Henvey Inlet Wind LP

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Henvey Inlet Wind Energy Centre

Volume A: Environmental Assessment - Addendum #1

Final

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Prepared by:

AECOM
105 Commerce Valley Drive West, Floor 7 905 886 7022 tel
Markham, ON, Canada L3T 7W3 905 886 9494 fax
www.aecom.com

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60341251

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List of Acronyms and Glossary

BMPs.....Best management practices
CCME.....Canadian Council of Ministers of the Environment
CDA.....Construction Dewatering Assessment
cm .....Centimetre
DFO.....Fisheries and Oceans Canada
EA .....Environmental Assessment
EC .....Environment Canada
EC-CWS.....Environment Canada-Canadian Wildlife Service
ELC .....Ecological Land Classification
FIT.....Feed-in-Tariff
FLAP .....Fatal Light Awareness Program
GBBR.....Georgian Bay Biosphere Reserve
ha .....Hectare
HIWEC.....Henvey Inlet Wind Energy Centre
HIFN.....Henvey Inlet First Nation
HIFN I.R. #2 .....Henvey Inlet First Nation Reserve No. 2
IESO.....Independent Electricity System Operator
IWH .....Important Wildlife Habitat
km .....Kilometre
km/hr .....Kilometre per hour
m .....Metre
mm .....Millimetre
MBCA.....*Migratory Birds Convention Act, 1994*
MNRF.....Ontario Ministry of Natural Resources and Forestry
MOECC.....Ontario Ministry of the Environment and Climate Change
MSDS.....Material Safety Data Sheets
MW.....Megawatt
NDA.....Non-Disclosure Agreement
Nigig.....Nigig Power Corporation
O&M.....Operations and maintenance
OBBA .....Ontario Breeding Bird Atlas
PWQO.....Provincial Water Quality Objectives
SAR.....Species at Risk
SARA .....*Species at Risk Act, 2002*
TS.....Transformer station
UTM .....Universal Transverse Mercator
VEC.....Valued Ecosystem Component
WTG.....Wind turbine generator
ZOI .....Zone of influence

This Addendum #1 to the Final Volume A, Henvey Inlet Wind Energy Centre (HIWEC) Environmental Assessment (EA) is to provide additional, current information on the ongoing environmental management planning for the HIWEC. The Final Volume A, HIWEC EA Report dated January 2016 predicts that, with the implementation of mitigation and compensation, there will be no significant adverse environmental effects associated with the construction, operation and decommissioning of the HIWEC.

The following provides the rationale for this assessment through a discussion of the ecological context, environmental design and management, and the significance of potential effects within the broader regional ecological context.

Also attached to this addendum are updates to Tables 6-4, 6-5, 8-1 and 8-2 of the Final HIWEC EA.

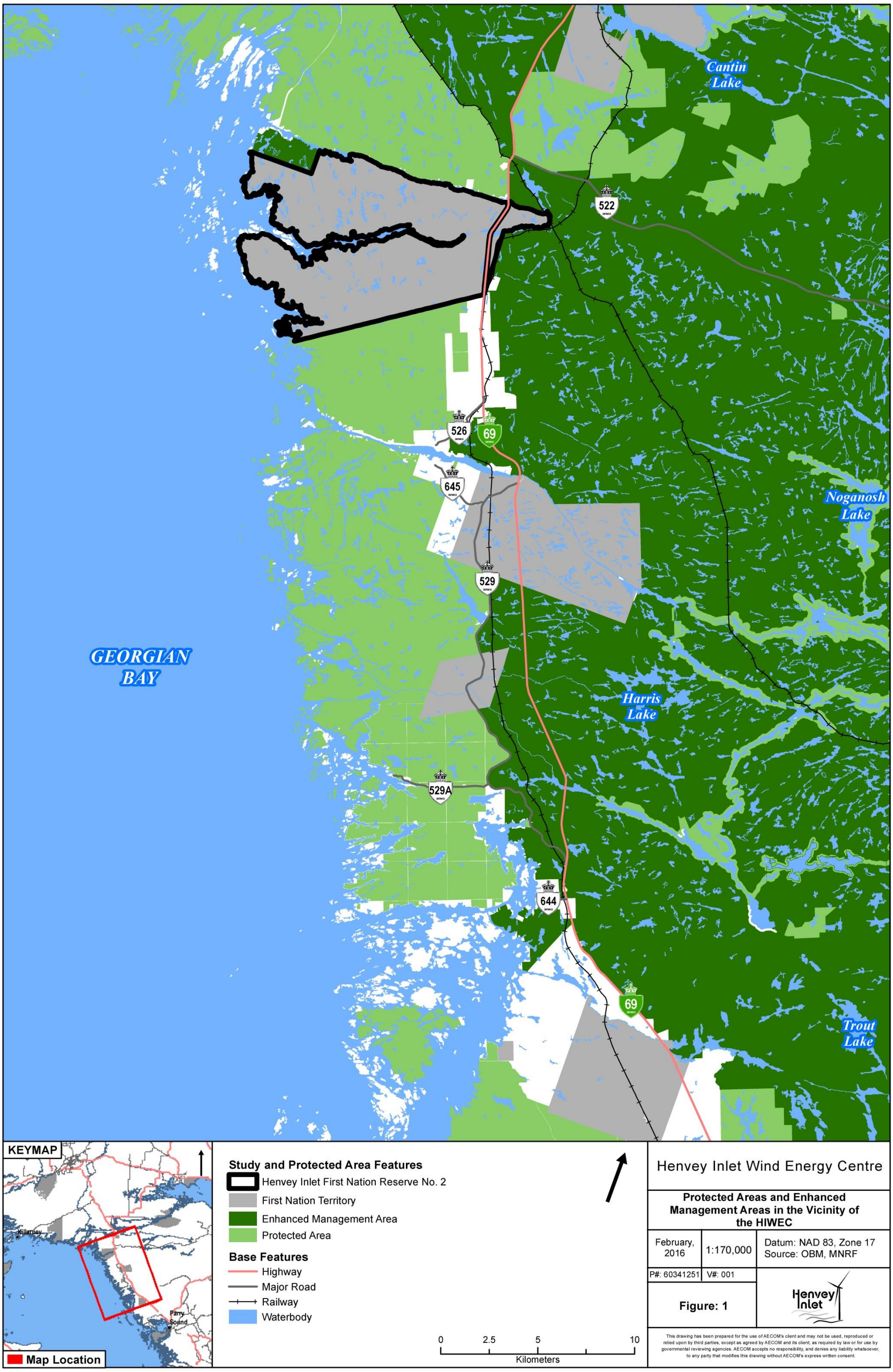
1. Ecological Context

Henvey Inlet First Nation Reserve No. 2 (HIFN I.R. #2), is part of a contiguous landscape of natural space along the eastern shoreline of Georgian Bay. A total of 14 Provincial Parks and 32 Conservation Reserves occur within the Parry Sound and Manitoulin Districts resulting in large portions of the area being protected from development. The Georgian Bay Biosphere Reserve (GBBR) which is largely made up of protected areas that are not open to development, provides habitat for all of the species affected by the HIWEC and encircles the HIWEC area between Parry Sound and the French River. The Georgian Bay Biosphere Reserve is approximately 347,000 hectares (ha) in area. Cumulatively, these protected areas total 260,907 ha in close proximity to HIFN I.R. #2 (Figure 1). By including Algonquin Provincial Park further east of HIFN I.R. #2, protected lands total over 1 million ha within or partially within Parry Sound and Manitoulin Island District.

HIFN I.R. #2 is over 8,500 ha, where portions of which provides suitable habitat for 13 Species at Risk (SAR) species found on the site. Of that 8,500 ha, the HIWEC will affect approximately 174 ha of habitat through the construction of access roads and wind turbine generator (WTG) bases and other HIWEC infrastructure. When viewed in a regional context of adjacent protected areas (over 200,000 ha), the amount of suitable SAR habitat affected by the HIWEC is relatively small. Of the 174 ha of habitat suitable for SAR species, a combination of suitable mitigation and compensation measures are proposed and will be implemented to offset the effects to individual SAR and their residences as discussed in the Final HIWEC EA.

Habitat disturbance within HIFN I.R. #2 is considered to be low given the openness of the site, thereby reducing potential effects such as fragmentation. Based on detailed Ecological Land Classification (ELC), the site has been identified as containing 4,656 ha that has been documented as being open, shrub, or sparsely treed rock barren. The amount of area that is proposed to be cleared for access road or WTG pad that is not already in open, shrub or sparsely treed rock barren is 51 ha, which has a negligible impact on the overall openness of the site itself, increasing site openness by less than 0.6%. Given this, the installation of gravel access roads that will be at most 15 metres (m) wide within these open rocky habitats is unlikely to change the overall functionality of the habitat.

Figure 1: Protected Areas and Enhanced Management Areas in the Vicinity of HIWEC

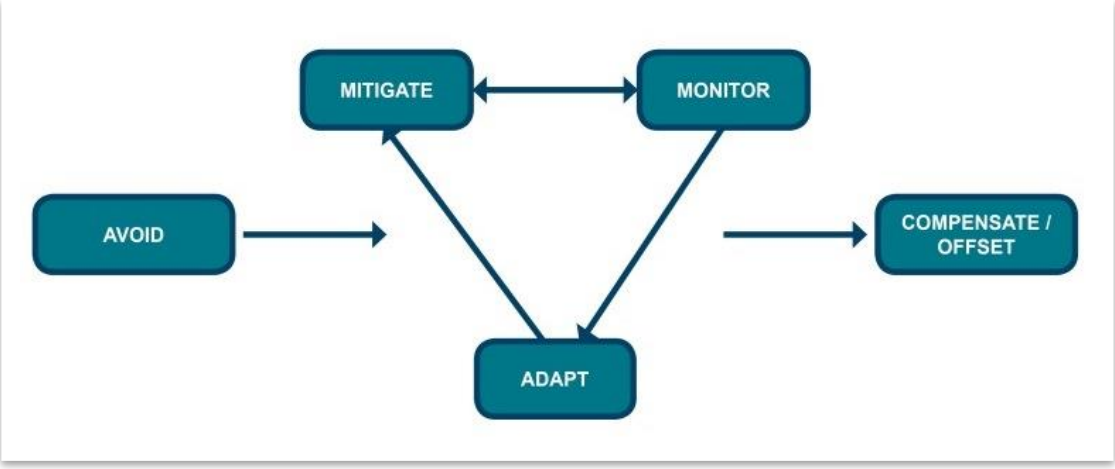


2. Environmental Design and Management

Considering the existing environment and the proposed HIWEC design, the key environmental principles intended to achieve no significant adverse environmental effects of the HIWEC are:

1. Avoid adverse environmental effects through the selection of the best alternative within the spatial and technical constraints of wind energy procurement and planning in Ontario under the Feed-in-Tariff (FIT) process;
2. Mitigate unavoidable adverse environmental effects;
3. Refine mitigation through detailed design and construction to maximize desired outcomes;
4. Implement monitoring and follow-up programs to confirm effectiveness of mitigation;
5. Implement adaptive management if follow-up indicates a need for additional measures; and,
6. Compensate/offset residual effects.

Figure 2: Environmental Design and Management Components



2.1 Avoid Adverse Environmental Effects

2.1.1 Baseline Field Studies

Site-specific field surveys have occurred at the HIFN I.R. #2 over the past five (5) years, including extensive field monitoring in 2015 that targeted SAR habitat following a monitoring program that was reviewed, and commented on, by Environment Canada-Canadian Wildlife Service (EC-CWS) prior to implementation. Field studies completed include the following surveys and assessments: bat cavity tree, bat acoustic, raptor migration, waterfowl migration, salamander habitat, amphibian call, snake basking, turtle basking, shoreline bird migration, breeding bird, crepuscular bird, Least Bittern, vascular plant, ecological land classification, wetland evaluation, aquatic habitat and significant wildlife habitat. Field monitoring contributed to a clear understanding of the ecological conditions present within the HIFN I.R. #2, including documentation of cryptic species that are often difficult to observe, even during targeted studies.

A minimum of 374 field days across five (5) years (2011-2015) have been undertaken to collect baseline data within HIFN I.R. #2. Through these field investigations a total of 26 vegetation communities with 598 vascular plants, lichen and moss have been documented. With respect to wildlife, a total of 327 species were observed including 189 birds, 22 mammals, 14 reptiles, 12 amphibians, 23 fish and 67 insects. The Final HIWEC EA provides a summary and results of all fieldwork completed. Table 1 presents search effort per each recorded SAR.

Table 1: Summary of Species at Risk Observed within HIFN I.R. #2

Species Group	Species[1]	SARA Status	Species Observations[2] from 2011 to 2015	Search Effort
Birds	Canada Warbler *Cardellina pusilla*	Threatened	267 observations	106 hours of breeding bird surveys 17 hours of crepuscular surveys
	Common Nighthawk *Chordeiles minor*	Threatened	223 observations	
	Eastern Whip-poor-will *Antrostomus vociferus*	Threatened	202 observations	
	Olive-sided Flycatcher *Contopus borealis*	Threatened	17 observations	
	Kirtland's Warbler *Setophaga kirtlandii*	Endangered	3 observations of one pair	107.2 hours of breeding bird surveys plus additional targeted surveys for Kirtland's Warbler (14 point counts at 5 minutes per station)
Turtles	Blanding's Turtle *Emydoidea blandingii*	Threatened	310 observations	2,989 hours of targeted field surveys plus time for incidental observations
	Eastern Musk Turtle *Sternotherus odoratus*	Threatened	1 observations	
Snakes	Eastern Foxsnake (Georgian Bay population) *Pantherophis gloydi pop. 1*	Endangered	3 observations	
	Eastern Hog-nosed Snake *Heterodon platirhinos*	Threatened	Not observed in any year[2]	
	Massasauga Rattlesnake (Great Lakes / St. Lawrence population) *Sistrurus catenatus pop. 1*	Threatened	99 observations	
Bats	Little Brown Bat *Myotis lucifugus*	Endangered	9,405 passes[3]	18 acoustic monitors deployed for 24 days
	Northern Myotis *Myotis septentrionalis*	Endangered	431 passes	
	Tri-coloured Bat *Perimyotis subflavus*	Endangered	98 passes	

Note: 1. The Species at Risk Act (SARA) protects Species at Risk designated as Endangered, Threatened and Extirpated listed under Schedule 1, including their habitats on federal land. The following are definitions of the SARA status rankings assigned to each species in the table above: Endangered (Schedule 1) – These species are listed as Endangered under Schedule 1 of SARA and receive species and habitat protection under SARA, as well as recovery strategies and action plans. Threatened (Schedule 1) – These species are listed as Threatened under Schedule 1 of SARA and receive species and habitat protection under SARA, as well as recovery strategies and action plans.

2. Species observations made through targeted surveys or through incidental observation

3. Even though this species was not observed between 2011 and 2015, this species is very difficult to detect because of its secretive nature and it is still possible that this species exists within the HIWEC study area.

4. Passes: Acoustic monitors cannot detect number of individuals but can only record the number of bat passes, which may include one individual passing the monitor more than one time. Data collected from 2011 to 2012.

2.1.2 Layout Design Using Results from Field Studies

The primary objective of environmental design is to avoid adverse environmental effects. Effect prediction and overall conclusions on significance in the EA are based on the probability and likelihood of an effect occurring. Multiple years of baseline data provide a thorough understanding of species occurrences and suitable habitat throughout the HIWEC site. The baseline provides the starting point for applying the environmental principle of avoidance.

The location (HIFN I.R. #2) and size (300 megawatt (MW)) of the HIWEC are set out in the FIT contract between Nigig Power Corporation (Nigig) and the Independent Electricity System Operator (IESO). Extensive field surveys have been undertaken by the construction and environmental teams to identify constructability and ecological constraints and determine the preferred layout for a 300 MW facility on HIFN I.R. #2.

Avoidance of effects to SAR has been a key consideration throughout the planning and design process. To select the best alternative from a HIWEC footprint perspective, a 3.5 MW WTG was ultimately selected as the preferred model so fewer WTGs and roads would be required. The layout presented in the Final HIWEC EA was reduced from 120 WTGs to ~91 WTGs for an approximate footprint reduction of 25%. The selection of specific WTGs to remove from the layout is driven by numerous factors including avoiding or minimizing effects to SAR. For example, a string of four (4) WTGs has been removed from the layout to specifically to avoid the confirmed Kirtland's Warbler habitat.

Wetland habitat used for various life-cycle phases by snake and turtle SAR was considered the most sensitive habitat in the study area so avoidance of wetlands was a primary driver for the layout of roads and WTGs. Minimizing siting in wetlands means that HIWEC components are placed primarily in upland areas (i.e. rock barrens) which also provides SAR habitat; however, effects in upland areas are readily mitigated and the amount of disturbance in this habitat is negligible when viewed in the local or regional context (see Section 1).

With most of the HIWEC components located on rock barren habitat, impacts to wetlands are minimized. Rock barrens are relatively inert compared with wetlands where flowing groundwater and surface water have a dynamic influence on the flora and fauna, creating challenges for reclamation in wetlands. Rock barrens are relatively easy to restore since they are dry most of the time and adapted plants are slow growing. Where damage has occurred, restoration can be achieved through soil replacement, reconfiguring topographic variability and planting of appropriate native species. SAR habitat on rock barrens such as snake gestation sites is also more easily restored to minimize effects on the species.

2.1.3 Pre-Construction Surveys

Pre-construction surveys are proposed in 2016 to further refine specific locations of species residences and movement patterns to inform mitigation planning. Pre-construction surveys will include species emergence and targeted habitat surveys. The location of ecopassages and artificial nests will be reviewed and potentially adjusted based on the results of these additional pre-construction surveys.

2.1.4 Construction Dewatering Assessment

Upon completion of pre-construction geotechnical assessments, a Construction Dewatering Assessment (CDA) will be conducted to determine potential hydrologic connectivity between dewatering sites (i.e., WTG foundations) and adjacent wetland features. The objective of the CDA is to avoid effects to wetlands and associated SAR habitat from construction dewatering. Mitigation is proposed in areas where the CDA identifies that dewatering volumes could be large enough to result in changes to a SAR dependent feature.

Proposed monitoring of wetland drawdown during construction dewatering activity is the final layer of mitigation that will be undertaken by onsite environmental monitors to confirm the predicted effects of dewatering activity. Environmental monitors will actively observe wetland conditions during dewatering near potentially affected features to confirm the effectiveness of mitigation.

2.1.5 Micrositing

"Micrositing" means minor shifts (i.e., up to 20 m) of project components (e.g., equipment, laydown areas, roads) to further avoid important habitat features. Micrositing involves identifying precise locations for HIWEC components prior to and during construction. Avoiding and minimizing potential SAR effects has been a key consideration during siting efforts in 2014 and 2015. Micrositing in 2016 will further address potential SAR effects through direct engagement between the environmental and construction teams. Baseline data and results from 2016 pre-construction surveys will inform micrositing of final HIWEC component locations. The ultimate goal of micrositing from an ecological perspective is to further avoid adverse effects to the greatest extent possible.

2.2 Mitigate and Monitor

Environmental management and protection planning is the bridge between the EA and effective implementation of avoidance and mitigation measures during construction, operations and decommissioning. It also provides the framework for the monitoring and follow-up programs proposed in the EA. Detailed environmental management planning is underway to allow for the efficient and effective implementation of mitigation and monitoring programs. Detailed mapping of ecological constraints and timing restrictions are being prepared for construction and environmental field crews to facilitate efficient collaboration between field crews to ensure environmental objectives are achieved.

For a full list of mitigation proposed for the HIWEC, refer to the attached tables.

2.3 Adaptive Management

Adaptive management is a systematic process for continually improving environmental management practices by learning about their outcomes and applying that knowledge to improve the outcome. Adaptive management allows for flexibility so that ongoing monitoring can inform the need for modifications to existing mitigation or implementation of new mitigation to achieve predicted outcomes (CEAA 2009). Adaptive management is fundamentally a way of incorporating learning through monitoring into a feedback loop that enhances project outcomes. The application of adaptive management is appropriate to achieve desired outcomes where there is a possibility that a mitigation measure may not function as intended (CEAA 2009).

The Final HIWEC EA proposes detailed mitigation measures to minimize adverse environmental effects. A follow-up monitoring program will confirm the effectiveness of those measures. Adaptive management will be applied in circumstances where follow-up monitoring indicates a need for additional measures. For example, follow-up monitoring will identify if wildlife passage utilization requires some adaptive management actions such as adjusting funnel fencing, corridor maintenance and/or identification of new corridors. These additional measures could then be proposed and implemented. During operation, adaptive management techniques, such as operational mitigation as determined appropriate through post-construction monitoring, will be considered if bird and/or bat mortality thresholds are reached.

A key environmental objective is to avoid SAR mortality associated with project activities. Proposed mitigation is expected to achieve this objective. Any unexpected SAR mortality will be reviewed and analyzed to determine the cause. Adaptive management actions such as additional vehicle controls, activity timing adjustment or operational controls would be proposed and implemented if it is determined they are likely to prevent future mortalities.

2.4 Compensation and Offsets

Given that the HIWEC is located in a landscape with minimal development, offsite compensation and offsets will be most beneficial in addressing effects to SAR. A combination of activities and initiatives will be implemented to compensate and offset residual effects on affected species. Proposed compensation and offset measures following recommendations outlined in the Recovery Strategies for SAR species could include the following:

2.4.1 Birds

Major threats to bird SAR include habitat loss and building collisions during the migratory period. Recommended Compensation/Offsets could include:

a) *Contribution to FLAP (Fatal Light Awareness Program)* www.flap.org
Many species of birds migrate at night and are attracted to the bright lights left on overnight in urban areas, causing them to collide with buildings. During the day, migratory birds cannot see a pane of glass, often having fatal collisions. Contribution to the FLAP program will benefit migratory birds, including bird SAR that have been identified at HIFN I.R. #2 by addressing their key threats.

b) *Habitat Enhancement within confirmed Kirtland's Warbler observations outside the HIWEC*
Kirtland's Warbler prefers very specific habitat conditions that require active management (i.e., young stands of Jack Pine). Areas outside the HIWEC have the potential to be enhanced to be more suitable for Kirtland's Warbler.

c) *Funding for Research*
Research opportunities will be examined with academic institutions and preference will be given to research programs that are targeting information gaps or potential threats associated with SAR birds found within the HIWEC study area.

2.4.2 Reptiles (Turtles and Snakes)

Major threats to reptile SAR include habitat loss, poaching and vehicle collisions during nesting period. Recommended Compensation/Offsets could include:

a) *Contribution to Georgian Bay Turtle Hospital*
Contribution to a wildlife rehabilitation centre within proximity to the HIWEC is an innovative solution to further offset potential environmental effects on SAR. Contribution to this trauma centre will be a long-term benefit to all reptiles within the area.

b) *Regional Anti-Poaching Initiatives*

c) *Road Enhancements*
Upgrades to existing Bekanon Road to reduce any current impacts to SAR that are unrelated to the HIWEC.

d) *Funding for Research*
Research opportunities will be examined with academic institutions and preference will be given to research programs that are targeting information gaps or potential threats associated with SAR reptiles found within the HIWEC study area.

2.4.3 Bats

Major threats to bat SAR include spread of white-nose syndrome. Recommended Compensation/Offsets could include:

a) *Funding for Research*
Research opportunities will be examined with academic institutions and preference will be given to research programs that are targeting information gaps (e.g. research with respect to White-nose Syndrome) or potential threats associated with SAR bats found within the HIWEC study area.

3. HIW Environmental Management

An Environmental Management Team comprised of the Environmental Manager, Construction Manager and/or Operations Manager will be responsible for overseeing environmental performance of the HIWEC. The HIW Environmental Manager will have appropriate qualifications and experience to ensure the implementation and ongoing management of all environmental commitments in the EA.

The Environmental Management Team will conduct regular reviews of monitoring results to determine the effectiveness of the mitigation and monitoring activities and adaptive management strategies and any complaints from outside parties related to the HIWEC. In addition, the following elements will be reviewed by the Team:

- Compliance with legal and other requirements, including results of visits from regulatory agencies;
- Communications from external interested parties, including complaints;
- Status of corrective and preventive actions;
- Follow-up actions from previous management reviews;
- Changing circumstances, including developments in legal and other requirements related to its environmental effects; and
- Recommendations for improvement.

Members of the Environmental Management Team will engage with community liaisons, government agency liaisons and other stakeholders to address concerns and fulfill all reporting requirements documented in the EA.

4. Summary

The HIWEC lies within HIFN I.R. #2 and is between the French River Provincial Park to the north and the Georgian Bay Shoreline and Islands Conservation Reserve to the south, which are part of an expansive system of protected areas that conserve and protect the ecological integrity and functionality of the regional landscape. Due to the large number and spatial extent of protected areas and relatively undeveloped landscape in the region, habitat and landscape connectivity is anticipated to remain high such that effects on a broader ecosystem scale are not anticipated as result of the development of the HIWEC. While disturbance is anticipated through the construction phase, HIWEC infrastructure (e.g., roads, WTGs and transmission lines) will not form significant barriers to the movement of wildlife since local effects are largely mitigated and extensive contiguous habitat will continue to surround the HIWEC components within the site and regionally. Additionally, with the implementation of mitigation, monitoring and compensation/ offset measures as discussed above and within the Final HIWEC EA, the HIWEC is not anticipated to have significant effects to ecological functions within the site.

Table 6-4: Potential Effects, Proposed Mitigation Measures and Residual Effects – Construction / Decommissioning

VEC	Project Activity	Potential Environmental Effects	Proposed Mitigation Measures	Residual Environmental Effects
Soils and Terrain	• Site preparation • Construction of access roads and laydown areas • Transportation of equipment and materials (construction) • Foundation excavation and construction • WTG installation • Collector system and transmission line installation • Installation of transformer stations (TSs) • Power connection and commissioning • Power disconnection and decommissioning • Transportation of equipment and materials (decommissioning) • Disassembly and removal of collector system components • WTG and / or tower disassembly and removal • Disassembly and removal of operations and maintenance (O&M) building infrastructure • Decommissioning completion	*Changes to soil quality* • Reduction in soil quality due to mixing of topsoil and subsoils.	• Strip and store topsoil (where present) from temporary work areas separately from subsoils and maintain for reclamation use after construction. • Where topsoil quality has been compromised, import topsoil for reclamation activities (according to the Rehabilitation Plan).	*Residual effect on soil quality* • Reduction in soil quality due to mixing of topsoil and subsoils would be minimized following mitigation; however, some mixing of topsoil and subsoil may still occur.
		Changes to soil quality • Reduction in soil quality due to accidental release of contaminants during construction, heavy equipment and vehicle use, excavation, concrete truck rinsing, etc.	• Develop and implement a Spill Prevention and Response Plan outlining steps to prevent and contain any chemicals and to avoid soil contamination. This plan will include, for example: ▪ In the event of a contaminant spill all work will stop in the immediate area until the spill is cleaned up. ▪ Spill control and containment equipment / materials shall be readily available on site. ▪ Protocols for access to additional spill clean-up materials, if needed. ▪ Contaminated materials to be handled in accordance with relevant federal and provincial guidelines and standards. ▪ Including the use of Material Safety Data Sheets (MSDS) which provides information on proper handling of chemicals readily available for the types of chemicals that will be used on-site. ▪ Proper training of construction staff on associated emergency response and spill clean-up procedures. ▪ Spills to be cleaned up as soon as possible, with contaminated soils removed to a licenced disposal site, if required. ▪ Materials contained in spill clean-up kits are restocked as necessary. ▪ Any soil encountered during excavation that has visual staining or odours, or contains rubble, debris, cinders or other visual evidence of impacts to be analyzed to determine its quality in order to identify the appropriate disposal method. ▪ To include reporting procedures to meet federal, provincial and local requirements (e.g., reporting spills and verification of clean-up), emergency contact and HIWEC management phone numbers. • Apply the following general mitigation measures to avoid soil contamination: ▪ Ensure machinery is maintained free of fluid leaks. ▪ Site maintenance, vehicle maintenance, vehicle washing and refuelling to be done on spill pads in specified areas at least 30 m away from wetlands and / or waterbodies. ▪ Store any stockpiled materials at least 30 m away wetlands and / or waterbodies. ▪ Store any potential contaminants (e.g., oil, fuels and chemicals) in designated areas using secondary containment, where necessary. • Undertake waste management in accordance with relevant federal and provincial guidelines and standards and construction site to be kept clear of garbage and debris. • Ensure that wash water used for the cleaning of cement construction materials does not come in contact with the ground. Deposit waste water in a concrete washout container that allows evaporation and hardening for easier disposal or recover and recycle wash water back into cement truck.	*Residual effect on soil quality* • Reduction in soil quality due to accidental release of contaminants would be minimized following mitigation; however, a minor reduction in soil quality may remain due to limitation in current spill clean-up processes.
		Changes to soil quantity and quality • Reduction in soil quantity and quality due to the release of construction dewatering discharge resulting in erosion and sedimentation.	• If dewatering of excavations is required, implement mitigation such as the use of splash pads, discharge diffusers, filter bags, sediment basins or similar measures (if required and as appropriate) at discharge locations to ensure that any water discharged to the natural environment does not result in scouring, erosion or physical alteration of the streams channel or banks. • Leave a layer of vegetation intact between the outfall and receiving waterbody to provide additional water dispersion and entrapment of suspended solids, if discharge is to a waterbody and / or wetland, where existing vegetation is present. Where existing vegetation is not present, appropriate erosion and sediment control measures will be utilized. • Ensure that any overland discharge complies with previous mitigation for erosion and sedimentation included with "*Reduction in soil quality and / or quantity due to erosion, sedimentation and compaction resulting from excavation, blasting, use of heavy equipment on exposed soils and stockpiling of cleared materials.*" under the Soils and Terrain Valued Ecosystem Component (VEC). • Routine visual inspections of sediment and erosion control devices for effectiveness. • Repair and maintenance to sediment and erosion control devices performed regularly.	*No residual effects* • No reduction in soil quantity and quality due to the release of construction dewatering discharge provided recommended mitigation is implemented.

Table 6-4: Potential Effects, Proposed Mitigation Measures and Residual Effects – Construction / Decommissioning

VEC	Project Activity	Potential Environmental Effects	Proposed Mitigation Measures	Residual Environmental Effects
		Changes to soil quantity and quality • Reduction in soil quality and / or quantity due to erosion, sedimentation and compaction resulting from excavation, blasting, use of heavy equipment on exposed soils and stockpiling of cleared materials.	• Develop and implement an Erosion and Sediment Control Plan. • Utilize erosion blankets, sediment control fencing, straw bale, etc. for construction activities in areas where there is erosion and sedimentation potential near a wetland, woodland or waterbody. • Utilize sediment logs (compost filter sock) in areas where bedrock is exposed at surface or trenching and securing of erosion control fencing is not possible. • Maintain undisturbed buffer strips greater than 30 m in width around watercourses, except where access roads approach water crossings. Where infrastructure is closer than 30m to a watercourse, additional erosion and sediment control measures will be installed to adequately protect the watercourse. • Store stockpiled material at least 30 m from a wetland or waterbody. • Monitor to ensure erosion and sedimentation control measures are in good repair and properly functioning prior to conducting daily work and re-install or repair as required prior to commencing daily construction activities for the duration of construction / decommissioning activity. • Minimize the size of cleared areas to limit the area of exposed soil. • Re-vegetate or stabilize exposed sites as soon as possible following disturbance using species native to the area to limit the duration of soil exposure. • Divert access road runoff through drainage ditches directed into vegetated areas or through environmental protection measures (such as sediment traps, rock flow check dams, sediment barriers, etc.) to ensure that exposed soils or road materials are not transported into waterbodies or wetlands. Ditches >5% in slope may require lining with appropriate sized rip rap to protect against erosion and also slow the flow velocity. • Grade disturbed / remediated slopes or stockpiles to a stable angle to avoid slope instability and reduce erosion. • Grade soil stockpiles by mechanical means to compact the soil and limit the erosion. Tracks of machinery should be perpendicular to the slope of the pile to reduce the flow velocity of rainfall over the stockpile. • Identify unstable rock structures and sensitive soils through field investigation prior to construction. If any areas of concern are identified, design modifications may be implemented (as required) to minimize potential erosion, settlement, slope instability, foundation failure or rock fall hazards as a result of construction. • Keep all equipment within identified work areas to minimize disturbance of adjacent soils. • Restrict construction equipment to designated controlled vehicle access routes to minimize the potential for soil compaction and to minimize vehicle traffic on exposed and / or sensitive soils. • Routine visual inspections of sediment and erosion control devices for effectiveness. • Repair and maintenance to sediment and erosion control devices performed regularly. • Undertake blasting operations in accordance with relevant federal and provincial guidelines and standards. • Investigate alternative rock-excavating techniques (i.e., mechanical means) to reduce blasting to the greatest extent possible. • Develop and implement a Blasting Plan that includes standard best management practices (BMPs) to minimize extent of adverse noise, vibration and slope instability from blasting, including: ▪ The construction footprint will be microsited to reduce blasting to the greatest extent possible; ▪ Follow proper drilling, explosive handling and loading procedures; ▪ Implement safe handling and storage procedures for all material, including soluble substances used for blasting; ▪ Blast mats will be used to control debris generated from blasting; ▪ Reduce blasting footprint to the extent possible; ▪ Remove all blasting debris and other associated equipment / products from the blast area. • Identify unstable rock structures through field investigations prior to construction. If any areas of concern are identified, design modifications may be implemented (as required) to minimize potential erosion, settlement, slope instability, foundation failure or rock fall hazards as a result of construction. • Routine visual inspections for slope instability performed during and after blasting operations.	*Residual effects on soil quality and soil quantity* • Reduction in soil quality due to erosion and sedimentation would be minimized through the implementation of an Erosion and Sediment Control Plan; however, disturbance to soils within construction areas cannot be avoided and a residual reduction in soil quality and quantity in these areas may remain. • Reduction in soil quality and / or quantity due to compaction, blasting and removal of soils within construction areas would be minimized provided recommended mitigation is implemented; however, the potential for removal and compaction of soils within construction areas may remain.

Table 6-4: Potential Effects, Proposed Mitigation Measures and Residual Effects – Construction / Decommissioning

VEC	Project Activity	Potential Environmental Effects	Proposed Mitigation Measures	Residual Environmental Effects
Groundwater	• Site preparation • Construction of access roads and laydown areas • Transportation of equipment and materials (construction) • Foundation excavation and construction • WTG installation • Collector system and transmission line installation • Installation of TSs • Construction completion • Power connection and commissioning • Power disconnection and decommissioning • Transportation of materials (decommissioning) • Disassembly and removal of collector system components • WTG and / or tower disassembly and removal • Disassembly and removal of O&M building infrastructure • Decommissioning completion	*Changes to groundwater quantity* • Reduction in groundwater recharge quantities due to increases in impervious surfaces.	• Minimize paved surfaces and design roads to promote groundwater infiltration. • Implement groundwater infiltration techniques to the maximum extent possible. Examples include: ▪ Releasing water to vegetated areas; ▪ Lining ditches with permeable material (rather than clay, for example); and ▪ Groundwater should remain on-site and not disposed of off-site (unless contaminated). • Direct groundwater discharge water to natural infiltration systems.	*No residual effects* • No reduction in groundwater recharge quantities anticipated provided recommended infiltration techniques and measures are implemented.
		Changes to groundwater quantity • Reduction in groundwater quantity resulting in changes in groundwater flow patterns and yield of private water wells, as a result of temporary construction dewatering and water taking activities.	• Conduct a Detailed Water Taking Assessment for WTG foundations and new water supply well locations based on geotechnical investigation results to determine anticipated groundwater taking quantities, groundwater quality and predicted zone of influence (ZOI) prior to construction. Based on this assessment site-specific mitigation measures and a monitoring program for groundwater dependent natural features and private wells within the anticipated ZOI will be provided. • Limit duration of dewatering to as short a time frame as possible. • Limit dewatering quantities by implementing targeted groundwater cut-offs (i.e., slurry trench walls) where possible. • Construct new water supply wells according to regulatory standards and be operated in a manner to conserve water (i.e., excessive water taking is avoided).	*Residual effect on groundwater quantity* • Reduction in groundwater quantity resulting in changes in groundwater flow patterns and yield of private water wells would be minimized provided the recommended mitigation measures are implemented; however, a reduction in groundwater quantity may not be avoided within the ZOI of dewatering activities, but will likely be temporary and have no long term residual effects.
		Changes to groundwater quality • Reduction in groundwater quality due to the accidental release of contaminated construction dewatering discharge in areas of substantial groundwater recharge	• Develop and implement a Construction Dewatering Discharge Plan describing appropriate areas and methods for discharge. • If dewatering of excavations is required and is expected to exceed 50,000 litres per day (L/day), sample discharge water daily during the days the water is discharged and tested for suspended sediments. The company shall not discharge turbid water and will comply with protocols in the Canadian Council of Ministers of the Environment (CCME) "Canadian Water Quality Guidelines for the Protection of Aquatic Life: Total Particulate Matter", which includes requirements for measuring suspended sediments, and the Provincial Water Quality Objectives (PWQO). • The Contractor shall implement appropriate measures (e.g., geosock or similar device) to reduce the amount of sediment released. • Dispose of any contaminated waste material generated from construction activities off-site by authorized and approved haulers and receivers. Leave a layer of vegetation intact between the outfall and receiving waterbody to provide additional water dispersion and entrapment of suspended solids. Where existing vegetation is present. Where existing vegetation is not present, appropriate erosion and sediment control measures will be utilized. • Ensure that no direct discharge to Georgian Bay, Key River, Henvey Inlet or any surface water feature outside the HIWEC will occur without acquiring applicable approvals. • Ensure that any overland discharge complies with previous mitigation for erosion and sedimentation included with "*Reduction in soil quality and quantity due to erosion, sedimentation and compaction resulting from excavation, use of heavy equipment and stockpiling of cleared materials*." under the Soils and Terrain VEC. • Should groundwater dewatering activities be expected to exceed 50,000 L/day, implement the following measures: ▪ Surround inlet pump head with clear stone and filter fabric. ▪ Regulate the discharge rate to ensure there is no flooding in the receiving waterbody and that no soil erosion is caused that impacts the receiving waterbody.	*Residual effect on groundwater quality* • Reduction in groundwater quality due to the accidental release of contaminated construction dewatering discharge in areas of substantial groundwater recharge would be minimized following mitigation; however, residual contaminants may remain in some areas of the HIWEC.
		Changes to groundwater quality and quantity • Reduction in groundwater quality (turbidity), quantity and physical damage to groundwater supply wells due to agitation of the subsurface during construction blasting (including potential release of soluble substances used during blasting) and pile driving.	• Undertake blasting operations and pile driving in accordance with relevant federal and provincial guidelines and standards. • Develop and implement a Blasting Plan that includes standard BMPs to minimize extent of adverse noise and vibration from blasting (also refer to mitigation measures for "*Reduction in soil quality and / or quantity due to erosion, sedimentation and compaction resulting from excavation, blasting, use of heavy equipment on exposed soils and stockpiling of cleared materials*" under the Soils and Terrain VEC for a list of proposed blasting BMPs). • In the event an impact to a private water well is detected, the well owner will be provided with a potable supply of water and maintain the supply until water quality conditions are comparable to baseline conditions. In the event water quality does not recover to baseline conditions, the impacted well will be modified (i.e., deepened) or a new well be constructed that is sufficient to provide the resident with a potable supply of water similar in quantity and quality of baseline conditions.	*Residual effect on groundwater quality and quantity* • Reduction in groundwater quality (turbidity) and quantity would be minimized through the development and implementation of a Blasting Plan; however, potential disturbance to the subsurface resulting in a temporary reduction in groundwater quality and / or quantity may remain. • Physical damage to groundwater supply wells would be compensated through the implementation of mitigation.

Table 6-4: Potential Effects, Proposed Mitigation Measures and Residual Effects – Construction / Decommissioning

VEC	Project Activity	Potential Environmental Effects	Proposed Mitigation Measures	Residual Environmental Effects
		Changes to groundwater quality • Reduction in groundwater quality due to accidental contaminant spills from vehicle and machinery operation, and concrete truck rinsing.	• Develop and implement a Spill Prevention and Response Plan outlining steps to prevent and contain any chemicals or to avoid contamination of adjacent waterbodies and train staff on associated procedures. • Apply the following general mitigation measures to avoid soil or water contamination: ▪ Ensure machinery is maintained free of fluid leaks. ▪ Site maintenance, vehicle maintenance, vehicle washing and refuelling to be done in specified areas at least 30 m away from wetlands, woodlands or waterbodies. ▪ Store any stockpiled materials at least 30 m away from wetlands, woodlands or waterbodies. ▪ Store any potential contaminants (e.g., oil, fuels and chemicals) in designated areas using secondary containment, where necessary. • Also refer to mitigation measures for "*Reduction in soil quality due accidental release of contaminants during construction, heavy equipment and vehicle use, excavation, and concrete truck rinsing, etc.*" under the Soil and Terrain VEC for additional proposed mitigation measures. • Ensure that wash water used for the cleaning of cement construction materials does not come in contact with the ground. Deposit waste water in a concrete washout container that allows evaporation and hardening for easier disposal or recover and recycle wash water back into cement truck. • In the event of a contaminant release that has potential to cause harm to an individual if consumed, the spill exceeds 100 L in volume and is located less than 500 m from a private water well, the potentially affected well(s) will be included in a well monitoring program that includes water quality sampling for the suspected contaminant. In the event an impact to a private water well is detected the well owner will be provided with a potable supply of water and maintain the supply until water quality conditions are comparable to baseline conditions. In the event water quality does not recover to baseline conditions, the impacted well will be modified (i.e., deepened) or a new well be constructed that is sufficient to provide the resident with a potable supply of water similar in quantity and quality of baseline conditions.	*Residual effect on groundwater quality* • Reduction in groundwater quality due to accidental contaminant spills from vehicle and machinery operation, and concrete truck rinsing would be minimized provided a Spill Prevention and Response Plan is developed and implemented; however, residual contaminants may remain in some areas of the HIWEC.
Wildlife and Wildlife Habitat (including Species of Conservation Concern)	• Site preparation • Construction of access roads and laydown areas • Transportation of equipment and materials (construction) • Foundation excavation and construction • WTG installation • Collector system and transmission line installation • Installation of TSs • Construction completion • Power disconnection and decommissioning of service • Transportation of equipment and materials (decommissioning) • Disassembly and removal of collector system components • WTG and / or tower disassembly and removal • Disassembly and removal of O&M building infrastructure • Decommissioning completion	*Habitat change* • Loss and fragmentation of wildlife habitat due to vegetation clearing.	• Minimize vegetation removal and limit to within the construction footprint area. The construction footprint will be clearly defined. Delineation will be in the form of flagging tape, wooden stakes and / or silt fence barriers that will each provide clear identification of the construction limits. With respect to the latter (silt fence barriers), these will be implemented if sedimentation control is also required. • Rehabilitation will be advanced within all temporary construction / decommissioning areas within one (1) year of the completion of the construction / decommissioning phase. For areas that will be temporarily disturbed during construction/decommissioning: ▪ Prior to removal, habitat type and conditions will be documented. ▪ Transplanting of species will occur for species that would have a high probability of survival success (i.e. tree seedlings). ▪ A biologist will ensure conditions of rehabilitated area contain suitable soil and moisture conditions for replanting/transplanting of native tree/shrub/herbaceous stock. ▪ In areas where soils are absent (i.e. the rock barrens), if the original habitat condition was bare rock devoid of vegetation, no replanting will occur. Should soils be absent in areas that originally contained vegetation, grading to establish moisture conditions suitable for moss mats will occur. • Where construction activities occur within 30 m of an Important Wildlife Habitat (IWH), install and maintain construction fencing (or similar delineation device) to clearly define the construction disturbance area and prevent accidental damage to vegetation. • Fell trees toward the construction footprint area to reduce damage to adjacent vegetation being retained.	*Residual effect on habitat change* • Effects on habitat change can be minimized provided recommended mitigation is implemented; however, some wildlife habitat will be removed as a result of construction of the HIWEC.
		Habitat change • Loss and fragmentation of wildlife habitat due to sub-surface excavation activities (e.g., blasting). *Change in mortality risk* • Possible mortality, harm and / or harassment to terrestrial wildlife due to sub-surface excavation activities (e.g., blasting). *Change in behaviour* • Disturbance to wildlife due to construction activities, including noise and vibration from sub-surface excavation activities (e.g., blasting).	• Reduce blasting footprint to the extent possible and undertake blasting operations in accordance with relevant federal and provincial guidelines and standards. • Provide suitable blasting timing windows to be included in a Blasting Plan. The Blasting Plan will include standard BMPs to minimize extent of habitat change, mortality risk and adverse noise and vibration from blasting: ▪ Blasting will only occur in areas that have already been cleared of vegetation; ▪ The construction footprint will be microsited to reduce blasting to the greatest extent possible. ▪ Blast mats will be used to control debris generated from blasting; ▪ Prior to blasting, a qualified Biologist will conduct an area search of the proposed blasting area to ensure no wildlife is present (e.g., ground-nesting birds) the day of blasting, as close to the blasting time as safety considerations will allow; ▪ Ensure wildlife (e.g., birds flying over) are not in the blasting zone prior to detonation. If wildlife is encountered in the blasting zone, postpone detonation until the wildlife has vacated the area;	*Residual effect on change in mortality risk* • Increase in mortality risk can be minimized provided recommended mitigation is implemented; however, isolated wildlife mortality may occur as a result of construction activities such as blasting. *Residual effect on change in behaviour* • Effects on the behaviour of wildlife can be minimized provided recommended mitigation is implemented; however, some wildlife may exhibit avoidance behaviour during construction activities such as blasting.

Table 6-4: Potential Effects, Proposed Mitigation Measures and Residual Effects – Construction / Decommissioning

VEC	Project Activity	Potential Environmental Effects	Proposed Mitigation Measures	Residual Environmental Effects
			▪ Follow proper drilling, explosive handling and loading procedures; ▪ Implement safe handling and storage procedures for all materials, including soluble substances used for blasting; and ▪ Remove all blasting debris and other associated equipment / products from the blast area. • The following mitigation measures will be implemented with respect to the Environmental Monitor: ▪ An Environmental Monitor will be on site during all construction activities. ▪ An Environmental Monitor will be present during all blasting activities (to review the site prior to and during blasting activities, and ensure compliance with the Blasting Plan); ▪ Additional Environmental Monitors will be present during key construction activities including vegetation removal, dewatering and blasting, and as required to ensure compliance with environmental requirements. ▪ Environmental Monitors will complete daily, weekly and monthly monitoring of general and specific activities / measures as required (such as monitoring ecopassages and culverts to ensure that no debris is compromising their use, effectiveness of erosion and sedimentation control measures, fuel storage tanks etc.). ▪ Environmental Monitors will keep logs of their activities and note any non-compliance issues. Any non-compliance issues will be provided to the General Contractor for immediate follow-up.	
		Change in mortality risk • Possible mortality, harm and / or harassment to terrestrial wildlife due to vegetation clearing. *Change in behaviour* • Disturbance to terrestrial wildlife due to vegetation clearing.	• If vegetation must be removed* during the overall bird nesting season of April 1 to August 31, the following mitigation will apply, in accordance with the *Migratory Birds Convention Act, 1994* (*MBCA)*: ▪ A qualified Avian Biologist will be on-site during clearing activities to oversee vegetation removal and conduct nest surveys as required; ▪ Within complex habitats**, removal of all vegetation will occur outside the core bird nesting season of May 1 to July 28, when a minimum of 60% of nesting activity occurs in each of the three (3) habitat types, as per EC's Nesting Calendar for Zone C3 (EC, 2014b); ▪ From April 1 to April 30, nest and nesting activity searches will be conducted by a qualified Biologist in areas defined as simple habitat* immediately prior to vegetation clearing and will include searching around the general vicinity of areas proposed for vegetation clearing, including within 10 m. Nesting activity will be documented when it consists of confirmed breeding evidence, as defined by Ontario Breeding Bird Atlas (OBBA) criteria (OBBA, 2001); ▪ From May 1 to July 28, nest and nesting activity searches will be conducted by a qualified Biologist in simple habitat immediately prior to vegetation clearing as described above. Vegetation clearing will not occur within complex habitats during this period; ▪ From July 29 to August 31, nest and nesting activity searches will be conducted by a qualified Biologist in simple habitat immediately prior to vegetation clearing as described above; ▪ If an active nest or confirmed nesting activity is found, a buffer area will be implemented around the nest or nesting activity. The radius of the buffer will range depending on the species, level of disturbance and landscape context which will be confirmed by a qualified Biologist (EC, 2014b), but will protect a minimum area of 10 m surrounding the nest. This minimum buffer is expected to provide protection of the nest from minor work, such as vegetation clearing, access road creation, and general heavy machinery usage or vehicle operation; and ▪ The nest itself will not be marked using flagging tape or other similar material as this increases the risk of nest predation; however, the outer limits of the buffer can be marked (EC, 2014b) and Universal Transverse Mercator (UTM) coordinates will be taken. • If vegetation* is to be removed between June 1 and September 15 within those areas that provide confirmed and / or likely turtle nesting habitat (i.e., within sandy habitats, shorelines, soil-filled cracks in rock barren, or wetlands where turtle nesting activity has been observed or suitable habitat is within an area with concentrated turtle observations) and that are identified to be cleared of vegetation, the following will be adhered to: ▪ Construction will avoid suitable nesting areas between June 1 and September 15; ▪ In suitable nesting areas that are unavoidable, exclusionary fencing will be installed around the extent of the construction footprint that overlaps nesting habitat prior to the turtle nesting / hatching period of June 1 to September 15 (GBBR, n.d.) to prevent turtle nesting activity prior to construction activities; ▪ Immediately prior to vegetation clearing between June 1 and September 15, a qualified Biologist will search the area to ensure no nests are present; ▪ In the rare case where construction initially avoided an area and exclusionary fencing had not been installed prior to the turtle nesting period, a qualified Biologist will complete area searches immediately prior to construction to identify any potential nesting areas and nesting activity during the turtle nesting / hatching period of June 1 to September 15 (GBBR, n.d.);	*Residual effect on change in mortality risk* • Increase in mortality risk can be minimized provided recommended mitigation is implemented; however, isolated wildlife mortality may occur as a result of vegetation clearing. *Residual effect on change in behaviour* • Effects on the behaviour of wildlife can be minimized provided recommended mitigation is implemented; however, some wildlife may exhibit changes in behaviour (e.g., avoidance) as a result of vegetation clearing.

Table 6-4: Potential Effects, Proposed Mitigation Measures and Residual Effects – Construction / Decommissioning

VEC	Project Activity	Potential Environmental Effects	Proposed Mitigation Measures	Residual Environmental Effects
			▪ If an active nest or confirmed nesting activity is found, a minimum buffer area of 30 m will be implemented around the nest or nesting activity. The radius of the buffer will range depending on the species, level of disturbance and landscape context, which will be confirmed by a qualified Biologist. This minimum buffer is expected to provide protection of the nest from minor work, such as vegetation clearing, access road creation, and general heavy machinery usage or vehicle operation. ▪ The nest itself will never be marked using flagging tape or other similar material as this increases the risk of nest predation; however, the outer limits of the buffer can be marked and UTM coordinates will be taken. Through consultation with EC-CWS, a protective cage may be placed over the nest to protect it from predation; and ▪ Once the Biologist has cleared the area, install turtle appropriate exclusionary fencing during construction / decommissioning within areas of concentrated turtle activity to limit road and construction-related mortality. • Construction activities will not occur within 30 m of any confirmed turtle nest during the period of June 1 to September 15 (GBBR n.d.). • Immediately prior to vegetation clearing, a qualified Biologist will conduct an area search of the proposed vegetation clearing area to ensure no reptiles are present; ▪ Field crews will immediately stop work for all reptiles observed within the construction area during area searches and observe whether the individual(s) vacate the construction area. Should observed non-SAR reptiles (except for nesting turtles) that are encountered within the construction area not vacate the construction area, they will be relocated to an area of similar habitat, in the same direction that they are facing / moving, by a qualified Biologist / Handler or Environmental Monitor. ▪ Any suspected nesting female turtle (i.e., terrestrial observation in May or June) that must be moved from the construction area will be moved to aquatic or wetland edge habitat to restore any water stores that may have been discharged during handling. Nesting turtles often carry water to discharge on a nest site to allow for easier nest excavation (Cahn, 1937). When handled, these water stores are often discharged. Relocation of the turtle to the shoreline of aquatic or wetland habitat will allow for water stores to be replenished before nesting activity is carried out (Cahn, 1937; OMNRF, n.d.). • Stockpile areas placed prior to June 30 (turtle egg laying period; GBBR, n.d.) will be assessed by a qualified Biologist to determine if they are suitable turtle nesting habitat, and exclusionary fencing will be installed where necessary. Stockpiles placed after June 30 do not require assessment or installation of exclusionary fencing as this is after the typical period for turtle egg laying. • Removal of natural vegetation using heavy machinery within suitable turtle and / or snake hibernating habitat is proposed to occur outside the winter turtle and snake hibernation season, from October 15 to April 30 (GBBR, n.d.), within aquatic habitats or wetlands. If this is not possible, the following will occur: ▪ Removal of natural vegetation within suitable turtle and snake hibernating habitat (wetland and aquatic habitat) will be completed by hand from October 15 to April 30 (GBBR, n.d.), when feasible; ▪ If vegetation clearing must occur within suitable turtle and snake hibernating habitat (wetland and aquatic habitat) through use of heavy machinery between October 15 to April 30 (GBBR, n.d.), known hibernation sites as identified through baseline and pre-construction surveys will be avoided. BMPs for heavy machinery usage within wetlands will be used to reduce impact on overwintering turtles. BMPs may include, but are not limited to, low ground pressure equipment, wide tires, rubberized tracks, swamp mats, lightweight equipment, varying paths (Wetland Stewardship Partnership, 2009), and low tire inflation pressure (Alakukku, *et al*. 2003); and ▪ Heavy machinery will be required to cross wetlands during the turtle and snake hibernation period of October 15 to April 30 (GBBR, n.d.). Where these crossings are necessary, heavy machinery will avoid known hibernation sites as identified through baseline pre-construction surveys and cross at the most narrow crossing location (as deemed reasonable) or as close to the edge as possible within the construction footprint. BMPs for heavy machinery use in wetlands will also be applied (see previous bullet). • Conduct construction and decommissioning activities during daylight hours for increased visibility as well as to avoid light pollution effects during the night. ▪ In emergency circumstances where construction / decommissioning activities must occur at night from April to September, a lighting scheme will be used to minimize potential risks to wildlife and will include the following: ▪ Lighting or spotlights will be directed downward, temporary and kept to a minimum. • Rehabilitation will be advanced within all temporary construction / decommissioning areas within one (1) year of the completion of the construction / decommissioning phase. For areas that will be temporarily disturbed during construction/decommissioning:	

Table 6-4: Potential Effects, Proposed Mitigation Measures and Residual Effects – Construction / Decommissioning

VEC	Project Activity	Potential Environmental Effects	Proposed Mitigation Measures	Residual Environmental Effects
			▪ Prior to removal, habitat type and conditions will be documented. ▪ Transplanting of species will occur for species that would have a high probability of survival success (i.e. tree seedlings). ▪ A biologist will ensure conditions of rehabilitated area contain suitable soil and moisture conditions for replanting/transplanting of native tree/shrub/herbaceous stock. ▪ In areas where soils are absent (i.e. the rock barrens), if the original habitat conditions was bare rock devoid of vegetation, no replanting will occur. Should soils be absent in areas that originally contained vegetation, grading to establish moisture conditions suitable for moss mats will occur. • The following mitigation measures will be implemented with respect to the Environmental Monitor: ▪ An Environmental Monitor will be on site during all construction activities; ▪ An Environmental Monitor will be present during all blasting activities (to review the site prior to and during blasting activities, and ensure compliance with the SAR Blasting Plan; ▪ Additional Environmental Monitors will be present during key construction activities including vegetation removal, dewatering and blasting, and as required to ensure compliance with environmental requirements; ▪ Environmental Monitors will also complete daily, weekly and monthly monitoring of general and specific activities / measures (such as monitoring ecopassages and culverts to ensure that no debris is compromising their use, effectiveness of erosion and sedimentation control measures, fuel storage tanks etc.); and ▪ Environmental Monitors will also keep daily logs of their activities and note any non-compliance issues. Any non-compliance issues will be provided to the General Contractor for immediate follow-up. **Note: Vegetation removal will be conducted utilizing a feller buncher where vegetation will be cut close to the root and laid down along the side of the removal area. Trees / shrubs will be de-limbed and hauled off-site on a skidder.* ***Note: Complex habitats refer to habitats that contain a variety of individual nesting sites in a range of habitats. For instance, forest and shrub-dominated communities may contain nesting spots within the canopy, sub-canopy, shrub layer and ground layer, where identification of active nests may be difficult. Simple habitats refer to habitats that contain few likely nesting spots or a homogenous community where identification of active nests can be completed with confidence. For instance, open rock barrens or other sparsely vegetated habitats may be considered simple habitats, depending on site-specific vegetation cover.*	
		Change in mortality risk • Mortality, harm and / or harassment to wildlife as result of vehicles using access roads.	• Clearly post speed limit and wildlife crossing signs along access roads (20 kilometres per hour (km/hr), install speed bumps and post speed limits of 10 km/hr within areas of concentrated wildlife activity and instruct all staff to be vigilant for wildlife while driving on site. • Conduct construction and decommissioning activities during daylight hours for increased visibility as well as to avoid light pollution effects during the night. ▪ In emergency circumstances where construction / decommissioning activities must occur at night from April to September, a lighting scheme will be used to minimize potential risks to wildlife and will include the following: ▪ Lighting or spotlights will be directed downward, temporary and kept to a minimum. • Ecopassages or designated movement corridors will be considered in areas of high reptile activity or abundance, to limit road mortality, in areas where constructability allows the installation of these structures. • Develop and implement a reporting and tracking system for turtle and snake sightings as well as any wildlife mortality on access roads, which will used to inform adaptive management for mortality, if required. • Install movement fencing in areas of high turtle and / or snake crossing activity or wildlife mortality. Monitor locations where fencing is installed to ensure that it is in good repair. • All construction vehicles and equipment that are parked overnight or left idle for over 1 hour within the HIWEC study area between April 1 and November 30 will be surveyed for the presence of snakes before ignition. • Any documented road mortality of a reptile species will trigger consideration of contingency measures and adaptive management (e.g., access road closure or additional ecopassages, speed bumps, or wildlife crossing signs). The selected approach will be based on the specific circumstances that contributed to the observed impact on the species and will be determined by a qualified Biologist for the purpose of further mitigating potential impacts to the species. • Avoid driving on access roads in proximity to amphibian breeding habitats at night between April 1 and June 30, and any rainy nights from spring to early autumn. Travel at night along access roads will only occur in emergency situations.	*Residual effect on change in mortality risk* • Increase in mortality risk can be minimized provided recommended mitigation is implemented; however, isolated wildlife mortality may occur as a result of vehicles using access roads.

Table 6-4: Potential Effects, Proposed Mitigation Measures and Residual Effects – Construction / Decommissioning

VEC	Project Activity	Potential Environmental Effects	Proposed Mitigation Measures	Residual Environmental Effects
		Habitat change • Increased erosion and sedimentation into wildlife habitat resulting from construction activity. *Habitat change* • Removal / disturbance of topsoil and increased soil compaction within wildlife habitat from manoeuvring of heavy machinery, excavation, backfilling and other construction activity.	• Minimize vegetation removal and limit to within the construction footprint area. The construction footprint will be clearly defined. Delineation will be in the form of flagging tape, wooden stakes and / or silt fence barriers that will each provide clear identification of the construction limits. With respect to the latter (silt fence barriers), these will be implemented if sedimentation control is also required. • Refer to mitigation measures for "*Reduction in soil quality and / or quantity due to erosion, sedimentation and compaction resulting from excavation, blasting, use of heavy equipment on exposed soils and stockpiling of cleared materials.*" under the Soils and Terrain VEC.	*No residual effect* • Effects on habitat change can be mitigated provided recommended mitigation is implemented.
		Habitat change • Damage to wildlife habitat as a result of accidental soil or water contamination (including groundwater) by oils, gasoline, grease and other materials from construction equipment, materials storage and handling.	• Refer to mitigation measures for "*Reduction in soil quality due to accidental release of contaminants during construction, heavy equipment and vehicle use, excavation, and concrete truck rinsing, etc.*" under the Soils and Terrain VEC.	*Residual effect on habitat change* • Effects on habitat change can be minimized provided recommended mitigation is implemented; however, some habitat change may occur due to limitation in current spill clean-up processes.
		Habitat change • Changes in surface water drainage patterns or obstruction of lateral flows in surface water to wildlife habitat in wetlands resulting from changes in land contours. • Reductions in groundwater recharge quantities into wildlife habitat in wetlands due to increases in impervious surfaces.	• Refer to mitigation measures in "*Changes in surface water drainage patterns or obstruction of lateral flows in surface water to wetlands resulting in effects to soil moisture and species composition of vegetation*" under the Vegetation and Ecological Communities VEC. • Refer to mitigation measures for "*Reduction in soil quality due to accidental release of contaminants during construction, heavy equipment and vehicle use, excavation, and concrete truck rinsing, etc.*" under the Soils and Terrain VEC. • Refer to mitigation measures for "*Reduction in groundwater recharge quantities due to increases in impervious surfaces.*" under the Groundwater VEC.	*Residual effect on habitat change* • Effects on habitat change can be minimized provided recommended mitigation is implemented; however, changes in surface water drainage patterns may result in alteration of some wildlife habitat.
		Habitat change • Loss and / or degradation of wildlife habitat due to construction dewatering activities and associated dewatering discharge. *Change in mortality risk* • Mortality, harm and harassment to wildlife due to construction dewatering activities and associated dewatering discharge. *Change in behaviour* • Disturbance to wildlife due to construction dewatering activities and associated dewatering discharge.	• Conduct a Detailed Water Taking Assessment based on geotechnical investigation results to determine anticipated groundwater taking quantities, groundwater quality and predicted ZOI prior to construction. Based on this assessment site-specific mitigation measures and a monitoring program for groundwater dependent natural features within the anticipated ZOI will be provided. • In areas where the detailed water taking assessment identifies connectivity between groundwater dependent wetlands and dewatering sites, and dewatering volumes will be large enough to potentially result in wetland drawdown, dewatering will be avoided during the reptile hibernation period (October 15 to April 30; GBBR, n.d.). • To confirm the effectiveness of the above mitigation during water taking activities, the following will occur during any dewatering activity: ▪ Monitor surface water levels in potentially affected groundwater-dependent natural features prior-to and during dewatering activities and compare to site-specific thresholds and early warning indicators for water level drawdown; ▪ If there is drawdown, stop construction work and determine mitigation appropriate to the site (i.e., redirect water, monitoring rain events) through discussions with a qualified Biologist and Hydrogeologist. ▪ Monitor shallow groundwater levels and vertical hydraulic conductivity in potentially affected groundwater-dependent natural features, where installation of mini-piezometer devices is possible (e.g. areas with a minimum of 40 centimetres (cm) soil depth). Monitor groundwater levels prior-to and during dewatering and compare to site-specific thresholds for groundwater level drawdown; ▪ Visual inspection of vegetation health during construction; and ▪ In the event surface water levels and / or groundwater level drawdown exceeds established site-specific thresholds mitigation measures may include where appropriate the diversion of groundwater dewatering discharge to affected feature following appropriate water quality control (e.g. sediment tanks, filter bags, flow diversion, soaker hoses, etc.). ▪ Limit duration of dewatering to as short a time frame as possible. ▪ Limit dewatering quantities by implementing targeted groundwater cut-offs (i.e., slurry trench walls) under specific conditions, which will assist in stopping the infiltration of groundwater into the excavations. • Refer to mitigation measures in "*Reduction in groundwater quantity resulting in changes in groundwater flow patterns and yield of private water wells, as a result of temporary construction dewatering and water taking activities*" under the Groundwater VEC.	*Residual effect on habitat change* • Effects on habitat change can be minimized provided recommended mitigation is implemented; however, construction dewatering may result in alteration of some wildlife habitat (e.g., water level drawdown) within the ZOI of dewatering activities. *Residual effect on change in mortality risk* • Increase in mortality can be minimized provided recommended mitigation is implemented; however, construction dewatering may result in isolated wildlife mortality within the ZOI of dewatering activities. *Residual effect on change in behaviour* • Effects on behaviour can be minimized provided recommended mitigation is implemented; however, construction dewatering may result in displacement or avoidance of wildlife within the ZOI of dewatering activities.

Table 6-4: Potential Effects, Proposed Mitigation Measures and Residual Effects – Construction / Decommissioning

VEC	Project Activity	Potential Environmental Effects	Proposed Mitigation Measures	Residual Environmental Effects
Vegetation and Ecological Communities	• Site preparation • Construction of access roads and laydown areas • Foundation excavation and construction • Collector system and transmission line installation • Installation of TSs • Construction completion • Disassembly and removal of collector system components • Decommissioning completion	*Change in community diversity* • Permanent loss of forest cover.	• The area of disturbance will be delineated to ensure that work does not occur outside the construction footprint. • Vegetation removal will be minimized to the extent possible. • Fell trees toward the construction footprint area to reduce damage to adjacent vegetation being retained. • Rehabilitation will be advanced within all temporary construction / decommissioning areas within one (1) year of the completion of the construction / decommissioning phase. For areas that will be temporarily disturbed during construction/decommissioning: ▪ Prior to removal, habitat type and conditions will be documented. ▪ Transplanting of species will occur for species that would have a high probability of survival success (i.e. tree seedlings). ▪ A biologist will ensure conditions of rehabilitated area contain suitable soil and moisture conditions for replanting/transplanting of native tree/shrub/herbaceous stock. ▪ In areas where soils are absent (i.e. the rock barrens), if the original habitat conditions was bare rock devoid of vegetation, no replanting will occur. Should soils be absent in areas that originally contained vegetation, grading to establish moisture conditions suitable for moss mats will occur. • Where excavation for construction of access roads, WTGs or collector lines is required within the rooting zone of trees (i.e., within 1 m of the dripline), implement proper root pruning measures to protect tree roots. • Also refer to mitigation measures under the Species at Risk VEC for additional species-specific mitigation measures.	*Residual effect for change in community diversity* • Effects on community diversity can be minimized provided recommended mitigation is implemented; however, some forest cover will be removed.
		Change in community diversity *Change in wetland quantity and function* • Increased erosion and sedimentation resulting from construction activity.	• Install and maintain sediment and erosion controls such as silt fence barriers, rock flow check dams, compost filter socks or approved alternative along the edge of the construction footprint area if within 30 m of a wetland to minimize potential sediment loading to the feature. • Also refer to mitigation measures for effects of "*Reduction in soil quality and / or quantity due to erosion, sedimentation and compaction resulting from excavation, blasting, use of heavy equipment on exposed soils and stockpiling of cleared materials*" under the Soils and Terrain VEC.	*No residual effects.* • Effect on community diversity can be mitigated provided recommended mitigation is implemented. • Effects on wetland quantity and function can be mitigated provided recommended mitigation is implemented.
		Change in community diversity *Change in wetland quantity and function* • Damage to vegetation as a result of soil or water contamination (including groundwater) by oils, gasoline, grease and other materials from construction equipment, materials storage and handling.	• Refer to mitigation measures for "*Reduction in soil quality due to accidental release of contaminants during construction, heavy equipment and vehicle use, excavation, and concrete truck rinsing, etc.*" under the Soils and Terrain VEC. • Also refer to mitigation measures for "*Reduction in groundwater quality due to the accidental release of contaminated construction dewatering discharge in areas of substantial groundwater recharge*" under the Groundwater VEC.	*Residual effect on change in community diversity* • Effects on community diversity can be minimized provided recommended mitigation is implemented; however, some changes to community diversity may occur due to limitation in current spill clean-up processes. *Residual effect on change in wetland quantity and function* • Effects on wetland quantity and function can be minimized provided recommended mitigation is implemented; however, some damage to wetlands may occur due to limitation in current spill clean-up processes.
		Change in wetland quantity and function • Permanent loss of wetlands.	• Vegetation removal will be minimized to the extent possible. • Site permanent infrastructure outside of wetlands to the extent possible. • Where excavation of a wetland cannot be avoided, the area of disturbance will be delineated to ensure that work does not occur outside the construction footprint. • Where construction activities occur within 30 m of a wetland, install and maintain construction fencing (or similar delineation device) to clearly define the construction footprint area to prevent accidental damage to vegetation. • Preserve topsoil (and therefore seed bank), where present, for use during rehabilitation. • Fell trees toward the construction footprint area to reduce damage to adjacent vegetation being retained. • Rehabilitation will be advanced within all temporary construction / decommissioning areas within one (1) year of the completion of the construction / decommissioning phase. For areas that will be temporarily disturbed during construction/decommissioning: ▪ Prior to removal, habitat type and conditions will be documented. ▪ Transplanting of species will occur for species that would have a high probability of survival success (i.e. tree seedlings). ▪ A biologist will ensure conditions of rehabilitated area contain suitable soil and moisture conditions for replanting/transplanting of native tree/shrub/herbaceous stock.	*Residual effect for change in wetland quantity and function* • Effects on wetland quantity and function can be minimized provided recommended mitigation is implemented; however, some wetlands will be removed.

Table 6-4: Potential Effects, Proposed Mitigation Measures and Residual Effects – Construction / Decommissioning

VEC	Project Activity	Potential Environmental Effects	Proposed Mitigation Measures	Residual Environmental Effects
			▪ In areas where soils are absent (i.e. the rock barrens), if the original habitat conditions was bare rock devoid of vegetation, no replanting will occur. Should soils be absent in areas that originally contained vegetation, grading to establish moisture conditions suitable for moss mats will occur. • Where excavation for construction of access roads, WTGs or collector lines is required within the rooting zone of trees (i.e., within 1 m of the dripline), implement proper root pruning measures to protect tree roots. • Also refer to mitigation measures under the Species at Risk VEC for additional species-specific mitigation measures.	
		Change in wetland quantity and function • Changes in surface water drainage patterns or obstruction of lateral flows in surface water to wetlands resulting in effects to soil moisture and species composition of vegetation. • Reductions in groundwater recharge quantities into wetlands due to increases in impervious surfaces.	• Ensure BMPs are used to maintain current drainage patterns, including: ▪ Minimize paved surfaces and design roads to promote infiltration; ▪ Limit changes in land contours to the maximum extent possible; and ▪ Ensure roadway culverts are designed and installed to maintain existing drainage patterns. • Where the installation of a flow equalizing culvert is proposed, appropriate erosion control measures (e.g., rip rap, seeding) will be installed at the ends of each culvert to prevent erosion which can change land contours. • Also refer to mitigation measures in "*Reduction in groundwater recharge quantities due to increases in impervious surfaces*" under the Groundwater VEC.	*Residual effect on change in wetland quantity and function* • Effects on wetland quantity and function can be minimized provided recommended mitigation is implemented; however, changes in surface water drainage patterns may result in some effects on wetland quantity and function.
		Change in wetland quantity and function • Change in wetland function due to reduced water levels caused by temporary construction dewatering activities and associated dewatering discharge.	• Conduct a Detailed Water Taking Assessment based on geotechnical investigation results to determine anticipated groundwater taking quantities, groundwater quality and predicted ZOI prior to construction. Based on this assessment site-specific mitigation measures and a monitoring program for groundwater dependent natural features within the anticipated ZOI will be provided. • Also refer to mitigation measures in "*Reduction in groundwater quantity resulting in changes in groundwater flow patterns and yield of private water wells, as a result of temporary construction dewatering and water taking activities*" under the Groundwater VEC. • Also refer to mitigation measures under the Species at Risk VEC for additional species-specific mitigation measures.	*Residual effect on change in wetland quantity and function* • Effects on wetland quantity and function can be minimized provided recommended mitigation is implemented; however, construction dewatering may result in some effects on wetland quantity and function within the ZOI of dewatering activities.
		Change in species diversity *Change in wetland quantity and function* • Damage to wetland vegetation due to increased dust accumulation.	• Use water as a dust suppressant, as needed, along areas where construction activities are located within 5 m of a wetland. • In the event that dust accumulates on leaves of wetland plants, which may reduce photosynthesis, water will be used to wash dust off of vegetation. • Also refer to mitigation measures for "*Dust generation from vehicle use and construction activity contributing to a reduction in local air quality*" under the Air Quality VEC.	*No residual effects* • Effects on species diversity can be mitigated provided recommended mitigation is implemented. • Effects on wetland quantity and function can be mitigated provided recommended mitigation is implemented.
Surface Water	• Site preparation • Construction of access roads and laydown areas • Transportation of equipment and materials • Foundation excavation and construction • WTG installation • Collector system and transmission line installation • Installation of TSs • Construction completion • Disassembly and removal of collector system components • WTG and / or tower disassembly and removal • Disassembly and removal of O&M building infrastructure • Decommissioning completion	*Changes to surface water quality* • Reduction in surface water quality from erosion and sedimentation.	• **Erosion and Sediment Control** ▪ An Erosion and Sediment Control Plan will be prepared prior to construction start. ▪ Implement sediment and erosion control measures prior to construction near wetlands or waterbodies and maintain such measures until re-vegetation of disturbed areas is complete. ▪ Monitoring to ensure erosion and sedimentation control measures are in good repair and properly functioning prior to conducting daily work and re-install or repair as required prior to commencing daily construction activities. ▪ In areas where bedrock is exposed at surface or trenching and securing of erosion control fencing is not possible, sediment logs (compost filter sock) may be utilized. ▪ Ensure an additional supply of erosion and sediment control materials are readily available on the site. ▪ Minimize removal of riparian vegetation to the greatest extent possible (maintaining riparian shrubs) in order to limit the area of exposed soil. ▪ In the Erosion and Sediment Control Plan include measures (e.g., monitoring and response) should a flood or higher water levels occur due to adverse weather events. ▪ Discharge water through energy dissipation and filtration systems (filter bag, sediment basin), as required. Ensure the volume of water is controlled and ensure that any water discharged to the natural environment does not result in scouring, erosion or physical alteration of the streams channel or banks. ▪ Use temporary crossing structures or other practices to cross waterbodies with steep and highly erodible (e.g., dominated by organic materials and silts) banks and beds. ▪ Remove non-biodegradable erosion and sediment control materials once site is stabilized. • **Grading and Excavation** ▪ Grade disturbed / remediated slopes or stockpiles to a stable angle to avoid slope instability and reduce erosion.	*Residual effect to surface water quality* • Reduction in surface water quality through releases of sediment can be minimized through the implementation of an Erosion and Sediment Control Plan, however minor sediment releases may still occur.

Table 6-4: Potential Effects, Proposed Mitigation Measures and Residual Effects – Construction / Decommissioning

VEC	Project Activity	Potential Environmental Effects	Proposed Mitigation Measures	Residual Environmental Effects
			▪ Where construction activities occur within 30 m of a waterbody, ensure BMPs are used to maintain current existing drainage patterns, including: ▪ Limit changes in land contours to the maximum extent possible. ▪ Ensure roadway culverts are designed and installed to maintain existing drainage patterns. ▪ Where the installation of a flow equalizing culvert is proposed, appropriate erosion control measures (i.e., rip rap, seeding) will be installed at the ends of each culvert to prevent erosion. • **Equipment Use** ▪ In order to avoid compacting or hardening of natural ground surface, and to avoid movement of machinery on sensitive slopes, restrict construction equipment to designated controlled vehicle access routes and to within identified work areas. ▪ Whenever possible, operate machinery from outside the waterbody and on land above the high water mark or on ice in a manner that minimizes disturbance to the banks and bed of the waterbody. ▪ Limit machinery fording (if required) to only the amount necessary and only outside of sensitive time periods and upon consultation with a qualified Environmental Monitor. If repeated fording of the waterbody is required, construct a temporary crossing structure (e.g., jersey bridge, swamp mats). ▪ Ensure machinery is maintained free of fluid leaks. ▪ Site maintenance, vehicle maintenance, vehicle washing and refuelling to be done in specified areas at least 30 m away from wetlands and waterbodies. ▪ Wash water used for the cleaning of cement construction materials not to come in contact with the ground. Deposit waste water in a concrete washout container that allows evaporation and hardening for easier disposal or recover and recycle wash water back into cement truck. ▪ Use and maintain emission control devices on motorized equipment (as provided by the manufacturer of the equipment) to minimize the emissions so that they remain within industry standards. Heavy equipment and machinery to be used within operating specifications. ▪ Run vehicles and equipment only when necessary (i.e., limit idling). • **Blasting** ▪ Undertake blasting operations in accordance with relevant federal and provincial guidelines and standards. ▪ Develop and implement a Blasting Plan that includes standard BMPs to minimize extent of adverse noise, vibration and slope instability from blasting, including: – The construction footprint will be microsited to reduce blasting to the greatest extent possible. – Follow proper drilling, explosive handling and loading procedures; – Implement safe handling and storage procedures for all material, including soluble substances used for blasting; – Blast mats will be used to control debris generated from blasting; – Reduce blasting footprint to the extent possible; – Do not use ammonium nitrate based explosives near water due to the production of toxic by-products; and – Remove all blasting debris and other associated equipment / products from the blast area. ▪ In the event of fish mortality, immediately stop all work and correct the cause of the mortality. ▪ Report the fish kill immediately to Fisheries and Oceans Canada (DFO) and Henvey Inlet First Nation (HIFN). ▪ If release of significant blast rock, dust or residues is detected, suspend blast work until additional mitigations as required are in place. • **Water Quality** ▪ Develop and implement a Spill Prevention and Response Plan outlining steps to prevent and contain any chemicals or to avoid contamination of adjacent waterbodies and train staff on associated procedures. ▪ Turbid water shall not be discharged to a watercourse or wetland. ▪ Vegetation management will be done using mechanical techniques rather than herbicides. • **Material Stockpiling and Handling** ▪ Stabilize and store stockpiled materials (topsoil, grubbed materials) above the high water mark and 30 m away from wetlands and waterbodies. Transmission and collector poles or other structures will be placed above the normal high water mark. ▪ Soil stockpiles to be graded by mechanical means to compact the soil and limit the erosion. Tracks of machinery should be perpendicular to the slope of the pile to reduce the flow velocity of rainfall over the stockpile. ▪ Place only clean materials free of fine particulate matter in the water for temporary construction measures (e.g., coffer dams to be constructed of 'pea gravel' bags / meter bags, geotextile fabric, sheet pile or other clean material).	

Table 6-4: Potential Effects, Proposed Mitigation Measures and Residual Effects – Construction / Decommissioning

VEC	Project Activity	Potential Environmental Effects	Proposed Mitigation Measures	Residual Environmental Effects
			▪ Waste management to be completed in accordance with relevant federal and provincial guidelines and standards. ▪ Dispose of any contaminated waste material generated from construction activities off-site by authorized and approved haulers and receivers. • **Rehabilitation** ▪ Re-vegetate or stabilize exposed sites as soon as possible following disturbance using species native to the area to limit the duration of soil exposure. • **Work Area** ▪ Delineate work areas. ▪ Maintain undisturbed buffer strips greater than 30 m in width around waterbodies and wetlands, except where access roads approach waterbody and wetland crossings. Where infrastructure is closer than 30m to a watercourse, additional erosion and sediment control measures will be installed to adequately protect the watercourse. ▪ Restrict vehicle traffic to posted speed limits. ▪ Investigate complaints related to dust and emissions and address to the extent possible. • **Monitoring** ▪ Monitor on-site conditions (i.e., erosion and sediment control, spills, flooding, etc.) where construction occurs within 30 m of a watercourse on the following basis: – Weekly during active construction periods. – Prior to, during and post forecasted large rainfall events (>20 millimetres (mm) in 24 hours) or significant snowmelt events (i.e., spring freshet). – Daily during extended rain or snowmelt periods. – Monthly during inactive construction periods, where the site is left alone for 30 days or longer.	
	• Site preparation • Construction of access roads and laydown areas • Transportation of equipment and materials (construction) • Foundation excavation and construction • Construction of O&M building infrastructure • WTG installation • Collector system and transmission line installation • Installation of TSs • Construction completion • Transportation of equipment and materials (decommissioning) • Disassembly and removal of collector system components • WTG and / or tower disassembly and removal • Disassembly and removal of O&M building infrastructure • Decommissioning completion	*Changes to surface water quality* • Reduction in surface water quality due to accidental spills including fuels, lubricants, and concrete washing near waterbodies.	• **Equipment Use (see above)** • **Water Quality (see above)** • **Spills** • Develop and implement a Spill Prevention and Response Plan outlining steps to prevent and contain any chemicals or to avoid contamination of adjacent waterbodies and train staff on associated procedures. • Apply the following general mitigation measures to avoid soil or water contamination: ▪ Ensure machinery is maintained free of fluid leaks. ▪ Site maintenance, vehicle maintenance, vehicle washing and refuelling to be done in specified areas at least 30 m away from natural features (wetlands, woodlands and wildlife habitats) or waterbodies. ▪ Store any stockpiled materials at least 30 m away from wetlands, woodlands, wildlife habitats, or waterbodies. • Store any potential contaminants (e.g., oil, fuels and chemicals) in designated areas using secondary containment, where necessary	*Residual effect on surface water quality* • Reduction in surface water quality from accidental spills can be mitigated provided a Spill Prevention and Response Plan is developed and implemented, however some minor effects may remain due to limitations in current spill clean-up processes.
		Changes to surface water quality and quantity • Potential effects on surface water quality and quantity due to dewatering discharge.	• **Dewatering Activities** ▪ Limit duration of dewatering to as short a time frame as possible. ▪ Develop and implement a Construction Dewatering Discharge Plan describing appropriate areas and methods for discharge. ▪ Leave a layer of vegetation intact between the outfall and receiving waterbody to provide additional water dispersion and entrapment of suspended solids, if discharge is to a waterbody and / or wetland, where existing vegetation is present. Where existing vegetation is not present, appropriate erosion and sediment control measures will be utilized. ▪ Discharge water shall not be directed to a waterbody that has potential to flood as a result of the added input of water caused by direct dewatering discharge. ▪ Screen all hoses drawing water from a waterbody to prevent potential entrainment of fish and other species. ▪ If dewatering of excavations is required, mitigation will include the use of splash pads, discharge diffusers, filter bags, sediment basins or similar measures (if required and as appropriate) at discharge locations to ensure that any water discharged to the natural environment does not result in scouring, erosion or physical alteration of the streams channel or banks. ▪ If dewatering of excavations is required and expected to exceed 50,000 L/day, discharge water shall be sampled daily during the days the water is discharged and tested for suspended sediments. If the increase in	*No residual effect* • Effects on surface water quality and quantity from dewatering discharge can be mitigated provided recommended mitigation is implemented.

Table 6-4: Potential Effects, Proposed Mitigation Measures and Residual Effects – Construction / Decommissioning

VEC	Project Activity	Potential Environmental Effects	Proposed Mitigation Measures	Residual Environmental Effects
			suspended sediments is greater than 25 milligrams per litre (mg/L), appropriate measures (e.g., geosock or similar device) to mitigate these impacts will be implemented. ▪ Limit water taking quantities by implementing targeted groundwater cut-offs (i.e., slurry trench walls) where possible. ▪ No direct discharge to Georgian Bay, Key River, Henvey Inlet or any surface water feature outside the HIWEC will occur without acquiring applicable approvals. • **Water Management** ▪ Should groundwater dewatering activities be expected to exceed 50,000 L/day, the following measures will be implemented: – Inlet pump head shall be surrounded with clear stone and filter fabric. ▪ The discharge shall be regulated at such a rate that there is no flooding in the receiving waterbody and that no soil erosion is caused that impacts the receiving waterbody. ▪ Conduct a Detailed Water Taking Assessment based on geotechnical investigation results to determine anticipated groundwater taking quantities, groundwater quality and predicted ZOI prior to construction. Based on this assessment site-specific mitigation measures and a monitoring program for groundwater dependent natural features within the anticipated ZOI will be provided. ▪ Leave a layer of low cover vegetation intact between the outfall and receiving waterbody to provide additional water dispersion and entrapment of suspended solids where existing vegetation is present. Where existing vegetation is not present, appropriate erosion and sediment control measures will be utilized. ▪ No direct discharge to Georgian Bay, Key River, Henvey Inlet or any surface water feature outside the HIWEC will occur without acquiring applicable regulatory approvals. ▪ Divert access road runoff through drainage ditches directed into vegetated areas or through environmental protection measures (such as sediment traps, rock flow check dams, sediment barriers, etc.) to ensure that exposed soils or road materials are not transported into watercourses or wetlands. Ditches >5% in slope may require lining with appropriate sized rip rap to protect against erosion and also slow the flow velocity. ▪ Apply measures for managing water flowing onto the construction site as well as water being pumped / diverted from the construction site such that sediment is filtered out prior to the water entering a waterbody or wetland. ▪ Minimize paved surfaces and design roads to promote groundwater infiltration. ▪ Implement groundwater infiltration techniques to the maximum extent possible. Examples include: – Releasing water to vegetated areas; – Ditches should not be lined with an impermeable material (i.e., clay); and – Groundwater should remain on-site and not disposed of off-site (unless contaminated). ▪ Groundwater discharge water shall be directed to areas of groundwater recharge to allow for natural infiltration to the groundwater system. • **Water Quality (see above)** • **Monitoring (see above)**	
	• Site preparation • Construction of access roads and laydown areas • Transportation of equipment and materials • Foundation excavation and construction • Construction of O&M building infrastructure • Collector system and transmission line installation • WTG installation • Installation of TSs • Disassembly and removal of collector system components • WTG and / or tower disassembly and removal • Disassembly and removal of O&M building infrastructure • Decommissioning completion	*Changes to surface water quantity* • Potential for alteration to local surface water quantity due to loss of vegetation, changes in surficial topography and changes in surficial soils in disturbed construction areas including along access roads.	• **Water Crossing Design** ▪ Design water crossings to accommodate high and low flows of the watercourse. • **Erosion and Sediment Control (see above)** • **Water management (see above)** • **Grading and Excavation (see above)** • **Rehabilitation (see above)** • **Monitoring (see above)**	*Residual effect on surface water quantity* • Alterations to local surface water quantity can be minimized provided recommended mitigation is implemented (e.g., proper culvert sizing and rehabilitation and enhancement activities), however minor changes to water quantity may occur.

Table 6-4: Potential Effects, Proposed Mitigation Measures and Residual Effects – Construction / Decommissioning

VEC	Project Activity	Potential Environmental Effects	Proposed Mitigation Measures	Residual Environmental Effects
Fish and Fish Habitat	• Site preparation • Construction of access roads and laydown areas • Collector system and transmission line installation • WTG installation • Installation of TSs • Disassembly and removal of collector system components • WTG and / or tower disassembly and removal	*Changes to fish habitat* *Changes to fish mortality* • Potential for disturbance of aquatic biota (fish and invertebrates) and aquatic habitat during water crossing installation and removal (due to in-water work, alteration to channel bed, banks and riparian area, due to erosion and sedimentation)	• **Water Crossing Design** ▪ Design water crossings installed at waterbodies supporting direct fish habitat to facilitate fish passage. ▪ Design water crossings to accommodate high and low flows of the waterbody. ▪ High sensitivity waterbodies will be avoided by using clear span structures (WB-S-M39-8 and WB-N-M26-21). • **Crossing Installation** ▪ If streams are flowing during waterbody crossing structure installation, use appropriate work site isolation techniques (e.g., dam and pump, bypass channel, partial coffer damming) to minimize impacts on aquatic environment. If work sites are isolated during construction, fish are to be salvaged from isolated area and transferred to undisturbed habitat downstream of the work site. ▪ Phase crossing structure removal so no fording of watercourses is required following structure removal (i.e., the last activity as the road is being decommissioned). • **Timing Windows** ▪ Time in-water work to avoid sensitive life stages of fish species (i.e., spawning) for waterbodies, as follows: – No in-water work from October 1 to July 15 ▪ WB-N-M4-59 – No in-water work from March 15 to July 15 ▪ WEC North (WB-N-M32-14, WB-N-M6-3, WB-N-M12-12-2, WB-N-M12-12, WB-N-M26-21, WB-N-M26-31, WB-N-M28-16, WB-N-M35-1, WB-A-M3-3); ▪ WEC South (WB-S-M17-29, WB-S-M30-11, WB-S-M39-8, WB-S-M19-6, WB-S-M34-53, WB-S-M13-13) • **Blasting (see above)** • **Work Area (see above)** • **Equipment Use (see above)** • **Erosion and Sediment Control (see above)** • **Material Stockpiling and Handling (see above)** • **Grading and Excavation (see above)** • **Dewatering Activities (see above)** • **Rehabilitation (see above)** • **Monitoring** ▪ Monitor all in-water work to ensure mitigation is applied and to identify any disturbances to fish habitat. ▪ Document any changes resulting from construction activities and obtain photographic documentation.	*Residual effect on fish habitat and fish mortality* • Disturbances to aquatic biota and aquatic habitat due to water crossing installation and removal will be minimized following effective implementation of recommended mitigation measures, such as in-water work timing windows and an Erosion and Sediment Control Plan, however, some change to fish habitat will remain at localized areas associated with temporary access road crossings. • Localized and temporary residual effects on high sensitivity waterbodies due to use of clear span structures at these water crossings and no "serious harm" (as per *Fisheries Act*) may still occur.
	• Site preparation • Construction of access roads and laydown areas • Transportation of equipment and materials • Collector system and transmission line installation • Installation of TSs • Construction completion • Disassembly and removal of collector system components • WTG and / or tower disassembly and removal • Disassembly and removal of O&M building infrastructure • Decommissioning completion	*Changes to fish habitat* *Changes to fish mortality* • Potential for effects on aquatic biota (fish, invertebrates) and aquatic habitat due to accidents and / or spills including fuels, lubricants and concrete washing near waterbodies.	• **Equipment Use (see above)** • **Material Stockpiling and Handling (see above)** • **Spills (see above)**	*Residual effect on fish habitat and fish mortality* • Effects on aquatic biota and aquatic habitat can be minimized from accidents and / or spills provided a Spill and Prevention Plan is developed and implemented, however some minor effects on aquatic biota and aquatic habitat may occur due to limitations in current spill clean-up processes.
	• Foundation excavation and installation of WTG • Construction of access road • Construction of collection line crossing • Installation of poles for overhead transmission line	*Changes to fish mortality* • Potential for disturbance to fish and fish habitat and changes in mortality of fish due to construction blasting and / or vibration (includes disturbance to or mortality of fish eggs or larvae).	• **Blasting (see above)** • **Timing Windows (see above)** • **Monitoring (see above)** ▪ Monitor effectiveness of mitigation and protection measures for blasting. ▪ In the event of fish mortality, stop all work and correct the cause of the mortality. ▪ Report the fish kill immediately to DFO, Ontario Ministry of Natural Resources and Forestry (MNRF) and HIFN. ▪ Suspend blasting until additional mitigation measures are applied.	*Residual effects on fish mortality* • Disturbance to fish habitat and changes in mortality of fish due to blasting are unlikely, but minimized provided recommended mitigation is implemented, however fish mortality may occur.

Table 6-4: Potential Effects, Proposed Mitigation Measures and Residual Effects – Construction / Decommissioning

VEC	Project Activity	Potential Environmental Effects	Proposed Mitigation Measures	Residual Environmental Effects
Species at Risk	• Site preparation • Construction of access roads and laydown areas • Transportation of equipment and materials (construction) • Foundation excavation and construction • WTG installation • Collector system and transmission line installation • Installation of TSs • Construction completion • Power disconnection and decommissioning of service • Transportation of equipment and materials (decommissioning) • Disassembly and removal of collector system components • WTG and / or tower disassembly and removal • Disassembly and removal of O&M building infrastructure • Decommissioning completion	*Habitat change (including possible damage, destruction and / or fragmentation of avian SAR residences or avian SAR habitat).* *Change in behaviour, due to disturbance of SAR.* *Change in mortality risk (including harm, harassment and / or killing of SAR)* <u>*Avian Species at Risk</u> Canada Warbler (*Cardellina canadensis*) • Up to 31.6 ha (1.8%) of suitable habitat loss Common Nighthawk (*Chordeiles minor*) • Up to 161.9 ha (2.2%) of suitable habitat loss Kirtland's Warbler (*Setophaga kirtlandii*) • Up to 116.8 ha (3.1%) of suitable habitat loss Olive-sided Flycatcher (*Contopus cooperi*) • Up to 9.3 ha (0.9%) of suitable habitat loss Eastern Whip-poor-will (*Antrostomus vociferus*). Up to 172.7 ha (2.3%) of suitable habitat loss *****Areas and associated percentages of suitable habitat loss are based on the 120 WTG layout.	• Preconstruction surveys will be undertaken to further identify key habitats such as hibernation, gestation, nesting areas for micrositing of project component layout to avoid these areas or application of appropriate mitigation. • If vegetation must be removed* during the overall bird nesting season of April 1 to August 31, the following mitigation will apply, in accordance with the *MBCA*: ▪ A qualified Avian Biologist will be on-site during clearing activities to oversee vegetation removal and conduct nest and nest activity surveys as required; ▪ Within complex habitats**, removal of all vegetation is proposed to occur outside the core bird nesting season of May 1 to July 28, when a minimum of 60% of nesting activity occurs in each of the three (3) habitat types, as per Environment Canada's Nesting Calendar for Zone C3 (EC, 2014b); ▪ From April 1 to April 30, nest and nesting activity searches will be conducted by a qualified Biologist in areas defined as simple habitat* immediately prior to vegetation clearing and will include searching around the general vicinity of areas proposed for vegetation clearing, including within 10 m. Nesting activity will be documented when it consists of confirmed breeding evidence, as defined by OBBA criteria (OBBA, 2001); ▪ From May 1 to July 28, nest and nesting activity searches will be conducted by a qualified Biologist in simple habitat immediately prior to vegetation clearing as described above. Vegetation clearing will not occur within complex habitats during this period; ▪ From July 29 to August 31, nest and nesting activity searches will be conducted by a qualified Biologist in simple habitat immediately prior to vegetation clearing as described above; ▪ If an active nest or confirmed nesting activity is found, a buffer area will be implemented around the nest or nesting activity until a qualified Biologist has confirmed the nest is no longer active. The radius of the buffer will range depending on the species, level of disturbance and landscape context which will be confirmed by a qualified Biologist (EC, 2014b), but will protect a minimum area of 10 m surrounding the nest. This minimum buffer is expected to provide protection of the nest from nearby activities, such as vegetation clearing and heavy machinery or vehicle operation; and ▪ The nest itself will not be marked using flagging tape or other similar material as this increases the risk of nest predation; however, the outer limits of the buffer can be marked (EC, 2014b) and UTM coordinates will be taken. • Develop and implement a SAR Blasting Plan, that might include, but will not be limited to: ▪ Blasting will only occur in areas that have already been cleared of vegetation; ▪ The construction footprint will be microsited to reduce blasting to the greatest extent possible. ▪ Blast mats will be used to control debris generated from blasting; ▪ Prior to blasting, a qualified Biologist will conduct an area search of the proposed blasting area to ensure no SAR birds or nests are present (e.g. ground-nesting birds) the day of blasting, as close to the blasting time as safety considerations will allow; ▪ Ensure wildlife (e.g. birds flying over) are not in the blasting zone prior to detonation. If wildlife is encountered in the blasting zone, postpone detonation until the wildlife has vacated the area; ▪ Follow proper drilling, explosive handling and loading procedures; ▪ Implement safe handling and storage procedures for all materials, including soluble substances used for blasting; and ▪ Remove all blasting debris and other associated equipment / products from the blast area. • Minimize vegetation removal and limit to within the construction footprint area. The construction footprint will be clearly defined. Delineation will be in the form of flagging tape, wooden stakes and / or silt fence barriers that will each provide clear identification of the construction limits. With respect to the latter (silt fence barriers), these will be implemented if sedimentation control is also required. • The construction footprint will be microsited within the larger permitted HIWEC location to construct HIWEC infrastructure, such as roads, away from SAR habitats and residences and complex habitats, , by a qualified Biologist. Micrositing will include notation of potential Kirtland Warbler's Habitat (e.g. Jack Pine stands at a height of 1.5 to 5 m). If this is not possible, appropriate timing windows, clearing restrictions, and nest buffers will be applied (see above). • Removal of WTGs T20, T21, T22 and T23, as well as infrastructure leading to those proposed WTG locations. • Rehabilitation will be advanced within all temporary construction / decommissioning areas within one (1) year of the completion of the construction / decommissioning phase. For areas that will be temporarily disturbed during construction/decommissioning: ▪ Prior to removal, habitat type and conditions will be documented.	*Residual effect on habitat change* • Effects on the habitat of avian SAR including possible damage or destruction of residences can be minimized provided recommended mitigation is implemented; however, some avian SAR habitat will be removed. Some fragmentation of bird SAR habitat may also occur, although it will be minimized with the application of the recommended mitigation measures. *Residual effect on change in behaviour* • Effects on the behaviour of avian SAR due to disturbance from construction activities can be minimized provided recommended mitigation is implemented; however, some avian SAR may exhibit changes in behaviour during construction activities. *Residual effect on change in mortality risk* • Increased mortality risk (including harm) to avian SAR can be minimized provided recommended mitigation is implemented; however, isolated avian SAR mortality is possible.

Table 6-4: Potential Effects, Proposed Mitigation Measures and Residual Effects – Construction / Decommissioning

VEC	Project Activity	Potential Environmental Effects	Proposed Mitigation Measures	Residual Environmental Effects
			▪ Transplanting of species will occur for species that would have a high probability of survival success (i.e. tree seedlings). ▪ A biologist will ensure conditions of rehabilitated area contain suitable soil and moisture conditions for replanting/transplanting of native tree/shrub/herbaceous stock. ▪ In areas where soils are absent (i.e. the rock barrens), if the original habitat conditions was bare rock devoid of vegetation, no replanting will occur. Should soils be absent in areas that originally contained vegetation, grading to establish moisture conditions suitable for moss mats will occur. ▪ In order to enhance insect prey populations preferred by bird SAR, specifically Canada Warbler and Olive-sided Flycatcher, planting plans for the rehabilitated areas as part of the Rehabilitation Plan will include flowering herbaceous plants that are known to occur within HIWEC study area. Although it is not possible to calculate the area of temporary disturbance associated with access roads due to micrositing and site-specific conditions, the temporary disturbance area associated with WTG construction / decommissioning is approximately 17.3 ha. • In order to minimize potential attractants (i.e., garbage) and consequently, an increased abundance of terrestrial predators (i.e., racoon [Procyon lotor], striped skunk [Mephitis mephitis], etc.), an anti-littering policy that will be required to be followed by all on-site staff, will be implemented. Outdoor garbage receptacles will only be installed at the Operations building, near the entrance to the site, and will be wildlife-proof to minimize the potential to attract scavengers and predators. • Conduct dust suppression (i.e., spraying water on access roads and work areas) during dry conditions to minimize dust generation on vegetation. In the event that dust accumulates on leaves of plants, which may reduce photosynthesis, water will be used to wash dust off of vegetation. • Conduct construction and decommissioning activities during daylight hours for increased visibility as well as to avoid light pollution effects during the night. ▪ In emergency circumstances where construction / decommissioning activities must occur at night during the breeding bird season (April 1 to August 31), a lighting scheme will be used to minimize potential risks to bird SAR and will include the following: ▪ Lighting or spotlights will be directed downward, temporary and kept to a minimum. • Clearly post speed limit and wildlife crossing signs along access roads (20 km/hr), install speed bumps and post speed limits of 10 km/hr within areas of concentrated wildlife activity and instruct all staff to be vigilant for wildlife while driving on site. Restrict driving on-site to daytime hours (sunrise to sunset) during the breeding bird season (April 1 to August 31). Travel at night along access roads will only occur in emergency situations. • Develop and implement a Sighting Response Protocol in the Wildlife Management Plan which will include: ▪ All on-site staff will receive formal training about SAR that may be encountered within the HIWEC, including how to recognize each SAR and the proper procedure to follow if SAR is encountered; ▪ Details on what to do if SAR are encountered: immediate stop in construction activity within 10 m of an observation of a SAR until a qualified Biologist can confirm the species has vacated the construction disturbance footprint. In lieu of calling a Biologist, work can be resumed after a 24 hr period if no evidence of the species exists within the immediate area of previous observation. If the species still exists within the immediate area after 24 hr, a qualified Biologist will be contacted to provide appropriate direction; ▪ For animals in immediate danger, handling procedures will be established for designated personnel (i.e., Environmental Monitor, qualified Biologist) in the event that a SAR needs to be moved out of potential harm; ▪ Maintain a species observation log to track species observations during the construction / decommissioning phase of the project so that adaptive management can be applied based on species concentrations; ▪ All required permits under Section 73(2) of SARA will be obtained prior to handling SAR; and ▪ Reporting procedures (e.g., frequency to HIFN and EC-CWS). • Post SAR Fact Sheets in areas where on-site staff can become familiar with possible species encounters. • The following mitigation measures will be implemented with respect to the Environmental Monitor: ▪ An Environmental Monitor will be on site during all construction activities; ▪ An Environmental Monitor will be present during all blasting activities (to review the site prior to and during blasting activities, and ensure compliance with the SAR Blasting Plan; ▪ Additional Environmental Monitors will be present during key construction activities including vegetation removal, dewatering and blasting, and as required to ensure compliance with environmental requirements; ▪ Environmental Monitors will also complete daily, weekly and monthly monitoring of general and specific activities / measures (such as monitoring ecopassages and culverts to ensure that no debris is compromising their use, effectiveness of erosion and sedimentation control measures, fuel storage tanks etc.); and	

Table 6-4: Potential Effects, Proposed Mitigation Measures and Residual Effects – Construction / Decommissioning

VEC	Project Activity	Potential Environmental Effects	Proposed Mitigation Measures	Residual Environmental Effects
			▪ Environmental Monitors will also keep daily logs of their activities and note any non-compliance issues. Any non-compliance issues will be provided to the General Contractor for immediate follow-up. **Note: Vegetation removal will be conducted utilizing a feller buncher where vegetation will be cut close to the root and laid down along the side of the removal area. Trees / shrubs will be de-limbed and hauled off-site on a skidder.* ***Note: Complex habitats refer to habitats that contain a variety of individual nesting sites in a range of habitats. For instance, forest and shrub-dominated communities may contain nesting spots within the canopy, sub-canopy, shrub layer and ground layer, where identification of active nests may be difficult. Simple habitats refer to habitats that contain few likely nesting spots or a homogenous community where identification of active nests can be completed with confidence. For instance, open rock barrens or other sparsely vegetated habitats may be considered simple habitats, depending on site-specific vegetation cover.*	
		Habitat change (including possible damage, destruction and / or fragmentation of turtle SAR residences or turtle SAR habitat) *Change in behaviour, due to disturbance of SAR* *Change in mortality risk (including harm, harassment and / or killing of SAR)* <u>*Turtle Species at Risk</u> Blanding's Turtle (*Emydoidea blandingii*) • Up to 157.9 ha (2.3%) of suitable habitat loss Eastern Musk Turtle (*Sternotherus odoratus*) • Up to 24.6 ha (1.0%) of suitable habitat loss *****Areas and associated percentages of suitable habitat loss are based on the 120 WTG layout.	• Preconstruction surveys will be undertaken to further identify key habitats such as hibernation, gestation, nesting areas for micrositing of project component layout to avoid these areas or application of appropriate mitigation. • If vegetation* is to be removed between June 1 and September 15 within those areas that provide confirmed and / or likely turtle nesting habitat (i.e., within sandy habitats, shorelines, soil-filled cracks in rock barren, or wetlands where turtle nesting activity has been observed or suitable habitat is within an area with concentrated turtle observations) and that are identified to be cleared for vegetation, the following will be adhered to: ▪ Construction will avoid suitable nesting areas between June 1 and September 15; ▪ ; ▪ In suitable nesting areas that are unavoidable, exclusionary fencing will be installed around the extent of the construction footprint that overlaps nesting habitat prior to the turtle nesting / hatching period of June 1 to September 15 (GBBR, n.d.) to prevent turtle nesting activity prior to construction activities; ▪ Immediately prior to vegetation clearing between June 1 and September 15, a qualified Biologist will search the area to ensure no nests are present; ▪ In the rare case where construction was initially designed to avoid an area and exclusionary fencing had not been installed prior to the turtle nesting period, a qualified Biologist will complete area searches immediately prior to construction to identify any potential nesting areas and nesting activity during the turtle nesting / hatching period of June 1 to September 15 (GBBR, n.d.); ▪ If an active nest or confirmed nesting activity is found, a minimum buffer area of 30 m will be implemented around the nest or nesting activity. The radius of the buffer will range depending on the species, level of disturbance and landscape context, which will be confirmed by a qualified Biologist. This minimum buffer is expected to provide protection of the nest from minor work, such as vegetation clearing, access road creation, and general heavy machinery usage or vehicle operation. ▪ The nest itself will never be marked using flagging tape or other similar material as this increases the risk of nest predation; however, the outer limits of the buffer can be marked and UTM coordinates will be taken. Through consultation with EC-CWS, a protective cage may be placed over the nest to protect it from predation; and ▪ Once the Biologist has cleared the area, install turtle appropriate exclusionary fencing during construction / decommissioning within areas of concentrated turtle activity to limit road and construction-related mortality. • Construction activities will not occur within 30 m of any confirmed turtle nest during the period of June 1 to September 15 (GBBR n.d.). • Immediately prior to vegetation clearing*, a qualified Biologist will conduct an area search of the proposed vegetation clearing area to ensure no turtle SAR are present; ▪ Field crews will immediately stop work for all turtles observed within the construction area during area searches and observe whether the individual(s) vacate the construction area. Should observed turtle(s) (except for nesting turtles) that are encountered within the construction area not vacate the construction area, they will be relocated to an area of similar habitat at least 50 m, but less than 300 m to where they were found and in the same direction that they are facing / moving by a trained turtle hander. A distance of 300 m represents the approximate distance of the home range of the turtle SAR considered in this report (Milam and Melvin, 2001). In the unlikely event that similar habitat is not found within those parameters, the turtle will be relocated to the next closest location of similar habitat. All required permits under Section 73(2) of SARA will be obtained prior to handling SAR.	*Residual effect on habitat change* • Effects on the habitat of turtle SAR including possible damage or destruction of residences can be minimized provided recommended mitigation is implemented; however, some turtle SAR habitat will be removed. No residual effects of habitat fragmentation are anticipated for turtle SAR provided recommended mitigation is implemented. *Residual effect on change in behaviour* • Effects on the behaviour of turtle SAR due to disturbance from construction activities can be minimized provided recommended mitigation is implemented; however, turtle SAR may elicit changes in behaviour such as avoidance. *Residual effect on change in mortality risk* • Increased mortality risk (including harm) to turtle SAR can be minimized provided recommended mitigation is implemented; however, isolated turtle SAR mortality is possible.

Table 6-4: Potential Effects, Proposed Mitigation Measures and Residual Effects – Construction / Decommissioning

VEC	Project Activity	Potential Environmental Effects	Proposed Mitigation Measures	Residual Environmental Effects
			• Any suspected nesting female turtle (i.e., terrestrial observation in May or June) that must be moved from the construction area will be moved to aquatic or wetland edge habitat to restore any water stores that may have been discharged during handling. Nesting turtles often carry water to discharge on a nest site to allow for easier nest excavation (Cahn, 1937). When handled, these water stores are often discharged. Relocation of the turtle to the shoreline of aquatic or wetland habitat will allow for water stores to be replenished before nesting activity is carried out (Cahn, 1937; OMNRF, n.d.).Removal of natural vegetation within suitable turtle hibernating habitat (wetland and aquatic habitat) will be completed by hand from October 15 to April 30 (GBBR, n.d.), when feasible. • If vegetation clearing must occur within suitable turtle hibernating habitat (wetland and aquatic habitat) through use of heavy machinery between October 15 to April 30 (GBBR, n.d.), known hibernation sites as identified through baseline and pre-construction surveys will be avoided. BMPs for heavy machinery usage within wetlands will be used to reduce impact on overwintering turtles. BMPs may include, but are not limited to, low ground pressure equipment, wide tires, rubberized tracks, swamp mats, lightweight equipment, varying paths (Wetland Stewardship Partnership, 2009), and low tire inflation pressure (Alakukku, *et al.* 2003). • Heavy machinery will be required to cross wetlands during the turtle hibernation period of October 15 to April 30 (GBBR, n.d.). Where these crossings are necessary, heavy machinery will avoid known hibernation sites as identified through baseline pre-construction surveys and cross at the most narrow crossing location (as deemed reasonable) or as close to the edge as possible within the construction footprint. BMPs for heavy machinery use in wetlands will also be applied (see bullet above). • Minimize vegetation removal and limit to within the identified construction footprint. The construction footprint will be clearly defined prior to vegetation removal. Delineation will be in the form of flagging tape, wooden stakes and / or silt fence barriers that will each provide clear identification of the construction limits. With respect to the latter (silt fence barriers), these will be implemented if sedimentation control is also required. • The construction footprint will be microsited within the larger permitted HIWEC location to construct HIWEC infrastructure, such as roads, away from SAR habitats and residences and complex habitats, by a qualified Biologist. If this is not possible, appropriate timing windows, clearing restrictions, and nest buffers will be applied (see above). • In order to minimize potential attractants (i.e., garbage) and consequently, an increased abundance of terrestrial predators (i.e., racoon [Procyon lotor], striped skunk [Mephitis mephitis], etc.), an anti-littering policy that will be required to be followed by all on-site staff, will be implemented. Outdoor garbage receptacles will only be installed at the Operations building, near the entrance to the site, and will be wildlife-proof to minimize the potential to attract scavengers and predators. • Rehabilitation will be advanced within all temporary construction / decommissioning areas within one (1) year of the completion of the construction / decommissioning phase. For areas that will be temporarily disturbed during construction/decommissioning: ▪ Prior to removal, habitat type and conditions will be documented. ▪ Transplanting of species will occur for species that would have a high probability of survival success (i.e. tree seedlings). ▪ A biologist will ensure conditions of rehabilitated area contain suitable soil and moisture conditions for replanting/transplanting of native tree/shrub/herbaceous stock. ▪ In areas where soils are absent (i.e. the rock barrens), if the original habitat conditions was bare rock devoid of vegetation, no replanting will occur. Should soils be absent in areas that originally contained vegetation, grading to establish moisture conditions suitable for moss mats will occur. • Although it is not possible to calculate the area of temporary disturbance associated with access roads due to micrositing and site-specific conditions, the temporary disturbance area associated with WTG construction / decommissioning is approximately 17.3 ha. • Stockpile areas placed prior to June 30 (turtle egg laying period; GBBR, n.d.) will be assessed by a qualified Biologist to determine if they are suitable turtle nesting habitat, and exclusionary fencing will be installed where necessary. Stockpiles placed after June 30 do not require assessment or installation of exclusionary fencing as this is after the typical period for turtle egg laying. • Habitat creation proposed to occur at the HIWEC will be completed either prior to the potential use of the habitat by the species or prior to the removal of the habitat, depending on the species and date of proposed removal. ▪ For turtle SAR, each nesting mound will be created prior to June 1 (if habitat removal occurs between September16 and May 31) or will be created prior to the removal of any suitable nearby site that it is intended to replace (if that habitat is removed between June 1 and September 15).	

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VEC	Project Activity	Potential Environmental Effects	Proposed Mitigation Measures	Residual Environmental Effects
			• A minimum of 12 artificial turtle nesting mounds within the HIWEC study area, with the potential for additional habitats to be created based on the micrositing process. Artificial nesting mounds will be created strategically throughout the site (without additional disturbance) by using a method developed by Paterson, *et al.* (2013) that combines a mixture of gravel (60%) and sand (40%) into a pile that is approximately 6 m across and 0.5 m high. Nest mounds will be preferentially placed within 100 m of a habitat that contains open aquatic features. Mounds will also be placed in areas where turtle observations have occurred on the same side of the access road as the open aquatic habitat. Specific mound sizes and locations will be developed through a more detailed site-specific evaluation of suitable habitat. Consideration will be given to ensure that nest mounds are not adversely impacting other important habitats. Artificial nest mounds will be created once appropriate equipment is able to reach the selected locations. As such, some road creation will be required prior to the implementation of artificial nest mounds. • Develop and implement a SAR Blasting Plan, that might include, but will not be limited to: ▪ Blasting will only occur in areas that have already been cleared of vegetation; ▪ The construction footprint will be microsited to reduce blasting to the greatest extent possible. ▪ No blasting will occur in wetland or open aquatic habitats; ▪ Blast mats will be used to control debris and sound generated from blasting; ▪ Pre-blast species searches will be completed by a qualified Biologist prior to any blasting activity that occurs during the active period for turtles (April 15 to September 30). If a turtle SAR is encountered during a pre-blast search, it will be relocated to an area of similar habitat at least 50 m, but less than 300 m, from the area proposed for blasting and in the same direction that they are facing / moving by a trained turtle handler. A distance of 300 m represents the approximate distance of the home range of the turtle SAR considered in this report (Milam and Melvin, 2001). In the unlikely event that similar habitat is not found within those parameters, the turtle will be relocated to the next closest location of similar habitat. All required permits under Section 73(2) of *SARA* will be obtained prior to handling SAR; ▪ Any suspected nesting female turtle (i.e., terrestrial observation in May or June) that must be moved from the construction area will be moved to aquatic or wetland edge habitat to restore any water stores that may have been discharged during handling. Nesting turtles often carry water to discharge on a nest site to allow for easier nest excavation (Cahn, 1937). When handled, these water stores are often discharged. Relocation of the turtle to the shoreline of aquatic or wetland habitat will allow for water stores to be replenished before nesting activity is carried out (Cahn, 1937; OMNRF, n.d.); and ▪ Follow proper drilling, explosive handling and loading procedures. • If turtle SAR is encountered while carrying out nesting activity, all construction activities within 30 m of the nesting site will be immediately halted until one of the following steps will be taken: ▪ If the nest can be avoided during the construction phase, it will be clearly delineated by a qualified Biologist as being outside the footprint and a nesting cage will be installed to protect from predation. ▪ If the nest cannot be avoided during the construction phase, a qualified biologist will carefully dig up the nest and relocate it to an area with similar site conditions and soil quality outside the construction footprint and protect it from predators with a nesting cage, or if similar conditions are not available within reasonable proximity, the eggs will be transported to an incubation facility for artificial incubation for the purpose of release at the original nest site. ▪ The installed nesting cage will be removed in advance of the anticipated hatching of the nest, prior to August 1st, or the nest will be inspected daily from August 1st until September 15th to ensure the cage is removed when hatchlings emerge. • During the turtle hibernation period (October 15 to April 30; GBBR, n.d.) where dewatering activities may have an effect on hibernation habitat located within wetlands or aquatic features: ▪ Area will be monitored to observe any drawdown; and ▪ If there is drawdown, stop construction work and determine mitigation appropriate to the site (i.e., redirect water, monitoring rain events) through discussions with a qualified Biologist and Hydrogeologist. • Water levels in wetlands or aquatic features adjacent to turtle hibernation sites (or if known to be hydrologically connected) will be taken prior to and during dewatering activities. • Conduct a Detailed Water Taking Assessment based on geotechnical investigation results to determine anticipated groundwater taking quantities, groundwater quality and predicted ZOI prior to construction. Based on this assessment site-specific mitigation measures and a monitoring program for groundwater dependent natural features within the anticipated ZOI will be provided.	

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VEC	Project Activity	Potential Environmental Effects	Proposed Mitigation Measures	Residual Environmental Effects
			• In areas where the detailed water taking assessment identifies connectivity between wetlands and dewatering sites, and dewatering volumes will be large enough to potentially result in wetland drawdown, dewatering will be avoided during the reptile hibernation period (October 15 to April 30; GBBR, n.d.). • To confirm the effectiveness of the above mitigation during water taking activities, the following will occur during any dewatering activity: ▪ Monitor surface water levels in potentially affected groundwater-dependent natural features prior-to and during dewatering activities and compare to site-specific thresholds and early warning indicators for water level drawdown; ▪ If there is drawdown, stop construction work and determine mitigation appropriate to the site (i.e., redirect water, monitoring rain events) through discussions with a qualified Biologist and Hydrogeologist. ▪ Monitor shallow groundwater levels and vertical hydraulic conductivity in potentially affected groundwater-dependent natural features, where installation of mini-piezometer devices is possible (e.g., areas with a minimum of 40 cm soil depth). Monitor groundwater levels prior-to and during dewatering and compare to site-specific thresholds for groundwater level drawdown; ▪ Visual inspection of vegetation health during construction; and ▪ In the event surface water levels and / or groundwater level drawdown exceeds established site-specific thresholds mitigation measures may include where appropriate the diversion of groundwater dewatering discharge to affected feature following appropriate water quality control (e.g., sediment tanks, filter bags, flow diversion, soaker hoses, etc.). • Limit duration of dewatering to as short a time frame as possible. • Limit dewatering quantities by implementing targeted groundwater cut-offs (i.e., slurry trench walls) under specific conditions, which will assist in stopping the infiltration of groundwater into the excavations. • Ecopassages, or designated movement corridors, will be installed during the construction phase to limit road mortality. A total of 32 ecopassages will be installed using large corrugated steel or box culverts designs. In addition two (2) clear-span bridges will also be installed within the HIWEC study area to facilitate turtle movement between habitats without crossing over a road. The locations of these have been based on a variety of site-specific conditions, including species observations, habitat, topography, and expected road use. In areas where species concentrations are more likely, higher densities of ecopassages have been proposed. • Pre-construction herpetofaunal surveys, as completed in 2015, will be repeated in 2016. The completion of additional pre-construction surveys will be used to locate a number of additional ecopassages if necessary. • Motion-sensor cameras will also be installed at each ecopassage to document the use of ecopassages by turtle SAR. • Movement fencing will be installed on either side of the ecopassage, providing site-specific conditions allow installation, to encourage the use of the ecopassage. Chain-link fencing, in combination with geotextile fabric or wire meshing will be used to provide a barrier to juveniles, as this is the most effective type of movement fencing for turtles (McIntosh Perry, 2013). Fencing will be constructed to be 60 cm in height. An overhanging lip of 10-20 cm on the species side should be used to prevent turtles from climbing the fence. Fences should be installed with a turn-around at the ends to assist in redirecting turtles away from any fence openings. Curving the fence inward may help to reduce access to these locations. Fencing should be buried into the ground / soil mounded along bottom edge, where possible. If not possible, flush to the rock so that individuals can not fit underneath. • Conduct construction and decommissioning activities during daylight hours for increased visibility as well as to avoid light pollution effects during the night. ▪ In emergency circumstances where construction / decommissioning activities must occur at night from April to September, a lighting scheme will be used to minimize potential risks to turtle SAR and will include the following: ▪ Lighting or spotlights will be directed downward, temporary and kept to a minimum. • Clearly post speed limit and wildlife crossing signs along access roads (20 km/hr) and instruct all staff to be vigilant for wildlife while driving on site. • Develop and implement a Sighting Response Protocol, which will include: ▪ All on-site staff will receive formal training about SAR that may be encountered within the HIWEC, including how to recognize each SAR and the proper procedure to follow if SAR is encountered;	

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VEC	Project Activity	Potential Environmental Effects	Proposed Mitigation Measures	Residual Environmental Effects
			▪ Details on what to do if SAR are encountered: immediate stop in construction activity within 10 m of an observation of a SAR until a qualified Biologist can confirm the species has vacated the construction disturbance footprint. In lieu of calling a Biologist, work can be resumed after a 24 hr period if no evidence of the species exists within the immediate area of previous observation. If the species still exists within the immediate area after 24 hr, a qualified Biologist will contacted to provide appropriate direction; ▪ For animals in immediate danger, handling procedures will be established for designated personnel (i.e., Environmental Monitor, qualified Biologist) in the event that a SAR needs to be moved out of potential harm; ▪ Maintain a species observation log to track species observations during the construction / decommissioning phase of the HIWEC so that adaptive management can be applied based on species concentrations; ▪ All construction staff will be required to report to the Environmental Monitor any turtle SAR mortality or turtle activity on roads; ▪ All required permits under Section 73(2) of *SARA* will be obtained prior to handling SAR; and ▪ Reporting procedures (e.g., frequency to HIFN and EC-CWS). • Post SAR Fact Sheets in areas where on-site staff can become familiar with possible species encounters. • Each construction crew that is completing site clearing or blasting will be accompanied by at least one (1) qualified Biologist that will report directly to HIW and will be responsible for searching for, and relocating (when appropriate), SAR and ensuring all applicable environmental mitigation measures are implemented if a SAR individual or residence is encountered. ▪ Each Biologist working with a construction team will be equipped with a probe camera that will allow for more robust searches under rocks or in crevices where searches may otherwise be difficult. ▪ The specific unit selected will have a minimum scope length to adequately search under, and within, gestation sites and surface crevices. ▪ The presence of any SAR individual within the construction footprint that either cannot, or should not, be re-located (as per the mitigation measures of this application), will trigger a temporary stop in local construction activity until that individual is no longer present. • The following mitigation measures will be implemented with respect to the potential for illegal poaching activities or persecution: ▪ HIW will employ an Environmental Monitor whose role will include regular patrol of the site to identify any potential illegal wildlife poaching activities. Any suspected illegal poaching activities will be reported to the appropriate authorities for action. ▪ Surveillance cameras will be placed strategically throughout the HIWEC. Camera placement will consider both sensitive and non-sensitive habitats, and both hidden and plain-view cameras will be used. The location of these cameras will not be disclosed to construction / operations staff. The Environmental Monitor (see above) will regularly review video material recorded within the site and will take appropriate steps if any suspicious or illegal poaching activity is noted. ▪ HIWEC will implement a check-in and check-out policy for vehicles. Each authorized vehicle will prominently display an access form in the windshield to demonstrate to other vehicles and site employees that the vehicle has checked in and is authorized to be on-site. ▪ Facilitate, either directly or in collaboration with another organization (i.e. EC-CWS, MNRF, Toronto Zoo, Crimestoppers, etc.), an anti-poaching public awareness initiative within Parry Sound District. ▪ Random vehicles checks for wildlife will occur for vehicles that are leaving the site. ▪ Illegal activities of any kind, including poaching or intentional harming, harassing or killing of a SAR, will not be tolerated by HIW and will result in immediate reporting to the responsible authorities. Should the illegal activities be undertaken by an individual(s) employed HIW, they will be dismissed. ▪ HIW commits to provide a monetary reward to any individual that provides information that leads to a successful investigation of a poaching incident within the HIWEC. ▪ All contractors will be required to sign a Non-Disclosure Agreement (NDA) that relates to all wildlife observed at HIWEC. The NDA will be worded in such a way that it protects all wildlife without naming any particular species. • The following mitigation measures will be implemented with respect to the Environmental Monitor: ▪ An Environmental Monitor will be on site during all construction activities; ▪ An Environmental Monitor will be present during all blasting activities (to review the site prior to and during blasting activities, and ensure compliance with the SAR Blasting Plan; ▪ Additional Environmental Monitors will be present during key construction activities including vegetation removal, dewatering and blasting, and as required to ensure compliance with environmental requirements;	

Table 6-4: Potential Effects, Proposed Mitigation Measures and Residual Effects – Construction / Decommissioning

VEC	Project Activity	Potential Environmental Effects	Proposed Mitigation Measures	Residual Environmental Effects
			▪ Environmental Monitors will also complete daily, weekly and monthly monitoring of general and specific activities / measures (such as monitoring ecopassages and culverts to ensure that no debris is compromising their use, effectiveness of erosion and sedimentation control measures, fuel storage tanks etc.); and ▪ Environmental Monitors will also keep daily logs of their activities and note any non-compliance issues. Any non-compliance issues will be provided to the General Contractor for immediate follow-up. **Vegetation removal will be conducted utilizing a feller buncher where vegetation will be cut close to the root and laid down along the side of the removal area. Trees / shrubs will be de-limbed and hauled off-site on a skidder.*	
		Habitat change (including possible damage, destruction and / or fragmentation of snake SAR residences or snake SAR habitat) *Change in behaviour, due to disturbance of SAR* *Change in mortality risk (including harm, harassment and / or killing of SAR)* <u>*Snake Species at Risk</u> Eastern Foxsnake (Georgian Bay population) (*Pantherophis gloydi pop. 1*) • Up to 90.2 ha(1.0%) of suitable habitat loss Eastern Hog-nosed Snake (*Heterodon platirhinos*) • Up to 171.1 ha (3.9%) of suitable habitat loss Massasauga Rattlesnake (Great Lakes / St. Lawrence population) (*Sistrurus catenatus pop. 1*) • Up to 189.1 ha (2.2%) of suitable habitat loss • Up to 174.1 ha (2.3%) of critical habitat *****Areas and associated percentages of suitable habitat loss are based on the 120 WTG layout.	• Preconstruction surveys will be undertaken to further identify key habitats such as hibernation, gestation, nesting areas for micrositing of project component layout to avoid these areas or application of appropriate mitigation. • During the active period for snakes, from April 15 to September 30 (GBBR, n.d.), a trained Rattlesnake Monitor will complete area searches immediately prior to vegetation removal and blasting to identify any snake SAR or snake activity. ▪ Field crews will immediately stop work for all snakes observed within the construction area and observe whether the individual(s) vacate the construction area. Should observed snake(s) encountered within the construction area not vacate the construction area, they will be relocated to an area of similar habitat at least 50 m, but less than 300 m, from the area where the activity is occurring and in the same direction that they are facing / moving by a trained snake handler. In the unlikely event that similar habitat is not found within those parameters, the snake will be relocated to the next closest location of similar habitat. • Removal of all natural vegetation within suitable nesting habitats is proposed to occur outside the nesting / early neonate season of July 1 to October 15 (Ontario Nature, 2014; COSEWIC, 2008; GBBR, n.d.) within sandy habitats or shorelines. • Removal of natural vegetation within suitable snake hibernation habitat (wetland habitat) will be completed by hand from October 15 to April 30 (GBBR, n.d.), when feasible. • If vegetation clearing must occur within suitable snake hibernation habitat (wetland habitat) through the use of heavy machinery between October 15 to April 30 (GBBR, n.d.), known hibernation sites as identified through baseline and pre-construction surveys will be avoided. BMPs for heavy machinery usage within wetlands will be used to reduce impact on overwintering snakes. BMPs may include, but are not limited to, low ground pressure equipment, wide tires, rubberized tracks, swamp mats, lightweight equipment, varying paths (Wetland Stewardship Partnership, 2009), and low tire inflation pressure (Alakukku, *et al*. 2003). • Heavy machinery will be required to cross wetlands during the snake hibernation period of October 15 to April 30 (GBBR, n.d.). Where these crossings are necessary, heavy machinery will avoid known hibernation sites as identified through baseline pre-construction surveys and cross at most narrow crossing location (as deemed reasonable) or as close to the edge as possible within the construction footprint. BMPs for heavy machinery use in wetlands will also be applied (see bullet above). • Minimize vegetation removal and limit to within the identified construction footprint. The construction footprint will be clearly defined prior to vegetation removal. Delineation will be in the form of flagging tape, wooden stakes and / or silt fence barriers that will each provide clear identification of the construction limits. With respect to the latter (silt fence barriers), these will be implemented if sedimentation control is also required. • The construction footprint will be microsited within the larger permitted HIWEC location to construct HIWEC infrastructure, such as roads, away from SAR habitats and residences and complex habitats, by a qualified Biologist. If this is not possible, appropriate timing windows and clearing restrictions will be applied (see above). • Where possible, avoid construction activities within the boundaries of suitable nesting habitat for Eastern Hog-nosed Snake. • Site transmission line poles outside the boundaries of suitable nesting habitat for Eastern Hog-nosed Snake, if possible. • Rehabilitation will be advanced within all temporary construction / decommissioning areas within one (1) year of the completion of the construction / decommissioning phase. For areas that will be temporarily disturbed during construction/decommissioning: ▪ Prior to removal, habitat type and conditions will be documented. ▪ Transplanting of species will occur for species that would have a high probability of survival success (i.e. tree seedlings). ▪ A biologist will ensure conditions of rehabilitated area contain suitable soil and moisture conditions for replanting/transplanting of native tree/shrub/herbaceous stock.	*Residual effect on habitat change* • Effects on the habitat of snake SAR including possible damage or destruction of residences can be minimized provided recommended mitigation is implemented; however, some snake SAR habitat will be removed. No residual effects of habitat fragmentation are anticipated for snake SAR provided recommended mitigation is implemented. *Residual effect on change in behaviour* • Effects on the behaviour of snake SAR due to disturbance from construction activities can be minimized provided recommended mitigation is implemented; however, snake SAR may elicit changes in their behaviours such as avoidance. *Residual effect on change in mortality risk* • Increased mortality risk (including harm) to snake SAR can be minimized provided recommended mitigation is implemented; however, isolated snake SAR mortality is possible.

Table 6-4: Potential Effects, Proposed Mitigation Measures and Residual Effects – Construction / Decommissioning

VEC	Project Activity	Potential Environmental Effects	Proposed Mitigation Measures	Residual Environmental Effects
			▪ In areas where soils are absent (i.e. the rock barrens), if the original habitat conditions was bare rock devoid of vegetation, no replanting will occur. Should soils be absent in areas that originally contained vegetation, grading to establish moisture conditions suitable for moss mats will occur. • Although it is not possible to calculate the area of temporary disturbance associated with access roads due to micrositing and site-specific conditions, the temporary disturbance area associated with WTG construction / decommissioning is approximately 17.3 ha. • A minimum of 24 gestation sites for Massasauga Rattlesnake and 10 hibernation sites for Eastern Hog-nosed Snake and Eastern Foxsnake will be established throughout the HIWEC study area, with the potential for additional habitats to be created based on micrositing process. Although preference will be for these habitats to be located away from access roads, consideration will be given to the potential disturbance associated with using machinery to transport the rock. Each location will be placed within 1 km of a habitat suitable for hibernation and gestation sites, and locations will be preferentially chosen to occur in areas where potential hibernation / gestation sites were removed during construction. Where reasonable, created gestation sites will be on the same side of the HIWEC infrastructure as the hibernation habitat to limit the need for the individuals to occur around HIWEC infrastructure. ▪ HIW will utilize blast rocks to create suitable gestation, basking, and retreat sites for Massasauga Rattlesnake; ▪ Artificial snake hibernacula will be constructed in a south-facing, well-drained area (Long Point Land Trust, n.d.; USFWS, 2006); and ▪ Artificial hibernacula will consist of a large hole / pit dug to below the frost line and within approximately 2 m of the water table. The hole will be then filled with layers of rubble (rocks, concrete rubble, timber, bricks) and placed in such a way to create multiple chambers at various depths wherein snakes can hibernate (Long Point Land Trust, n.d.; USFWS, 2006). ▪ Brush piles will also be placed around the edge of the created artificial hibernaculas. • Habitat creation proposed to occur at the HIWEC will be completed either prior to the potential use of the habitat by the species or prior to the removal of the habitat, depending on the species and date of proposed removal. ▪ For Massasauga Rattlesnake, each gestation site will be created prior to May 1 (if habitat removal occurs between October 15 and April 30) or will be created prior to the removal of any suitable nearby site that it is intended to replace (if the habitat is removed between May 1 and October 14). • In order to minimize potential attractants (i.e., garbage) and consequently, an increased abundance of terrestrial predators (i.e., racoon [Procyon lotor], striped skunk [Mephitis mephitis], etc.), an anti-littering policy that will be required to be followed by all on-site staff, will be implemented. Outdoor garbage receptacles will only be installed at the Operations building, near the entrance to the site, and will be wildlife-proof to minimize the potential to attract scavengers and predators. • During the snake hibernation period (October 15 to April 30; GBBR, n.d.) where dewatering activities may have an effect on hibernation habitat located within wetlands or aquatic features: ▪ Area will be monitored to observe any drawdown; and ▪ If there is drawdown, stop construction work and determine mitigation appropriate to the site (i.e., redirect water, monitoring rain events) through discussions with a qualified Biologist and Hydrogeologist. • Water levels in wetlands or aquatic features adjacent to snake hibernation sites (or if known to be hydrologically connected) will be taken prior to and during dewatering activities. • Conduct a Detailed Water Taking Assessment based on geotechnical investigation results to determine anticipated groundwater taking quantities, groundwater quality and predicted ZOI prior to construction. Based on this assessment site-specific mitigation measures and a monitoring program for groundwater dependent natural features within the anticipated ZOI will be provided. • In areas where the detailed water taking assessment identifies connectivity between wetlands and dewatering sites, and dewatering volumes will be large enough to potentially result in wetland drawdown, dewatering will be avoided during the reptile hibernation period (October 15 to April 30; GBBR, n.d.). • To confirm the effectiveness of the above mitigation during water taking activities, the following will occur during any dewatering activity: ▪ Monitor surface water levels in potentially affected groundwater-dependent natural features prior-to and during dewatering and compare to site-specific thresholds and early warning indicators for water level drawdown; ▪ If there is drawdown, stop construction work and determine mitigation appropriate to the site (i.e., redirect water, monitoring rain events) through discussions with a qualified Biologist and Hydrogeologist.	

Table 6-4: Potential Effects, Proposed Mitigation Measures and Residual Effects – Construction / Decommissioning

VEC	Project Activity	Potential Environmental Effects	Proposed Mitigation Measures	Residual Environmental Effects
			▪ Monitor shallow groundwater levels and vertical hydraulic conductivity in potentially affected groundwater-dependent natural features, where installation of mini-piezometer devices is possible (e.g., areas with a minimum of 40 cm soil depth). Monitor groundwater levels prior-to and during dewatering and compare to site-specific thresholds for Groundwater level drawdown; ▪ Visual inspection of vegetation health during construction; and ▪ In the event surface water levels and / or groundwater level drawdown exceeds established site-specific thresholds mitigation measures may include where appropriate the diversion of groundwater dewatering discharge to affected feature following appropriate water quality control (e.g., sediment tanks, filter bags, flow diversion, soaker hoses, etc.). • Limit duration of dewatering to as short a time frame as possible. • Limit dewatering quantities by implementing targeted groundwater cut-offs (i.e., slurry trench walls), under specific conditions, which will assist in stopping the infiltration of groundwater into the excavations. • Develop and implement a SAR Blasting Plan, that might include, but will not be limited to: ▪ Blasting will only occur in areas that have already been cleared of vegetation; ▪ The construction footprint will be microsited to reduce blasting to the greatest extent possible. ▪ No blasting will occur in wetland or open aquatic habitats; ▪ Blast mats will be used to control debris and sound generated from blasting; ▪ Pre-blast species searches will be completed by a qualified Biologist prior to any blasting activity that occurs during the active period for snakes (April 15 to September 30). If a snake SAR is encountered during a pre-blast search, it will be relocated to an area of similar habitat at least 50 m, but less than 300 m, from the area proposed for blasting and in the same direction that they are facing / moving. In the unlikely event that similar habitat is not found within those parameters, the snake will be relocated to the next closest location of similar habitat; and ▪ Follow proper drilling, explosive handling and loading procedures. • Ecopassage, or designated movement corridors, will be installed during the construction phase to limit road mortality. A total of 32 ecopassages will be installed using large corrugated steel or box culverts designs. In addition two (2) clear-span bridges will also be installed within the HIWEC study area to facilitate turtle movement between habitats without crossing over a road. The locations of these have been based on a variety of site-specific conditions, including species observations, habitat, topography, and expected road use. In areas where species concentrations are more likely, higher densities of ecopassages have been proposed. • Pre-construction herpetofaunal surveys, as completed in 2015, will be repeated in 2016. The completion of additional pre-construction surveys will be used to locate a number of additional ecopassages if necessary. • Motion-sensor cameras will also be installed at each ecopassage to document the use of ecopassages by snake SAR. • Movement fencing will be installed on either side of the ecopassage, providing site-specific conditions allow installation, to encourage the use of the ecopassage by snake SAR. Chain-link fencing, in combination with geotextile fabric or wire meshing will be used (McIntosh Perry, 2013). Fencing will be constructed to be 60 cm in height. An overhanging lip of 10-20 cm on the species side should be used to prevent snakes from climbing the fence. Fences should be installed with a turn-around at the ends to assist in redirecting snakes away from any fence openings. Curving the fence inward may help to reduce access to these locations. Fencing should be buried into the ground / soil mounded along bottom edge where possible. If not possible, flush to the rock so that individuals can not fit underneath. • Install exclusionary fencing around the extent of the construction footprint that is adjacent to concentrated Massasauga activity during construction / decommissioning within areas (where feasible), to limit road and construction-related mortality. • All construction vehicles and equipment that are parked overnight or left idle for over 1 hr within the HIWEC study area between April 1 and November 30 will be surveyed for the presence of snakes before ignition. • Conduct construction and decommissioning activities during daylight hours for increased visibility as well as to avoid light pollution effects during the night. ▪ In emergency circumstances where construction / decommissioning activities must occur at night from April to September, a lighting scheme will be used to minimize potential risks to snake SAR and will include the following: ▪ Lighting or spotlights will be directed downward, temporary and kept to a minimum. • Clearly post speed limit and wildlife crossing signs along access roads (20 km/hr) and instruct all staff to be vigilant for wildlife while driving on site.	

Table 6-4: Potential Effects, Proposed Mitigation Measures and Residual Effects – Construction / Decommissioning

VEC	Project Activity	Potential Environmental Effects	Proposed Mitigation Measures	Residual Environmental Effects
			• Develop and implement a Sighting Response Protocol, which will include: ▪ All on-site staff will receive formal training about SAR that may be encountered within the HIWEC, including how to recognize each SAR and the proper procedure to follow if SAR is encountered; ▪ Details on what to do if SAR are encountered: immediate stop in construction activity within 10 m of an observation of a SAR until a qualified Biologist can confirm the species has vacated the construction disturbance footprint. In lieu of calling a Biologist, work can be resumed after a 24 hr period if no evidence of the species exists within the immediate area of previous observation. If the species still exists within the immediate area after 24 hr, a qualified Biologist will contacted to provide appropriate direction; ▪ For animals in immediate danger, handling procedures will be established for designated personnel (i.e., Environmental Monitor, qualified Biologist) in the event that a SAR needs to be moved out of potential harm; ▪ Maintain a species observation log to track species observations during the construction / decommissioning phase of the HIWEC so that adaptive management can be applied based on species concentrations; ▪ All construction staff will be required to report to the Environmental Monitor any snake SAR mortality or snake activity on roads; ▪ All required permits under Section 73(2) of *SARA* will be obtained prior to handling SAR; and ▪ Reporting procedures (e.g., frequency to HIFN and EC-CWS). • Post SAR Fact Sheets in areas where on-site staff can become familiar with possible species encounters. • Each construction crew that is completing site clearing or blasting will be accompanied by at least one (1) qualified Biologist that will report directly to HIW and will be responsible for searching for, and relocating (when appropriate), SAR and ensuring all applicable environmental mitigation measures are implemented if a SAR individual or residence is encountered. ▪ Each Biologist working with a construction team will be equipped with a probe camera that will allow for more robust searches under rocks or in crevices where searches may otherwise be difficult. ▪ The specific unit selected will have a minimum scope length to adequately search under, and within, gestation sites and surface crevices. ▪ The presence of any SAR individual within the construction footprint that either cannot, or should not, be re-located (as per the mitigation measures of this application), will trigger a temporary stop in local construction activity until that individual is no longer present. • The following mitigation measures will be implemented with respect to the potential for illegal poaching activities or persecution: ▪ HIW will employ an Environmental Monitor whose role will include regular patrol of the site to identify any potential illegal wildlife poaching activities. Any suspected illegal poaching activities will be reported to the appropriate authorities for action. ▪ Surveillance cameras will be placed strategically throughout the HIWEC. Camera placement will consider both sensitive and non-sensitive habitats, and both hidden and plain-view cameras will be used. The location of these cameras will not be disclosed to construction / operations staff. The Environmental Monitor (see above) will regularly review video material recorded within the site and will take appropriate steps if any suspicious or illegal poaching activity is noted. ▪ HIWEC will implement a check-in and check-out policy for vehicles. Each authorized vehicle will prominently display an access form in the windshield to demonstrate to other vehicles and site employees that the vehicle has checked in and is authorized to be on-site. ▪ Facilitate, either directly or in collaboration with another organization (i.e. EC-CWS, MNRF, Toronto Zoo, Crimestoppers, etc.), an anti-poaching public awareness initiative within Parry Sound District. ▪ Random vehicles checks for wildlife will occur for vehicles that are leaving the site. ▪ Illegal activities of any kind, including poaching or intentional harming, harassing or killing of a SAR, will not be tolerated by HIW and will result in immediate reporting to the responsible authorities. Should the illegal activities be undertaken by an individual(s) employed HIW, they will be dismissed. ▪ HIW commits to provide a monetary reward to any individual that provides information that leads to a successful investigation of a poaching incident within the HIWEC. ▪ All contractors will be required to sign a Non-Disclosure Agreement (NDA) that relates to all wildlife observed at HIWEC. The NDA will be worded in such a way that it protects all wildlife without naming any particular species. • The following mitigation measures will be implemented with respect to the Environmental Monitor: ▪ An Environmental Monitor will be on site during all construction activities; ▪ An Environmental Monitor will be present during all blasting activities (to review the site prior to and during	

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VEC	Project Activity	Potential Environmental Effects	Proposed Mitigation Measures	Residual Environmental Effects
			blasting activities, and ensure compliance with the SAR Blasting Plan; ▪ Additional Environmental Monitors (e.g., Rattlesnake Monitors) will be present during key construction activities including vegetation removal, dewatering and blasting, and as required to ensure compliance with environmental requirements; ▪ Environmental Monitors will also complete daily, weekly and monthly monitoring of general and specific activities / measures (such as monitoring ecopassages and culverts to ensure that no debris is compromising their use, effectiveness of erosion and sedimentation control measures, fuel storage tanks etc.); and ▪ Environmental Monitors will also keep daily logs of their activities and note any non-compliance issues. Any non-compliance issues will be provided to the General Contractor for immediate follow-up.	
		Habitat change (including possible damage, destruction and / or fragmentation of bat SAR residences or bat SAR habitat) *Change in behaviour, due to disturbance of SAR* *Change in mortality risk (including harm, harassment and / or killing of SAR)* <u>*Bat Species at Risk</u> • Little Brown Bat (*Myotis lucifugus*)Up to 189.1 ha (2.2%) of suitable habitat loss Northern Myotis (*Myotis septentrionalis*) • Up to 189.1 ha (2.2%) of suitable habitat loss Tri-colored Bat (*Perimyotis subflavus*) • Up to 189.1 ha (2.2%) of suitable habitat loss *****Areas and associated percentages of suitable habitat loss are based on the 120 WTG layout.	• Preconstruction surveys will be undertaken to further identify key habitats such as hibernation, gestation, nesting areas for micrositing of project component layout to avoid these areas or application of appropriate mitigation. • Any trees proposed for removal and any suitable rock crevices in areas proposed for blasting during the bat roosting season (April 30 to September 1) will be searched for signs of maternity roosts by a qualified Biologist prior to any construction activities that may affect the habitat. ▪ Searches will initially consist of visual scans of the habitat for signs of use to determine the likelihood of occupancy. ▪ If habitat assessments confirm that a site is being used, or likely being used, evening exit surveys will be completed to confirm whether individuals are actively using a particular site. ▪ If an active roost site is found within the construction footprint: ▪ A minimum buffer of 10 m will be implemented around the site. The radius of the buffer will range depending on the species, type of roosting (bachelor or day roosting versus maternity roosting), level of disturbance and landscape context, which will be confirmed by a qualified Biologist experienced in bat ecology. The UTM of the roost location will be recorded, and the limits of the buffer area will be clearly identified. ▪ Since roost locations regularly move within a season, the removal of trees or blasting can occur once a qualified Biologist provides confirmation that the roost site is no longer being used, providing that disturbance activities occur within 24 hrs as to not allow for re-occupation of the habitat. ▪ If habitat assessments and / or exit surveys indicate a site is not being used, there is no restriction on proposed activity. • Minimize vegetation removal and limit to within the construction footprint. The construction footprint will be clearly defined prior to vegetation removal. Delineation will be in the form of flagging tape, wooden stakes and / or silt fence barriers that will each provide clear identification of the construction limits. With respect to the latter (silt fence barriers), these will be implemented if sedimentation control is also required. • The construction footprint will be microsited within the larger permitted HIWEC location to construct HIWEC infrastructure, such as roads, away from SAR habitats and residences and complex habitats, by a qualified Biologist. If this is not possible, appropriate timing windows and clearing restrictions will be applied (see above). • To prevent the spread of WNS, construction vehicles are to remain within the existing access routes and construction areas. • Rehabilitation will be advanced within all temporary construction / decommissioning areas within one (1) year of the completion of the construction / decommissioning phase. For areas that will be temporarily disturbed during construction/decommissioning: ▪ Prior to removal, habitat type and conditions will be documented. ▪ Transplanting of species will occur for species that would have a high probability of survival success (i.e. tree seedlings). ▪ A biologist will ensure conditions of rehabilitated area contain suitable soil and moisture conditions for replanting/transplanting of native tree/shrub/herbaceous stock. ▪ In areas where soils are absent (i.e. the rock barrens), if the original habitat conditions was bare rock devoid of vegetation, no replanting will occur. Should soils be absent in areas that originally contained vegetation, grading to establish moisture conditions suitable for moss mats will occur. • Although it is not possible to calculate the area of temporary disturbance associated with access roads due to micrositing and site-specific conditions, the temporary disturbance area associated with WTG construction / decommissioning is approximately 17.3 ha. • Prior to the construction phase, erect a minimum of 30 artificial roosting structures within the HIWEC study area, with the potential for additional habitats to be created based on the micrositing process. The artificial roosting structures may include bat houses and / or artificial bark. The location of artificial roosting structures will be preferentially chosen for areas away from operational WTGs, but may include locations around the substation, along portions of the access road, or in other areas of the HIWEC study area away from any infrastructure.	*Residual effect on habitat change* • Effects on the habitat of bat SAR including possible damage or destruction of residences can be minimized provided recommended mitigation is implemented; however, some bat SAR habitat will be removed. No residual effects of habitat fragmentation are anticipated for bat SAR, given that these species will likely forage in newly created small opening in forest cover. *No residual effect on change in behaviour* • Effects on the behaviour of bat SAR due to artificial lighting at night can be mitigated provided construction and decommissioning activities occur during daylight hours. *Residual effect on change in mortality risk* • Increased mortality risk (including harm) to bat SAR can be minimized provided recommended mitigation is implemented; however, isolated bat SAR mortality is possible.

Table 6-4: Potential Effects, Proposed Mitigation Measures and Residual Effects – Construction / Decommissioning

VEC	Project Activity	Potential Environmental Effects	Proposed Mitigation Measures	Residual Environmental Effects
			Specific locations will be determined in consultation with EC. Suitable off-site locations will also be considered, such as other Reserve lands or through collaborations with Ontario Parks or other conservation organizations. • In order to minimize potential attractants (i.e., garbage) and consequently, an increased abundance of terrestrial predators (i.e., racoon [Procyon lotor], striped skunk [Mephitis mephitis], etc.), an anti-littering policy that will be required to be followed by all on-site staff, will be implemented. Outdoor garbage receptacles will only be installed at the Operations building, near the entrance to the site, and will be wildlife-proof to minimize the potential to attract scavengers and predators. • Develop and implement a SAR Blasting Plan, that might include, but will not be limited to: ▪ Blasting will only occur in areas that have already been cleared of vegetation; ▪ The construction footprint will be microsited to reduce blasting to the greatest extent possible. ▪ No blasting will occur in wetland or open aquatic habitats; ▪ Blast mats will be used to control debris and sound generated from blasting; ▪ Pre-blast species searches will be completed by a qualified Biologist prior to any blasting activity that occurs during the bat roosting season (April 30 to September 1) to ensure no bat SAR are present; and ▪ Follow proper drilling, explosive handling and loading procedures. • Conduct construction and decommissioning activities during daylight hours for increased visibility as well as to avoid light pollution effects during the night. ▪ In emergency circumstances where construction / decommissioning activities must occur at night from April to September, a lighting scheme will be used to minimize potential risks to bat SAR and will include the following: ▪ Lighting or spotlights will be directed downward, temporary and kept to a minimum. • Develop and implement a Sighting Response Protocol, which will include: ▪ All on-site staff will receive formal training about SAR that may be encountered within the HIWEC, including how to recognize each SAR and the proper procedure to follow if SAR is encountered; ▪ Details on what to do if SAR are encountered: immediate stop in construction activity within 10 m of an observation of a SAR until a qualified Biologist can confirm the species has vacated the construction disturbance footprint. In lieu of calling a Biologist, work can be resumed after a 24 hr period if no evidence of the species exists within the immediate area of previous observation. If the species still exists within the immediate area after 24 hr, a qualified Biologist will be contacted to provide appropriate direction; ▪ For animals in immediate danger, handling procedures will be established for designated personnel (i.e., Environmental Monitor, qualified Biologist) in the event that a SAR needs to be moved out of potential harm; ▪ Maintain a species observation log to track species observations during the construction / decommissioning phase of the HIWEC so that adaptive management can be applied based on species concentrations; ▪ All required permits under Section 73(2) of *SARA* will be obtained prior to handling SAR; and ▪ Reporting procedures (e.g., frequency to HIFN and EC-CWS). • Post SAR Fact Sheets in areas where on-site staff can become familiar with possible species encounters. • The following mitigation measures will be implemented with respect to the Environmental Monitor: ▪ An Environmental Monitor will be on site during all construction activities; ▪ An Environmental Monitor will be present during all blasting activities (to review the site prior to and during blasting activities, and ensure compliance with the SAR Blasting Plan; ▪ Additional Environmental Monitors will be present during key construction activities including vegetation removal, dewatering and blasting, and as required to ensure compliance with environmental requirements; ▪ Environmental Monitors will also complete daily, weekly and monthly monitoring of general and specific activities / measures (such as monitoring ecopassages and culverts to ensure that no debris is compromising their use, effectiveness of erosion and sedimentation control measures, fuel storage tanks etc.); and ▪ Environmental Monitors will also keep daily logs of their activities and note any non-compliance issues. Any non-compliance issues will be provided to the General Contractor for immediate follow-up.	

Table 6-4: Potential Effects, Proposed Mitigation Measures and Residual Effects – Construction / Decommissioning

VEC	Project Activity	Potential Environmental Effects	Proposed Mitigation Measures	Residual Environmental Effects
Land and Resources Used for Traditional Purposes by Aboriginal Persons	• Site preparation • Construction of access roads and laydown areas • Transportation of equipment and materials (construction) • Foundation excavation and construction • WTG installation • Collector system and transmission line installation • Installation of TSs • Construction completion • Power connection and commissioning • Power disconnection and commissioning • Transportation of equipment and materials (decommissioning) • Disassembly and removal of collector system components • WTG and / or tower disassembly and removal • Disassembly and removal of O&M building infrastructure • Decommissioning completion	• Change in land use on lands currently available for traditional activities such as hunting, trapping, fishing and plant gathering.	• Develop a site policy for safety and permitted access within the HIWEC regarding Aboriginal traditional uses allowed on the site during construction / decommissioning, (e.g., a firearms and / or hunting policy). • HIWEC components sited based on feedback from the community through Aboriginal Traditional Knowledge and constraint discussions. • Continue existing access to Henvey Inlet. • Minimize clearing widths for access roads, collector lines, transmission lines and WTG areas to the area necessary for safe construction and operation of the HIWEC. • Initiate site reclamation of temporarily disturbed areas immediately following construction. • Mitigation measures proposed in under the Vegetation and Ecological Communities VEC, Wildlife and Wildlife Habitat VEC and Fish and Fish Habitat VEC to minimize loss of habitat and disturbance to wildlife will serve to further reduce impacts to HIFN traditional use activities.	*Residual effect on land and resources used for traditional purposes by Aboriginal persons* • Temporary change in land use on lands currently available for traditional activities such as hunting, trapping, fishing and plant gathering due to loss of habitat and disturbance to wildlife and vegetation species within the construction footprint. Land uses including hunting, trapping, fishing, plant gathering, boating and the use of seasonal and permanent residences can continue outside of the construction / decommissioning footprint.
		• Disturbance to current land users from construction / decommissioning noise and vibration.	• Limit construction activities to daylight hours. • Equip vehicles with effective muffler and exhaust systems. • Avoid unnecessary idling of engines. • Ensure that construction equipment is frequently maintained and kept in good working condition. • Ensure that noise emissions from construction equipment not exceed guidelines specified in Ontario Ministry of the Environment and Climate Change (MOECC) publication NPC-115 and manufacturer recommendations. • Implement construction speed limit of 20 km/hr on all access roads. • Undertake blasting operations in accordance with applicable federal and provincial guidelines (Ontario Ministry of the Environment Guidelines on Information Required for the Assessment of Blasting Noise and Vibration, 1985). • Maintain ongoing communication with Bekanon Road residents, other HIFN members on HIFN I.R. #2 and other affected land users about construction timelines and activities. • If complaints arise from users, develop and maintain a reporting log, respond to complaint in a timely fashion and mitigate accordingly.	*Residual effect on land and resources used for traditional purposes by Aboriginal persons* • Disturbance to current land users can be mitigated be partially mitigated through standard mitigation measures for construction noise effects; however, some intermittent disturbance will remain through the construction and decommissioning phases.
		• Reduced access to on-Reserve lands during construction / decommissioning	• Maintain ongoing communication with Bekanon Road residents, other HIFN members on HIFN I.R. #2 and other affected land users about construction / decommissioning timelines, activities and associated access limitations. • Maintain existing access Henvey Inlet throughout construction / decommissioning. • Access limitations will be confined to active construction areas. • Restricted areas to be clearly marked. • Develop access plans for authorized users during the construction / decommissioning period. • Install signage to notify authorized road users of construction / decommissioning activities, where appropriate. • If complaints arise from users, develop and maintain a reporting log, respond to complaint in a timely fashion and mitigate accordingly.	*Residual effect on land and resources used for traditional purposes by Aboriginal persons* • Reduced access will be confined to the active construction areas. Access to primary land uses including hunting, trapping, fishing, plant gathering, boating and the use of seasonal and permanent residences will be largely unaffected by construction / decommissioning activities. Some restricted access to active construction areas would remain.
Cultural Resources / Heritage and Archaeological Sites	• Site preparation • Construction of O&M building infrastructure • Construction of access roads and laydown areas • Foundation excavation and construction • Collector system and transmission line installation • WTG installation • Installation of TSs • Disassembly and removal of collector system components • WTG and / or tower disassembly and removal • Disassembly and removal of O&M building infrastructure	*Potential effects on archaeological resources* • Potential to impact archaeological resources during excavation activities.	• If unanticipated archaeological resources are uncovered during construction and decommissioning all activities must stop until an archaeologist can evaluate the situation and carry out any required assessment to preserve the archaeological information. Construction activities will not re-commence until any negative impacts to archaeological resources are mitigated either through fully excavating any archaeological sites and removing them from the ground, or by adjusting infrastructure placement to avoid archaeological sites. No archaeological resource will leave the site as it is the property of HIFN.	*No residual effects* • No effects to archaeological resources provided the resources are mitigated through excavation or avoidance.
		Potential direct and indirect effects on cultural heritage features • Potential to impact cultural heritage features during construction activities.	• Site HIWEC infrastructure to avoid cultural heritage features. • If unanticipated cultural heritage features are discovered during construction and decommissioning all activities must stop until an Archaeologist can evaluate the situation and carry out any required assessments. Construction activities will not re-commence until any negative impacts are mitigated.	*No residual effects* • No effects to cultural heritage features provided the HIWEC infrastructure is sited to avoid features.

Table 6-4: Potential Effects, Proposed Mitigation Measures and Residual Effects – Construction / Decommissioning

VEC	Project Activity	Potential Environmental Effects	Proposed Mitigation Measures	Residual Environmental Effects
Air Quality	• Site preparation • Construction of access roads and laydown areas • Transportation of equipment and materials (construction) • Foundation excavation and construction • WTG installation • Collector system and transmission line installation • Installation of TSs • Construction completion • Power connection and commissioning • Power disconnection and commissioning • Transportation of equipment and materials (decommissioning) • Disassembly and removal of collector system components • WTG and / or tower disassembly and removal • Disassembly and removal of O&M building infrastructure • Decommissioning completion	• Vehicle and equipment emissions contributing to a reduction in local air quality.	• Equip vehicles with effective exhaust systems. • Avoid unnecessary idling of engines. • Ensure that construction equipment is frequently maintained and kept in good working condition.	*No residual effects* • Emissions from construction activities are not anticipated to result in a measureable increase in local or regional air quality parameters.
		• Dust generation from vehicle use and construction activity contributing to a reduction in local air quality.	• Implement construction speed limit of 20 km/hr on all access roads. • Conduct dust suppression (i.e., spraying water on access roads and work areas) during dry conditions to minimize dust generation on vegetation. In the event that dust accumulates on leaves of plants, which may reduce photosynthesis, water will be used to wash dust off of vegetation. • • If complaints arise, develop and maintain a reporting log, respond to complaint in a timely fashion and mitigate accordingly.	*No residual effects* • Emissions from construction activities are not anticipated to result in a measureable increase in local or regional air quality parameters.
Local Residents, Cottagers and Businesses	• Site preparation • Construction of access roads and laydown areas • Transportation of equipment and materials (construction) • Foundation excavation and construction • WTG installation • Collector system and transmission line installation • Installation of TSs • Construction completion • Power disconnection and commissioning • Transportation of equipment and materials (decommissioning) • Disassembly and removal of collector system components • WTG and / or tower disassembly and removal • Disassembly and removal of O&M building infrastructure • Decommissioning completion	• Disturbance to local residents, cottagers and businesses from construction / decommissioning noise and vibration.	• Mitigation for disturbance to local residents, cottagers and businesses due to construction / decommissioning noise and vibration is considered under the Land and Resources Used for Traditional Purposes by Aboriginal Persons VEC.	*Residual effect on local resident, cottagers and businesses* • Disturbance to local residents, cottagers and businesses can be minimized through standard mitigation measures for construction noise effects; however, some intermittent disturbance may remain through the construction and decommissioning phases.
		• Reduced access to HIFN I.R. #2 by Aboriginal and non-Aboriginal residence/cottage owners on I.R. #2.	• Maintain existing access to Henvey Inlet, throughout construction/ decommissioning. • Access limitations will be confined to active construction areas. • Work restricted areas to be clearly marked. • Develop access plans for authorized users during the construction / decommissioning period. • Install signage to notify authorized road users of construction / decommissioning activities, where appropriate.	*No residual effect.* • Reduced access is not anticipated since construction and decommissioning activity will not affect access primary use areas for recreation and tourism such as Henvey Inlet, Georgian Bay and Key River.

Table 6-4: Potential Effects, Proposed Mitigation Measures and Residual Effects – Construction / Decommissioning

VEC	Project Activity	Potential Environmental Effects	Proposed Mitigation Measures	Residual Environmental Effects
Recreation and Tourism	• Site preparation • Construction of access roads and laydown areas • Transportation of equipment and materials (construction) • Foundation excavation and construction • WTG installation • Collector system and transmission line installation • Installation of TSs • Construction completion • Power disconnection and commissioning • Transportation of equipment and materials (decommissioning) • Disassembly and removal of collector system components • WTG and / or tower disassembly and removal • Disassembly and removal of O&M building infrastructure • Decommissioning completion	• Avoidance of overnight accommodations and recreational activities near the HIWEC due to noise and vibration.	• Mitigation for avoidance of overnight accommodations and recreational activities near the HIWEC due to noise and vibration is considered under the Land and Resources Used for Traditional Purposes by Aboriginal Persons VEC.	*Residual effect on recreation and tourism* • Avoidance of overnight accommodations and recreational activities near HIWEC is not anticipated. Noise and vibration disturbance can be partially mitigated through standard mitigation measures for construction noise effects; however, some disturbance may remain through the construction and decommissioning phases.
Community Services and Infrastructure	• Transportation of equipment and materials	• Increase in truck traffic where the south access road crosses Bekanon Road.	• Prohibit construction vehicles (including personal vehicles) from travelling along Bekanon Road, except to cross Bekanon Road, wherever possible. • Notify HIFN in advance of construction delivery schedules and install signage to notify road users of construction activity, where appropriate.	*Residual effect on traffic* • Construction vehicles will not be permitted to travel along Bekanon Road, wherever possible; however, some residual traffic effects may occur intermittently where the south access road crosses Bekanon Road throughout the construction period.
	• Construction of access roads and laydown areas • Foundation excavation and construction	• Potential disruption to local water supply wells from construction activity.	• Mitigation measures proposed under the Groundwater VEC will be followed and include: ▪ Undertake blasting operations and pile driving in accordance with relevant federal and provincial guidelines and standards. ▪ Develop and implement a Blasting Plan that includes standard BMPs to minimize extent of adverse noise and vibration from blasting (also refer to mitigation measures for "*Reduction in soil quality and / or quantity due to erosion, sedimentation and compaction resulting from excavation, blasting, use of heavy equipment on exposed soils and stockpiling of cleared materials*" under the Soils and Terrain VEC for a list of proposed blasting BMPs). ▪ In the event an impact to private water well is detected the well owner will be provided with a potable supply of water and maintain the supply until water quality conditions are comparable to baseline conditions. In the event water quality does not recover to baseline conditions, the impacted well will be modified (i.e., deepened) or a new well be constructed that is sufficient to provide the resident with a potable supply of water similar in quantity and quality of baseline conditions.	*Residual effect on local water supply wells* • Reduction in groundwater quality (turbidity) and quantity would be minimized through the development and implementation of a Blasting Plan; however, a disturbance to the subsurface resulting in a temporary reduction in groundwater quality and / or quantity may remain. • In the unlikely event of physical damage to groundwater supply wells appropriate mitigation to the affected well owner will ensure effects are minimal. • See the Groundwater VEC for residual effects on water supply wells from construction activity.

Table 6-5: Potential Effects, Proposed Mitigation Measures and Residual Effects – Operations

VEC	Project Activity	Potential Environmental Effects	Proposed Mitigation Measures	Residual Environmental Effects
Soils and Terrain	• WTG, collector system / on-Reserve transmission, road and crossing repair / maintenance	*Changes to soil quality* • Reduction in soil quality due accidental release of contaminants.	• Develop and implement a Spill Prevention and Response Plan outlining steps to prevent and contain any chemicals and to avoid soil contamination. This plan will include, for example: ▪ Protocols for access to spill control and containment equipment / materials (e.g., ensure that spill control and containment equipment / materials are readily available on-site and additional spill clean-up materials will be available if needed, restock materials contained in spill clean-up kits as necessary). ▪ Protocols for handling contaminated materials (i.e., to be handled in accordance with relevant federal and provincial guidelines and standards). ▪ MSDS which provides information on proper handling of chemicals readily available for the types of chemicals that will be used on-site. ▪ Training requirements for operational staff on associated emergency response plan and spill clean-up procedures. ▪ Protocols for cleaning up spills (i.e., clean up spills as soon as possible, with contaminated soils removed to a licenced disposal site, if required; analyze any soil encountered during operations that has visual staining or odours, or contains rubble, debris, cinders or other visual evidence of impacts to determine its quality in order to identify the appropriate disposal method). ▪ Reporting procedures to meet federal, provincial and local requirements (e.g., reporting spills and verification of clean-up), emergency contact and HIWEC management phone numbers. • Apply the following general mitigation measures to avoid soil contamination: ▪ Ensure machinery is maintained free of fluid leaks. ▪ Site maintenance, vehicle maintenance, vehicle washing and refuelling to be done on spill pads in specified areas at least 30 m away from wetlands and / or waterbodies. ▪ Store any stockpiled materials at least 30 m away from wetlands and / or waterbodies. ▪ Store any potential contaminants (e.g., oil, fuels and chemicals) in designated areas using secondary containment, where necessary. ▪ All potentially hazardous materials to be stored in containment sites within the O&M building, within berms where possible. ▪ Keep ROW for access roads, collector lines /on-Reserve transmission lines and WTGs clear of garbage and debris.	*Residual effect on soil quality* • Reduction in soil quality due to accidental release of contaminants during operations would be minimized following implementation of mitigation measures; however, residual contaminants may remain in some areas of the HIWEC.
Groundwater	• Physical presence of WTG and roads	*Changes to groundwater quantity* • Reduction in groundwater recharge quantities due to increases in impervious surfaces (e.g., WTG foundations, access roads and buildings) and changes to infiltration and surface runoff patterns.	• Apply mitigation measures to increase groundwater infiltration, as described in the **Construction and Decommissioning Effects and Mitigation Table 6-4** during the design and construction phase.	*Residual effect on groundwater quantity* • Reduction in groundwater recharge quantities due to increases in impervious surfaces and changes to infiltration and surface runoff patterns would be minimized following implementation of mitigation measures; however, the creation of impervious surface (i.e., paved parking lots, compressed gravel roads, WTG foundations and buildings) is not completely avoidable and therefore some reduction in groundwater recharge may remain.
	• WTG, collector system / on-Reserve transmission, road and crossing repair / maintenance	*Changes to groundwater quality* • Reduction in groundwater quality due to accidental contaminant spills, vehicle and machinery operation.	• Develop and implement a Spill Prevention and Response Plan outlining steps to prevent and contain any chemicals or to avoid contamination of adjacent waterbodies and train staff on associated procedures. • Apply the following general mitigation measures to avoid soil and / or water contamination: ▪ Ensure machinery is maintained free of fluid leaks. ▪ Site maintenance, vehicle maintenance, vehicle washing and refuelling to be done in specified areas at least 30 m away from wetlands, woodlands and / or waterbodies. ▪ Store any stockpiled materials at least 30 m away from wetlands and / or waterbodies. ▪ Store any potential contaminants (e.g., oil, fuels and chemicals) in designated areas using secondary containment, where necessary. • Also refer to mitigation measures for "*Reduction in soil quality due to accidental release of contaminants during operation, etc.*" for additional proposed mitigation measures.	*Residual effect on groundwater quality* • Reduction in groundwater quality due to accidental contaminant spills, vehicle and machinery operation during operations would be minimized through the implementation of a Spill Prevention and Response Plan and other mitigation measures; however, residual contaminants may remain in some areas of the HIWEC.

Table 6-5: Potential Effects, Proposed Mitigation Measures and Residual Effects – Operations

VEC	Project Activity	Potential Environmental Effects	Proposed Mitigation Measures	Residual Environmental Effects
Wildlife and Wildlife Habitat (including Species of Conservation Concern)	• HIWEC operation • WTG, collector system, road and water crossing repair / maintenance • Environmental monitoring	*Change in mortality risk* • Possible bat and bird mortality as a result of collision with WTGs.	• Utilize a lighting scheme that will minimize continuous lighting and the use of bright lights through the HIWEC to reduce confusion to bird SAR and minimize attraction to lit structures. Lighting scheme to include the following, while still fulfilling minimum Transport Canada requirements: ▪ Implement red LED flashing lights on WTG; ▪ Light WTGs and permanent meteorological / communication towers to the minimum federal standards; ▪ Ground-level lights (i.e., buildings, WTG bases, etc.) will be directed downward and shall use motion or heat sensors where practical and allowed by applicable codes and the authority having jurisdiction; ▪ Use of high-intensity lighting or spotlights, if required, will be temporary and will be kept to a minimum; and ▪ Any internal nacelle lighting will only be used when occupied. • Implement a proactive approach to feathering WTG blades below the manufacturer's recommended cut-in speed. Feathering refers to the act of pitching WTG blades by 90°, parallel to the wind or turning the WTG nacelle so that the blades are facing away from the wind. • Develop and implement a follow-up and monitoring plan as per EC guidelines which includes a post-construction bird and bat mortality and disturbance monitoring program consistent with *Recommended Protocols for Monitoring Impacts of Wind Turbines on Birds* (EC-CWS, 2007a) and *Wind Turbines and Birds A Guidance Document for Environmental Assessment* (EC-CWS, 2007b). • Report the findings of the post-construction monitoring program to HIFN and EC-CWS on an annual basis. • Implement adaptive management techniques, such as operational mitigation as determined appropriate through post-construction monitoring.	*Residual effect for change in mortality risk* • Increase in mortality risk to birds and bats can be minimized provided recommended mitigation is implemented; however, some mortality of birds and bats as a result of collisions with WTGs is anticipated.
		Change in behaviour • Disturbance to wildlife caused by noise and light from operating WTGs and other infrastructure, and possible avoidance of the area.	• Utilize a lighting scheme that will minimize potential risks for bird and bat collisions, while still fulfilling Transport Canada requirements. Lighting scheme will include the following: ▪ Implement red LED flashing lights on WTGs. ▪ Light WTGs and permanent meteorological / communication towers to the minimum federal standards. ▪ Ground-level lights (i.e., buildings, WTG bases, etc.) will be directed downward and shall use motion or heat sensors where practical and allowed by applicable codes and the authority having jurisdiction. ▪ Use of high-intensity lighting or spotlights, if required, will be temporary and will be kept to a minimum. ▪ Any internal nacelle lighting will only be used when occupied. • Develop and implement a follow-up and monitoring plan which includes a post-construction disturbance effects monitoring program to confirm continued use of wildlife habitat following pre-construction monitoring approaches. • Report the findings of the post-construction monitoring program to HIFN and EC-CWS on an annual basis. • Implement adaptive management techniques, such as operational mitigation as determined appropriate through post-construction monitoring.	*Residual effect for change in behaviour* • Effects on the behaviour of wildlife can be minimized provided recommended mitigation is implemented; however, some wildlife may exhibit changes in behaviour during operations.
		Change in mortality risk • Possible bird and bat mortality as result of vegetation removal during routine maintenance of the overhead collector lines, on-Reserve transmission line and other HIWEC infrastructure.	• Conduct maintenance activities during daylight hours for increased visibility as well as to avoid light pollution effects during the night. ▪ In emergency circumstances where operations activities must occur at night from April to September, a lighting scheme will be used to minimize potential risks to wildlife and will include the following: ▪ Lighting or spotlights will be directed downward, temporary and kept to a minimum. • Vegetation trimming will be limited to within areas that have been previously cleared during construction. • Schedule trimming of any necessary vegetation removal during routine maintenance activities to occur outside of the overall bird nesting season, from April 1 to August 31 (EC, 2014b). The following mitigation will apply in emergency situations, in accordance with the *MBCA* and the Wildlife Management Plan: ▪ Within complex habitats*, removal of all vegetation is proposed to occur outside the core bird nesting season of May 1 to July 28, when a minimum of 60% of nesting activity occurs in each of the three (3) habitat types, as per Environment Canada's Nesting Calendar for Zone C3 (EC, 2014b); ▪ Nest surveys will be conducted by a qualified Biologist in areas defined as simple habitat* immediately prior to vegetation clearing and will include searching around the general vicinity of areas proposed for vegetation clearing, including within 10 m. Nesting activity will be documented when it consists of confirmed breeding evidence, as defined by OBBA criteria (OBBA, 2001); ▪ If an active nest or confirmed nesting activity is found, a buffer area will be implemented around the nest or nesting activity until a qualified Biologist has confirmed the nest is no longer active. The radius of the buffer will range depending on the species, level of disturbance and landscape context which will be confirmed by a qualified Biologist (EC, 2014b), but will protect a minimum area of 10 m surrounding the nest. This minimum buffer is expected to provide protection of the nest from nearby activities, such as vegetation clearing and heavy machinery or vehicle operation; ▪ The nest itself will never be marked using flagging tape or other similar material as this increases the risk of nest predation; however, the outer limits of the buffer can be marked (EC, 2014b) and UTM coordinates will be taken; and	*Residual effect for change in mortality risk* • Increase in mortality risk to birds and bats can be minimized provided recommended mitigation is implemented; however, isolated mortality as a result of vegetation removal during maintenance activities is possible.

Table 6-5: Potential Effects, Proposed Mitigation Measures and Residual Effects – Operations

VEC	Project Activity	Potential Environmental Effects	Proposed Mitigation Measures	Residual Environmental Effects
			• Schedule trimming of any necessary vegetation removal during routine maintenance activities to occur outside of the overall bat roosting season, from April 30 to September 1. If any trees must be trimmed during the bat roosting season (April 30 to September 1) during the operation of the project, each tree will be searched for signs of maternity roosts by a qualified Biologist prior to vegetation maintenance. If an active maternity roost is found, removal activities will be scheduled after the bat roosting season (April 30 to September 1) or once a qualified biologist has confirmed the tree is no longer being actively used as a roost. ▪ If an active roost site is found, a buffer area will be implemented around the site. The radius of the buffer will vary depending on the species, type of roosting (bachelor or day roosting versus maternity roosting), level of disturbance and landscape context, which will be confirmed by a qualified Biologist experienced in bat ecology. The buffer will have a minimum radius of 10 m and will be applied only when bats are present at the roost site. This minimum buffer is expected to provide protection of the roost site from minor work, such as vegetation clearing and general heavy machinery usage or vehicle operation. ▪ The UTM of the roost location will be recorded, and the limits of the buffer area will be clearly identified. If the qualified Biologist confirms that no bats are using the roost site, vegetation removal can proceed. • If any suitable hazard tree, such as a tree which poses an immediate safety risk to individuals and / or a risk to the functionality of HIWEC equipment, is identified, the tree may be removed at any time through consultation with EC-CWS. The need for additional mitigation measures or permits in these circumstances will be addressed on a site-specific basis. **Note: Complex habitats refer to habitats that contain a variety of individual nesting sites in a range of habitats. For instance, forest and shrub-dominated communities may contain nesting spots within the canopy, sub-canopy, shrub layer and ground layer, where identification of active nests may be difficult. Simple habitats refer to habitats that contain few likely nesting spots or a homogenous community where identification of active nests can be completed with confidence. For instance, open rock barrens or other sparsely vegetated habitats may be considered simple habitats, depending on site-specific vegetation cover.*	
		Change in mortality risk • Possible mortality of wildlife as result of vehicles using access roads and maintenance of access roads.	• Conduct maintenance activities during daylight hours for increased visibility as well as to avoid light pollution effects during the night. ▪ In emergency circumstances where operations activities must occur at night from April to September, a lighting scheme will be used to minimize potential risks to wildlife and will include the following: ▪ Lighting or spotlights will be directed downward, temporary and kept to a minimum. • Maintain speed limit (both 10 and 20 km/hr), wildlife crossing signs, and speed bumps installed along access roads and instruct all staff to be vigilant for wildlife while driving on site. • Avoid driving on access roads in proximity to amphibian breeding habitats at night between April 1 and June 30, and any rainy nights from spring to early autumn. Travel at night along access roads will only occur in emergency situations. • Restrict public use of access roads to minimize risk of road mortality and poaching through installation of electronic access gate in coordination with operations staff throughout the site. Security cameras at the entrance and any known turtle nesting sites will also be installed. It is the intent of HIFN to regulate the use of the HIWEC and HIFN I.R. #2 by members of HIFN and non-members. Gates will be installed at the entrances to the HIWEC and patrolling will be conducted. Currently, the site is monitored by HIFN and the MNRF. • Avoid grading as part of access road maintenance during the turtle nesting / hatching period (June 1 to September 15; GBBR, n.d.). If there are serious safety concerns or other circumstances where road maintenance may be required during this period, EC-CWS will be consulted prior to the activity taking place. • Avoid maintenance of culverts where substrates at or below the frost line are disturbed during the reptile winter hibernation period (October 15 to April 30; GBBR, n.d.) to where suitable reptile hibernation habitat within wetlands or aquatic features has been identified. However, under emergency circumstances, a contingency mitigation strategy will be developed in consultation with EC-CWS, which will include: ▪ A qualified Biologist will be on site monitoring emergency maintenance activities should any hibernating snakes or turtles be found; and ▪ In the unlikely case that a reptile is disturbed and brought out of hibernation, EC-CWS will be notified and the individual will be transported immediately to the nearest turtle trauma centre. Through the permitting process, alternative wildlife trauma centres and / or rehabilitation centres closer to the HIWEC will be examined. A map and directions to the nearest turtle trauma centre and wildlife rehabilitation centre will be posted in all operations buildings. • During the sensitive wildlife period (April 1 to September 30), all maintenance and biological crews (which will encompass the vast majority of vehicle traffic on access roads) will consist of two (2) people, one of which will be trained to scan for wildlife that may be on the road, and will use binoculars (when appropriate). The trained wildlife spotter will continually scan the access road ahead of the vehicle to ensure no wildlife (e.g., birds roosting or nesting on the ground) are near or	*Residual effect for change in mortality risk* • Increase in mortality risk to wildlife can be minimized provided recommended mitigation is implemented; however, isolated wildlife mortality as a result of vehicles using access roads may occur.

Table 6-5: Potential Effects, Proposed Mitigation Measures and Residual Effects – Operations

VEC	Project Activity	Potential Environmental Effects	Proposed Mitigation Measures	Residual Environmental Effects
			on the road. If wildlife is identified on the road, the vehicle will immediately stop and will continue around the animal at a very low speed (e.g., less than 5 km/h), if there is enough room to safely proceed. • Periodically monitor (once in early spring after snow melt and once in summer / fall) to determine if any maintenance or repair is required at all installed ecopassages and repair accordingly to allow for movement corridors in areas where high wildlife activity has been identified in order to limit road mortality.	
		Change in mortality risk • Possible bird mortality as a result of collision with overhead collector lines and on-Reserve transmission lines.	• Bird diverters / anti-perching devices will be considered in areas of concentrated bird nests (i.e., Osprey and other raptor nests) along the on-Reserve transmission line to minimize potential collisions.	*Residual effect for change in mortality risk* • Increase in mortality risk to birds can be minimized provided recommended mitigation is implemented; however, isolated mortality as a result of collisions with overhead collector lines or the transmission line may occur.
Vegetation and Ecological Communities	• WTG, collector system, road and water crossing repair / maintenance • Environmental monitoring	*Change in species diversity,* *Change in community diversity* *Change in wetland quantity and function* • Introduction of invasive species.	• If encroachment of invasive species is detected, management recommendations will be determined by a qualified Biologist. • Vegetation trimming will be limited to within areas that have been previously cleared during construction.	*Residual effect for change in species diversity* • Effects of invasive species introductions on species diversity can be minimized provided recommended mitigation is implemented; however, temporary changes in species diversity may occur. *Residual effect for change in community diversity* • Effects of invasive species introductions on community diversity can be minimized provided recommended mitigation is implemented; however, temporary changes in community diversity may occur. *Residual effect for change in wetland quantity and function* • Effects of invasive species introductions on wetland quantity and function can be minimized provided recommended mitigation is implemented; however, temporary changes in wetland quantity or function may occur.
		Change in wetland quantity and function • Risk of accidental soil or water contamination from oil, gas, etc. during maintenance activities.	• Refer to mitigation measures for *"Reduction in soil quality due to accidental release of contaminants during operation, etc."* under the Soils and Terrain VEC.	*No residual effects.* • Changes in wetland quantity and function can be mitigated provided a Spill Prevention and Response Plan is developed and implemented.
Surface Water	• WTG operation • WTG, collector system, road and crossing repair / maintenance • Environmental Monitoring	*Changes to surface water quality* • Potential effects on surface water quality due to contaminant spills, dust and emissions from maintenance vehicles and equipment and maintenance / repair of water crossings.	• **Equipment Use** ▪ In order to avoid compacting or hardening of natural ground surface, and to avoid movement of machinery on sensitive slopes, restrict equipment to designated controlled vehicle access routes and to within identified work areas. ▪ Ensure machinery is maintained free of fluid leaks. ▪ Site maintenance, vehicle maintenance, vehicle washing and refuelling to be done in specified areas at least 30 m away from wetlands and waterbodies. ▪ Use and maintain emission control devices on motorized equipment (as provided by the manufacturer of the equipment) to minimize the emissions so that they remain within industry standards. Heavy equipment and machinery to be used within operating specifications. ▪ Run vehicles and equipment only when necessary (i.e., limit idling). • **Water Quality** ▪ Develop and implement a Spill Prevention and Response Plan outlining steps to prevent and contain any chemicals or to avoid contamination of adjacent waterbodies and train staff on associated procedures. ▪ Turbid water shall not be discharged to a waterbody or wetland. ▪ Vegetation management will be done using mechanical techniques rather than herbicides. ▪ Whenever possible, operate machinery from outside the waterbody and on land above the high water mark or on ice in a manner that minimizes disturbance to the banks and bed of the waterbody. ▪ Limit machinery Fording (if required) to only the amount necessary and only outside of sensitive time periods and upon consultation with a qualified environmental monitor. If repeated fording of the watercourse is required, construct a temporary crossing structure (e.g., jersey bridge, swamp mats). ▪ Dust will be suppressed using water as a suppressant, if required.	*Residual effect on surface water quality* • Effects on surface water quality during maintenance can be minimized provided a Spill Prevention and Response Plan is developed and implemented, however, some minor effects may remain due to limitations in current spill clean-up processes.

Table 6-5: Potential Effects, Proposed Mitigation Measures and Residual Effects – Operations

VEC	Project Activity	Potential Environmental Effects	Proposed Mitigation Measures	Residual Environmental Effects
			• **Spills** • Develop and implement a Spill Prevention and Response Plan outlining steps to prevent and contain any chemicals or to avoid contamination of adjacent waterbodies and train staff on associated procedures. • Apply the following general mitigation measures to avoid soil or water contamination: ▪ Ensure machinery is maintained free of fluid leaks. ▪ Site maintenance, vehicle maintenance, vehicle washing and refuelling to be done in specified areas at least 30 m away from natural features (wetlands, woodlands and wildlife habitats) or waterbodies. ▪ Store any stockpiled materials at least 30 m away from wetlands, woodlands, wildlife habitats, or waterbodies. • Store any potential contaminants (e.g., oil, fuels and chemicals) in designated areas using secondary containment, where necessary.	
	• Operation of culverts at road crossings	*Changes to surface water quantity* • Potential for obstruction of lateral flows in waterbodies due to design of water crossing structures and debris build-up at watercourses.	• **Water Crossing Maintenance** ▪ Regular inspection of water crossing structures to confirm high and low flow of waterbody are accommodated. ▪ Regular inspection for debris buildup and / or obstruction of flow, and maintenance of such if required.	*No residual effects* • Effects minimized by proper culvert sizing and maintenance.
Fish and Fish Habitat	• WTG, collector system, road and crossing repair / maintenance • Environmental Monitoring	*Changes to fish habitat* • Potential for effects on aquatic biota and habitat due to contaminant spills, dust and emissions from maintenance vehicles and equipment.	• **Equipment Use (see above)** • **Water Quality (see above)** • **Spills (see above)**	*Residual effect on fish habitat* • Effects on aquatic biota and habitat due to dust from maintenance vehicles may be minimized following effective mitigation, however, equipment use on access roads may cause minor sedimentation into waterbodies. • Effects on fish and aquatic biota habitat due to spills are minimized following effective mitigation and implementation of a Spill Prevention and Response Plan, however, some minor effects may remain due to limitations in current spill clean-up processes.
	• Replacement and maintenance of culverts at road crossings	*Changes to fish habitat* • Potential for obstruction of fish passage in waterbodies due to design of replacement water crossings and debris build-up at watercourses.	• **Water Crossing Design** ▪ Design culverts installed at waterbodies supporting direct fish habitat to facilitate fish passage. ▪ Design culverts to accommodate high and low flows of the watercourse. • **Timing Windows** ▪ Time in-water work to avoid sensitive life stages of fish species (i.e., spawning), as follows: ▪ No in-water work from October 1 to July 15 ▪ WB-N-M4-59 ▪ No in-water work from March 15 to July 15 ▪ WEC North (WB-N-M32-14, WB-N-M6-3, WB-N-M12-12-2, WB-N-M12-12, WB-N-M26-21, WB-N-M26-31, WB-N-M28-16, WB-N-M35-1, WB-A-M3-3); ▪ WEC South (WB-S-M17-29, WB-S-M30-11, WB-S-M39-8, WB-S-M19-6, WB-S-M34-53, WB-S-M13-13) • **Monitoring** ▪ Monitor all in-water work to ensure mitigation is applied and to identify any disturbances to fish habitat. ▪ Document any changes resulting from construction activities and obtain photographic documentation.	*Residual effect on fish habitat* • Obstruction of fish passage through blocked water crossings on access roads prior to maintenance of- and during replacement of-access road crossings will be minimized by proper culvert sizing and adherence to timing windows for maintenance activities in-water; however, some change to fish habitat will remain at localized areas associated with maintenance.
Species at Risk	• HIWEC operation • WTG, collector system, road and water crossing repair / maintenance • Environmental monitoring	*Change in behaviour, due to disturbance of SAR* *Change in mortality risk (including harm, harassment and / or killing of SAR)* <u>Avian Species at Risk</u> Canada Warbler (*Cardellina canadensis*) Common Nighthawk (*Chordeiles minor*) Kirtland's Warbler (*Setophaga kirtlandii*)	• Utilize a lighting scheme that will minimize continuous lighting and the use of bright lights through the HIWEC to reduce confusion to bird SAR and minimize attraction to lit structures. Lighting scheme to include the following, while still fulfilling minimum Transport Canada requirements: ▪ Implement red LED flashing lights on WTG; ▪ Light WTGs and permanent meteorological / communication towers to the minimum federal standards; ▪ Ground-level lights (i.e., buildings, WTG bases, etc.) will be directed downward and shall use motion or heat sensors where practical and allowed by applicable codes and the authority having jurisdiction; ▪ Use of high-intensity lighting or spotlights, if required, will be temporary and will be kept to a minimum; and ▪ Any internal nacelle lighting will only be used when occupied. • Implement a proactive approach to feathering WTG blades below the manufacturer's recommended cut-in speed. Feathering refers to the act of pitching WTG blades by 90°, parallel to the wind or turning the WTG nacelle so that the blades are facing away from the wind. • Conduct maintenance activities during daylight hours for increased visibility as well as to avoid light pollution effects during the night.	*Residual effect on change in behaviour* • Effects on the behaviour of bird SAR can be minimized provided recommended mitigation is implemented; however, some bird SAR may exhibit avoidance behaviour during operations. *Residual effect for change in mortality risk* • Increase in mortality risk to bird SAR can be minimized provided recommended mitigation is implemented; however, isolated mortality of bird SAR is possible as a result of collisions with WTGs and maintenance activities.

Table 6-5: Potential Effects, Proposed Mitigation Measures and Residual Effects – Operations

VEC	Project Activity	Potential Environmental Effects	Proposed Mitigation Measures	Residual Environmental Effects
		Olive-sided Flycatcher (*Contopus cooperi*) Whip-poor-will (*Antrostomus vociferus*)	▪ In emergency circumstances where operations activities must occur at night from April to September, a lighting scheme will be used to minimize potential risks to bird SAR and will include the following: ▪ Lighting or spotlights will be directed downward, temporary and kept to a minimum. • Vegetation trimming will be limited to areas that have been previously cleared during construction. • Schedule trimming of any necessary vegetation removal during routine maintenance activities to occur outside of the overall bird nesting season, from April 1 to August 31 (EC, 2014b). If this is not possible (e.g., hazard tree), the following mitigation will apply, in accordance with the *MBCA* and the Wildlife Management Plan: ▪ Within complex habitats*, removal of all vegetation is proposed to occur outside the core bird nesting season of May 1 to July 28, when a minimum of 60% of nesting activity occurs in each of the three (3) habitat types, as per EC's Nesting Calendar for Zone C3 (EC, 2014b); ▪ Nest surveys will be conducted by a qualified Biologist in areas defined as simple habitat* immediately prior to vegetation clearing and will include searching around the general vicinity of areas proposed for vegetation clearing, including within 10 m. Nesting activity will be documented when it consists of confirmed breeding evidence, as defined by OBBA criteria (OBBA, 2001); ▪ If an active nest or confirmed nesting activity is found, a buffer area will be implemented around the nest or nesting activity until a qualified Biologist has confirmed the nest is no longer active. The radius of the buffer will range depending on the species, level of disturbance and landscape context which will be confirmed by a qualified Biologist (EC, 2014b), but will protect a minimum area of 10 m surrounding the nest. This minimum buffer is expected to provide protection of the nest from nearby activities, such as vegetation clearing and heavy machinery or vehicle operation; ▪ The nest itself will not be marked using flagging tape or other similar material as this increases the risk of nest predation; however, the outer limits of the buffer can be marked (EC, 2014b) and UTM coordinates will be taken; and • If any suitable hazard tree, such as a tree which poses an immediate safety risk to individuals and / or a risk to the functionality of HIWEC equipment, is identified, the tree may be removed at any time through consultation with EC-CWS. The need for additional mitigation measures or permits in these circumstances will be addressed on a site-specific basis. • Clearly post speed limit signs along access roads (both 10 and 20 km/hr), install speed bumps within areas of concentrated wildlife activity, and instruct all staff to be vigilant for wildlife while driving on site. • During the breeding bird season (April 1 to August 31), all maintenance and biological crews (which will encompass the vast majority of vehicle traffic on access roads) will consist of two (2) people, one (1) of which will be trained to scan for SAR birds that may be on the road, and will use binoculars (when appropriate). The trained wildlife spotter will continually scan the access road ahead of the vehicle to ensure no SAR birds are roosting or nesting on the road or shoulder. If a SAR bird is identified on the road, the vehicle will immediately stop and will continue around the bird at a very low speed (e.g., less than 5 km/h), if there is enough room to safely proceed. • Post SAR Fact Sheets in areas where on-site staff can become familiar with species that may be encountered. • Develop and implement a Sighting Response Protocol, which will include: ▪ All on-site staff will receive formal training about SAR that may be encountered within the HIWEC, including how to recognize each SAR and the proper procedure to follow if SAR is encountered; ▪ For animals in immediate danger, handling procedures will be established for site personnel in the event that a SAR needs to be moved out of potential harm (i.e., off a road); ▪ Maintain a species observation log to track species observations during the operational phase of the HIWEC so that adaptive management can be applied based on species concentrations; ▪ All operations staff will be required to report any SAR bird mortality or bird activity on roads to the appropriate staff; and ▪ All required permits under Section 73(2) of *SARA* will be obtained prior to handling SAR. • In order to minimize potential attractants (i.e., garbage) and consequently, an increased abundance of terrestrial predators (i.e., racoon [*Procyon lotor*], striped skunk [*Mephitis mephitis*], etc.), an anti-littering policy that will be required to be followed by all on-site staff, will be implemented. Outdoor garbage receptacles will only be installed at the Operations building, near the entrance to the site, and will be wildlife-proof to minimize the potential to attract scavengers and predators. • The following mitigation measures regarding post-construction monitoring will be implemented: ▪ Develop and implement a follow-up and monitoring plan as per EC guidelines which includes a post-construction bird mortality and disturbance monitoring program consistent with *Birds and Bird Habitats: Guidelines for Wind Power Projects* (MNRF, 2011a); ▪ Report the findings of the post-construction monitoring program to HIFN and EC-CWS as required on an annual basis; ▪ Implement adaptive management techniques, such as operational mitigation as determined appropriate through post-construction monitoring; and ▪ Report confirmed Species at Risk mortalities during post-construction monitoring to HIFN and EC-CWS within 48 hrs of confirmed species identification.	

Table 6-5: Potential Effects, Proposed Mitigation Measures and Residual Effects – Operations

VEC	Project Activity	Potential Environmental Effects	Proposed Mitigation Measures	Residual Environmental Effects
			**Note: Complex habitats refer to habitats that contain a variety of individual nesting sites in a range of habitats. For instance, forest and shrub-dominated communities may contain nesting spots within the canopy, sub-canopy, shrub layer and ground layer, where identification of active nests may be difficult. Simple habitats refer to habitats that contain few likely nesting spots or a homogenous community where identification of active nests can be completed with confidence. For instance, open rock barrens or other sparsely vegetated habitats may be considered simple habitats, depending on site-specific vegetation cover.*	
		Change in behaviour *Change in mortality risk (including harm, harassment and / or killing of SAR)* <u>Turtle Species at Risk</u> Blanding's Turtle (*Emydoidea blandingii*) Eastern Musk Turtle (*Sternotherus odoratus*)	• Periodically monitor (once in early spring after snow melt and once in summer / fall) to determine if any maintenance or repair is required at all installed ecopassages and repair accordingly to allow for movement corridors in areas where high turtle activity has been identified in order to limit road mortality. • Conduct maintenance activities during daylight hours for increased visibility as well as to avoid light pollution effects during the night. ▪ In emergency circumstances where operations activities must occur at night from April to September, a lighting scheme will be used to minimize potential risks to turtle SAR and will include the following: ▪ Lighting or spotlights will be directed downward, temporary and kept to a minimum. • Avoid grading as part of access road maintenance during the turtle nesting / hatching period (June 1 to September 15; GBBR, n.d.). If there are serious safety concerns or other circumstances where road maintenance may be required during this period, EC-CWS will be consulted prior to the activity taking place. • Avoid maintenance of culverts where substrates at or below the frost line are disturbed during the turtle winter hibernation period (October 15 to April 30; GBBR, n.d.) where suitable turtle hibernation habitat within wetlands or aquatic features has been identified. However, under emergency circumstances, a contingency mitigation strategy will be developed in consultation with EC-CWS, which will include: ▪ A qualified Biologist will be on site monitoring emergency maintenance activities should any hibernating turtle SAR be found; and ▪ In the unlikely case that a turtle is disturbed and brought out of hibernation, EC-CWS will be notified and the individual will be transported immediately to the nearest turtle trauma centre. Through the permitting process, alternative wildlife trauma centres and / or rehabilitation centres closer to the HIWEC will be examined. A map and directions to the nearest turtle trauma centre and wildlife rehabilitation centre will be posted in all operations buildings. • Maintain speed limit (both 10 and 20 km/hr), wildlife crossing signs, and speed bumps installed along access roads and instruct all staff to be vigilant for wildlife while driving on site. • Restrict public use of access roads to minimize risk of road mortality and poaching through installation of electronic access gate in coordination with operations staff throughout the site. Security cameras at the entrance and any known turtle nesting sites will also be installed. It is the intent of HIFN to regulate the use of the HIWEC and HIFN I.R. #2 by members of HIFN and non-members. Gates will be installed at the entrances to the HIWEC and patrolling will be conducted. Currently, the site is monitored by HIFN and the MNRF. • A long-term anti-poaching strategy, including a communication protocol for detecting and reporting suspected poaching activity within HIWEC, will be developed as part of the SAR Management Plan. • The following mitigation measures will be implemented with respect to the potential for illegal poaching activities or persecution: ▪ HIW will employ an Environmental Monitor whose role will include regular patrol of the site to identify any potential illegal wildlife poaching activities. Any suspected illegal poaching activities will be reported to the appropriate authorities for action. ▪ Surveillance cameras will be placed strategically throughout the HIWEC. Camera placement will consider both sensitive and non-sensitive habitats, and both hidden and plain-view cameras will be used. The location of these cameras will not be disclosed to construction / operations staff. The Environmental Monitor (see above) will regularly review video material recorded within the site and will take appropriate steps if any suspicious or illegal poaching activity is noted. ▪ HIWEC will implement a check-in and check-out policy for vehicles. Each authorized vehicle will prominently display an access form in the windshield to demonstrate to other vehicles and site employees that the vehicle has checked in and is authorized to be on-site. ▪ Facilitate, either directly or in collaboration with another organization (i.e. EC-CWS, MNRF, Toronto Zoo, Crimestoppers, etc.), an anti-poaching public awareness initiative within Parry Sound District. ▪ Random vehicles checks for wildlife will occur for vehicles that are leaving the site. ▪ Illegal activities of any kind, including poaching or intentional harming, harassing or killing of a SAR, will not be tolerated by HIW and will result in immediate reporting to the responsible authorities. Should the illegal activities be undertaken by an individual(s) employed HIW, they will be dismissed.	• *Residual effect on change in behaviour* • Effects on the behaviour of turtle SAR can be minimized provided recommended mitigation is implemented; however, some turtle SAR may alter nest site selection along access roads. *Residual effect on change in mortality risk* • Increase in mortality risk to turtle SAR can be minimized provided recommended mitigation is implemented; however, isolated mortality of turtle SAR may occur as a result of vehicular traffic on access roads and maintenance activities.

Table 6-5: Potential Effects, Proposed Mitigation Measures and Residual Effects – Operations

VEC	Project Activity	Potential Environmental Effects	Proposed Mitigation Measures	Residual Environmental Effects
			▪ HIW commits to provide a monetary reward to any individual that provides information that leads to a successful investigation of a poaching incident within the HIWEC. ▪ All contractors will be required to sign a Non-Disclosure Agreement (NDA) that relates to all wildlife observed at the HIWEC. The NDA will be worded in such a way that it protects all wildlife without naming any particular species. • During the active turtle period (April 15 – September 30), all maintenance and biological crews (which will encompass the vast majority of vehicle traffic on access roads) will consist of two (2) people, one of which will be trained to scan for turtle SAR that may be on the road. The trained wildlife spotter will use binoculars (when appropriate) and will continually scan the access road ahead of the vehicle to ensure no turtle SAR are near or on the road. If a turtle SAR is identified on the road, the vehicle will immediately stop and will continue around the turtle at a very low speed (e.g., less than 5 km/h), if there is enough room to safely proceed. All measures will be taken to ensure the safety of the turtle, which may include moving the turtle to a safe location off the road, and keeping vehicles at a safe distance to limit influence on natural movement behaviour. • Post SAR Fact Sheets in areas where on-site staff can become familiar with species that may be encountered. • Develop and implement a Sighting Response Protocol, which will include: ▪ All on-site staff will receive formal training about SAR that may be encountered within the HIWEC, including how to recognize each SAR and the proper procedure to follow if SAR is encountered; ▪ For animals in immediate danger, handling procedures will be established for site personnel in the event that a SAR needs to be moved out of potential harm (i.e., off a road); ▪ Maintain a species observation log to track species observations during the operational phase of the HIWEC so that adaptive management can be applied based on species concentrations; ▪ All operations staff will be required to report any turtle SAR mortality or turtle activity on roads to the appropriate staff; and ▪ All required permits under Section 73(2) of *SARA* will be obtained prior to handling SAR. • In order to minimize potential attractants (i.e., garbage) and consequently, an increased abundance of terrestrial predators (i.e., racoon [*Procyon lotor*], striped skunk [*Mephitis mephitis*], etc.), an anti-littering policy that will be required to be followed by all on-site staff, will be implemented. Outdoor garbage receptacles will only be installed at the Operations building, near the entrance to the site, and will be wildlife-proof to minimize the potential to attract scavengers and predators. • Conduct the following post-construction monitoring to determine operational impacts, if any, on turtle SAR: ▪ Two (2) years of post-construction turtle behaviour surveys; ▪ Prepare a two (2)-year report that will be provided to EC-CWS to determine if additional monitoring and / or mitigation measures are warranted; and ▪ Report confirmed SAR observed during post-construction monitoring to HIFN and EC-CWS.	
		Change in behaviour *Change in mortality risk (including harm, harassment and / or killing of SAR)* <u>Snake Species at Risk</u> Eastern Foxsnake (Georgian Bay population) (*Pantherophis gloydi pop. 1*) Eastern Hog-nosed Snake (*Heterodon platirhinos*) Massasauga Rattlesnake (Great Lakes / St. Lawrence population) (*Sistrurus catenatus pop. 1*)	• Periodically monitor (once in early spring after snow melt and once in summer / fall) to determine if any maintenance or repair is required at all installed ecopassages and repair accordingly to allow for movement corridors in areas where high snake activity has been identified in order to limit road mortality. • Conduct maintenance activities during daylight hours for increased visibility as well as to avoid light pollution effects during the night. ▪ In emergency circumstances where operations activities must occur at night from April to September, a lighting scheme will be used to minimize potential risks to snake SAR and will include the following: ▪ Lighting or spotlights will be directed downward, temporary and kept to a minimum. • Avoid maintenance of culverts where substrates at or below the frost line are disturbed during the snake winter hibernation period (October 15 to April 30; GBBR, n.d.) where suitable snake hibernation habitat within wetlands or aquatic features has been identified. However, under emergency circumstances, a contingency mitigation strategy will be developed in consultation with EC-CWS, which will include: ▪ A qualified Biologist will be on site monitoring emergency maintenance activities should any hibernating snake SAR be found; and ▪ In the unlikely case that a snake is disturbed and brought out of hibernation, EC-CWS will be notified and the individual will be transported immediately to the nearest turtle trauma centre. Through the permitting process, alternative wildlife trauma centres and / or rehabilitation centres closer to the HIWEC will be examined. A map and directions to the nearest turtle trauma centre and wildlife rehabilitation centre will be posted in all operations buildings. • Maintain speed limit (both 10 and 20 km/hr), wildlife crossing signs, and speed bumps installed along access roads and instruct all staff to be vigilant for wildlife while driving on-site.	*Residual effect on change in behaviour* • Effects on the behaviour of snake SAR can be minimized provided recommended mitigation is implemented; however, some snake SAR may alter basking site selection along access roads. *Residual effect on change in mortality risk* • Increase in mortality risk to snake SAR can be minimized provided recommended mitigation is implemented; however, isolated mortality of snake SAR is possible as a result of vehicular traffic on access roads and maintenance activities.

Table 6-5: Potential Effects, Proposed Mitigation Measures and Residual Effects – Operations

VEC	Project Activity	Potential Environmental Effects	Proposed Mitigation Measures	Residual Environmental Effects
			• Restrict public use of access roads to minimize risk of road mortality through installation of electronic access gate in coordination with operations staff throughout the site. It is the intent of HIFN to regulate the use of the HIWEC and HIFN I.R. #2 by members of HIFN and non-members. Gates will be installed at the entrances to the HIWEC and patrolling will be conducted. Currently, the site is monitored by HIFN and the MNRF. • The following mitigation measures will be implemented with respect to the potential for illegal poaching activities or persecution: ▪ HIW will employ an Environmental Monitor whose role will include regular patrol of the site to identify any potential illegal wildlife poaching activities. Any suspected illegal poaching activities will be reported to the appropriate authorities for action. ▪ Surveillance cameras will be placed strategically throughout the HIWEC. Camera placement will consider both sensitive and non-sensitive habitats, and both hidden and plain-view cameras will be used. The location of these cameras will not be disclosed to construction / operations staff. The Environmental Monitor (see above) will regularly review video material recorded within the site and will take appropriate steps if any suspicious or illegal poaching activity is noted. ▪ HIWEC will implement a check-in and check-out policy for vehicles. Each authorized vehicle will prominently display an access form in the windshield to demonstrate to other vehicles and site employees that the vehicle has checked in and is authorized to be on-site. ▪ Facilitate, either directly or in collaboration with another organization (i.e. EC-CWS, MNRF, Toronto Zoo, Crimestoppers, etc.), an anti-poaching public awareness initiative within Parry Sound District. ▪ Random vehicles checks for wildlife will occur for vehicles that are leaving the site. ▪ Illegal activities of any kind, including poaching or intentional harming, harassing or killing of a SAR, will not be tolerated by HIW and will result in immediate reporting to the responsible authorities. Should the illegal activities be undertaken by an individual(s) employed HIW, they will be dismissed. ▪ HIW commits to provide a monetary reward to any individual that provides information that leads to a successful investigation of a poaching incident within the HIWEC. ▪ All contractors will be required to sign a Non-Disclosure Agreement (NDA) that relates to all wildlife observed at the HIWEC. The NDA will be worded in such a way that it protects all wildlife without naming any particular species. • During the active snake period (April 15 – September 30), all maintenance and biological crews (which will encompass the vast majority of vehicle traffic on access roads) will consist of two (2) people, one (1) of which will be trained to scan for snake SAR that may be on the road. The trained wildlife spotter will use binoculars (when appropriate) and will continually scan the access road ahead of the vehicle to ensure no snake SAR are near or on the road. If a snake SAR is identified on the road, the vehicle will immediately stop and will continue around the snake at a very low speed (e.g., less than 5 km/h), if there is enough room to safely proceed. All measures will be taken to ensure the safety of the snake, which may include moving the snake to a safe location off the road, and keeping vehicles at a safe distance to limit influence on natural movement behaviour. • Post SAR Fact Sheets in areas where on-site staff can become familiar with species that may be encountered. • Develop and implement a Sighting Response Protocol, which will include: ▪ All on-site staff will receive formal training about SAR that may be encountered within the HIWEC, including how to recognize each SAR and the proper procedure to follow if SAR is encountered; ▪ For animals in immediate danger, handling procedures will be established for site personnel in the event that a SAR needs to be moved out of potential harm (i.e., off a road); ▪ Maintain a species observation log to track species observations during the operational phase of the project so that adaptive management can be applied based on species concentrations; ▪ All operations staff will be required to report any snake SAR mortality or snake activity on roads to the appropriate staff; and ▪ All required permits under Section 73(2) of *SARA* will be obtained prior to handling SAR. • In order to minimize potential attractants (i.e., garbage) and consequently, an increased abundance of terrestrial predators (i.e., racoon [*Procyon lotor*], striped skunk [*Mephitis mephitis*], etc.), an anti-littering policy that will be required to be followed by all on-site staff, will be implemented. Outdoor garbage receptacles will only be installed at the Operations building, near the entrance to the site, and will be wildlife-proof to minimize the potential to attract scavengers and predators. • Conduct the following post-construction monitoring to determine operational impacts, if any, on snake SAR: ▪ Two (2) years of post-construction snake behaviour surveys; ▪ Prepare a two (2)-year report that will be provided to EC-CWS to determine if additional monitoring and / or mitigation measures are warranted; and ▪ Report confirmed SAR observed during post-construction monitoring to HIFN and EC-CWS.	

Table 6-5: Potential Effects, Proposed Mitigation Measures and Residual Effects – Operations

VEC	Project Activity	Potential Environmental Effects	Proposed Mitigation Measures	Residual Environmental Effects
		Change in behaviour, due to disturbance of SAR *Change in mortality risk (including harm, harassment and / or killing of SAR)* <u>Bat Species at Risk</u> Little Brown Bat (*Myotis lucifugus*) Northern Myotis Bat (*Myotis septentrionalis*) Tri-colored Bat (*Perimyotis subflavus*)	• Utilize a lighting scheme that will minimize continuous lighting and the use of bright lights throughout the HIWEC to minimize attraction of bat SAR to lit structures (Rydell, 1992). Lighting scheme to include the following, while still fulfilling minimum Transport Canada requirements: ▪ Implement red LED flashing lights on WTGs. ▪ Light WTGs and permanent meteorological / communication towers to the minimum federal standards. ▪ Ground-level lights (i.e., buildings, WTG bases, etc.) will be directed downward and shall use motion or heat sensors where practical and allowed by applicable codes and the authority having jurisdiction. ▪ Use of high-intensity lighting or spotlights, if required, will be temporary and will be kept to a minimum. ▪ Any internal nacelle lighting will only be used when occupied. • Implement a proactive approach to feathering WTG blades below the manufacturer's recommended cut-in speed. Feathering refers to the act of pitching WTG blades by 90°, parallel to the wind or turning the WTG nacelle so that the blades are facing away from the wind. • Conduct maintenance activities during daylight hours for increased visibility as well as to avoid light pollution effects during the night. ▪ In emergency circumstances where operations activities must occur at night from April to September, a lighting scheme will be used to minimize potential risks to bat SAR and will include the following: ▪ Lighting or spotlights will be directed downward, temporary and kept to a minimum. • Vegetation trimming will be limited to areas that have been previously cleared during construction. • Schedule trimming of any necessary vegetation removal during routine maintenance activities to occur outside of the overall bat roosting season, from April 30 to September 1. If any trees must be trimmed during the bat roosting season (April 30 to September 1) during the operation of the HIWEC, each tree will be searched for signs of maternity roosts by a qualified Biologist prior to vegetation maintenance. If an active maternity roost is found, removal activities will be scheduled after the bat roosting season (April 30 to September 1) or once a qualified biologist has confirmed the tree is no longer being actively used as a roost. ▪ If an active roost site is found, a buffer area will be implemented around the site. The radius of the buffer will vary depending on the species, type of roosting (bachelor or day roosting versus maternity roosting), level of disturbance and landscape context, which will be confirmed by a qualified Biologist experienced in bat ecology. The buffer will have a minimum radius of 10 m and will be applied only when bats are present at the roost site. This minimum buffer is expected to provide protection of the roost site from minor work, such as vegetation clearing and general heavy machinery usage or vehicle operation. ▪ The UTM of the roost location will be recorded, and the limits of the buffer area will be clearly identified. If the qualified Biologist confirms that no bats are using the roost site, vegetation removal can proceed. • If any suitable hazard tree, such as a tree which poses an immediate safety risk to individuals and / or a risk to the functionality of HIWEC equipment, is identified, the tree may be removed at any time through consultation with EC-CWS. The need for additional mitigation measures or permits in these circumstances will be addressed on a site-specific basis. • Post SAR Fact Sheets in areas where on-site staff can become familiar with species that may be encountered. • Develop and implement a Sighting Response Protocol, which will include: ▪ All on-site staff will receive formal training about SAR that may be encountered within the HIWEC, including how to recognize each SAR and the proper procedure to follow if SAR is encountered; ▪ For animals in immediate danger, handling procedures will be established for site personnel in the event that a SAR needs to be moved out of potential harm (i.e., off a road); ▪ Maintain a species observation log to track species observations during the operational phase of the project so that adaptive management can be applied based on species concentrations; ▪ All operations staff will be required to report any bat SAR mortality or bat activity on roads to the appropriate staff; and ▪ All required permits under Section 73(2) of *SARA* will be obtained prior to handling SAR. • In order to minimize potential attractants (i.e., garbage) and consequently, an increased abundance of terrestrial predators (i.e., racoon [Procyon lotor], striped skunk [Mephitis mephitis], etc.), an anti-littering policy that will be required to be followed by all on-site staff, will be implemented. Outdoor garbage receptacles will only be installed at the Operations building, near the entrance to the site, and will be wildlife-proof to minimize the potential to attract scavengers and predators. • The following mitigation measures regarding post-construction monitoring will be implemented: ▪ Develop and implement a follow-up and monitoring plan, which includes a post-construction bat mortality and disturbance monitoring program consistent with *Bats and Bat Habitats: Guidelines for Wind Power Projects* (OMNR, 2011b); ▪ Report the findings of the post-construction monitoring program to HIFN and EC-CWS as required on an annual basis; ▪ Implement adaptive management techniques, such as operational mitigation, as determined appropriate through post-construction monitoring; and	*Residual effect on change in behaviour* • Effects on the behaviour of bat SAR can be minimized provided recommended mitigation is implemented; however, some bat SAR may exhibit altered feeding behaviour. *Residual effect for change in mortality risk* • Increase in mortality risk to bat SAR can be minimized provided recommended mitigation is implemented; however, isolated mortality of bat SAR is possible through collisions with WTGs and maintenance activities.

Table 6-5: Potential Effects, Proposed Mitigation Measures and Residual Effects – Operations

VEC	Project Activity	Potential Environmental Effects	Proposed Mitigation Measures	Residual Environmental Effects
			▪ Report confirmed SAR mortalities during post-construction monitoring to HIFN and EC-CWS within 48 hrs of a confirmed species identification. • Develop and implement an Operational Mitigation Plan that addresses site-specific responses to observed bat SAR mortality. This plan will devise specific thresholds at which specific steps will be taken by HIW to progressively minimize the potential impact to bat SAR.	
Land and Resources Used for Traditional Purposes by Aboriginal Persons	• WTG operation • WTG, collector system, road and crossing repair / maintenance	• Change in land use on lands currently available for traditional activities such as hunting, trapping, fishing and plant gathering due to loss of habitat and disturbance to wildlife and vegetation species.	• Develop a site policy for safety and permitted access within the HIWEC on HIFN I.R. #2 regarding Aboriginal traditional uses allowed on the site during operations (e.g., a firearms and / or hunting policy). • Ensure maintenance activity is limited to pre-determined work areas. • Mitigation measures proposed in under the Vegetation and Ecological Communities VEC, Wildlife and Wildlife Habitat VEC and Fish and Fish Habitat VEC to minimize disturbance to wildlife will serve to further reduce impacts to HIFN traditional use activities.	*No residual effects* • Change in land use on lands currently available for traditional activities such as hunting, trapping, fishing and plant gathering will be confined to WTG locations (approximately 173.1 ha or 1.4% of the HIWEC study area) are temporary and will be available after decommissioning. Development of a site policy for safety and permitted access within the HIWEC on HIFN I.R. #2 regarding traditional uses will minimize potential effects.
	• WTG, collector system, road and crossing repair / maintenance • Environmental monitoring	• Disturbance to current land users from noise associated with maintenance activity.	• Limit maintenance activities to daylight hours. • Maintain ongoing communication with Bekanon Road residents, other HIFN members on HIFN I.R. #2 and other affected land users about maintenance timelines and activities. • Equip vehicles with effective muffler and exhaust systems. • Avoid unnecessary idling of engines. • Ensure that maintenance equipment is frequently maintained and kept in good working condition. • Ensure that noise emissions from maintenance equipment not exceed guidelines specified in MOECC publication NPC-115 and manufacturer recommendations. • Implement construction speed limit of 20 km/hr on all access roads. • Undertake pile driving and blasting operations in accordance with applicable federal and provincial guidelines. • If complaints arise, develop and maintain a reporting log, respond to complaint in a timely fashion and mitigate accordingly.	*Residual effect on land users* • Noise associated with maintenance activity will be very infrequent and is not expected to affect nearby receptors; however, some noise may be experienced at nearby receptors.
	• WTG operation	• Disturbance to current land users resulting from noise from WTG operation.	• Noise levels from WTGs at all non-participating receptors[1] will comply with regulatory requirements for similar projects in Ontario.	*Residual effect on land users* • Some WTG operational noise may be heard at nearby receptors but will remain below provincial standards (see **Appendix M** for detailed operational noise assessment).
Cultural Resources / Heritage and Archaeological Sites	• WTG operation • WTG, collector system, road and crossing repair / maintenance • Environmental monitoring	*Potential effects on archaeological resources* • Potential impact unknown archaeological resources during maintenance.	• Should any archaeological sites or material be identified during operations, all maintenance activities must stop until an Archaeologist can evaluate the situation and carry out any required assessment to preserve the archaeological information. Maintenance activities will not re-commence until any negative impacts to archaeological resources are mitigated either through fully excavating any archaeological sites and removing them from the ground, or by adjusting infrastructure placement to avoid archaeological sites. • In addition, an Archaeology and Cultural Resources Management Plan for discovery of unknown archaeological sites during operations will be prepared and implemented as part of an EPP.	*No residual effects* • No effects to archaeological resources provided the resources are mitigated through excavation or avoidance.
		Potential direct and indirect effects on cultural heritage features • Potential to impact cultural heritage features during maintenance activities.	• Infrastructure will be sited to avoid direct and indirect effects to cultural heritage resources. • In addition, an Archaeology and Cultural Resources Management Plan for discovery of unknown cultural heritage features during operations will be prepared and implemented as part of an EPP.	*No residual effects* • No effects to cultural heritage resources provided the infrastructure is sited to avoid direct and indirect effects.
Air Quality	• WTG, collector system, road and crossing repair / maintenance • Environmental monitoring	• Vehicle and equipment emissions contributing to a reduction in local air quality.	• Equip vehicles with effective exhaust systems. • Avoid unnecessary idling of engines. • Ensure that maintenance equipment is frequently maintained and kept in good working condition.	*No residual effects* • Emissions from maintenance activities are not anticipated to result in a measureable increase in local or regional air quality parameters.
		• Dust generation from maintenance vehicle access contributing to a reduction in local air quality.	• Implement speed limit of 20 km/hr on all access roads. • Conduct dust suppression (i.e., spraying water on access roads and work areas) during dry conditions to minimize dust generation. • If complaints arise, develop and maintain a reporting log, respond to complaint in a timely fashion and mitigate accordingly.	*No residual effects* • Emissions from maintenance activities are not anticipated to result in a measureable increase in local or regional air quality parameters.

1. *HIFN has advised that certificates of possession under the Indian Act or certificates of entitlement under the HIFN Land Code, grant exclusive use and possession of reserve lands to individual band members. As such, receptors identified within 2 km of Project turbines and transformers, on lands leased from HIFN, can only be considered participating receptors (consistent with the MOECC Noise Guidelines for Wind Farms), if they are not located within set lots delineated by certificates of possession or certificates of entitlement. Based on information provided by HIFN to the Project, there are no set lots delineated by certificates of possession or entitlement within 2 km of Project turbines or transformers.*

Table 6-5: Potential Effects, Proposed Mitigation Measures and Residual Effects – Operations

VEC	Project Activity	Potential Environmental Effects	Proposed Mitigation Measures	Residual Environmental Effects
Local Residents, Cottagers and Businesses	• WTG operation • WTG, collector system, road and crossing repair / maintenance	• Reduced access to HIFN I.R. #2 by Aboriginal and non-Aboriginal residence / cottage owners on HIFN I.R. #2.	• Develop access plans for authorized users during the operations phase. • Maintain ongoing communication with authorized users of HIFN I.R. #2 and other affected adjacent land users about maintenance activities and associated access limitations. • Maintain existing access to primary use areas including Henvey Inlet throughout operations. • Access limitations will be confined to active maintenance areas. Work restricted areas to be clearly marked.	*No residual effects* • Reduced access to lands within and adjacent to HIFN I.R. #2 for recreation is not anticipated as access to primary recreation and tourism areas such as Henvey Inlet, will not be restricted.
	• WTG, collector system, road and crossing repair / maintenance • Environmental monitoring	• Disturbance to local residents, cottagers and businesses due to noise from noise associated with maintenance activity.	• Mitigation for disturbance to local residents, cottagers and businesses due to noise from WTG and TS operation and maintenance is considered under the Land and Resources Used for Traditional Purposes by Aboriginal Persons VEC.	*Residual effect on local residents, cottagers and businesses* • Disturbance to local residents, cottagers and businesses can be partially mitigated by complying with regulatory noise emission standards and standard practices for operation and maintenance noise effects; however, some disturbance will remain.
	• WTG operation	• Disturbance to local residents, cottagers, businesses, overnight accommodations and recreational activities resulting from noise from WTG operation.	• Noise emissions from WTGs at all non-participating receptors will comply with regulatory requirements for similar projects in Ontario.	*Residual effect on local residents, cottagers and businesses* • Some WTG operational noise may be heard at nearby receptors but will remain below provincial standards (see **Appendix M** for detailed operational noise assessment).
		• Changes to the visual landscape for local residents, cottagers and businesses from the operation of WTGs.	• Minimum 500 m setback from Georgian Bay shoreline. • Potential WTG locations in areas along the Key River, Henvey Inlet and Georgian Bay have been removed as up to 91 locations will be constructed. • No vegetation clearing within 120 m of Georgian Bay, Henvey Inlet and Key River shoreline areas to preserve the shoreline landscape . HIW will ensure that the final location and determination of WTGs to be constructed meet a setback of 120 m from waterbodies and shoreline. • Limit WTG markings to manufacturer / company markings / logos. • WTG lighting beam angle will be adjusted to minimize lighting observed from ground level. • Avoid white obstruction lighting. • Ensure that all lights flash simultaneously. • Use minimum amount of lighting required to meet Transport Canada requirements.	*Residual effect on local residents, cottagers and businesses* • Changes to the visual landscape for local residents, cottagers and businesses will be partially mitigated by applying minimum setbacks from waterbodies, minimizing lighting requirements and reducing the overall layout from 120 to up to 91 WTGs. However, there will be some residual effect as WTGs will continue to be visible from various vantage points within and adjacent to the HIWEC study area.
Recreation and Tourism	• WTG operation • WTG, collector system, road and crossing repair / maintenance • Environmental monitoring	• Avoidance of overnight accommodations and recreational activities near the HIWEC due to noise from WTG and TS operation. • Avoidance of overnight accommodations and recreational activities near the HIWEC due to noise from maintenance vehicles and equipment.	• Mitigation for avoidance of overnight accommodations and recreational activities due to noise from WTG and TS operation and maintenance is considered under the Land and Resources Used for Traditional Purposes by Aboriginal Persons VEC.	*Residual effect on overnight accommodations and recreational activities* • Avoidance of overnight accommodations and recreational activities near HIWEC is not anticipated. • Any disturbance can be partially mitigated by complying with regulatory noise emission standards for similar projects and standard practices for operation and maintenance noise effects; however, some disturbance may remain.
		• Avoidance of overnight accommodations and recreational activities near the HIWEC from changes to the visual landscape.	• Minimum 500 m setback from Georgian Bay shoreline. • Potential WTG locations along the Key River and Georgian Bay have been removed as up to 91 locations will be constructed. • No vegetation clearing within 120 m of Georgian Bay, Henvey Inlet and Key River shoreline areas to preserve the shoreline landscape. HIW will ensure that the final location and determination of WTGs to be constructed meet a setback of 120 m from waterbodies and shoreline. • Limit WTG markings to manufacturer / company markings / logos. • WTG lighting beam angle will be adjusted to minimize lighting observed from ground level. • Avoid white obstruction lighting. • Ensure that all lights flash simultaneously. • Use minimum amount of lighting required to meet Transport Canada requirements.	*Residual effects on overnight accommodations and recreational activities* • Avoidance of overnight accommodations and recreational activities near the HIWEC due to changes to the visual landscape during operations is not anticipated, but difficult to predict; some avoidance by people who do not like the appearance of wind WTGs is possible. Changes to the visual landscape will be minimized by applying minimum setbacks from waterbodies and reducing the overall layout from 120 to up to 91 WTGs; however, WTGs will be visible from various vantage points within and adjacent to the HIWEC study area.

Table 6-5: Potential Effects, Proposed Mitigation Measures and Residual Effects – Operations

VEC	Project Activity	Potential Environmental Effects	Proposed Mitigation Measures	Residual Environmental Effects
Community Services and Infrastructure	• WTG operation	• Increase in truck traffic where the south access road crosses Bekanon Road.	• Prohibit maintenance vehicles (including personal vehicles) from travelling along Bekanon Road, except to cross Bekanon Road.	*Residual effect on traffic near south access road* • Construction vehicles will not be permitted to travel along Bekanon Road so minimal residual traffic effects may occur intermittently throughout the operations and maintenance period.

Table 8-1: Follow-Up Program, Monitoring and Compensation for Species at Risk

Species at Risk	Phase	Monitoring	Contingency Measures
Avian Species at Risk • Canada Warbler (*Cardellina pusilla*) • Common Nighthawk (*Chordeiles minor*) • Kirtland's Warbler (*Setophaga kirtlandii*) • Olive-sided Flycatcher (*Contopus borealis*) • Whip-poor-will (*Antrostomus vociferus*)	Construction / Decommissioning	**Follow-up Program:** • Surveys to confirm Kirtland's Warbler use of habitat within the greater landscape will be completed between May 7 to July 7 in 2016 by the same team of qualified Avian Biologists that conducted the 2015 breeding bird surveys following the standard methods outlined in the *Search Protocol for Kirtland's Warbler* (Kirtland's Warbler Recovery Team, 2012). The following two surveys will be conducted: ▪ A survey will be conducted in the vicinity of the 2015 Kirtland's Warbler observation within the HIWEC study area. ▪ Additional surveys will be conducted in suitable habitats for Kirtland's Warbler where they occur within areas that are publically accessible along the Georgian Bay Shoreline.	**Follow-up Program:** • No contingency measures are required.
		Monitoring Program: • The Environmental Monitor will be on-site during construction activities and conduct daily inspections during vegetation removal and blasting, and as necessary during other activities to ensure compliance with environmental requirements. • An Environmental Monitor will be present during key blasting activities (to review the site prior to blasting activities, prior to blasting and during blasting) to ensure compliance with the Blasting Plan. • Daily monitoring of areas where active vegetation removal is occurring by Environmental Monitor. Regular Environmental Monitoring and routine inspections will be undertaken to ensure vegetation removal occurs within the delineated construction footprint. • A qualified Biologist or trained Environmental Monitor will drive along the existing access roads and monitor for SAR each morning and afternoon. Should a SAR be encountered, steps outlined in the Sighting Response Protocol will be followed. • Confirmation of delineation of the construction footprint will be completed by the Environmental or Engineering Monitor as per construction drawings. • Monitoring of the rehabilitation activities will be completed annually for the first three (3) years between July and September to confirm vegetation has established. • The Environmental Monitor is to ensure speed limits are posted and communicated to project staff. • With respect to the Sighting Response Plan, the Environmental Monitor to ensure the species observation log is kept up to date, procedures are followed and reporting is submitted to EC.	**Monitoring Program:** • Repair any barrier fencing/boundary delineation materials if damaged, as identified by the Environmental Monitor, project staff, or construction personnel. • Prune any perimeter tree limbs or roots that are accidentally damaged by construction activities using proper arboricultural techniques. Accidental damage to trees, or unexpected vegetation removal, may require re-planting of similar, native species. If re-planting is required, a re-planting strategy will be provided to EC-CWS. • If any accidental damage to habitat occurs, rehabilitation will occur as appropriate to the type of habitat that was accidentally removed, within 1 year of the completion of the construction/ decommissioning phase. • If, after three (3) years, vegetation has not established, additional rehabilitation activities will be undertaken in areas that remain deficient of established vegetation. • Should any mortality occur outside in areas where speed bumps have not already been installed, consideration will be given to installing additional speed bumps or speed limit signs in the immediate vicinity of areas of SAR mortality. • Should there be a SAR mortality, the related procedures that are followed will be reviewed and enhanced, if necessary, to provide further SAR protection. • If any of the requirements or procedures of the Sighting Response Protocol related to staff understanding or implementation are not effective or appropriate for specific circumstances, the Environmental Team will discuss and revise the Protocol accordingly. The Environmental Team is made up of the environmental specialists from the General Contractor and HIW.
	Operations	**Follow-up Program:** • Conduct three (3) years of bird mortality monitoring consistent with *Birds and Bird Habitats: Guidelines for Wind Power Projects* (MNRF, 2011a). ▪ An end of year report, supplemented by an interim technical memo during the migratory / breeding bird season of each surveyed year, outlining the methods employed and the results of monitoring will be prepared and submitted to EC-CWS on an annual basis for the three (3) years of bird mortality monitoring to determine if additional monitoring and/or mitigation measures are warranted. • Conduct the following post-construction bird disturbance monitoring for a minimum of three (3) years: ▪ Pre-construction breeding bird surveys completed in 2015, as well as 12 other representative sites at varying distances from the HIWEC location, will be repeated annually for a minimum of three (3) years post-construction to ensure similar species abundance and diversity continue to be found in the HIWEC study area. ▪ Pre-construction crepuscular bird surveys completed in 2015 will be repeated annually for a minimum of three (3) years post-construction to ensure similar species abundance and diversity continue to be found in the HIWEC study area. ▪ An end of year report will be provided to EC-CWS, on an annual basis for the a minimum of three (3) years of post-construction bird disturbance monitoring to determine if additional monitoring and / or mitigation measures are warranted. • Conduct the post-construction bird disturbance monitoring for Kirtland's Warbler for three (3) years following the protocol for Monitoring Known Kirtland's Warbler Occurrences (Section 3.3) as described in the *Protocol for Searching and Monitoring Kirtland's Warbler in Canada* (Kirtland's Warbler Recovery Team 2010).	**Follow-up Program:** • If mortality of Common Nighthawk is recorded during the three (3) years of post-construction mortality monitoring, adaptive management measures will be determined by a qualified avian Biologist and HIW (e.g., potential turbine curtailment at dusk and dawn during the breeding bird season for Common Nighthawk in confirmed breeding areas). • Consider changes in WTG operations (e.g., changes in cut-in speed, selective shutdown of specific WTGs at key times of year or under certain weather conditions) during periods of high mortality. • In the event that, after two (2) years, breeding bird and crepuscular surveys indicate notable changes in bird populations, EC-CWS will be consulted to determine if additional mitigation measures are warranted through an adaptive management approach. Specific details of the adaptive management framework will be developed in consultation with EC-CWS during the permitting phase and documented in the Environmental Protection Plan. • In the event that post-construction breeding bird surveys note an increase in the presence of Brown-headed Cowbird, selective culling or trapping of Brown-headed Cowbird may occur or additional breeding bird monitoring may be implemented, as determined necessary through consultation with EC-CWS.
	Operations	**Monitoring Program:** • Daily monitoring of areas where active vegetation removal is occurring will be conducted by the Environmental Monitor. • During the breeding bird season (April 1 to August 31), all maintenance and biological crews will consist of two people, one of which will be trained to spot SAR birds that may be on the road.	**Monitoring Program:** • Prune any tree limbs or roots using proper arboricultural techniques • Any documented road mortality of a SAR bird will trigger consideration of contingency measures and adaptive management. The selected approach will be based on the specific circumstances that contributed to the observed impact on the species and will be determined by a qualified Biologist for the purpose of further mitigating against potential impacts to the species. • Should any mortality occur in areas where speed bumps have not already been installed, consideration will be given to installing additional speed bumps or speed limit signs in the immediate vicinity of areas of SAR mortality.

Table 8-1: Follow-Up Program, Monitoring and Compensation for Species at Risk

Species at Risk	Phase	Monitoring	Contingency Measures
Turtle Species at Risk • Blanding's Turtle (*Emydoidea blandingii*) • Eastern Musk Turtle (*Sternotherus odoratus*)	Construction / Decommissioning	**Follow-up Program:** • No follow-up program recommended during construction / decommissioning. **Monitoring Program:** • The Environmental Monitor will be on-site during construction activities and conduct daily inspections during vegetation removal, dewatering and blasting, and as necessary during other activities to ensure compliance with environmental requirements. • An Environmental Monitor will be present during key blasting activities (to review the site prior to blasting activities, prior to blasting and during blasting) to ensure compliance with the Blasting Plan. • Daily monitoring of areas where active vegetation removal is occurring by Environmental Monitor. Regular Environmental Monitoring and routine inspections will be undertaken to ensure vegetation removal occurs within the delineated construction footprint. • A qualified Biologist or trained Environmental Monitor will drive along the existing access roads and monitor for SAR each morning and afternoon. Should a SAR be encountered, steps outlined in the Sighting Response Protocol will be followed. • Confirmation of delineation of the construction footprint will be completed by the Environmental or Engineering Monitor as per construction drawings. • If any confirmed, or suspected, turtle nests are identified within the vicinity of the HIWEC location, nest monitoring will be conducted twice per week during the construction and decommissioning phases to monitor the success of the nest and ensure its protection from construction impacts. Surveys will be completed during the turtle nesting/hatching season between June 1 and September 15. • Monitoring of the rehabilitation activities will be completed annually for the first three (3) years between July and September to confirm vegetation has established. • Visual inspections will occur prior to May 1 to ensure the construction nest site(s) is suitable for turtle nesting activity. If modifications are required, these will be completed prior to the nesting period (May 15-June 30). ▪ To assess the use of the sites by turtles, monitoring of the nest sites will be completed through the use of strategically placed wildlife (game) cameras. These cameras should activated by a motion-sensor and be able to record still or video evidence during daylight or nighttime (i.e. infrared) hours. Cameras should be left in place for the entire period of May 1 to September 30, and data will be revised at a minimum of weekly during the nesting period (May 15-June 30) and monthly during the remainder of the monitoring season (July 1 to September 30). ▪ In the event that nesting activity is documented, CWS will be engaged to determine whether additional efforts should be taken to protect nests from predation. ▪ Monitoring will begin at the installation of nesting sites and will continue until the completion of the third year that the HIWEC is operational. • Water levels of wetlands or aquatic features experiencing dewatering activities will be monitored to observe any drawdown. Monitoring will include taking pre-, during and post-dewatering levels at the feature. • Develop and implement a detailed monitoring program to effectively assess impacts to wetlands through monitoring wells installed as required in accordance with the Detailed Water Taking Assessment, within the predicted ZOI for changes in wetland water level and / or water quality (i.e. suspended solids) prior to, during, and post completion of construction. • Road mortality surveys will be conducted twice a week from April 1 to October 31 during the construction and decommissioning phases to monitor the effectiveness of ecopassages / designated movement corridors and turtle mortality rates. ▪ In combination with road mortality surveys, motion-sensor cameras will be installed within each ecopassage in an effort to quantify movement activities and species use of the ecopassages. Motion-sensor cameras will be checked regularly during the active period for turtles (April 15 to September 30) when construction is occurring. ▪ These surveys will consist of a combination of incidental observations while driving along access roads and targeted walking surveys at areas of high turtle activity. ▪ All construction staff will be required to report to the Environmental Monitor any SAR turtle mortality or turtle activity on roads, as per the Sighting Response Protocol. • With respect to the Sighting Response Plan, the Environmental Monitor to ensure the species observation log is kept up to date, procedures are followed and reporting is submitted to EC.	**Follow-up Program:** • No contingency measures are required. **Monitoring Program:** • If an active nest or confirmed nesting activity is found, a buffer area will be implemented around the nest or nesting activity. The radius of the buffer will range depending on the species, level of disturbance and landscape context which will be confirmed by a qualified Biologist but will be protected by a minimum of 30 m surrounding the nest. This minimum buffer is expected to provide protection of the nest from minor work, such as vegetation clearing, access road creation, and general heavy machinery usage or vehicle operation. The nest itself should never be marked using flagging tape or other similar material as this increases the risk of nest predation; however, the outer limits of the buffer can be marked and UTM coordinates will be taken. • The nest itself will not be marked using flagging tape or other similar material as this increases the risk of nest predation, however the outer limits of the buffer can be marked and UTM co-ordinates will be taken. Through consultation with EC-CWS, a protective cage may be placed over the nest to protect it from predation. • If a turtle SAR is encountered during a pre-blast search, it will be relocated to an area of similar habitat at least 50 m, but less than 300m, from the area proposed for blasting and in the same direction that they are facing / moving by a trained turtle handler. A distance of 300 m represents the approximate distance of the home range of the turtle SAR considered in this report (Milam and Melvin 2001). In the highly unlikely event that similar habitat is not found within those parameters, the turtle will be relocated to the next closest location of similar habitat. All required permits under Section 73(2) of SARA will be obtained prior to handling SAR. • Repair any exclusionary fencing, movement fencing and /or barrier fencing/boundary materials, if damaged or otherwise not functioning properly, as identified by the Environmental Monitor, project staff, or construction personnel. • Prune any perimeter tree limbs or roots that are accidentally damaged by construction activities using proper arboricultural techniques. Accidental damage to trees, or unexpected vegetation removal, may require re-planting of similar, native species. If re-planting is required, a re-planting strategy will be provided to EC-CWS. • If any accidental damage to habitat occurs, rehabilitation will be advanced, as appropriate to the type of habitat that was accidentally removed, within 1 year of the completion of the construction/ decommissioning phase. • If, after three (3) years, vegetation has not established, additional rehabilitation activities will be undertaken in areas that remain deficient of established vegetation. • If there is drawdown, stop construction work and confirm that the drawdown is due to dewatering. If this is confirmed, then determine mitigation appropriate to the site (e.g., redirect water or monitor rain events to see if water will be replenished) through discussions with a qualified Biologist and Hydrogeologist. • In the event of a reduction in wetland water level and / or water quantity (i.e. suspended solids), corrective measures will be undertaken in accordance with the recommendations of the Detailed Water Taking Assessment. Contingency measures including but not limited to rescue of stranded wildlife will also be developed. A post construction monitoring program will be implemented to evaluate the effectiveness of mitigation measures. • Contingency measures including but not limited to the rescue of stranded turtles will also be developed. A post-construction monitoring program will be implemented to evaluate the effectiveness of mitigation measures. • Any documented road mortality of a SAR turtle species will trigger consideration of contingency measures and adaptive management. The selected approach will be based on the specific circumstances that contributed to the observed impact on the species and will be determined by a qualified Biologist for the purpose of further mitigating against potential impacts to the species. • Analysis of road mortality surveys, as well as Species Encounter Reports will determine high use areas and assist in identifying potential locations to consider retrofitting a road with an ecopassage, speed bump, or wildlife crossing sign. • If road mortality is noted, consideration will be given to closing specific access road segments to all non-essential vehicular traffic. Essential vehicular traffic will include any traffic required to meet permitting obligations or maintain infrastructure in good working order. The duration of access road closure will be determined by a qualified Biologist and will be based on the specific circumstances under which the impact has occurred. • Reduced speed limits will be considered in any area where road mortality is apparent or in other areas identified as high-use through observations during the construction phase. • A map and directions to the nearest turtle trauma centre and wildlife rehabilitation centre will be posted in all construction buildings. • Signage will be considered to raise awareness and alert vehicle drivers that wildlife may be crossing the road using wildlife crossing signs. If implemented, signage will be placed at least 10 m from the ecopassage openings to maintain the natural appearance.

Table 8-1: Follow-Up Program, Monitoring and Compensation for Species at Risk

Species at Risk	Phase	Monitoring	Contingency Measures
			• Additional site-specific mitigation measures may be identified through ongoing analysis of monitoring results and will be considered in an adaptive management approach in consultation with EC-CWS. • Should there be a SAR mortality, the related procedures that are followed will be reviewed and revised, if necessary, to provide SAR protection. • If any of the requirements or procedures of the Sighting Response Plan related to staff understanding or implementation are not effective or appropriate for specific circumstances, the Environmental Team will discuss and revise the Protocol accordingly. The Environmental Team is made up of the environmental specialists from the General Contractor and HIW.
	Operations	**Follow-up Program:** • Pre-construction herpetofauna surveys completed in 2015 will be repeated annually for a minimum of three (3) years post-construction to ensure similar species abundance and diversity continue to be found in the HIWEC study area. ▪ Turtle monitoring will be conducted following methodology used in pre-construction surveys unless otherwise required through consultation with the appropriate agencies. ▪ An end of year report will be provided to EC-CWS, supplemented by an interim technical memo, on an annual basis for the minimum three (3) years of post-construction herpetofauna surveys to determine if additional monitoring and / or mitigation measures are warranted.	**Follow-up Program:** • In the event that, after two (2) years, post-construction herpetofauna surveys indicate notable changes in turtle populations, EC-CWS will be consulted to determine if additional mitigation measures are warranted.
		Monitoring Program: • Road mortality surveys will be conducted twice a week from April 1 to October 31 for a minimum of two (2) years post-construction to monitor turtle mortality rates and the effectiveness of mitigation measures (e.g. ecopassages, speed limits, speed bumps and wildlife crossing signs). This monitoring period encompasses the period when the most vehicle activity will occur on site, albeit still relatively low traffic is expected. ▪ These surveys will consist of a combination of incidental observations while driving along access roads and targeted walking surveys at areas of high turtle activity. ▪ In combination with road mortality surveys, motion-sensor cameras will be installed within each ecopassage in an effort to quantify movement activities and species use of the ecopassages. ▪ Motion-sensor cameras will be checked regularly during the active period for turtles (April 15 to September 30) for the first three (3) years that the HIWEC is operational. ▪ An end of year report will be provided to EC-CWS, supplemented by an interim technical memo on an annual basis for the two (2) years of post-construction road mortality surveys. • During the active turtle period (April 15-September 30) all maintenance and biological crews will consist of two people, one of which will be trained to spot SAR turtles that may be on or near the road. • Conduct inspections of ecopassages (once in early spring after snow melt and once in summer/fall) during road mortality surveys for a minimum of two (2) years post-construction. • If any confirmed turtle nests are identified within the vicinity of the Project Location, nest monitoring will be conducted twice times per week during the operational phase to monitor the success of the nest and ensure its protection from operational impacts. Surveys will be completed during the turtle nesting/hatching season between June 1 and September 15. • With respect to the Sighting Response Plan, operations staff to ensure the species observation log is kept up to date and that procedures are followed.	**Monitoring Program:** • Any documented road mortality of a SAR turtle species will trigger consideration of contingency measures and adaptive management. • Analysis of road mortality surveys will determine high use areas and assist in identifying potential locations to consider installation of another ecopassage, speed bump, or wildlife crossing sign. • If road mortality is noted, specific access roads will be restricted to essential vehicular traffic only. Essential vehicular traffic will include any traffic required to meet permitting obligations or maintain infrastructure in good working order. The duration of access road closure will be determined by a qualified Biologist and will be based on life cycle characteristics of the species of which the impact has occurred. • Analysis of motion-detector camera monitoring of ecopassages will determine whether snake SAR actively use ecopassages, and may identify locations where modification to culvert design is required. • Reduced speed limits will be considered in any area where road mortality is apparent or in other areas identified as high-use through observations during the operational phase. • If a nest is identified, it will not be marked using flagging tape or other similar material as this increases the risk of nest predation, however the UTM co-ordinates of the nest will be documented. Through consultation with EC-CWS, a protective cage may be placed over the nest to protect it from predation. • All required permits under Section 73(2) of SARA will be obtained prior to handling SAR. Individuals will be handled by qualified Biologists. • If any of the requirements or procedures of the Sighting Response Plan related to staff understanding or implementation are not effective or appropriate for specific circumstances, the operations staff will discuss and revise the Protocol accordingly.
<u>Snake Species at Risk</u> • Eastern Foxsnake (Georgian Bay population) (*Pantherophis gloydi pop. 1*) • Eastern Hog-nosed Snake (*Heterodon platirhinos*) • Massasauga Rattlesnake (Great Lakes / St. Lawrence population) (Sistrurus catenatus pop. 1)	Construction / Decommissioning	**Follow-up Program:** • No follow-up program recommended during construction / decommissioning.	**Follow-up Program:** • No contingency measures are required.
		Monitoring Program: • An Environmental Monitor will be on site during all construction activities. Additional Environmental Monitors (e.g., Rattlesnake Monitors) will be present during key construction activities including vegetation removal, dewatering and blasting, and as required to ensure compliance with environmental requirements. • An Environmental Monitor will be present during key blasting activities (to review the site prior to blasting activities, prior to blasting and during blasting) to ensure compliance with the Blasting Plan. • Daily monitoring of areas where active vegetation removal is occurring by Environmental Monitor. Regular Environmental Monitoring and routine inspections will be undertaken to ensure vegetation removal occurs within the delineated construction footprint. • A qualified Biologist or trained Environmental Monitor will drive along the existing access roads and monitor for SAR each morning and afternoon. Should a SAR be encountered, steps outlined in the Sighting Response Protocol will be followed. • Confirmation of delineation of the construction footprint will be completed by the Environmental or Engineering Monitor as per construction drawings.	**Monitoring Program:** • If snake SAR are encountered during a pre-work search, work will be immediately stopped until a trained snake handler can relocate the snake to an area of similar habitat at least 50m, but less than 300m, from the area where the activity is occurring and in the same direction that they are facing / moving. A distance of 300 m is well within the home range of the snake SAR considered in this report (Rowell, 2012; COSEWIC, 2008b; Parks Canada Agency, 2013). In the highly unlikely event that similar habitat is not found within those parameters, the snake will be relocated to the next closest location of similar habitat. • Repair any exclusionary fencing, movement fencing and /or barrier fencing/boundary materials, if damaged or otherwise not functioning properly, as identified by the Environmental Monitor, project staff, or construction personnel. • Prune any perimeter tree limbs or roots that are accidentally damaged by construction activities using proper arboricultural techniques. Accidental damage to trees, or unexpected vegetation removal, may require re-planting of similar, native species. If re-planting is required, a re-planting strategy will be provided to EC-CWS. • If any accidental damage to habitat occurs, rehabilitation will be advanced, as appropriate to the type of habitat that was accidentally removed, within 1 year of the completion of the construction/ decommissioning phase.

Table 8-1: Follow-Up Program, Monitoring and Compensation for Species at Risk

Species at Risk	Phase	Monitoring	Contingency Measures
		• Monitoring of the rehabilitation activities will be completed annually for the first three (3) years between July and September to confirm vegetation has established. • Visual inspections will occur prior to May 1 to ensure the constructed gestation or hibernacula sites are suitable for snake nesting activity. If modifications are required, these will be completed prior to the nesting period (May 15-June 30). • Water levels of wetlands or aquatic features experiencing dewatering activities will be monitored to observe any drawdown. Monitoring will include taking pre-, during and post-dewatering levels at the feature. • Develop and implement a detailed monitoring program to effectively assess impacts to wetlands through monitoring wells installed as required in accordance with the Detailed Water Taking Assessment, within the predicted ZOI for changes in wetland water level and / or water quality (i.e. suspended solids) prior to, during, and post completion of construction. • Road mortality surveys will be conducted twice a week from April 1 to October 31 during the construction and decommissioning phases to monitor the effectiveness of ecopassages / designated movement corridors and snake mortality rates. ▪ In combination with road mortality surveys, motion-sensor cameras will be installed within each ecopassage in an effort to quantify movement activities and species use of the ecopassages. Motion-sensor cameras will be checked regularly during the active period for snakes (April 15 to September 30) when construction is occurring. ▪ These surveys will consist of a combination of incidental observations while driving along access roads and targeted walking surveys at areas of high snake activity. ▪ All construction staff will be required to report to the Environmental Monitor any SAR snake mortality or snake activity on roads, as per the Sighting Response Protocol. • With respect to the Sighting Response Protocol, the Environmental Monitor to ensure the species observation log is kept up to date, procedures are followed and reporting is submitted to EC.	• If, after three (3) years, vegetation has not established, additional rehabilitation activities will be undertaken in areas that remain deficient of established vegetation. • If modifications to created gestation sites are required as identified through visual inspections, these will be completed prior to the nesting period (May 15-June 30). • If there is drawdown, stop construction work and confirm that the drawdown is due to dewatering. If this is confirmed, then determine mitigation appropriate to the site (e.g., redirect water or monitor rain events to see if water will be replenished) through discussions with a qualified Biologist and Hydrogeologist. • In the event of a reduction in wetland water level and / or water quantity (i.e. suspended solids), corrective measures will be undertaken in accordance with the recommendations of the Detailed Water Taking Assessment. Contingency measures including but not limited to rescue of stranded wildlife will also be developed. A post construction monitoring program will be implemented to evaluate the effectiveness of mitigation measures. • Contingency measures including but not limited to the rescue of stranded wildlife will also be developed. A post-construction monitoring program will be implemented to evaluate the effectiveness of mitigation measures. • Any documented road mortality of a SAR snake species will trigger consideration of contingency measures and adaptive management. The selected approach will be based on the specific circumstances that contributed to the observed impact on the species and will be determined by a qualified Biologist for the purpose of further mitigating against potential impacts to the species. • Analysis of road mortality surveys, as well as Species Encounter Reports will determine high use areas and assist in identifying potential locations to consider installing an additional ecopassage, speed bump, or wildlife crossing sign. • If road mortality is noted, consideration will be given to closing specific access road segments to all non-essential vehicular traffic. Essential vehicular traffic will include any traffic required to meet permitting obligations or maintain infrastructure in good working order. The duration of access road closure will be determined by a qualified Biologist and will be based on the specific circumstances under which the impact has occurred. • If a mortality of Eastern Foxsnake is observed, movement fencing will be increased to 200cm in height to prohibit Eastern Foxsnake from gaining access to the road (MNRF, 2013). • Signage will be considered to raise awareness and alert vehicle drivers that wildlife may be crossing the road using wildlife crossing signs. If implemented, signage will be placed at least 10 m from the ecopassage openings to maintain the natural appearance. • Reduced speed limits will be considered in any area where road mortality is apparent or in other areas identified as high-use through observations during the construction phase. • Additional site-specific mitigation measures may be identified through ongoing analysis of monitoring results and will be considered in an adaptive management approach in consultation with EC-CWS. • Should there be a SAR mortality, the related procedures that are followed will be reviewed and revised, if necessary, to provide SAR protection. • If any of the requirements or procedures of the Sighting Response Plan related to staff understanding or implementation are not effective or appropriate for specific circumstances, the Environmental Team will discuss and revise the Protocol accordingly. The Environmental Team is made up of the environmental specialists from the General Contractor and HIW.
	Operations	**Follow-up Program:** • Pre-construction herpetofauna surveys completed in 2015 will be repeated annually for a minimum of three (3) years post-construction to ensure similar species abundance and diversity continue to be found in the areas of the HIWEC study area. ▪ Snake monitoring will be conducted following methodology used in 2015 pre-construction surveys unless otherwise required through consultation with the appropriate agencies. ▪ Each created gestation or hibernacula site will be added as a snake monitoring location and will be assessed following the same methods, frequency and for the same duration as identified above. ▪ An end of year report will be provided to EC-CWS, supplemented by an interim technical memo, on an annual basis for the minimum three (3) years of post-construction herpetofauna surveys to determine if additional monitoring and / or mitigation measures are warranted.	**Follow-up Program:** • In the event that, after two (2) years, herpetofauna surveys indicate notable changes in snake populations, EC-CWS will be consulted to determine if additional mitigation measures are warranted.

Table 8-1: Follow-Up Program, Monitoring and Compensation for Species at Risk

Species at Risk	Phase	Monitoring	Contingency Measures
		Monitoring Program: • Road mortality surveys will be conducted twice a week from April 1 to October 31 for a minimum of three (3) years post-construction to monitor snake mortality rates and the effectiveness of mitigation measures (e.g. ecopassages, speed limits, speed bumps and wildlife crossing signs). ▪ These surveys will consist of a combination of incidental observations while driving along access roads and targeted walking surveys at areas of high snake activity. ▪ In combination with road mortality surveys, motion-sensor cameras will be installed within each ecopassage in an effort to quantify movement activities and species use of the ecopassages. ▪ Motion-sensor cameras will be checked regularly during the active period for snakes (April 15 to September 30) for the first three (3) years that the HIWEC is operational. ▪ An end of year report will be provided to EC-CWS, supplemented by an interim technical memo on an annual basis for the minimum three (3) years of post-construction road mortality surveys. • During the active snake period (April 15-September 30) all maintenance and biological crews will consist of two people, one of which will be trained to spot SAR snakes that may be on or near the road. • Conduct inspections of ecopassages (once in early spring after snow melt and once in summer/fall) during road mortality surveys for a minimum of two (2) years post-construction. • With respect to the Sighting Response Plan, operations staff to ensure the species observation log is kept up to date and that procedures are followed.	**Monitoring Program:** • Any documented road mortality of a SAR snake species will trigger consideration of contingency measures and adaptive management. • Analysis of road mortality surveys will determine high use areas and assist in identifying potential locations to consider installation of another ecopassage, speed bump, or wildlife crossing sign. • If road mortality is noted, specific access roads will be restricted to essential vehicular traffic only. Essential vehicular traffic will include any traffic required to meet permitting obligations or maintain infrastructure in good working order. The duration of access road closure will be determined by a qualified Biologist and will be based on life cycle characteristics of the species of which the impact has occurred. • Analysis of motion-detector camera monitoring of ecopassages will determine whether snake SAR actively use ecopassages, and may identify locations where modification to culvert design is required. • Reduced speed limits will be considered in any area where road mortality is apparent or in other areas identified as high-use through observations during the operational phase. • Implement an adaptive management plan in the event of snake SAR mortality on access roads, which may include additional restrictions on use of access roads during sensitive timing windows, or the installation of traffic control measures or ecopassages in specific areas. The details of the adaptive management framework will be developed in consultation with EC-CWS. • All required permits under Section 73(2) of SARA will be obtained prior to handling SAR. Individuals will be handled by qualified Biologists. • If any of the requirements or procedures of the Sighting Response Plan related to staff understanding or implementation are not effective or appropriate for specific circumstances, the operations staff will discuss and revise the Protocol accordingly.
<u>Bat Species at Risk</u> • Little Brown Bat (*Myotis lucifugus*) • Northern Myotis Bat (*Myotis septentrionalis*) • Tri-colored Bat (*Perimyotis subflavus*)	Construction / Decommissioning	**Follow-up Program:** • No follow-up program recommended during construction / decommissioning.	**Follow-up Program:** • No contingency measures are required.
		Monitoring Program: • The Environmental Monitor will be on-site during all construction activities and conduct daily inspections during key construction activities, such as vegetation removal, dewatering and blasting, and as required to ensure compliance with environmental requirements. • An Environmental Monitor will be present during key blasting activities (to review the site prior to blasting activities, prior to blasting and during blasting) to ensure compliance with the Blasting Plan. • Daily monitoring of areas where active vegetation removal is occurring by Environmental Monitor. Regular Environmental Monitoring and routine inspections will be undertaken to ensure vegetation removal occurs within the delineated construction footprint. • A qualified Biologist or trained Environmental Monitor will drive along the existing access roads and monitor for SAR each morning and afternoon. Should a SAR be encountered, steps outlined in the Sighting Response Protocol will be followed. • Confirmation of delineation of the construction footprint will be completed by the Environmental or Engineering Monitor as per construction drawings. • Monitoring of the rehabilitation activities will be completed annually for the first three (3) years between July and September to confirm vegetation has established. • With respect to the Sighting Response Plan, the Environmental Monitor to ensure the species observation log is kept up to date, procedures are followed and reporting is submitted to EC.	**Monitoring Program:** • Repair any barrier fencing/boundary delineation materials, if damaged or otherwise not functioning properly, as identified by the Environmental Monitor, project staff or construction personnel. • Prune any perimeter tree limbs or roots that are accidentally damaged by construction activities using proper arboricultural techniques. Accidental damage to trees, or unexpected vegetation removal, may require re-planting of similar, native species. If re-planting is required, a re-planting strategy will be provided to EC-CWS. • If any accidental damage to habitat occurs, rehabilitation will be advanced, as appropriate to the type of habitat that was accidentally removed, within 1 year of the completion of the construction/ decommissioning phase. • If, after three (3) years, vegetation has not established, additional rehabilitation activities will be undertaken in areas that remain deficient of established vegetation. • If any of the requirements or procedures related to staff understanding or implementation are not effective or appropriate for specific circumstances, the Environmental Team will discuss and revise the Protocol accordingly. The Environmental Team is made up of the environmental specialists from the General Contractor and HIW.
	Operations	**Follow-up Program:** • Conduct three (3) years of post-construction mortality monitoring following MNRF *Bats and Bat Habitats Guidelines for Wind Power Projects* (2011b). ▪ A report outlining the methods employed and the results of monitoring will be prepared and submitted to EC-CWS on an annual basis to determine if additional monitoring and/or mitigation measures are warranted. ▪ An end of year report, supplemented by an interim technical memo, outlining the methods employed and the results of monitoring will be prepared and submitted to EC-CWS on an annual basis for the three (3) years of bat mortality monitoring to determine if additional monitoring and/or mitigation measures are warranted. • Monitoring as part of the Operational Mitigation Plan will occur at a minimum frequency of monthly visits to each WTG, from May to September for the first three (3) years that the HIWEC is operational and every five (5) years thereafter. • Pre-construction bat acoustic monitoring surveys completed in 2011 will be repeated annually for two (2) years post-construction to ensure similar species abundance and diversity continue to be found in the HIWEC study area. ▪ An end of year report will be provided to EC-CWS, on an annual basis for the two (2) years of post-construction bat disturbance monitoring to determine if additional monitoring and / or mitigation measures are warranted.	**Follow-up Program:** • In the event that, after two (2) years, bat acoustic monitoring surveys indicate notable changes in bat populations, EC-CWS will be consulted to determine if additional mitigation measures are warranted through an adaptive management approach. ▪ Quantifying changes in local bat populations, as a result of the operation of this Project, will be difficult to determine based on the dramatic population declines of bat SAR as a result of white-nose syndrome. The effects of this disease are already evident when comparing data from 2011 to 2013. Despite this difficulty in quantifying changes that may be attributed to the operating Henvey Inlet Wind Energy Centre, two (2) years of acoustic monitoring will be completed and compared to pre-construction results. Results will be discussed with EC-CWS to determine if additional mitigation measures are warranted through an adaptive management approach. • Consider changes in WTG operations (e.g., changes in cut-in speed, selective shutdown of specific WTGs at key times of year or under certain weather conditions) during periods of high mortality. • No contingency measures are specifically required as the Operational Mitigation Plan itself has incorporated adaptive management and numerous contingency measures to progressively increase operational mitigation in the unlikely event that bat SAR mortalities continue to be observed.

Table 8-1: Follow-Up Program, Monitoring and Compensation for Species at Risk

Species at Risk	Phase	Monitoring	Contingency Measures
		Monitoring Program: • All artificial roosting structures established within the HIWEC study area will be monitored for signs of use at least twice per year for the first three (3) years after installation, with surveys once in each of May and June. ▪ At a minimum, each roost structure will be examined for signs of use. These surveys can occur at any time of day and will utilize flashlights or low-light cameras to look for occupancy. Other signs, such as guano, will also be considered to determine occupancy. If any sign of occupancy is noted, an evening survey* will be completed, combining the use of an ultrasound detector with visual observations to collect information on both abundance and species. ▪ If off-site locations are utilized, other monitoring arrangements may be established; however Henvey Inlet Wind will offer resources to complete a monitoring program that is at least equivalent to on-site locations. ▪ Qualified Biologists monitoring artificial roosting structures will take the appropriate precautions (i.e., disinfect all equipment and clothing) before and after each monitoring event to prevent the spread of White-Nose Syndrome as described, and where applicable, in the *Decontamination of Equipment and Clothing to Prevent the Spread of White-Nose Syndrome (the causal fungus: Pseudogymnoascus destructans) in Canada* (CWHC, 2014). ▪ Any evidence of White-nose Syndrome detected during these monitoring events will be reported to MNRF in accordance with the *Ontario's White-nose Syndrome Response Plan* (MNRF, 2015c). • With respect to the Sighting Response Plan, operations staff to ensure the species observation log is kept up to date and that procedures are followed. **The completion of visual evening surveys will be subject to Health and Safety considerations for completing evening monitoring. Alternate approaches, including low-light video cameras, will be considered, where reasonable.*	**Monitoring Program:** • Prune any tree limbs or roots using proper arboricultural techniques. • Any documented road mortality of a SAR bat will trigger consideration of contingency measures and adaptive management. The selected approach will be based on the specific circumstances that contributed to the observed impact on the species and will be determined by a qualified Biologist for the purpose of further mitigating against potential impacts to the species. • If any of the requirements or procedures of the Sighting Response Plan related to staff understanding or implementation are not effective or appropriate for specific circumstances, the operations staff will discuss and revise the Protocol accordingly.

Contribution to Overall Benefit for Species at Risk	
Species Groups	**Contribution to Overall Benefit**
Birds • Canada Warbler (*Cardellina pusilla*) • Common Nighthawk (*Chordeiles minor*) • Kirtland's Warbler (*Setophaga kirtlandii*) • Olive-sided Flycatcher (*Contopus borealis*) • Whip-poor-will (*Antrostomus vociferus*)	• *Contribution to FLAP (Fatal Light Awareness Program) www.flap.org* - Many species of birds migrate at night and are attracted to the bright lights left on overnight in urban areas, causing them to collide with buildings. During the day, migratory birds cannot see a pane of glass, often having fatal collisions. Contribution to the FLAP program will benefit migratory birds, including bird SAR that have been identified at HIFN I.R. #2 by addressing their key threats. • *Habitat Enhancement within confirmed Kirtland's Warbler observations outside HIWEC* – Kirtland's Warbler prefers very specific habitat conditions that require active management (i.e. young stands of Jack Pine). Areas with Kirtland's Warbler breeding pairs outside HIWEC have the potential to be enhanced to be more suitable for Kirtland's Warbler. Enhancement measures will also ensure habitat is suitable for all bird SAR that have been identified at HIFN I.R. #2. • *Funding for Research* – Research program opportunities will be examined with reputable academic institutions and preference will be given to research programs that are targeting information gaps or potential threats associated with SAR birds found within the HIWEC study area. • *Continued Surveys* – Surveys to confirm Kirtland's Warbler use of habitat within the greater landscape will be completed between May 7 and July 7 in 2016 by the same team of qualified Avian Biologists that conducted the 2015 breeding bird surveys following the standard methods outlined in the Search Protocol for Kirtland's Warbler (Kirtland's Warbler Recovery Team, 2012). Gaining an understanding of where Kirtland's Warbler occurs along the eastern Georgian Bay shoreline will benefit the species overall through informing the recovery team of known occurrences so that recovery efforts can be targeted within those areas. The following two surveys will be conducted: ▪ A survey will be conducted in the vicinity of the 2015 Kirtland's Warbler observation within the HIWEC study area. ▪ Additional surveys will be conducted in suitable habitats for Kirtland's Warbler where they occur within areas that are publically accessible along the Georgian Bay Shoreline.
Turtles • Blanding's Turtle (*Emydoidea blandingii*) • Eastern Musk Turtle (*Sternotherus odoratus*)	• *Contribution to Georgian Bay Turtle Hospital* – contribution to a wildlife rehabilitation centre within proximity to the HIWEC is an innovative solution to further offset potential environmental effects on SAR. Contribution to this trauma centre will be a long-term benefit to all reptiles within the area. • *Regional Anti-Poaching Initiatives* • *Road Enhancements* - Upgrades to existing Bekanon Road to reduce any current impacts to SAR that are unrelated to the HIWEC. Upgrades to this road will provide a long-term benefit to all reptiles within the area. • *Funding for Research* – Research opportunities will be examined with academic institutions and preference will be given to research programs that are targeting information gaps or potential threats associated with SAR reptiles found within the HIWEC study area.
Snakes • Eastern Foxsnake (Georgian Bay population) (*Pantherophis gloydi pop. 1*) • Eastern Hog-nosed Snake (*Heterodon platirhinos*) • Massasauga Rattlesnake (Great Lakes/St. Lawrence population) (*Sistrurus catenatus* pop. 1)	• *Contribution to Georgian Bay Turtle Hospital* – contribution to a wildlife rehabilitation centre within proximity to the HIWEC is an innovative solution to further offset potential environmental effects on SAR. Contribution to this trauma centre will be a long-term benefit to all reptiles within the area. • *Regional Anti-Poaching Initiatives* • *Road Enhancements* - Upgrades to existing Bekanon Road to reduce any current impacts to SAR that are unrelated to the HIWEC. Upgrades to this road will provide a long-term benefit to all reptiles within the area. • *Funding for Research* – Research opportunities will be examined with academic institutions and preference will be given to research programs that are targeting information gaps or potential threats associated with SAR reptiles found within the HIWEC study area.
Bats • Little Brown Bat (*Myotis lucifugus*) • Northern Myotis Bat (*Myotis septentrionalis*) • Tri-colored Bat (*Perimyotis subflavus*)	• *Funding for Research* – Research opportunities will be examined with academic institutions and preference will be given to research programs that are targeting information gaps or potential threats associated with SAR bats (i.e., research with respect to white-nose syndrome) found within the HIWEC study area.

Table 8-2: Long-term Monitoring and Research Programs for Targeted Species at Risk

Long-term Monitoring and Research Programs for Targeted Species at Risk	
Targeted Species	Contribution to Long-Term Monitoring
Blanding's Turtle	Research program opportunities will be examined with reputable academic institutions, and preference will be given to research programs that are targeting information gaps or potential threats associated with this species, including, but not limited to: • Local population size, demographics and trends (e.g. mark-recapture studies); • Distribution and animal movements/dispersal (e.g. radio-telemetry studies); • Survivorship rates; • Habitat size for long-term population success; • Success of alternative nesting sites; • Nest predation; • Success of ecopassages; and • Success rate for species reintroductions.
Eastern Musk Turtle	Research program opportunities will be examined with reputable academic institutions, and preference will be given to research programs that are targeting information gaps or potential threats associated with this species, including, but not limited to: • Habitat characterization and use; • Local population size, demographics and trends (e.g. mark-recapture studies); • Distribution and animal movements/dispersal (e.g. radio-telemetry studies); • Survivorship rates; • Habitat size for long-term population success; • Success of alternative nesting sites; • Nest predation; • Success of ecopassages; and • Success rate for species reintroductions.
Eastern Foxsnake	Research program opportunities will be examined with reputable academic institutions, and preference will be given to research programs that are targeting information gaps or potential threats associated with this species, including, but not limited to: • Habitat characterization and use; • Local population size, demographics and trends (e.g. mark-recapture studies); • Distribution and animal movements/dispersal (e.g. radio-telemetry studies); • Juvenile snake's ecological needs and dispersal; • Survivorship rates; • Habitat size for long-term population success; • Success of alternative nesting sites; • Nest predation; • Success rate for species reintroductions; and • Success of ecopassages, speed limits and wildlife crossing signs.
Massasauga	Research program opportunities will be examined with reputable academic institutions, and preference will be given to research programs that are targeting information gaps or potential threats associated with this species, including, but not limited to: • Local population size, demographics and trends (e.g. mark-recapture studies); • Distribution and animal movements/dispersal (e.g. radio-telemetry studies); • Development of detailed habitat modeling; • Habitat size required for viable population; • Factors for successful gestation habitat creation; • Success rate for species reintroductions and neonate headstarting; • Success of translocations as a management tool; and • Success of ecopassages, speed limits and wildlife crossing signs.
Eastern Hog-nosed Snake	Research program opportunities will be examined with reputable academic institutions, and preference will be given to research programs that are targeting information gaps or potential threats associated with this species, including, but not limited to: • Habitat characteristics and use; • Local population size, demographics and trends (e.g. mark-recapture studies); • Distribution and animal movements/dispersal (e.g. radio-telemetry studies); • Genetic analysis; • Habitat size for long-term population success; • Success of alternative nesting sites; and • Success of ecopassages, speed limits and wildlife crossing signs.
Kirtland's Warbler	Research program opportunities will be examined with reputable academic institutions, and preference will be given to research programs that are targeting information gaps or potential threats associated with this species, including, but not limited to: • Local population size in Parry Sound District; • Habitat characteristics and use (compared to habitat use in Michigan); • Dispersal Techniques; • Site fidelity; • Cowbird parasitism; • Nesting and fledgling success; • Competing species and predators; and • Possible management or habitat enhancement techniques.