GZA GeoEnvironmental of New York

Engineers and Scientists

June 4, 2015 File No. 03.0033579.04

Mr. David Szymanski Project Manager New York State Department of Environmental Conservation Division of Environmental Remediation, Region 9 270 Michigan Avenue Buffalo, New York 14203-2915



Re: Site Management Periodic Review Report and IC/EC Certification Submittal

Monitoring Period: May 5, 2014 through May 5, 2015 Tecumseh Redevelopment Site (Site No. C915205)

Lackawanna, New York

Dear Mr. Szymanski:

GZA GeoEnvironmental, Inc. (GZA) is pleased to submit this Site Management Periodic Review Report and Institutional Controls/Engineering Controls (IC/EC) Certification Submittal (PRR) to the New York State Department of Environmental Conservation (NYSDEC), for the Steel Winds I portion of the Tecumseh Redevelopment Site (Site No. C915205), located in Lackawanna, New York. This letter report has been prepared on behalf of the Site operator, Niagara Wind Power, LLC (NWP) an affiliate of Sun Edison, dba First Wind Energy, LLC (First Wind) and has been prepared in general accordance with NYSDEC's DER-10 Technical Guidance for Site Investigation and Remediation, dated May 23, 2010. This letter report is subject to the Limitations provided in Attachment A.

EXECUTIVE SUMMARY AND SITE OVERVIEW

Tecumseh Redevelopment, Inc. (Tecumseh) owns approximately 1,100 acres of land at 1951 Hamburg Turnpike, as shown on Figure 1. The property was formerly used for the production of steel, coke and related products by Bethlehem Steel Corporation (BSC). Steel production on the Tecumseh property was discontinued in 1983 and the coke ovens ceased activity in 2000. Tecumseh acquired the property, along with other BSC assets, out of bankruptcy in 2003.

In September 2006, BQ Energy entered into a long-term lease agreement with Tecumseh to construct and operate wind turbines and supporting power generation equipment and infrastructure on an approximately 29-acre parcel of the Tecumseh property, referred to as the Steel Winds Site. BQ Energy and the NYSDEC also entered into a Brownfield Cleanup Agreement for the Steel Winds Site. The Site is wholly contained within the Slag Fill Area (SFA) Zones 3 and 4 of the Tecumseh property bordered by Lake Erie to the west, Smokes Creek to the south, and former industrial lands of BSC to the north and east, as shown on Figure 2. A Site Plan is provided as Figure 3. NWP operates the eight wind turbines installed at the Site.

535 Washington Street 11th Floor Buffalo, New York 14203 716-685-2300 Fax: 716-685-3629 www.gza.com The Brownfield Cleanup Program (BCP) was successful in achieving the remedial objectives for the Steel Winds Site. The Site Management Plan (SMP) and Final Engineering Report (FER) were approved by NYSDEC in December 2007. NYSDEC issued a Certificate of Completion (COC) for the Site on December 18, 2007.



The remedial activities conducted at the Site include:

- Excavation and off-site disposal of impacted slag fill from the eight wind turbine foundations and interconnecting utility trenches;
- In-situ enhanced biodegradation of residual volatile organic compounds (VOCs), including benzene, toluene, total xylenes, and naphthalene, using oxygen release compound (ORC®) socks within the saturated soil and groundwater in the vicinity of WT-01 and associated monitoring; and,
- Completion of a soil cover system.

An Operation, Monitoring and Maintenance Request for Modification, dated November 2011, was submitted to NYSDEC by Benchmark Environmental Engineering and Science, PLLC (Benchmark) on behalf of First Wind. This report proposed ceasing operation of the oxygen releasing compound (ORC®) groundwater remedy for the WT-01 Vicinity. NYSDEC provided comments to this report on April 10, 2012 and GZA provided a response letter on May 9, 2012. Based on this letter, and subsequent correspondence with NYSDEC, the ORC® remedy has been terminated (the ORC socks were removed from five wells on May 16, 2012). Semi-annual groundwater monitoring will continue in the WT-01 vicinity following the recently revised program; and the Site-wide Long-Term Groundwater Monitoring (LTGWM) Plan will continue in accordance with the SMP. The WT-01 vicinity environmental conditions will be reevaluated in the future, following milestones described in GZA's May 9, 2012 letter to NYSDEC. Monitoring well WT01-05, which was noted as destroyed in Benchmark's May 2011 PRR, was replaced in May 2012 by GZA and is included in the semi-annual groundwater monitoring program.

The IC/EC (i.e., a soil cap and land use restrictions) are in general compliance with the SMP. Minor areas of soil erosion, rutting and thin vegetation were observed. No evidence of animal burrow holes were observed. Repairs/maintenance to the areas of thin vegetation and/or isolated areas of ruts or erosion to the soil cap are scheduled to be completed during summer 2015 as part of routine maintenance.

RECENT PROGRAM MODIFICATIONS

Due to the extended cold weather conditions experienced during the 2015 winter months, the semi-annual groundwater sampling event that was scheduled to be completed in January 2015 was delayed until March 2015. In an effort to allow for sufficient time between sampling events and to reduce potential for future delays due to cold weather conditions, First Wind would like to request that the scheduled times for the annual/semi-annual and semi-annual groundwater sampling events be modified from June and January, respectively, to September and March for the current and future monitoring periods. The PRR evaluations will continue to be conducted on an annual basis with no impact from the requested scheduling change. It is GZA's opinion that the requirements for discontinuing Site management have not yet been met.

SITE MANAGEMENT PLAN



A SMP was prepared for the Site and approved by NYSDEC in December 2007. The SMP includes an Operation, Monitoring, and Maintenance (OM&M) Plan, a Soil/Fill Management Plan (SFMP), and Environmental Easements. The OM&M Plan consists of three major components: 1) the Site-wide LTGWM Plan and WT-01 Vicinity monitoring; 2) a WT-01 Vicinity ORC Monitoring and Maintenance Plan; and 3) the Annual Inspection & Certification Program. A brief description of the components of the SMP is presented below.

Groundwater Monitoring OM&M Plan

As a requirement of the SMP, LTGWM is being performed at nine (9) wells across the Site. The following semi-annual and annual groundwater reports have been prepared by GZA and submitted to NYSDEC in accordance with the SMP since our previous PRR submission in July 2014.

- "Annual-Semi-Annual Groundwater Monitoring Report, Steel Winds I Facility, Lackawanna, New York" prepared by GZA GeoEnvironmental of New York for First Wind Energy, LLC, dated, August 2014.
- "Semi-Annual Groundwater Monitoring Report, Steel Winds I Facility, Lackawanna, New York" prepared by GZA GeoEnvironmental of New York for First Wind Energy, LLC, dated, May 2015.

The two monitoring reports listed above have previously been provided under separate cover and submitted electronically to NYSDEC. GZA is currently scheduled to conduct the next annual/semi-annual sampling event consisting of the nine (9) LTGWM wells and the six (6) WT-01 vicinity wells in June 2015. However, as previously discussed, due to the extended cold weather this past winter, the scheduled January semi-annual sampling event was delayed until March 2015. In an effort to allow sufficient time between sampling event, we are requesting the annual/semi-annual sampling event to be modified to September 2015 (with the subsequent semi-annual sampling event to take place in March 2016).

An *Operation, Monitoring and Maintenance Request for Modification*, dated November 2011, was submitted to NYSDEC by Benchmark. This report proposed ceasing operation of the ORC® groundwater remedy for the WT-01 vicinity because the remedy was not effective in reducing VOC concentrations, due primarily to the geochemical conditions (high baseline chemical oxygen demand, highly negative oxidation reduction potential and high pH) of the Site. NYSDEC provided comments to this report on April 10, 2012 and GZA provided a response letter on May 9, 2012. Based on this letter and subsequent correspondence with NYSDEC, the ORC® remedy has been terminated.

As discussed in the May 9, 2012 letter, six wells in the WT-01 vicinity (BCP-ORP-1, MWN-01, MWN-01B, WT1-02, WT1-04 and replacement well WT1-05) will be sampled on a semi-annual basis for the following compounds:

- STARS list VOCs via EPA Method 8260B; and
- Base-Neutral semi-volatile organic compounds via EPA Method 8270C.

The LTGWM Plan will continue in accordance with the SMP although, as discussed above, the sample times are requested to be modified from June and January to September and March.



As described in the May 9, 2012 letter, remedial alternatives have not yet been selected or implemented for the various Solid Waste Management Units (SMUs) which make up the former Bethlehem Steel Site (i.e., the Tecumseh Redevelopment property). Assessing the relative contaminant contribution from the Steel Winds Site is difficult. As such, GZA proposed that the recently agreed to semi-annual groundwater monitoring in the WT-01 vicinity continue until these remedies have been selected, implemented and their effectiveness evaluated. Once this has occurred, the relative impact of the contaminant contribution from the Steel Winds Site can be assessed.

On September 30, 2013, GZA submitted a Technical Impracticability Waiver Supplemental Field Studies Work Plan for the Site, detailing sampling, laboratory analysis, data evaluation and reporting to be conducted in support of a Technical Impracticability Waiver request for the Site. This Work Plan was approved by NYSDEC on February 24, 2014. The Work Plan was implemented in the summer 2014 and a Technical Impracticability Waiver Application was submitted to NYSDEC on November 5, 2014. The study included an evaluation of the potential impact of groundwater discharges to adjacent water bodies and benthic invertebrates, a regional groundwater mass flux and contaminant mass loading evaluation, as well as an ecological risk assessment. The study concluded that:

- Previously implemented Institutional and Engineering Controls (IC/ECs) voluntarily implemented at the Steel Winds Site under the Brownfield Cleanup Program (BCP), including a soil cap and offsite disposal of displaced soil and activity and use limitations, have effectively mitigated potential risks to human health.
- The Fish and Wildlife Resource Impact Analysis (FWRIA)¹ prepared by GZA identified PAHs in sediment, and certain VOCs in pore water within Smokes Creek, at concentrations that may potentially be harmful to exposed aquatic/benthic organisms. Inputs from sources other than the WT-01 pore water likely contributed to the concentrations of PAHs and VOCs measured. Furthermore, comparisons of sediment and pore water data to screening levels likely resulted in a conservative assessment because of the limited number of PAHs reported, and suspended particulates in the pore water samples. For this reason, GZA recommends additional sampling to evaluate the relative contribution from other sources, and to collect data more representative of potential bioavailability and risk.
- GZA evaluated five potential remedies for the WT-01 AOC using criteria described in DEC's DER-10 (Technical Guidance for Site Investigation and Remediation, dated

¹ Note that an information request was submitted to the New York Natural Heritage (NYSNH) Program, as the DEC ERM indicated that rare species habitat is present in Lake Erie adjacent to the Site. The results were not available in time to be reported with the November 5, 2014 TI Waiver Application. The results of that inquiry were subsequently reported to DEC in a letter dated January 28, 2015. They substantiated the findings presented in the TI Waiver Application and confirmed the need for a limited supplemental ecological evaluation.

May 3, 2010) and EPA's "Guidance for Evaluating Guidance for Evaluating the Technical Impracticability of Ground-Water Restoration", dated September 1993.

- Monitored Natural Attenuation (MNA);
- Air Sparge/biosparge with a contingency enhanced denitrification system;
- Reactive Barrier (Air-sparge/biosparge curtain using a continuous stone trench with a contingency enhanced denitrification injection system);
- In-situ Chemical Oxidation (ISCO); and
- Hydrodynamic Groundwater Containment (HGC).

Based on this evaluation, it is GZA's opinion that active remediation is not warranted or feasible, would not result in significant benefit to the environment relative to the cost, and is technically impracticable.

As noted GZA recommended, and in April 2015 DEC personnel approved, additional surface water and sediment sampling and analysis from Smokes Creek and Lake Erie to further evaluate potential impacts to ecological receptors. This work is tentatively scheduled to commence in July of 2015 and we anticipate a final report of the supplemental investigations will be submitted by November 1, 2015.

Engineered and Institutional Controls

An engineered control (EC) consisting of a soil cover system has been installed at the Site. Maintenance of the 12-inch soil and vegetated cover system is being performed in compliance with the SMP.

The Steel Winds Site is subject to the following institutional controls (ICs):

- Groundwater-Use Restriction the use of groundwater for potable and non-potable purposes is prohibited;
- Land-Use Restriction the controlled property may be used for commercial and/or industrial use;
- Implementation of the SMP including the OM&M Plan and SFMP.

The SFMP provides guidelines for the management of soil and fill material during any intrusive actives. No intrusive activities requiring management of on-Site soil or fill material, or the placement of backfill materials (beyond that required for minor cap repairs described in last year's report), are known to have occurred during the current monitoring period.

Annual Inspection and Certification Program

As a requirement of the SMP and in accordance with NYSDEC DER-10, this PRR is to provide the information necessary to document the basis for the IC/EC certification. The certification primarily consists of an annual Site inspection to complete NYSDEC's IC/EC Certification Form in order to confirm that:

• The IC/ECs are in place, performing properly, and remain effective;



- Nothing has occurred that would impair the ability of the controls to protect the public health and environment:
- Nothing has occurred that would constitute a violation or failure to comply with any
 operation and maintenance plan for the IC/ECs; and
- Access is available to the Site to evaluate continued maintenance of the IC/ECs.



A Site visit of the property was conducted by GZA on May 29, 2015 and the IC/EC Certification Form has been signed by an engineer who meets the requirements of a Qualified Environmental Professional (QEP) and is a Professional Engineer registered in the State of New York. At the time of the inspection, the Site was observed to be in compliance with the IC/ECs. Minor surface damage (minor rutting and thin vegetation coverage) to the vegetated cover system in the vicinity of WT-01 through WT-08 was noted during the site visit. The minor surface damage was likely the result of vehicular traffic on the cap during moist to wet conditions. In general, the LTGWM network was noted to be in good condition. The minor grading and vegetative cover repair will be conducted by First Wind during the summer of 2015 as weather conditions permit.

The completed Institutional and Engineering Controls Form is included in Attachment B. A photographic log of the Site inspection is included in Attachment C.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions and recommendations are as follows:

- At the time of the Site inspection, the Site was in compliance with the IC/ECs including: groundwater monitoring, maintenance of the cover system, land-use restrictions, groundwater-use restrictions, and soil/fill management plan.
- Minor surface and vegetative cover damage was noted in the vicinity of WT-01 through WT-08. The cover system damages are currently being addressed, and repairs are expected to be completed by First Wind by September 1, 2015.
- Site-wide LTGWM and WT-01 vicinity groundwater monitoring will be continued. In accordance with the SMP, the next semi-annual WT-01 and LTGWM event is scheduled for June 2015, although assuming NYSDEC approval for the modification of the groundwater monitoring schedule is approved, this sampling event will be moved to September 2015 with the following semi-annual sampling in March 2016.
- The groundwater remedy for the WT-01 Vicinity has been re-evaluated as described above.
- No modifications to the current SMP are recommended at this time other than the
 groundwater monitoring scheduling modification from June and January to September
 and March. PRR evaluations should continue to be conducted on an annual basis and
 GZA believes that the requirements for discontinuing site management have not yet been
 met.

We trust this letter report addresses your requirements. If you need any additional information, 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.

Sincerely,



GZA GEOENVIRONMENTAL, INC.

Richard A. Carlone, P.E.

Project Manager

Daniel J. Troy, P.E. Consultant/Reviewer

Edward A. Summerly, P.G.

Principal

RAC/EAS:blm

Attachments: Figures 1 through 3

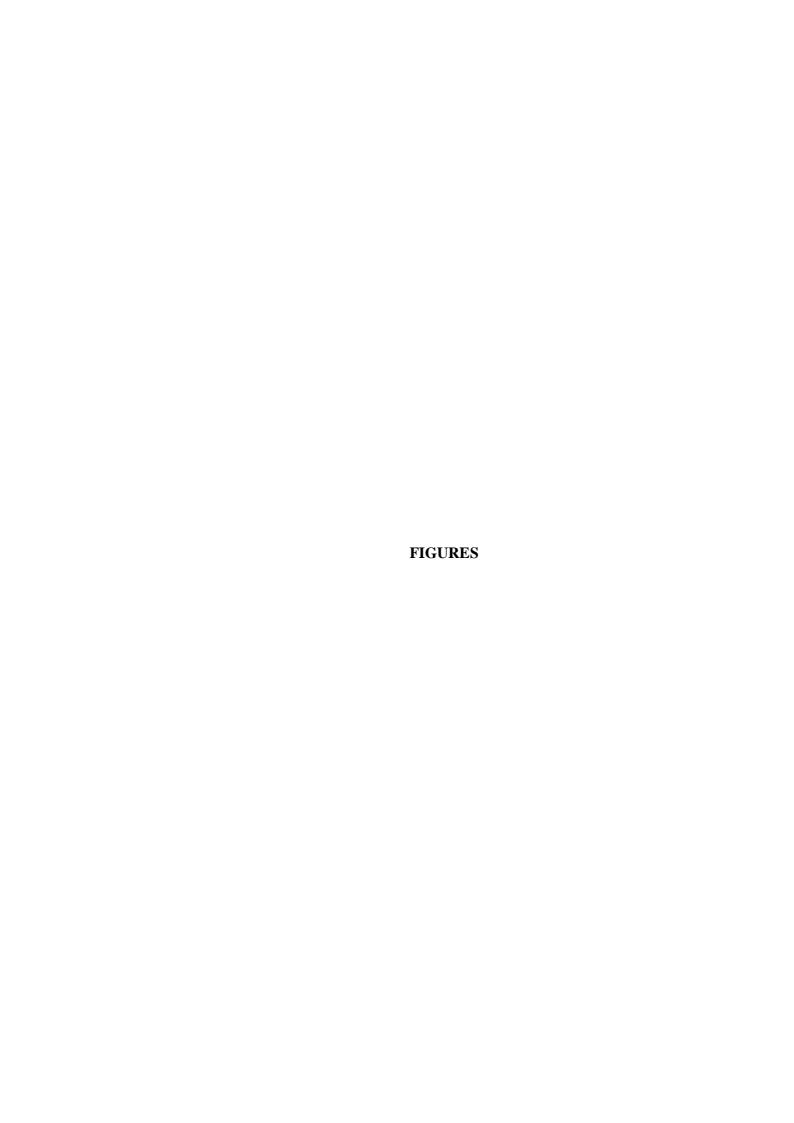
Attachment A - Limitations

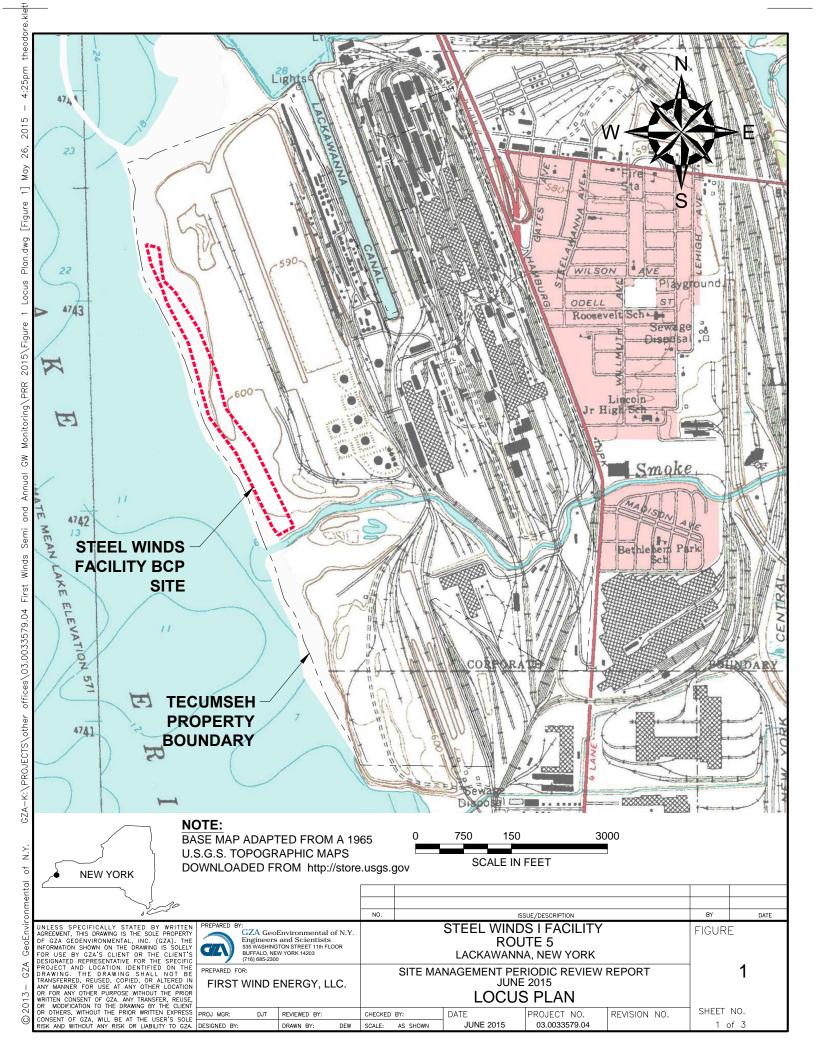
Attachment B - Institutional and Engineering Controls Form

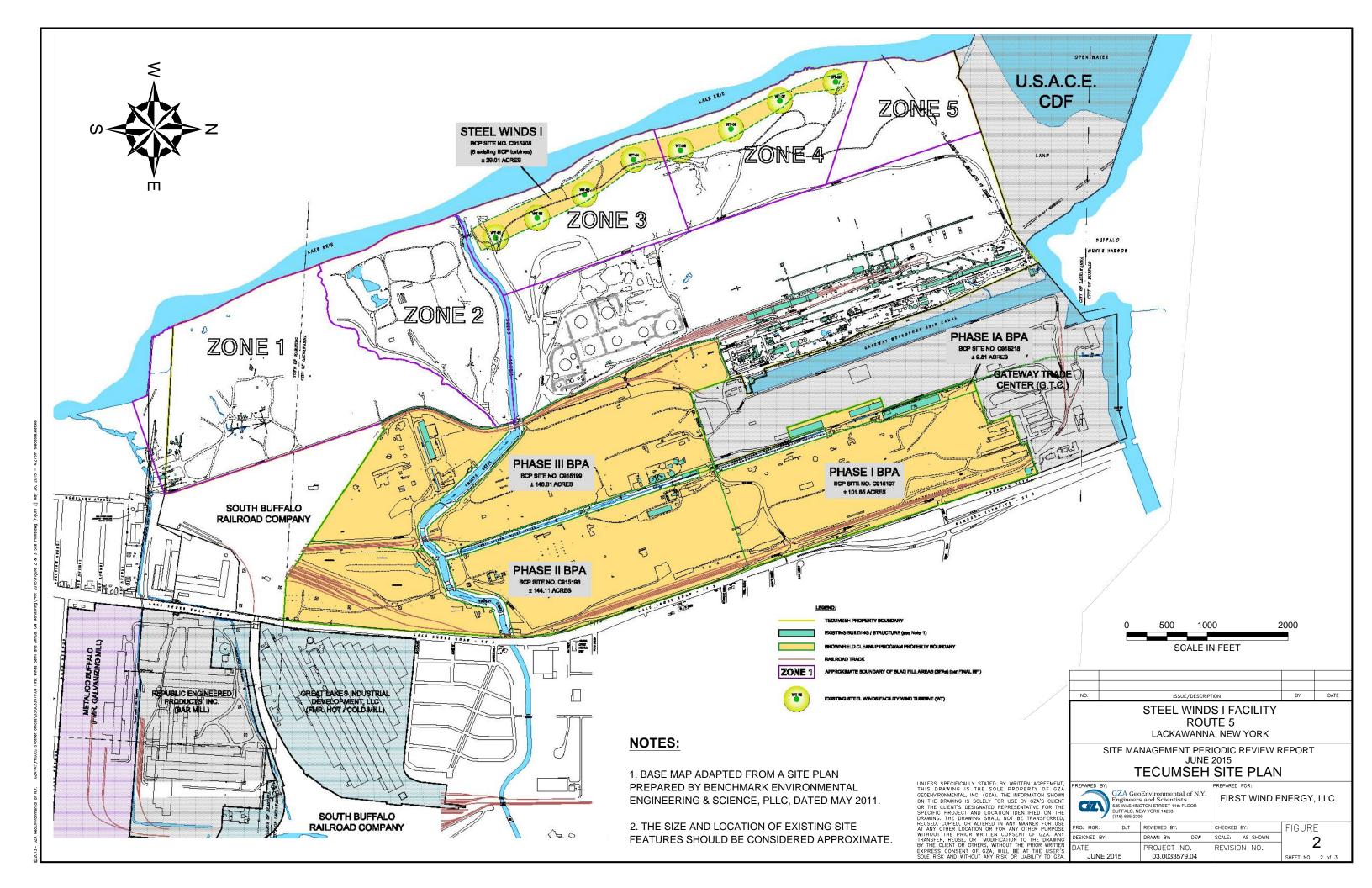
Attachment C - Site Photographs

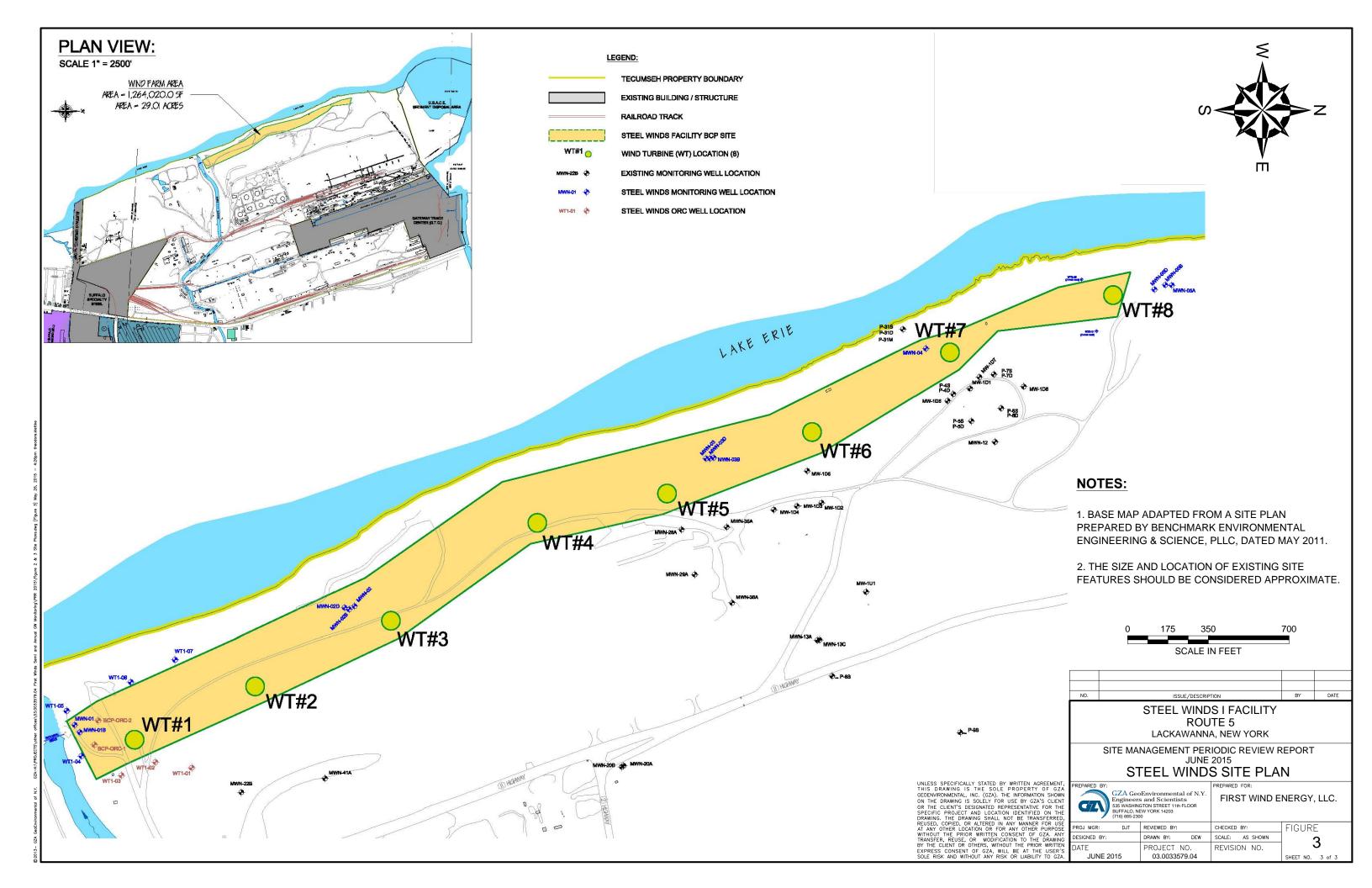
cc: Maurice Moore, NYSDEC

Claude Cote, First Wind Energy, LLC (electronic copy)









ATTACHMENT A

LIMITATIONS

LIMITATIONS

- 1. The Objective of this Periodic Review Report was to observe whether physical conditions and activities at the Site are consistent with the approved institutional and engineering controls. The observations described in this report were made under the conditions stated at the time of the reconnaissance.
- 2. Observations were made of the site and of structures on the site as described within the report. Where access to portions of the site or to structures on the site was restricted or limited, GZA GeoEnvironmental, Inc. renders no opinion as to site conditions relative to the approved institutional and engineering controls.
- 3. In preparing this report, GZA GeoEnvironmental, Inc. may have relied on certain information provided by the site contact, key site manager and/or other parties referenced therein. GZA GeoEnvironmental, Inc. did not attempt to independently verify the accuracy or completeness of all information reviewed or received during the course of preparing this Periodic Review Report.
- 4. The purpose of this report was to evaluate and document the condition of the engineered control caps and approved uses of the subject site soley with respect to the approved institutional and engineering controls. No specific attempt was made to evaluate the compliance of present or past owners or operators of the site with federal, state, or local laws and regulations, environmental or otherwise. In addition, GZA GeoEnvironmental, Inc. renders no opinion as to the presence of hazardous material or oil, or to the presence of indirect evidence relating to hazardous material or oil, at the site.

LIMIT ESA (1/1/91) Page 1

ATTACHMENT B INSTITUTIONAL AND ENGINEERING CONTROLS FORM



Enclosure 2 NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION Site Management Periodic Review Report Notice Institutional and Engineering Controls Certification Form



Site	e No.	C915205	ite Details	Box 1	
Site	e Name Ted	cumseh Redevelopment, Inc	cSteelwinds		
City	e Address: y/Town: Lac unty:Erie e Acreage: 2	ckawanna	Zip Code: 14218		
Re	porting Perio	od: May 05, 2014 to May 05,	2015		
				YES	NO
1.		nation above correct?		L	
		de handwritten above or on a			
2.	Has some tax map an	or all of the site property beer nendment during this Reportir	n sold, subdivided, merged, or undergone a ng Period?		M
3.	Has there to (see 6NYC	peen any change of use at the RR 375-1.11(d))?	e site during this Reporting Period		M
4.		ederal, state, and/or local per e property during this Reportir	mits (e.g., building, discharge) been issued ng Period?		A
	If you are:		nru 4, include documentation or evidence		
	that door	wered YES to questions 2 to	oly submitted with this certification form		
5.	that docur	wered YES to questions 2 to nentation has been previou currently undergoing develope	sly submitted with this certification form.		M.
5.	that docur	nentation has been previou	sly submitted with this certification form.		√
5.	that docur	nentation has been previou	sly submitted with this certification form.		NO
 5. 6. 	Is the site of	nentation has been previou	sly submitted with this certification form.	Box 2	NO
6.	Is the curre	nentation has been previous currently undergoing develope ent site use consistent with the	sly submitted with this certification form. ment? e use(s) listed below?	Box 2	
6.	Is the curre Commercia	ent site use consistent with the al and Industrial ECs in place and functioning	sly submitted with this certification form. ment? e use(s) listed below?	Box 2 YES	
6.	Is the curre Commercia Are all ICs/	ent site use consistent with the all and Industrial ECs in place and functioning HE ANSWER TO EITHER QUE	sly submitted with this certification form. ment? e use(s) listed below? as designed? STION 6 OR 7 IS NO, sign and date below a	Box 2 YES	

				Вох	2A
				YES	NO
8.	Has any new information revea Assessment regarding offsite c	led that assumptions made in ontamination are no longer v	n the Qualitative Exposure alid?		
	If you answered YES to ques that documentation has been	tion 8, include documentat previously submitted with	ion or evidence this certification form,	,	
9.	Are the assumptions in the Qualitative Exposure Assessment still valid? (The Qualitative Exposure Assessment must be certified every five years)		ď		
	If you answered NO to questi updated Qualitative Exposure	on 9, the Periodic Review I e Assessment based on the	Report must include an e new assumptions.		
SITE	NO. C915205			Box 3	3
	Description of Institutiona	I Controls			
Parcel	•		Institutional Control		
141.11	-1-1.111 Tecun	nseh Redevelopment, Inc.	Site Management Plan		
			Ground Water Use Restr	iction	
			Soil Management Plan Landuse Restriction		
			Languse Restriction		
(i) Co	mpliance with the Site Manager	ment Plan ("SMP") for the im	plemented remedy;		
(ii) M	aintenance of the 12 inch soil co	over system and vegetation o	ver the Site;		
	he groundwater beneath the Sit rritten permission of the Departr		e water source or for any other	use witho	ut the
(iv) G	roundwater monitoring as speci	fied in the SMP;			
	the event that buildings are cor ts will be required.	structed, a Department appr	oved evaluation of potential sub	-slab vapo	or
				Box 4	
	Description of Engineering	g Controls			
<u>Parce</u>	[Engineering Control			
141.1	1-1-1.111	Cover System			

Box 5

Periodic Review Report (PRR) Certification Statements

	Periodic Review Report (PRR) Certification Statements
1	I certify by checking "YES" below that:
	 a) the Periodic Review report and all attachments were prepared under the direction of, and reviewed by, the party making the certification;
	 b) to the best of my knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the site remedial program, and generally accepted engineering practices; and the information presented is accurate and compete.
	YES NO
2.	If this site has an IC/EC Plan (or equivalent as required in the Decision Document), for each Institutional or Engineering control listed in Boxes 3 and/or 4, I certify by checking "YES" below that all of the following statements are true:
	(a) the Institutional Control and/or Engineering Control(s) employed at this site is unchanged since the date that the Control was put in-place, or was last approved by the Department;
	(b) nothing has occurred that would impair the ability of such Control, to protect public health and the environment;
	 (c) access to the site will continue to be provided to the Department, to evaluate the remedy, including access to evaluate the continued maintenance of this Control;
	(d) nothing has occurred that would constitute a violation or failure to comply with the Site Management Plan for this Control; and
	(e) if a financial assurance mechanism is required by the oversight document for the site, the mechanism remains valid and sufficient for its intended purpose established in the document.
	YES NO
	IF THE ANSWER TO QUESTION 2 IS NO, sign and date below and DO NOT COMPLETE THE REST OF THIS FORM. Otherwise continue.
	A Corrective Measures Work Plan must be submitted along with this form to address these issues.
	Signature of Owner, Remedial Party or Designated Representative Date

IC CERTIFICATIONS SITE NO. C915205

Box 6

SITE OWNER OR DESIGNATED REPRESENTATIVE SIGNATURE

I certify that all information and statements in Boxes 1,2, and 3 are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law.

Ferial Law.
print name at 179 Lincoln St. Boston Ma 0211
am certifying as Romedial Party (Owner or Remedial Party)
for the Site named in the Site Details Section of this form.
Signature of Owner, Remedial Party, or Designated Representative Rendering Certification

IC/EC CERTIFICATIONS

Box 7

Professional Engineer Signature

I certify that all information in Boxes 4 and 5 are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law.

Danie Troy at 624 GEOENVIRON MENTAL OF NY BUFFILO NY print name print business address 14203

am certifying as a Professional Engineer for the STEELWINDS (NIA GARA WIND FIWER LLC

Signature of Professional Engineer, for the Owner or Remedial Party, Rendering Certification

or Stamp (Required for PE)

APPENDIX C SITE PHOTOGRAPHS

Steel Winds Site 2015 BCP Site No. C915205 Lackawanna, New York



View of monitoring well WT1-05.



View of WT-1 looking southeast.



View of turbine array looking northwest.



Looking southwest towards WT1-7.



Patch of light vegetation between WT-3 and WT-4 alongside access road.



View of turbine array looking southeast.

Steel Winds Site 2015 BCP Site No. C915205 Lackawanna, New York



Slight tire rutting and bare vegetation patches west of WT-6.



Area of light vegetation between WT-6 and WT-7.



View of turbine array looking southeast.



View of soil cover cap looking northwest to WT-7 and WT-8.



Slight erosion along rut on slope south of WT-8.



Equipment repair work occurring near WT-6, minor patches of bare vegetation observed.