

Interim Remedial Measures (IRM) Work Plan for Soil Cover System

Brownfield Cleanup Program

Steel Winds Site Lackawanna, New York

June 2007

0071-003-120

Prepared For:

BQ Energy, LLC



Prepared By:



In Association
With



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**IRM WORK PLAN FOR SOIL COVER SYSTEM
STEELWINDS SITE**

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1.0 INTRODUCTION

This document presents the proposed scope of work for completion of an Interim Remedial Measure (IRM) at the Steel Winds Site in Lackawanna, New York (Figure 1). BQ Energy, LLC has entered into a long-term lease agreement with Tecumseh to construct and operate wind turbines and supporting power generation equipment and infrastructure on the Steel Winds Site. The IRM is being performed on behalf of BQ Energy, LLC through the New York State Department of Environmental Conservation (NYSDEC) Brownfield Cleanup Program (BCP). In September 2006, BQ Energy and the NYSDEC entered into a Brownfields Cleanup Agreement for the wind energy facilities and the associated property, hereafter referred to as the “Steel Winds Site,” “subject property,” or the “BCP Site.”

In the fall of 2006, TurnKey Environmental Restoration LLC (TurnKey) in concert with Benchmark Engineering & Science, PLLC (Benchmark) performed a Site Investigation (SI)/Remedial Alternatives Report (RAR)/Interim Remedial Measures (IRM). The IRM related to turbine foundation excavations was completed in late 2006 to supplement existing site data and complete characterization of the site.

BQ Energy will be completing a separate IRM to address shallow and surficial impacted slag/fill present at the Site. The planned approach for the Soil Cover System IRM and related activities is discussed in Section 2.0.

1.1 Background

The Steel Winds Site encompasses approximately 29 acres located in the City of Lackawanna, New York. The Steel Winds BCP parcel that is the subject of this report is located within the Slag Fill Area along the lake shore north of Smokes Creek (see Figure 2). The Slag Fill Area was created from the deposition of dredge spoils by the US Army Corps of Engineers and later from the deposition of slag by Bethlehem Steel (starting in 1937). According to the Real Estate Records, in 1937, Bethlehem Steel Company owned the subject Site. In 1964, Bethlehem Steel Company merged into Bethlehem Steel Corporation. Steel production on the property was discontinued in 1983 and the coke ovens ceased activity in 2001. Tecumseh acquired the property, along with other BSC assets, out of bankruptcy in 2003.

The Steel Winds Site sits atop a bluff approximately 20 to 45 feet above average Lake Erie elevation. Prior to site grading and preparation for the wind farm, Site topography was highly variable due to historic slag/fill deposition patterns. The Steel Winds Site contained no structures or discernable features, except for rough graded access roads and slag/fill piles prior to initiation of construction of the wind farm in September 2006. The land surface is generally flat and sparsely vegetated with voluntary indigenous shrubs, grasses, weeds and emergent trees. The Site is now dominated by the eight windmills with their 3-blade (each 153 feet long) rotors atop 240-foot monolithic tubular steel towers. The towers are anchored to octagon-shaped subsurface reinforced concrete foundations measuring approximately 65 feet across by 8 feet deep.

The previous site investigation conducted on or adjacent to the Steel Winds Site is the RCRA Facilities Investigation (RFI) conducted by Bethlehem Steel over the period of 1990 to 1995 (Ref. 1). The RFI focused primarily on SWMUs that are located off the Steel Winds Site, therefore prior to conducting the BCP Site Investigation, virtually no soil/fill data existed for the area that now comprises the Steel Winds Site. Five monitoring well clusters (MWN-01 through MWN-05) were installed by BSC as part of the RFI activities (Ref. 1) on or adjacent to the subject property. As described in the 2004 RFI, benzene and naphthalene are the most commonly observed constituents in groundwater throughout the various rounds of RFI sampling. In RFI monitoring well pairs now located within or adjacent to the BCP Site, total BTEX concentrations were typically less than 100 µg/L and tended to be higher in the sand unit than in the fill unit. Low levels of BTEX (non-detect to 12 µg/L) were also detected in bedrock wells associated with these well clusters. RFI monitoring wells are shown on Figure 2.

In September 2006, TurnKey and Benchmark jointly submitted a SI/RAR/IRM Work Plan to the NYSDEC for review and approval (Ref. 2). The purpose of the SI was to more fully characterize slag/fill and groundwater at the Steel Winds Site. On-site field activities included: surface and subsurface slag/fill sampling; existing monitoring well development and sampling; collection of hydraulic data; and completion of a Site survey. The SI was geared toward collection of representative analytical data to fully characterize on-site source area slag/fill, slag/fill outside the wind turbine excavation footprints but within Site boundaries, and groundwater quality. The field activities included:

- Analysis of representative surface and subsurface slag/fill sample(s) to establish concentrations of Constituents of Potential Concern (COPCs)

within the slag/fill matrix (e.g., RCRA metals) outside the wind turbine footprints. A total of 27 surface samples (approximately 1 per acre) were collected and analyzed for TCL SVOCs and TAL metals plus cyanide. Six subsurface composite samples, consisting of four grab samples each, were collected and analyzed for TCL VOCs, STARS List VOCs, TCL SVOCs, TAL metals plus cyanide. Synthetic precipitation leaching procedure (SPLP) was also performed on the subsurface slag /fill composite samples to assess the potential for these constituents to leach to groundwater.

- Visual/olfactory/PID characterization of surface and subsurface slag/fill in the wind turbine locations and interconnecting conduit trenches. The excavated slag/fill was monitored for staining or discoloration, and was field-screened for the presence of VOCs with a photoionization detector PID.
- Collection of a total of 6 bottom and 27 sidewall documentation samples within test pits WT-1 through WT-8.. In addition, NYSDEC collected one composite and one grab sample from WT-1.
- Collection and analysis of groundwater samples and groundwater potentiometric data from existing installed monitoring wells on the Site and water level data only from existing monitoring wells on the adjacent Tecumseh property. Existing on-site monitoring well clusters MWN-01 through MWN-04 and off-site monitoring well cluster MWN-05 were sampled and analyzed for TCL VOCs, STARS List VOCs, TCL SVOCs (base neutral only), and TAL metals plus cyanide.

Results of the Site Investigation are presented in the April 2007 SI/RAR/IRM Report (Ref. 3). IRM activities related to the wind turbine footprint excavations are detailed in the April 2007 Final Engineering Report (Ref. 4).

1.2 Purpose and Scope

An IRM is proposed to mitigate risks to public health and the environment attributable to contamination at the Steel Winds Site. Based on the nature and extent of contamination as indicated by prior investigations, the most applicable remedial measure is a one foot soil cover consistent with the NYSDEC and NYSDOH presumptive cover criteria for protection of human health and the environment.

This IRM Work Plan includes proposed drawings that delineate the planned subgrade preparation across the site to provide a suitable grade (i.e., maximum slope of 25 % or 1 on 4) on all slopes in order to place soil cover and establish necessary vegetative

cover. The proposed subgrade preparation drawings and details (refer to Figures SG-1 through SG-9) illustrate the planned approach to the IRM work, including anticipated soil cover limits based on surveyed site boundaries and the limits of new on-site access road and wind turbine perimeters (crane pad access and general turbine tower access areas) that will not be covered. The proposed work will include:

- Re-grading of all current slopes on the site that exceed a 25 percent grade and leveling and filling of smaller slag/fill stockpiles or depressions to facilitate placement of final cover soil. It is estimated that approximately 35,000 cubic yards of slag/fill will be re-graded due to the current slopes exceeding a 25% grade. These steeper slopes are located primarily on the south side of WT-1, the west side of the Site between WT-4 and WT-6 and between WT-7 and WT-8. Other regrading will be performed in small areas to improve the aesthetics of the final cover. Figures SG-1 through SG-8 illustrates the existing and proposed site subgrade contours.
- Identifying and properly handling and disposing of grossly contaminated soils, drums, and other unanticipated waste materials, if encountered/uncovered during re-grading activities.
- Importation and placement of an estimated 38,000 cubic yards of soil cover (meeting the Restricted Commercial or Industrial SCOs per 6NYCRR Part 375-3.8(4)(iii)(c)(1) for cover soils as presented in Table 1) within the property boundaries and excluding the new access roads and turbine tower perimeter access areas as shown on Figures SG-1 through SG-8.
- Seeding of cover soils in accordance with the seeding specifications presented on Figure SG-9 in order to establish vegetative growth on the cover within 60 days of completion of soil placement.

This Work Plan addresses the following tasks in detail:

- Pre-mobilization meetings.
- Pre-excavation survey.
- Health, safety, and community air monitoring procedures.
- Sequencing of slag/fill sub-grade preparation and soil cover placement and establishment of vegetative cover.

- Dust, stormwater, and erosion control measures required for minimizing potential releases of fill/soils outside the work zone during construction.
- Equipment decontamination requirements.
- Acceptance criteria for soil cover.
- Project documentation and schedule.

Implementation of the remedial activities outlined in this IRM Work Plan will be conducted on a design-build basis, with Benchmark serving as Design-Build Engineer. A remediation contractor will be retained to assist in carrying out the work in accordance with the activities described herein. IRM construction will be supervised and documented per the Work Plan.

1.3 Project Organization and Responsibilities

TurnKey and Benchmark will manage the brownfield cleanup on behalf of the property owner, including selection of the remediation contractor to perform the IRM activities. The NYSDEC Division of Environmental Remediation will monitor the remedial actions to verify that the work is performed in accordance with the BCA.

2.0 TECHNICAL APPROACH

2.1 Pre-Mobilization Tasks

Community residents and other interested parties will be informed of the project schedule, objectives, and details via a fact sheet before work begins. The intent of this effort is to seek community cooperation; minimize disruption of neighborhood residential and commercial activities; and facilitate a safe and secure work site. NYSDEC will coordinate and lead community relations throughout the course of the project, with support from TurnKey and Benchmark.

2.1.1 Meetings

2.1.1.1 Public Information and Outreach

A Citizen Participation (CP) Plan has been prepared for the Steel Winds Site (Ref. 5). The CP Plan provides for issuance of fact sheets and/or public meetings at various stages in the remedial process. A fact sheet containing information about the IRM will be direct-mailed by NYSDEC to those individuals on the CP Plan contact list, including property owners and residents adjacent to the project site, environmental groups, local political representatives, and interested regulatory agencies. A copy of this Work Plan has been made available for public review at the NYSDEC Region 9 office and the Lackawanna Public Library.

2.1.1.2 Project Coordination Meeting

A project coordination meeting will be held with representatives of the Project Team, including the Engineer's Project Manager; the remediation contractor; and the designated NYSDEC contact(s) as the involved regulatory agency. The New York State Department of Health (NYSDOH) will also be notified and invited to attend as an interested agency. The meeting will be held prior to the start of IRM activities to review responsibilities, personnel assignments, and construction details. Agenda items will include:

- Construction schedule.

- Work sequencing.
- Designation of responsibilities, contact personnel and pager/phone numbers.
- Identification of borrow soil source and review of soils characterization and acceptance criteria.
- Project documentation requirements.
- Staging of equipment and location of temporary office.
- Transportation routes/site egress.
- Health and safety requirements.
- Temporary controls (dust suppression).
- Work hours.
- Site security.
- Public relations, including procedures for addressing news media and citizen inquiries.

TurnKey will prepare meeting minutes for distribution to attendees following the project coordination meeting.

2.1.1.3 Progress Meetings

Progress meetings will be conducted at the project site by TurnKey's Project Manager on a bi-weekly basis throughout the construction period. Progress meetings will be attended by the contractor and key subcontractors, if appropriate. NYSDEC and NYSDOH will have access to all progress meetings.

2.1.2 Health and Safety Plan Development

The September 2006 Site Health and Safety Plan (HASP) for SI/RAR/IRM Activities (Ref. 6), prepared in accordance with the requirements of 29 CFR 1910.120, will be used for the IRM soil cover activities described herein. TurnKey will be responsible for site control and for the health and safety of its authorized site workers. The

remediation contractor will be required to develop a HASP as or more stringent than TurnKey's HASP.

TurnKey will also be responsible for the performance of community air monitoring, as discussed in Section 3.0 of this Work Plan.

2.2 Soil Cover System

The remediation contractor's field operations at the Site will commence with mobilization, which will include establishing and staking the elevation grid; setting up and connecting temporary utilities at the field trailer; and erecting safety fencing and other temporary controls identified in Section 2.2.2. Operation of heavy equipment on the work site will be limited throughout the duration of the project to 7:00 a.m. through 7:00 p.m., Monday through Friday, excluding holidays. Saturday work may be permitted upon prior arrangement with the Engineer.

2.2.1 Site Preparation and Regrading

Site preparation activities will begin with removing any loose debris and trash located on the surface of the property. All exposed steel scrap and steel "pot buttons" will be removed from the site for scrap recovery purposes. Slopes greater than 4:1 will be regraded to facilitate cover soil placement and establishment of vegetative cover. Pre- and post-grading elevation measurements for verification purposes will be made by the Engineer to confirm final subgrade maximum slope grades have not been exceeded and verify that one foot of cover has been placed. A minimum of 10 subgrade spot elevation shots will be collected and documented per acre and to verify that final subgrade slope elevations conform to the design.

2.2.2 Temporary Facilities and Controls

The construction field trailer and sanitary facilities will be available for use during the IRM activities. Temporary controls will be employed for protection against safety hazards during construction. This will include dust suppression as further described below.

2.2.2.1 Dust Suppression

Dust suppression will be an integral component of the regrading and cover system activities. During regrading activities, the remediation contractor will apply a water spray across the surface and surrounding areas as necessary to mitigate airborne dust formation and migration. Water will also be sprayed as needed to control dust migration from the handling, placement, and compaction of cover soils. Water will be obtained from the onsite Tecumseh hydrant's supplied by the Mittal cooling water pump station. Other dust suppression techniques that may be used to supplement the water spray include:

- Applying water on haul roads.
- Hauling materials in properly tarped containers or vehicles.
- Restricting vehicle speeds on-site.

All reasonable attempts will be made to keep visible and/or fugitive dust to a minimum.

2.2.3 Cover System Construction

Construction of a soil cover system will follow regrading activities. Requirements for off-site backfill soils characterization and placement are described below. The soil cover system will include placement of a 1-foot layer of soil over the entire Site with the exception of new access roads and turbine access pads as delineated on the subgrade preparation drawings. Soils shall not be formally compacted; however, placement will be conducted to achieve a stable and homogeneous cover system that is free of stratifications, lenses, or voids that may settle. Verification of soil cover depth will be performed by placement of pre-marked grade stakes in the designated areas to be covered at a spacing of no greater than 75 feet on center that will allow for visual confirmation that one foot of cover has been achieved. No demarcation layer or visual barrier will be placed between the new cover soils and the existing site slag fill due to the obvious difference in appearance and physical characteristics between the two materials.

The imported soil will conform to the NYSDEC criteria listed in Table 1 as per 375-3.8(4)(iii)(c)(1). Off-site sources intended for use as backfill must be inspected and approved by the Engineer and NYSDEC prior to acceptance at the Site. Acceptance of all off-site borrow sources will only occur after the borrow site owner/operator submits a

written certification that the site is neither known to have or exhibit evidence of disposal or release of hazardous or toxic substances, radioactive wastes, solid wastes or petroleum products.

Following placement, the cover soils will be seeded to promote vegetative growth. The seeding will be performed in accordance with the mixture and procedures specified on Figure SG-9.

2.2.3.1 Characterization Requirements

In addition to the above criteria, backfill materials originating from non-virgin sources will be subject to the following characterization requirements:

- **Off-Site Material:** Off-site material originating from “non-virgin” sources, or virgin sources that have been stockpiled at an uncontrolled site, will be sampled according to the following schedule:
 - One composite sample per 250 cubic yards of material from each source area. The represented soil will be acceptable for use as backfill provided it does not exceed the SCOs in Table 1.
 - If more than 1,000 yards are borrowed from a given off-site source area and all samples of the first 1,000 yards meet the criteria in Table 1, the sampling frequency may be reduced to one composite for every 1000 yards of additional soils from the same source area up to 5,000 yards.
 - For borrow sources greater than 5000 yards, sampling frequency may be reduced to one sample per 5,000 yards, providing all earlier samples meet the SCOs in Table 1.

Each composite will be comprised of a minimum of three grab samples (samples for VOC analysis will be collected as individual grabs in lieu of composites). Samples will be analyzed for the following constituents in accordance with USEPA SW-846 methodology:

- Target Compound List (TCL) VOCs - Method 8260B
- TCL SVOCs - Method 8270C
- TCL Organochlorine Pesticides and PCBs - Method 8081A/8082
- TAL Metals – Method 6010B
- Cyanide - Method 9013

Only materials that contain concentrations of these organic compounds and metals at or below those listed in Table 1 will be used. In addition, off-site backfill soils will not contain any material (i.e., rocks) greater than 3 inches in any dimension; will be classified as SC, SM, CL, GC, GM or ML by the Unified Soil Classification System; and will be substantially free of roots and other degradable materials.

Characterization testing for off-site sources will be performed by an independent, NYSDOH ELAP-approved laboratory having CLP certification. An equivalent ASP Category B deliverables package will be furnished with the data to allow data evaluation and preparation of a Data Usability Summary Report by an independent, third party data validation expert. QA samples will be collected to support the data evaluation. The QA samples will include a minimum of one matrix spike, one matrix spike duplicate, and one blind duplicate per 20 verification samples.

3.0 COMMUNITY AIR MONITORING

Real-time community air monitoring will be performed during IRM activities at the Site. A Community Air Monitoring Plan is included with TurnKey's HASP. Particulate and VOC monitoring will be performed along the downward perimeter of the work area during regrading and soil placement/compaction activities in accordance with this plan. This plan is consistent with the requirements for community air monitoring at remediation sites as established by the NYSDOH and NYSDEC. Accordingly, it follows procedures and practices outlined under NYSDOH's Generic Community Air Monitoring Plan (dated June 20, 2000) and NYSDEC Technical Assistance and Guidance Memorandum (TAGM) 4031: Fugitive Dust Suppression and Particulate Monitoring Program at Inactive Hazardous Waste Sites.

4.0 DOCUMENTATION AND REPORTING

The Engineer will be on-site on a part-time basis as required during regrading and construction of the soil cover system to document IRM activities. Such documentation will include, at minimum, daily reports of construction activities, community air monitoring results, and photographs and sketches, as necessary. In addition, NYSDEC and NYSDOH will be invited to attend weekly progress meetings, and will be provided written progress reports every month.

4.1 Construction Monitoring

Standard daily reporting procedures will include preparation of a daily report and, when appropriate, problem identification and corrective measures reports. Appendix A contains sample project documentation forms. Information that may be included on the daily report form includes:

- Processes and locations of construction under way.
- Equipment and personnel working in the area, including subcontractors.
- A description of off-site materials received, including any quality verification (certification) documentation.

The completed reports will be available on-site and will be submitted to the NYSDEC as part of the Final Report.

A problem identification report and a corrective measure report will be completed whenever major field problems are encountered and corrective measures may be necessary. These reports will be attached to the monthly progress reports. The NYSDEC will be promptly notified of problems requiring modifications to this Work Plan prior to proceeding or completion of the construction item. Changes or additions will be noted in the Progress and Final Reports.

Photo documentation of the IRM activities will be prepared by the Engineer throughout the duration of the project as necessary to convey typical work activities and whenever changed conditions or special circumstances arise. Photos will be provided in digital format.

4.2 Progress Reports

TurnKey will prepare and submit to NYSDEC monthly progress reports that include:

- Activities performed during reporting period.
- Results of tests or other pertinent data.
- Work scheduled for the upcoming reporting period.
- Other actions/information pertinent to the project.
- Percentage of completion, delays encountered or anticipated that may affect the schedule, and a description of efforts made to mitigate those delays or anticipated delays.

4.3 IRM Construction Closeout Report

An IRM construction closeout report will be prepared and submitted to the NYSDEC after the Site is remediated. The report will be stamped by a NYS licensed Professional Engineer and will be submitted within 60 days of completion of the work. At a minimum, the report will include:

- A Site or area planimetric map showing the parcel(s) remediated.
- A survey showing: the grade before and after regrading activities, and following cover soil placement. The survey will be accurate to within 0.1 feet on a grid spacing no greater than 25 feet by 25 feet.
- Tabular summary of volume/type/source of cover system soil.
- Copies of daily inspection reports and, if applicable, problem identification and corrective measure reports.
- Text describing the regrading and cover system construction activities performed; a description of any deviations from the Work Plan and associated corrective measures taken; and other pertinent information necessary to document that the site activities were carried out in accordance with this Work Plan.
- A certification by a licensed NYS Professional Engineer that all work was performed in accordance with the Brownfield Cleanup Agreement and

approved IRM Work Plan. The certification will include the following text. “I (name), residing at (address), certify that at all pertinent times hereinafter mentioned was, a currently registered professional engineer; was the individual who had primary direct responsibility for the implementation of the subject remedial program; and that all requirements of the remedial program have been complied with.”

4.4 Cover System Maintenance Plan

A Cover System Maintenance Plan will be prepared and submitted to the Department under separate cover prior to completion of the cover system construction which will identify the procedures and methods that will be performed to maintain appropriate vegetative growth on the cover soil system.

5.0 PROJECT SCHEDULE

The IRM activities detailed in this Work Plan shall be completed within approximately three months of approval of this Work Plan.

6.0 REFERENCES

1. URS Consultants, Inc. 2004. *RCRA Facility Investigation (RFI) Report for the Former Bethlehem Steel Corporation Facility, Lackawanna, New York, Parts I through VII*, prepared for Bethlehem Steel Corporation. October.
2. TurnKey Environmental Restoration, LLC. 2006. *Site Investigation/Remedial Alternatives Report/Interim Remedial Measures Work Plan*, prepared for BQ Energy, LLC. September.
3. TurnKey Environmental Restoration, LLC. 2007. *Site Investigation/Remedial Alternatives Report/IRM Report*, prepared for BQ Energy, LLC. April
4. TurnKey Environmental Restoration, LLC. 2007. *Final Engineering Report*, prepared for BQ Energy, LLC. February.
5. TurnKey Environmental Restoration, LLC. 2006. *Citizen Participation Plan for BQ Energy, LLC Steel Winds Site*. May.
6. TurnKey Environmental Restoration, LLC. 2006. *Site Health and Safety Plan for Brownfield Cleanup Program SI/RAR/IRM Activities, BW Energy, LLC Steel Winds Site*. September.

TABLES

TABLE 1

**CRITERIA FOR USE OF OFF-SITE SOIL
AS COVER SYSTEM MATERIAL**

**IRM Work Plan for Soil Cover System
Steel Winds Site
Lackawanna, New York**

Parameter	TRACK 4 Restricted-Commercial or Industrial SCOs
Volatile Organic Compounds (mg/kg)	
1,1,1-Trichloroethane	0.68
1,1-Dichloroethane	0.27
1,1-Dichloroethene	0.33
1,2-Dichlorobenzene	1.1
1,2-Dichloroethane	0.02
1,2-Dichloroethene(cis)	0.25
1,2-Dichloroethene(trans)	0.19
1,3-Dichlorobenzene	2.4
1,4-Dichlorobenzene	1.8
1,4-Dioxane	0.1
Acetone	0.05
Benzene	0.06
Butylbenzene	12
Carbon tetrachloride	0.76
Chlorobenzene	1.1
Chloroform	0.37
Ethylbenzene	1
Hexachlorobenzene	3.2
Methyl ethyl ketone	0.12
Methyl tert-butyl ether	0.93
Methylene chloride	0.05
Propylbenzene-n	3.9
Sec-Butylbenzene	11
Tert-Butylbenzene	5.9
Tetrachloroethene	1.3
Toluene	0.7
Trichloroethene	0.47

TABLE 1

**CRITERIA FOR USE OF OFF-SITE SOIL
AS COVER SYSTEM MATERIAL**

**IRM Work Plan for Soil Cover System
Steel Winds Site
Lackawanna, New York**

Parameter	TRACK 4 Restricted-Commercial or Industrial SCOs
Volatile Organic Compounds (mg/kg)	
Trimethylbenzene-1,2,4	3.6
Trimethylbenzene-1,3,5	8.4
Vinyl chloride	0.02
Xylene (mixed)	1.6
Semi-Volatile Organic Compounds (mg/kg)	
Acenaphthene	98
Acenaphthylene	107
Anthracene	500
Benzo(a)anthracene	1
Benzo(a)pyrene	1
Benzo(b)fluoranthene	1.7
Benzo(g,h,i)perylene	500
Benzo(k)fluoranthene	1.7
Chrysene	1
Dibenz(a,h)anthracene	0.56
Fluoranthene	500
Fluorene	386
Indeno(1,2,3-cd)pyrene	5.6
m-Cresol(s)	0.33
Naphthalene	12
o-Cresol(s)	0.33
p-Cresol(s)	0.33
Pentachlorophenol	0.8
Phenanthrene	500
Phenol	0.33
Pyrene	500

TABLE 1

**CRITERIA FOR USE OF OFF-SITE SOIL
AS COVER SYSTEM MATERIAL**

**IRM Work Plan for Soil Cover System
Steel Winds Site
Lackawanna, New York**

Parameter	TRACK 4 Restricted-Commercial or Industrial SCOs
Metals (mg/kg)	
Arsenic	16
Barium	400
Beryllium	47
Cadmium	7.5
Chromium, Hexavalent ¹	19
Chromium, Trivalent ¹	1500
Copper	270
Cyanide	27
Lead	450
Manganese	2000
Mercury (total)	0.73
Nickel	130
Selenium	4
Silver	8.3
Zinc	2480
PCBs/Pesticides (mg/kg)	
2,4,5-TP Acid (Silvex)	3.8
4,4'-DDE	17
4,4'-DDT	47
4,4'-DDD	14
Aldrin	0.19
Alpha-BHC	0.02
Beta-BHC	0.09
Chlordane (alpha)	2.9
Delta-BHC	0.25
Dibenzofuran	210
Dieldrin	0.1
Endosulfan I	102

TABLE 1

**CRITERIA FOR USE OF OFF-SITE SOIL
AS COVER SYSTEM MATERIAL**

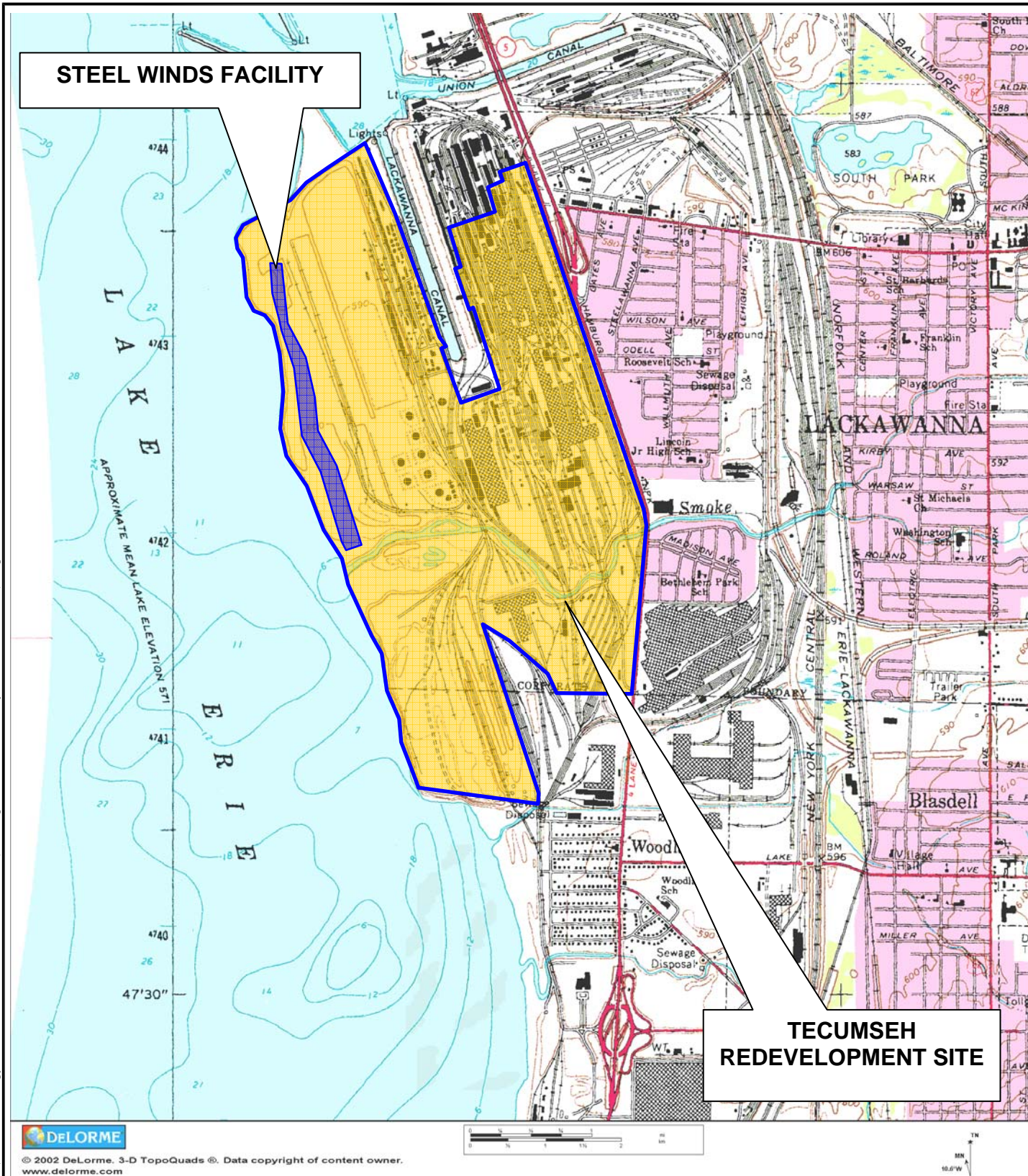
**IRM Work Plan for Soil Cover System
Steel Winds Site
Lackawanna, New York**

Parameter	TRACK 4 Restricted-Commercial or Industrial SCOs
PCBs/Pesticides (mg/kg)	
Endosulfan II	102
Endosulfan sulfate	200
Endrin	0.06
Heptachlor	0.38
Lindane	0.1
Polychlorinated biphenyls	1

Notes:

1. The SCO for Hexavalent or Trivalent Chromium is considered to be met if the analysis for the total species of this contaminant is below the specific SCO for Hexavalent Chromium.

FIGURES



FILEPATH:\cad\turnkey\energy & process energy\steel winds\irm-soil cover work plan\figure 1, site vicinity and location map.dwg



726 EXCHANGE STREET
SUITE 624
BUFFALO, NEW YORK 14210
(716) 856-635

SITE LOCATION AND VICINITY MAP

IRM SOIL COVER WORK PLAN

STEEL WINDS FACILITY
LACKAWANNA, NEW YORK

PREPARED FOR
BQ ENERGY, LLC

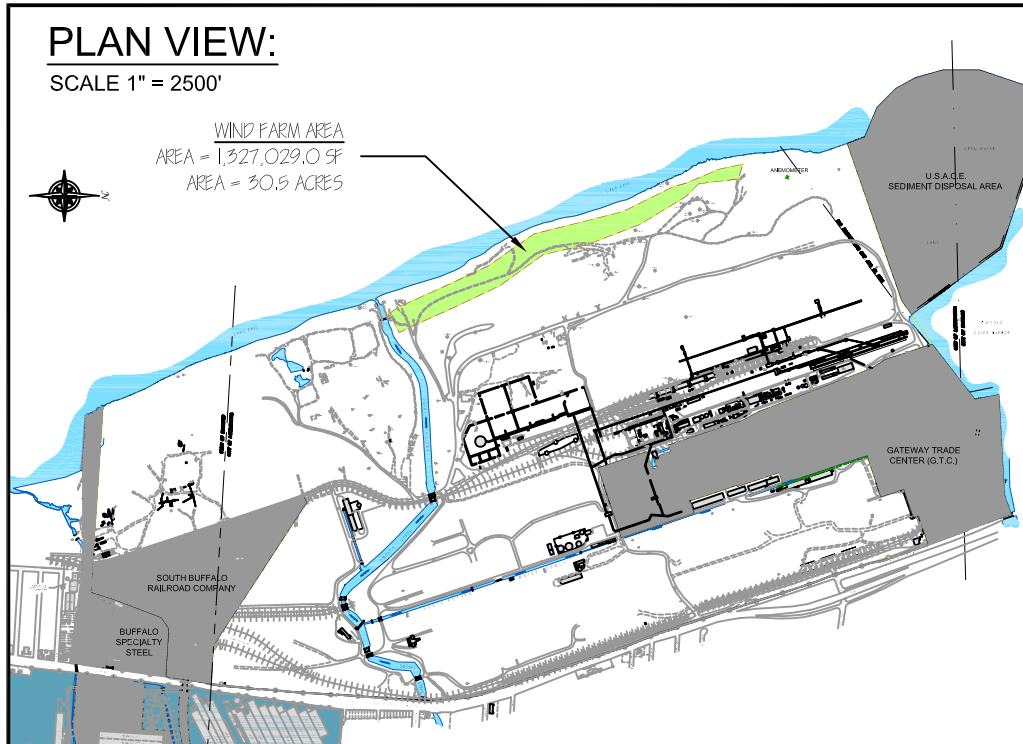
PROJECT NO.: 0071-003-100
DATE: MAY 2007
DRAFTED BY: BCH

F:\CAD\Turnkey\BQ Energy & Process Energy\Steel Winds\IRM - Soil Cover Work Plan\Figure 2: Steel Winds Site Plan.dwg

PLAN VIEW:

SCALE 1" = 2500'

WIND FARM AREA
AREA = 1,327,029.0 SF
AREA = 30.5 ACRES

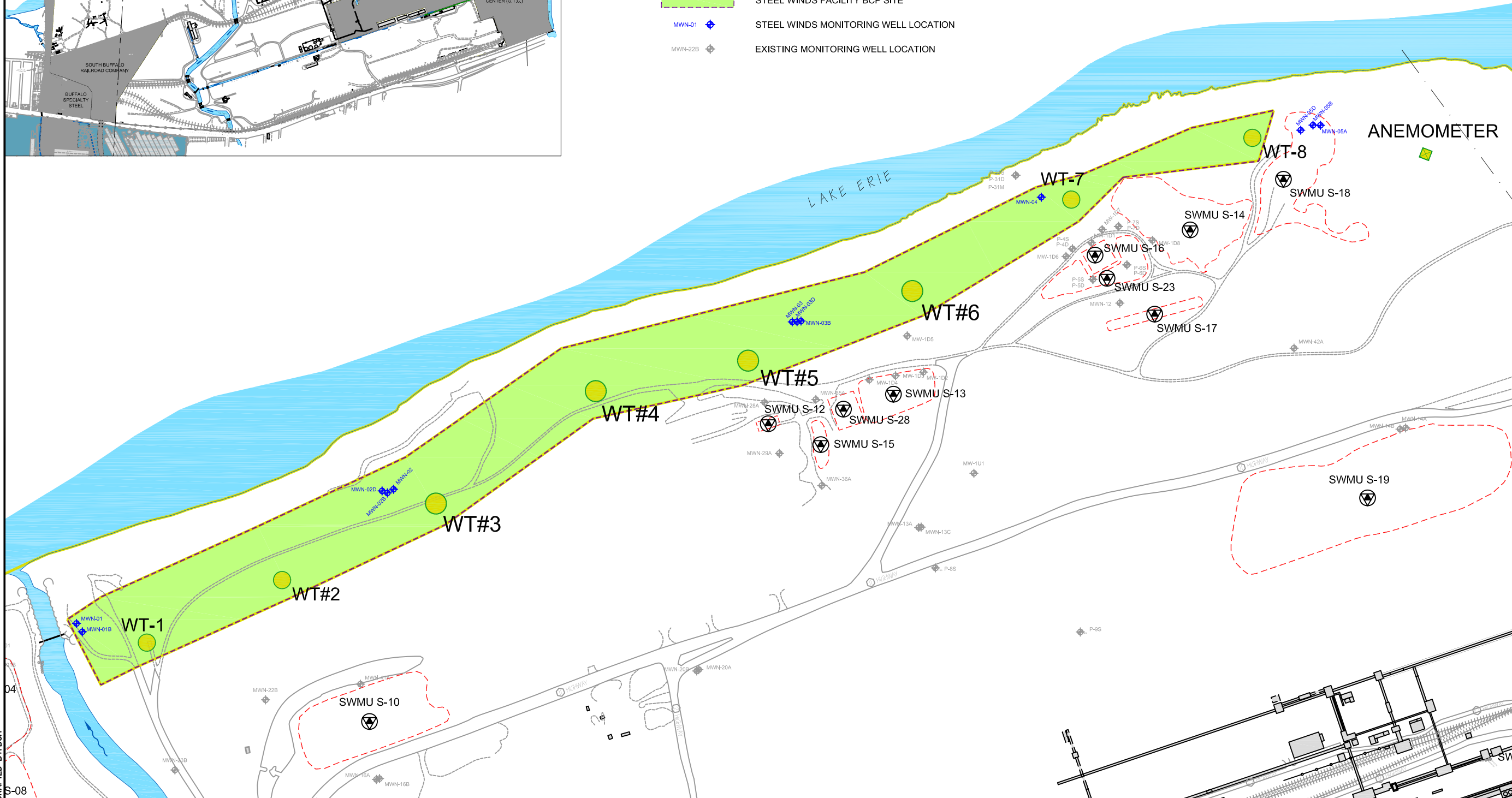


LEGEND:

- TECUMSEH PROPERTY BOUNDARY
- EXISTING BUILDING / STRUCTURE
- RAILROAD TRACK
- WT#1 WIND TURBINE (WT) LOCATION (8)
- ANEMOMETER LOCATION
- SWMU P-07 APPROXIMATE LOCATION OF SOLID WASTE MANAGEMENT UNIT (SWMU) - REQUIRES FURTHER ASSESSMENT
- APPROXIMATE BOUNDARY OF SWMU
- STEEL WINDS FACILITY BCP SITE
- MWN-01 STEEL WINDS MONITORING WELL LOCATION
- MWN-22B EXISTING MONITORING WELL LOCATION



SCALE: 1 INCH = 400 FEET
SCALE IN FEET
(approximate)



STEEL WINDS SITE PLAN

IRM SOIL COVER WORK PLAN

STEEL WINDS FACILITY
LACKAWANNA, NEW YORK

PREPARED FOR
BQ ENERGY, LLC

726 EXCHANGE STREET
SUITE 624
BUFFALO, NEW YORK 14210
(716) 856-0835

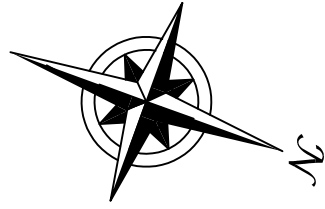


JOB NO.: 0071-003-100








FIGURE 2

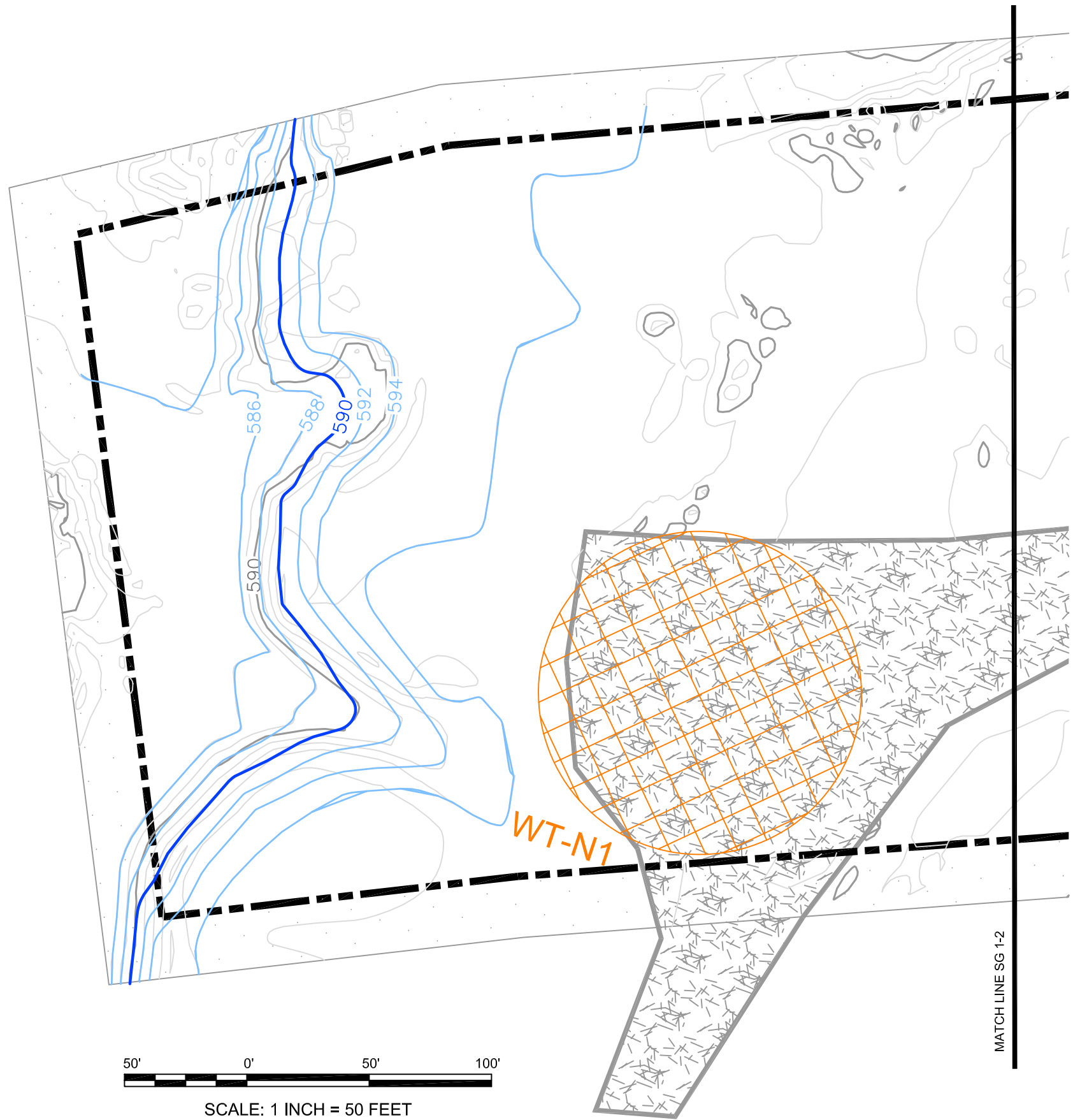
DATE: MAY 2007
DRAFTED BY: BCH

DATE: 5/07
DRAFTED BY: wfm



LEGEND

	WIND TURBINE ACCESS AREAS
	25' TRANSITION LIMIT
	10' MAJOR EXISTING CONTOUR
	2' MINOR EXISTING CONTOUR
	10' MAJOR DESIGN CONTOUR
	2' MINOR DESIGN CONTOUR
	BCP PROPERTY LINE



SCALE: 1 INCH = 50 FEET
SCALE IN FEET
(approximate)

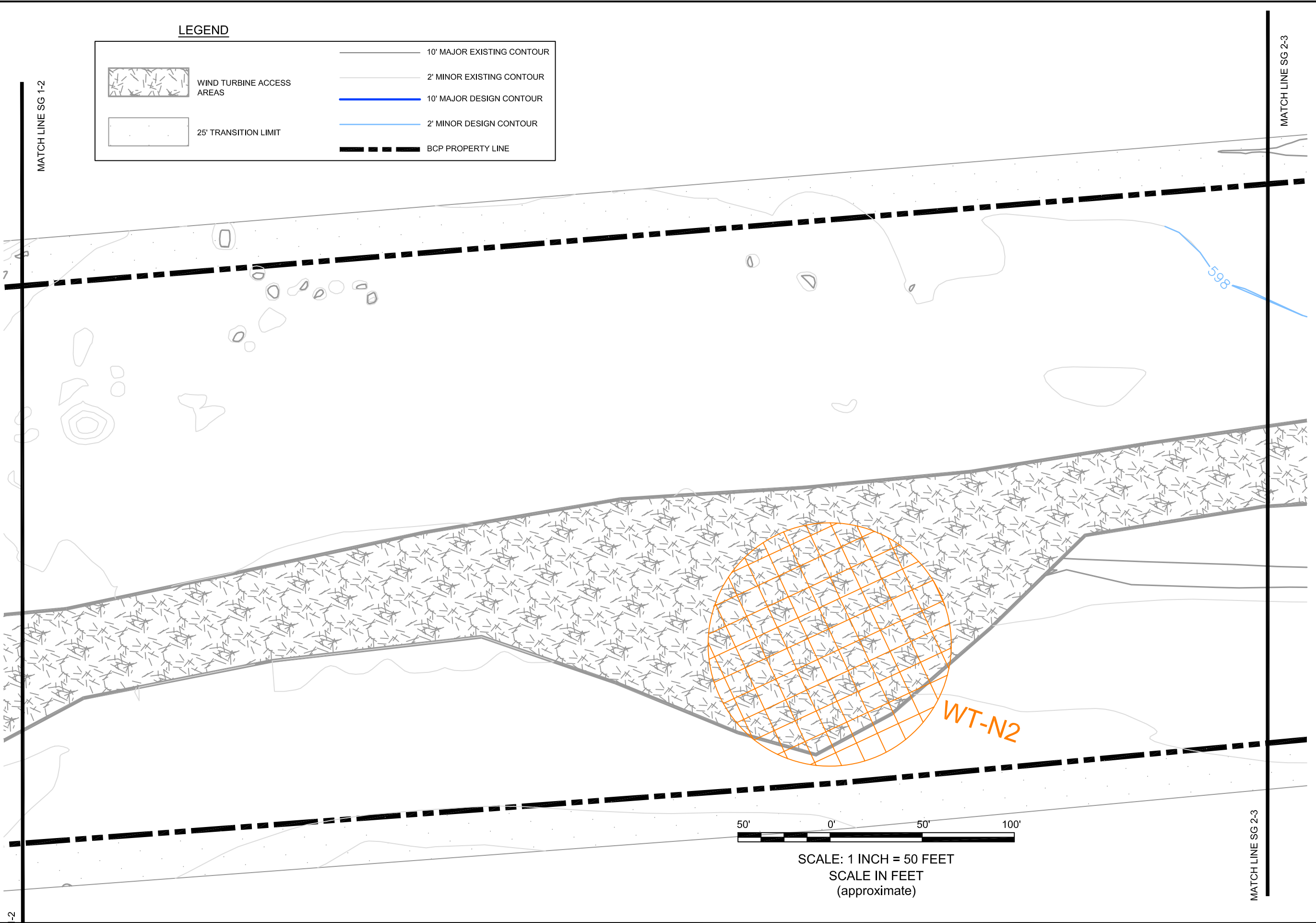
**SOIL COVER
SUB-GRADE PLAN**
STEELWINDS PROJECT
IRM SOIL COVER WORK PLAN
BROWNFIELDS CLEANUP PROGRAM
STEELWINDS, LACKAWANNA, NEW YORK
PREPARED FOR
BQ ENERGY, LLC

SG - 1




JOB NO.: 0071-003-120

DATE: 5/07
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LEGEND



	WIND TURBINE ACCESS AREAS		10' MAJOR EXISTING CONTOUR
	25' TRANSITION LIMIT		2' MINOR EXISTING CONTOUR
			10' MAJOR DESIGN CONTOUR
			2' MINOR DESIGN CONTOUR
			BCP PROPERTY LINE

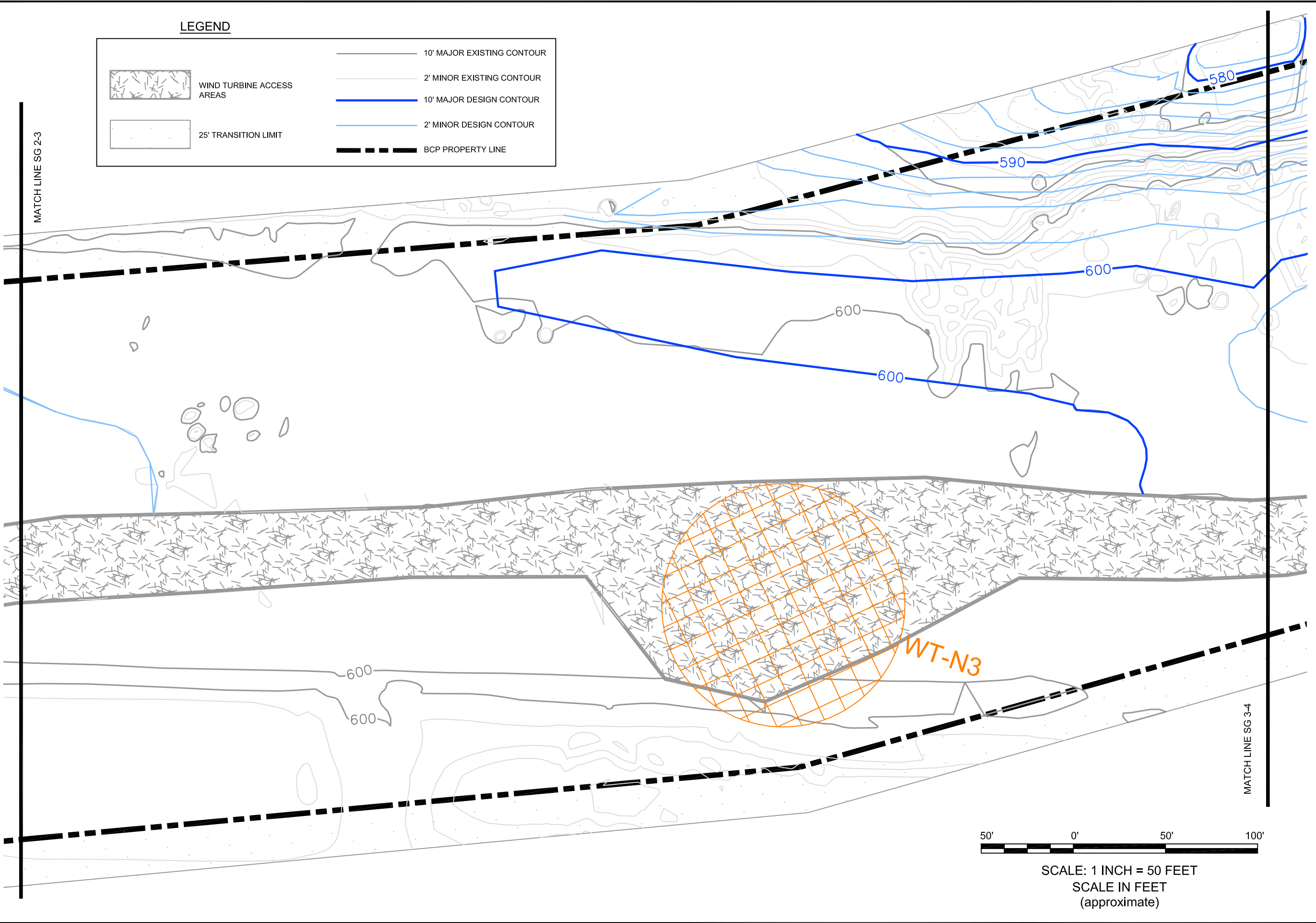


SCALE: 1 INCH = 50 FEET
SCALE IN FEET
(approximate)

	
	JOB NO.: 0071-003-120
<p>SOIL COVER SUB-GRADE PLAN STEELWINDS PROJECT IRM SOIL COVER WORK PLAN BROWNFIELDS CLEANUP PROGRAM STEELWINDS, LACKAWANNA, NEW YORK PREPARED FOR BQ ENERGY, LLC</p>	
<p>SG - 2</p>	

LEGEND

	WIND TURBINE ACCESS AREAS		10' MAJOR EXISTING CONTOUR
	25' TRANSITION LIMIT		2' MINOR EXISTING CONTOUR
			10' MAJOR DESIGN CONTOUR
			2' MINOR DESIGN CONTOUR
			BCP PROPERTY LINE



SCALE: 1 INCH = 50 FEET
SCALE IN FEET
(approximate)

DATE: 5/07
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JOB NO.: 0071-003-120

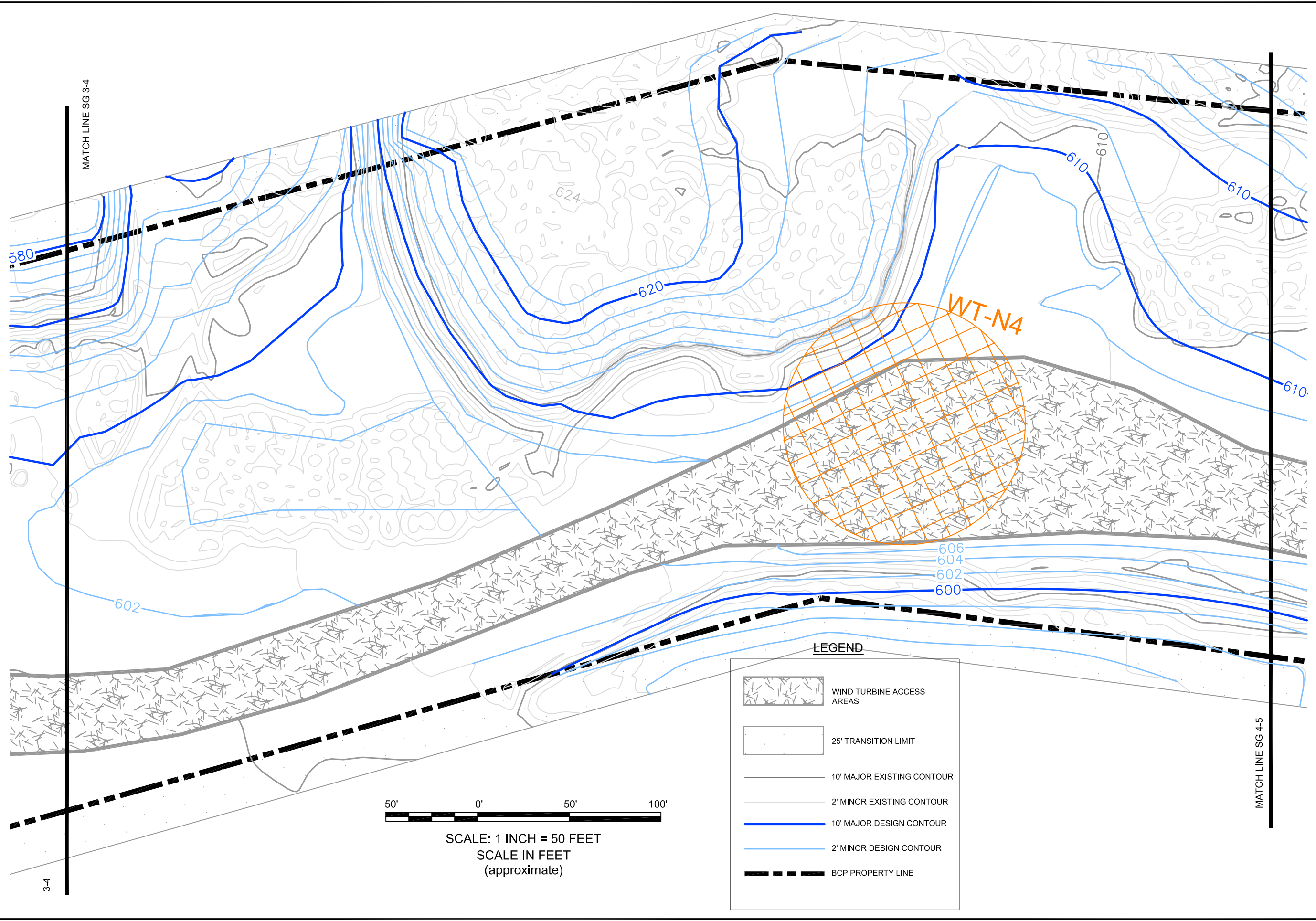
**SOIL COVER
SUB-GRADE PLAN**

STEELWINDS PROJECT
IRM SOIL COVER WORK PLAN
BROWNFIELDS CLEANUP PROGRAM
STEELWINDS, LACKAWANNA, NEW YORK
PREPARED FOR
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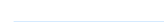

SG - 3

DATE: 5/07
DRAFTED BY: wfm

3-4



LEGEND

	WIND TURBINE ACCESS AREAS
	25' TRANSITION LIMIT
	10' MAJOR EXISTING CONTOUR
	2' MINOR EXISTING CONTOUR
	10' MAJOR DESIGN CONTOUR
	2' MINOR DESIGN CONTOUR
	BCP PROPERTY LINE



SCALE: 1 INCH = 50 FEET
SCALE IN FEET
(approximate)



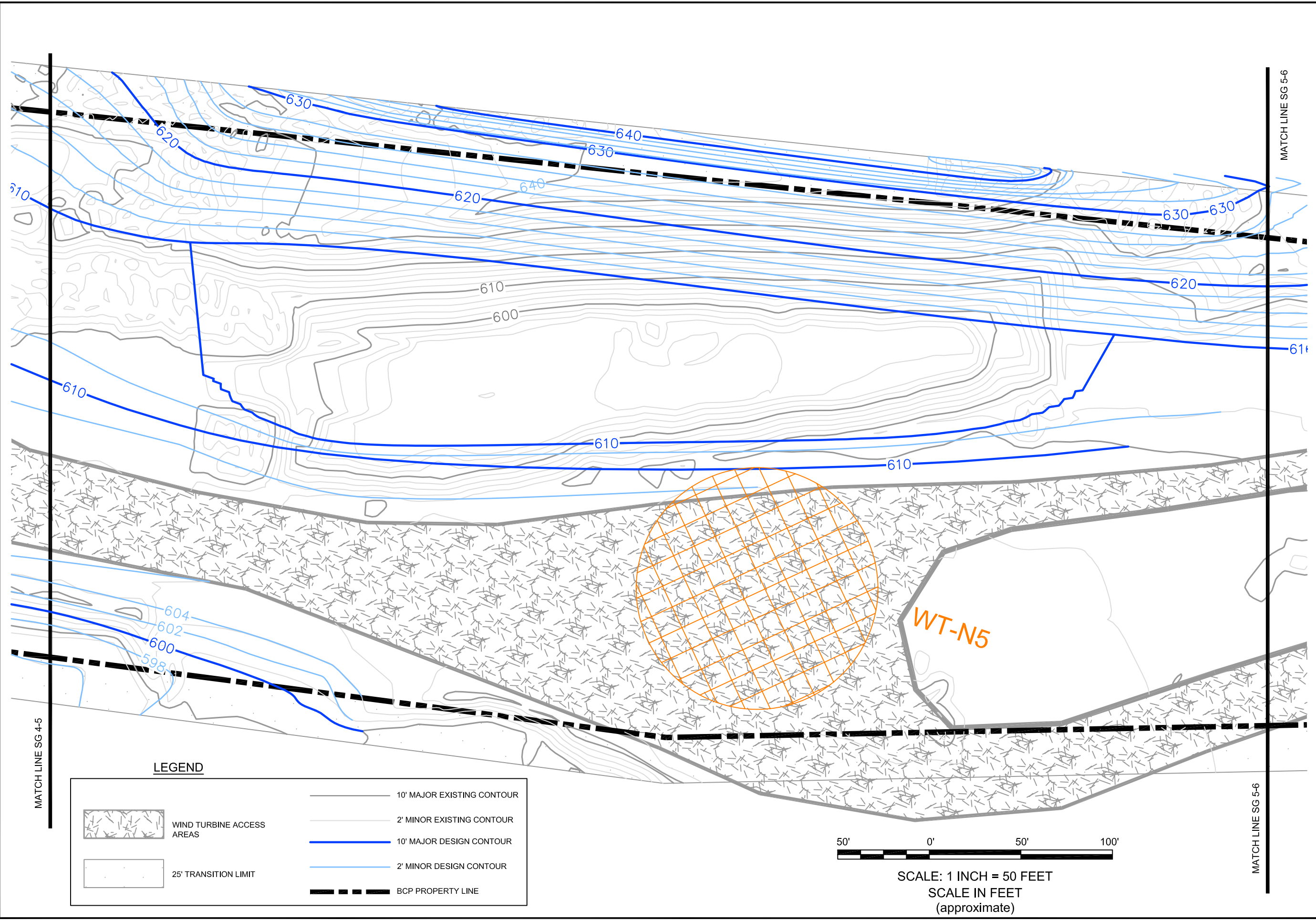
JOB NO.: 0071-003-120

**SOIL COVER
SUB-GRADE PLAN**








STEELWINDS PROJECT
IRM SOIL COVER WORK PLAN
BROWNFIELDS CLEANUP PROGRAM
STEELWINDS, LACKAWANNA, NEW YORK
PREPARED FOR
BQ ENERGY, LLC

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DATE: 5/07
DRAFTED BY: wfm



LEGEND

	WIND TURBINE ACCESS AREAS		10' MAJOR EXISTING CONTOUR
	25' TRANSITION LIMIT		2' MINOR EXISTING CONTOUR
			10' MAJOR DESIGN CONTOUR
			2' MINOR DESIGN CONTOUR
			BCP PROPERTY LINE



SteelWinds
Lackawanna, New York



TURNKEY
ENVIRONMENTAL
RESTORATION, LLC

JOB NO.: 0071-003-120

**SOIL COVER
SUB-GRADE PLAN**

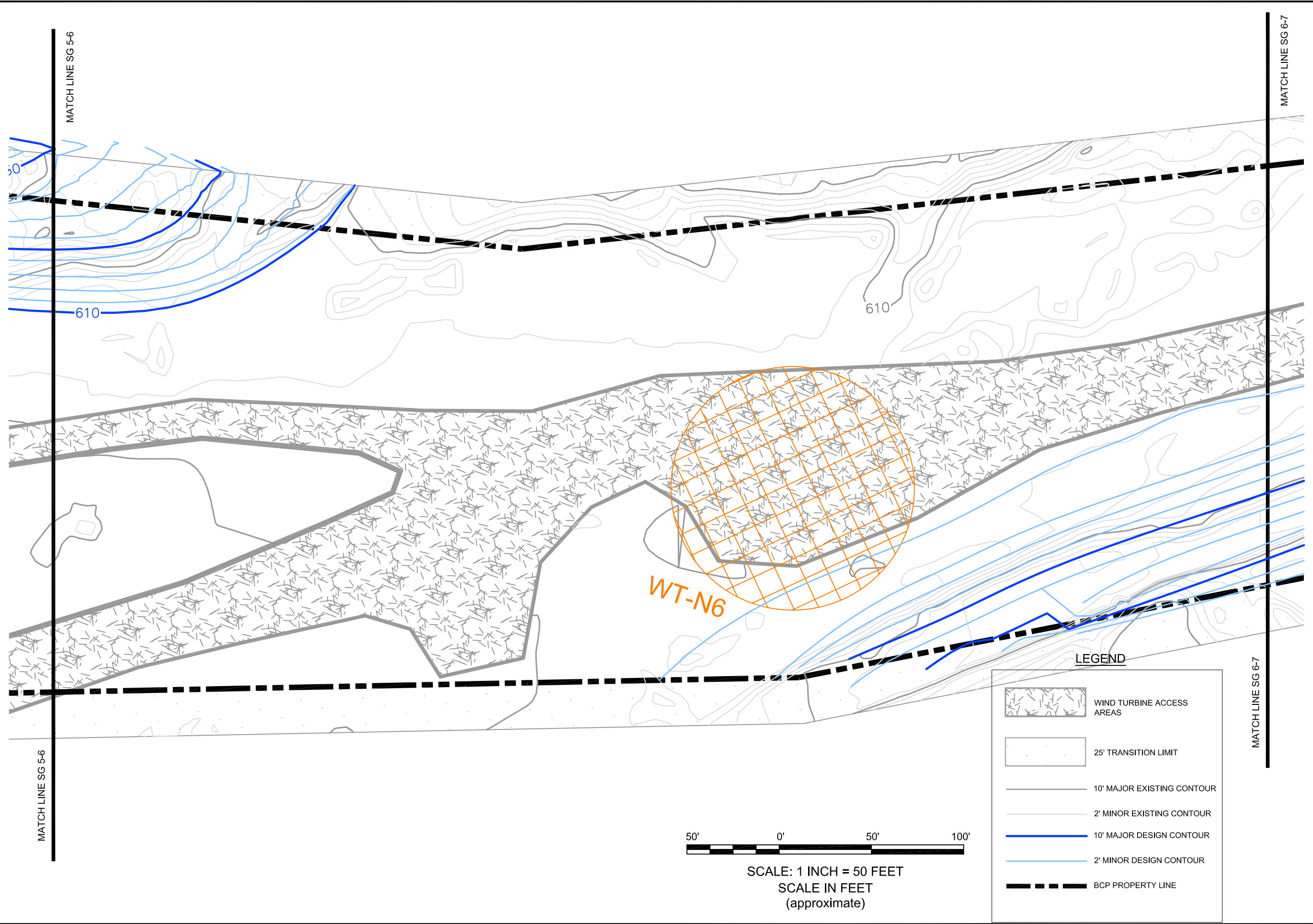
STEELWINDS PROJECT

IRM SOIL COVER WORK PLAN
BROWNFIELDS CLEANUP PROGRAM
STEELWINDS, LACKAWANNA, NEW YORK

PREPARED FOR
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SG - 5

DATE: 5/07
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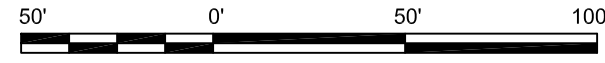
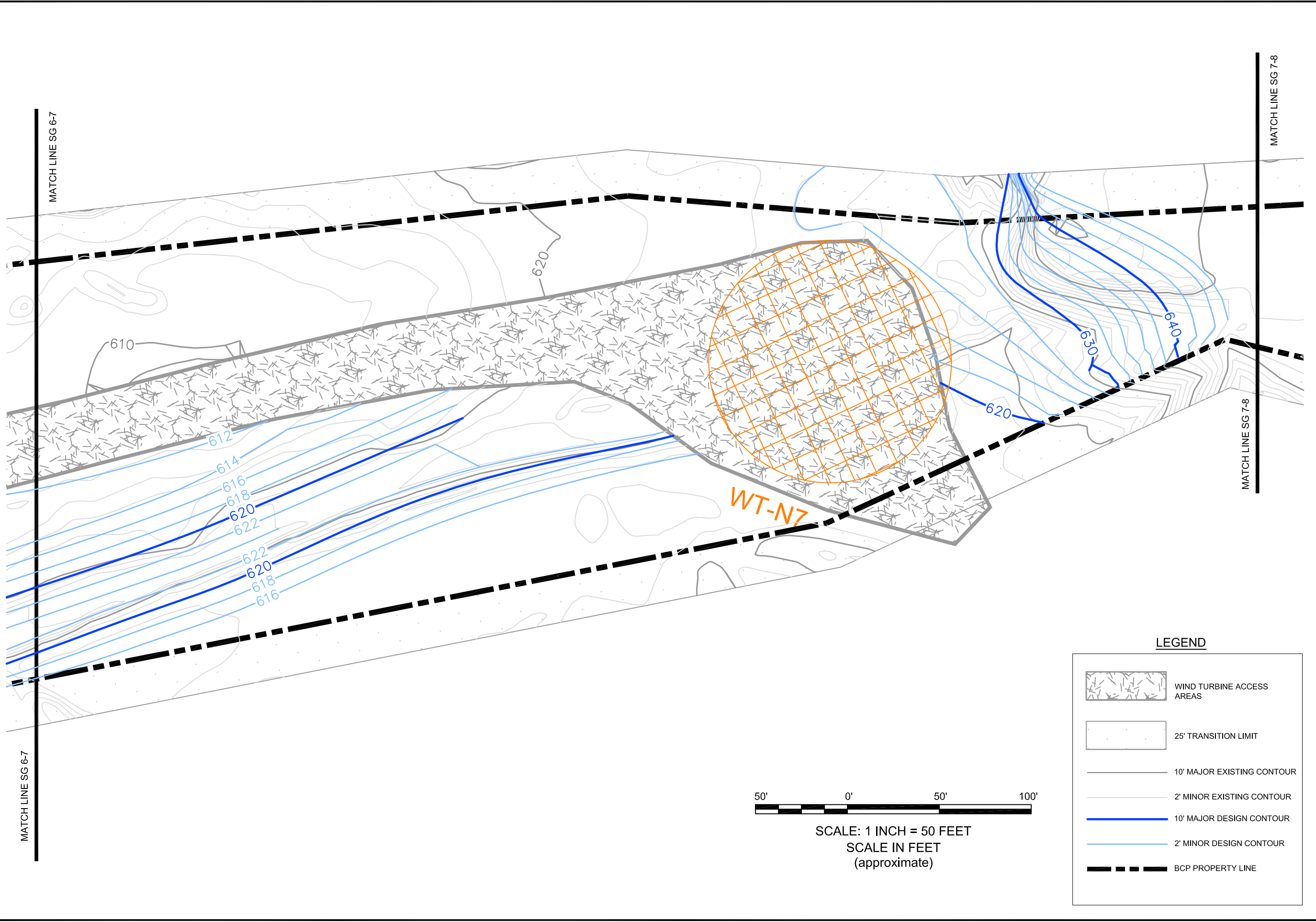


LEGEND

	WIND TURBINE ACCESS AREAS
	25' TRANSITION LIMIT
	10' MAJOR EXISTING CONTOUR
	2' MINOR EXISTING CONTOUR
	10' MAJOR DESIGN CONTOUR
	2' MINOR DESIGN CONTOUR
	BCP PROPERTY LINE








 SteelWinds <small>Lackawanna, New York</small>
 TURNKEY <small>ENVIRONMENTAL RESTORATION, LLC</small>
SOIL COVER SUB-GRADE PLAN STEELWINDS PROJECT IIRM SOIL COVER WORK PLAN BROWNFIELDS CLEANUP PROGRAM STEELWINDS, LACKAWANNA, NEW YORK <small>PREPARED FOR</small> BQ ENERGY, LLC
JOB NO.: 0071-003-120
SG - 6

DATE: 5/07
DRAFTED BY: wfm



SCALE: 1 INCH = 50 FEET
SCALE IN FEET
(approximate)

LEGEND

	WIND TURBINE ACCESS AREAS
	25' TRANSITION LIMIT
	10' MAJOR EXISTING CONTOUR
	2' MINOR EXISTING CONTOUR
	10' MAJOR DESIGN CONTOUR
	2' MINOR DESIGN CONTOUR
	BCP PROPERTY LINE

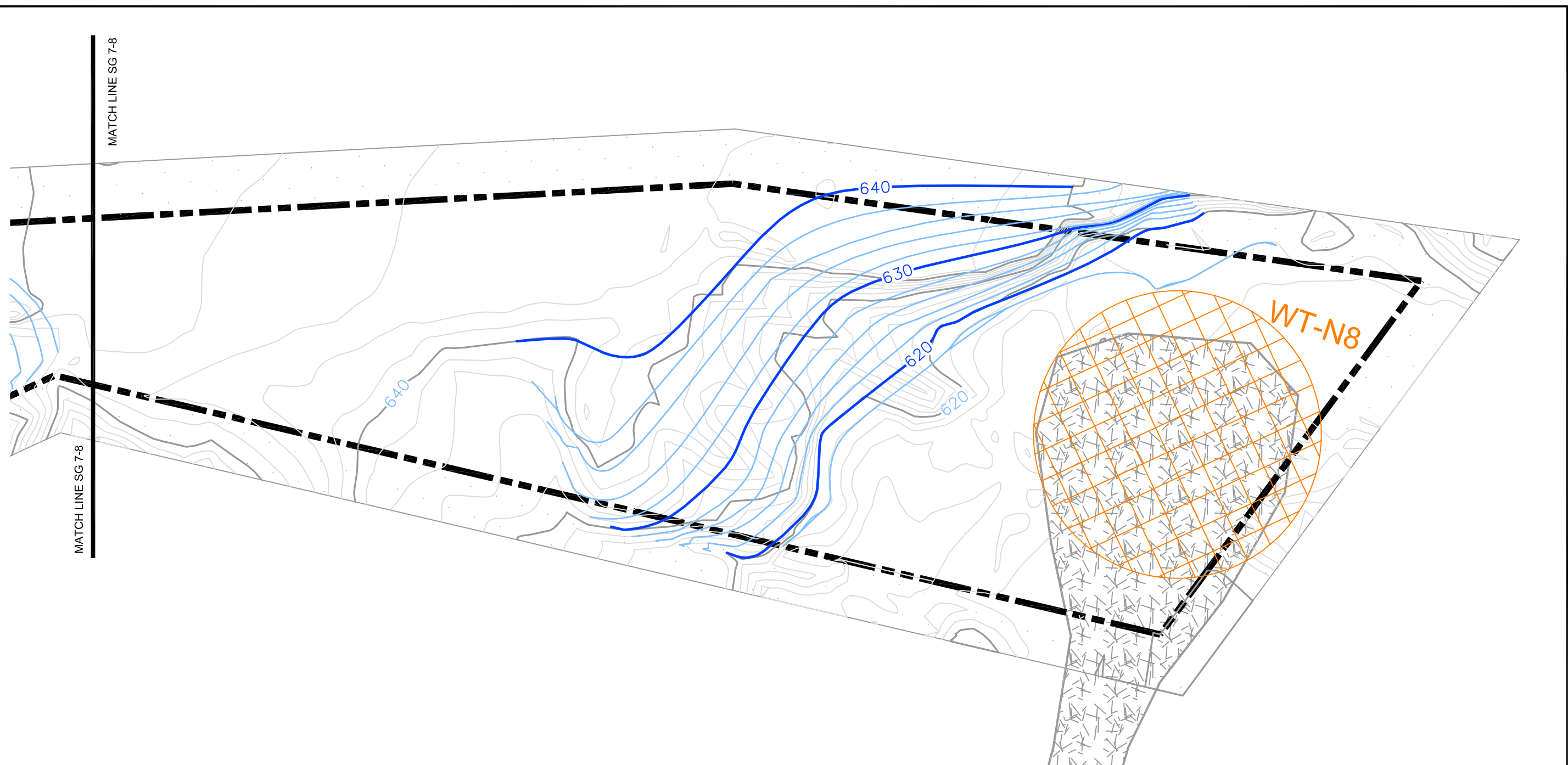
**SOIL COVER
SUB-GRADE PLAN**
STEELWINDS PROJECT
IRM SOIL COVER WORK PLAN
BROWNFIELDS CLEANUP PROGRAM
STEELWINDS, LACKAWANNA, NEW YORK
PREPARED FOR
BQ ENERGY, LLC

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JOB NO.: 0071-003-120

DATE: 5/07
DRAFTED BY: wjm

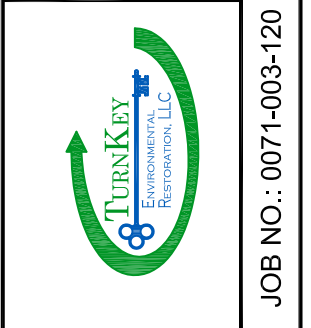
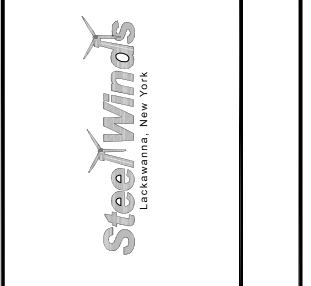


LEGEND

-  WIND TURBINE ACCESS AREAS
-  25' TRANSITION LIMIT
-  10' MAJOR EXISTING CONTOUR
-  2' MINOR EXISTING CONTOUR
-  10' MAJOR DESIGN CONTOUR
-  2' MINOR DESIGN CONTOUR
-  BCP PROPERTY LINE



SCALE: 1 INCH = 50 FEET
SCALE IN FEET
(approximate)



**SOIL COVER
SUB-GRADE PLAN**
STEELWINDS PROJECT
IRM SOIL COVER WORK PLAN
BROWNFIELDS CLEANUP PROGRAM
STEELWINDS, LACKAWANNA, NEW YORK
PREPARED FOR
BQ ENERGY, LLC

SG - 8

JOB NO.: 0071-003-120

NOTES:

1. THESE PLANS REPRESENT SUB-GRADE CONDITIONS EXISTING AND MODIFIED ON THE STEEL WINDS BCP PARCEL AND ADJACENT TECUMSEH PROPERTY.
2. ALL SITE GRADING TO CONFORM TO A MAXIMUM 25% SLOPE (1' VERTICAL TO 4' HORIZONTAL) AS POSSIBLE. ADDITIONAL GRADING MAY BE REQUIRED BEYOND WHAT IS DEPICTED IN THESE PLANS. AESTHETIC GRADING WILL ALSO BE REQUIRED IN PORTIONS OF THE SITE TO MINIMIZE EXTRANEIOUS STOCK PILES, ETC.
3. GRADING SHALL BE LIMITED TO WITHIN THE BCP SITE LIMITS. TRANSITIONS TO EXISTING TOPOGRAPHY SHALL BE COMPLETED WITHIN SITE LIMITS WHERE FEASIBLE, HOWEVER LIMITED GRADING MAY EXTEND INTO A 25' TRANSITION ZONE TO MITIGATE EROSION AND UNSUITABLE SLOPE CONDITIONS IMMEDIATELY ADJACENT TO THE BCP PARCEL.
4. TIRES CURRENTLY STOCKPILED ON THE BCP SITE AND ANY ENCOUNTERED DURING SUBGRADE PREPARATION SHALL BE COLLECTED AND DISPOSED OFF-SITE BY THE CONTRACTOR.
5. SOLID WASTE ENCOUNTERED ON THE BCP SITE DURING SUBGRADE PREPARATION MAY BE REQUIRED TO BE REMOVED AND DISPOSED OF AT AN OFF-SITE PERMITTED LANDFILL. THE ENGINEER SHALL MAKE ALL DETERMINATION OF WHAT CONSTITUTES UNSUITABLE REFUSE AND COLLECTION AND DISPOSAL SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
6. AREAS PREVIOUSLY BACKFILLED AND GRADED SURROUNDING WIND TURBINES AND ACCESS ROADS AS DEPICTED IN THESE PLANS (REFER TO SHADING LEGEND) ARE NOT TO BE DISTURBED. ALL GRADING TRANSITIONS ARE TO BE FIELD FIT TO BEST POSSIBLE CONDITIONS.
7. SOIL COVER IS TO BE PLACED UPON FINISHED SUB-GRADE WITHIN THE PROPERTY BOUNDARIES WITH THE EXCEPTION OF THE PREVIOUSLY BACKFILLED AND GRADED AREAS ACCESSING AND IMMEDIATELY SURROUNDING THE WIND TURBINES AS INDICATED.
8. COVER SOIL SHALL BE PLACED FULL THICKNESS UP TO AND INCLUDING THE PROPERTY BOUNDARIES AND TAPERED TO EXISTING GRADE AS NECESSARY WITHIN THE 25' TRANSITION ZONE TO MINIMIZE EROSION ALL PLACED SOILS SHALL BE MACHINE TRACKED TO MINIMIZE VOIDS & SETTLEMENT.
9. ALL SOIL COVER TO BE IMPORTED SHALL BE TESTED AND FOUND TO MEET CRITERIA AS REFERENCED IN THE IRM REPORT AND ADJACENT TABLE.
10. ALL TREES AND WOODED VEGETATION SHALL BE REMOVED WITHIN THE BCP SITE. TREES, SHRUBS, AND VEGETATION TO BE DISPOSED OF BY THE CONTRACTOR.

SEEDING:

1. APPLY COMMERCIAL FERTILIZERS TO ALL AREAS BEING SEEDED.
2. SEED AREAS RECEIVING TOPSOIL WITH POUNDS PER ACRE OF SEED CONFORMING TO THE FOLLOWING GENERAL REQUIREMENTS:

NAME OF GRASS	VARIETY	% OF MIX	APPLICATION RATE (LBS/ACRE)
TALL FESCUE	KY-31	36	70.6
ORCHARD GRASS	PENNLATE	15	29.4
CREEPING RED FESCUE	ENSYLVA	20	39.2
PERRENIAL RYEGRASS	POLLY	25	49
BIRDS-FOOT TREFOIL	VIKING	4	7.8

3. IN ADDITION TO THE SEED MIXTURE LISTED ABOVE, SOW 10 LBS PER ACRE OF ANNUAL RYEGRASS SEED OVER THE ENTIRE AREA TO PROVIDE QUICK SHADE COVER AND TO PREVENT EROSION DURING PERMANENT SEED ESTABLISHMENT.
4. APPLY SEED BY THE HYDROSEED METHOD ONLY. SPREAD ANCHOR MULCH BY SPRAYING WITH LIQUID TACKIFIER AT A RATE OF 10 TO 13 GALLONS PER 1000 SF.
5. PREVENT FOOT OR VEHICULAR TRAFFIC OR THE MOVEMENT OF EQUIPMENT OVER THE SEEDED AREAS.
6. AFTER SEEDLINGS APPEAR IN 2 TO 3 WEEKS, RESEED ALL BARE SPOTS LARGER THAN 18 INCHES IN DIAMETER.

TABLE 1
CRITERIA FOR USE OF OFF-SITE SOIL AS COVER SYSTEM MATERIAL

IRM Work Plan for Soil Cover System
Steel Winds Site
Lackawanna, New York

Parameter	TRACK 4 Restricted-Commercial or Industrial SCOs
Volatile Organic Compounds (mg/kg)	
1,1,1-Trichloroethane	0.68
1,1-Dichloroethane	0.27
1,1-Dichloroethene	0.33
1,2-Dichlorobenzene	1.1
1,2-Dichloroethane	0.02
1,2-Dichloroethene(cis)	0.25
1,2-Dichloroethene(trans)	0.19
1,3-Dichlorobenzene	2.4
1,4-Dichlorobenzene	1.8
1,4-Dioxane	0.1
Acetone	0.05
Benzene	0.06
Butylbenzene	12
Carbon tetrachloride	0.76
Chlorobenzene	1.1
Chloroform	0.37
Ethylbenzene	1
Hexachlorobenzene	3.2
Methyl ethyl ketone	0.12
Methyl tert-butyl ether	0.93
Methylene chloride	0.05
Propylbenzene-n	3.9
Sec-Butylbenzene	11
Tert-Butylbenzene	5.9
Tetrachloroethene	1.3
Toluene	0.7
Trichloroethene	0.47
Volatile Organic Compounds (mg/kg)	
Trimethylbenzene-1,2,4	3.6
Trimethylbenzene-1,3,5	8.4
Vinyl chloride	0.02
Xylene (mixed)	1.6

Semi-Volatile Organic Compounds (mg/kg)	
Acenaphthene	98
Acenaphthylene	107
Anthracene	500
Benzo(a)anthracene	1
Benzo(a)pyrene	1
Benzo(b)fluoranthene	1.7
Benzo(g,h,i)perylene	500
Benzo(k)fluoranthene	1.7
Chrysene	1
Dibenz(a,h)anthracene	0.56
Fluoranthene	500
Fluorene	386
Indeno(1,2,3-cd)pyrene	5.6
m-Cresol(s)	0.33
Naphthalene	12
o-Cresol(s)	0.33
p-Cresol(s)	0.33
Pentachlorophenol	0.8
Phenanthrene	500
Phenol	0.33
Pyrene	500
Metals (mg/kg)	
Arsenic	16
Barium	400
Beryllium	47
Cadmium	7.5
Chromium, Hexavalent ¹	19
Chromium, Trivalent ¹	1500
Copper	270
Cyanide	27
Lead	450
Manganese	2000
Mercury (total)	0.73
Nickel	130
Selenium	4
Silver	8.3
Zinc	2480
PCBs/Pesticides (mg/kg)	
2,4,5-TP Acid (Silvex)	3.8
4,4'-DDE	17
4,4'-DDT	47
4,4'-DDD	14
Aldrin	0.19
Alpha-BHC	0.02
Beta-BHC	0.09
Chlordane (alpha)	2.9
Delta-BHC	0.25
Dibenzofuran	210
Dieldrin	0.1
Endosulfan I	102
PCBs/Pesticides (mg/kg)	
Endosulfan II	102
Endosulfan sulfate	200
Endrin	0.06
Heptachlor	0.38
Lindane	0.1
Polychlorinated biphenyls	1

Notes:
1. The SCO for Hexavalent or Trivalent Chromium is considered to be met if the analysis for the total species of this contaminant is below the specific SCO for Hexavalent Chromium.

DATE: 5/07
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SOIL COVER
SUB-GRADE PLAN - NOTES & DETAILS
STEELWINDS PROJECT

IRM SOIL COVER WORK PLAN
BROWNFIELDS CLEANUP PROGRAM
STEELWINDS, LACKAWANNA, NEW YORK
PREPARED FOR
BQ ENERGY, LLC



JOB NO.: 0071-003-120

APPENDIX A

PROJECT DOCUMENTATION FORMS



INSPECTOR'S DAILY REPORT

CONTRACTOR					
CLIENT				DATE:	
LOCATION			DAY		JOB NO.
WEATHER		TEMP ° F	START		END

WORK PERFORMED:

CONTRACTOR ACTIVITIES:

[PUT CONTRACTOR ACTIVITIES HERE, BE SPECIFIC. TYPE OF EQUIPMENT, ACTIVITIES PERFORMED, BY WHOM, LOCATION OF LANDFILL ETC.]

TURNKEY ACTIVITIES:

[PUT ENGINEER ACTIVITIES HERE, BE SPECIFIC. TYPE OF EQUIPMENT, ACTIVITIES AND TESTING PERFORMED, SAMPLES COLLECTED, BY WHOM, LOCATION OF LANDFILL ETC.]

TEST PERFORMED			<i>QA PERSONNEL</i>		
PICTURES TAKEN	none		SIGNATURE		
VISITORS	none		REPORT NO.		
			SHEET	1	OF



INSPECTOR'S DAILY REPORT

CONTRACTOR					
CLIENT				DATE:	
LOCATION			DAY		JOB NO.
WEATHER		TEMP ° F	START		END

MEETINGS HELD & RESULTS:

CONTRACTOR'S WORK FORCE AND EQUIPMENT											
DESCRIPTION	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#
Field Engineer						Equipment			Front Loader Ton		
Superintendent			Ironworker			Generators			Bulldozer		
						Welding Equip.			DJ Dump truck		
Laborer-Foreman			Carpenter						Water Truck		
Laborer									Backhoe		
Operating Engineer			Concrete Finisher						Excavator		
						Roller			Pad foot roller		
Carpenter						Paving Equipment					
						Air Compressor					

REMARKS:

REFERENCES TO OTHER FORMS:

SAMPLES COLLECTED:				
SAMPLE NUMBER				
APPROX. LOCATION OF STOCKPILE				
NO. OF STOCKPILE				
DATE OF COLLECTION				
CLIMATOLOGIC CONDITIONS				
FIELD OBSERVATION			SHEET	OF

