Penn Energy- Van Dorp
SOLAR ENERGY FACILITY

in the Municipality of Port Hope
Northumberland County
FIT Application No. FIT-FLTV77L
FIT Contract No. F-001573- SPV-130-505

Natural Heritage Assessment
Evaluation of Significance

Prepared for: Penn Energy Renewables Ltd.
620 Righters Ferry Road, Bala Cynwyd, PA 19004

Submitted by: Niblett Environmental Associates Inc.
PN 10-066

October 2012

Niblett Environmental Associates Inc.
Biological Consultants

October 26, 2012 PN 10-066

Penn Energy Trust
620 Righters Ferry Road
Bala Cynwyd, PA 19004

Attention : Mr. Glen Tomkinson

RE: **Penn Energy- Van Dorp**
SOLAR ENERGY FACILITY
in the Municipality of Port Hope, Northumberland County
FIT Application No. FIT-FLTV77L
FIT Contract No. F-001573- SPV-130-505

Natural Heritage Assessment
Evaluation of Significance

Dear Mr. Tomkinson:

We are pleased to submit the Evaluation of Significance Report for the proposed Van Dorp solar energy facility as part of the Natural Heritage Assessment for this project.

The report follows the outline provided in the MNR Natural Heritage Assessment Manual.

If there are any comments or questions on the content please contact us.

Yours very truly,

Chris Ellingwood
President and Sr. Terrestrial and Wetland Biologist

55 Mary Street West, Suite 112, Lindsay, Ontario K9V 5Z6 Tel: (705) 878-9399 Fax: (705) 878-9390
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1.0 Introduction

The evaluation of significance is the third step of a Natural Heritage Assessment (NHA) as required under Part IV, Section 27 of the REA Regulation. The purpose of the evaluation of significance is to confirm the significance of natural features on or within 120 meters of the project location that has not been previously evaluated (Figure 1). Natural features are evaluated using criteria or procedures that have been established or accepted by the MNR. The evaluation of significance makes use of all available information and includes information obtained from the records review and site investigation.

Natural features to be evaluated include all natural features in and within 120m of the project location (Figure 2).

2.0 Methodology

The evaluation criteria for evaluating the significance of a woodland is outlined in Section 6.2.2.1 in the Natural Heritage Assessment Guide (MNR, 2011).

A significant woodland does not include:

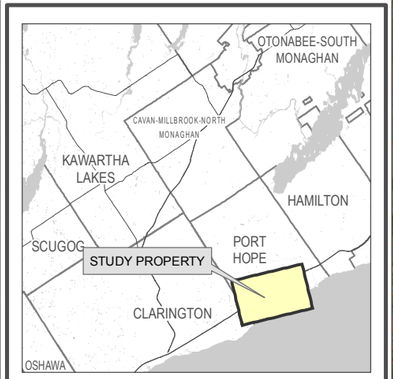
a) a plantation management for production of nursery stock; or
b) a plantation managed for tree products with an average rotation of less than 20 years (e.g. hybrid poplar or willow); or
c) a plantation established and continuously managed for the sole purpose of complete removal at rotation, without a forest restoration objective; or
d) a woodland dominated by the invasive non-native tree species buckthorn or Norway maple; if native tree cover is less than 10% of the ground and are represented by less than 100 stems of any size per hectare.

For a woodland to be considered significant it must have a tree crown cover of over 60% or over 10% if stem estimates meet a minimum number and size of trees per hectare. For example:

1:30,000

STUDY AREA

PROJECT LOCATION



NIBLETT ENVIRONMENTAL ASSOCIATES INC.

FIGURE 1: LOCATION OF PROJECT & STUDY AREA

17N 709253 4869455

Revision 1

10-066

HOPE TOWNSHIP

PETERBOROUGH DISTRICT

1 centimeter = 300 meters

Meters

0 412.5 825 1,650

LEGEND

Project Specific

- Project Location
- Study Area

Municipal

- Lot Parcel

Natural Features within 120m of Project Location

Wetland Wetland Area WE01- 82m

Woodlot Due to the amount of features, please refer to the report. Not all distances can be shown on map.

Corridor Potentially within project location and 120m project zone.

Email: mail.niblett.ca
Phone: 705.878.9399
GIS/Mapping Phone: 705.878.9399 x207
www.niblett.ca

NAD83 UTM ZONE 17N

1:15,000

706600 706900 707200 707500 707800 708100 708400 708700 709000 709300 709600 709900 710200 710500 710800 711100 711400 711700 712000 712300

4871200 4870900 4870600 4870300 4870000 4869700 4869400 4869100 4868800 4868500 4868200 4867900 4867600

Wesleyville North Wetland

106m (WO05)

95m (WO06)

10m (FOC1)

82m (WE01)

30m (WO02)

94m (WO08)

120m Project Zone

98m (WO03)

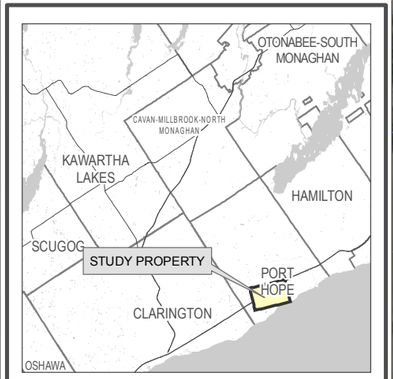
30m (WO03)

HIGHWAY 401

Wesleyville North Wetland

Wesleyville Ravines ANSI

Willowbeach Marsh ANSI



NEA NIBLETT ENVIRONMENTAL ASSOCIATES INC.

FIGURE 2: PROJECT LOCATION & NATURAL FEATURES

17N 709253 4869455

Revision 6

10-066

HOPE TOWNSHIP

PETERBOROUGH DISTRICT

N W E S

1 centimeter = 150 meters

Meters

0 210 420 840

LEGEND

Road Classes
- Local
- Arterial
- Collector
- Expressway / Highway
- Freeway

Municipal
- Lot Parcel
- Owner Parcel

Community Types
- Wooded Area
- Wetland Pocket
- Wetland, PSW
- Wetland, Other
- ANSI
- ESA
- Possible Wildlife Corridor

Project Specific
- Project Location
- 120m Project Area
- Study Area

Natural Features within 120m of Project Location

Wetland Wetland Area WE01- 82m

Woodlot Due to the amount of features, please refer to the report. Not all distances can be shown on map.

Corridor Potentially within project location and 120m project zone.

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-1, 000 trees of any size per hectare, or
-750 trees measuring over 5 cm in diameter, per hectare, or
-500 trees measuring over 12 cm in diameter, per hectare, or
-250 trees measuring over 20 cm in diameter, per hectare.

Woodlands which meet the criteria listed above are then evaluated using the criteria listed in Table 8 of the same guide.

To be considered significant, a woodland meeting a significance criterion in Table 8 must have an average minimum width of 40 meters measured to crown edges where the criterion size threshold is 0.5 to 4 hectares, and 60 meters where the criterion size threshold is 10 hectares or more.

Table 8. Significant Woodland Evaluation Criteria and Standards(Natural Heritage Assessment Guide (MNR, 2011))

<table>
<tr><th>Criteria Comments</th><th>Standards</th></tr>
<tr><td colspan="2">1. Woodland Size Criterion</td></tr>
<tr><td>• Size refers to the areal (spatial) extend of the woodland, continuous even if intersected by narrow gaps 20m or less in width between crown edges.
• Size value is related to the scarcity of woodland in the landscape derived on a lower-tier or single-tier municipal basis</td><td>
<table>
<tr><td colspan="5">Woodland Cover within Municipality</td></tr>
<tr><td><5%</td><td>5-15%</td><td>16-30%</td><td>31-60%</td><td>>60%</td></tr>
<tr><td colspan="5">Woodlands are considered significant if they encompass:</td></tr>
<tr><td>2ha</td><td>4ha</td><td>20ha</td><td>50ha</td><td>NA</td></tr>
</table>
Note: As a consideration in addressing the potential loss of biodiversity, the largest woodland in each lower-tier or single-tier municipality is considered significant.
</td></tr>
<tr><td colspan="2">2. Ecological Functions Criteria</td></tr>
<tr><td colspan="2">a) Woodland Interior</td></tr>
<tr><td>• Interior habitat is within the woodland more than 100 meters from the edge.
• For purposes of this criterion, a maintained public road would create an edge even if the opening was not wider than 20 m and did not create a separate woodland</td><td>Woodlands are considered significant if they have an amount of interior habitat more than 100m from the edge according to the woodland cover in the lower-tier or single-tier municipality:</td></tr>
</table>

	Woodland Cover within Municipality *<5%* | *5-15%* | *16-30%* | *31-60%* | *>60%* *Interior habitat area threshold for significance:* *any* | *any* | *2ha* | *8ha* | *20ha*
b) Proximity to other significant woodlands or habitats	
• *Patches close to each other are of greater mutual benefit and value to wildlife.*	*Woodlands are considered significant if a portion of the woodland is located within 30m from a significant natural feature or fish habitat and the entire woodland meets the area threshold according to the woodland cover in the lower-tier municipality:* *Woodland Cover Within Municipality* *<5%* | *5-15%* | *16-30%* | *31-30%* | *>60%* *Area threshold for significance* *0.5 ha* | *1ha* | *4ha* | *10ha* | *50ha*
c) Linkages	
• *Linkages are important connections providing for movement between habitats.* • *Woodlands that are located between other significant features can be important "stepping stones" for movement between habitats.*	*Woodlands are considered significant if they are located between two other significant features, each of which is within 120m, and the woodland meets the area threshold according to the woodland cover in the lower-tier or single-tier municipality:* *Woodland Cover within Municipality* *<5%* | *5-15%* | *16-30%* | *31-60%* | *>60%* *Area threshold for significance:* *0.5ha* | *1ha* | *4ha* | *10ha* | *50ha*
d) Water protection	
• *Source water protection is important.* • *Natural hydrological processes should be maintained.*	*Woodlands are considered significant if they are located within 50m (or top of valley bank if greater) of a sensitive groundwater discharge, sensitive recharge, sensitive headwater area, watercourse or fish habitat and the woodland within this distance meets the minimum area threshold according to the*

<table>
<tr><td></td><td>woodland cover in the lower-tier or single-tier municipality:

<table><tr><td colspan="5">Woodland Cover within Municipality</td></tr><tr><td><5%</td><td>5-15%</td><td>16-30%</td><td>31-60%</td><td>>60%</td></tr><tr><td colspan="5">Area threshold for significance:</td></tr><tr><td>0.5ha</td><td>0.5ha</td><td>2ha</td><td>4ha</td><td>4ha</td></tr></table></td></tr>
<tr><td colspan="2">Woodland diversity representation (composition)</td></tr>
<tr><td>Certain representative native woodland species have had major reductions in their natural distribution on the landscape south and east of the Canadian Shield</td><td>Woodlands are considered significant if they have an area dominated, singly or in combination, by native naturally occurring (not planted) sugar maple, black maple, silver maple, red maple, yellow birch, hickory, beech, black ash, walnut, tamarack, spruce, pine, oak, basswood or hemlock which meets the minimum area threshold according to the woodland cover in the lower-tier or single-tier municipality

<table><tr><td colspan="5">Woodland Cover within Municipality</td></tr><tr><td><5%</td><td>5-15%</td><td>16-30%</td><td>31-60%</td><td>>60%</td></tr><tr><td colspan="5">Area threshold for significance</td></tr><tr><td>0.5ha</td><td>1ha</td><td>4ha</td><td>10ha</td><td>20ha</td></tr></table></td></tr>
<tr><td colspan="2">UNCOMMON CHARACTERISTICS CRITERIA</td></tr>
<tr><td>Woodlands that are uncommon in terms of species composition, cover type, age or structure.
Older woodlands (i.e. woodlands greater than 100 years old) are particularly valuable for several reasons including their contributions to genetic, species, and ecosystem diversity</td><td>Woodlands are considered significant if they have:
A vegetation community with a provincial ranking of S1, S2 or S3 (as ranked by the Natural Heritage Information Centre [NHIC]) and are 0.5hectares or more in size.
Habitat (with 10 individual stems or 100m2 of leaf coverage) of a rare uncommon or restricted woodland plant species (natural,</td></tr>
</table>

not planted):
-vascular plant species for which the NHIC's Southern Ontario Coefficient of Conservation is 8, 9, or 10)
-tree species of restricted distribution such as sassafras or rock elm;or
Species existing in only a limited number of sites within the planning area,
And are 0.5 hectares or more in size.

- *Characteristics of older woodlands or woodlands with larger tree size structure in native species:*
  -older woodlands having 10 or more trees/ha at least 50 cm in diameter, or a basal area of 8 or more m2/ha in trees that are at least 40cm in diameter meeting the minimum area threshold according to the woodland cover in the lower-tier or single tier municipality.

Woodland Cover within Municipality				
<5%	*5-15%*	*16-30%*	*31-60%*	*>60%*
Area threshold for significance:				
0.5ha	*1ha*	*2ha*	*4ha*	*10ha*

The percentage of woodland cover in the municipality in which the project is proposed forms the basis of the criteria. Woodlands that meet the minimum standard for any one of the criteria listed in the table are considered significant.

Table 1: Summary of Evaluation of Significance Methods

Feature Type/ID	Distance From Project Location	Evaluation of Significance Criteria & Procedures Used	Dates, Times & Duration of Evaluation	Names & qualifications of evaluators
Woodland-WO01	<1m	Desktop assessment: Significant woodland evaluation criteria (Natural Heritage Reference Manual, 2005). Site investigation: Ecological Land Classification, area searches	July 22, 2010; 9:30-14:30 (5 hrs)& September 6, 2011; 14:00 - 15:30 (1.5 hrs)	Kelly Cordick, Chris Ellingwood & Ali Giroux
Woodland-WO02	30 m	Desktop assessment: Significant woodland evaluation criteria (Natural Heritage Reference Manual, 2005). Site investigation: Ecological Land Classification, area searches	July 22, 2010; 9:30-14:30 (5 hrs)& September 6, 2011; 14:00 - 15:30 (1.5 hrs)	Kelly Cordick, Chris Ellingwood & Ali Giroux
Woodland-WO03	98m	Desktop assessment: Significant woodland evaluation criteria (Natural Heritage Reference Manual, 2005). Site investigation: Ecological Land Classification, area searches	July 22, 2010; 9:30-14:30 (5 hrs)& September 6, 2011; 14:00 - 15:30 (1.5 hrs)	Kelly Cordick, Chris Ellingwood & Ali Giroux
Woodland-WO04	102m	Desktop assessment: Significant woodland evaluation criteria (Natural Heritage Reference Manual, 2005). Site investigation: Ecological Land Classification, area searches	July 22, 2010; 9:30-14:30 (5 hrs)& September 6, 2011; 14:00 - 15:30 (1.5 hrs)	Kelly Cordick, Chris Ellingwood & Ali Giroux
Woodland-WO05	106m	Desktop assessment: Significant woodland evaluation criteria (Natural Heritage Reference Manual, 2005).	July 22, 2010; 9:30-14:30 (5 hrs)& September 6, 2011; 14:00 - 15:30	Kelly Cordick, Chris Ellingwood & Ali Giroux

		Site investigation: Ecological Land Classification, area searches	(1.5 hrs)	
Woodland-WO06	95m	Desktop assessment: Significant woodland evaluation criteria (Natural Heritage Reference Manual, 2005). Site investigation: Ecological Land Classification, area searches	July 22, 2010; 9:30-14:30 (5 hrs)& September 6, 2011; 14:00 - 15:30 (1.5 hrs)	Kelly Cordick, Chris Ellingwood & Ali Giroux
Woodland-WO07	10m	Desktop assessment: Significant woodland evaluation criteria (Natural Heritage Reference Manual, 2005). Site investigation: Ecological Land Classification, area searches	July 22, 2010; 9:30-14:30 (5 hrs)& September 6, 2011; 14:00 - 15:30 (1.5 hrs)	Kelly Cordick, Chris Ellingwood & Ali Giroux
Woodland-WO08	94m	Desktop assessment: Significant woodland evaluation criteria (Natural Heritage Reference Manual, 2005). Site investigation: Ecological Land Classification, area searches	July 22, 2010; 9:30-14:30 (5 hrs)& September 6, 2011; 14:00 - 15:30 (1.5 hrs)	Kelly Cordick, Chris Ellingwood & Ali Giroux
Wetland-WE-01	82m	Desktop assessment: Ontario Wetland Evaluation System (OWES Manual, 1993 with 2002 revisions) Site investigation: Ecological Land Classification, area searches	July 22, 2010; 9:30-14:30 (5 hrs)& September 6, 2011; 14:00 - 15:30 (1.5 hrs)	Kelly Cordick, Chris Ellingwood & Ali Giroux
SWH01	0m	Desktop assessment: Significant Wildlife Habitat Manual (MNR, 2008) Site Investigation: Ecological Land Classification, area searches	July 22, 2010; 9:30-14:30 (5 hrs)& September 6, 2011; 14:00 - 15:30 (1.5 hrs)	Kelly Cordick, Chris Ellingwood & Ali Giroux

3.0 Results

The woodland cover for the municipality of Port Hope has not been previously established by a planning authority.

NEA established a percentage of woodlot cover based on Geographic Layers from LIO containing woodlots. Hedgerows and plantations were excluded in the calculation of this percentage. NEA calculated the percentage to be 28.86% woodland cover for the Municipality of Port Hope. Based on Table 8 of the REA Manual the woodlot must encompass 20ha or more to be considered significant.

The location of the woodlands and wildlife habitat and assessment of significance is shown on Figure 3.

Table 2. Evaluation of Significance for Woodland Features in or within 120m of the Project location based on MNR's Natural Heritage Assessment Guide for Renewable Energy Projects.

Feature Information		Criteria for Evaluating Woodland Significance							Feature Information	Evaluation of Significance
		Woodland Size Criterion	Ecological Functions Criteria					Uncommon Characteristics Criteria		
Feature ID	Size (ha)	Woodland Size	Woodland Interior	Proximity to other significant woodlands or habitats	Linkages	Water Protection	Woodland Diversity Representation	Uncommon Characteristics	Minimum distance between feature & project location	Significance (y/n)
Woodland -WO01	1.16	<20ha	None	Not located within 30m of significant woodland	Not located between two significant features	None	-dominated by sugar maple <4ha in size	None	<1 m	n
Woodland -WO02	1.74	None	None	Not located within 30m of significant woodland	Not located between two significant features	-located within 50m of a watercourse -<2ha in size	None	None	30m	n
Woodland –WO03	11.17	None	None	Not located within 30m of significant woodland	Not located between two significant features	Not located within 50m of a watercourse	None	None	98m	n
Woodland -WO04	0.07	None	None	Not located within 30m of significant woodland	Not located between two significant features	-located within 50m of a watercourse -<2ha in size	None	None	102m	n

Feature Information		Criteria for Evaluating Woodland Significance							Feature Information	Evaluation of Significance
		Woodland Size Criterion	Ecological Functions Criteria					Uncommon Characteristics Criteria		
Feature ID	Size (ha)	Woodland Size	Woodland Interior	Proximity to other significant woodlands or habitats	Linkages	Water Protection	Woodland Diversity Representation	Uncommon Characteristics	Minimum distance between feature & project location	Significance (y/n)
Woodland -WO05-	0.12	None	None	Not located within 30m of significant woodland	Not located between two significant features	-located within 50m of a watercourse -<2ha in size	None	None	106m	n
Woodland -WO06	0.13	None	None	Not located within 30m of significant woodland	Not located between two significant features	-located within 50m of a watercourse -<2ha in size	None	None	95m	n
Woodland WO07	0.12	None	None	Not located within 30m of significant woodland	Not located between two significant features	Not located within 50m of a watercourse	None	None	10m	n
Woodland -WO08	0.29	None	None	Not located within 30m of significant woodland	Not located between two significant features	Not located within 50m of a watercourse	None	None	94m	n

Table 3. Evaluation of Significance for All other Natural Features located in or within 120m of Project Location

Feature ID	Size (ha)	Minimum distance between feature & project location	Justification for Significance or non-significance	Significance (y/n)
Wetland-WE01	0.19	82m	Based on Appendix C of the NHAG the wetland is significant. No OWES evaluation and report was conducted.	Y

1:6,500

FIGURE 3: COMMUNITIES & SIGNIFICANT WILDLIFE HABITAT

17N 709253 4869455
Revision 4

10-066
HOPE TOWNSHIP
PETERBOROUGH DISTRICT

1 centimeter = 65 meters

Meters
0 90 180 360

LEGEND

Plan
- Proposed Solar Array
- Proposed Road

Community Types
- Vegetation Community
- Significant Community

Road Classes
- Local
- Arterial
- Collector
- Expressway / Highway
- Freeway

Project Specific
- Study Property
- 120m Project Area

Municipal
- Lot Parcel
- Owner Parcel

Significant Community Type Descriptions

SWH01 (CUM1-1) Old Field Meadow

MAS2-1/ MAS2-9 (MAS2-1) Cattail Mineral Shallow Marsh Type
(MAS2-9) Rush Grass Organic Shallow Marsh Type

Total amount of Significant Communities is 10.26 ha.

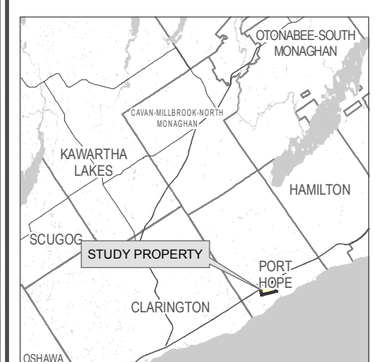

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Table 4: Significant Features and/or Habitat After Evaluation of Significance

Feature Type/ID	Minimum Distance between feature and project location	Evaluation Results	Significant/ Provincially Significant Feature or Treated as (y/n)
SWH01-Habitat for Species of Special Concern	<1m	• 7.87 ha in size (CUM and FOD) north of project location (Figure 3) • Highway exit medians and road allowances dominated by grasses and few nectar plants or woodland edges • A few scattered milkweed plants • No caterpillars or adults observed within the project location • Western edge of farm fields with woody debris, soil piles and cuttings- low diversity of plants and nectar species and cedar tree edge • Below 10 ha required in SWH guidelines • High traffic area	Y: Treated as generalized significant wildlife habitat

Habitat for Species of Special Concern was observed outside of the project location boundary however within the 120m. An area of 7.87 ha of cultural field meadow (CUM1-1) was contained within 120m of the project location boundary. Common milkweed was present within these fields, however not in abundance. Additionally the monarch butterfly, a species of special concern provincially and nationally (SARO, 2012; COSEWIC, 2011) was observed within these areas, again not in abundance. This habitat is being treated as Generalized Candidate Significant Wildlife Habitat is Accordance with Appendix D of the NHAG (MNR, 2011). It is anticipated that no operational impact will occur to this habitat as a result of the project. A full description of construction related mitigation will be discussed in a subsequent Environmental Impact Study.

The wetland WE01 is being treated as significant following the Wetland Characteristics and Ecological Functions Assessment for Renewable Energy Projects (Appendix C). Refer to Table 5 for a full description and evaluation of wetland characteristics and ecological functions.

Table 5: Wetland Characteristics and Ecological Functions Assessment

ID	Size (ha)	Biological						Hydrological				Special Features		
		Wetland Type	Site Type	Vegetation Communities	Proximity to Other Wetlands	Interspersion (# of intersections and description of "edges" of communities)	Open Water Types	Flood Attenuation (Total)	Water Quality Improvement (Total)	Shoreline Erosion Control	Groundwater Recharge (Total)	Species Rarity (Total)	Significant Features and Habitats (Total)	Fish Habitat (Total)
WE-01	0.19	Marsh	Isolated	One vegetation community(ne)	Within 900m of other wetlands, but not hydrologically connected by surface water	Low interspersion (26 intersections or less), wetland is very small comprised of only one vegetation community	None	Wetland is entirely isolated, (100)	FA of isolated wetland (0.5) Over 50% agricultural and/or urban (1) FA of wetland with live trees, shrubs, herbs or mosses (c, h, ts, ls, gc, m) (0.75)	Wetland entirely isolated (0) No shoreline present (0) Total =0	The wetland is isolated (50) and could provide valuable groundwater recharge , soils surrounding the wetland are sandy loam (10)	none Total=0	No known nesting of colonial waterbirds (0) Little or poor winter cover present (0) No known waterfowl staging and/or moulting (0) No suitable habitat for waterfowl breeding (0) No significant passerine shorebird or raptor stopover area (0)	None (0)

4.0 References

Ontario Ministry of Natural Resources (OMNR). 2000. Significant Wildlife Habitat Technical Guide. 151 p.

OMNR. 2005. Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement. Second Edition. Queen's Printer for Ontario. 245 p.

OMNR. 2011. Natural Heritage Assessment Guide for Renewable Energy Projects. First edition, July 2011. Queen's Printer for Ontario. 97 p.