:03	14	06:28 (3)	20:36	19:46	18:50	17:00	16:36
6	07:52	07:29	06:45	06:49	06:00			05:32		06:07 (3)	05:37		06:13 (3)	06:07	06:43	07:18	06:59	07:36
	16:51	17:31	18:09	19:48	20:25			20:56	15	06:22 (3)	21:03	15	06:28 (3)	20:35	19:44	18:48	16:59	16:36
7	07:52	07:28	06:44	06:47	05:59			05:31		06:08 (3)	05:38		06:13 (3)	06:08	06:44	07:20	07:00	07:37
	16:52	17:32	18:10	19:49	20:26			20:57	14	06:22 (3)	21:03	16	06:29 (3)	20:34	19:42	18:47	16:58	16:36
8	07:52	07:26	07:42	06:45	05:57			05:31		06:09 (3)	05:38		06:14 (3)	06:09	06:45	07:21	07:01	07:38
	16:53	17:33	19:12	19:51	20:27			20:58	13	06:22 (3)	21:02	16	06:30 (3)	20:32	19:41	18:45	16:56	16:36
9	07:51	07:25	07:40	06:43	05:56			05:31		06:09 (3)	05:39		06:13 (3)	06:10	06:46	07:22	07:03	07:39
	16:54	17:35	19:13	19:52	20:29			20:58	13	06:22 (3)	21:02	16	06:29 (3)	20:31	19:39	18:43	16:55	16:36
10	07:51	07:24	07:38	06:42	05:55			05:31		06:09 (3)	05:40		06:13 (3)	06:11	06:48	07:23	07:04	07:40
	16:55	17:36	19:14	19:53	20:30			20:59	12	06:21 (3)	21:02	17	06:30 (3)	20:29	19:37	18:41	16:54	16:36
11	07:51	07:22	07:37	06:40	05:53			05:30		06:10 (3)	05:41		06:13 (3)	06:13	06:49	07:25	07:05	07:41
	16:56	17:38	19:16	19:54	20:31			21:00	11	06:21 (3)	21:01	18	06:31 (3)	20:28	19:35	18:39	16:53	16:36
12	07:50	07:21	07:35	06:38	05:52			05:30		06:11 (3)	05:42		06:13 (3)	06:14	06:50	07:26	07:07	07:42
	16:57	17:39	19:17	19:56	20:32			21:00	10	06:21 (3)	21:01	18	06:31 (3)	20:27	19:33	18:38	16:52	16:36
13	07:50	07:20	07:33	06:36	05:51			05:30		06:11 (3)	05:42		06:13 (3)	06:15	06:51	07:27	07:08	07:43
	16:58	17:41	19:18	19:57	20:33			21:00	10	06:21 (3)	21:00	19	06:32 (3)	20:25	19:31	18:36	16:51	16:36
14	07:49	07:18	07:31	06:35	05:50			05:30		06:12 (3)	05:43		06:13 (3)	06:16	06:52	07:28	07:09	07:44
	17:00	17:42	19:19	19:58	20:34			21:01	9	06:21 (3)	20:59	18	06:31 (3)	20:24	19:29	18:34	16:50	16:36
15	07:49	07:17	07:29	06:33	05:49			05:30		06:13 (3)	05:44		06:13 (3)	06:17	06:53	07:30	07:11	07:44
	17:01	17:43	19:21	19:59	20:35			21:01	8	06:21 (3)	20:58	19	06:32 (3)	20:22	19:28	18:32	16:49	16:36
16	07:48	07:15	07:27	06:31	05:48			05:30		06:13 (3)	05:45		06:13 (3)	06:18	06:55	07:31	07:12	07:45
	17:02	17:45	19:22	20:00	20:37			21:02	7	06:20 (3)	20:57	19	06:32 (3)	20:20	19:26	18:31	16:48	16:36
17	07:48	07:14	07:26	06:29	05:47		06:09 (3)	05:30		06:14 (3)	05:46		06:13 (3)	06:20	06:56	07:32	07:13	07:46
	17:03	17:46	19:23	20:02	20:38	8	06:17 (3)	21:02	6	06:20 (3)	20:57	19	06:32 (3)	20:19	19:24	18:29	16:47	16:37
18	07:47	07:12	07:24	06:28	05:46		06:08 (3)	05:30		06:14 (3)	05:47		06:14 (3)	06:21	06:57	07:33	07:15	07:47
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19	07:47	07:11	07:22	06:26	05:44		06:07 (3)	05:30		06:14 (3)	05:48		06:14 (3)	06:22	06:58	07:35	07:16	07:47
	17:06	17:49	19:26	20:04	20:40	13	06:20 (3)	21:03	6	06:20 (3)	20:55	18	06:32 (3)	20:16	19:20	18:26	16:45	16:37
20	07:46	07:09	07:20	06:24	05:43		06:06 (3)	05:30		06:16 (3)	05:49		06:14 (3)	06:23	06:59	07:36	07:17	07:48
	17:07	17:50	19:27	20:05	20:41	14	06:20 (3)	21:03	5	06:21 (3)	20:54	18	06:32 (3)	20:14	19:18	18:24	16:44	16:38
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26	07:41	06:59	07:09	06:15	05:38		06:04 (3)	05:32		06:15 (3)	05:55		06:19 (3)	06:30	07:06	07:44	07:25	07:51
	17:15	17:58	19:34	20:13	20:47	19	06:23 (3)	21:04	7	06:22 (3)	20:48	10	06:29 (3)	20:04	19:07	18:14	16:40	16:41
27	07:40	06:58	07:07	06:13	05:37		06:04 (3)	05:32		06:16 (3)	05:56		06:21 (3)	06:31	07:07	07:45	07:26	07:51
	17:17	18:00	19:36	20:14	20:48	18	06:22 (3)	21:04	7	06:23 (3)	20:47	5	06:26 (3)	20:02	19:05	18:13	16:39	16:42
28	07:39	06:56	07:05	06:12	05:37		06:04 (3)	05:33		06:15 (3)	05:57			06:32	07:09	07:46	07:27	07:51
	17:18	18:01	19:37	20:15	20:49	19	06:23 (3)	21:04	9	06:24 (3)	20:46			20:00	19:03	18:11	16:39	16:42
29	07:38		07:03	06:10	05:36		06:04 (3)	05:33		06:15 (3)	05:58			06:34	07:10	07:48	07:29	07:51
	17:19		19:38	20:16	20:50	19	06:23 (3)	21:04	9	06:24 (3)	20:45			19:59	19:01	18:10	16:38	16:43
30	07:37		07:02	06:09	05:35		06:04 (3)	05:34		06:15 (3)	05:59			06:35	07:11	07:49	07:30	07:52
	17:21		19:39	20:18	20:51	18	06:22 (3)	21:04	10	06:25 (3)	20:44			19:57	18:59	18:09	16:38	16:44
31	07:36		07:00		05:35		06:05 (3)				06:00			06:36		07:51		07:52
	17:22		19:41		20:52	18	06:23 (3)				20:43			19:55		18:07		16:45
Potential sun hours	287	292	369	404	458			465			470			435	376	341	289	276
Total, worst case						245			298			416						

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
738 Terence Bay Wind Project

Description:
3 Turbine Wind project
Haliafx County, Nova Scotia

Printed/Page
2/7/2014 9:14 AM / 25

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Calculated:
2/7/2014 9:10 AM/2.9.207

SHADOW - Calendar

Calculation: Medium Worst**Shadow receptor:** U - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (22)

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:
The sun is shining all the day, from sunrise to sunset
The rotor plane is always perpendicular to the line from the WTG to the sun
The WTG is always operating

	January	February	March	April	May			June			July			August	September	October	November	December
1	07:52	07:35	06:54	06:58	06:07			05:34		06:01 (3)	05:34		06:09 (3)	06:01	06:37	07:12	06:52	07:31
	16:46	17:24	18:02	19:42	20:19			20:53	19	06:20 (3)	21:04	16	06:25 (3)	20:42	19:53	18:58	17:06	16:37
2	07:52	07:34	06:52	06:56	06:06			05:34		06:02 (3)	05:35		06:09 (3)	06:02	06:38	07:13	06:53	07:32
	16:47	17:25	18:04	19:43	20:20			20:53	19	06:21 (3)	21:04	17	06:26 (3)	20:40	19:52	18:56	17:04	16:37
3	07:52	07:33	06:51	06:54	06:04			05:33		06:03 (3)	05:35		06:10 (3)	06:03	06:39	07:15	06:55	07:33
	16:48	17:26	18:05	19:44	20:21			20:54	18	06:21 (3)	21:04	16	06:26 (3)	20:39	19:50	18:54	17:03	16:37
4	07:52	07:31	06:49	06:52	06:03			05:33		06:02 (3)	05:36		06:09 (3)	06:05	06:41	07:16	06:56	07:34
	16:49	17:28	18:06	19:46	20:23			20:55	19	06:21 (3)	21:04	17	06:26 (3)	20:38	19:48	18:52	17:02	16:36
5	07:52	07:30	06:47	06:51	06:01			05:32		06:03 (3)	05:36		06:10 (3)	06:06	06:42	07:17	06:57	07:35
	16:50	17:29	18:08	19:47	20:24			20:56	18	06:21 (3)	21:03	17	06:27 (3)	20:36	19:46	18:50	17:00	16:36
6	07:52	07:29	06:45	06:49	06:00			05:32		06:03 (3)	05:37		06:09 (3)	06:07	06:43	07:18	06:59	07:36
	16:51	17:31	18:09	19:48	20:25			20:56	18	06:21 (3)	21:03	18	06:27 (3)	20:35	19:44	18:48	16:59	16:36
7	07:52	07:28	06:44	06:47	05:59			05:31		06:03 (3)	05:38		06:09 (3)	06:08	06:44	07:20	07:00	07:37
	16:52	17:32	18:10	19:49	20:26			20:57	18	06:21 (3)	21:03	18	06:27 (3)	20:34	19:42	18:47	16:58	16:36
8	07:52	07:26	07:42	06:45	05:57			05:31		06:04 (3)	05:38		06:10 (3)	06:09	06:45	07:21	07:01	07:38
	16:53	17:33	19:12	19:51	20:27			20:58	17	06:21 (3)	21:02	18	06:28 (3)	20:32	19:41	18:45	16:56	16:36
9	07:51	07:25	07:40	06:43	05:56			05:31		06:05 (3)	05:39		06:09 (3)	06:10	06:46	07:22	07:03	07:39
	16:54	17:35	19:13	19:52	20:29			20:58	16	06:21 (3)	21:02	19	06:28 (3)	20:31	19:39	18:43	16:55	16:36
10	07:51	07:24	07:38	06:42	05:55			05:31		06:04 (3)	05:40		06:09 (3)	06:11	06:48	07:23	07:04	07:40
	16:55	17:36	19:14	19:53	20:30			20:59	17	06:21 (3)	21:02	19	06:28 (3)	20:29	19:37	18:41	16:54	16:36
11	07:51	07:22	07:37	06:40	05:53			05:30		06:05 (3)	05:41		06:10 (3)	06:13	06:49	07:25	07:05	07:41
	16:56	17:38	19:16	19:54	20:31			21:00	16	06:21 (3)	21:01	19	06:29 (3)	20:28	19:35	18:39	16:53	16:36
12	07:50	07:21	07:35	06:38	05:52			05:30		06:05 (3)	05:42		06:10 (3)	06:14	06:50	07:26	07:07	07:42
	16:57	17:39	19:17	19:56	20:32			21:00	16	06:21 (3)	21:01	19	06:29 (3)	20:27	19:33	18:38	16:52	16:36
13	07:50	07:20	07:33	06:36	05:51			05:30		06:06 (3)	05:42		06:10 (3)	06:15	06:51	07:27	07:08	07:43
	16:58	17:41	19:18	19:57	20:33			21:00	15	06:21 (3)	21:00	19	06:29 (3)	20:25	19:31	18:36	16:51	16:36
14	07:49	07:18	07:31	06:35	05:50			05:30		06:06 (3)	05:43		06:10 (3)	06:16	06:52	07:28	07:09	07:44
	17:00	17:42	19:19	19:58	20:34			21:01	15	06:21 (3)	20:59	18	06:28 (3)	20:24	19:29	18:34	16:50	16:36
15	07:49	07:17	07:29	06:33	05:49			05:30		06:06 (3)	05:44		06:10 (3)	06:17	06:53	07:30	07:11	07:44
	17:01	17:43	19:21	19:59	20:35			21:01	15	06:21 (3)	20:58	19	06:29 (3)	20:22	19:28	18:32	16:49	16:36
16	07:48	07:15	07:27	06:31	05:48			05:30		06:07 (3)	05:45		06:11 (3)	06:18	06:55	07:31	07:12	07:45
	17:02	17:45	19:22	20:00	20:37			21:02	14	06:21 (3)	20:57	18	06:29 (3)	20:20	19:26	18:31	16:48	16:36
17	07:48	07:14	07:26	06:29	05:47			05:30		06:07 (3)	05:46		06:11 (3)	06:20	06:56	07:32	07:13	07:46
	17:03	17:46	19:23	20:02	20:38			21:02	14	06:21 (3)	20:57	18	06:29 (3)	20:19	19:24	18:29	16:47	16:37
18	07:47	07:12	07:24	06:28	05:46			05:30		06:07 (3)	05:47		06:12 (3)	06:21	06:57	07:33	07:15	07:47
	17:05	17:47	19:24	20:03	20:39			21:02	14	06:21 (3)	20:56	17	06:29 (3)	20:17	19:22	18:27	16:46	16:37
19	07:47	07:11	07:22	06:26	05:44			05:30		06:07 (3)	05:48		06:12 (3)	06:22	06:58	07:35	07:16	07:47
	17:06	17:49	19:26	20:04	20:40			21:03	14	06:21 (3)	20:55	16	06:28 (3)	20:16	19:20	18:26	16:45	16:37
20	07:46	07:09	07:20	06:24	05:43		06:06 (3)	05:30		06:09 (3)	05:49		06:13 (3)	06:23	06:59	07:36	07:17	07:48
	17:07	17:50	19:27	20:05	20:41	8	06:14 (3)	21:03	13	06:22 (3)	20:54	15	06:28 (3)	20:14	19:18	18:24	16:44	16:38
21	07:45	07:07	07:18	06:23	05:43		06:05 (3)	05:30		06:09 (3)	05:50		06:14 (3)	06:24	07:00	07:37	07:19	07:48
	17:09	17:52	19:28	20:07	20:42	11	06:16 (3)	21:03	13	06:22 (3)	20:53	13	06:27 (3)	20:12	19:16	18:22	16:43	16:38
22	07:44	07:06	07:16	06:21	05:42		06:04 (3)	05:31		06:09 (3)	05:51		06:15 (3)	06:25	07:02	07:39	07:20	07:49
	17:10	17:53	19:29	20:08	20:43	13	06:17 (3)	21:04	13	06:22 (3)	20:52	12	06:27 (3)	20:11	19:14	18:21	16:43	16:39
23	07:44	07:04	07:15	06:19	05:41		06:03 (3)	05:31		06:09 (3)	05:52		06:16 (3)	06:27	07:03	07:40	07:21	07:49
	17:11	17:54	19:31	20:09	20:44	14	06:17 (3)	21:04	13	06:22 (3)	20:51	10	06:26 (3)	20:09	19:12	18:19	16:42	16:39
24	07:43	07:03	07:13	06:18	05:40		06:02 (3)	05:31		06:08 (3)	05:53		06:18 (3)	06:28	07:04	07:41	07:22	07:50
	17:13	17:56	19:32	20:10	20:45	16	06:18 (3)	21:04	14	06:22 (3)	20:50	6	06:24 (3)	20:07	19:11	18:18	16:41	16:40
25	07:42	07:01	07:11	06:16	05:39		06:02 (3)	05:31		06:09 (3)	05:54			06:29	07:05	07:43	07:24	07:50
	17:14	17:57	19:33	20:12	20:46	17	06:19 (3)	21:04	14	06:23 (3)	20:49			20:06	19:09	18:16	16:40	16:40
26	07:41	06:59	07:09	06:15	05:38		06:02 (3)	05:32		06:09 (3)	05:55			06:30	07:06	07:44	07:25	07:51
	17:15	17:58	19:34	20:13	20:47	17	06:19 (3)	21:04	14	06:23 (3)	20:48			20:04	19:07	18:14	16:40	16:41
27	07:40	06:58	07:07	06:13	05:37		06:01 (3)	05:32		06:10 (3)	05:56			06:31	07:07	07:45	07:26	07:51
	17:17	18:00	19:36	20:14	20:48	18	06:19 (3)	21:04	14	06:24 (3)	20:47			20:02	19:05	18:13	16:39	16:42
28	07:39	06:56	07:05	06:12	05:37		06:02 (3)	05:33		06:09 (3)	05:57			06:32	07:09	07:46	07:27	07:51
	17:18	18:01	19:37	20:15	20:49	18	06:20 (3)	21:04	15	06:24 (3)	20:46			20:00	19:03	18:11	16:39	16:42
29	07:38		07:03	06:10	05:36		06:02 (3)	05:33		06:09 (3)	05:58			06:34	07:10	07:48	07:29	07:51
	17:19		19:38	20:16	20:50	18	06:20 (3)	21:04	15	06:24 (3)	20:45			19:59	19:01	18:10	16:38	16:43
30	07:37		07:02	06:09	05:35		06:01 (3)	05:34		06:09 (3)	05:59			06:35	07:11	07:49	07:30	07:52
	17:21		19:39	20:18	20:51	19	06:20 (3)	21:04	16	06:25 (3)	20:44			19:57	18:59	18:09	16:38	16:44
31	07:36		07:00		05:35		06:02 (3)				06:00			06:36		07:51		07:52
	17:22		19:41		20:52	19	06:21 (3)				20:43			19:55		18:07		16:45
Potential sun hours	287	292	369	404	458			465			470			435	376	341	289	276
Total, worst case						188			466			394						

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
738 Terence Bay Wind Project

Description:
3 Turbine Wind project
Haliafx County, Nova Scotia

Printed/Page
2/7/2014 9:14 AM / 26

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Kirk Schmidt / kirk.schmidt@al-pro.ca

Calculated:
2/7/2014 9:10 AM/2.9.207

SHADOW - Calendar

Calculation: Medium Worst**Shadow receptor:** V - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (23)

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:
The sun is shining all the day, from sunrise to sunset
The rotor plane is always perpendicular to the line from the WTG to the sun
The WTG is always operating

	January	February	March	April	May			June			July			August	September	October	November	December
1	07:52	07:35	06:54	06:58	06:07			05:34		05:58 (3)	05:34		06:04 (3)	06:01	06:37	07:12	06:52	07:31
	16:46	17:24	18:02	19:42	20:19			20:53	18	06:16 (3)	21:04	18	06:22 (3)	20:42	19:53	18:58	17:06	16:37
2	07:52	07:34	06:52	06:56	06:06			05:34		05:59 (3)	05:35		06:05 (3)	06:02	06:38	07:13	06:53	07:32
	16:47	17:25	18:04	19:43	20:20			20:53	18	06:17 (3)	21:04	18	06:23 (3)	20:40	19:52	18:56	17:04	16:37
3	07:52	07:33	06:51	06:54	06:04			05:33		05:59 (3)	05:35		06:05 (3)	06:03	06:39	07:15	06:55	07:33
	16:48	17:26	18:05	19:44	20:21			20:54	19	06:18 (3)	21:04	19	06:24 (3)	20:39	19:50	18:54	17:03	16:37
4	07:52	07:31	06:49	06:52	06:03			05:33		05:59 (3)	05:36		06:05 (3)	06:05	06:41	07:16	06:56	07:34
	16:49	17:28	18:06	19:46	20:23			20:55	18	06:17 (3)	21:04	18	06:23 (3)	20:38	19:48	18:52	17:02	16:36
5	07:52	07:30	06:47	06:51	06:01			05:32		05:59 (3)	05:36		06:05 (3)	06:06	06:42	07:17	06:57	07:35
	16:50	17:29	18:08	19:47	20:24			20:56	19	06:18 (3)	21:03	19	06:24 (3)	20:36	19:46	18:50	17:00	16:36
6	07:52	07:29	06:45	06:49	06:00			05:32		05:59 (3)	05:37		06:05 (3)	06:07	06:43	07:18	06:59	07:36
	16:51	17:31	18:09	19:48	20:25			20:56	18	06:17 (3)	21:03	19	06:24 (3)	20:35	19:44	18:48	16:59	16:36
7	07:52	07:28	06:44	06:47	05:59			05:31		05:59 (3)	05:38		06:05 (3)	06:08	06:44	07:20	07:00	07:37
	16:52	17:32	18:10	19:49	20:26			20:57	19	06:18 (3)	21:03	19	06:24 (3)	20:34	19:42	18:47	16:58	16:36
8	07:52	07:26	07:42	06:45	05:57			05:31		06:00 (3)	05:38		06:06 (3)	06:09	06:45	07:21	07:01	07:38
	16:53	17:33	19:12	19:51	20:27			20:58	18	06:18 (3)	21:02	18	06:24 (3)	20:32	19:41	18:45	16:56	16:36
9	07:51	07:25	07:40	06:43	05:56			05:31		06:00 (3)	05:39		06:05 (3)	06:10	06:46	07:22	07:03	07:39
	16:54	17:35	19:13	19:52	20:29			20:58	19	06:19 (3)	21:02	19	06:24 (3)	20:31	19:39	18:43	16:55	16:36
10	07:51	07:24	07:38	06:42	05:55			05:31		05:59 (3)	05:40		06:06 (3)	06:11	06:48	07:23	07:04	07:40
	16:55	17:36	19:14	19:53	20:30			20:59	19	06:18 (3)	21:02	18	06:24 (3)	20:29	19:37	18:41	16:54	16:36
11	07:51	07:22	07:37	06:40	05:53			05:30		06:00 (3)	05:41		06:07 (3)	06:13	06:49	07:25	07:05	07:41
	16:56	17:38	19:16	19:54	20:31			21:00	18	06:18 (3)	21:01	17	06:24 (3)	20:28	19:35	18:39	16:53	16:36
12	07:50	07:21	07:35	06:38	05:52			05:30		06:00 (3)	05:42		06:07 (3)	06:14	06:50	07:26	07:07	07:42
	16:57	17:39	19:17	19:56	20:32			21:00	19	06:19 (3)	21:01	18	06:25 (3)	20:27	19:33	18:38	16:52	16:36
13	07:50	07:20	07:33	06:36	05:51			05:30		06:01 (3)	05:42		06:08 (3)	06:15	06:51	07:27	07:08	07:43
	16:58	17:41	19:18	19:57	20:33			21:00	18	06:19 (3)	21:00	17	06:25 (3)	20:25	19:31	18:36	16:51	16:36
14	07:49	07:18	07:31	06:35	05:50			05:30		06:01 (3)	05:43		06:07 (3)	06:16	06:52	07:28	07:09	07:44
	17:00	17:42	19:19	19:58	20:34			21:01	18	06:19 (3)	20:59	17	06:24 (3)	20:24	19:29	18:34	16:50	16:36
15	07:49	07:17	07:29	06:33	05:49			05:30		06:01 (3)	05:44		06:08 (3)	06:17	06:53	07:30	07:11	07:44
	17:01	17:43	19:21	19:59	20:35			21:01	18	06:19 (3)	20:58	15	06:23 (3)	20:22	19:28	18:32	16:49	16:36
16	07:48	07:15	07:27	06:31	05:48			05:30		06:01 (3)	05:45		06:09 (3)	06:18	06:55	07:31	07:12	07:45
	17:02	17:45	19:22	20:00	20:37			21:02	18	06:19 (3)	20:57	14	06:23 (3)	20:20	19:26	18:31	16:48	16:36
17	07:48	07:14	07:26	06:29	05:47			05:30		06:02 (3)	05:46		06:10 (3)	06:20	06:56	07:32	07:13	07:46
	17:03	17:46	19:23	20:02	20:38			21:02	17	06:19 (3)	20:57	13	06:23 (3)	20:19	19:24	18:29	16:47	16:37
18	07:47	07:12	07:24	06:28	05:46			05:30		06:02 (3)	05:47		06:11 (3)	06:21	06:57	07:33	07:15	07:47
	17:05	17:47	19:24	20:03	20:39			21:02	18	06:20 (3)	20:56	11	06:22 (3)	20:17	19:22	18:27	16:46	16:37
19	07:47	07:11	07:22	06:26	05:44			05:30		06:02 (3)	05:48		06:12 (3)	06:22	06:58	07:35	07:16	07:47
	17:06	17:49	19:26	20:04	20:40			21:03	18	06:20 (3)	20:55	9	06:21 (3)	20:16	19:20	18:26	16:45	16:37
20	07:46	07:09	07:20	06:24	05:43			05:30		06:03 (3)	05:49		06:14 (3)	06:23	06:59	07:36	07:17	07:48
	17:07	17:50	19:27	20:05	20:41			21:03	18	06:21 (3)	20:54	5	06:19 (3)	20:14	19:18	18:24	16:44	16:38
21	07:45	07:07	07:18	06:23	05:43			05:30		06:03 (3)	05:50			06:24	07:00	07:37	07:19	07:48
	17:09	17:52	19:28	20:07	20:42			21:03	18	06:21 (3)	20:53			20:12	19:16	18:22	16:43	16:38
22	07:44	07:06	07:16	06:21	05:42			05:31		06:03 (3)	05:51			06:25	07:02	07:39	07:20	07:49
	17:10	17:53	19:29	20:08	20:43			21:04	18	06:21 (3)	20:52			20:11	19:14	18:21	16:43	16:39
23	07:44	07:04	07:15	06:19	05:41			05:31		06:03 (3)	05:52			06:27	07:03	07:40	07:21	07:49
	17:11	17:54	19:31	20:09	20:44			21:04	18	06:21 (3)	20:51			20:09	19:12	18:19	16:42	16:39
24	07:43	07:03	07:13	06:18	05:40		06:03 (3)	05:31		06:03 (3)	05:53			06:28	07:04	07:41	07:22	07:50
	17:13	17:56	19:32	20:10	20:45	7	06:10 (3)	21:04	18	06:21 (3)	20:50			20:07	19:11	18:18	16:41	16:40
25	07:42	07:01	07:11	06:16	05:39		06:02 (3)	05:31		06:04 (3)	05:54			06:29	07:05	07:43	07:24	07:50
	17:14	17:57	19:33	20:12	20:46	10	06:12 (3)	21:04	17	06:21 (3)	20:49			20:06	19:09	18:16	16:40	16:40
26	07:41	06:59	07:09	06:15	05:38		06:01 (3)	05:32		06:03 (3)	05:55			06:30	07:06	07:44	07:25	07:51
	17:15	17:58	19:34	20:13	20:47	12	06:13 (3)	21:04	18	06:21 (3)	20:48			20:04	19:07	18:14	16:40	16:41
27	07:40	06:58	07:07	06:13	05:37		06:00 (3)	05:32		06:04 (3)	05:56			06:31	07:07	07:45	07:26	07:51
	17:17	18:00	19:36	20:14	20:48	13	06:13 (3)	21:04	18	06:22 (3)	20:47			20:02	19:05	18:13	16:39	16:42
28	07:39	06:56	07:05	06:12	05:37		06:00 (3)	05:33		06:04 (3)	05:57			06:32	07:09	07:46	07:27	07:51
	17:18	18:01	19:37	20:15	20:49	15	06:15 (3)	21:04	18	06:22 (3)	20:46			20:00	19:03	18:11	16:39	16:42
29	07:38		07:03	06:10	05:36		05:59 (3)	05:33		06:04 (3)	05:58			06:34	07:10	07:48	07:29	07:51
	17:19		19:38	20:16	20:50	16	06:15 (3)	21:04	18	06:22 (3)	20:45			19:59	19:01	18:10	16:38	16:43
30	07:37		07:02	06:09	05:35		05:59 (3)	05:34		06:04 (3)	05:59			06:35	07:11	07:49	07:30	07:52
	17:21		19:39	20:18	20:51	16	06:15 (3)	21:04	19	06:23 (3)	20:44			19:57	18:59	18:09	16:38	16:44
31	07:36		07:00		05:35		05:59 (3)				06:00			06:36		07:51		07:52
	17:22		19:41		20:52	17	06:16 (3)				20:43			19:55		18:07		16:45
Potential sun hours	287	292	369	404	458			465			470			435	376	341	289	276
Total, worst case						106			545			321						

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

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SHADOW - Calendar

Calculation: Medium Worst**Shadow receptor:** W - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (24)

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:
The sun is shining all the day, from sunrise to sunset
The rotor plane is always perpendicular to the line from the WTG to the sun
The WTG is always operating

	January	February	March	April	May			June			July			August	September	October	November	December
1	07:52	07:35	06:54	06:58	06:07			05:34		05:57 (3)	05:34		06:00 (3)	06:01	06:37	07:12	06:52	07:31
	16:46	17:24	18:02	19:42	20:19			20:53	12	06:09 (3)	21:04	18	06:18 (3)	20:42	19:53	18:58	17:06	16:37
2	07:52	07:34	06:52	06:56	06:06			05:34		05:57 (3)	05:35		06:01 (3)	06:02	06:38	07:13	06:53	07:32
	16:47	17:25	18:04	19:43	20:20			20:53	13	06:10 (3)	21:04	17	06:18 (3)	20:40	19:52	18:56	17:04	16:37
3	07:52	07:33	06:51	06:54	06:04			05:33		05:57 (3)	05:35		06:01 (3)	06:03	06:39	07:15	06:55	07:33
	16:48	17:26	18:05	19:44	20:21			20:54	14	06:11 (3)	21:04	18	06:19 (3)	20:39	19:50	18:54	17:03	16:37
4	07:52	07:31	06:49	06:52	06:03			05:33		05:56 (3)	05:36		06:01 (3)	06:05	06:41	07:16	06:56	07:34
	16:49	17:28	18:06	19:46	20:23			20:55	15	06:11 (3)	21:04	17	06:18 (3)	20:38	19:48	18:52	17:02	16:36
5	07:52	07:30	06:47	06:51	06:01			05:32		05:56 (3)	05:36		06:02 (3)	06:06	06:42	07:17	06:57	07:35
	16:50	17:29	18:08	19:47	20:24			20:56	16	06:12 (3)	21:03	17	06:19 (3)	20:36	19:46	18:50	17:00	16:36
6	07:52	07:29	06:45	06:49	06:00			05:32		05:55 (3)	05:37		06:02 (3)	06:07	06:43	07:18	06:59	07:36
	16:51	17:31	18:09	19:48	20:25			20:56	17	06:12 (3)	21:03	16	06:18 (3)	20:35	19:44	18:48	16:59	16:36
7	07:52	07:28	06:44	06:47	05:59			05:31		05:56 (3)	05:38		06:02 (3)	06:08	06:44	07:20	07:00	07:37
	16:52	17:32	18:10	19:49	20:26			20:57	16	06:12 (3)	21:03	16	06:18 (3)	20:34	19:42	18:47	16:58	16:36
8	07:52	07:26	07:42	06:45	05:57			05:31		05:56 (3)	05:38		06:03 (3)	06:09	06:45	07:21	07:01	07:38
	16:53	17:33	19:12	19:51	20:27			20:58	17	06:13 (3)	21:02	15	06:18 (3)	20:32	19:41	18:45	16:56	16:36
9	07:51	07:25	07:40	06:43	05:56			05:31		05:56 (3)	05:39		06:03 (3)	06:10	06:46	07:22	07:03	07:39
	16:54	17:35	19:13	19:52	20:29			20:58	18	06:14 (3)	21:02	15	06:18 (3)	20:31	19:39	18:43	16:55	16:36
10	07:51	07:24	07:38	06:42	05:55			05:31		05:55 (3)	05:40		06:04 (3)	06:11	06:48	07:23	07:04	07:40
	16:55	17:36	19:14	19:53	20:30			20:59	18	06:13 (3)	21:02	13	06:17 (3)	20:29	19:37	18:41	16:54	16:36
11	07:51	07:22	07:37	06:40	05:53			05:30		05:56 (3)	05:41		06:05 (3)	06:13	06:49	07:25	07:05	07:41
	16:56	17:38	19:16	19:54	20:31			21:00	18	06:14 (3)	21:01	12	06:17 (3)	20:28	19:35	18:39	16:53	16:36
12	07:50	07:21	07:35	06:38	05:52			05:30		05:56 (3)	05:42		06:06 (3)	06:14	06:50	07:26	07:07	07:42
	16:57	17:39	19:17	19:56	20:32			21:00	18	06:14 (3)	21:01	11	06:17 (3)	20:27	19:33	18:38	16:52	16:36
13	07:50	07:20	07:33	06:36	05:51			05:30		05:56 (3)	05:42		06:07 (3)	06:15	06:51	07:27	07:08	07:43
	16:58	17:41	19:18	19:57	20:33			21:00	18	06:14 (3)	21:00	9	06:16 (3)	20:25	19:31	18:36	16:51	16:36
14	07:49	07:18	07:31	06:35	05:50			05:30		05:56 (3)	05:43		06:08 (3)	06:16	06:52	07:28	07:09	07:44
	17:00	17:42	19:19	19:58	20:34			21:01	19	06:15 (3)	20:59	6	06:14 (3)	20:24	19:29	18:34	16:50	16:36
15	07:49	07:17	07:29	06:33	05:49			05:30		05:57 (3)	05:44		06:11 (3)	06:17	06:53	07:30	07:11	07:44
	17:01	17:43	19:21	19:59	20:35			21:01	18	06:15 (3)	20:58	1	06:12 (3)	20:22	19:28	18:32	16:49	16:36
16	07:48	07:15	07:27	06:31	05:48			05:30		05:57 (3)	05:45			06:18	06:55	07:31	07:12	07:45
	17:02	17:45	19:22	20:00	20:37			21:02	18	06:15 (3)	20:57			20:20	19:26	18:31	16:48	16:36
17	07:48	07:14	07:26	06:29	05:47			05:30		05:57 (3)	05:46			06:20	06:56	07:32	07:13	07:46
	17:03	17:46	19:23	20:02	20:38			21:02	18	06:15 (3)	20:57			20:19	19:24	18:29	16:47	16:37
18	07:47	07:12	07:24	06:28	05:46			05:30		05:57 (3)	05:47			06:21	06:57	07:33	07:15	07:47
	17:05	17:47	19:24	20:03	20:39			21:02	18	06:15 (3)	20:56			20:17	19:22	18:27	16:46	16:37
19	07:47	07:11	07:22	06:26	05:44			05:30		05:57 (3)	05:48			06:22	06:58	07:35	07:16	07:47
	17:06	17:49	19:26	20:04	20:40			21:03	19	06:16 (3)	20:55			20:16	19:20	18:26	16:45	16:37
20	07:46	07:09	07:20	06:24	05:43			05:30		05:58 (3)	05:49			06:23	06:59	07:36	07:17	07:48
	17:07	17:50	19:27	20:05	20:41			21:03	19	06:17 (3)	20:54			20:14	19:18	18:24	16:44	16:38
21	07:45	07:07	07:18	06:23	05:43			05:30		05:58 (3)	05:50			06:24	07:00	07:37	07:19	07:48
	17:09	17:52	19:28	20:07	20:42			21:03	19	06:17 (3)	20:53			20:12	19:16	18:22	16:43	16:38
22	07:44	07:06	07:16	06:21	05:42			05:31		05:58 (3)	05:51			06:25	07:02	07:39	07:20	07:49
	17:10	17:53	19:29	20:08	20:43			21:04	19	06:17 (3)	20:52			20:11	19:14	18:21	16:43	16:39
23	07:44	07:04	07:15	06:19	05:41			05:31		05:58 (3)	05:52			06:27	07:03	07:40	07:21	07:49
	17:11	17:54	19:31	20:09	20:44			21:04	19	06:17 (3)	20:51			20:09	19:12	18:19	16:42	16:39
24	07:43	07:03	07:13	06:18	05:40			05:31		05:58 (3)	05:53			06:28	07:04	07:41	07:22	07:50
	17:13	17:56	19:32	20:10	20:45			21:04	18	06:16 (3)	20:50			20:07	19:11	18:18	16:41	16:40
25	07:42	07:01	07:11	06:16	05:39			05:31		05:59 (3)	05:54			06:29	07:05	07:43	07:24	07:50
	17:14	17:57	19:33	20:12	20:46			21:04	18	06:17 (3)	20:49			20:06	19:09	18:16	16:40	16:40
26	07:41	06:59	07:09	06:15	05:38			05:32		05:59 (3)	05:55			06:30	07:06	07:44	07:25	07:51
	17:15	17:58	19:34	20:13	20:47			21:04	18	06:17 (3)	20:48			20:04	19:07	18:14	16:40	16:41
27	07:40	06:58	07:07	06:13	05:37			05:32		06:00 (3)	05:56			06:31	07:07	07:45	07:26	07:51
	17:17	18:00	19:36	20:14	20:48			21:04	18	06:18 (3)	20:47			20:02	19:05	18:13	16:39	16:42
28	07:39	06:56	07:05	06:12	05:37			05:33		05:59 (3)	05:57			06:32	07:09	07:46	07:27	07:51
	17:18	18:01	19:37	20:15	20:49			21:04	19	06:18 (3)	20:46			20:00	19:03	18:11	16:39	16:42
29	07:38		07:03	06:10	05:36		06:00 (3)	05:33		05:59 (3)	05:58			06:34	07:10	07:48	07:29	07:51
	17:19		19:38	20:16	20:50	5	06:05 (3)	21:04	18	06:17 (3)	20:45			19:59	19:01	18:10	16:38	16:43
30	07:37		07:02	06:09	05:35		05:58 (3)	05:34		06:00 (3)	05:59			06:35	07:11	07:49	07:30	07:52
	17:21		19:39	20:18	20:51	9	06:07 (3)	21:04	18	06:18 (3)	20:44			19:57	18:59	18:09	16:38	16:44
31	07:36		07:00		05:35		05:58 (3)				06:00			06:36		07:51		07:52
	17:22		19:41		20:52	10	06:08 (3)				20:43			19:55		18:07		16:45
Potential sun hours	287	292	369	404	458			465			470			435	376	341	289	276
Total, worst case						24			523			201						

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

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Calculated:
2/7/2014 9:10 AM/2.9.207

SHADOW - Calendar

Calculation: Medium Worst**Shadow receptor:** X - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (25)

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:
- The sun is shining all the day, from sunrise to sunset
- The rotor plane is always perpendicular to the line from the WTG to the sun
- The WTG is always operating

	January	February	March	April	May			June	July			August			September	October	November	December
1	07:52	07:35	06:54	06:58	06:07			05:34	05:34			06:01		06:26 (3)	06:37	07:12	06:52	07:31
	16:46	17:24	18:02	19:42	20:19			20:53	21:04			20:42	18	06:44 (3)	19:53	18:58	17:06	16:37
2	07:52	07:34	06:52	06:56	06:06			05:34	05:35			06:02		06:26 (3)	06:38	07:13	06:53	07:32
	16:47	17:25	18:04	19:43	20:20			20:53	21:04			20:40	18	06:44 (3)	19:52	18:56	17:04	16:37
3	07:52	07:33	06:51	06:54	06:04			05:33	05:35			06:03		06:27 (3)	06:39	07:15	06:55	07:33
	16:48	17:26	18:05	19:44	20:21			20:54	21:04			20:39	16	06:43 (3)	19:50	18:54	17:03	16:37
4	07:52	07:31	06:49	06:52	06:03			05:33	05:36			06:05		06:28 (3)	06:41	07:16	06:56	07:34
	16:49	17:28	18:06	19:46	20:23			20:55	21:04			20:38	14	06:42 (3)	19:48	18:52	17:02	16:36
5	07:52	07:30	06:47	06:51	06:01			05:32	05:36			06:06		06:29 (3)	06:42	07:17	06:57	07:35
	16:50	17:29	18:08	19:47	20:24			20:56	21:03			20:36	12	06:41 (3)	19:46	18:50	17:00	16:36
6	07:52	07:29	06:45	06:49	06:00		06:21 (3)	05:32	05:37			06:07		06:30 (3)	06:43	07:18	06:59	07:36
	16:51	17:31	18:09	19:48	20:25	7	06:28 (3)	20:56	21:03			20:35	9	06:39 (3)	19:44	18:48	16:59	16:36
7	07:52	07:28	06:44	06:47	05:59		06:20 (3)	05:31	05:38			06:08		06:31 (3)	06:44	07:20	07:00	07:37
	16:52	17:32	18:10	19:49	20:26	10	06:30 (3)	20:57	21:03			20:34	6	06:37 (3)	19:42	18:47	16:58	16:36
8	07:52	07:26	07:42	06:45	05:57		06:19 (3)	05:31	05:38			06:09			06:45	07:21	07:01	07:38
	16:53	17:33	19:12	19:51	20:27	13	06:32 (3)	20:58	21:02			20:32			19:41	18:45	16:56	16:36
9	07:51	07:25	07:40	06:43	05:56		06:17 (3)	05:31	05:39			06:10			06:46	07:22	07:03	07:39
	16:54	17:35	19:13	19:52	20:29	15	06:32 (3)	20:58	21:02			20:31			19:39	18:43	16:55	16:36
10	07:51	07:24	07:38	06:42	05:55		06:16 (3)	05:31	05:40			06:11			06:48	07:23	07:04	07:40
	16:55	17:36	19:14	19:53	20:30	17	06:33 (3)	20:59	21:02			20:29			19:37	18:41	16:54	16:36
11	07:51	07:22	07:37	06:40	05:53		06:15 (3)	05:30	05:41			06:13			06:49	07:25	07:05	07:41
	16:56	17:38	19:16	19:54	20:31	18	06:33 (3)	21:00	21:01			20:28			19:35	18:39	16:53	16:36
12	07:50	07:21	07:35	06:38	05:52		06:15 (3)	05:30	05:42			06:14			06:50	07:26	07:07	07:42
	16:57	17:39	19:17	19:56	20:32	19	06:34 (3)	21:00	21:01			20:27			19:33	18:38	16:52	16:36
13	07:50	07:20	07:33	06:36	05:51		06:15 (3)	05:30	05:42			06:15			06:51	07:27	07:08	07:43
	16:58	17:41	19:18	19:57	20:33	19	06:34 (3)	21:00	21:00			20:25			19:31	18:36	16:51	16:36
14	07:49	07:18	07:31	06:35	05:50		06:15 (3)	05:30	05:43			06:16			06:52	07:28	07:09	07:44
	17:00	17:42	19:19	19:58	20:34	19	06:34 (3)	21:01	20:59			20:24			19:29	18:34	16:50	16:36
15	07:49	07:17	07:29	06:33	05:49		06:15 (3)	05:30	05:44			06:17			06:53	07:30	07:11	07:44
	17:01	17:43	19:21	19:59	20:35	19	06:34 (3)	21:01	20:58			20:22			19:28	18:32	16:49	16:36
16	07:48	07:15	07:27	06:31	05:48		06:15 (3)	05:30	05:45			06:18			06:55	07:31	07:12	07:45
	17:02	17:45	19:22	20:00	20:37	19	06:34 (3)	21:02	20:57			20:20			19:26	18:31	16:48	16:36
17	07:48	07:14	07:26	06:29	05:47		06:15 (3)	05:30	05:46			06:20			06:56	07:32	07:13	07:46
	17:03	17:46	19:23	20:02	20:38	19	06:34 (3)	21:02	20:57			20:19			19:24	18:29	16:47	16:37
18	07:47	07:12	07:24	06:28	05:46		06:16 (3)	05:30	05:47			06:21			06:57	07:33	07:15	07:47
	17:05	17:47	19:24	20:03	20:39	17	06:33 (3)	21:02	20:56			20:17			19:22	18:27	16:46	16:37
19	07:47	07:11	07:22	06:26	05:44		06:16 (3)	05:30	05:48		06:33 (3)	06:22			06:58	07:35	07:16	07:47
	17:06	17:49	19:26	20:04	20:40	17	06:33 (3)	21:03	20:55	3	06:36 (3)	20:16			19:20	18:26	16:45	16:37
20	07:46	07:09	07:20	06:24	05:43		06:17 (3)	05:30	05:49		06:31 (3)	06:23			06:59	07:36	07:17	07:48
	17:07	17:50	19:27	20:05	20:41	15	06:32 (3)	21:03	20:54	7	06:38 (3)	20:14			19:18	18:24	16:44	16:38
21	07:45	07:07	07:18	06:23	05:43		06:17 (3)	05:30	05:50		06:29 (3)	06:24			07:00	07:37	07:19	07:48
	17:09	17:52	19:28	20:07	20:42	14	06:31 (3)	21:03	20:53	11	06:40 (3)	20:12			19:16	18:22	16:43	16:38
22	07:44	07:06	07:16	06:21	05:42		06:18 (3)	05:31	05:51		06:28 (3)	06:25			07:02	07:39	07:20	07:49
	17:10	17:53	19:29	20:08	20:43	12	06:30 (3)	21:04	20:52	13	06:41 (3)	20:11			19:14	18:21	16:43	16:39
23	07:44	07:04	07:15	06:19	05:41		06:19 (3)	05:31	05:52		06:28 (3)	06:27			07:03	07:40	07:21	07:49
	17:11	17:54	19:31	20:09	20:44	10	06:29 (3)	21:04	20:51	14	06:42 (3)	20:09			19:12	18:19	16:42	16:39
24	07:43	07:03	07:13	06:18	05:40		06:21 (3)	05:31	05:53		06:27 (3)	06:28			07:04	07:41	07:22	07:50
	17:13	17:56	19:32	20:10	20:45	6	06:27 (3)	21:04	20:50	16	06:43 (3)	20:07			19:11	18:18	16:41	16:40
25	07:42	07:01	07:11	06:16	05:39			05:31	05:54		06:27 (3)	06:29			07:05	07:43	07:24	07:50
	17:14	17:57	19:33	20:12	20:46			21:04	20:49	16	06:43 (3)	20:06			19:09	18:16	16:40	16:40
26	07:41	06:59	07:09	06:15	05:38			05:32	05:55		06:26 (3)	06:30			07:06	07:44	07:25	07:51
	17:15	17:58	19:34	20:13	20:47			21:04	20:48	18	06:44 (3)	20:04			19:07	18:14	16:40	16:41
27	07:40	06:58	07:07	06:13	05:37			05:32	05:56		06:26 (3)	06:31			07:07	07:45	07:26	07:51
	17:17	18:00	19:36	20:14	20:48			21:04	20:47	18	06:44 (3)	20:02			19:05	18:13	16:39	16:42
28	07:39	06:56	07:05	06:12	05:37			05:33	05:57		06:26 (3)	06:32			07:09	07:46	07:27	07:51
	17:18	18:01	19:37	20:15	20:49			21:04	20:46	18	06:44 (3)	20:00			19:03	18:11	16:39	16:42
29	07:38		07:03	06:10	05:36			05:33	05:58		06:25 (3)	06:34			07:10	07:48	07:29	07:51
	17:19		19:38	20:16	20:50			21:04	20:45	20	06:45 (3)	19:59			19:01	18:10	16:38	16:43
30	07:37		07:02	06:09	05:35			05:34	05:59		06:25 (3)	06:35			07:11	07:49	07:30	07:52
	17:21		19:39	20:18	20:51			21:04	20:44	20	06:45 (3)	19:57			18:59	18:09	16:38	16:44
31	07:36		07:00		05:35				06:00		06:25 (3)	06:36				07:51		07:52
	17:22		19:41		20:52				20:43	19	06:44 (3)	19:55				18:07		16:45
Potential sun hours	287	292	369	404	458			465	470			435			376	341	289	276
Total, worst case						285				193			93					

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
738 Terence Bay Wind Project

Description:
3 Turbine Wind project
Haliafx County, Nova Scotia

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2/7/2014 9:14 AM / 29

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Kirk Schmidt / kirk.schmidt@al-pro.ca

Calculated:
2/7/2014 9:10 AM/2.9.207

SHADOW - Calendar

Calculation: Medium Worst**Shadow receptor:** Y - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (26)

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:
- The sun is shining all the day, from sunrise to sunset
- The rotor plane is always perpendicular to the line from the WTG to the sun
- The WTG is always operating

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:52	07:35	06:54	06:58	06:07	05:34	05:34	06:01	06:37	07:12	06:52	07:31
	16:46	17:24	18:02	19:42	20:19	20:53	21:04	20:42	19:53	18:58	17:06	16:37
2	07:52	07:34	06:52	06:56	06:06	05:34	05:35	06:02	06:38	07:13	06:53	07:32
	16:47	17:25	18:04	19:43	20:20	20:53	21:04	20:40	19:52	18:56	17:04	16:37
3	07:52	07:33	06:51	06:54	06:04	05:33	05:35	06:03	06:39	07:15	06:55	07:33
	16:48	17:26	18:05	19:44	20:21	20:54	21:04	20:39	19:50	18:54	17:03	16:37
4	07:52	07:31	06:49	06:52	06:03	05:33	05:36	06:05	06:41	07:16	06:56	07:34
	16:49	17:28	18:06	19:46	20:23	20:55	21:04	20:38	19:48	18:52	17:02	16:36
5	07:52	07:30	06:47	06:51	06:01	05:32	05:36	06:06	06:42	07:17	06:57	07:35
	16:50	17:29	18:08	19:47	20:24	20:56	21:03	20:36	19:46	18:50	17:00	16:36
6	07:52	07:29	06:45	06:49	06:00	05:32	05:37	06:07	06:43	07:18	06:59	07:36
	16:51	17:31	18:09	19:48	20:25	20:56	21:03	20:35	19:44	18:48	16:59	16:36
7	07:52	07:28	06:44	06:47	05:59	05:31	05:38	06:08	06:44	07:20	07:00	07:37
	16:52	17:32	18:10	19:49	20:26	20:57	21:03	20:34	19:42	18:47	16:58	16:36
8	07:52	07:26	07:42	06:45	05:57	05:31	05:38	06:09	06:45	07:21	07:01	07:38
	16:53	17:33	19:12	19:51	20:27	20:58	21:02	20:32	19:41	18:45	16:56	16:36
9	07:51	07:25	07:40	06:43	05:56	05:31	05:39	06:10	06:46	07:22	07:03	07:39
	16:54	17:35	19:13	19:52	20:29	20:58	21:02	20:31	19:39	18:43	16:55	16:36
10	07:51	07:24	07:38	06:42	05:55	05:31	05:40	06:11	06:48	07:23	07:04	07:40
	16:55	17:36	19:14	19:53	20:30	20:59	21:02	20:29	19:37	18:41	16:54	16:36
11	07:51	07:22	07:37	06:40	05:53	05:30	05:41	06:13	06:49	07:25	07:05	07:41
	16:56	17:38	19:16	19:54	20:31	21:00	21:01	20:28	19:35	18:39	16:53	16:36
12	07:50	07:21	07:35	06:38	05:52	05:30	05:42	06:14	06:50	07:26	07:07	07:42
	16:57	17:39	19:17	19:56	20:32	21:00	21:01	20:27	19:33	18:38	16:52	16:36
13	07:50	07:20	07:33	06:36	05:51	05:30	05:42	06:15	06:51	07:27	07:08	07:43
	16:58	17:41	19:18	19:57	20:33	21:00	21:00	20:25	19:31	18:36	16:51	16:36
14	07:49	07:18	07:31	06:35	05:50	05:30	05:43	06:16	06:52	07:28	07:09	07:44
	17:00	17:42	19:19	19:58	20:34	21:01	20:59	20:24	19:29	18:34	16:50	16:36
15	07:49	07:17	07:29	06:33	05:49	05:30	05:44	06:17	06:53	07:30	07:11	07:44
	17:01	17:43	19:21	19:59	20:35	21:01	20:58	20:22	19:28	18:32	16:49	16:36
16	07:48	07:15	07:27	06:31	05:48	05:30	05:45	06:18	06:55	07:31	07:12	07:45
	17:02	17:45	19:22	20:00	20:37	21:02	20:57	20:20	19:26	18:31	16:48	16:36
17	07:48	07:14	07:26	06:29	05:47	05:30	05:46	06:20	06:56	07:32	07:13	07:46
	17:03	17:46	19:23	20:02	20:38	21:02	20:57	20:19	19:24	18:29	16:47	16:37
18	07:47	07:12	07:24	06:28	05:46	05:30	05:47	06:21	06:57	07:33	07:15	07:47
	17:05	17:47	19:24	20:03	20:39	21:02	20:56	20:17	19:22	18:27	16:46	16:37
19	07:47	07:11	07:22	06:26	05:44	05:30	05:48	06:22	06:58	07:35	07:16	07:47
	17:06	17:49	19:26	20:04	20:40	21:03	20:55	20:16	19:20	18:26	16:45	16:37
20	07:46	07:09	07:20	06:24	05:43	05:30	05:49	06:23	06:59	07:36	07:17	07:48
	17:07	17:50	19:27	20:05	20:41	21:03	20:54	20:14	19:18	18:24	16:44	16:38
21	07:45	07:07	07:18	06:23	05:43	05:30	05:50	06:24	07:00	07:37	07:19	07:48
	17:09	17:52	19:28	20:07	20:42	21:03	20:53	20:12	19:16	18:22	16:43	16:38
22	07:44	07:06	07:16	06:21	05:42	05:31	05:51	06:25	07:02	07:39	07:20	07:49
	17:10	17:53	19:29	20:08	20:43	21:04	20:52	20:11	19:14	18:21	16:43	16:39
23	07:44	07:04	07:15	06:19	05:41	05:31	05:52	06:27	07:03	07:40	07:21	07:49
	17:11	17:54	19:31	20:09	20:44	21:04	20:51	20:09	19:12	18:19	16:42	16:39
24	07:43	07:03	07:13	06:18	05:40	05:31	05:53	06:28	07:04	07:41	07:22	07:50
	17:13	17:56	19:32	20:10	20:45	21:04	20:50	20:07	19:11	18:18	16:41	16:40
25	07:42	07:01	07:11	06:16	05:39	05:31	05:54	06:29	07:05	07:43	07:24	07:50
	17:14	17:57	19:33	20:12	20:46	21:04	20:49	20:06	19:09	18:16	16:40	16:40
26	07:41	06:59	07:09	06:15	05:38	05:32	05:55	06:30	07:06	07:44	07:25	07:51
	17:15	17:58	19:34	20:13	20:47	21:04	20:48	20:04	19:07	18:14	16:40	16:41
27	07:40	06:58	07:07	06:13	05:37	05:32	05:56	06:31	07:07	07:45	07:26	07:51
	17:17	18:00	19:36	20:14	20:48	21:04	20:47	20:02	19:05	18:13	16:39	16:42
28	07:39	06:56	07:05	06:12	05:37	05:33	05:57	06:32	07:09	07:46	07:27	07:51
	17:18	18:01	19:37	20:15	20:49	21:04	20:46	20:00	19:03	18:11	16:39	16:42
29	07:38		07:03	06:10	05:36	05:33	05:58	06:34	07:10	07:48	07:29	07:51
	17:19		19:38	20:16	20:50	21:04	20:45	19:59	19:01	18:10	16:38	16:43
30	07:37		07:02	06:09	05:35	05:34	05:59	06:35	07:11	07:49	07:30	07:52
	17:21		19:39	20:18	20:51	21:04	20:44	19:57	18:59	18:09	16:38	16:44
31	07:36		07:00		05:35		06:00	06:36		07:51		07:52
	17:22		19:41		20:52		20:43	19:55		18:07		16:45
Potential sun hours	287	292	369	404	458	465	470	435	376	341	289	276
Total, worst case												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
738 Terence Bay Wind Project

Description:
3 Turbine Wind project
Haliafx County, Nova Scotia

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2/7/2014 9:14 AM / 30

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Calculated:
2/7/2014 9:10 AM/2.9.207

SHADOW - Calendar

Calculation: Medium Worst**Shadow receptor:** Z - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (27)

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:
The sun is shining all the day, from sunrise to sunset
The rotor plane is always perpendicular to the line from the WTG to the sun
The WTG is always operating

	January	February	March	April	May			June	July			August			September	October	November	December
1	07:52	07:35	06:54	06:58	06:07			05:34	05:34			06:01		06:26 (3)	06:37	07:12	06:52	07:31
	16:46	17:24	18:02	19:42	20:19			20:53	21:04			20:42	19	06:45 (3)	19:53	18:58	17:06	16:37
2	07:52	07:34	06:52	06:56	06:06			05:34	05:35			06:02		06:26 (3)	06:38	07:13	06:53	07:32
	16:47	17:25	18:04	19:43	20:20			20:53	21:04			20:40	19	06:45 (3)	19:52	18:56	17:04	16:37
3	07:52	07:33	06:51	06:54	06:04			05:33	05:35			06:03		06:27 (3)	06:39	07:15	06:55	07:33
	16:48	17:26	18:05	19:44	20:21			20:54	21:04			20:39	17	06:44 (3)	19:50	18:54	17:03	16:37
4	07:52	07:31	06:49	06:52	06:03			05:33	05:36			06:05		06:28 (3)	06:41	07:16	06:56	07:34
	16:49	17:28	18:06	19:46	20:23			20:55	21:04			20:38	16	06:44 (3)	19:48	18:52	17:02	16:36
5	07:52	07:30	06:47	06:51	06:01		06:22 (3)	05:32	05:36			06:06		06:29 (3)	06:42	07:17	06:57	07:35
	16:50	17:29	18:08	19:47	20:24	6	06:28 (3)	20:56	21:03			20:36	14	06:43 (3)	19:46	18:50	17:00	16:36
6	07:52	07:29	06:45	06:49	06:00		06:21 (3)	05:32	05:37			06:07		06:30 (3)	06:43	07:18	06:59	07:36
	16:51	17:31	18:09	19:48	20:25	10	06:31 (3)	20:56	21:03			20:35	11	06:41 (3)	19:44	18:48	16:59	16:36
7	07:52	07:28	06:44	06:47	05:59		06:20 (3)	05:31	05:38			06:08		06:31 (3)	06:44	07:20	07:00	07:37
	16:52	17:32	18:10	19:49	20:26	12	06:32 (3)	20:57	21:03			20:34	8	06:39 (3)	19:42	18:47	16:58	16:36
8	07:52	07:26	07:42	06:45	05:57		06:19 (3)	05:31	05:38			06:09			06:45	07:21	07:01	07:38
	16:53	17:33	19:12	19:51	20:27	14	06:33 (3)	20:58	21:02			20:32			19:41	18:45	16:56	16:36
9	07:51	07:25	07:40	06:43	05:56		06:17 (3)	05:31	05:39			06:10			06:46	07:22	07:03	07:39
	16:54	17:35	19:13	19:52	20:29	16	06:33 (3)	20:58	21:02			20:31			19:39	18:43	16:55	16:36
10	07:51	07:24	07:38	06:42	05:55		06:16 (3)	05:31	05:40			06:11			06:48	07:23	07:04	07:40
	16:55	17:36	19:14	19:53	20:30	18	06:34 (3)	20:59	21:02			20:29			19:37	18:41	16:54	16:36
11	07:51	07:22	07:37	06:40	05:53		06:16 (3)	05:30	05:41			06:13			06:49	07:25	07:05	07:41
	16:56	17:38	19:16	19:54	20:31	19	06:35 (3)	21:00	21:01			20:28			19:35	18:39	16:53	16:36
12	07:50	07:21	07:35	06:38	05:52		06:16 (3)	05:30	05:42			06:14			06:50	07:26	07:07	07:42
	16:57	17:39	19:17	19:56	20:32	19	06:35 (3)	21:00	21:01			20:27			19:33	18:38	16:52	16:36
13	07:50	07:20	07:33	06:36	05:51		06:16 (3)	05:30	05:42			06:15			06:51	07:27	07:08	07:43
	16:58	17:41	19:18	19:57	20:33	19	06:35 (3)	21:00	21:00			20:25			19:31	18:36	16:51	16:36
14	07:49	07:18	07:31	06:35	05:50		06:16 (3)	05:30	05:43			06:16			06:52	07:28	07:09	07:44
	17:00	17:42	19:19	19:58	20:34	19	06:35 (3)	21:01	20:59			20:24			19:29	18:34	16:50	16:36
15	07:49	07:17	07:29	06:33	05:49		06:16 (3)	05:30	05:44			06:17			06:53	07:30	07:11	07:44
	17:01	17:43	19:21	19:59	20:35	19	06:35 (3)	21:01	20:58			20:22			19:28	18:32	16:49	16:36
16	07:48	07:15	07:27	06:31	05:48		06:16 (3)	05:30	05:45			06:18			06:55	07:31	07:12	07:45
	17:02	17:45	19:22	20:00	20:37	19	06:35 (3)	21:02	20:57			20:20			19:26	18:31	16:48	16:36
17	07:48	07:14	07:26	06:29	05:47		06:16 (3)	05:30	05:46			06:20			06:56	07:32	07:13	07:46
	17:03	17:46	19:23	20:02	20:38	19	06:35 (3)	21:02	20:57			20:19			19:24	18:29	16:47	16:37
18	07:47	07:12	07:24	06:28	05:46		06:17 (3)	05:30	05:47			06:21			06:57	07:33	07:15	07:47
	17:05	17:47	19:24	20:03	20:39	17	06:34 (3)	21:02	20:56			20:17			19:22	18:27	16:46	16:37
19	07:47	07:11	07:22	06:26	05:44		06:17 (3)	05:30	05:48			06:22			06:58	07:35	07:16	07:47
	17:06	17:49	19:26	20:04	20:40	17	06:34 (3)	21:03	20:55			20:16			19:20	18:26	16:45	16:37
20	07:46	07:09	07:20	06:24	05:43		06:18 (3)	05:30	05:49		06:32 (3)	06:23			06:59	07:36	07:17	07:48
	17:07	17:50	19:27	20:05	20:41	15	06:33 (3)	21:03	20:54	7	06:39 (3)	20:14			19:18	18:24	16:44	16:38
21	07:45	07:07	07:18	06:23	05:43		06:19 (3)	05:30	05:50		06:31 (3)	06:24			07:00	07:37	07:19	07:48
	17:09	17:52	19:28	20:07	20:42	13	06:32 (3)	21:03	20:53	10	06:41 (3)	20:12			19:16	18:22	16:43	16:38
22	07:44	07:06	07:16	06:21	05:42		06:20 (3)	05:31	05:51		06:30 (3)	06:25			07:02	07:39	07:20	07:49
	17:10	17:53	19:29	20:08	20:43	11	06:31 (3)	21:04	20:52	12	06:42 (3)	20:11			19:14	18:21	16:43	16:39
23	07:44	07:04	07:15	06:19	05:41		06:21 (3)	05:31	05:52		06:29 (3)	06:27			07:03	07:40	07:21	07:49
	17:11	17:54	19:31	20:09	20:44	8	06:29 (3)	21:04	20:51	14	06:43 (3)	20:09			19:12	18:19	16:42	16:39
24	07:43	07:03	07:13	06:18	05:40		06:23 (3)	05:31	05:53		06:28 (3)	06:28			07:04	07:41	07:22	07:50
	17:13	17:56	19:32	20:10	20:45	4	06:27 (3)	21:04	20:50	16	06:44 (3)	20:07			19:11	18:18	16:41	16:40
25	07:42	07:01	07:11	06:16	05:39			05:31	05:54		06:28 (3)	06:29			07:05	07:43	07:24	07:50
	17:14	17:57	19:33	20:12	20:46			21:04	20:49	16	06:44 (3)	20:06			19:09	18:16	16:40	16:40
26	07:41	06:59	07:09	06:15	05:38			05:32	05:55		06:27 (3)	06:30			07:06	07:44	07:25	07:51
	17:15	17:58	19:34	20:13	20:47			21:04	20:48	18	06:45 (3)	20:04			19:07	18:14	16:40	16:41
27	07:40	06:58	07:07	06:13	05:37			05:32	05:56		06:27 (3)	06:31			07:07	07:45	07:26	07:51
	17:17	18:00	19:36	20:14	20:48			21:04	20:47	18	06:45 (3)	20:02			19:05	18:13	16:39	16:42
28	07:39	06:56	07:05	06:12	05:37			05:33	05:57		06:26 (3)	06:32			07:09	07:46	07:27	07:51
	17:18	18:01	19:37	20:15	20:49			21:04	20:46	20	06:46 (3)	20:00			19:03	18:11	16:39	16:42
29	07:38		07:03	06:10	05:36			05:33	05:58		06:26 (3)	06:34			07:10	07:48	07:29	07:51
	17:19		19:38	20:16	20:50			21:04	20:45	20	06:46 (3)	19:59			19:01	18:10	16:38	16:43
30	07:37		07:02	06:09	05:35			05:34	05:59		06:26 (3)	06:35			07:11	07:49	07:30	07:52
	17:21		19:39	20:18	20:51			21:04	20:44	20	06:46 (3)	19:57			18:59	18:09	16:38	16:44
31	07:36		07:00		05:35				06:00		06:26 (3)	06:36				07:51		07:52
	17:22		19:41		20:52				20:43	20	06:46 (3)	19:55				18:07		16:45
Potential sun hours	287	292	369	404	458			465	470			435			376	341	289	276
Total, worst case						294				191			104					

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
738 Terence Bay Wind Project

Description:
3 Turbine Wind project
Haliafx County, Nova Scotia

Printed/Page
2/7/2014 9:14 AM / 31

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Calculated:
2/7/2014 9:10 AM/2.9.207

SHADOW - Calendar

Calculation: Medium Worst**Shadow receptor:** AA - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (28)

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:
The sun is shining all the day, from sunrise to sunset
The rotor plane is always perpendicular to the line from the WTG to the sun
The WTG is always operating

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:52	07:35	06:54	06:58	06:07	05:34	05:34	06:01	06:37	07:12	06:52	07:31
	16:46	17:24	18:02	19:42	20:19	20:53	21:04	20:42	19:53	18:58	17:06	16:37
2	07:52	07:34	06:52	06:56	06:06	05:34	05:35	06:02	06:38	07:13	06:53	07:32
	16:47	17:25	18:04	19:43	20:20	20:53	21:04	20:40	19:52	18:56	17:04	16:37
3	07:52	07:33	06:51	06:54	06:04	05:33	05:35	06:03	06:39	07:15	06:55	07:33
	16:48	17:26	18:05	19:44	20:21	20:54	21:04	20:39	19:50	18:54	17:03	16:37
4	07:52	07:31	06:49	06:52	06:03	05:33	05:36	06:05	06:41	07:16	06:56	07:34
	16:49	17:28	18:06	19:46	20:23	20:55	21:04	20:38	19:48	18:52	17:02	16:36
5	07:52	07:30	06:47	06:51	06:01	05:32	05:36	06:06	06:42	07:17	06:57	07:35
	16:50	17:29	18:08	19:47	20:24	20:56	21:03	20:36	19:46	18:50	17:00	16:36
6	07:52	07:29	06:45	06:49	06:00	05:32	05:37	06:07	06:43	07:18	06:59	07:36
	16:51	17:31	18:09	19:48	20:25	20:56	21:03	20:35	19:44	18:48	16:59	16:36
7	07:52	07:28	06:44	06:47	05:59	05:31	05:38	06:08	06:44	07:20	07:00	07:37
	16:52	17:32	18:10	19:49	20:26	20:57	21:03	20:34	19:42	18:47	16:58	16:36
8	07:52	07:26	07:42	06:45	05:57	05:31	05:38	06:09	06:45	07:21	07:01	07:38
	16:53	17:33	19:12	19:51	20:27	20:58	21:02	20:32	19:41	18:45	16:56	16:36
9	07:51	07:25	07:40	06:43	05:56	05:31	05:39	06:10	06:46	07:22	07:03	07:39
	16:54	17:35	19:13	19:52	20:29	20:58	21:02	20:31	19:39	18:43	16:55	16:36
10	07:51	07:24	07:38	06:42	05:55	05:31	05:40	06:11	06:48	07:23	07:04	07:40
	16:55	17:36	19:14	19:53	20:30	20:59	21:02	20:29	19:37	18:41	16:54	16:36
11	07:51	07:22	07:37	06:40	05:53	05:30	05:41	06:13	06:49	07:25	07:05	07:41
	16:56	17:38	19:16	19:54	20:31	21:00	21:01	20:28	19:35	18:39	16:53	16:36
12	07:50	07:21	07:35	06:38	05:52	05:30	05:42	06:14	06:50	07:26	07:07	07:42
	16:57	17:39	19:17	19:56	20:32	21:00	21:01	20:27	19:33	18:38	16:52	16:36
13	07:50	07:20	07:33	06:36	05:51	05:30	05:42	06:15	06:51	07:27	07:08	07:43
	16:58	17:41	19:18	19:57	20:33	21:00	21:00	20:25	19:31	18:36	16:51	16:36
14	07:49	07:18	07:31	06:35	05:50	05:30	05:43	06:16	06:52	07:28	07:09	07:44
	17:00	17:42	19:19	19:58	20:34	21:01	20:59	20:24	19:29	18:34	16:50	16:36
15	07:49	07:17	07:29	06:33	05:49	05:30	05:44	06:17	06:53	07:30	07:11	07:44
	17:01	17:43	19:21	19:59	20:35	21:01	20:58	20:22	19:28	18:32	16:49	16:36
16	07:48	07:15	07:27	06:31	05:48	05:30	05:45	06:18	06:55	07:31	07:12	07:45
	17:02	17:45	19:22	20:00	20:37	21:02	20:57	20:20	19:26	18:31	16:48	16:36
17	07:48	07:14	07:26	06:29	05:47	05:30	05:46	06:20	06:56	07:32	07:13	07:46
	17:03	17:46	19:23	20:02	20:38	21:02	20:57	20:19	19:24	18:29	16:47	16:37
18	07:47	07:12	07:24	06:28	05:46	05:30	05:47	06:21	06:57	07:33	07:15	07:47
	17:05	17:47	19:24	20:03	20:39	21:02	20:56	20:17	19:22	18:27	16:46	16:37
19	07:47	07:11	07:22	06:26	05:44	05:30	05:48	06:22	06:58	07:35	07:16	07:47
	17:06	17:49	19:26	20:04	20:40	21:03	20:55	20:16	19:20	18:26	16:45	16:37
20	07:46	07:09	07:20	06:24	05:43	05:30	05:49	06:23	06:59	07:36	07:17	07:48
	17:07	17:50	19:27	20:05	20:41	21:03	20:54	20:14	19:18	18:24	16:44	16:38
21	07:45	07:07	07:18	06:23	05:43	05:30	05:50	06:24	07:00	07:37	07:19	07:48
	17:09	17:52	19:28	20:07	20:42	21:03	20:53	20:12	19:16	18:22	16:43	16:38
22	07:44	07:06	07:16	06:21	05:42	05:31	05:51	06:25	07:02	07:39	07:20	07:49
	17:10	17:53	19:29	20:08	20:43	21:04	20:52	20:11	19:14	18:21	16:43	16:39
23	07:44	07:04	07:15	06:19	05:41	05:31	05:52	06:27	07:03	07:40	07:21	07:49
	17:11	17:54	19:31	20:09	20:44	21:04	20:51	20:09	19:12	18:19	16:42	16:39
24	07:43	07:03	07:13	06:18	05:40	05:31	05:53	06:28	07:04	07:41	07:22	07:50
	17:13	17:56	19:32	20:10	20:45	21:04	20:50	20:07	19:11	18:18	16:41	16:40
25	07:42	07:01	07:11	06:16	05:39	05:31	05:54	06:29	07:05	07:43	07:24	07:50
	17:14	17:57	19:33	20:12	20:46	21:04	20:49	20:06	19:09	18:16	16:40	16:40
26	07:41	06:59	07:09	06:15	05:38	05:32	05:55	06:30	07:06	07:44	07:25	07:51
	17:15	17:58	19:34	20:13	20:47	21:04	20:48	20:04	19:07	18:14	16:40	16:41
27	07:40	06:58	07:07	06:13	05:37	05:32	05:56	06:31	07:07	07:45	07:26	07:51
	17:17	18:00	19:36	20:14	20:48	21:04	20:47	20:02	19:05	18:13	16:39	16:42
28	07:39	06:56	07:05	06:12	05:37	05:33	05:57	06:32	07:09	07:46	07:27	07:51
	17:18	18:01	19:37	20:15	20:49	21:04	20:46	20:00	19:03	18:11	16:39	16:42
29	07:38		07:03	06:10	05:36	05:33	05:58	06:34	07:10	07:48	07:29	07:51
	17:19		19:38	20:16	20:50	21:04	20:45	19:59	19:01	18:10	16:38	16:43
30	07:37		07:02	06:09	05:35	05:34	05:59	06:35	07:11	07:49	07:30	07:52
	17:21		19:39	20:18	20:51	21:04	20:44	19:57	18:59	18:09	16:38	16:44
31	07:36		07:00		05:35		06:00	06:36		07:51		07:52
	17:22		19:41		20:52		20:43	19:55		18:07		16:45
Potential sun hours	287	292	369	404	458	465	470	435	376	341	289	276
Total, worst case												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

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SHADOW - Calendar

Calculation: Medium Worst**Shadow receptor:** AB - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (29)

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:
The sun is shining all the day, from sunrise to sunset
The rotor plane is always perpendicular to the line from the WTG to the sun
The WTG is always operating

	January	February	March	April	May	June			July			August	September	October	November	December
1	07:52	07:35	06:54	06:58	06:07	05:34			05:34		05:58 (3)	06:01	06:37	07:12	06:52	07:31
	16:46	17:24	18:02	19:42	20:19	20:53			21:04	9	06:07 (3)	20:42	19:53	18:58	17:06	16:37
2	07:52	07:34	06:52	06:56	06:06	05:34			05:35		05:59 (3)	06:02	06:38	07:13	06:53	07:32
	16:47	17:25	18:04	19:43	20:20	20:53			21:04	8	06:07 (3)	20:40	19:52	18:56	17:04	16:37
3	07:52	07:33	06:51	06:54	06:04	05:33			05:35		06:00 (3)	06:03	06:39	07:15	06:55	07:33
	16:48	17:26	18:05	19:44	20:21	20:54			21:04	7	06:07 (3)	20:39	19:50	18:54	17:03	16:37
4	07:52	07:31	06:49	06:52	06:03	05:33			05:36		06:01 (3)	06:05	06:41	07:16	06:56	07:34
	16:49	17:28	18:06	19:46	20:23	20:55			21:04	4	06:05 (3)	20:38	19:48	18:52	17:02	16:36
5	07:52	07:30	06:47	06:51	06:01	05:32			05:36			06:06	06:42	07:17	06:57	07:35
	16:50	17:29	18:08	19:47	20:24	20:56			21:03			20:36	19:46	18:50	17:00	16:36
6	07:52	07:29	06:45	06:49	06:00	05:32			05:37			06:07	06:43	07:18	06:59	07:36
	16:51	17:31	18:09	19:48	20:25	20:56			21:03			20:35	19:44	18:48	16:59	16:36
7	07:52	07:28	06:44	06:47	05:59	05:31			05:38			06:08	06:44	07:20	07:00	07:37
	16:52	17:32	18:10	19:49	20:26	20:57			21:03			20:34	19:42	18:47	16:58	16:36
8	07:52	07:26	07:42	06:45	05:57	05:31		05:57 (3)	05:38			06:09	06:45	07:21	07:01	07:38
	16:53	17:33	19:12	19:51	20:27	20:58	2	05:59 (3)	21:02			20:32	19:41	18:45	16:56	16:36
9	07:51	07:25	07:40	06:43	05:56	05:31		05:55 (3)	05:39			06:10	06:46	07:22	07:03	07:39
	16:54	17:35	19:13	19:52	20:29	20:58	6	06:01 (3)	21:02			20:31	19:39	18:43	16:55	16:36
10	07:51	07:24	07:38	06:42	05:55	05:31		05:54 (3)	05:40			06:11	06:48	07:23	07:04	07:40
	16:55	17:36	19:14	19:53	20:30	20:59	7	06:01 (3)	21:02			20:29	19:37	18:41	16:54	16:36
11	07:51	07:22	07:37	06:40	05:53	05:30		05:54 (3)	05:41			06:13	06:49	07:25	07:05	07:41
	16:56	17:38	19:16	19:54	20:31	21:00	8	06:02 (3)	21:01			20:28	19:35	18:39	16:53	16:36
12	07:50	07:21	07:35	06:38	05:52	05:30		05:54 (3)	05:42			06:14	06:50	07:26	07:07	07:42
	16:57	17:39	19:17	19:56	20:32	21:00	9	06:03 (3)	21:01			20:27	19:33	18:38	16:52	16:36
13	07:50	07:20	07:33	06:36	05:51	05:30		05:54 (3)	05:42			06:15	06:51	07:27	07:08	07:43
	16:58	17:41	19:18	19:57	20:33	21:00	10	06:04 (3)	21:00			20:25	19:31	18:36	16:51	16:36
14	07:49	07:18	07:31	06:35	05:50	05:30		05:54 (3)	05:43			06:16	06:52	07:28	07:09	07:44
	17:00	17:42	19:19	19:58	20:34	21:01	10	06:04 (3)	20:59			20:24	19:29	18:34	16:50	16:36
15	07:49	07:17	07:29	06:33	05:49	05:30		05:54 (3)	05:44			06:17	06:53	07:30	07:11	07:44
	17:01	17:43	19:21	19:59	20:35	21:01	11	06:05 (3)	20:58			20:22	19:28	18:32	16:49	16:36
16	07:48	07:15	07:27	06:31	05:48	05:30		05:54 (3)	05:45			06:18	06:55	07:31	07:12	07:45
	17:02	17:45	19:22	20:00	20:37	21:02	11	06:05 (3)	20:57			20:20	19:26	18:31	16:48	16:36
17	07:48	07:14	07:26	06:29	05:47	05:30		05:54 (3)	05:46			06:20	06:56	07:32	07:13	07:46
	17:03	17:46	19:23	20:02	20:38	21:02	12	06:06 (3)	20:57			20:19	19:24	18:29	16:47	16:37
18	07:47	07:12	07:24	06:28	05:46	05:30		05:54 (3)	05:47			06:21	06:57	07:33	07:15	07:47
	17:05	17:47	19:24	20:03	20:39	21:02	12	06:06 (3)	20:56			20:17	19:22	18:27	16:46	16:37
19	07:47	07:11	07:22	06:26	05:44	05:30		05:54 (3)	05:48			06:22	06:58	07:35	07:16	07:47
	17:06	17:49	19:26	20:04	20:40	21:03	12	06:06 (3)	20:55			20:16	19:20	18:26	16:45	16:37
20	07:46	07:09	07:20	06:24	05:43	05:30		05:55 (3)	05:49			06:23	06:59	07:36	07:17	07:48
	17:07	17:50	19:27	20:05	20:41	21:03	12	06:07 (3)	20:54			20:14	19:18	18:24	16:44	16:38
21	07:45	07:07	07:18	06:23	05:43	05:30		05:55 (3)	05:50			06:24	07:00	07:37	07:19	07:48
	17:09	17:52	19:28	20:07	20:42	21:03	12	06:07 (3)	20:53			20:12	19:16	18:22	16:43	16:38
22	07:44	07:06	07:16	06:21	05:42	05:31		05:55 (3)	05:51			06:25	07:02	07:39	07:20	07:49
	17:10	17:53	19:29	20:08	20:43	21:04	12	06:07 (3)	20:52			20:11	19:14	18:21	16:43	16:39
23	07:44	07:04	07:15	06:19	05:41	05:31		05:55 (3)	05:52			06:27	07:03	07:40	07:21	07:49
	17:11	17:54	19:31	20:09	20:44	21:04	12	06:07 (3)	20:51			20:09	19:12	18:19	16:42	16:39
24	07:43	07:03	07:13	06:18	05:40	05:31		05:55 (3)	05:53			06:28	07:04	07:41	07:22	07:50
	17:13	17:56	19:32	20:10	20:45	21:04	12	06:07 (3)	20:50			20:07	19:11	18:18	16:41	16:40
25	07:42	07:01	07:11	06:16	05:39	05:31		05:56 (3)	05:54			06:29	07:05	07:43	07:24	07:50
	17:14	17:57	19:33	20:12	20:46	21:04	12	06:08 (3)	20:49			20:06	19:09	18:16	16:40	16:40
26	07:41	06:59	07:09	06:15	05:38	05:32		05:56 (3)	05:55			06:30	07:06	07:44	07:25	07:51
	17:15	17:58	19:34	20:13	20:47	21:04	12	06:08 (3)	20:48			20:04	19:07	18:14	16:40	16:41
27	07:40	06:58	07:07	06:13	05:37	05:32		05:57 (3)	05:56			06:31	07:07	07:45	07:26	07:51
	17:17	18:00	19:36	20:14	20:48	21:04	11	06:08 (3)	20:47			20:02	19:05	18:13	16:39	16:42
28	07:39	06:56	07:05	06:12	05:37	05:33		05:57 (3)	05:57			06:32	07:09	07:46	07:27	07:51
	17:18	18:01	19:37	20:15	20:49	21:04	11	06:08 (3)	20:46			20:00	19:03	18:11	16:39	16:42
29	07:38		07:03	06:10	05:36	05:33		05:57 (3)	05:58			06:34	07:10	07:48	07:29	07:51
	17:19		19:38	20:16	20:50	21:04	10	06:07 (3)	20:45			19:59	19:01	18:10	16:38	16:43
30	07:37		07:02	06:09	05:35	05:34		05:58 (3)	05:59			06:35	07:11	07:49	07:30	07:52
	17:21		19:39	20:18	20:51	21:04	10	06:08 (3)	20:44			19:57	18:59	18:09	16:38	16:44
31	07:36		07:00		05:35				06:00			06:36		07:51		07:52
	17:22		19:41		20:52				20:43			19:55		18:07		16:45
Potential sun hours	287	292	369	404	458	465			470			435	376	341	289	276
Total, worst case							236			28						

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
738 Terence Bay Wind Project

Description:
3 Turbine Wind project
Haliafx County, Nova Scotia

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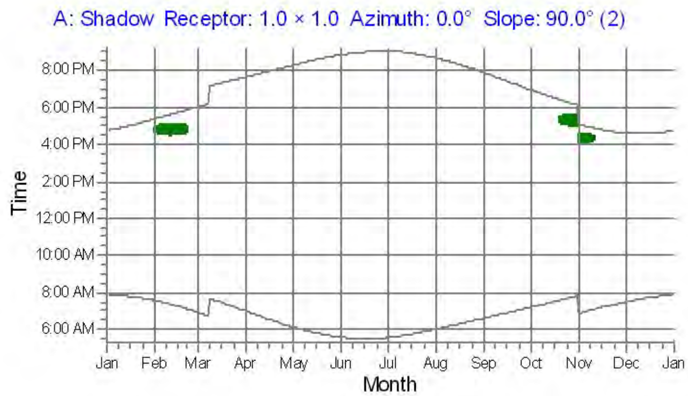
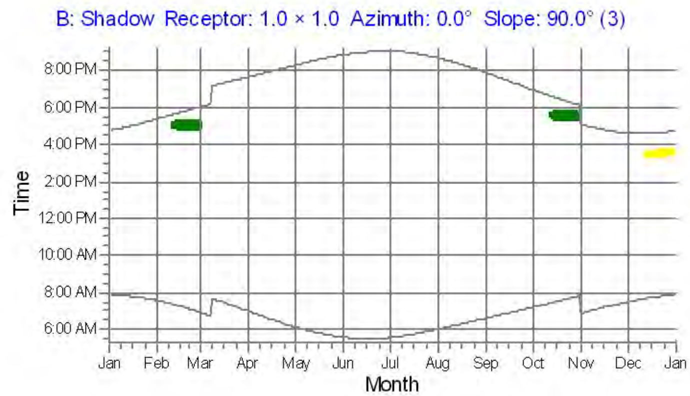
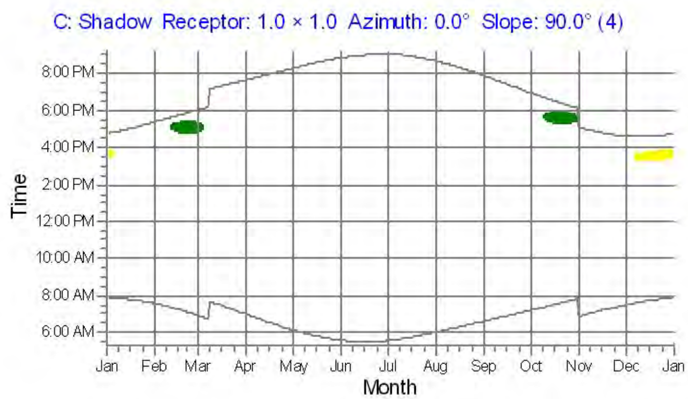
Calculated:
2/7/2014 9:10 AM/2.9.207

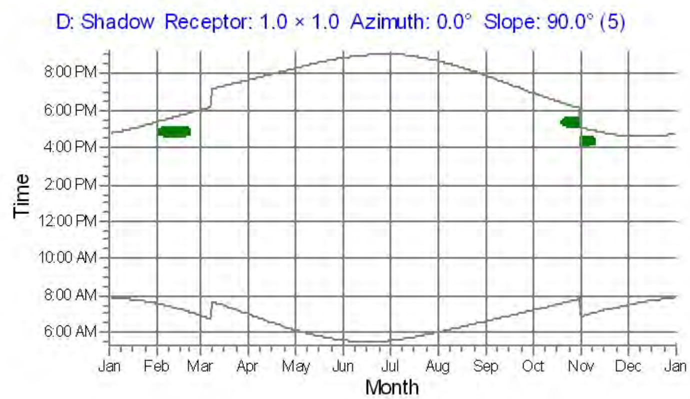
SHADOW - Calendar, graphical

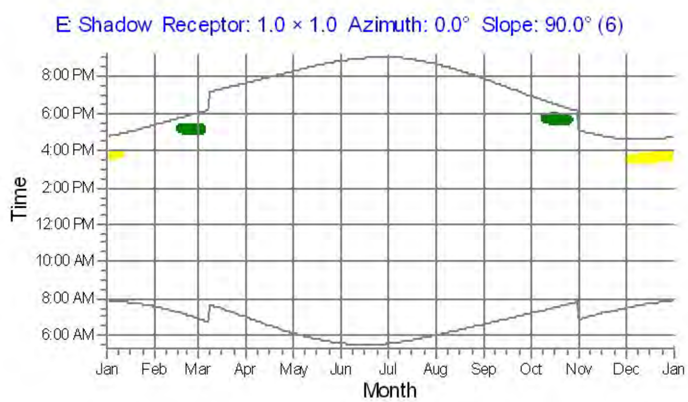
Calculation: Medium Worst

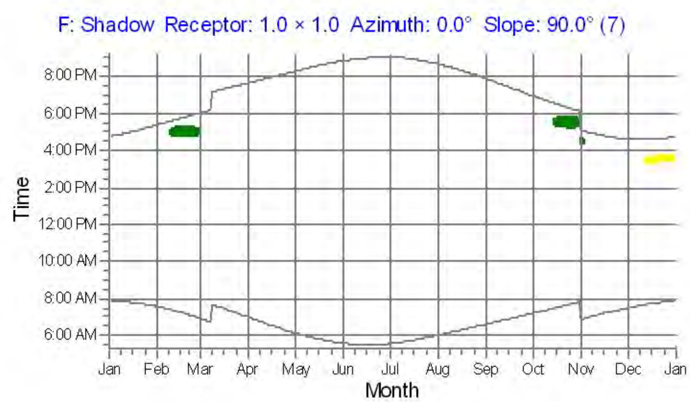












WTGs

1: ENERCON E-92 2,3 MW 2300 92.0 !-! hub: 85.0 m (TOT: 131.0 m) (1)

2: ENERCON E-92 2,3 MW 2300 92.0 !-! hub: 85.0 m (TOT: 131.0 m) (2)

Project:
738 Terence Bay Wind Project

Description:
3 Turbine Wind project
Haliafx County, Nova Scotia

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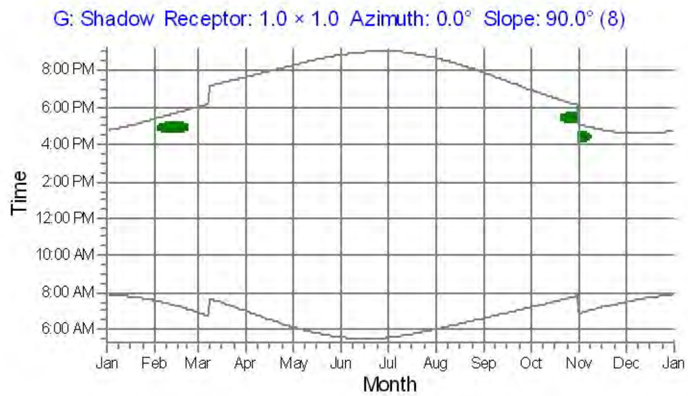
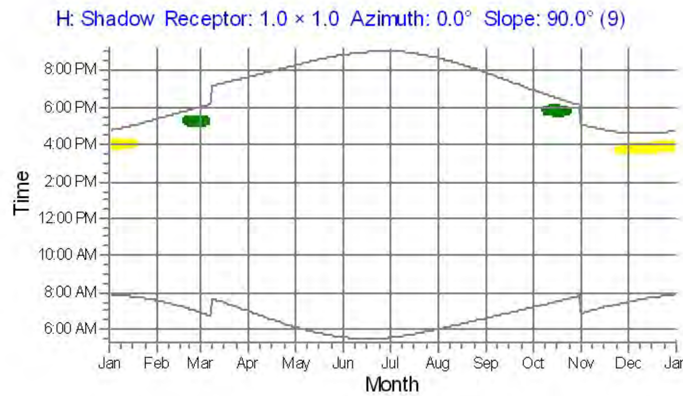
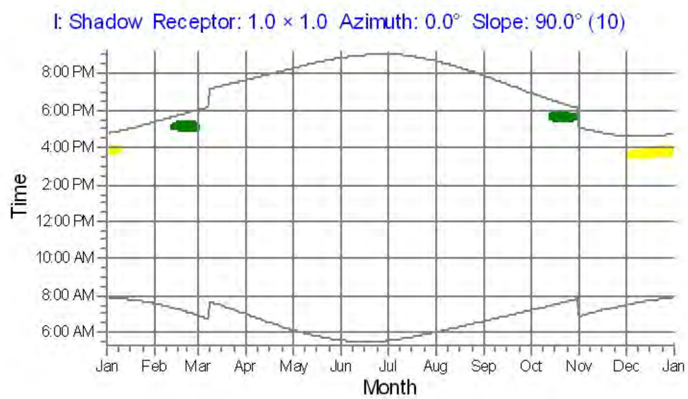
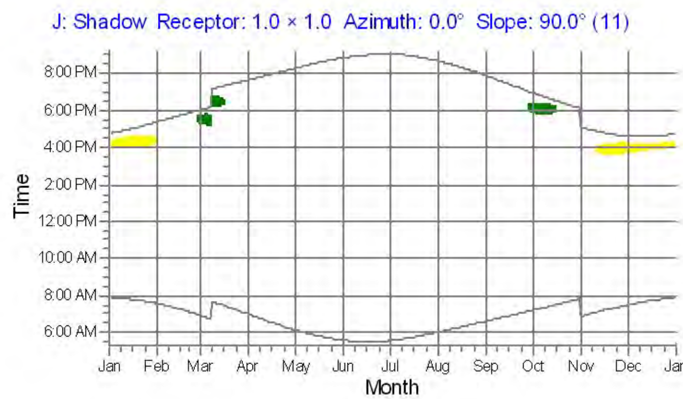
SHADOW - Calendar, graphical

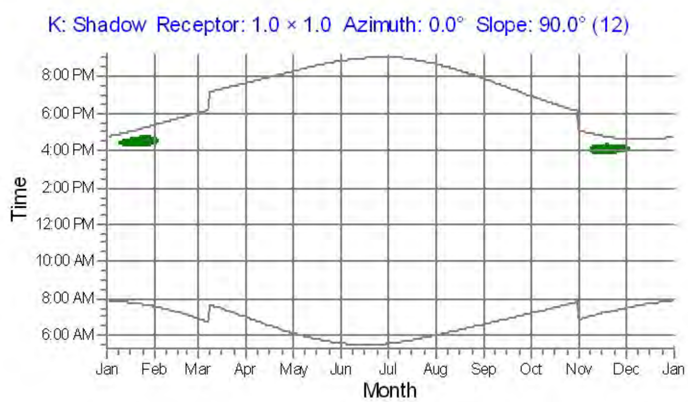
Calculation: Medium Worst

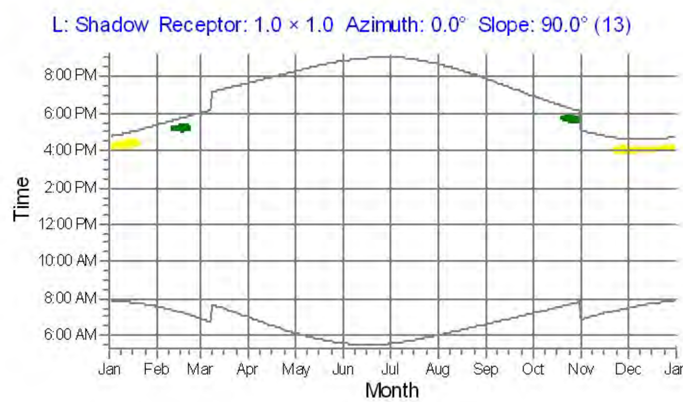












WTGs

1: ENERCON E-92 2,3 MW 2300 92.0 !-! hub: 85.0 m (TOT: 131.0 m) (1)

2: ENERCON E-92 2,3 MW 2300 92.0 !-! hub: 85.0 m (TOT: 131.0 m) (2)

Project:	Description:	Printed/Page
738 Terence Bay Wind Project	3 Turbine Wind project Haliafx County, Nova Scotia	2/7/2014 9:14 AM / 35

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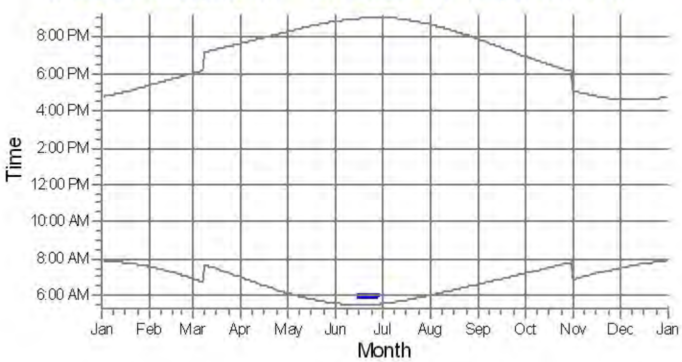
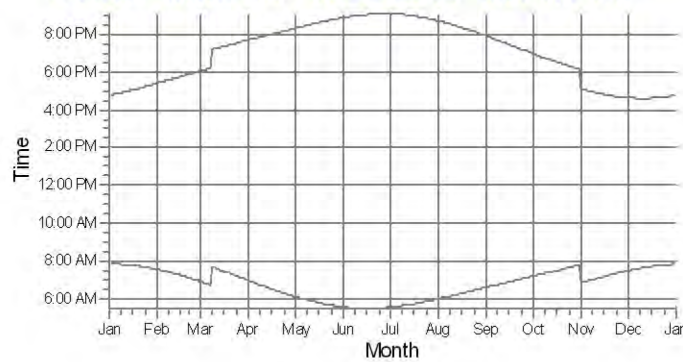
SHADOW - Calendar, graphical

Calculation: Medium Worst

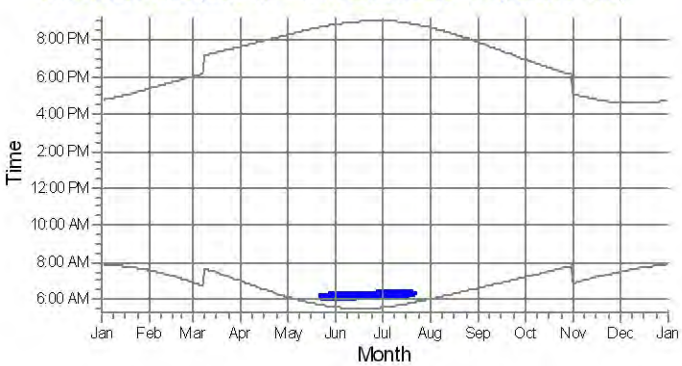
M: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (14)



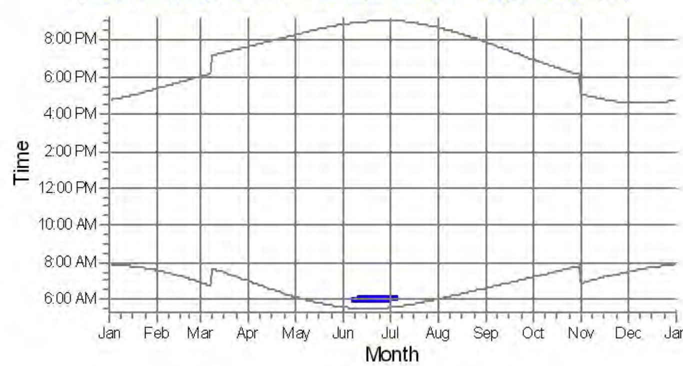
N: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (15)



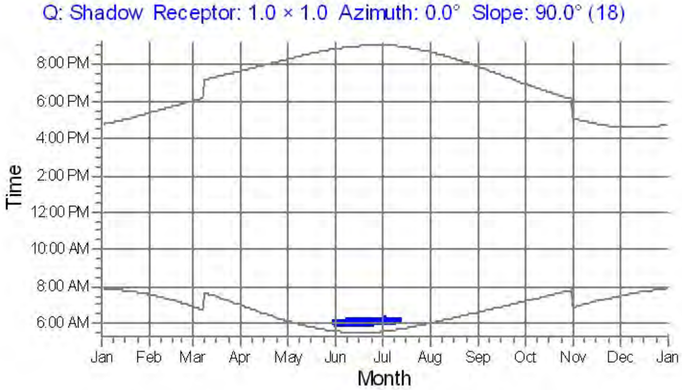
O: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (16)



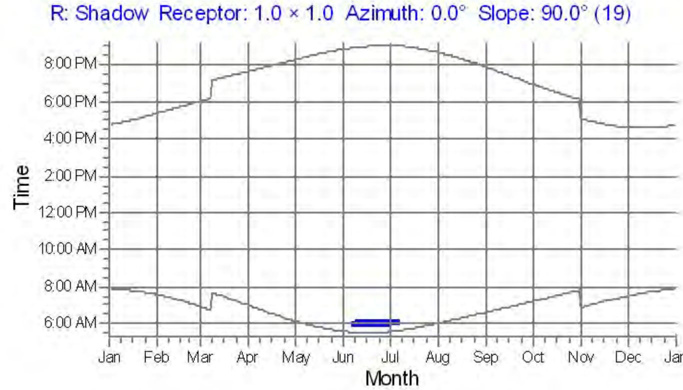
P: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (17)



Q: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (18)



R: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (19)



WTGs

3: ENERCON E-92 2,3 MW 2300 92.0 !-! hub: 85.0 m (TOT: 131.0 m) (3)

Project:
738 Terence Bay Wind Project

Description:
3 Turbine Wind project
Haliafx County, Nova Scotia

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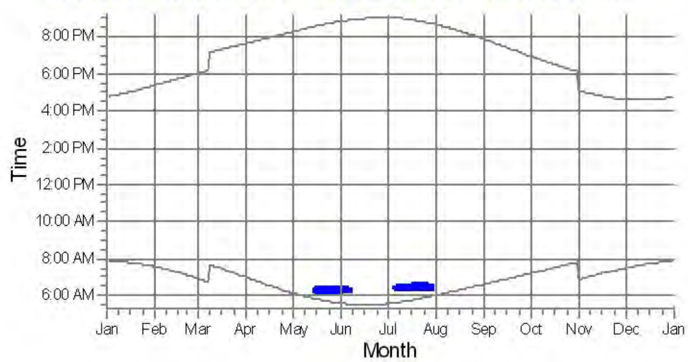
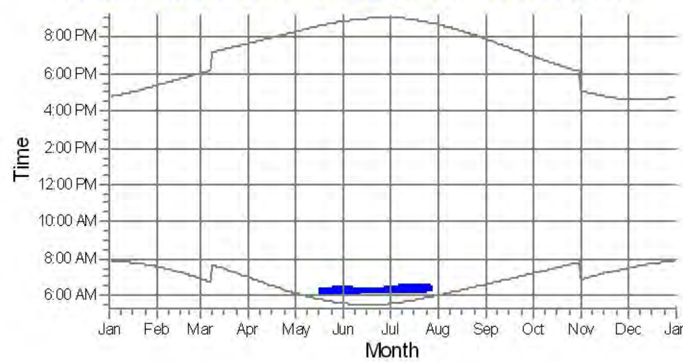
SHADOW - Calendar, graphical

Calculation: Medium Worst

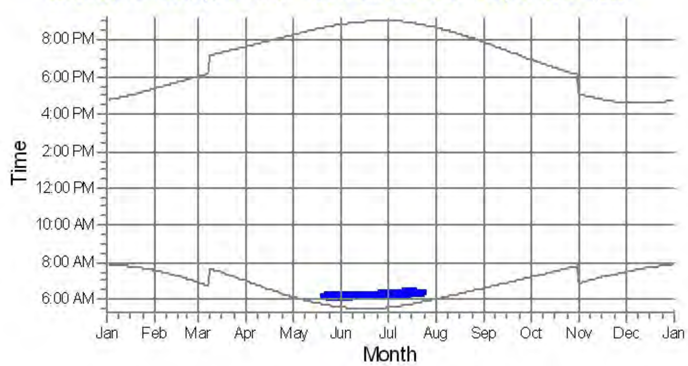
S: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (20)



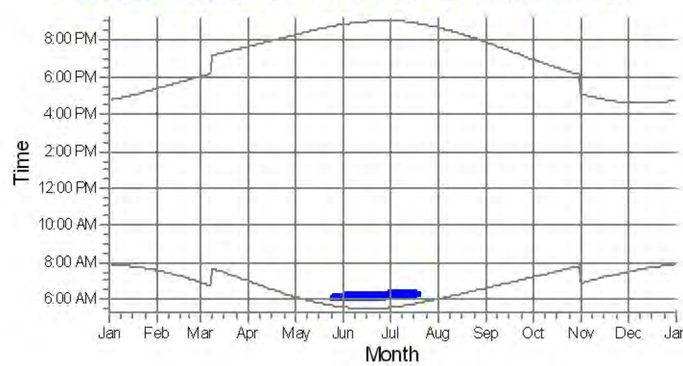
T: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (21)



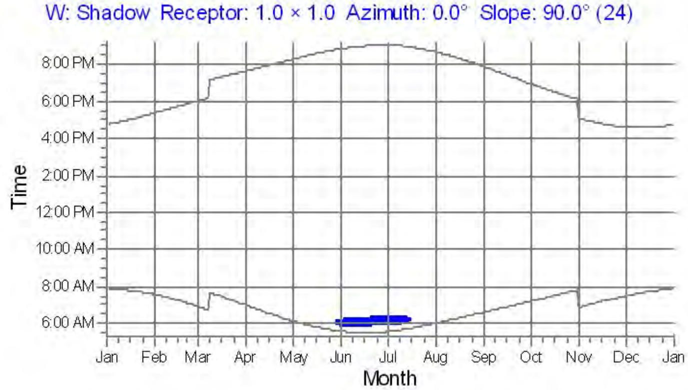
U: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (22)



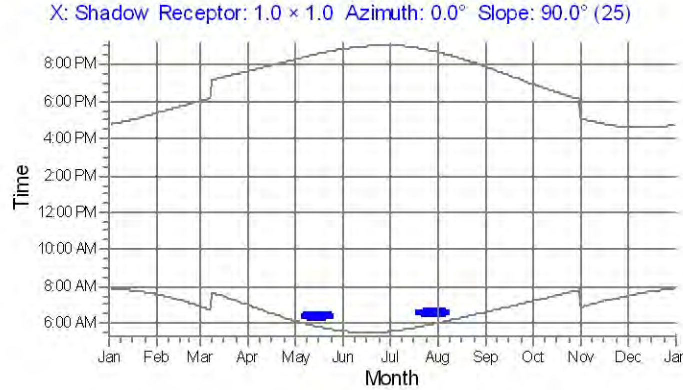
V: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (23)



W: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (24)



X: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (25)



WTGs

3: ENERCON E-92 2,3 MW 2300 92.0 !-! hub: 85.0 m (TOT: 131.0 m) (3)

Project:
738 Terence Bay Wind Project

Description:
3 Turbine Wind project
Haliafx County, Nova Scotia

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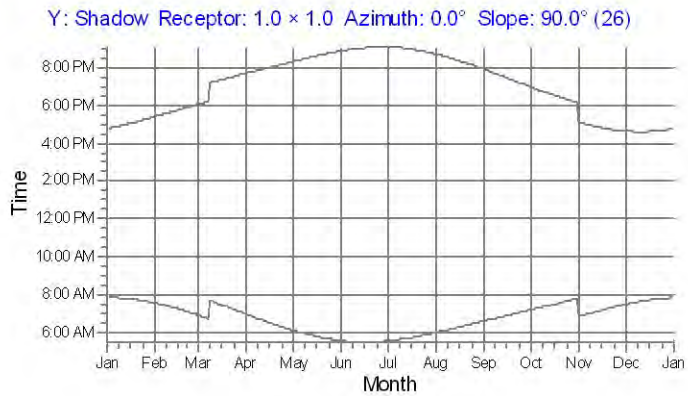
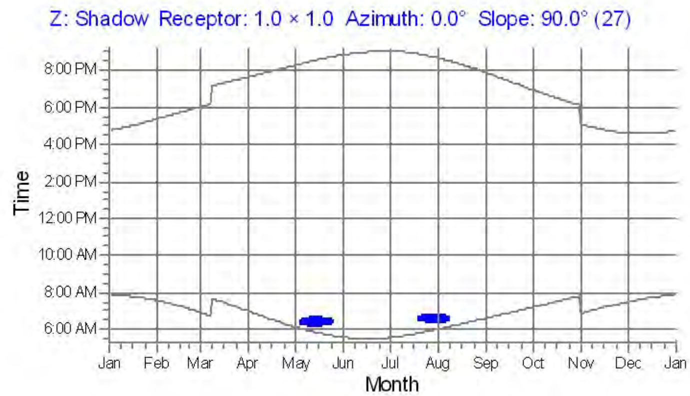
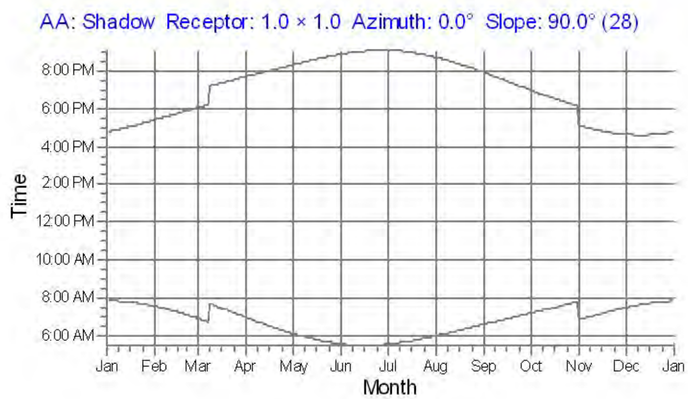
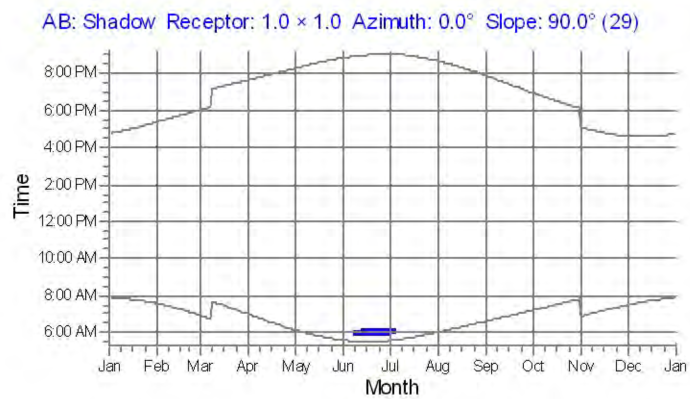
SHADOW - Calendar, graphical

Calculation: Medium Worst









WTGs

3: ENERCON E-92 2,3 MW 2300 92.0 !-! hub: 85.0 m (TOT: 131.0 m) (3)

Project:
738 Terence Bay Wind Project

Description:
3 Turbine Wind project
Haliafx County, Nova Scotia

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SHADOW - Calendar per WTG

Calculation: Medium Worst**WTG:** 1 - ENERCON E-92 2,3 MW 2300 92.0 !-! hub: 85.0 m (TOT: 131.0 m) (1)

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:
- The sun is shining all the day, from sunrise to sunset
- The rotor plane is always perpendicular to the line from the WTG to the sun
- The WTG is always operating

Day	January		February		March		April	May	June
1	07:52		07:35	16:28-16:38/10	06:54	16:56-17:40/44	06:58	06:07	05:34
	16:46		17:24	16:46-16:53/7	18:02	17:05-17:12/7	19:42	20:19	20:53
2	07:52		07:34	16:31-16:34/3	06:52	16:57-17:41/44	06:56	06:06	05:34
	16:47		17:25	16:43-16:56/13	18:04		19:43	20:20	20:53
3	07:52		07:33	16:41-16:58/17	06:51	16:59-17:42/43	06:54	06:04	05:33
	16:48		17:26		18:05		19:44	20:21	20:54
4	07:52		07:31	16:40-17:02/22	06:49	17:00-17:42/42	06:52	06:03	05:33
	16:48		17:28		18:06		19:46	20:23	20:55
5	07:52		07:30	16:39-17:04/25	06:47	17:04-17:44/40	06:51	06:01	05:32
	16:49		17:29		18:08		19:47	20:24	20:56
6	07:52		07:29	16:37-17:05/28	06:45	17:12-17:43/31	06:49	06:00	05:32
	16:50		17:31		18:09		19:48	20:25	20:56
7	07:52		07:28	16:37-17:06/29	06:44	17:17-17:43/26	06:47	05:59	05:31
	16:52		17:32		18:10		19:49	20:26	20:57
8	07:52		07:26	16:37-17:08/31	07:42	18:17-18:43/26	06:45	05:57	05:31
	16:53		17:33		19:12		19:51	20:27	20:58
9	07:51		07:25	16:36-17:08/32	07:40	18:17-18:42/25	06:43	05:56	05:31
	16:54		17:35		19:13		19:52	20:29	20:58
10	07:51	16:26-16:27/1	07:24	16:36-17:09/33	07:38	18:17-18:41/24	06:42	05:55	05:31
	16:55		17:36	17:11-17:12/1	19:14		19:53	20:30	20:59
11	07:51	16:23-16:28/5	07:22	16:35-17:13/38	07:37	18:18-18:41/23	06:40	05:53	05:30
	16:56		17:38		19:15		19:54	20:31	21:00
12	07:50	16:22-16:30/8	07:21	16:36-17:15/39	07:35	18:19-18:39/20	06:38	05:52	05:30
	16:57		17:39		19:17		19:55	20:32	21:00
13	07:50	16:21-16:30/9	07:20	16:36-17:16/40	07:33	18:20-18:38/18	06:36	05:51	05:30
	16:58		17:40		19:18		19:57	20:33	21:00
14	07:49	16:21-16:32/11	07:18	16:36-17:17/41	07:31	18:22-18:35/13	06:35	05:50	05:30
	17:00		17:42		19:19		19:58	20:34	21:01
15	07:49	16:20-16:33/13	07:17	16:37-17:20/43	07:29	18:25-18:31/6	06:33	05:49	05:30
	17:01		17:43		19:21		19:59	20:35	21:01
16	07:48	16:20-16:35/15	07:15	16:37-17:21/44	07:27		06:31	05:48	05:30
	17:02		17:45		19:22		20:00	20:37	21:02
17	07:48	16:20-16:36/16	07:14	16:37-17:22/45	07:26		06:29	05:46	05:30
	17:03		17:46		19:23		20:02	20:38	21:02
18	07:47	16:19-16:37/18	07:12	16:38-17:23/45	07:24		06:28	05:45	05:30
	17:05		17:47		19:24		20:03	20:39	21:02
19	07:47	16:19-16:38/19	07:11	16:39-17:22/43	07:22		06:26	05:44	05:30
	17:06		17:49	17:22-17:25/3	19:26		20:04	20:40	21:03
20	07:46	16:20-16:40/20	07:09	16:41-17:23/42	07:20		06:24	05:43	05:30
	17:07		17:50	17:21-17:27/6	19:27		20:05	20:41	21:03
21	07:45	16:20-16:41/21	07:07	16:42-17:21/39	07:18		06:23	05:42	05:30
	17:08		17:52	17:19-17:28/9	19:28		20:07	20:42	21:03
22	07:44	16:20-16:41/21	07:06	16:44-17:23/39	07:16		06:21	05:42	05:31
	17:10		17:53	17:22-17:28/6	19:29		20:08	20:43	21:04
23	07:44	16:20-16:42/22	07:04	16:49-17:23/34	07:15		06:19	05:41	05:31
	17:11		17:54	17:22-17:30/8	19:31		20:09	20:44	21:04
24	07:43	16:20-16:42/22	07:03	16:49-17:22/33	07:13		06:18	05:40	05:31
	17:12		17:56	17:21-17:30/9	19:32		20:10	20:45	21:04
25	07:42	16:20-16:42/22	07:01	16:50-17:21/31	07:11		06:16	05:39	05:31
	17:14		17:57	17:20-17:29/9	19:33		20:12	20:46	21:04
26	07:41	16:21-16:42/21	06:59	16:51-17:21/30	07:09		06:15	05:38	05:32
	17:15		17:58	17:20-17:30/10	19:34		20:13	20:47	21:04
27	07:40	16:21-16:42/21	06:58	16:52-17:34/42	07:07		06:13	05:37	05:32
	17:17		18:00	16:59-17:17/18	19:36		20:14	20:48	21:04
28	07:39	16:22-16:42/20	06:56	16:53-17:38/45	07:05		06:12	05:37	05:33
	17:18		18:01	17:00-17:15/15	19:37		20:15	20:49	21:04
29	07:38	16:23-16:41/18			07:03		06:10	05:36	05:33
	17:19				19:38		20:16	20:50	21:04
30	07:37	16:24-16:41/17			07:02		06:08	05:35	05:33
	17:21				19:39		20:18	20:51	21:04
31	07:36	16:26-16:40/14			07:00			05:35	
	17:22				19:41			20:52	
Potential sun hours	287		292		369		404	458	465
Sum of minutes with flicker		354		1017		425	0	0	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Project:
738 Terence Bay Wind Project

Description:
3 Turbine Wind project
Haliafx County, Nova Scotia

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Dorfstraße 100
DE-26532 Großheide
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Kirk Schmidt / kirk.schmidt@al-pro.ca

Calculated:
2/7/2014 9:10 AM/2.9.207

SHADOW - Calendar per WTG

Calculation: Medium Worst**WTG:** 1 - ENERCON E-92 2,3 MW 2300 92.0 !-! hub: 85.0 m (TOT: 131.0 m) (1)

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:
The sun is shining all the day, from sunrise to sunset
The rotor plane is always perpendicular to the line from the WTG to the sun
The WTG is always operating

	July	August	September	October	November	December
1	05:34	06:01	06:37	07:12 17:58-18:18/20	06:52 16:06-16:38/32	07:31 16:05-16:10/5
	21:04	20:42	19:53	18:57	17:06	16:37
2	05:34	06:02	06:38	07:13 17:57-18:19/22	06:53 16:06-16:37/31	07:32 16:07-16:09/2
	21:04	20:40	19:51	18:56	17:04	16:37
3	05:35	06:03	06:39	07:15 17:56-18:19/23	06:55 16:07-16:37/30	07:33
	21:04	20:39	19:50	18:54	17:03	16:37
4	05:36	06:05	06:41	07:16 17:55-18:19/24	06:56 16:07-16:36/29	07:34
	21:04	20:38	19:48	18:52	17:01	16:36
5	05:36	06:06	06:42	07:17 17:54-18:19/25	06:57 16:07-16:34/27	07:35
	21:03	20:36	19:46	18:50	17:00	16:36
6	05:37	06:07	06:43	07:18 17:53-18:19/26	06:59 16:09-16:34/25	07:36
	21:03	20:35	19:44	18:48	16:59	16:36
7	05:38	06:08	06:44	07:20 17:51-17:52/1	07:00 16:10-16:31/21	07:37
	21:03	20:34	19:42	18:47 17:54-18:19/25	16:58	16:36
8	05:38	06:09	06:45	07:21 17:41-18:19/38	07:01 16:12-16:29/17	07:38
	21:02	20:32	19:41	18:45	16:56	16:36
9	05:39	06:10	06:46	07:22 17:37-18:18/41	07:03 16:01-16:06/5	07:39
	21:02	20:31	19:39	18:43	16:55 16:14-16:27/13	16:35
10	05:40	06:11	06:47	07:23 17:35-18:17/42	07:04 15:59-16:10/11	07:40
	21:02	20:29	19:37	18:41	16:54 16:18-16:24/6	16:35
11	05:41	06:13	06:49	07:25 17:32-18:16/44	07:05 15:57-16:11/14	07:41
	21:01	20:28	19:35	18:39	16:53	16:35
12	05:41	06:14	06:50	07:26 17:29-18:14/45	07:07 15:56-16:13/17	07:42
	21:01	20:27	19:33	18:38	16:52	16:36
13	05:42	06:15	06:51	07:27 17:27-18:11/44	07:08 15:55-16:13/18	07:43
	21:00	20:25	19:31	18:36 17:35-17:46/11	16:51	16:36
14	05:43	06:16	06:52	07:28 17:26-18:10/44	07:09 15:54-16:14/20	07:44
	20:59	20:23	19:29	18:34 17:33-17:49/16	16:50	16:36
15	05:44	06:17	06:53	07:30 17:24-17:52/28	07:11 15:54-16:15/21	07:44
	20:58	20:22	19:27	18:32 17:51-18:02/11	16:49	16:36
16	05:45	06:18	06:54	07:31 17:22-17:53/31	07:12 15:54-16:15/21	07:45
	20:57	20:20	19:26	18:31 17:52-18:02/10	16:48	16:36
17	05:46	06:19	06:56	07:32 17:22-17:54/32	07:13 15:54-16:16/22	07:46
	20:57	20:19	19:24	18:29 17:53-18:02/9	16:47	16:36
18	05:47	06:21	06:57	07:33 17:21-17:54/33	07:15 15:54-16:16/22	07:47
	20:56	20:17	19:22	18:27 17:53-18:01/8	16:46	16:37
19	05:48	06:22	06:58	07:35 17:18-17:54/36	07:16 15:55-16:17/22	07:47
	20:55	20:16	19:20	18:26 17:53-18:00/7	16:45	16:37
20	05:49	06:23	06:59	07:36 17:15-17:50/35	07:17 15:55-16:16/21	07:48
	20:54	20:14	19:18	18:24 17:47-18:00/13	16:44	16:38
21	05:50	06:24	07:00	07:37 17:12-17:52/40	07:19 15:55-16:16/21	07:48
	20:53	20:12	19:16	18:22 17:50-17:58/8	16:43	16:38
22	05:51	06:25	07:02	07:39 17:11-17:53/42	07:20 15:56-16:16/20	07:49
	20:52	20:11	19:14	18:21 17:51-17:57/6	16:42	16:38
23	05:52	06:26	07:03	07:40 17:09-17:53/44	07:21 15:56-16:15/19	07:49
	20:51	20:09	19:12	18:19 17:53-17:55/2	16:42	16:39
24	05:53	06:28	07:04	07:41 17:07-17:52/45	07:22 15:56-16:14/18	07:50
	20:50	20:07	19:11	18:18	16:41	16:40
25	05:54	06:29	07:05	07:42 17:07-17:52/45	07:24 15:58-16:14/16	07:50
	20:49	20:06	19:09	18:16	16:40	16:40
26	05:55	06:30	07:06	07:44 17:06-17:50/44	07:25 15:58-16:13/15	07:51
	20:48	20:04	19:07	18:14	16:40	16:41
27	05:56	06:31	07:07	07:45 17:06-17:48/42	07:26 15:59-16:12/13	07:51
	20:47	20:02	19:05	18:13	16:39	16:41
28	05:57	06:32	07:09	07:46 17:05-17:47/42	07:27 16:01-16:12/11	07:51
	20:46	20:00	19:03	18:11	16:39	16:42
29	05:58	06:34	07:10 18:03-18:15/12	07:48 17:05-17:45/40	07:29 16:02-16:12/10	07:51
	20:45	19:59	19:01	18:10	16:38	16:43
30	05:59	06:35	07:11 18:00-18:17/17	07:49 17:05-17:44/39	07:30 16:03-16:11/8	07:52
	20:44	19:57	18:59	18:08	16:38	16:44
31	06:00	06:36		07:50 17:05-17:42/37		07:52
	20:43	19:55		18:07		16:45
Potential sun hours	470	435	376	341	289	276
Sum of minutes with flicker	0	0	29	1181	596	7

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Project:
738 Terence Bay Wind Project

Description:
3 Turbine Wind project
Haliafx County, Nova Scotia

Printed/Page
2/7/2014 9:14 AM / 40

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Kirk Schmidt / kirk.schmidt@al-pro.ca

Calculated:
2/7/2014 9:10 AM/2.9.207

SHADOW - Calendar per WTG

Calculation: Medium Worst**WTG:** 2 - ENERCON E-92 2,3 MW 2300 92.0 !-! hub: 85.0 m (TOT: 131.0 m) (2)

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:
The sun is shining all the day, from sunrise to sunset
The rotor plane is always perpendicular to the line from the WTG to the sun
The WTG is always operating

	January	February	March	April	May	June	July	August	Septembe	October	November	December
1	07:52 15:32-16:17/45	07:35	06:54	06:58	06:07	05:34	05:34	06:01	06:37	07:12	06:52	07:31 15:29-16:10/41
	16:46 15:40-16:00/20	17:24	18:02	19:42	20:19	20:52	21:04	20:42	19:53	18:57	17:06	16:37
2	07:52 15:33-16:18/45	07:34	06:52	06:56	06:06	05:34	05:34	06:02	06:38	07:13	06:53	07:32 15:27-16:09/42
	16:47 15:41-16:00/19	17:25	18:04	19:43	20:20	20:53	21:04	20:40	19:51	18:56	17:04	16:37 15:34-15:40/6
3	07:52 15:35-16:19/44	07:33	06:51	06:54	06:04	05:33	05:35	06:03	06:39	07:15	06:55	07:33 15:26-16:10/44
	16:48 15:42-16:01/19	17:26	18:05	19:44	20:21	20:54	21:04	20:39	19:50	18:54	17:03	16:37 15:33-15:43/10
4	07:52 15:36-16:20/44	07:31	06:49	06:52	06:03	05:33	05:36	06:05	06:41	07:16	06:56	07:34 15:26-16:09/43
	16:48 15:43-16:01/18	17:28	18:06	19:46	20:23	20:55	21:04	20:38	19:48	18:52	17:01	16:36 15:32-15:45/13
5	07:52 15:37-16:21/44	07:30	06:47	06:51	06:01	05:32	05:36	06:06	06:42	07:17	06:57	07:35 15:25-16:09/44
	16:49 15:44-16:01/17	17:29	18:08	19:47	20:24	20:56	21:03	20:36	19:46	18:50	17:00	16:36 15:32-15:46/14
6	07:52 15:39-16:23/44	07:29	06:45	06:49	06:00	05:32	05:37	06:07	06:43	07:18	06:59	07:36 15:25-16:09/44
	16:50 15:45-16:01/16	17:31	18:09	19:48	20:25	20:56	21:03	20:35	19:44	18:48	16:59	16:36 15:31-15:47/16
7	07:52 15:40-16:24/44	07:28	06:44	06:47	05:59	05:31	05:38	06:08	06:44	07:20	07:00	07:37 15:25-16:08/43
	16:52 15:47-16:01/14	17:32	18:10	19:49	20:26	20:57	21:03	20:34	19:42	18:47	16:58	16:36 15:31-15:48/17
8	07:52 15:41-16:24/43	07:26	07:42	06:45	05:57	05:31	05:38	06:09	06:45	07:21	07:01	07:38 15:24-16:08/44
	16:53 15:47-16:00/13	17:33	19:12	19:51	20:27	20:58	21:02	20:32	19:41	18:45	16:56	16:36 15:31-15:49/18
9	07:51 15:42-16:26/44	07:25	07:40	06:43	05:56	05:31	05:39	06:10	06:46	07:22	07:03	07:39 15:24-16:08/44
	16:54 15:49-15:59/10	17:35	19:13	19:52	20:28	20:58	21:02	20:31	19:39	18:43	16:55	16:35 15:31-15:50/19
10	07:51 15:44-16:27/43	07:24	07:38	06:42	05:55	05:31	05:40	06:11	06:47	07:23	07:04	07:40 15:23-16:08/45
	16:55 15:52-15:58/6	17:36	19:14	19:53	20:30	20:59	21:02	20:29	19:37	18:41	16:54	16:35 15:31-15:50/19
11	07:51 15:46-16:28/42	07:22	07:37	06:40	05:53	05:30	05:41	06:13	06:49	07:24	07:05	07:41 15:23-16:08/45
	16:56	17:38	19:15	19:54	20:31	21:00	21:01	20:28	19:35	18:39	16:53	16:35 15:31-15:51/20
12	07:50 15:53-16:30/37	07:21	07:35	06:38	05:52	05:30	05:41	06:14	06:50	07:26	07:07 15:52-15:58/6	07:42 15:23-16:08/45
	16:57	17:39	19:17	19:55	20:32	21:00	21:01	20:27	19:33	18:38	16:52	16:36 15:32-15:52/20
13	07:50 15:54-16:30/36	07:20	07:33	06:36	05:51	05:30	05:42	06:15	06:51	07:27	07:08 15:49-16:01/12	07:43 15:22-16:07/45
	16:58	17:40	19:18	19:57	20:33	21:00	21:00	20:25	19:31	18:36	16:51	16:36 15:27-15:52/25
14	07:49 15:55-16:32/37	07:18	07:31	06:35	05:50	05:30	05:43	06:16	06:52	07:28	07:09 15:47-16:02/15	07:44 15:23-16:08/45
	17:00	17:42	19:19	19:58	20:34	21:01	20:59	20:23	19:29	18:34	16:50	16:36 15:27-15:53/26
15	07:49 15:56-16:32/36	07:17	07:29	06:33	05:49	05:30	05:44	06:17	06:53	07:30	07:11 15:46-16:04/18	07:44 15:23-16:08/45
	17:01	17:43	19:21	19:59	20:35	21:01	20:58	20:22	19:27	18:32	16:49	16:36 15:26-15:54/28
16	07:48 15:57-16:31/34	07:15	07:27	06:31	05:48	05:30	05:45	06:18	06:54	07:31	07:12 15:45-16:05/20	07:45 15:24-16:09/45
	17:02 16:31-16:32/1	17:45	19:22	20:00	20:37	21:02	20:57	20:20	19:26	18:31	16:48	16:36 15:27-15:54/27
17	07:48 15:59-16:32/33	07:14	07:26	06:29	05:46	05:30	05:46	06:19	06:56	07:32	07:13 15:45-16:07/22	07:46 15:23-16:08/45
	17:03 16:32-16:33/1	17:46	19:23	20:02	20:38	21:02	20:57	20:19	19:24	18:29	16:47	16:36 15:26-15:54/28
18	07:47 16:02-16:31/29	07:12	07:24	06:28	05:45	05:30	05:47	06:21	06:57	07:33	07:15 15:44-16:07/23	07:47 15:24-16:09/45
	17:05 16:31-16:33/2	17:47	19:24	20:03	20:39	21:02	20:56	20:17	19:22	18:27	16:46	16:37 15:26-15:55/29
19	07:47 16:07-16:29/22	07:11	07:22	06:26	05:44	05:30	05:48	06:22	06:58	07:35	07:16 15:45-16:08/23	07:47 15:25-16:10/45
	17:06 16:29-16:33/4	17:49	19:26	20:04	20:40	21:03	20:55	20:16	19:20	18:26	16:45	16:37 15:27-15:56/29
20	07:46 16:08-16:34/26	07:09	07:20	06:24	05:43	05:30	05:49	06:23	06:59	07:36	07:17 15:44-16:09/25	07:48 15:24-16:09/45
	17:07	17:50	19:27	20:05	20:41	21:03	20:54	20:14	19:18	18:24	16:44	16:38 15:27-15:56/29
21	07:45 16:09-16:34/25	07:07	07:18	06:23	05:42	05:30	05:50	06:24	07:00	07:37	07:19 15:44-16:09/25	07:48 15:25-16:10/45
	17:08	17:52	19:28	20:07	20:42	21:03	20:53	20:12	19:16	18:22	16:43	16:38 15:28-15:57/29
22	07:44 16:09-16:34/25	07:06	07:16	06:21	05:42	05:31	05:51	06:25	07:02	07:39	07:20 15:44-16:10/26	07:49 15:25-16:10/45
	17:10	17:53	19:29	20:08	20:43	21:04	20:52	20:11	19:14	18:21	16:42	16:38 15:28-15:57/29
23	07:44 16:10-16:33/23	07:04	07:14	06:19	05:41	05:31	05:52	06:26	07:03	07:40	07:21 15:44-16:06/22	07:49 15:26-16:11/45
	17:11	17:54	19:31	20:09	20:44	21:04	20:51	20:09	19:12	18:19	16:42 16:06-16:10/4	16:39 15:29-15:58/29
24	07:43 16:10-16:33/23	07:03	07:13	06:18	05:40	05:31	05:53	06:28	07:04	07:41	07:22 15:39-16:08/29	07:50 15:26-16:11/45
	17:12	17:56	19:32	20:10	20:45	21:04	20:50	20:07	19:11	18:18	16:41 16:08-16:10/2	16:40 15:29-15:58/29
25	07:42 16:11-16:33/22	07:01	07:11	06:16	05:39	05:31	05:54	06:29	07:05	07:42	07:24 15:38-16:10/32	07:50 15:27-16:12/45
	17:14	17:57	19:33	20:12	20:46	21:04	20:49	20:06	19:09	18:16	16:40 16:10-16:11/1	16:40 15:29-15:58/29
26	07:41 16:12-16:32/20	06:59	07:09	06:15	05:38	05:32	05:55	06:30	07:06	07:44	07:25 15:36-16:10/34	07:51 15:28-16:13/45
	17:15	17:58	19:34	20:13	20:47	21:04	20:48	20:04	19:07	18:14	16:40 16:10-16:11/1	16:41 15:31-15:59/28
27	07:40 16:14-16:31/17	06:58	07:07	06:13	05:37	05:32	05:56	06:31	07:07	07:45	07:26 15:35-16:11/36	07:51 15:28-16:13/45
	17:17	18:00	19:36	20:14	20:48	21:04	20:47	20:02	19:05	18:13	16:39	16:41 15:31-15:59/28
28	07:39 16:15-16:30/15	06:56	07:05	06:12	05:37	05:33	05:57	06:32	07:09	07:46	07:27 15:35-16:12/37	07:51 15:29-16:14/45
	17:18	18:01	19:37	20:15	20:49	21:04	20:46	20:00	19:03	18:11	16:39	16:42 15:32-15:59/27
29	07:38 16:17-16:29/12		07:03	06:10	05:36	05:33	05:58	06:34	07:10	07:48	07:29 15:35-16:12/37	07:51 15:29-16:15/46
	17:19		19:38	20:16	20:50	21:04	20:45	19:59	19:01	18:10	16:38	16:43 15:33-16:00/27
30	07:37 16:21-16:26/5		07:02	06:08	05:35	05:33	05:59	06:35	07:11	07:49	07:30 15:34-16:11/37	07:52 15:30-16:15/45
	17:21		19:39	20:18	20:51	21:04	20:44	19:57	18:59	18:08	16:38	16:44 15:34-16:00/26
31	07:36		07:00		05:35		06:00	06:36		07:50		07:52 15:31-16:16/45
	17:22		19:41		20:52		20:43	19:55		18:07		16:45 15:37-16:00/23
Potential sun hours	287	292	369	404	458	465	470	435	376	341	289	276
Sum of minutes with flicker	967	0	0	0	0	0	0	0	0	0	487	1403

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Project:
738 Terence Bay Wind Project

Description:
3 Turbine Wind project
Haliafx County, Nova Scotia

Printed/Page
2/7/2014 9:14 AM / 41

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Calculated:
2/7/2014 9:10 AM/2.9.207

SHADOW - Calendar per WTG

Calculation: Medium Worst**WTG:** 3 - ENERCON E-92 2,3 MW 2300 92.0 !-! hub: 85.0 m (TOT: 131.0 m) (3)

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:
The sun is shining all the day, from sunrise to sunset
The rotor plane is always perpendicular to the line from the WTG to the sun
The WTG is always operating

	January	February	March	April	May		June		July		August		Septembe	October	November	December
1	07:52	07:35	06:54	06:58	06:07		05:34	05:57-06:14/17	05:34	05:58-06:12/14	06:01	06:26-06:45/19	06:37	07:12	06:52	07:31
	16:46	17:24	18:02	19:42	20:19		20:52	06:10-06:24/14	21:04	06:08-06:25/17	20:42		19:53	18:57	17:06	16:37
2	07:52	07:34	06:52	06:56	06:06		05:34	05:57-06:15/18	05:35	05:59-06:12/13	06:02	06:26-06:45/19	06:38	07:13	06:53	07:32
	16:47	17:25	18:04	19:43	20:20		20:53	06:11-06:24/13	21:04	06:08-06:26/18	20:40		19:51	18:56	17:04	16:37
3	07:52	07:33	06:51	06:54	06:04		05:33	05:57-06:16/19	05:35	06:00-06:11/11	06:03	06:27-06:44/17	06:39	07:15	06:55	07:33
	16:48	17:26	18:05	19:44	20:21		20:54	06:12-06:24/12	21:04	06:08-06:27/19	20:39		19:50	18:54	17:03	16:37
4	07:52	07:31	06:49	06:52	06:03		05:33	05:56-06:16/20	05:36	06:00-06:10/10	06:05	06:28-06:44/16	06:41	07:16	06:56	07:34
	16:48	17:28	18:06	19:46	20:23		20:55	06:12-06:23/11	21:04	06:06-06:27/21	20:38		19:48	18:52	17:01	16:36
5	07:52	07:30	06:47	06:51	06:01	06:22-06:28/6	05:32	05:56-06:17/21	05:36	06:01-06:23/22	06:06	06:29-06:43/14	06:42	07:17	06:57	07:35
	16:49	17:29	18:08	19:47	20:24		20:56	06:13-06:23/10	21:03	06:20-06:28/8	20:36		19:46	18:50	17:00	16:36
6	07:52	07:29	06:45	06:49	06:00	06:21-06:31/10	05:32	05:55-06:17/22	05:37	06:01-06:23/22	06:07	06:30-06:41/11	06:43	07:18	06:59	07:36
	16:50	17:31	18:09	19:48	20:25		20:56	06:13-06:22/9	21:03	06:19-06:28/9	20:35		19:44	18:48	16:59	16:36
7	07:52	07:28	06:44	06:47	05:59	06:20-06:32/12	05:31	05:55-06:16/21	05:38	06:02-06:23/21	06:08	06:31-06:39/8	06:44	07:20	07:00	07:37
	16:52	17:32	18:10	19:49	20:26		20:57	06:13-06:22/9	21:03	06:19-06:29/10	20:34		19:42	18:47	16:58	16:36
8	07:52	07:26	07:42	06:45	05:57	06:19-06:33/14	05:31	05:55-06:04/9	05:38	06:03-06:23/20	06:09		06:45	07:21	07:01	07:38
	16:53	17:33	19:12	19:51	20:27		20:58	06:00-06:22/22	21:02	06:19-06:30/11	20:32		19:41	18:45	16:56	16:36
9	07:51	07:25	07:40	06:43	05:56	06:17-06:33/16	05:31	05:55-06:06/11	05:39	06:03-06:23/20	06:10		06:46	07:22	07:03	07:39
	16:54	17:35	19:13	19:52	20:28		20:58	06:02-06:22/20	21:02	06:19-06:30/11	20:31		19:39	18:43	16:55	16:35
10	07:51	07:24	07:38	06:42	05:55	06:16-06:34/18	05:31	05:54-06:06/12	05:40	06:04-06:22/18	06:11		06:47	07:23	07:04	07:40
	16:55	17:36	19:14	19:53	20:30		20:59	06:02-06:21/19	21:01	06:18-06:31/13	20:29		19:37	18:41	16:54	16:35
11	07:51	07:22	07:37	06:40	05:53	06:15-06:35/20	05:30	05:54-06:07/13	05:41	06:05-06:22/17	06:13		06:49	07:24	07:05	07:41
	16:56	17:38	19:15	19:54	20:31		21:00	06:03-06:21/18	21:01	06:18-06:32/14	20:28		19:35	18:39	16:53	16:35
12	07:50	07:21	07:35	06:38	05:52	06:15-06:35/20	05:30	05:54-06:08/14	05:41	06:06-06:22/16	06:14		06:50	07:26	07:07	07:42
	16:57	17:39	19:17	19:55	20:32		21:00	06:04-06:21/17	21:00	06:18-06:33/15	20:26		19:33	18:38	16:52	16:36
13	07:50	07:20	07:33	06:36	05:51	06:15-06:35/20	05:30	05:54-06:09/15	05:42	06:07-06:21/14	06:15		06:51	07:27	07:08	07:43
	16:58	17:40	19:18	19:57	20:33		21:00	06:05-06:21/16	21:00	06:17-06:33/16	20:25		19:31	18:36	16:51	16:36
14	07:49	07:18	07:31	06:35	05:50	06:12-06:35/23	05:30	05:54-06:09/15	05:43	06:07-06:19/12	06:16		06:52	07:28	07:09	07:44
	17:00	17:42	19:19	19:58	20:34		21:01	06:05-06:21/16	20:59	06:15-06:33/18	20:23		19:29	18:34	16:50	16:36
15	07:49	07:17	07:29	06:33	05:49	06:11-06:35/24	05:30	05:54-06:10/16	05:44	06:08-06:16/8	06:17		06:53	07:30	07:11	07:44
	17:01	17:43	19:21	19:59	20:35		21:01	06:06-06:21/15	20:58	06:13-06:34/21	20:22		19:27	18:32	16:49	16:36
16	07:48	07:15	07:27	06:31	05:48	06:10-06:35/25	05:30	05:54-06:10/16	05:45	06:09-06:26/17	06:18		06:54	07:31	07:12	07:45
	17:02	17:45	19:22	20:00	20:37		21:02	06:06-06:21/15	20:57	06:24-06:34/10	20:20		19:26	18:31	16:48	16:36
17	07:48	07:14	07:26	06:29	05:46	06:09-06:35/26	05:30	05:54-06:11/17	05:46	06:10-06:26/16	06:19		06:56	07:32	07:13	07:46
	17:03	17:46	19:23	20:02	20:38		21:02	06:07-06:21/14	20:57	06:24-06:35/11	20:19		19:24	18:29	16:47	16:36
18	07:47	07:12	07:24	06:28	05:45	06:08-06:34/26	05:30	05:54-06:11/17	05:47	06:11-06:25/14	06:21		06:57	07:33	07:15	07:47
	17:05	17:47	19:24	20:03	20:39		21:02	06:07-06:21/14	20:56	06:23-06:35/12	20:17		19:22	18:27	16:46	16:37
19	07:47	07:11	07:22	06:26	05:44	06:07-06:34/27	05:30	05:54-06:11/17	05:48	06:12-06:32/20	06:22		06:58	07:35	07:16	07:47
	17:06	17:49	19:26	20:04	20:40		21:03	06:07-06:21/14	20:55	06:12-06:36/24	20:16		19:20	18:26	16:45	16:37
20	07:46	07:09	07:20	06:24	05:43	06:06-06:14/8	05:30	05:55-06:12/17	05:49	06:13-06:28/15	06:23		06:59	07:36	07:17	07:48
	17:07	17:50	19:27	20:05	20:41	06:06-06:33/27	21:03	06:08-06:22/14	20:54	06:13-06:39/26	20:14		19:18	18:24	16:44	16:38
21	07:45	07:07	07:18	06:23	05:42	06:05-06:16/11	05:30	05:55-06:12/17	05:50	06:14-06:27/13	06:24		07:00	07:37	07:19	07:48
	17:08	17:52	19:28	20:07	20:42	06:05-06:32/27	21:03	06:08-06:22/14	20:53	06:15-06:41/26	20:12		19:16	18:22	16:43	16:38
22	07:44	07:06	07:16	06:21	05:42	06:04-06:17/13	05:31	05:55-06:12/17	05:51	06:15-06:27/12	06:25		07:02	07:39	07:20	07:49
	17:10	17:53	19:29	20:08	20:43	06:04-06:31/27	21:04	06:08-06:22/14	20:52	06:15-06:42/27	20:11		19:14	18:21	16:42	16:38
23	07:44	07:04	07:14	06:19	05:41	06:03-06:17/14	05:31	05:55-06:12/17	05:52	06:16-06:26/10	06:26		07:03	07:40	07:21	07:49
	17:11	17:54	19:31	20:09	20:44	06:03-06:29/26	21:04	06:08-06:22/14	20:51	06:16-06:43/27	20:09		19:12	18:19	16:42	16:39
24	07:43	07:03	07:13	06:18	05:40	06:02-06:18/16	05:31	05:55-06:12/17	05:53	06:17-06:44/27	06:28		07:04	07:41	07:22	07:50
	17:12	17:56	19:32	20:10	20:45	06:02-06:27/25	21:04	06:08-06:22/14	20:50	06:18-06:24/6	20:07		19:11	18:18	16:41	16:40
25	07:42	07:01	07:11	06:16	05:39	06:02-06:15/13	05:31	05:56-06:13/17	05:54	06:18-06:44/26	06:29		07:05	07:42	07:24	07:50
	17:14	17:57	19:33	20:12	20:46	06:13-06:26/13	21:04	06:09-06:23/14	20:49		20:06		19:09	18:16	16:40	16:40
26	07:41	06:59	07:09	06:15	05:38	06:01-06:16/15	05:32	05:56-06:13/17	05:55	06:19-06:45/26	06:30		07:06	07:44	07:25	07:51
	17:15	17:58	19:34	20:13	20:47	06:14-06:26/12	21:04	06:09-06:23/14	20:48		20:04		19:07	18:14	16:40	16:41
27	07:40	06:58	07:07	06:13	05:37	06:00-06:16/16	05:32	05:57-06:13/16	05:56	06:20-06:45/25	06:31		07:07	07:45	07:26	07:51
	17:17	18:00	19:36	20:14	20:48	06:14-06:25/11	21:04	06:09-06:24/15	20:47		20:02		19:05	18:13	16:39	16:41
28	07:39	06:56	07:05	06:12	05:37	06:00-06:18/18	05:33	05:57-06:13/16	05:57	06:21-06:46/25	06:32		07:09	07:46	07:27	07:51
	17:18	18:01	19:37	20:15	20:49	06:16-06:26/10	21:04	06:09-06:24/15	20:46		20:00		19:03	18:11	16:39	16:42
29	07:38		07:03	06:10	05:36	05:59-06:10/11	05:33	05:57-06:12/15	05:58	06:22-06:46/24	06:34		07:10	07:48	07:29	07:51
	17:19		19:38	20:16	20:50	06:06-06:25/19	21:04	06:08-06:24/16	20:45		19:59		19:01	18:10	16:38	16:43
30	07:37		07:02	06:08	05:35	05:58-06:12/14	05:33	05:58-06:13/15	05:59	06:24-06:46/22	06:35		07:11	07:49	07:30	07:52
	17:21		19:39	20:18	20:51	06:08-06:24/16	21:04	06:09-06:25/16	20:44		19:57		18:59	18:08	16:38	16:44
31	07:36		07:00		05:35	05:58-06:13/15			06:00	06:25-06:46/21	06:36			07:50		07:52
	17:22		19:41		20:52	06:09-06:25/16			20:43		19:55			18:07		16:45
Potential sun hours	287	292	369	404	458		465		470		435		376	341	289	276
Sum of minutes with flicker	0	0	0	0		614		814		807		104	0	0	0	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Project:
738 Terence Bay Wind Project

Description:
3 Turbine Wind project
Haliafx County, Nova Scotia

Printed/Page
2/7/2014 9:14 AM / 42

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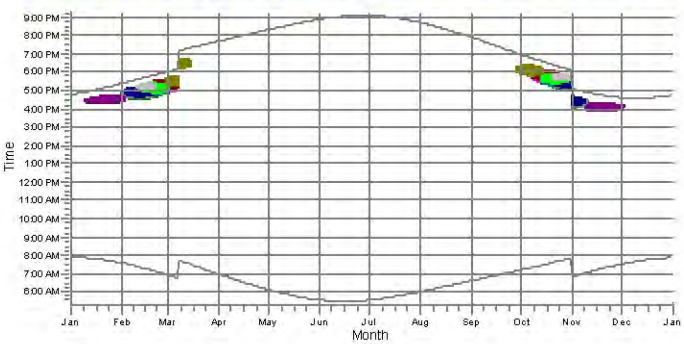
Calculated:
2/7/2014 9:10 AM/2.9.207

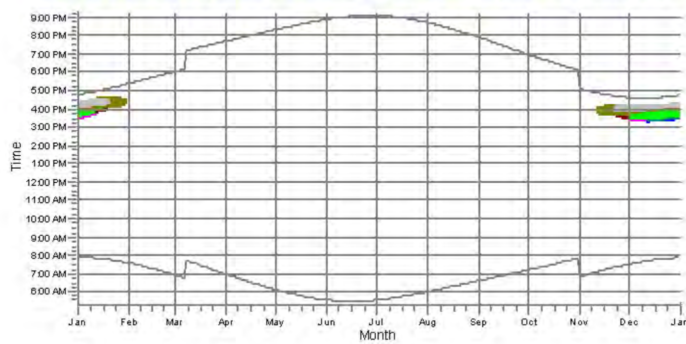
SHADOW - Calendar per WTG, graphical

Calculation: Medium Worst

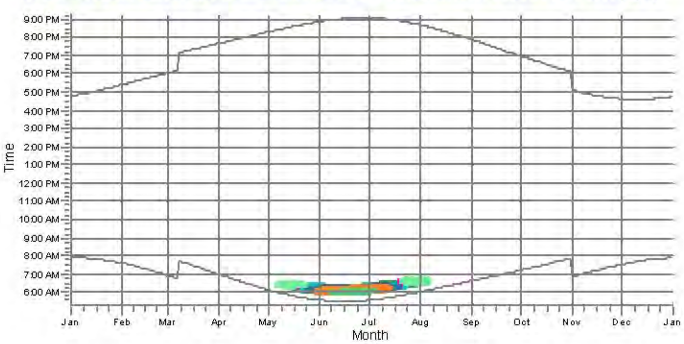
1: ENERCON E-92 2,3 MW 2300 92.0 !-! hub: 85.0 m (TOT: 131.0 m) (1)



2: ENERCON E-92 2,3 MW 2300 92.0 !-! hub: 85.0 m (TOT: 131.0 m) (2)



3: ENERCON E-92 2,3 MW 2300 92.0 !-! hub: 85.0 m (TOT: 131.0 m) (3)



Shadow receptors

A: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (2)
B: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (3)
C: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (4)
D: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (5)
E: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (6)
F: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (7)
G: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (8)
H: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (9)
I: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (10)
J: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (11)
K: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (12)
L: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (13)
M: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (14)
O: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (16)
P: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (17)
Q: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (18)
R: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (19)
S: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (20)
T: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (21)
U: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (22)
V: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (23)
W: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (24)
X: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (25)
Z: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (27)
AB: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (29)

APPENDIX N

List of Vascular Plants on Site

Plant Species List: Current as of 20/06/2014

Present	Latin Name	Common Name	S RANK	General Status	COSEWIC	NSESA	Family
1	*Abies balsamea*	Balsam Fir	S5	4 Secure			Pinaceae
1	*Acer rubrum*	Red Maple	S5	4 Secure			Aceraceae
1	*Agalinis purpurea*	Large-Purple False-Foxglove	SNA				Scrophulariaceae
1	*Agrostis capillaris*	Colonial Bentgrass	SNA	7 Exotic			Poaceae
1	*Agrostis perennans*	Perennial Bentgrass	S4S5	4 Secure			Poaceae
1	*Alnus incana*	Speckled Alder	S5	4 Secure			Betulaceae
1	*Alnus viridis*	Green Alder	S5	4 Secure			Betulaceae
1	*Amelanchier interior*	Shadbush	S4S5	4 Secure			Rosaceae
1	*Anaphalis margaritacea*	Pearly Everlasting	S5	4 Secure			Asteraceae
1	*Andromeda polifolia*	Bog Rosemary	S5	4 Secure			Ericaceae
1	*Aralia hispida*	Bristly Sarsaparilla	S5	4 Secure			Araliaceae
1	*Aralia nudicaulis*	Wild Sarsaparilla	S5	4 Secure			Araliaceae
1	*Athyrium filix-femina*	Lady-Fern	S5	4 Secure			Dryopteridaceae
1	*Betula papyrifera*	Paper Birch	S5	4 Secure			Betulaceae
1	*Betula populifolia*	Gray Birch	S5	4 Secure			Betulaceae
1	*Calamagrostis canadensis*	Blue-Joint Reedgrass	S5	4 Secure			Poaceae
1	*Calamagrostis pickeringii*	Pickering's Reed Bent-Grass	S4S5	4 Secure			Poaceae
1	*Carex atlantica*	Prickly Bog Sedge	S4	4 Secure			Cyperaceae
1	*Carex crinita*	Fringed Sedge	S5	4 Secure			Cyperaceae
1	*Carex echinata*	Little Prickly Sedge	S5	4 Secure			Cyperaceae
1	*Carex exilis*	Coast Sedge	S4	4 Secure			Cyperaceae
1	*Carex folliculata*	Long Sedge	S5	4 Secure			Cyperaceae
1	*Carex gynandra*	A Sedge	S5	4 Secure			Cyperaceae
1	*Carex intumescens*	Bladder Sedge	S5	4 Secure			Cyperaceae
1	*Carex lacustris*	Lake-Bank Sedge	S4	4 Secure			Cyperaceae
1	*Carex magellanica ssp. irrigua*	A Sedge	S5	4 Secure			Cyperaceae
1	*Carex nigra*	Black Sedge	S5	4 Secure			Cyperaceae
1	*Carex pauciflora*	Few-Flowered Sedge	S4S5	4 Secure			Cyperaceae
1	*Carex scoparia*	Pointed Broom Sedge	S5	4 Secure			Cyperaceae
1	*Carex stricta*	Tussock Sedge	S5	4 Secure			Cyperaceae
1	*Carex trisperma*	Three-Seed Sedge	S5	4 Secure			Cyperaceae
1	*Carex viridula*	Little Green Sedge	S4	4 Secure			Cyperaceae
1	*Centaurea nigra*	Black Starthistle	SNA	7 Exotic			Asteraceae
1	*Chamaedaphne calyculata*	Leatherleaf	S5	4 Secure			Ericaceae
1	*Clintonia borealis*	Clinton Lily	S5	4 Secure			Liliaceae
1	*Coptis trifolia*	Goldthread	S5	4 Secure			Ranunculaceae
1	*Cornus canadensis*	Dwarf Dogwood	S5	4 Secure			Cornaceae
1	*Cypripedium acaule*	Pink Lady's-Slipper	S5	4 Secure			Orchidaceae
1	*Daucus carota*	Wild Carrot	SNA	7 Exotic			Apiaceae

Present	Latin Name	Common Name	S RANK	General Status	COSEWIC	NSESA	Family
1	*Doellingeria umbellata*	Parasol White-Top	S5	4 Secure			Asteraceae
1	*Drosera rotundifolia*	Roundleaf Sundew	S5	4 Secure			Droseraceae
1	*Dryopteris carthusiana*	Spinulose Shield Fern	S5	4 Secure			Dryopteridaceae
1	*Dryopteris cristata*	Crested Shield-Fern	S5	4 Secure			Dryopteridaceae
1	*Dryopteris intermedia*	Evergreen Woodfern	S5	4 Secure			Dryopteridaceae
1	*Eleocharis acicularis*	Least Spike-Rush	S5	4 Secure			Cyperaceae
1	*Empetrum nigrum*	Black Crowberry	S5	4 Secure			Empetraceae
1	*Eriophorum vaginatum*	Tussock Cotton-Grass	S5	4 Secure			Cyperaceae
1	*Eriophorum virginicum*	Tawny Cotton-Grass	S5	4 Secure			Cyperaceae
1	*Euphrasia nemorosa*	Common Eyebright	S5	4 Secure			Scrophulariaceae
1	*Eurybia macrophylla*	Large-Leaf Wood-Aster	S5	4 Secure			Asteraceae
1	*Gaultheria hispidula*	Creeping Snowberry	S5	4 Secure			Ericaceae
1	*Gaultheria procumbens*	Teaberry	S5	4 Secure			Ericaceae
1	*Gaylussacia baccata*	Black Huckleberry	S5	4 Secure			Ericaceae
1	*Gaylussacia bigeloviana*	Dwarf Huckleberry	S5	4 Secure			Ericaceae
1	*Gnaphalium uliginosum*	Low Cudweed	SNA	7 Exotic			Asteraceae
1	*Hamamelis virginiana*	American Witch-Hazel	S5	4 Secure			Hamamelidaceae
1	*Hypericum canadense*	Canadian St. John's-Wort	S5	4 Secure			Clusiaceae
1	*Ilex glabra*	Ink-Berry	S5	4 Secure			Aquifoliaceae
1	*Ilex verticillata*	Black Holly	S5	4 Secure			Aquifoliaceae
1	*Impatiens capensis*	Spotted Jewel-Weed	S5	4 Secure			Balsaminaceae
1	*Iris versicolor*	Blueflag	S5	4 Secure			Iridaceae
1	*Juncus articulatus*	Jointed Rush	S5	4 Secure			Juncaceae
1	*Juncus canadensis*	Canada Rush	S5	4 Secure			Juncaceae
1	*Juncus effusus*	Soft Rush	S5	4 Secure			Juncaceae
1	*Juncus pelocarpus*	Brown-Fruited Rush	S5	4 Secure			Juncaceae
1	*Juniperus communis*	Ground Juniper	S5	4 Secure			Cupressaceae
1	*Kalmia angustifolia*	Sheep-Laurel	S5	4 Secure			Ericaceae
1	*Kalmia polifolia*	Pale Laurel	S5	4 Secure			Ericaceae
1	*Larix laricina*	American Larch	S5	4 Secure			Pinaceae
1	*Ledum groenlandicum*	Common Labrador Tea	S5	4 Secure			Ericaceae
1	*Linnaea borealis*	Twinflower	S5	4 Secure			Caprifoliaceae
1	*Lycopodium annotinum*	Stiff Clubmoss	S5	4 Secure			Lycopodiaceae
1	*Lycopodium clavatum*	Running Pine	S5	4 Secure			Lycopodiaceae
1	*Maianthemum canadense*	Wild Lily-of-The-Valley	S5	4 Secure			Liliaceae
1	*Maianthemum trifolium*	Three-Leaf Solomon's-Plume	S5	4 Secure			Liliaceae
1	*Mitchella repens*	Partridge-Berry	S5	4 Secure			Rubiaceae
1	*Monotropa hypopithys*	American Pinesap	S4	4 Secure			Monotropaceae
1	*Monotropa uniflora*	Indian-Pipe	S5	4 Secure			Monotropaceae

Present	Latin Name	Common Name	S RANK	General Status	COSEWIC	NSESA	Family
1	*Morella pensylvanica*	Northern Bayberry	S5	4 Secure			Myricaceae
1	*Muhlenbergia uniflora*	Fall Dropseed Muhly	S5	4 Secure			Poaceae
1	*Myrica gale*	Sweet Bayberry	S5	4 Secure			Myricaceae
1	*Nemopanthus mucronatus*	Mountain Holly	S5	4 Secure			Aquifoliaceae
1	*Oclemena acuminata*	Whorled Aster	S5	4 Secure			Asteraceae
1	*Oclemena nemoralis*	Bog Aster	S5	4 Secure			Asteraceae
1	*Osmunda cinnamomea*	Cinnamon Fern	S5	4 Secure			Osmundaceae
1	*Osmunda claytoniana*	Interrupted Fern	S5	4 Secure			Osmundaceae
1	*Oxalis montana*	White Wood-Sorrel	S5	4 Secure			Oxalidaceae
1	*Photinia melanocarpa*	Black Chokeberry	S5	4 Secure			Rosaceae
1	*Picea glauca*	White Spruce	S5	4 Secure			Pinaceae
1	*Picea mariana*	Black Spruce	S5	4 Secure			Pinaceae
1	*Picea rubens*	Red Spruce	S5	4 Secure			Pinaceae
1	*Pinus strobus*	Eastern White Pine	S5	4 Secure			Pinaceae
1	*Polypodium virginianum*	Rock Polypody	S5	4 Secure			Polypodiaceae
1	*Populus grandidentata*	Large-Tooth Aspen	S5	4 Secure			Salicaceae
1	*Populus tremuloides*	Quaking Aspen	S5	4 Secure			Salicaceae
1	*Prenanthes altissima*	Tall Rattlesnake-root	S5	4 Secure			Asteraceae
1	*Prenanthes trifoliolata*	Three-Leaved Rattlesnake-roo	S5	4 Secure			Asteraceae
1	*Prunus pensylvanica*	Fire Cherry	S5	4 Secure			Rosaceae
1	*Prunus serotina*	Wild Black Cherry	S5	4 Secure			Rosaceae
1	*Pteridium aquilinum*	Bracken Fern	S5	4 Secure			Dennstaedtiaceae
1	*Rhododendron canadense*	Rhodora	S5	4 Secure			Ericaceae
1	*Rhynchospora alba*	White Beakrush	S5	4 Secure			Cyperaceae
1	*Rosa nitida*	Shining Rose	S4	4 Secure			Rosaceae
1	*Rubus allegheniensis*	Allegheny Blackberry	S5	4 Secure			Rosaceae
1	*Rubus chamaemorus*	Cloudberry	S4	4 Secure			Rosaceae
1	*Rubus hispidus*	Bristly Dewberry	S5	4 Secure			Rosaceae
1	*Rubus idaeus*	Red Raspberry	S5	4 Secure			Rosaceae
1	*Rubus recurvicaulis*	a bramble	SNR	4 Secure			Rosaceae
1	*Sambucus racemosa*	Red Elderberry	S5	4 Secure			Caprifoliaceae
1	*Sarracenia purpurea*	Northern Pitcher-Plant	S5	4 Secure			Sarraceniaceae
1	*Sibbaldiopsis tridentata*	Three-Toothed Cinquefoil	S5	4 Secure			Rosaceae
1	*Solidago canadensis*	Canada Goldenrod	S5	4 Secure			Asteraceae
1	*Solidago rugosa*	Rough-Leaf Goldenrod	S5	4 Secure			Asteraceae
1	*Sorbus americana*	American Mountain-Ash	S5	4 Secure			Rosaceae
1	*Spiraea alba*	Narrow-Leaved Meadow-Swee	S5	4 Secure			Rosaceae
1	*Spiranthes cernua*	Nodding Ladies'-Tresses	S5	4 Secure			Orchidaceae
1	*Streptopus lanceolatus*	Rosy Twistedstalk	S5	4 Secure			Liliaceae

Present	Latin Name	Common Name	S RANK	General Status	COSEWIC	NSESA	Family
1	*Symphyotrichum lateriflorum*	Farewell-Summer	S5	4 Secure			Asteraceae
1	*Symphyotrichum novi-belgii*	New Belgium American-Aster	S5	4 Secure			Asteraceae
1	*Symphyotrichum puniceum*	Swamp Aster	S5	4 Secure			Asteraceae
1	*Thalictrum pubescens*	Tall Meadow-Rue	S5	4 Secure			Ranunculaceae
1	*Thelypteris noveboracensis*	New York Fern	S5	4 Secure			Thelypteridaceae
1	*Thelypteris palustris*	Marsh Fern	S5	4 Secure			Thelypteridaceae
1	*Thelypteris simulata*	Bog Fern	S4S5	4 Secure			Thelypteridaceae
1	*Trichophorum caespitosum*	Tufted Clubrush	S5	4 Secure			Cyperaceae
1	*Trientalis borealis*	Northern Starflower	S5	4 Secure			Primulaceae
1	*Vaccinium angustifolium*	Late Lowbush Blueberry	S5	4 Secure			Ericaceae
1	*Vaccinium macrocarpon*	Large Cranberry	S5	4 Secure			Ericaceae
1	*Vaccinium myrtilloides*	Velvetleaf Blueberry	S5	4 Secure			Ericaceae
1	*Vaccinium oxycoccos*	Small Cranberry	S5	4 Secure			Ericaceae
1	*Vaccinium vitis-idaea*	Mountain Cranberry	S5	4 Secure			Ericaceae
1	*Viburnum nudum var. cassinoid*	Northern Wild Raisin	S5	4 Secure			Caprifoliaceae

APPENDIX O

Terence Bay Wind Farm Questionnaire

Terence Bay Wind Farm

Open House: Tuesday, 17th July, 2012

QUESTIONNAIRE

Thank you for taking the time to attend this Information Session. It would be useful if you would take a few minutes to answer the following questions. Your observations and input are important to us. Please complete and leave the questionnaire, or mail to the address provided below.

1. **Name, address and phone number:**____

   ____

2. **Do you live near the proposed wind farm? < 2 km ___ 2-5 km ___ 5+ km _______**

3. **Do you have any environmental or related knowledge of the site which you think might be of value to us? If so, please detail:** ____

   ____

   ____

4. **Are you in favour of the proposed development? Yes ___ No ___ Don't Know __________**

5. **Please provide any thoughts or concerns that you have regarding the proposed development:**

   ____

   ____

   ____

   ____

   ____

6. **Are you interested in participating on a community liaison committee regarding this project?**
   Yes ___ No ___ Maybe ___

If you require any additional information or wish to talk with a member of the project team, please contact one of the following:

Terry Norman, President, Chebucto Terence Bay Wind Field Limited, (902) 429-8810, terryjnorman@gmail.com
Peter Archibald, Renewable Energy Services Ltd, (902) 471-7344, parchibald@resl.ca
Ann Wilkie, VP Environment, CBCL Limited, (902) 492-6764, annw@cbcl.ca

Completed Questionnaires can be forwarded to Ann's attention at:
CBCL Limited, 1489 Hollis Street, PO Box 606, Halifax, B3J 2R7