GZA
GeoEnvironmental, Inc.

Engineers and
Scientists

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Mr. Maurice F. Moore
Engineering Geologist 1
New York State Department of Environmental Conservation
Division of Environmental Remediation, Region 9
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Buffalo, New York 14203-2915

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Re: Technical Impracticability Waiver Application-Endangered Species Review
Steel Winds I Wind Facility
Tecumseh Redevelopment Site (Site No. C915205)
Lackawanna, New York

Dear Mr. Moore:

GZA GeoEnvironmental, Inc. (GZA) is pleased to provide this Endangered Species Review Letter related to the Technical Impracticability (TI) Waiver Application for the Steel Winds I portion of the Tecumseh Redevelopment Site (Site) to the New York State Department of Environmental Conservation (DEC). This letter has been submitted as a follow up to the TI Waiver Application, submitted to DEC on November 5, 2014. This application has been prepared on behalf of the Site operator, Niagara Wind Power, LLC (NWP) an affiliate of First Wind Energy, LLC (First Wind). This letter is an addendum to the TI Waiver Application and is subject to the limitations provided therein.

INTRODUCTION

As described in the TI Waiver Application, groundwater beneath the Steel Winds I, WT-01 Area of Concern (AOC) vicinity Site contains volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs) that likely discharge to the near-shore area of Lake Erie, and the lower reach of Smokes Creek. The TI Waiver Application included a Fish and Wildlife Resource Impact Analysis (FWRIA) which evaluated potential exposure of ecological receptors to VOCs and SVOCs discharging from groundwater to sediment and surface water in Lake Erie and Smokes Creek.

The FWRIA concluded that SVOCs, specifically polycyclic aromatic hydrocarbons (PAHs), are present in sediment and sediment pore water of Smokes Creek adjacent to the WT-01 AOC at concentrations that may cause adverse effects to exposed benthic organisms. The FWRIA also concluded that, although PAHs were detected in Lake Erie sediment samples adjacent to the WT-01 AOC, the concentrations were at low levels and do not present a significant risk to exposed organisms.

The DEC Environmental Resource Mapper (ERM) shows habitat of Rare Plants or Animals on and adjacent to the Site. The ERM rare species polygon covers roughly 25 square miles of the northeastern corner of Lake Erie and extends northward on the Niagara River, and onto land, one-half mile west from the shore of Lake Erie. GZA submitted a rare species information request to

the New York State Natural Heritage (NYSNH) Program on October 17, 2014, and received a response from the NYSNH dated November 14, 2014 (after the TI Waiver Application was submitted), provided as Attachment A. As described in the TI Waiver Application, this letter has been prepared to evaluate if rare species associated with this portion of Lake Erie have territorial or feeding habits that might concentrate their activities at, and have exposure to, the Site groundwater discharge zone.

NYSNH FINDINGS

The NYSNH Program listed the following species as being on or near (generally within about 0.5 miles) the Steel Winds I property:

- Peregrine Falcon (*Falco peregrinus*), listed by the NYNH Program as Endangered[1].
- Mooney Fish (*Hiodon tergisus*), listed by the NYNH Program as Threatened[2].
- Lake Sturgeon (*Acipenser fulvenscens*), listed by the NYNH Program as Threatened[2].

In addition, the NYSNH Program identified a gull colony at Stony Point as a significant natural community. Stony Point is not within the flow path of groundwater from the WT-01 AOC, as it is located approximately 1.3 miles north on Lake Erie of the WT-01 AOC and groundwater from the WT-01 AOC flows east/southeast.

It is GZA's opinion that contaminated groundwater from the WT-01 AOC property does not present a significant exposure potential to peregrine falcons or to the gull colony. The areal extent of the groundwater discharge zone is very small compared to the feeding area of these bird species, none of the groundwater contaminants are bioaccumulative, and potential for direct exposure is very low. Similarly for the rare fish species, the aerial extent of the discharge zone is small relative to their feeding ranges, so significant exposure of fish during feeding is unlikely.

Depending on the breeding habits of these rare fish species, discharge of groundwater contaminants may present a potentially significant exposure pathway to the endangered fish species during breeding activities. GZA reviewed the life history, feeding and breeding habits of the mooneye and lake sturgeon to characterize the potential for exposure to Site-related groundwater contaminants.

Mooneye (*Hiodon tergisus*)

Mooneye can be found predominantly in the deeper holes of large freshwater rivers and lakes. Water bodies with firm substrates and swift currents are ideal since these promote the clear, non-turbid water that this species requires (MNFI, 2004). This species occurs in waters from south-central Canada south through the Great Lakes and other large lakes and rivers in the central and northeast United States. In New York, populations are known to exist in Lake Champlain, Black Lake, Lake Erie, the Oswegatchie River, the St. Lawrence River, and the mouth of Cattaraugus Creek. Annually, between March and May (as late as June), this species migrates to rivers to spawn. This action is based on the presence of appropriate water temperatures of 10-13°C. Females release between 10,000 and 20,000 eggs which are deposited over rocky surfaces in areas

[1] Native species in imminent danger of extirpation of extinction in New York State.
[2] Native species likely to become an endangered species within the foreseeable future in New York State.

with strong currents. Eggs are encased in a gelatinous material. Juveniles reach approximately four or more inches in length by the end of their first year. They reach maturity between four and six years of age. As juveniles, Mooneye predominantly feed on the larval stages of insects including mayflies, caddisflies, and midges. Adults feed on these as well as the adult forms, water boatman, beetles, crustaceans, small fish, and mollusks[3].

The mooneye breeds primarily, or exclusively in clear, running waters of rivers and streams. The potential for exposure to contaminants discharging with groundwater to the littoral zone of Lake Erie is small. Groundwater from beneath the Steel Winds I property also discharges to the lower reach of Smokes Creek. However, water quality within Smokes Creek has been impacted such that it likely is not suitable for mooneye breeding. According to the NYSDEC 2012 Section 305b Water Quality Reports for Niagara River/Lake Erie Basin prepared by the NYS DEC (available at: http://www.dec.ny.gov/chemical/36738.html), aquatic life, recreational uses and aesthetics are stressed in this section of Smokes Creek due to presence of sludge banks, nutrient, silt and pathogen inputs.

Based on these habitat requirements, and the degraded water and habitat quality in Smokes Creek, it is GZA's opinion that additional evaluation of potential risks to the mooneye fish is not warranted.

Lake Sturgeon (*Acipenser fulvescens*)

Lake sturgeon can be found predominantly in large freshwater lakes and rivers. This species occurs in waters in the eastern half of the United States and into Canada. In New York, populations are known to exist in Grasse Lake, Lake Ontario, Lake Erie, Lake Champlain, Cayuga Lake, the St. Lawrence River, the Niagara River, the Oswegatchie River, and the Seneca and Cayuga canals. (NYDEC Lake Sturgeon Fact Sheet, 2015). As water temperatures approach the 11.5-16°C range, this species gathers in groups in shallow pools near areas with clean, large rubble including wind swept rocky shores and below stream rapids to spawn. Suitable breeding habitat requires substrate for the eggs to stick to and sufficiently aerated water. Males arrive before females. When eggs and milt are released, individuals participate in a "porpoising" which creates turbulence that aids diversity during the fertilization process. Eggs take approximately a week to hatch and juveniles will grow roughly 8.5 inches in length during their first year. Males reach maturity between the ages of 14 and 16 years while females reach maturity between the ages of 24 and 26 years. Once maturity is reached, males will return to their spawning ground biannually and females will return between every three and six years. Lake sturgeon are benthic feeding fish. Their diet consists of both animal and plant matter found at the bottom of lakes and rivers including clams, crayfish, leeches, mollusks, snails, other invertebrates, small fish, and algae[4,5,6].

The shore of Lake Erie adjacent to the WT-01 AOC is a windswept, high energy rocky shore that may be suitable for lake sturgeon breeding. In that case, incubating sturgeon eggs and recently

[3] NYDEC. 2015. Mooneye Fact Sheet. http://www.dec.ny.gov/animals/26032.html
[4]Galarowicz, Tracy. 2003. Conservation Assessment for Lake Sturgeon (Acipenser fulvescens). http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fsm91_054374.pdf.
[5] Bruch, R. M. and Binkowski, F. P. (2002), Spawning behavior of lake sturgeon (Acipenser fulvescens). Journal of Applied Ichthyology, 18: 570–579. doi: 10.1046/j.1439-0426.2002.00421.x.
[6] NYDEC. 2015. Lake Sturgeon Fact Sheet. http://www.dec.ny.gov/animals/26035.htm.l

hatched larvae may be exposed to groundwater contaminants discharging from the WT-01 AOC to the lake bottom. Because eggs and larvae are relatively sessile (i.e., attached to the lake/river bottom) and are in sensitive life stages, this may represent a potentially significant exposure to a rare fish species such as the lake sturgeon.

The degradation of habitat quality in Smokes Creek, which is unrelated to discharge of contaminated groundwater from beneath the Steel Winds 1 property (see above), likely renders Smokes Creek unsuitable for lake sturgeon breeding. Therefore, evaluation of potential lake sturgeon exposure to groundwater contaminants in Smokes Creek is not warranted.

RECOMMENDATIONS

Based on the FWRIA, the TI Waiver Application recommended additional sampling of sediment and pore water in Smokes Creek. The intent of the proposed additional sampling is to compare concentrations in the groundwater discharge zone to upstream background concentrations, and to collect less turbid pore water samples to better evaluate potential bioavailability of contaminants detected in the pore water samples.

Based on the sediment samples collected in support of the TI Waiver Application, additional sampling in the groundwater discharge along the shore of Lake Erie was not recommended. However, in light of the possibility that lake sturgeons may use the littoral zone (i.e., the lake shore) adjacent to the WT-01 AOC for breeding, additional evaluation of potential exposure to breeding fish in the littoral zone is warranted.

GZA recommends the following activities to evaluate potential exposure and risk to lake sturgeon from the WT-01 AOC:

- Perform a habitat characterization for the littoral zone of Lake Erie adjacent to the WT-01 AOC, focused on fish breeding requirements. In particular, we will better characterize the extent and nature of the consolidated slag deposits and loose slag rubble, as well as natural substrates. These observations will be used to form an opinion as to the suitability of the area for lake sturgeon breeding.
- Collect additional sediment samples for VOC and PAH analyses from the Lake Erie littoral zone adjacent to the WT-01 AOC in order to provide additional data to evaluate the potential exposure of lake sturgeon to groundwater contaminants.
- Attempt to collect sediment pore water samples in Lake Erie, adjacent to the WT-01 AOC by looking for gaps in the consolidated slag where steel piezometers may be driven. As described in the TI Waiver Application, pore water samples were not collected at the proposed sampling locations along Lake Erie as part of the TI Waiver Application due to the presence of a solid slag shelf which the steel rods could not penetrate.
- Compile toxicity data specific to fish eggs and larvae, and compare site data to these values.

If DEC agrees with these recommendations, we will propose additional sampling/monitoring/habitat characterization in the supplemental sampling plan described in the TI Waiver Application.

We look forward to your approval of the TI Waiver Application. If you have any questions or comments, or would like to discuss the waiver application, please feel free to contact Ed or Rick at (401) 421-4140 or via email at edward.summerly@gza.com or richard.carlone@gza.com.

Respectfully,

GZA GEOENVIRONMENTAL, INC.

Richard A. Carlone, P.E.
Project Manager

Timothy Briggs
Consultant/Reviewer

Edward A. Summerly, P.G.
Principal

RAC/EAS:lal

cc: Matthew Forcucci, New York State Department of Health (electronic copy)
Claude Cote, First Wind Energy, LLC (electronic copy)
Ryan Fonbuena, First Wind Energy, LLC (electronic copy)
Michael Andrzejczak, First Wind Energy, LLC (electronic copy)

Attachments: Attachment A – NYSNH Program

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Division of Fish, Wildlife & Marine Resources
New York Natural Heritage Program
625 Broadway, 5th Floor, Albany, New York 12233-4757
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Website: www.dec.ny.gov

Joe Martens
Commissioner

November 14, 2014

Timothy Briggs
GZA GeoEnvironmental
249 Vanderbilt Avenue
Norwood, MA 02062

Re: Tecumseh Redevelopment Site (Site No. C915205) Route 5
Town/City: City Of Lackawana. County: Erie.

Dear Timothy Briggs :

In response to your recent request, we have reviewed the New York Natural Heritage Program database with respect to the above project.

Enclosed is a report of rare or state-listed animals and plants, and significant natural communities, which our databases indicate occur, or may occur, on your site or in the immediate vicinity of your site.

For most sites, comprehensive field surveys have not been conducted; the enclosed report only includes records from our databases. We cannot provide a definitive statement as to the presence or absence of all rare or state-listed species or significant natural communities. Depending on the nature of the project and the conditions at the project site, further information from on-site surveys or other sources may be required to fully assess impacts on biological resources.

Our databases are continually growing as records are added and updated. If this proposed project is still under development one year from now, we recommend that you contact us again so that we may update this response with the most current information.

The presence of the plants and animals identified in the enclosed report may result in this project requiring additional review or permit conditions. For further guidance, and for information regarding other permits that may be required under state law for regulated areas or activities (e.g., regulated wetlands), please contact the appropriate NYS DEC Regional Office, Division of Environmental Permits, as listed at www.dec.ny.gov/about/39381.html.

Sincerely,

Andrea Chaloux

Andrea Chaloux
Environmental Review Specialist
New York Natural Heritage Program

1109

The following state-listed animals have been documented at your project site, or in its vicinity.

The following list includes animals that are listed by NYS as Endangered, Threatened, or Special Concern; and/or that are federally listed or are candidates for federal listing. The list may also include significant natural communities that can serve as habitat for Endangered or Threatened animals, and/or other rare animals and rare plants found at these habitats.

For information about potential impacts of your project on these populations, how to avoid, minimize, or mitigate any impacts, and any permit considerations, contact the Wildlife Manager or the Fisheries Manager at the NYSDEC Regional Office for the region where the project is located. A listing of Regional Offices is at http://www.dec.ny.gov/about/558.html.

The following species and habitats have been documented at or near the project site, generally within 0.5 mile. Potential onsite and offsite impacts from the project may need to be addressed.

COMMON NAME	*SCIENTIFIC NAME*	*NY STATE LISTING*	*FEDERAL LISTING*	
Birds				
Peregrine Falcon *Breeding*	*Falco peregrinus*	Endangered		13796
Fish				
Mooneye	*Hiodon tergisus*	Threatened		13865
Lake Sturgeon	*Acipenser fulvescens*	Threatened		11154

This report only includes records from the NY Natural Heritage databases. For most sites, comprehensive field surveys have not been conducted, and we cannot provide a definitive statement as to the presence or absence of all rare or state-listed species. Depending on the nature of the project and the conditions at the project site, further information from on-site surveys or other sources may be required to fully assess impacts on biological resources.

If any rare plants or animals are documented during site visits, we request that information on the observations be provided to the New York Natural Heritage Program so that we may update our database.

Information about many of the listed animals in New York, including habitat, biology, identification, conservation, and management, are available online in Natural Heritage's Conservation Guides at www.guides.nynhp.org, and from NYSDEC at www.dec.ny.gov/animals/7494.html.

The following rare plants, rare animals, and significant natural communities have been documented at your project site, or in its vicinity.

We recommend that potential onsite and offsite impacts of the proposed project on these species or communities be addressed as part of any environmental assessment or review conducted as part of the planning, permitting and approval process, such as reviews conducted under SEQR. Field surveys of the project site may be necessary to determine the status of a species at the site, particularly for sites that are currently undeveloped and may still contain suitable habitat. Final requirements of the project to avoid, minimize, or mitigate potential impacts are determined by the lead permitting agency or the government body approving the project.

The following animals, while not listed by New York State as Endangered or Threatened, are of conservation concern to the state, and are considered rare by the New York Natural Heritage Program.

COMMON NAME	*SCIENTIFIC NAME*	*NY STATE LISTING*	*HERITAGE CONSERVATION STATUS*

Animal Assemblages

Gull Colony

Stony Point, 1985-05-14: Dredge spoil disposal site separated by dikes from Lake Erie. Low lying, gravelly, sparsely vegetated beach. Open water will eventually be eliminated as dredge spoils fill site. Huge slag pile at southern end, with steep banks down to beach. Surrounding land use is industrial. 7534

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If any rare plants or animals are documented during site visits, we request that information on the observations be provided to the New York Natural Heritage Program so that we may update our database.

Information about many of the rare animals and plants in New York, including habitat, biology, identification, conservation, and management, are available online in Natural Heritage's Conservation Guides at www.guides.nynhp.org, from NatureServe Explorer at www.natureserve.org/explorer, and from USDA's Plants Database at http://plants.usda.gov/index.html (for plants).

Information about many of the natural community types in New York, including identification, dominant and characteristic vegetation, distribution, conservation, and management, is available online in Natural Heritage's Conservation Guides at www.guides.nynhp.org. For descriptions of all community types, go to www.dec.ny.gov/animals/97703.html for Ecological Communities of New York State.