Environmental Concerns Regarding the Niagara Region Wind Corporation Wind Energy Project

Environmental Review Tribunal Case No. 14-096

Prepared by Loretta Shields

Protection of Natural Heritage

2.1 Natural Heritage

2.1.1 Natural features and areas **shall** be protected for the long term.

2.1.2 The diversity and connectivity of natural features in an area, and the long-term *ecological function* and biodiversity of *natural heritage systems*, should be maintained, restored or, where possible, improved**, recognizing linkages between and among *natural heritage features and areas*, *surface water features* and *ground water features*.**

2.1.3 *Natural heritage systems* shall be identified in Ecoregions 6E & 7E[1], recognizing that *natural heritage systems* will vary in size and form in *settlement areas*, *rural areas*, and *prime agricultural areas*.

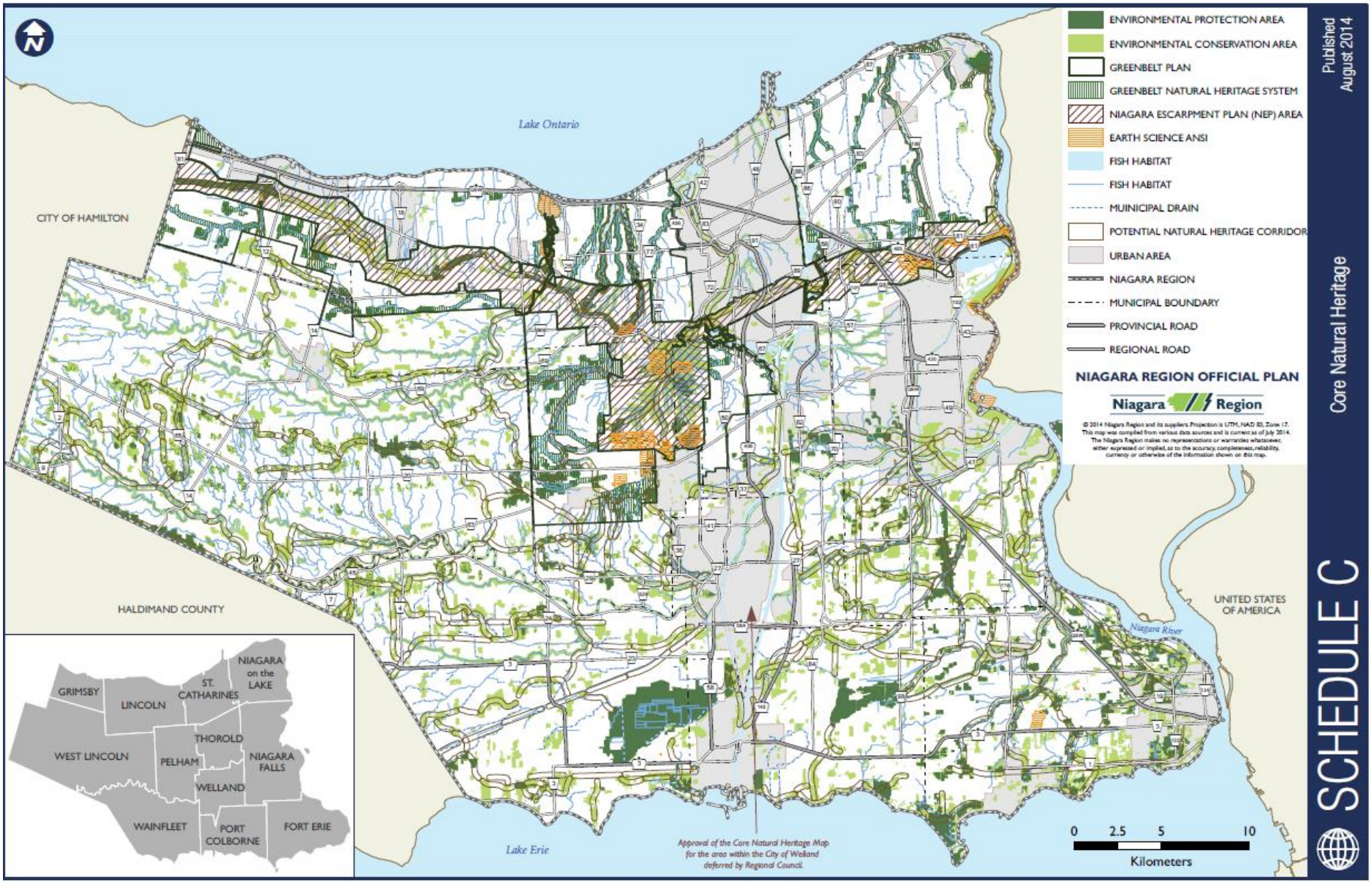
2.1.4 *Development* and *site alteration* shall not be permitted in:
a) *significant wetlands* in Ecoregions 5E, 6E and 7E1; and
b) *significant coastal wetlands*.

Protection of Natural Heritage

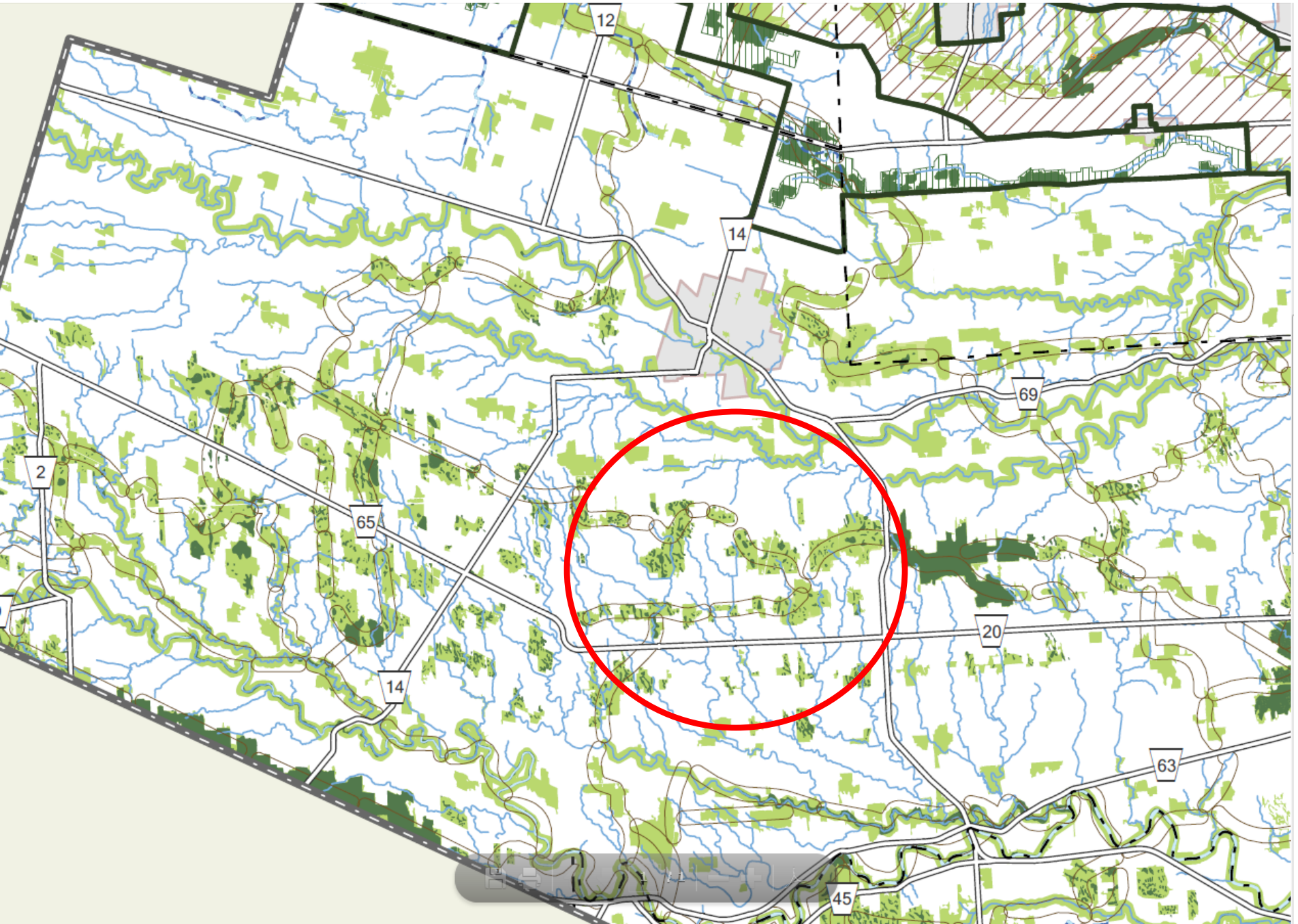
2.1.5 *Development* and *site alteration* shall not be permitted in:
a) *significant wetlands* in the Canadian Shield north of Ecoregions 5E, 6E and 7E[1];
b) *significant woodlands* in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Marys River)[1];
c) *significant valleylands* in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Marys River)[1];
d) *significant wildlife habitat*;
e) *significant areas of natural and scientific interest*; and
f) *coastal wetlands* in Ecoregions 5E, 6E and 7E[1] that are not subject to policy 2.1.4(b)
unless it has been demonstrated that there will be no *negative impacts* on the natural features or their *ecological functions*.

2.1.7 Development and site alteration shall not be permitted in habitat of endangered species and threatened species, except in accordance with provincial and federal requirements.
2.1.8 Development and site alteration shall not be permitted on adjacent lands to the natural heritage features and areas identified in policies 2.1.4, 2.1.5, and 2.1.6
unless the ecological function of the adjacent lands has been evaluated and it has been demonstrated that there will be no negative impacts on the natural features or on their ecological functions.

Ref: Provincial Policy Statement Under the Planning Act - 2014



Ref: http://www.niagararegion.ca/living/icp/pdf/2014/schedules/Official-Plan-Schedule-C.pdf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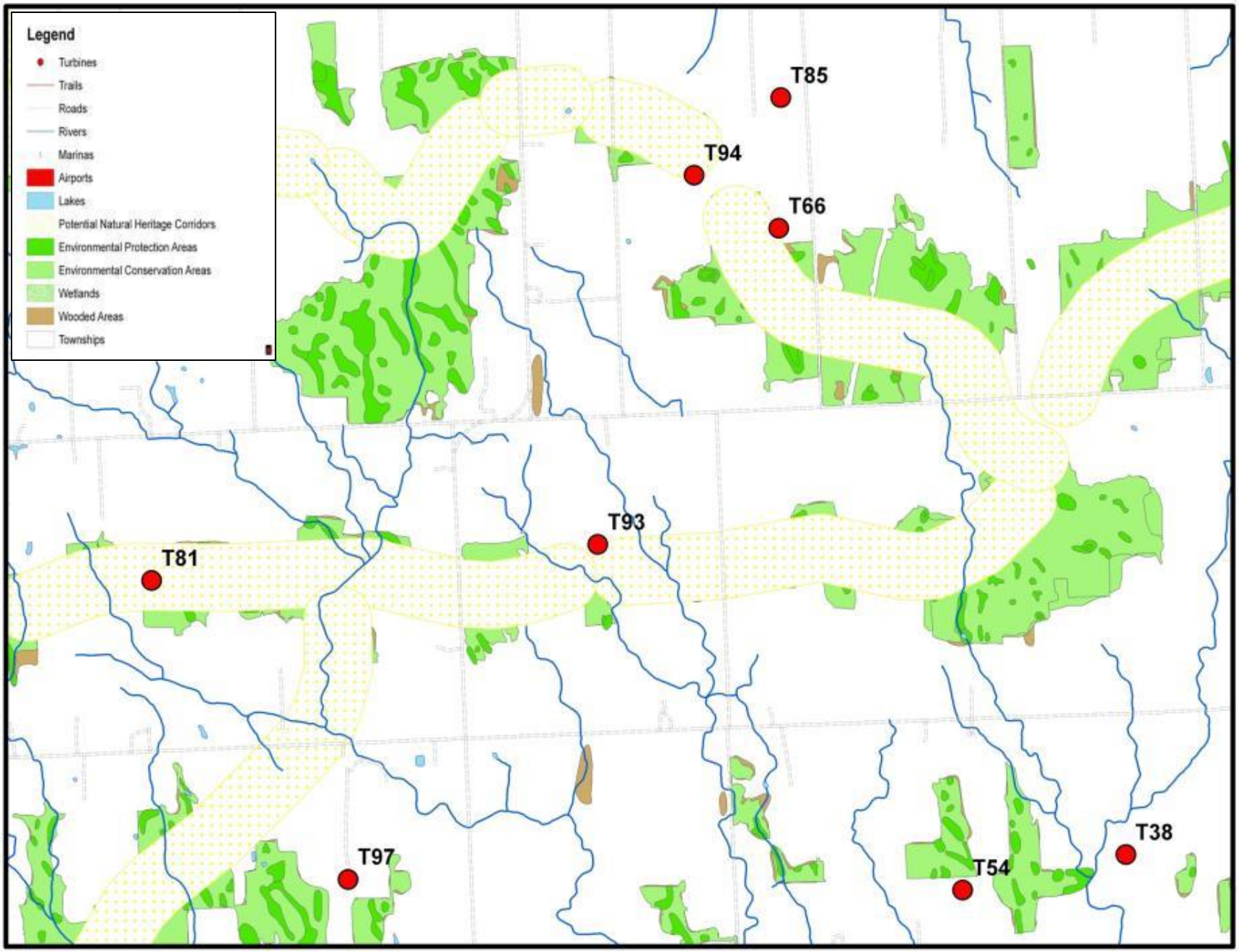
Proposed Siting of NRWC Industrial Wind Turbines within Potential Natural Heritage Corridors Connecting Core Natural Areas – Official Plan Niagara Region



Migratory Butterfly Concentration Areas

DRAFT February 2012 Eco-Region 7E

Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria
colony in area and are used annually.		pastures with scattered trees or shrubs (Brewer's Blackbird) MAM1 – 6; MAS1 – 3; CUM CUT CUS	Information Sources • Ontario Breeding Bird Atlas [ccv], rare/colonial species records. • Canadian Wildlife Service • Reports and other information available from CAs • NHIC Colonial Waterbird Nesting Area • MNR District Offices. • Local naturalist clubs.	• The edge of the colony and a minimum 150m area of habitat, or the extent of the ELC ecosites containing the colony or any island <3.0ha with a colony is the SWH [cc, ccvii] • Studies would be done during May/June when actively nesting. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHDSS[cxlix] Index #6 provides development effects and mitigation measures.
Migratory Butterfly Stopover Areas **Rationale:** Butterfly stopover areas are extremely rare habitats and are biologically important for butterfly species that migrate south for the winter.	Painted Lady White Admiral Special Concern Monarch	Combination of ELC Community Series; need to have present one Community Series from each landclass: Field: CUM CUT CUS Forest: FOC FOD FOM CUP Anecdotally, a candidate sight for butterfly stopover will have a history	A butterfly stopover area will be a minimum of 10 ha in size with a combination of field and forest habitat present, and will be located within 5 km of Lake Ontario and Erie [cxlix]. • The habitat is typically a combination of field and forest, and provides the butterflies with a location to rest prior to their long migration south [xxxii, xxxiii, xxxiv, xxxv, xxxvi]. • The habitat should not be disturbed, fields/meadows with an abundance of preferred nectar plants and woodland edge providing shelter are requirements for this habitat [cxlviii, cxlix].	Studies confirm: • The presence of Monarch Use Days (MUD) during fall migration (Aug/Oct)[xliii]. MUD is based on the number of days a site is used by Monarchs, multiplied by the number of individuals using the site. Numbers of butterflies can range from 100-500/day[xxxvii], significant variation can occur between years and multiple years of sampling should occur [xl, xlii]. • MUD of >5000 **or** >3000 with the presence of Painted Ladies or White Admiral's is to be considered significant.[e] SWHDSS [cxlix] Index #16 provides

Ref: Significant Wildlife Habitat Criterion Schedule, Ecoregion 7E DRAFT February 2012

Migratory Butterfly Concentration Areas

Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria
		of butterflies being observed.	• Stopover areas usually provide protection from the elements and are often spits of land or areas with the shortest distance to cross the Great Lakes [xxxvii, xxxviii, xxxix, xl, xli] Information Sources • OMNR (NHIC) • Agriculture Canada in Ottawa may have list of butterfly experts. • Naturalist Clubs • Toronto Entomologists Association • Conservation Authorities	development effects and mitigation measures.
Landbird Migratory Stopover Areas **Rationale:** Sites with a high diversity of	All migratory songbirds. Canadian Wildlife Service Ontario website: http://www.on.ec.gc.ca/wildlife_e.html	All Ecosites associated with these ELC Community Series; FOC FOM FOD	Woodlots need to be >5 ha(E) in size and within 5 km [iv, v, vi, vii, viii, ix, x, xi, xii, xiii, xiv, xv] of Lake Ontario and Erie. • Woodlands <2km from Lake Erie or Ontario are more significant [cxlix]	Studies confirm: • Use of the woodlot by >200 birds/day and with >35 spp with at least 10 bird spp. recorded on at least 5 different survey dates(E). This abundance and diversity of migrant bird species

Migratory Butterfly Concentration Areas

The Natural Heritage Assessment report – Site Investigation Summary provides the criteria that were used to identify migratory butterfly stopover areas, as follows:

Table 4.1 Characteristics Used to Identify Candidate Seasonal Concentration Areas

Candidate Seasonal Concentration Area	Criteria	Methods
	ditches within farmlands. • The edge of the colony and a minimum 150m area of habitat, or the extent of the ELC ecosites containing the colony or any island <3.0ha with a colony is the SWH.	
Migratory butterfly stopover areas	• A minimum of 10 ha in size with a combination of field and forest habitat within 5 km of Lake Ontario and Lake Erie. • Habitat should not be disturbed with an abundance of nectar plants and woodland edges.	• Vegetation community classifications were utilized to assess features in and within 120m of the Project Location that would support seasonal concentration habitats.

Ref: NRWC Natural Heritage Assessment and Environmental Impact Study report, March 26, 2013, Table 4.1

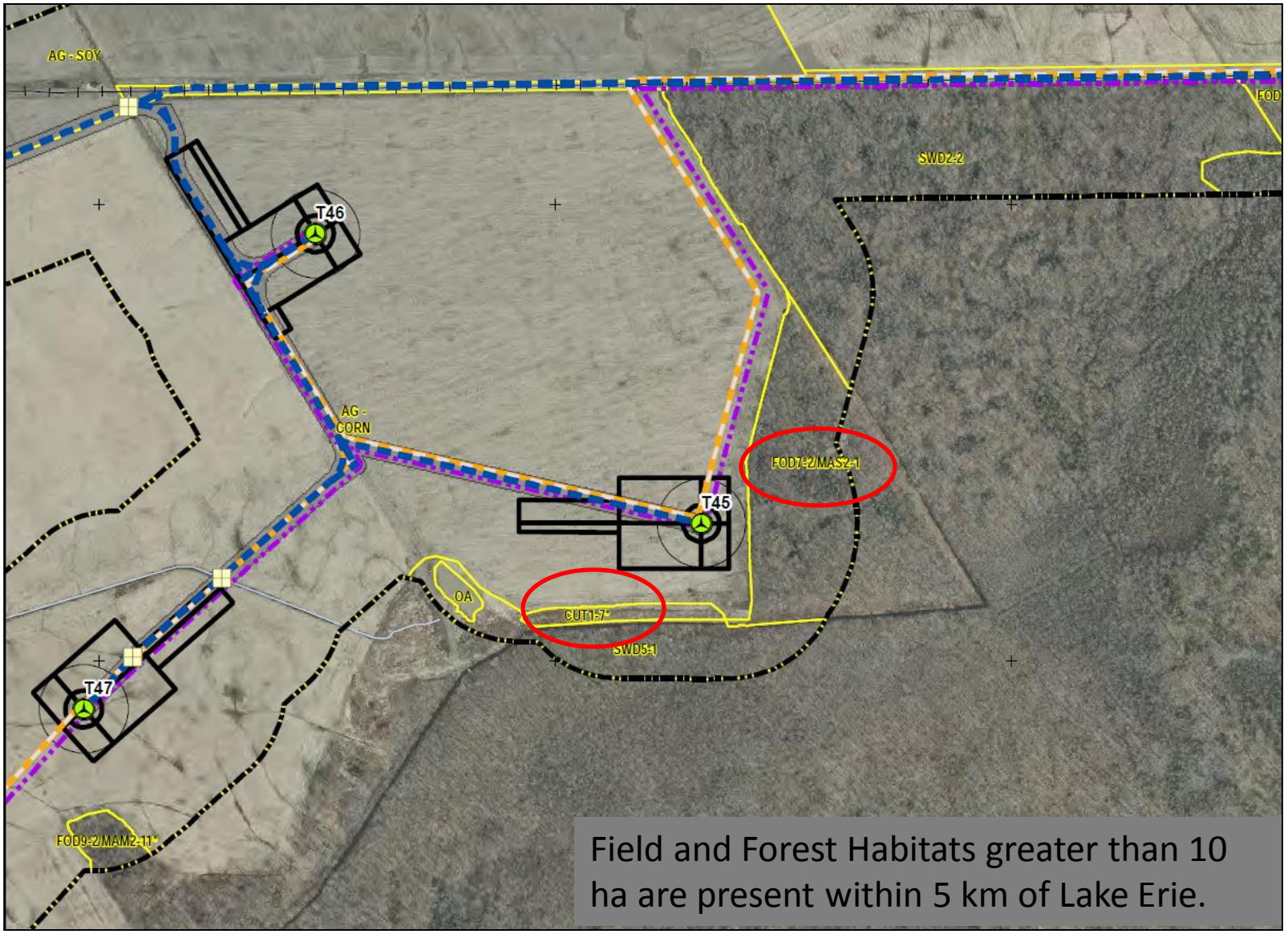
Migratory Butterfly Concentration Areas

Table 4.4 Summary of Site Investigation Results for Seasonal Concentration Areas

Candidate Seasonal Concentration Areas	Present in or within 120m of Project Location	Rationale	Carried Forward to Summary and EOS (Y/N)
Turtle Wintering Areas	Yes	Vegetation classification surveys identified the presence of wetland areas within 120m of the Project Location consisting primarily of swamp maple and green ash deciduous swamps with scattered meadow marshes and swamp thickets. The Welland River has been identified as candidate significant wildlife habitat for turtle overwintering.	Yes (twa1)
Snake Hibernacula	Yes	Snake hibernacula features such as buried concrete or rock (e.g. building foundations, culverts, rock crevices or abandoned animal burrows) were found within 120m of the Project Location. During site investigations, 6 candidate habitats for hibernacula sites were identified 1 habitat feature isolated within 120m of a collector line considered to be a component with no operational impacts and will be considered Generalized Candidate Significant Wildlife Habitat. .	Yes (sh2, sh3 sh4, sh6, sh7) Generalized (sh5)
Colonial-Nesting Bird Breeding Habitat (bank/cliff)	No	Results of the vegetation community surveys determined that there no eroding banks, sandy hills, borrow pits, steep slopes and sand piles present in or within 120m of the Project Location.	No
Colonial-Nesting Bird Breeding Habitat (tree/shrub)	No	Woodlands containing deciduous treed swamp inclusions were present in or within 120m of the project location; however, none of these sites had nests to demonstrate this habitat is used by colonial-nesting birds.	No
Colonial-Nesting Bird Breeding Habitat (ground)	No	There are no lakes or large rivers providing shoreline habitat or containing rocky island or peninsula features within 120m of the project location. Brewer's Blackbird has only been recorded from two locations in the extreme southwestern corner of Ecoregion 7E and is not known to occur within the Project Location (Cadman et al, 2007).	No
Migratory butterfly stopover areas	No	No habitat a minimum of 10 ha in size with a combination of field and forest habitat was found in and within the Project location within 5 km of Lake Erie.	No

Ref: NRWC Natural Heritage Assessment and Environmental Impact Study report, March 26, 2013, Table 4.4

Migratory Butterfly Concentration Areas

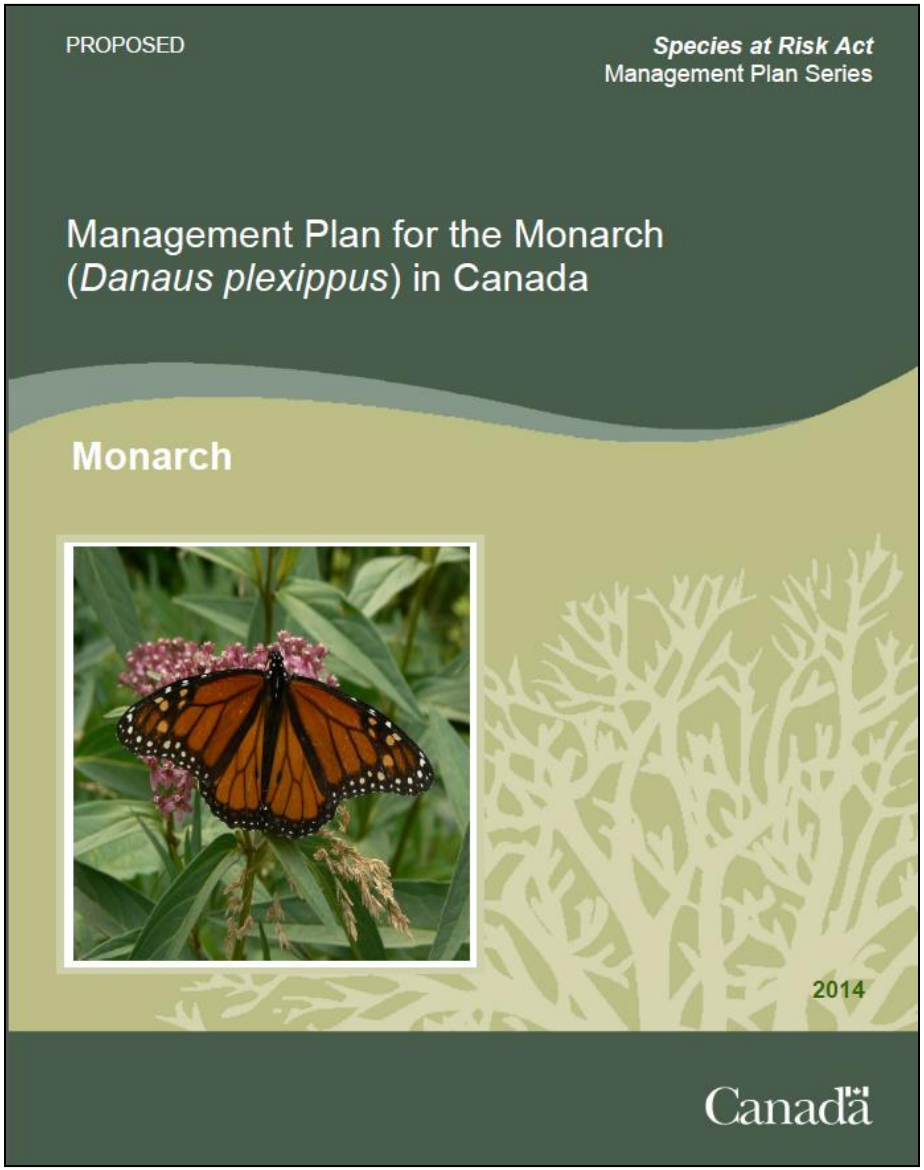


Ref: NRWC Natural Heritage Assessment and Environmental Impact Study– Appendix A – Fig 3.55 Ecological Land Classification (ELC) Natural Features

Migratory Butterfly Concentration Areas

Ref: NRWC Natural Heritage Assessment and Environmental Impact Study – Appendix A – Fig 3.57 Ecological Land Classification (ELC) Natural Features

Migratory Butterfly Concentration Areas



"The potential for collisions with wind turbines has been identified as a possible threat to Monarch (COSEWIC, 2010), particularly during migrations, although very little evidence on the extent or severity of butterfly collision mortality with wind turbines currently exists (Damus, 2007). In Ontario, Monarch have been observed in large clusters in roosts on the north shores of Lake Erie and Lake Ontario, where wind turbines have been built, or where they are planned or proposed. "

Ref: Management Plan for the Monarch (Danaus plexippus) in Canada, Environment Canada 2014

Severe Encroachment of Provincially Significant Wetland Features

The NRWC Project Area includes 16 provincially significant wetland complexes.

88 Provincially significant wetlands (PSW) have been identified within 120 meters of project components.

Of these 88 PSW, 28 of these have project components proposed within 0.1 meters of these wetland features. These project components include access roads, collector lines, laydown areas and transmission lines.

Fourteen access roads are proposed within 0.1 meters of PSW. The Construction report estimates over 1300 truckloads of material moving and leaving each turbine location site.

Mitigation measures do not address the negative impacts of habitat disruption, soil compaction, collision mortality. There are significant wildlife habitats adjacent to these access roads.

Severe Encroachment of Provincially Significant Wetland Features

Stantec

NIAGARA REGION WIND FARM
CONSTRUCTION PLAN REPORT
Construction and Installation Activities
April 2013

2.2 COMPONENT TRANSPORTATION

The table below summarizes the expected number of truck deliveries and removals per turbine site based on a typical site and the approximate quantity of materials (estimates) discussed above.

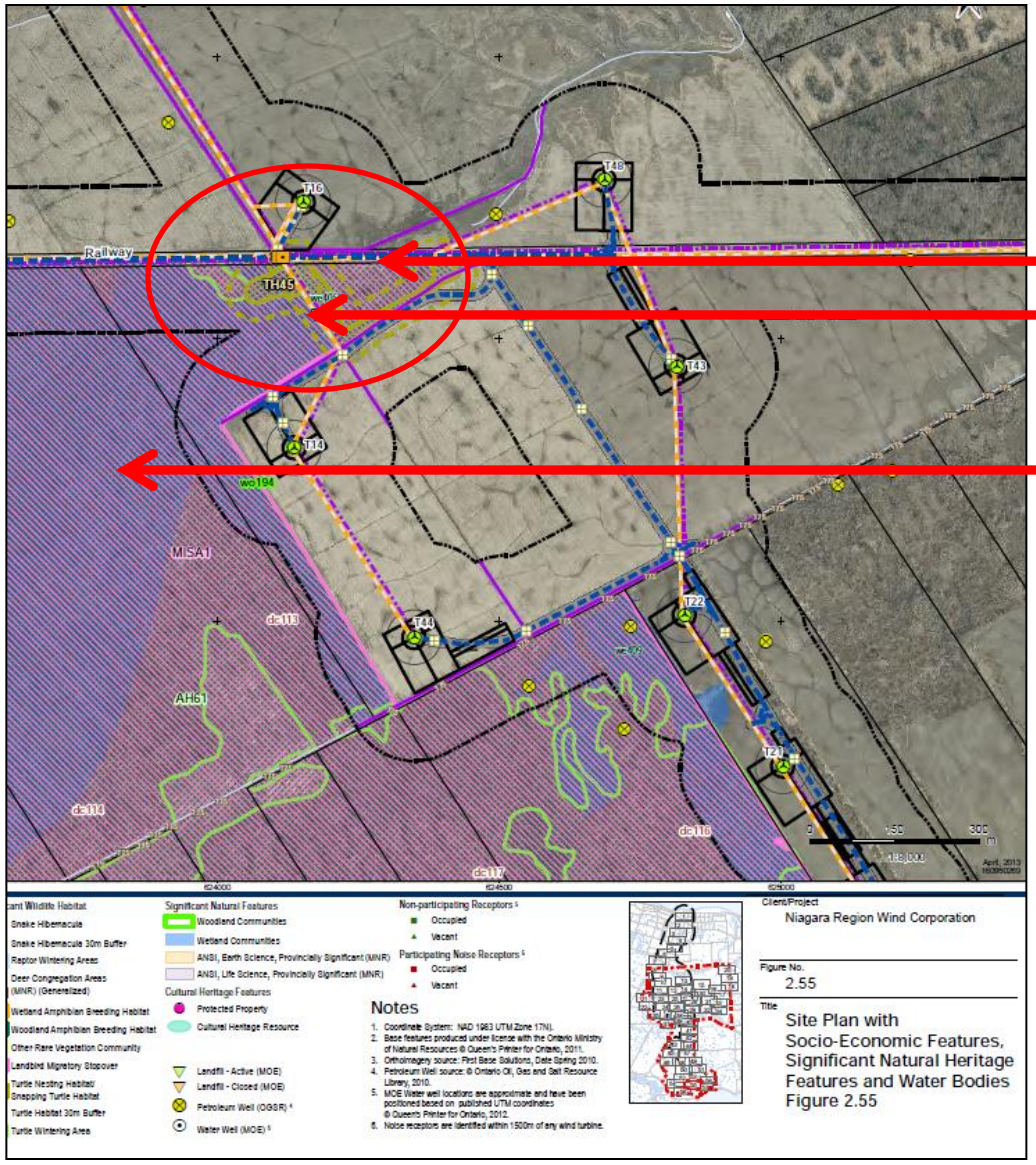
Table 2.2: Trucks per turbine

Component Description	Delivery Trucks Per Turbine	Removal Trucks Per Turbine	Total
Transports for Turbine Tower Sections, Nacelles, and Blades	79		79
Transports to deliver turbine erection cranes	80	80	160
Transports to deliver smaller/assist cranes	10	10	20
Delivery trucks for foundation forms	3	3	6
Concrete truck loads per foundation	100		100
Delivery truck for rebar	3		3
Delivery truck for containers	4	4	8
Delivery truck for special tools and manlifts etc.	10		10
Granular deliveries per crane pad	282		282
Granular removals per crane pad		271	271
Granular deliveries per access road	37		37
Granular removals per access road		15	15
Cement deliveries per access road	88		88
Cement removal per access road		36	36
Foundation excavation (soil removal)		257	257
TOTAL	**696**	**676**	**1372**

A Transportation and Traffic Management Plan (TTMP) will be developed to describe and coordinate the delivery of the wind turbine components to the Project site. The TTMP will identify and deal with specific traffic planning issues including the management of traffic during construction (ex. cement trucks, dump trucks, contractor vehicles) and the delivery of materials (ex. blades, nacelle, tower components). The TTMP will include details on the size and number of trucks, and the timeline and operational plan for transporting materials to the Project site (including the sequence of events, duration of activities, routing and timing with respect to season). The TTMP will also include the use of signage, road closures, speed restrictions, truck lighting, load restrictions, and equipment inspections. The TTMP will be finalized during the

Ref: NRWC Construction Plan Report April 2013

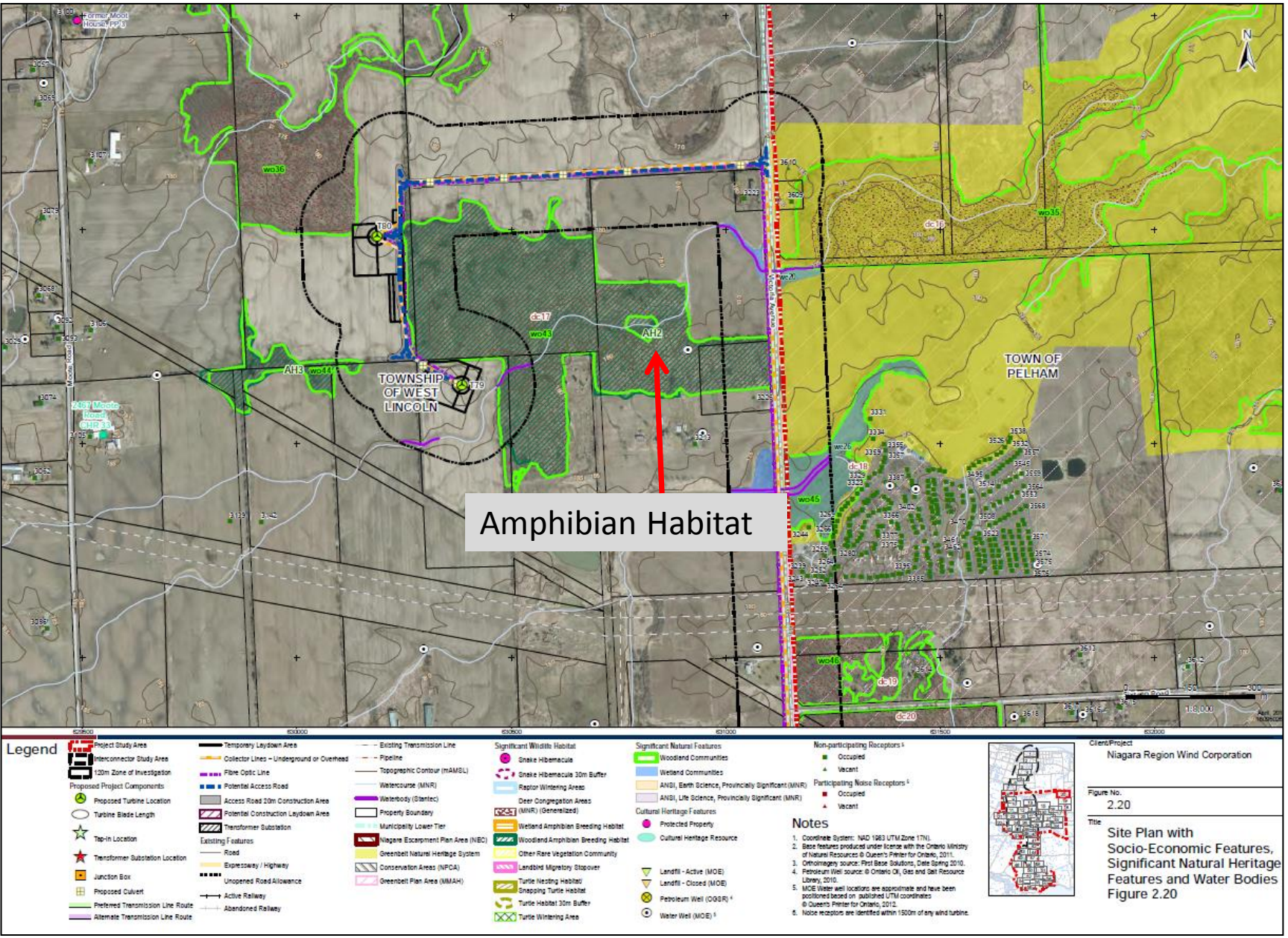
Severe Encroachment of Provincially Significant Wetland Features



Access Roads within 0.1 meters of we 408

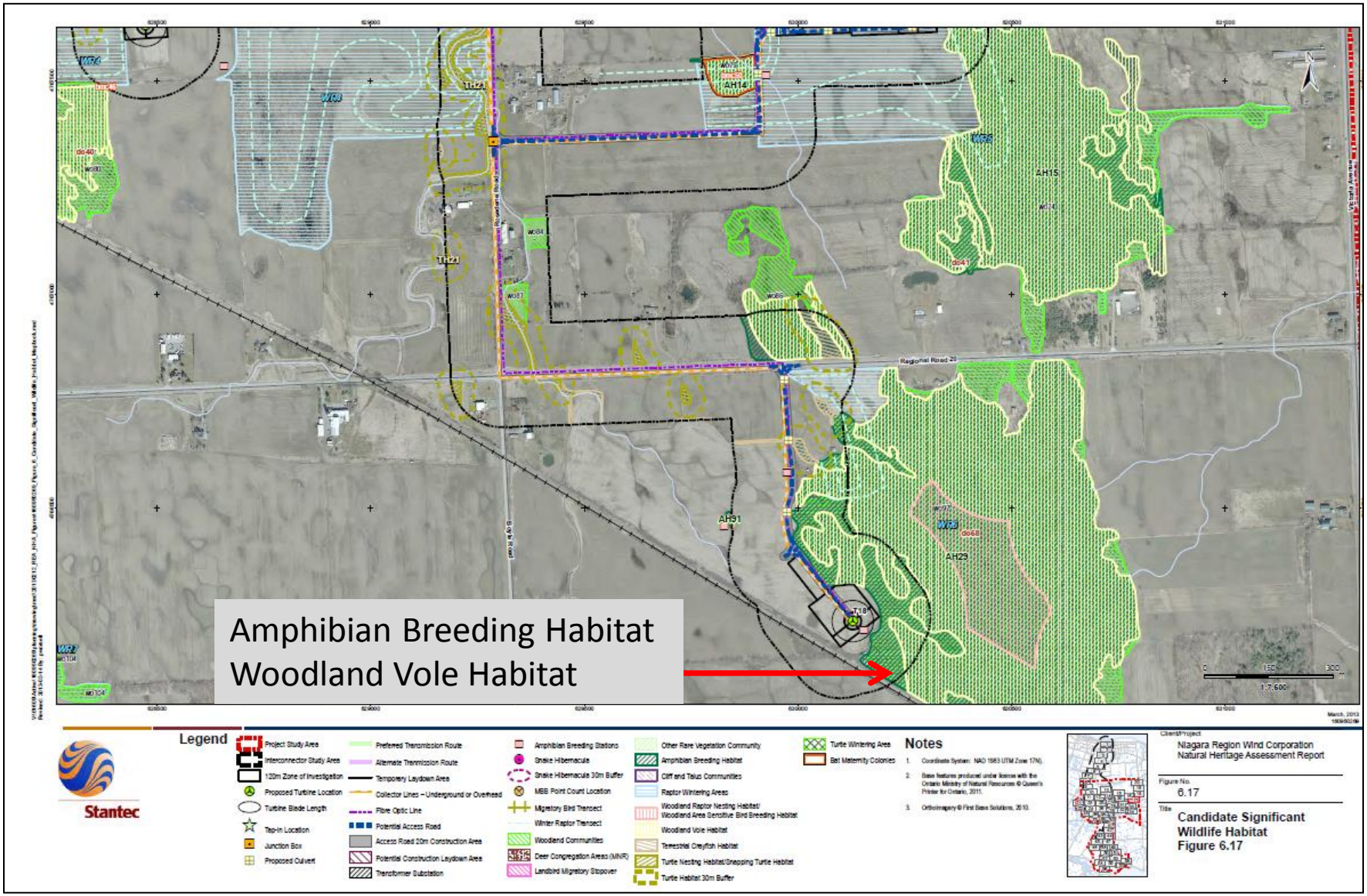
Ref: NRWC Project Description Report – Appendix A – Site Plan with Socio-Economic Features, Significant Natural Heritage Features and Water Bodies, Figure 2.55

Severe Encroachment of Provincially Significant Wetland Features



Ref: NRWC Project Description Report – Appendix A – Site Plan with Socio-Economic Features, Significant Natural Heritage Features and Water Bodies, Figure 2.20

Severe Encroachment of Provincially Significant Wetland Features



Ref: NRWC Natural Heritage Assessment Report And Environmental Impact Study - Candidate Significant Wildlife Habitat, Figure 6.17

Severe Encroachment of Provincially Significant Wetland Features

Unique Feature ID	Potential Operational Negative Environmental Effects	Performance Objective	Mitigation Strategy	Environmental Effects Monitoring Plan					Contingency Measure
				Methodology	Monitoring Locations	Frequency and Duration of Sample Collection	Technical and Statistical Value of Data	Reporting Requirements	
									measures to be undertaken.
Significant Wetlands	Potential disturbance effects to wetland hydrology and potential sedimentation	Maintain hydrological flows to provincially significant wetlands	Installation of culverts to maintain hydrological conditions	Inspection of culverts to ensure flow maintained	The periphery of significant wetlands See Appendix B for survey locations	Hydrological conditions will be monitored once seasonally in each of spring and summer during the first year post-construction	Determine if there is a disturbance to hydrological conditions that could impact provincially significant wetland features	Notify MNR of hydrological issues and actions taken to resolve the issue. Any negative impacts that occurred to the provincially significant wetland will also be reported to MNR and where necessary will be restored.	Contingency measures will be determined in consultation with MNR.
Significant Woodlands	Potential disturbance effects to woodland hydrology and potential sedimentation cause by access roads	Maintain hydrological flows to significant woodlands	Installation of culverts to maintain hydrological conditions	Inspection of culverts to ensure flow maintained	The periphery of significant woodlands See Appendix B for survey locations	Hydrological conditions will be monitored once seasonally in each of spring and summer during the first year post-construction	Determine if there is a disturbance to hydrological conditions that could impact significant woodland features	Notify MNR of hydrological issues and actions taken to resolve the issue. Any negative impacts that occurred to the significant woodland will also be reported to MNR and where necessary will be restored.	Contingency measures will be determined in consultation with MNR.

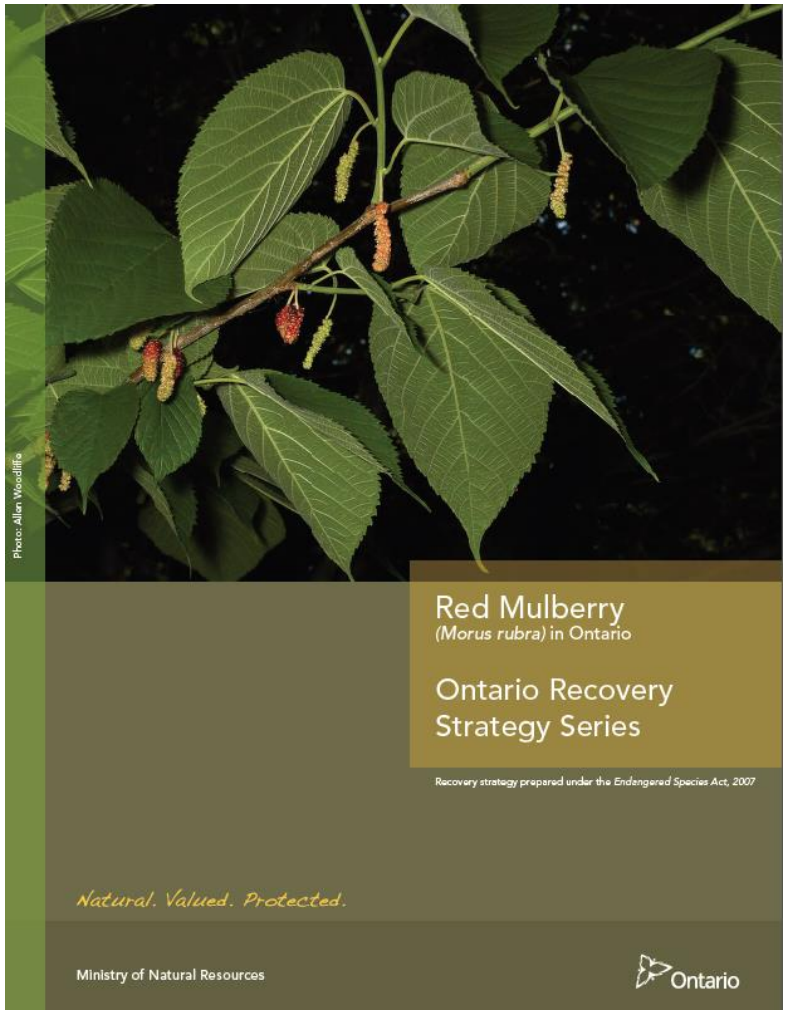
Severe Encroachment of Provincially Significant Wetland Features

Section 7.2.3 Environmental Effects Monitoring Plan of the 2012 Natural Heritage Assessment Guide requires the following:

When preparing an EIS Report, the applicant must provide a description of how the environmental effects monitoring plan addresses any negative environmental effects of the project on a natural feature, provincial park or conservation reserve for which the EIS is being prepared. The EIS Report should provide sufficient detail to fully describe the approach in the environmental effects monitoring plan including:

-methodologies to be used;
-locations of monitoring;
-frequency of sample collection;
-how the results of the monitoring plan will be reported; and
-**contingency measures that will be undertaken, including their timing, design and operational considerations**

Red Mulberry (Endangered under SAR) within 120 meters of IWT



7.1 Activities Likely to Result in the Destruction of Critical Habitat

Examples of activities, in or near critical habitat, likely to destroy critical habitat include, but are not limited to those outlined in Table 4 below.

Table 4: Examples of activities likely to result in the destruction of critical habitat.

Effect of an Activity that May Destroy Critical Habitat	Examples of Activities likely to Destroy Critical Habitat
Loss or fragmentation of critical habitat.	Anthropogenic development within critical habitat (e.g. agricultural activities such as land clearing and/or tilling of the soil, industrial or residential development, or infrastructure developments such as new road, pipeline, water main, and wind power construction) or high intensity logging within critical habitat (clearing paths or other areas for log removal and/or stockpiling).
Damage to canopy or understory vegetation, increased evaporation leading to drying of the soil or soil compaction (which may result in reduced establishment of Red Mulberry recruits).	Logging - removal of trees within critical habitat using practices that do not conform to low impact logging standards (e.g. Forest Stewardship Council 2004). Examples of logging activities that are likely to destroy critical habitat include clear-cutting, high-grading, and diameter limit cuts.
Alteration of drainage patterns, ground water flow and soil moisture levels within critical habitat.	Property drainage (e.g. for agriculture or residential or industrial development) in or adjacent to critical habitat.
Alteration of forest vegetation resulting in increased hybridization with White Mulberry or hybrid mulberry trees and reduced production of pure Red Mulberry seed.	Intentional planting of White Mulberry plants within critical habitat.
Increased shading, or alteration of forest canopy or understory vegetation, leading to competition with Red Mulberry seedlings or saplings.	Intentional planting of non-native species within critical habitat.
Disturbance of soil (which may result in increased establishment of exotic plants) and/or destruction of vegetation.	Vandalism or off-road vehicle use within critical habitat.

7.2 Schedule of Studies to Identify Critical Habitat

Additional work required to refine the population and distribution objectives and determine if critical habitat identification requires modification to support these objectives for recovery is outlined in Table 5.

Red Mulberry (Morus rubra) in Ontario – Ontario Recovery Strategy Series, OMNR 2013

Red Mulberry (Endangered under SAR) within 120 meters of IWT

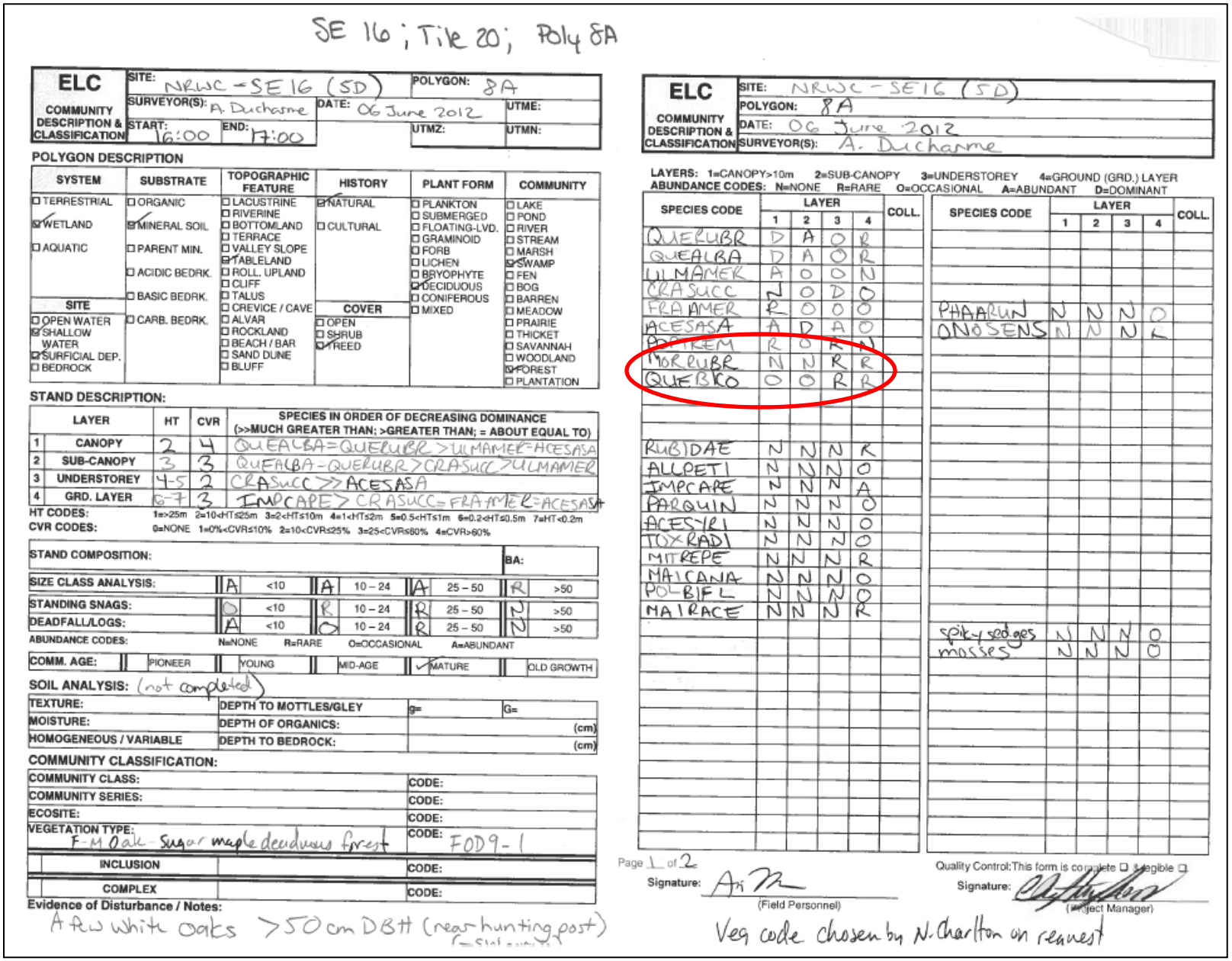
Appendix G
Plant List

LATIN NAME	LOCAL STATUS SOURCE	COMMON NAME	COEFFICIENT OF CONSERVATISM	WETNESS INDEX	WEEDINESS INDEX	PROVINCIAL STATUS	OMNR STATUS	COSEWIC STATUS	GLOBAL STATUS	LOCAL STATUS NIAG
Juglandaceae		**Walnut Family**								
Carya	*cordiformis*	Bitternut hickory	6	0		S5			G5	X
Carya	*ovata* var. *ovata*	Shagbark Hickory	6	3		S5			G5	X
Juglans	*cinerea*	Butternut	6	2		S3?	END	END	G4	X
Juglans	*nigra*	Black Walnut	5	3		S4			G5	X
Lamiaceae		**Mint Family**								
Ajuga	*reptans*	Creeping Bugleweed		5	-1	SE2			G?	
Glechoma	*hederacea*	Creeping Charlie		5	-2	SE5			G?	I
Leonurus	*cardiaca* ssp. *cardiaca*	Common Motherwort		5	-2	SE5			G?T?	I
Lycopus	*americanus*	Cut-leaved Water-horehound	4	-5		S5			G5	X
Lycopus	*uniflorus*	Northern Water-horehound	5	-5		S5			G5	X
Mentha	*species*									
Mentha	*arvensis* ssp. *borealis*	American Wild Mint	3	-3		S5				X
Monarda	*fistulosa*	Wild Bergamot	6	3		S5			G5	X
Prunella	*vulgaris* ssp. *vulgaris*	Common Heal-all		0	-1	SE3			G5T?	I
Lauraceae		**Laurel Family**								
Lindera	*benzoin*	Spicebush	6	-2		S5			G5	X
Lythraceae		**Loosestrife Family**								
Lythrum	*salicaria*	Purple Loosestrife		-5	-3	SE5			G5	X
Malvaceae		**Mallow Family**								
Abutilon	*theophrasti*	Velvet-leaf		4	-1	SE5			G?	I
Malva	*species*									
Moraceae		**Mulberry Family**								
Morus	*alba*	White Mulberry		0	-3	SE5			G?	I
Nymphaeaceae		**Water-lily Family**								
Nuphar	*variegata*	Bulhead Pond-lily	4	-5		S5			G5	U
Oleaceae		**Olive Family**								
Fraxinus	*americana*	White Ash	4	3		S5			G5	X
Fraxinus	*nigra*	Black Ash	7	-4		S5			G5	X

Ref: NRWC Natural Heritage Assessment and Environmental Impact Study – Appendix G – Plant List, pdf page 611/649

Red Mulberry (Endangered under SAR) within 120 meters of IWT

Issue 1(c)



SE 16 ; Tile 20 ; Poly 8A

ELC COMMUNITY DESCRIPTION & CLASSIFICATION

SITE: NRWC - SE16 (5D) POLYGON: 8A
SURVEYOR(S): A. Ducharme DATE: 06 June 2012 UTME:
START: 16:00 END: 17:00 UTMZ: UTMN:

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
☐ TERRESTRIAL	☐ ORGANIC	☐ LACUSTRINE	☑ NATURAL	☐ PLANKTON	☐ LAKE
☑ WETLAND	☑ MINERAL SOIL	☐ RIVERINE	☐ CULTURAL	☐ SUBMERGED	☐ POND
☐ AQUATIC	☐ PARENT MIN.	☐ BOTTOMLAND		☐ FLOATING-LVD.	☐ RIVER
	☐ ACIDIC BEDRK.	☐ TERRACE		☐ GRAMINOID	☐ STREAM
	☐ BASIC BEDRK.	☐ VALLEY SLOPE		☐ FORB	☐ MARSH
	☐ CARB. BEDRK.	☑ TABLELAND		☐ LICHEN	☑ SWAMP
SITE		☐ ROLL. UPLAND		☐ BRYOPHYTE	☐ FEN
☐ OPEN WATER		☐ CLIFF		☑ DECIDUOUS	☐ BOG
☑ SHALLOW WATER		☐ TALUS		☐ CONIFEROUS	☐ BARREN
☑ SURFICIAL DEP.		☐ CREVICE / CAVE	COVER	☐ MIXED	☐ MEADOW
☐ BEDROCK		☐ ALVAR	☐ OPEN		☐ PRAIRIE
		☐ ROCKLAND	☐ SHRUB		☐ THICKET
		☐ BEACH / BAR	☑ TREED		☐ SAVANNAH
		☐ SAND DUNE			☐ WOODLAND
		☐ BLUFF			☑ FOREST
					☐ PLANTATION

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (>>MUCH GREATER THAN; >GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	2	4	QUEALBA=QUERUBR >ULMAMER=ACESASA
2	SUB-CANOPY	3	3	QUEALBA-QUERUBR>CRASUCC>ULMAMER
3	UNDERSTOREY	4-5	2	CRASUCC >> ACESASA
4	GRD. LAYER	6-7	3	IMPCARE > CRASUCC=FRAMER=ACESASA

HT CODES: 1=>25m 2=10<HT≤25m 3=2<HT≤10m 4=1<HT≤2m 5=0.5<HT≤1m 6=0.2<HT≤0.5m 7=HT<0.2m
CVR CODES: 0=NONE 1=0%<CVR≤10% 2=10<CVR≤25% 3=25<CVR≤50% 4=CVR>50%

STAND COMPOSITION:							BA:	
SIZE CLASS ANALYSIS:	A	<10	A	10 – 24	A	25 – 50	R	>50
STANDING SNAGS:	O	<10	R	10 – 24	R	25 – 50	N	>50
DEADFALL/LOGS:	A	<10	O	10 – 24	R	25 – 50	N	>50

ABUNDANCE CODES: N=NONE R=RARE O=OCCASIONAL A=ABUNDANT

COMM. AGE:	PIONEER	YOUNG	MID-AGE	✓ MATURE	OLD GROWTH

SOIL ANALYSIS: (not completed)

TEXTURE:	DEPTH TO MOTTLES/GLEY	g=	G=
MOISTURE:	DEPTH OF ORGANICS:		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION:

COMMUNITY CLASS:		CODE:
COMMUNITY SERIES:		CODE:
ECOSITE:		CODE:
VEGETATION TYPE:	F-M Oak - Sugar maple deciduous forest	CODE: FOD9-1
INCLUSION		CODE:
COMPLEX		CODE:

Evidence of Disturbance / Notes:
A few white oaks >50 cm DBH (near hunting post)

ELC COMMUNITY DESCRIPTION & CLASSIFICATION

SITE: NRWC - SE16 (5D)
POLYGON: 8A
DATE: 06 June 2012
SURVEYOR(S): A. Ducharme

LAYERS: 1=CANOPY>10m 2=SUB-CANOPY 3=UNDERSTOREY 4=GROUND (GRD.) LAYER
ABUNDANCE CODES: N=NONE R=RARE O=OCCASIONAL A=ABUNDANT D=DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COLL.
QUERUBR	D	A	O	R	
QUEALBA	D	A	O	R	
ULMAMER	A	O	O	N	
CRASUCC	N	O	D	O	
FRAMER	R	O	O	O	
ACESASA	A	D	A	O	
PRUSER	R	O	R	N	
MORRUBR	N	N	R	R	
QUEBIC	O	O	R	R	
RUBIDAE	N	N	N	R	
ALLPETI	N	N	N	O	
IMPCARE	N	N	N	A	
PARQUIN	N	N	N	O	
ACESYRI	N	N	N	O	
TOXRADI	N	N	N	O	
MITREPE	N	N	N	R	
MAICANA	N	N	N	O	
POLBIFL	N	N	N	O	
MAIRACE	N	N	N	R	

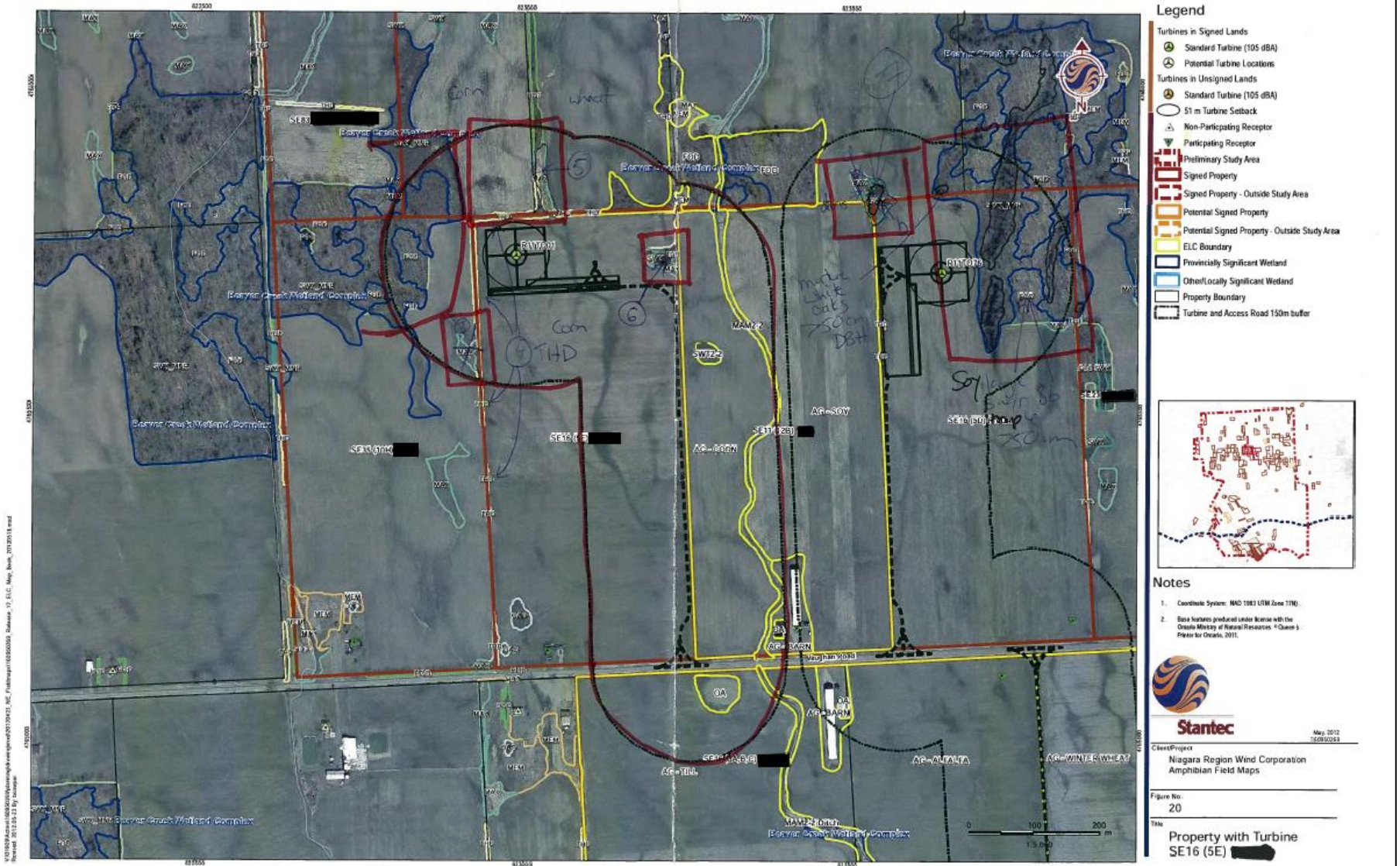
SPECIES CODE	LAYER 1	2	3	4	COLL.
PHAARUN	N	N	N	O	
ONOSENS	N	N	N	R	
spiky sedges	N	N	N	O	
mosses	N	N	N	O	

Page 1 of 2
Signature: (Field Personnel)
Quality Control: This form is complete ☐ Legible ☐
Signature: (Project Manager)

Veg code chosen by N. Charlton on request

Ref: NRWC Natural Heritage Assessment report and Environmental Impact Study, Appendix F – 2012 Field Notes Compiled (pdf page 169/467

Red Mulberry (Endangered under SAR) within 120 meters of IWT



Ref: NRWC Natural Heritage Assessment report and Environmental Impact Study, Appendix F – 2012 Field Notes Compiled (pdf page 171/467

Non-Specific Mitigation Measures for each of 104 significant woodlands within 120 meters of project components

vegetation removal, the potential for spills and contamination to the woodland, and temporary disturbance to habitat from construction noise

The constructible area for access roads and underground collector lines has been sited away from woodlands. Given access roads would be narrow, relatively flat, unpaved roads that will receive relatively little regular traffic during the operation of the Project, they are not anticipated to cause significant root zone disturbance or changes to surface water flow from existing conditions. Underground collector lines are not anticipated to cause any significant root damage, as proposed works will be situated outside of the woodland edge drip line.

Indirect impacts resulting from construction and decommissioning activities, such as dust generation, sedimentation and erosion are expected to be short term, temporary in duration and mitigated for through the use of standard site control measures. During operation there is the potential for spills and contamination to the woodland.

Mitigation

Mitigation measures specific to significant woodlands are outlined in **Table 6.1, Appendix B**.

For all significant woodlands where tree trimming is required (i.e. due to accidental damage caused by construction activities), the following mitigation measures will be implemented:

- No development is permitted within the woodland boundary.
- Clearly delineate work area using erosion fencing to avoid accidental damage to trees
- The erosion fencing should be placed as far away as possible from the significant woodland and be placed no closer to the significant woodland than the drip-line.
- Erosion and sediment control structures should be monitored regularly to ensure that they are fully functional especially before and after major rainfall events. Should erosion and sediment control measures not be functional, they should be immediately repaired.
- Instruct workers on the importance of avoiding entrance to the demarcated area.
- Inspectors will ensure construction vehicles and personnel stay within the construction envelope, thereby limiting the disturbance of natural vegetation.
- All refueling activities will occur well away from the woodland. In the event of an accidental spill, the MOE Spills Action Centre should be contacted and emergency spill procedures implemented immediately.
- All maintenance activities, vehicle refueling or washing, as well as the storage of chemical and construction equipment will be located more than 30m from significant woodlands.

Ref: NRWC Natural Heritage Assessment Report and Environmental Impact Study, pdf page 155/649

Non-Specific Mitigation Measures for each of 104 significant woodlands within 120 meters of project components

features wo5, wo14, wo22, wo24, wo25, wo47, wo49, wo88, wo89, wo118, wo141, wo144, wo145, wo198, wo199 and wo206.

For some of these features, construction and decommissioning activities would occur on the opposite side of the road and no direct impact to the woodland function or form or habitat is expected. For the remaining features where construction/decommissioning would take place on the same side of the road, activities would occur within the municipal road allowance adjacent to the woodland feature. If overhead/underground lines are required adjacent to these features, the collector system would be installed within the municipal road allowance in areas that have been previously cleared. Construction and decommissioning activities include installing or removing collector lines.

For installation of new overhead lines, poles would be set to a depth of approximately 2 to 3 m and power lines strung between them. Overall, construction and decommissioning activities are to be low impact and very short term in duration. The trenches (or poles) would be installed at a shallow depth and the total area impacted would be small, therefore there are no anticipated changes to the surface water or groundwater contributions to the features. Construction and decommissioning activities adjacent to each feature are expected to be short term in duration (completed within a day) and small in scale, and so minimal dust would be generated.

Underground collector lines are located within 120m of woodland features wo35, wo36, wo43, wo44, wo52, wo55, wo61, wo67, wo69, wop74, wo85, wo86, wo88, wo91, wo92, wo97, wo98, wo99, wo100, wo102, wo103, wo105, wo107, wo108, wo111, wo112, wo113, wo114, wo115, wo119, wo124, wo129, wo136, wo138, wo139, wo142, wo150, 151, wo153, wo154, wo163, wo170, wo176, wo177, wo178, wo180, wo183, wo184, wo185, wo190, wo191, wo194, wo196. Underground collector lines are proposed within 1m of 12 of these woodland features (wo43, wo66, wo69, wo103, wo108, wo113, wo119, wo153, wo190, wo191 and wo194). Potential impacts of underground collector lines during construction and decommissioning on adjacent woodlands include temporary dust generation, sedimentation and erosion, the potential for spills and contamination to the woodland, temporary disturbance to habitat from construction noise, root zone disturbance, and changes to surface water flow from existing conditions.

Of note, the specific sections of collector and transmission lines to be installed above ground and underground may change during the detailed design stage. For the purposes of the NHA, any impacts and mitigation associated with specific significant woodlands has been assessed assuming either design (above or below ground) would be applicable.

The constructible areas for access roads are within 120m of woodland features wo35, wo36, wo43, wo44, wo51, wo52, wo55, wo61, wo66, wo67, wo69, wo74, wo80, wo85, wo86, wo88, wo91, wo92, wo97, wo98, wo99, wo100, wo102, wo103, wo104, wo105, wo107, wo108, wo111, wo112, wo113, wo115, wo124, wo129, wo136, wo138, wo139, wo142, wo149, wo150, wo151, wo153, wo154, wo163, wo170, wo176, wo177, wo178, wo180, wo183, wo184, wo185, wo190, wo191, wo194 and wo196. Potential impacts of access roads on woodlands within 120 m include temporary dust generation, sedimentation and erosion, accidental intrusion and

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NATURAL HERITAGE ASSESSMENT AND ENVIRONMENTAL IMPACT STUDY
Environmental Impact Study
March 26, 2013

vegetation removal, the potential for spills and contamination to the woodland, and temporary disturbance to habitat from construction noise

The constructible area for access roads and underground collector lines has been sited away from woodlands. Given access roads would be narrow, relatively flat, unpaved roads that will receive relatively little regular traffic during the operation of the Project, they are not anticipated to cause significant root zone disturbance or changes to surface water flow from existing conditions. Underground collector lines are not anticipated to cause any significant root damage, as proposed works will be situated outside of the woodland edge drip line.

Indirect impacts resulting from construction and decommissioning activities, such as dust generation, sedimentation and erosion are expected to be short term, temporary in duration and mitigated for through the use of standard site control measures. During operation there is the potential for spills and contamination to the woodland.

Mitigation

Mitigation measures specific to significant woodlands are outlined in **Table 6.1, Appendix B**.

For all significant woodlands where tree trimming is required (i.e. due to accidental damage caused by construction activities), the following mitigation measures will be implemented:

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- All maintenance activities, vehicle refueling or washing, as well as the storage of chemical and construction equipment will be located more than 30m from significant woodlands.

Ref: NRWC Natural Heritage Assessment Report and Environmental Impact Study, pdf page 154-155/649

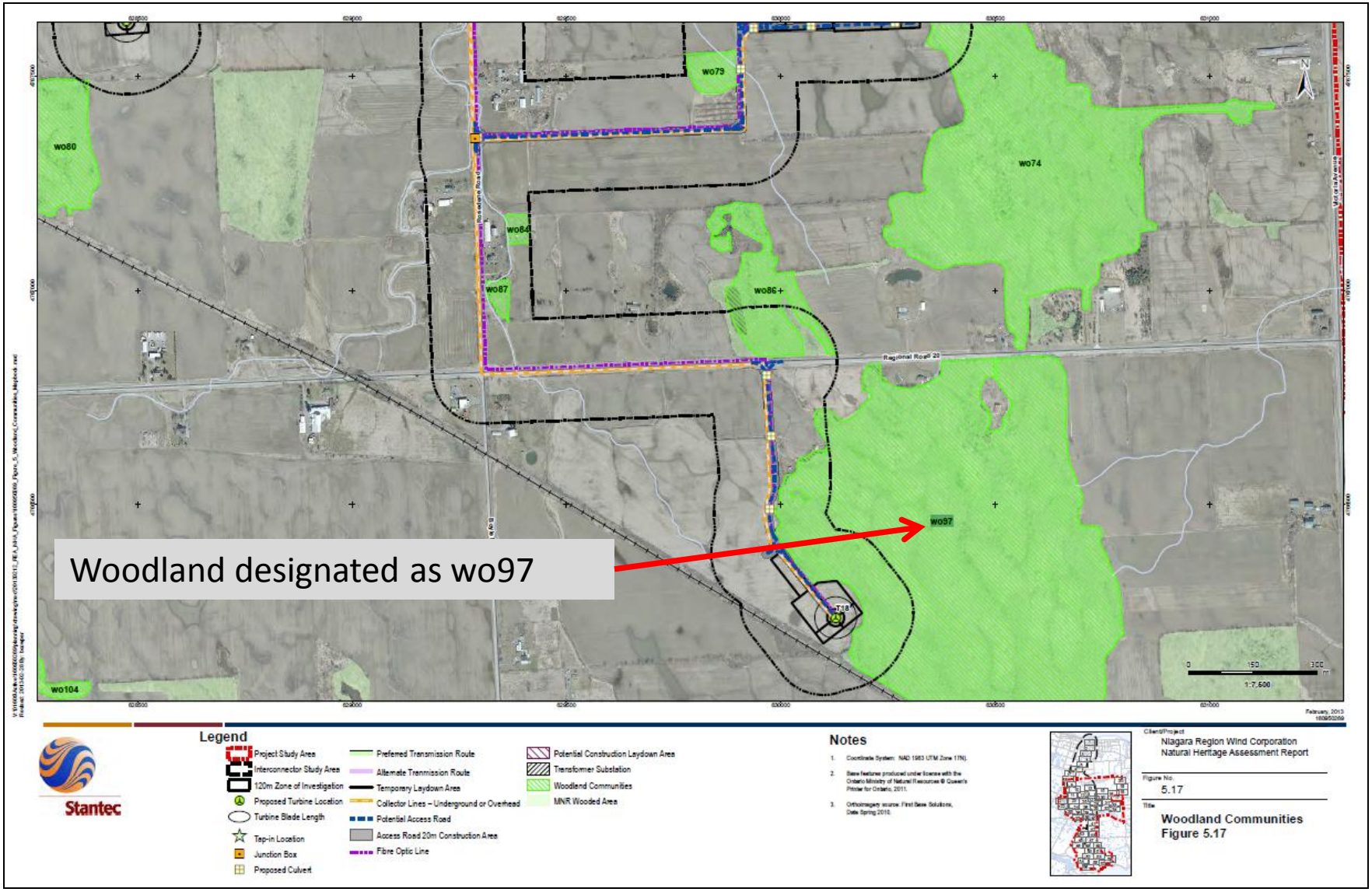
Non-Specific Mitigation Measures for each of 104 significant woodlands within 120 meters of project components

Table 12: EIS Considerations for Specific Natural Features

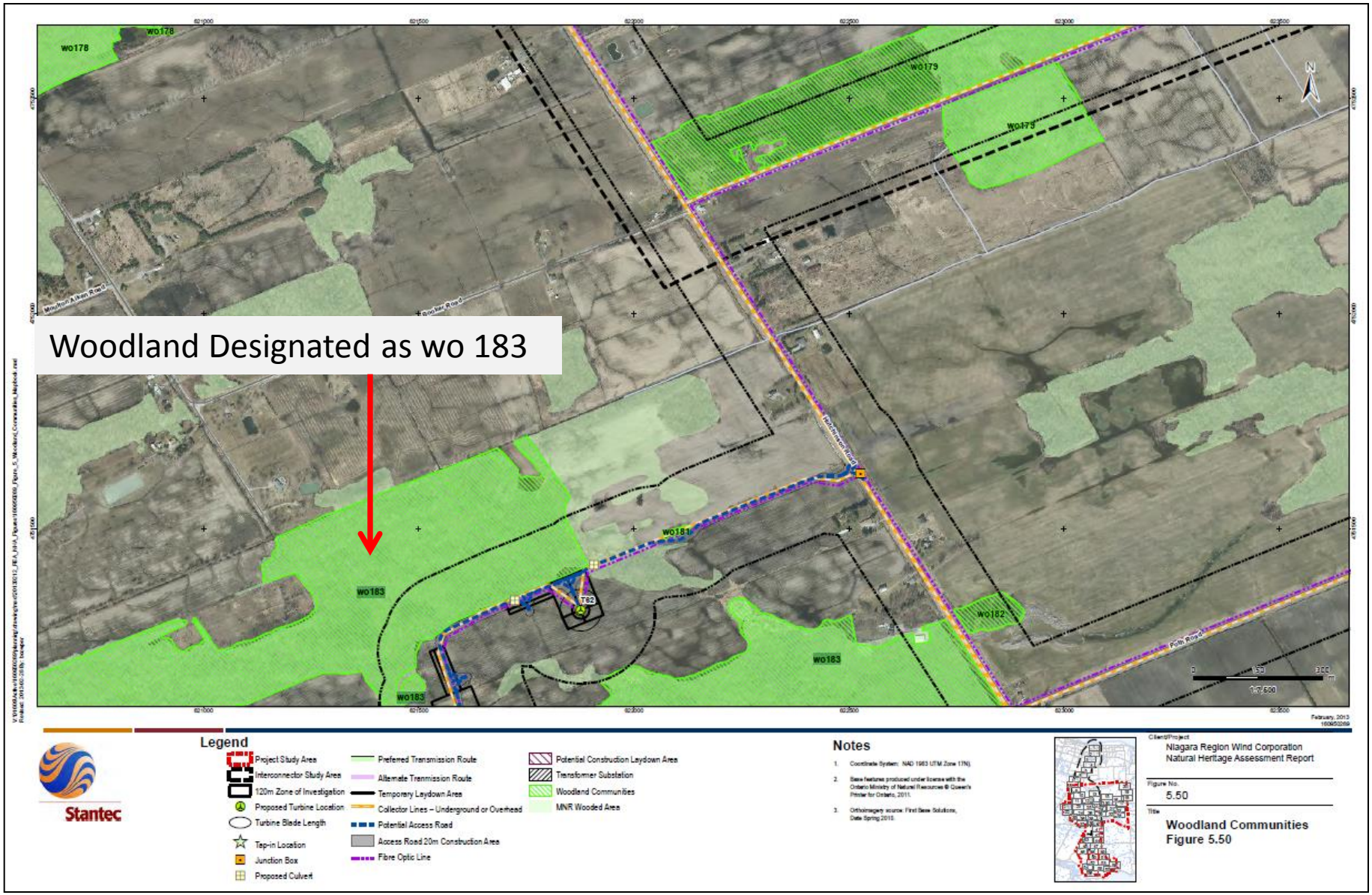
Natural feature	Characteristics and ecological functions	EIS Considerations
Provincially significant southern wetlands Provincially significant coastal wetlands Provincially significant northern wetlands Southern wetlands (in specified provincial plan areas)	***Characteristics*** ▪ water cover, or proximity to the water table; hydric soils and hydrophytic or water tolerant vegetation communities; other features identified by MNR or any other person using procedures established by MNR ***Functions*** ▪ primary production; watershed protection; preservation of bio-diversity; maintenance of three dimensional vegetation systems; maintenance of conditions essential for symbiosis; natural cycles (carbon, nitrogen, water); provision of species to support food chains; wildlife habitat; fish habitat	▪ wildlife habitat function including upland habitat within setback ▪ plant communities, topography, hydrological connectivity, groundwater recharge and discharge ▪ vegetated areas that physically protect the wetland edge from sedimentation ▪ overhanging trees that provide detritus to support food webs
Significant woodlands	***Characteristics*** ▪ woodland size and boundary; shape and potential for forest interior habitat; linkages/connectivity to other natural features; proximity to other habitat types, interior vs. edge habitat, diversity including community types, soil types, species composition (e.g. overstory, understory, health/vigour), uncommon characteristics with respect to composition (e.g. uncommon species and uncommon ages), vegetation type, quality or condition, age/size classes, structures as represented by diameter classes as well as presence of older portions (>100yrs.) ***Functions*** ▪ extent of landscape cover, species composition and age/structure distribution, presence of sensitive forest species (e.g. species that tend to diminish with development), contribution to local and regional water quantity and quality, site productivity, amount of existing and potential riparian cover, potential for nutrient cycling and food web, amount and type of existing and potential wildlife habitat	▪ potential changes to surfacewater hydrology; ▪ survivability of trees located near a woodland edge ▪ sensitivities of plant and animal species in the woodland ▪ potential for direct and indirect disruption, and changes in soil moisture and compaction ▪ susceptibility to erosion

Ref: 2012 Natural Heritage Assessment Guide for Renewable Energy Projects, Section 7.0 (Environmental Impact Study Report, Table 12

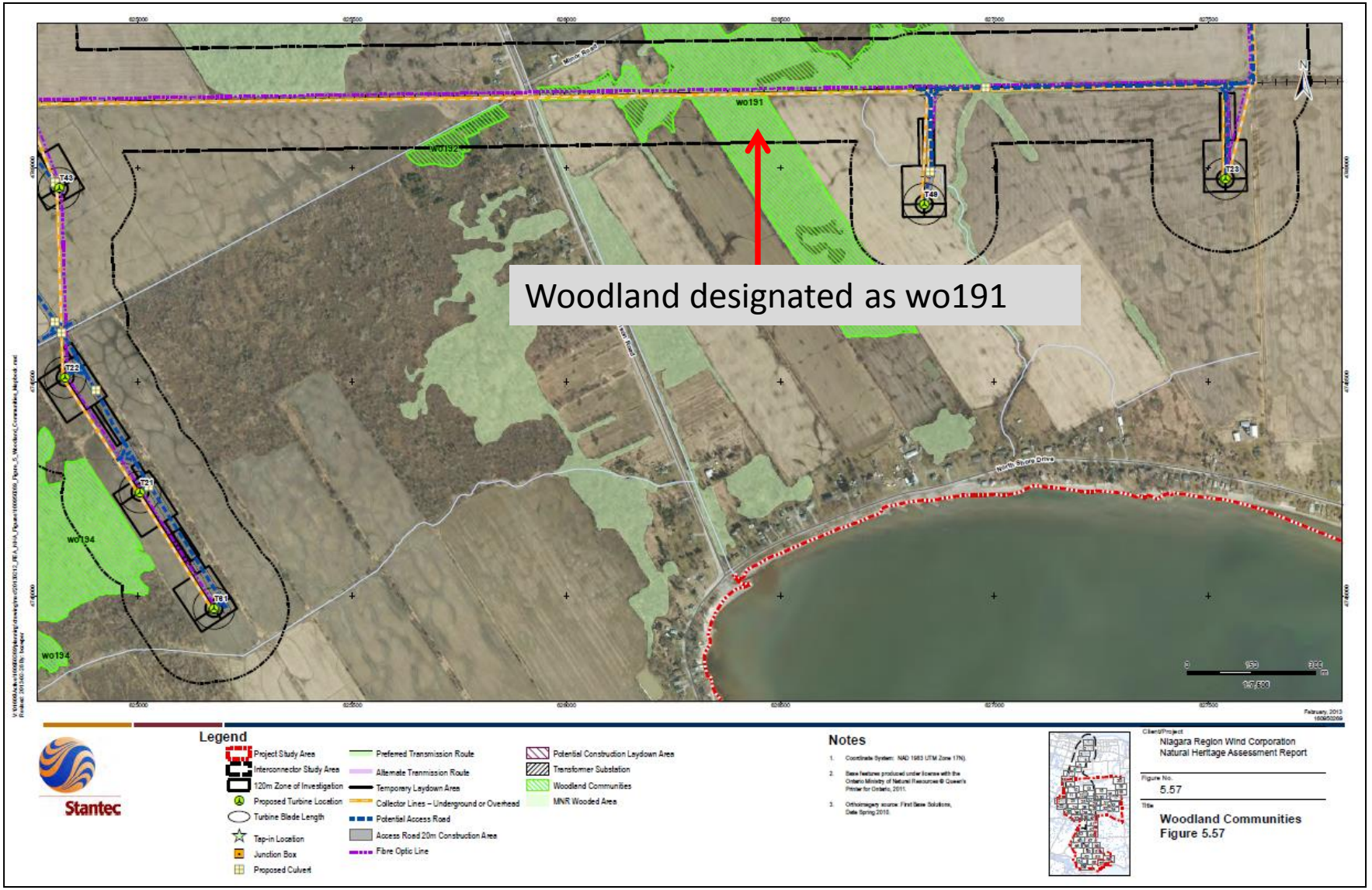
Non-Specific Mitigation Measures for each of 104 significant woodlands within 120 meters of project components



Non-Specific Mitigation Measures for each of 104 significant woodlands within 120 meters of project components

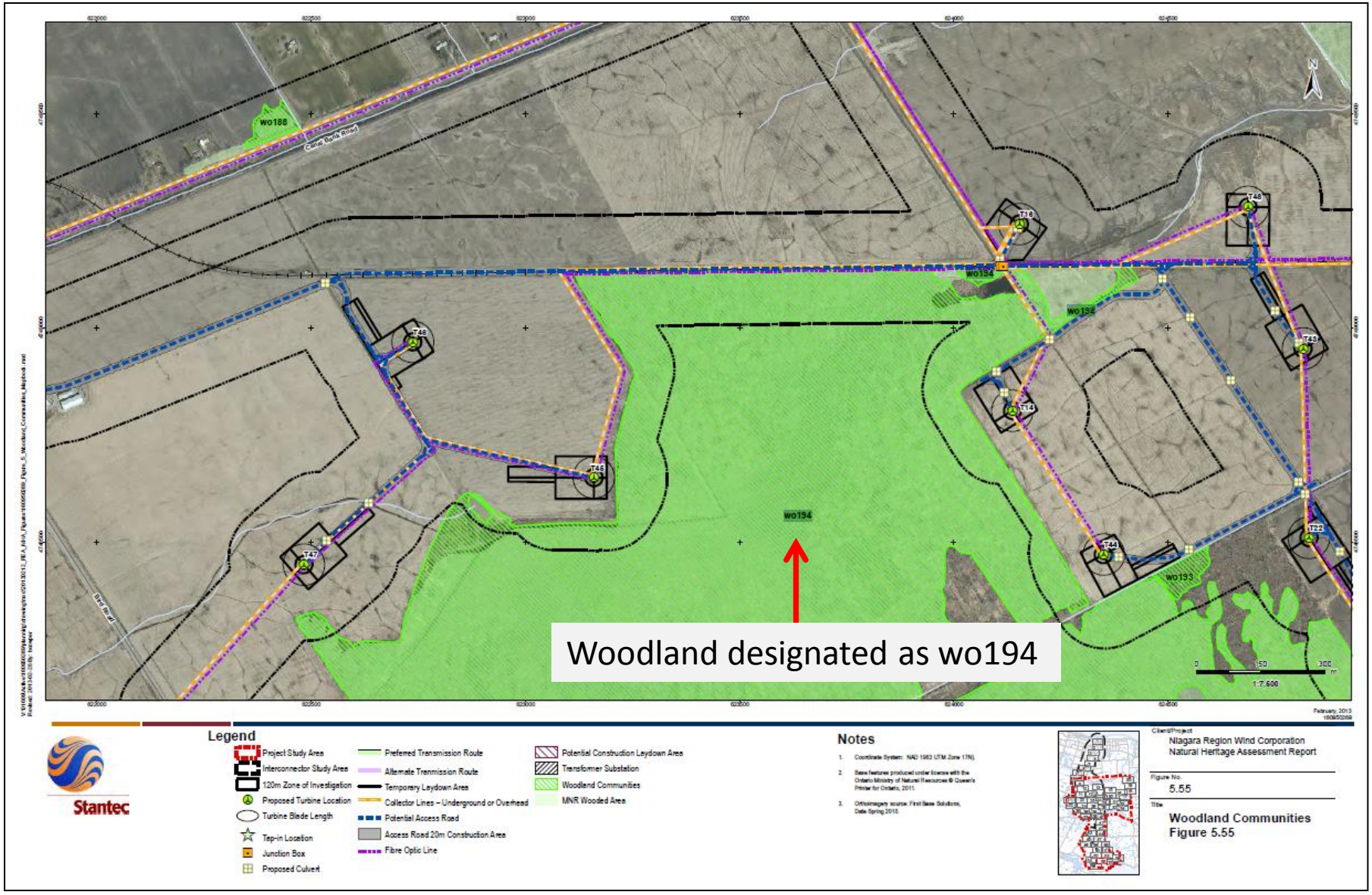


Non-Specific Mitigation Measures for each of 104 significant woodlands within 120 meters of project components



Ref: NRWC Natural Heritage Assessment Report and Environmental Impact Study – Figure 5.57 Woodland Communities)

Non-Specific Mitigation Measures for each of 104 significant woodlands within 120 meters of project components



Ref: NRWC Natural Heritage Assessment Report and Environmental Impact Study – Figure 5.55 Woodland Communities)