NEW YORK STATE OF OPPORTUNITY. Department of Environmental Conservation

PROPOSED STATEMENT OF BASIS CORRECTIVE MEASURES SELECTION

Bethlehem Steel
(aka Tecumseh Redevelopment, Inc.)

OU-05 - Slag Fill Area Zone 2
and
OU-08 - Slag Fill Area Zones 4 and 5

City of Lackawanna, Erie County
Site No. 915009
EPA ID No. NYD002134880

May 2021

PREPARED BY
DIVISION OF ENVIRONMENTAL REMEDIATION

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SECTION 1: INTRODUCTION

The New York State Department of Environmental Conservation (Department), in consultation with the New York State Department of Health (NYSDOH), is proposing a remedy for the above referenced site. The disposal or release of hazardous wastes at this site, as more fully described in this document, has contaminated various environmental media. The remedy is intended to attain the remedial action objectives identified for this site for the protection of public health and the environment. This proposed Statement of Basis (SB) identifies the proposed remedy and discusses the reasons that the remedy is being proposed. This document includes a summary of the information that can be found in the site-related reports and documents.

The New York State Inactive Hazardous Waste Disposal Site Remedial Program (also known as the State Superfund Program) is an enforcement program, the mission of which is to identify and characterize suspected inactive hazardous waste disposal sites and to investigate and remediate those sites found to pose a significant threat to public health and environment. The New York State Hazardous Waste Management Program (also known as the RCRA Program) requires corrective action for releases of hazardous waste and hazardous constituents to the environment. This facility is subject to both programs, and this remedy is consistent with the remedial requirements of both programs. The proposed Statement of Basis will serve as the Proposed Remedial Action Plan. This document is a summary of the information that can be found in the site-related reports and documents.

SECTION 2: CITIZEN PARTICIPATION

The Department seeks input from the community on all final remedies. This is an opportunity for public participation in the remedy selection process. The public is encouraged to review the reports and documents, which are available at the following repositories:

NYSDEC Region 9 Office
270 Michigan Avenue
Buffalo, NY 14203
Call 716-851-7220 for Appointment
Mr. Stanley Radon

Lackawanna Public Library
560 Ridge Road
Lackawanna, NY 14218

- Access the Statement of Basis and other project documents online through the DECinfo Locator: https://gisservices-dev.dec.ny.gov/gis/dil/index.html?rs=915009 (Click the Excavator icon, then click Document Folder Link)

A public comment period has been set for:

May 5, 2021 through June 18, 2021

A virtual public meeting will be held on **May 18, 2021 at 6:00 PM** via Webex (virtual platform). The public is encouraged to participate in the virtual public meeting using the link and login information provided on the public availability website: www.bethlehemsteelcleanup.com or request a call-in number to attend via the toll-free hotline at 833-578-2019.

Written comments may be sent through June 18, 2021 to:

Stanley Radon
NYS Department of Environmental Conservation
Division of Environmental Remediation
270 Michigan Avenue, Buffalo, NY 14203
stanley.radon@dec.ny.gov

The Department may modify the proposed remedy based on new information or public comments. Therefore, the public is encouraged to review and comment on the proposed remedy identified herein. Comments will be summarized and addressed in the responsiveness summary that will accompany the Department's final selection of the remedy for this site.

Receive Site Citizen Participation Information By Email

Please note that the Department's Division of Environmental Remediation (DER) is "going paperless" relative to citizen participation information. The ultimate goal is to distribute citizen participation information about contaminated sites electronically by way of county

email listservs. Information will be distributed for all sites that are being investigated and cleaned up in a particular county under the State Superfund Program, Environmental Restoration Program, Brownfield Cleanup Program, and Resource Conservation and Recovery Act Program. We encourage the public to sign up for one or more county listservs at:

http://www.dec.ny.gov/chemical/61092.html

SECTION 3: SITE DESCRIPTION AND HISTORY

Location - The Bethlehem Steel Site (also known as Tecumseh Redevelopment Inc. [Tecumseh]) is located in an urban area along the eastern shores of Lake Erie in the City of Lackawanna, Erie County (Figure 1). The site is located along the west side of Route 5, comprising a significant portion of the former Bethlehem Steel Corporation's Lackawanna facility, and extends to the lake shore.

Site Features - The site is an irregular parcel which extends from south of Smokes Creek to the Buffalo Outer Harbor on the north, and from the east end of Lake Erie to the Gateway Metroport Ship Canal (Ship Canal). The site has approximately 1.5 miles of shoreline along Lake Erie. Smokes Creek passes westward across the site where it discharges to Lake Erie. The Ship Canal, located toward the northern end of the site, extends approximately 3,000 feet southward into the site from the Buffalo Harbor. The western portion of the site was created by the placement of slag-fill materials from iron and steel-making within an area that was formerly waters of Lake Erie. The site is mostly undeveloped, especially the western slag fill portion. Operable Unit 05 - Slag Fill Area (SFA) Zone 2 is located south of Smokes Creek along the Lake Erie shoreline (Figure 2). Operable Unit 08 - SFA Zones 4 and 5 is located in the northwestern part of the site along the Lake Erie shoreline (Figure 2).

Current Zoning and Land Use - This site is currently zoned for industrial use and is used for slag reclamation, coal handling facilities, wood recycling facilities, and the site groundwater treatment plants. Renewable energy facilities have been constructed upon the site which were previously developed through the Brownfield Cleanup Program (BCP) (Site Nos. C915216 and C915217). These installations include 14 wind turbines (Steel Winds I and II) located along the Lake Erie shoreline, and two (2) large solar arrays present in the southeastern corner of the site. The majority of the land is vacant/undeveloped.

Past Use of the Site - The former Bethlehem Steel Corporation (BSC) property was used for iron, steel, and coke production since the beginning of the 20th century. Iron- and steel-making operations were discontinued by the end of 1983, and by the mid-1990s, most of the steel-making facilities on the west side of Hamburg Turnpike (NYS Route 5) had been demolished. In September 2001, BSC's coke oven operation was terminated. While some buildings remain, most structures have been razed. The western portion, that includes approximately 1.5 miles of Lake Erie waterfront, consists of a considerable area

of manmade land (~440 acres) where iron- and steel-making slag and plant wastes were disposed.

Site Geology and Hydrogeology - The predominant site feature is the slag fill area that extends into Lake Erie. This area extends from the historic lake shore, on the east side of the MetroPort Ship Canal, an average of 1,300 feet westward, and now forms the eastern shoreline of Lake Erie. The site geology beneath the slag-fill layer consists of lake and glacial sediments overlying shale or limestone bedrock. Beneath the deposited slag-fill there is, in order of increasing depth, a sand layer with occasional peat deposits, lake clay/silt deposits, and glacial till overlying shale or limestone bedrock.

The depth to groundwater is variable and depends upon the topography and can vary in depth ranging from about 10- to over 60-feet below ground surface. Groundwater generally flows toward Lake Erie, Smokes Creek, or the Ship Canal. Groundwater occurs within the fill and sand layers in the overburden and in the bedrock beneath the site.

Operable Units - The site has been divided into operable units. An operable unit (OU) represents a portion of a remedial program for a site that for technical or administrative reasons can be addressed separately to investigate, eliminate or mitigate a release, threat of release or exposure pathway resulting from the site contamination. A number of Solid Waste Management Units (SWMUs), Areas of Concern (AOCs), and two Hazardous Waste Management Units (HWMUs) in the Corrective Measures Study (CMS) area have been designated as OUs due to their proximity to each other, the similar composition of waste material, and/or similarity of remedy selection. To date, the following OUs have been designated for the Bethlehem Steel Site:

- OU-01 (Site-Wide Remedial Program) encompasses 44 SWMUs, nine areas of concern (AOCs), and five watercourses; Smokes Creek, Blasdell Creek, and the Gateway MetroPort Ship Canal. Several SWMUs and AOCs have been addressed as separate OUs, such as OU-02, OU-03 and OU-04, under Department approved Interim or Expedited Corrective Measures.

- OU-02 (Independent SWMUs and AOCs) consists of SWMUs P-9 (Tar Decanter Pit), P-18A and P-18B (Blast Furnace Cold and Hot Wells respectively), P-76 (Coke Oven Gas Line), and two AOCs (B and C) within S-18 (Lime and Kish Landfill R). The Tar Decanter Pit was located near the center of the coke oven area just west of the Ship Canal. The Blast Furnace Hot and Cold Wells were located at the southwest corner of the Ship Canal. The Lime and Kish Landfill covers approximately 2 acres and is located in the northwest portion of the site. These SWMUs were found to be impacted primarily with elevated levels of benzene and lead. Waste from these SWMUs were excavated, treated, and consolidated within the OU-03 containment unit.

- OU-03 (Acid Tar Pit) is approximately six acres and consists of SWMUs S-11, S-21, S-22, and S-24 known as the Acid Tar Pit Group. S-11, S-21, and S-22 are located south of Smokes Creek in the southwestern corner of the CMS area. S-24

is located just north of Smokes Creek west of the intersection of Site BSC Highways 9 and 11. These SWMUs were found to be impacted with elevated levels of metals and various organic compounds.

- OU-04 (Coke Oven Area – Groundwater) consists of groundwater associated with an approximately 27-acre area along the western side of the Gateway MetroPort Ship Canal. OU-04 is not intended to address soil, soil vapor, or other environmental issues associated with the former Coke Oven Area. This area contains portions of the former coke oven area and SWMUs P-11 (former Benzol Plant) and P-11A ("old" former Benzol Plant). These SWMUs were found to be impacted with various organic compounds.

- OU-05 (SFA Zone 2): OU-05 is approximately 74.4-acres and encompasses SFA Zone 2, with the exception of OU-03. OU-05 consists of steep slag bluffs located along the eastern shores of Lake Erie and the south shore of Smokes Creek. OU-05 is comprised of the SWMUs commonly referred to as The Impoundments (S-1, S-2, S-3, S-4, S-5, S-6, S-7/20, S-8, and S-27) (Figure 3). The Impoundment SWMUs comprise approximately 21-acres and are primarily located in the western portion of OU-05. Disposal in the Impoundment SWMUs consisted of Water Quality Control Station sludges and dredge spoils from Smokes Creek. Areas outside the SWMUs are comprised of slag fill, access roads, and the aforementioned OU-03. OU-05 does not address groundwater. Groundwater will be addressed under OU-10.

- OU-06 (Former Petroleum Bulk Storage Sub-Area), the subject of this SB along with OU-07, is approximately 116-acres located just north of Smokes Creek and encompasses SWMUs; P-8 Waste Oil Storage Tanks; S-10 Slag Quench Area J; P-74 (A, B, C, and D) Solid Fuel Mix Storage Piles; P-75 Tank Storage Area for No. 6 Fuel Oil and Petroleum Tar; and tar impacted slag AOC-H and AOC-I. Currently, there is no active use of OU-06.

- OU-07 (Coal/Coke/Ore Storage and Handling | Coke Plant and By-Products Processing) is approximately 178-acres located just west of the MetroPort Ship Canal and encompasses SWMUs: P-1 North Quench Water Pit; P-2 Arctic Quench Water Pit; P-3 Central Quench Water Pit; P-4 'A' Quench Water Pit; P-5 'B' Quench Water Pit; P-6 Lime Sludge Settling Basin; P-7 Abandoned Lime Sludge Settling Basin; P-10 Contaminated Soil Near Ball Mill; P-12 Stockpile Storage Area; S-19 Murphy's Mountain Landfill; S-25 Impoundment Under North End of Coal Pile; and S-26 Fill Area Near Coke Battery No. 8. The OU-04 groundwater extraction and treatment system, including extractions wells, piping, treatment facility and infiltration galleries are located in the southeastern extent of OU-07.

- OU-08 (SFA Zones 4 and 5): OU-08 is approximately 113-acres located in the northwest portion of the site along Lake Erie and encompasses nine SWMUs: S-12 Asbestos Landfill L; S-13 Tar Sludge Surface Impoundment (HWMU 1A); S-14 General Rubble Landfill N; S-15 General Rubble Landfill O; S-16 Lime Stabilized

Spent Pickle Liquor (SPL) Sludge Landfill (HWMU 1B); S-17 Vacuum Carbonate Blowdown Landfill Q; S-18 Lime Dust and Kish Landfill R; S-23 Tar Pit Adjacent to Lime Stabilized SPL Sludge Landfill; and S-28 Drum Landfill (Figures 4 through 8). In addition, seven AOCs are also included within OU-08: AOC-A is a lead-impacted area within SWMU S-18; AOCs-B and -C were lead-impacted areas within SWMU S-18; AOC-D is a tar-impacted area north of SWMU S-23; AOC-E was a tar-impacted area north of SWMU S-14; AOC-F was a tar-impacted area in the Iron City Slag Reclamation area; and AOC-G was a tar-impacted area at Steel Winds II Wind Turbine 9 (WT-9).

- OU-09 (Water Courses) is comprised of Lake Erie, Smokes Creek, the North Return Water Trench (NRWT), the South Return Water Trench (SRWT), and the MetroPort Ship Canal. Approximately 8,500-feet of the eastern shoreline of Lake Erie borders the Bethlehem Steel Site.

- OU-10 (Site Wide Groundwater) covers groundwater across the entire site except for the portion already addressed under the OU-04 and OU-03 groundwater extraction and treatment systems.

This proposed Statement of Basis is for Operable Unit Five (OU-05), Slag Fill Zone 2; and OU-08, Slag Fill Area - Zones 4 and 5 SWMU/AOC Group.

A site location map is attached as Figure 1. A facility-wide map depicting the CMS Area SWMUs, AOCs, and water courses is attached as Figure 2. Figure 3 depicts the OU-05 SWMUs. Figures 4 through 8 depict the OU-08 SWMUs and AOCs. Figures 10 through 13 depict aspects of the OU-05 remedy. The figures included in this document are enumerated in the following table:

Figure Number	Area of Interest
No. 1	Site Location and Vicinity Map
No. 2	Facility-wide CMS Study Area
No. 3	OU-05 SWMUs
No. 4	OU-08 SWMUs S-12, -13, -15, -28 Locations
No. 5	OU-08 SWMUs S-14, -16, -23, and AOCs-A, -D, -E Locations
No. 6	OU-08 SWMUs S-14, -16, -17, -23, and AOC-D Locations
No. 7	OU-08 SWMUs S-18 and AOCs-A, -B, -C, -E Locations
No. 8	OU-08 AOC-F and AOC-G Locations
No. 9	OU-05 West Slope Cross Sections
No. 10	OU-05 North Slope Cross Section
No. 11	OU-05 Proposed Western Revetment – Northern Section
No. 12	OU-05 Proposed Western Revetment – Southern Section
No. 13	OU-05 Recommended Impoundments Closure and SW-CAMU Preliminary Grading Plan

SECTION 4: LAND USE AND PHYSICAL SETTING

The Department may consider the current, intended, and reasonably anticipated future land use of the site and its surroundings when evaluating a remedy. For these Operable Units, alternatives which allow for industrial use of the site are proposed, with portions that will allow for commercial use in OU-05 as part of the initiative to allow public access to the Lake Erie shoreline.

SECTION 5: ENFORCEMENT STATUS

The Bethlehem Steel site is subject to hazardous waste treatment, storage, and disposal facility (TSDF) permitting requirements under New York State (NYS) hazardous waste regulations (6 NYCRR Part 373) and has RCRA EPA ID No. NYD002134880. Under this regulatory program, Tecumseh is responsible for implementing Corrective Action to address releases to the environment from solid waste management units (SWMUs) and areas of concern (e.g., watercourses). On June 30, 2009 the Department and Tecumseh signed an Order on Consent (the "Order") to complete a Corrective Measures Study (CMS) for the facility. On September 24, 2020 the Department and Tecumseh signed an Order on Consent (the "Order") to complete comprehensive investigation; evaluation; and implementation of Corrective Measures/Remedial Actions, Closure and Post-Closure Care requirements of the site, to protect public health and the environment and to allow, when and where appropriate, the continued use of the site and its redevelopment by Tecumseh and/or third parties. Respondents' outstanding and on-going substantive remediation obligations and/or financial assurance obligations under previous Orders, agreements, and authorizations survive and shall be binding and enforceable under this Order.

The property is also a site listed on the Department's Registry of Inactive Hazardous Waste Disposal Sites (Site No. 915009- Bethlehem Steel) and is currently classified as a Class 2 site as defined in the associated 6NYCRR Part 375 regulations (significant threat to the public health or environment - action required). The proposed Statement of Basis will serve as the Proposed Remedial Action Plan. Portions of the former Bethlehem Steel property are also participating in the Brownfield Cleanup Program administered by the Department.

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SECTION 6: SITE CONTAMINATION

6.1 Summary of Site Investigations

A site investigation serves as the mechanism for collecting data to:

- characterize site conditions;
- determine the nature of the contamination; and
- assess risk to public health and the environment.

A RCRA Facility Investigation (RFI) was initiated by Bethlehem Steel in 1990 and subsequently completed by Tecumseh in October 2004 (URS 2004). The investigation

was intended to identify the nature (or type) of contamination which may be present at the site and the extent of that contamination in the environment on the site or leaving the site. The investigation reports on data gathered to determine if wastes containing hazardous substances were disposed at the site, and if the soil, groundwater, soil vapor, indoor air, surface water or sediments may have been contaminated. The RFI investigated conditions on approximately 1,600 acres of former Bethlehem Steel property. Based on the RFI results, areas of the former Bethlehem Steel property were identified as needing remediation or further assessment. Sub-areas of the original 1,600-acre site were identified based on the historic use or disposal practice that took place in each area. A number of these sub-areas have yet to be remediated and are the subject of this and other SBs. Other sub-areas have been remediated and repurposed through programs such as the BCP for the alternative energy projects previously mentioned. Further investigation and assessment of remedial alternatives was performed by Tecumseh in a Corrective Measures Study (CMS) Report (TK-BM 2011; revised 2014 and 2019). A supplemental Comprehensive Groundwater Quality Report (TK-BM 2014; revised 2019) was also prepared that summarized and assessed the groundwater data collected during both the RFI and CMS. Data is also available from semiannual (2006-2008) and annual (2009-2019) groundwater monitoring events performed at HWMUs 1A and 1B. Investigation reports are available for review in the site document repository and pertinent results are summarized in **Exhibit A**.

The analytical data collected for OU-05 and OU-08 was derived from samples of:

- soil/fill/waste material contained in SWMUs/AOCs
- groundwater

6.1.1 Standards, Criteria, and Guidance (SCGs)

The remedy must conform to promulgated standards and criteria that are directly applicable or that are relevant and appropriate. The selection of a remedy must also take into consideration guidance, as appropriate. Standards, Criteria and Guidance are hereafter called SCGs.

To determine whether the contaminants identified in various media are present at levels of concern, the data from the site investigations were compared to media-specific SCGs. The Department has developed SCGs for groundwater, surface water, sediments, and soil. The NYSDOH has developed SCGs for drinking water and soil vapor intrusion. The tables found in Exhibits A and B list the applicable SCGs. For a full listing of all SCGs see: http://www.dec.ny.gov/regulations/61794.html

6.1.2 Investigation Results

The data have identified contaminants of concern. A "contaminant of concern" is a contaminant that is sufficiently present in frequency and concentration in the environment to require evaluation for remedial action. Not all contaminants identified on the property are contaminants of concern. The nature and extent of contamination and environmental

media requiring action are summarized below. Additionally, the site investigation reports contain a full discussion of the data. The contaminants of concern identified for OU-05 and OU-08 SWMUs and AOCs are:

Asbestos (for SWMU S-12 Asbestos Landfill L only)
Benzene
Ethylbenzene
Toluene
Trichloroethene
Xylenes
Naphthalene
Polycyclic Aromatic Hydrocarbon Compounds (PAHs)
Phenolic Compounds
Arsenic
Barium
Cadmium
Cyanide
Lead
Mercury
Selenium

The contaminants of concern exceed the applicable SCGs for:

- soil
- groundwater

The proposed remedy in this SB only addresses contamination in OU-05 and OU-08 SWMU/AOC soil/fill/waste material. Groundwater contamination beneath OU-05 and OU-08 will be addressed separately in the OU-10 Site Wide Groundwater remedy.

6.2 Expedited and Final Corrective Measures

On the eastern side of OU-05, final corrective measures have been implemented or completed at OU-02 and OU-03. OU-03 is known as the Acid Tar Pit SWMU Expedited Corrective Measure (ATP-ECM) and is located within the OU-05 boundary. Expedited corrective measures (ECMs) are remedial measures that are undertaken at one or more SWMUs before or during performance of a CMS in order to more promptly control or mitigate the release of hazardous constituents into the environment and/or to reduce the potential for human or biological exposure. ECMs are considered long-term final remedies. The ECM is considered a valuable tool to expedite the remedial process at high-priority SWMUs when the need for remedial action and/or the final remedy selection is readily apparent.

A Consent Order (File No. 10-09) to implement the ATP-ECM was executed by Tecumseh and the Department on May 10, 2010. The remedy, completed between 2010 and 2015, included: site clearing, grading, and construction of a soil-bentonite slurry wall

surrounding SWMUs S-11 and S-22 and keyed into the native glaciolacustrine silty-clay confining unit; excavation, transport, and consolidation of residuals from SWMU S-24, and other SWMUs/AOCs as detailed in OU-02 below, into the containment cell; placement of a multi-layer geosynthetic membrane, drainage, and vegetated soil RCRA final cover system; and construction of a groundwater/leachate collection, pretreatment, and conveyance system. The ATP containment system physically isolates the solid SWMU/AOC waste/fill from the environment and contains the aqueous groundwater constituents immediately surrounding them by maintaining an inward hydraulic gradient. Groundwater/leachate from within the ATP containment cell is removed by several pumped wells with on-site pretreatment consisting of oil/water separation, neutralization, air stripping of volatile organic constituents, and filtration followed by sewer conveyance to the Erie County Sewer District (ECSD) No. 6 publicly owned treatment works (POTW) in Lackawanna for final biological treatment and discharge to Smokes Creek. A revised CCR for OU-02 and OU-03 was submitted on July 26, 2016 and approved by the Department on August 12, 2016. Additional details regarding OU-02 and OU-03 are provided below.

OU-02 (Tar Decanter Pit, Blast Furnace Hot and Cold Wells, and Lime and Kish Landfill): OU-02 consists of SWMUs P-9 (Tar Decanter Pit), P-18A and P-18B (Blast Furnace Hot and Cold Wells), P-76 (Coke Oven Gas Line), and two AOCs (B and C) within S-18 (Lime and Kish Landfill R). The Tar Decanter Pit is located near the center of the coke oven area just west of the Ship Canal and is made of reinforced concrete measuring approximately 51 feet long, 37 feet wide, and 14.5 feet deep. The Tar Decanter Pit separated tar sludge from weak ammonia flushing liquor used to quench coke oven gases and was decommissioned and backfilled in 1960. The Blast Furnace Hot and Cold Wells are located at the southwest corner of the Ship Canal. The Hot Well is an irregular shape measuring approximately 130 feet across the longest section and 16 feet across the narrowest section. The Cold Well is rectangular, measuring 173 feet by 23 feet. Both wells are approximately 39 feet deep. The wells were operated from 1978 to 1983 and used to cool and recycle blast furnace scrubber water. The Lime and Kish Landfill comprises of approximately 2 acres located in the northwest portion of the site. The landfill contained wastes generated from the Basic Oxygen Furnace (BOF) process consisting of lime dust and baghouse dust from iron transfer points called Kish. These SWMUs were found to be impacted primarily with elevated levels of benzene and lead. Wastes from these SWMUs were excavated, treated, and consolidated within the OU-03 containment unit.

OU-03 (Acid Tar Pit SWMU Expedited Corrective Measure): OU-03 is approximately 6 acres and consists of SWMUs S-11, S-21, S-22, and S-24 known as the Acid Tar Pit Group. S-11, S-21, and S-22 are located south of Smokes Creek in the southeast corner of the CMS Area. S-24 is located just north of Smokes Creek west of the intersection of Site Highways #9 and #11. SWMU S-11 measures approximately 1.4 acres and consists of various wastes generated from steel and coke making operations deposited from the 1950s through the early 1970s. The various wastes include drums containing petroleum wastes and solvents, open-hearth precipitator dust from exhaust gas treatment, and baghouse lime dust from the BOF process. SWMU S-21 consists of a pile of scrap melter precipitator dust 40 feet long, 40 feet wide, and 8 feet high. This dust, mostly consisting

of iron oxides, was generated during the movement of scrap metal used in the BOF process and was collected with an electrostatic precipitator from 1978 to 1980 prior to disposal. SWMU S-22 measures approximately 1.4 acres and consists of spent carbonate solution, also called vacuum carbonate blowdown. The solution was used in the coking process to treat off-gas from the coke ovens prior to re-use as fuel. SWMU S-24 is believed to have been used for the disposal of agitator sludge, also known as acid tar sludge, and is oval shaped and approximately 1 acre in size. Sulfuric acid used to wash and separate impurities from benzene processing of coke oven off-gas was neutralized with caustic solution generating the agitator sludge. The SWMU was identified from a 1938 aerial photo and based on subsequent photos, believed to have been unused after 1950. These SWMUs were found to be impacted with elevated levels of metals and various organic compounds that were migrating to Smokes Creek via groundwater discharge and surface water flow.

Final corrective measures have also been completed at the following OU-08 SWMU/AOCs:

SWMU S-13 (also known as the Tar Sludge Surface Impoundment or Hazardous Waste Management Unit [HWMU] 1A): Located in the south-central portion of SFA Zone 4, this Unit was operated by Bethlehem Steel as a permitted HWMU from 1978 to 1982 for disposal of an estimated 5,600 cubic yards (CY) of coal tar tank bottoms, ammonia absorber acid, and tar decanter sludge. Unit closure with a multi-layered RCRA final cover system was completed by Bethlehem Steel in October 1988 under a Consent Agreement with USEPA and NYSDEC approval. Post-closure inspections, maintenance, and groundwater monitoring has been performed since closure.

AOC-B and AOC-C: As noted previously, a final remedy was selected and implemented for these AOCs, located within SWMU S-18, as part of OU-02. An estimated 160 CY of residual waste from AOC-B and 320 CY of waste/fill from AOC-C were mechanically mixed in-situ with Portland cement and the stabilized residuals were placed into the ATP containment cell for final disposal on October 12, 2015. These activities are summarized in the revised CCR for OU-02 and OU-03 submitted on July 26, 2016 and approved by the Department on August 12, 2016.

AOC-D and AOC-E: In November 2006 during utility excavation work for the Steel Winds I project, three tar-impacted areas were encountered. Two areas located just north of SWMU S-23 were designated AOC-D. The first area within AOC-D measured approximately 20 feet wide by 25 feet long by 6 inches thick and the other area measured approximately 15 feet wide by 50 feet long by 3 inches thick. Another tar-impacted area, measuring approximately 30 feet wide by 20 feet long by 3 feet thick, was located between SWMUs S-14 and S-18 and was designated AOC-E. Approximately 545 tons of tar-impacted material from these AOCs was excavated, characterized, and transported offsite in 2007 to Piney Creek L.P., a 32-megawatt net capacity electric generating plant located in Clarion, Pennsylvania, and reused as an alternate waste fuel by co-combustion with coal. Additional tar-impacted material was subsequently found at AOC-D and is discussed in the attached Exhibits.

AOC-F: An approximately 80 feet wide by 90 feet long by 4 feet deep deposit of tar-impacted slag identified during Iron City slag reclamation activities in the northwest portion of SFA Zone 5 in 2010. Approximately 1,065 CY of tar-impacted slag material was excavated and transported via tandem dump truck to the ATP-ECM Containment Cell for disposal. Results of these activities were summarized in the *CMS SFA Zone 5 Slag Reclamation Area Tar-Impacted Slag Remediation Report* submitted on February 11, 2011.

AOC-G: A localized deposit of tar-impacted slag identified during Steel Winds II wind turbine WT-9 foundation excavation activities in the southwest portion of SFA Zone 5 in 2011. Approximately 1.5 CY of tar-impacted slag material was excavated and transported via tandem dump truck to the ATP-ECM Containment Cell for disposal.

AOC-H and AOC-I: During installation of electric transmission poles for the Steel Winds II project in October 2011, two small, localized deposits of tar-impacted slag/fill were identified along the eastern edge of the Former Petroleum Bulk Storage Sub-Area. Approximately 85 CY of tar-impacted slag material was subsequently excavated and transported to the ATP-ECM Containment Cell where it was consolidated with other waste fill for final disposal as part of OU-02.

6.3 Summary of Environmental Assessment

The corrective action process began with evaluations and investigations to identify potential areas of the site that may have been impacted by hazardous wastes and/or hazardous constituents. Based on the results of numerous phases of investigations, the Department has determined that hazardous substances are present in the material disposed at the OU-05 and OU-08 SWMUs/AOCs and that these materials have impacted underlying groundwater. The nature of these materials was characterized and evaluated to identify contaminants of concern, migration potential, engineering properties, and stabilization options.

Environmental assessments and investigations have focused on the soil/fill/waste material and underlying groundwater associated with the OU-05 and OU-08 SWMUs/AOCs. A brief summary of these assessments and investigations is included in Exhibit A. Evaluation of other environmental media and surrounding areas will be addressed through separate remedy selection actions.

Special Resources Impacted/Threatened:

No Special Resources are known to exist within OU-05 or OU-08.

6.4 Summary of Human Exposure Pathways

This human exposure assessment identifies ways in which people may be exposed to site-related contaminants. Chemicals can enter the body through three major pathways - breathing, touching or swallowing. This is referred to as exposure.

The site is partially fenced, gated and has signage, which restricts public access. However, persons who enter the site could contact contaminants in the soil by walking on the site, digging or otherwise disturbing the soil. There are several surface water areas where persons may come in contact with contaminants on-site. People are not coming into contact with the contaminated groundwater because the area is served by a public water supply that is not affected by this contamination. Volatile organic compounds in the groundwater may move into the soil vapor (air spaces within the soil), which in turn may move into overlying buildings and affect the indoor air quality. This process, which is similar to the movement of radon gas from the subsurface into the indoor air of buildings, is referred to as soil vapor intrusion. Because the site is undeveloped or used for outdoor industrial purposes the inhalation of site-related contaminants due to soil vapor intrusion does not represent a current concern.

6.5 Summary of the Remediation Objectives

The objectives for the remedial program have been established through the remedy selection process in 6 NYCRR Parts 373 and 375. The goal for the remedial program is to restore the site to pre-disposal conditions to the extent feasible. At a minimum, the remedy shall eliminate or mitigate all significant threats to public health and the environment presented by the contamination identified at the site through the proper application of scientific and engineering principles.

Because OU-05 and OU-08 are vacant and no permanent structures are currently present, the inhalation of site-related contaminants due to soil vapor intrusion does not represent a current concern. Groundwater contamination beneath OU-05 and OU-08 will be addressed separately in the OU-10 Site Wide Groundwater remedy. The OU-05 and OU-08 proposed remedy only addresses contamination in SWMU/AOC soil/fill/waste material. The remedial action objectives (RAOs) for OU-05 and OU-08 are:

Soil

RAOs for Public Health Protection

- Prevent ingestion or direct contact with contaminated soil.

RAOs for Environmental Protection

- Prevent migration of contaminants that would result in groundwater, surface water or sediment contamination.
- Prevent impacts to biota from ingestion/direct contact with soil causing toxicity or impacts from bioaccumulation through the terrestrial food chain.

SECTION 7: SUMMARY OF THE PROPOSED OU-05 and OU-08 REMEDY

To be selected the remedy must be protective of human health and the environment, be cost-effective, comply with other statutory requirements, and utilize permanent solutions, alternative technologies or resource recovery technologies to the maximum extent

practicable. The remedy must also attain the remedial action objectives identified for the site, which are presented in Section 6.5. The criteria that will be used to determine if the remedial action objectives are being achieved are presented in Exhibit B. Potential remedial alternatives for the Site were identified, screened and evaluated in the CMS report and further evaluated by the Department in the development of this proposed remedy.

A summary of the remedial alternatives that were considered for the OU-05 and OU-08 SWMUs is presented in Exhibit C. Where applicable, cost information is presented in the form of present worth, which represents the amount of money invested in the current year that would be sufficient to cover all present and future costs associated with the alternative. This enables the costs of remedial alternatives to be compared on a common basis. As a convention, a time frame of 30 years is used to evaluate present worth costs for alternatives with an indefinite duration. This does not imply that operation, maintenance, or monitoring would cease after 30 years if remediation goals are not achieved. A summary of the Corrective Measure Alternative Costs is included as Exhibit D.

The basis for the Department's proposed remedy is set forth at Exhibit E. The proposed remedies are referred to as the Final Corrective Measures and include:

OU-05

SWMU	Proposed Remedy
S-1, S-2, S-3, S-4, S-5, and S-6	Closure in-place, including excavation and consolidation, shoreline revetment and slope stabilization, capping of SWMUs S-1 through S-6, and a cover system.
S-7/S-20	Partial excavation, consolidation, and capping.
S-8	Stormwater control.
S-27	Excavation and consolidation.

OU-08

SWMU	Proposed Remedy
S-12, S-14, S-18 and AOC A	Excavation and consolidation on-site.
S-15	Debris removal and consolidation on-site.
S-16, S-23, and AOC D	Consolidation and cover in place.
S-17	Excavation and off-site disposal.
S-28	No further action.

The estimated present worth cost to implement the proposed corrective measures is $18,674,000. The cost to construct the remedy is estimated to be $18,033,000 and the estimated average annual cost is $42,000.

The elements of the proposed corrective measure are as follows:

1. Pre-Design Investigation

A Pre-Design Investigation (PDI) will be implemented to fill data gaps and inform the OU-05 and OU-08 remedial designs. A PDI Work Plan will be developed for each OU, and approved by the Department, to ensure that adequate information is available to complete the remedial designs. The PDI will include, but is not limited to, the following elements:

- Additional soil sampling, in accordance with remedy element 8, to determine the extent of areas within OU-5 and OU-08 where the upper one foot of exposed surface soil exceeds commercial (OU-05 only) or industrial soil cleanup objectives and a site cover may be needed to allow for commercial or industrial use of the site;
- Additional soil/fill/waste sampling to further characterize the nature and extent of soil/fill/waste to inform remedial design decisions regarding disposition of excavated materials and site cover needs;
- Radiation surveys and/or sampling to identify material exhibiting elevated radiological readings and inform remedial design decisions regarding disposition of excavated materials and site cover needs;
- Utilizing a utility locator to determine the location of any underground wind turbine utilities or other obstructions that may impact remedial construction activities. This information would be utilized to either re-route these utilities outside the remediation or to identify, accommodate, and protect their locations, including during any future anticipated maintenance activities;
- Geotechnical sampling to provide the details necessary to inform the remedial design;
- Surveying, including the location of any additional soil sampling, appropriate to support the remedial design and implementation of the remedy;

2. Remedial Design

A remedial design program will be implemented to provide the details necessary for the construction, operation, optimization, maintenance, and monitoring of the remedial program. Green remediation principles and techniques will be implemented to the extent feasible in the design, implementation, and site management of the remedy as per DER-31. The major green remediation components are as follows:

- Considering the environmental impacts of treatment technologies and remedy stewardship over the long term;
- Reducing direct and indirect greenhouse gases and other emissions;
- Increasing energy efficiency and minimizing use of non-renewable energy;
- Conserving and efficiently managing resources and materials;
- Reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste;
- Maximizing habitat value and creating habitat when possible;

- Fostering green and healthy communities and working landscapes which balance ecological, economic and social goals;
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development; and
- Additionally, proposed designs shall incorporate green remediation principles and techniques to the extent feasible in the future development at this site. Any future on-site buildings will include, at a minimum, a 20-mil vapor barrier/waterproofing membrane, or Department-approved equivalent, on the foundation to improve energy efficiency as an element of construction.

The remedial design program must also consider climate resiliency, to be incorporated into the site wide climate resiliency plan, which includes:

- Climate change vulnerability analyses and adaptation planning leading to increased remedy resilience;
- Identifying potential hazards posed by climate change;
- Characterizing the remedy(s) exposure to those hazards;
- Characterizing the remedy(s) sensitivity to the hazards;
- Considering factors that may exacerbate remedy exposure and sensitivity, identifying measures that potentially apply to the vulnerabilities in a range of weather/climate scenarios; and
- Selecting and implementing priority adaptation measures for the given remedy.

3. Excavation

Excavation and appropriate solidification/stabilization and/or off-site disposal of contaminant source areas, including:

- grossly contaminated soil, as defined in 6 NYCRR Part 375-1.2(u);
- soil exceeding the 6 NYCRR Part 371 hazardous criteria;
- concentrated solid or semi-solid hazardous substances per 6 NYCRR Part 375-1.2(f) and (au)
- non-aqueous phase liquids;
- soil with visual waste material or non-aqueous phase liquid;
- soil containing arsenic exceeding 16 ppm or soil containing total PAHs exceeding 500 ppm;
- soils, present within one foot of finished grade, which exceed the Restricted Use Soil Cleanup Objectives for the Protection of Public Health for Industrial Use (ISCO), as defined by 6 NYCRR Part 375-6.8;
- soils which exceed the protection of groundwater soil cleanup objectives (PGWSCOs), as defined by 6 NYCRR Part 375-6.8, for those contaminants found in site groundwater above standards; and
- soils that create a nuisance condition, as defined in Commissioner Policy CP-51 Section G.

At OU-05, approximately 15,000 to 94,000 CY of waste from all of SWMU S-27 and a portion of S-7/20 will be excavated and consolidated within the remaining Impoundment SWMUs (S-1, S-2, S-3, S-5, and S-6). There will be no additional consolidation in SWMU S-4, since the 1.5H:1V slope stability is contingent upon no additional loading in S-4. Construction and demolition (C&D) debris may be imported from other OUs (e.g., OU-08 SWMU S-15) to facilitate re-grading in order to accommodate installation of an engineered cover system as described in element 7. Saturated materials, particularly, but not limited to, SWMU S-1 and S-5, will be appropriately stabilized, solidified, or otherwise dewatered.

At OU-08, approximately 66,150 CY of contaminated materials will be excavated from the OU-08 SWMUs/AOCs, with an estimated 41,000 CY reclaimed as slag/scrap (S-14), 21,500 CY consolidated in an onsite Corrective Action Management Unit (CAMU) (S-12, S-14, S-15, and S-18), 2,500 CY consolidated and closed with S-16/S-23 (AOC-D), and 1,000 CY going for disposal at an off-site facility (S-17). Mercury impacted waste/fill in OU-08 SWMU S-17 with TCLP mercury >0.2 mg/L will require solidification/ stabilization to meet off-site TSDF disposal criteria. Lead impacted waste/fill in OU-08 SWMU S-18 (AOC-A) with TCLP lead >5 mg/L will also require solidification/stabilization.

Solidification/stabilization is a process that mixes agents with contaminated soil to physically or chemically modify the material to allow it to meet remedial goals, allowing it to be placed back on-site or hauled to an appropriate disposal facility. Under this process, the contaminated soil will be excavated and mixed with solidifying or stabilizing agents such as Portland cement or Phosphate-based binders to address leachability of the contaminants from soils. The treated soil will then either be graded and covered with a cover system as described in element 8 to prevent direct exposure, or alternatively, the treated soils may be disposed of at an appropriately permitted facility and the area backfilled and covered with a system meeting appropriate SCOs.

Following completion of excavation, verification sampling and analysis will be performed to determine residual concentrations of constituents of concern in soil/fill at the base and sidewalls of the excavations.

4. Disposition of Excavated Material

The disposition of excavated materials will be subject to a site-wide materials management plan meeting the requirements in *Statement of Basis for OU-1 Site Wide Remedial Elements, OU-9 Water Courses, and OU-10 Site-Wide Groundwater*.

The excavated materials may be:

a) sent off-site for disposal if it is found to be hazardous waste pursuant to NYCRR Part 371;
b) if determined to be non-hazardous, the off-site disposal option will allow for the staging of material on-site (for up to 24 months) in accordance with 6NYCRR Part

373-2.19(d) and 40 CFR Section 264.5 and other applicable requirements to maximize the beneficial reuse of the remedial waste as daily cover at commercial landfills, provided the remedy selection authorizes such activity. If utilized, temporary soil pile(s) may not exceed 28 feet in height; and/or

c) placed in a CAMU to be constructed on the former Bethlehem Steel site property designed to meet all applicable rules and regulations, or if approved by DEC, staged while the CAMU is being constructed. To utilize a CAMU, a design must be completed and approved, and construction must begin within 24 months of this SB (or such other time frame as the DEC agrees upon in writing) and be completed in accordance with a Department-approved schedule. If the CAMU is not constructed in accordance with the approved schedule the remedial wastes will be disposed of off-site in accordance with (a) above.

While the method of transportation mode will be determined during the remedial design, the DEC Department's preferred mode of transportation is rail since it reduces truck traffic, reduces greenhouse gases, utilizes rail facilities are located near the site, and is in line with previously received community comments.

5. Backfill

A. On-site soil which does not exceed the above excavation criteria may be used below the cover system described in remedy element 8 to backfill the excavation to the extent that a sufficient volume of on-site soil is available to establish the designed grades at the site.

B. On-site soil which does not exceed the above excavation criteria or the protection of groundwater SCOs for any constituent may be used anywhere beneath the cover system, including below the water table, to backfill the excavation or re-grade the site.

C. Clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d) will be imported to replace any excavated soil and to establish the designed grades at the site, if sufficient material meeting the above criteria is not present at the site.

D. The site will be re-graded to accommodate installation of a cover system as described in remedy element 8.

6. OU-05 Shoreline Revetment and Slope Stabilization

OU-05 SWMU waste material along the western edges of SWMUs S-1, S-2, S-3, and S-4 and the northern edge of SWMU S-4 will be pulled back from the slag bluffs to achieve a minimum separation distance of 50 feet from the SWMU waste material to the outside edge of the slag bluffs (Figures 9 and 10). A shoreline revetment will be installed at the toe of the western slag bluff (refer to Figures 11 and 12). Rip Rap placement above the shoreline revetment will be minimized to the extent possible, with natural shoreline protection methods integrated as much as possible into the slope stabilization design. The slag bluffs will be graded to achieve, at a maximum, a 1.5-horizontal to 1 vertical

slope. The design will minimize waterward encroachment, incorporate structural, environmental, and ecological enhancements to restore the Lackawanna lakeshore to a more natural state, soften the shoreline, and provide stability of the slag bluffs.

7. Closure In-Place of OU-05 SWMUs S-1 through S-6 and OU-08 SWMUs S-16, S-23, and AOC-D

This element includes closure of OU-05 SWMUs S-1, S-2, S-3, S-4, S-5, and S-6 in-place with an engineered cap (Figure 13) and lake shore revetment as described in element 6. These impoundments cover approximately 11.5 acres. The final surface grades of the SWMUs will be modified by the addition of approximately 15,000 to 94,000 CY of waste from SWMU S-27 and water quality sludge and mill scale to be excavated from SWMU S-7/20 to construct the CAMU. The CAMU will be constructed in the partially excavated SWMU S-7/20 and is further discussed in the *Statement of Basis for OU-01 Site Wide Remedial Elements, OU-09 Water Courses, and OU-10 Site Wide Groundwater*. The balance of the fill material needed to achieve a minimum 4% slope on the finished grade for positive drainage will be obtained from slag generated from grading modifications to the impoundment area (or other areas of the Bethlehem Steel site).

In OU-08, the non-hazardous tar waste from AOC-D would be excavated and consolidated in the SWMU S-23 footprint proximate to SWMU S-16 to provide a more confined area for the cover system and to provide materials to improve the grades so that positive surface drainage will be provided from the cover system. The geo-composite cover system would include the following elements from bottom to top: 6-inch geotextile cushion, 40-mil HDPE geomembrane, geosynthetic drainage layer, 12-inch barrier protection soil layer, and 6-inch topsoil layer. The topsoil would be seeded with a grass/pollinator seed mix, fertilized, and mulched to promote vegetative growth.

8. Cover System

A cover system will be required to allow for commercial (passive recreational) use in portions of OU-05 and industrial use in OU-08 and the remainder of OU-05 in areas where the upper one foot of exposed surface soil exceeds applicable SCOs. The site cover will be integrated into the site wide cover required in *Statement of Basis for OU-1 Site Wide Remedial Elements, OU-9 Water Courses, and OU-10 Site-Wide Groundwater*. Where a cover system is to be used, it will be a minimum of one foot of soil, with the upper six inches of soil of sufficient quality to maintain a vegetative layer, or an approved fill placed over a demarcation layer. Soil cover material, including any fill material brought to the site, will meet the SCOs for cover material for the use of the site as set forth in 6 NYCRR Part 375-6.7(d). Substitution of other materials and components, in lieu of soil and vegetative cover, may be allowed where such components already exist or are a component of the tangible property to be placed as part of site redevelopment. Such components may include, but are not necessarily limited to, pavement, concrete, paved surface parking areas, sidewalks, building foundations and building slabs. To the extent practical, areas with one foot of cover will enhance habitat or be appropriately regraded to facilitate future use.

For areas of the OUs not previously investigated or lying outside of defined SWMUs/AOCs, a sampling program will be required following regrading of the site. This sampling program will be implemented to confirm the existence of the site cover described above.

9. Stormwater Management

Stormwater controls will be implemented to minimize infiltration in and around the capped SWMUs and CAMU. Stormwater controls implemented in the OU-05 SWMU S-8 boundary (or other designated areas) will be designed to minimize infiltration, retain stormwater, and discharge in a controlled manner. Slag/fill beneath stormwater control units will meet protection of groundwater SCOs. Stormwater controls will be designed and implemented in accordance with applicable SCOs. In the event SWMU S-8 is not utilized for stormwater management, the cover system requirements described in element 8 will apply.

10. Financial Assurance

Tecumseh Redevelopment, Inc., will post financial assurance using one or more of the financial instruments specified in 6 NYCRR 373-2.8 in the amount of the cost projection for the remedy selected in the Statement of Basis. This will supplement the financial assurance for all site-wide remedial activities, closure and post-closure care for the site that have not been implemented.

11. Institutional Control

Imposition of an institutional control in the form of a site-wide environmental easement for the controlled property as required in Statement of Basis for OU-1 Site Wide Remedial Elements, OU-9 Water Courses and OU-10 Site-Wide Groundwater which will:

- require the remedial party or site owner to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3);
- allow the use and development of the controlled property within OU-05 for commercial use as defined by Part 375-1.8(g) which includes passive recreational use, although land use is subject to local zoning laws;
- allow the use and development of the controlled property within OU-05 and OU-08 for industrial use as defined by Part 375-1.8(g), although land use is subject to local zoning laws;
- restrict the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or County DOH; and
- require compliance with the Department approved Site Management Plan.

12. Site Management Plan

Supplemental elements will be added to the site-wide Site Management Plan as required in the Statement of Basis for OU-1 Site Wide Remedial Elements, OU-9 Water Courses and OU-10 Site-Wide Groundwater to address requirements of OU-05 and OU-8, including the following:

1. an Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for OU-5 and OU-08 and details the steps and media-specific requirements necessary to ensure the following institutional and/or engineering controls remain in place and effective:

   Institutional Controls: the Environmental Easement described in element 11.

   Engineering Controls: the engineered cap discussed in element 7, the shoreline revetment and stabilization discussed in element 6, the cover system discussed in element 8, and the stormwater controls discussed in element 9.

   This plan includes, but may not be limited to:

   - an Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination;
   - a provision for further investigation and remediation should redevelopment occur or if the subsurface is otherwise made accessible. The nature and extent of contamination in areas where access was previously limited or unavailable will be immediately and thoroughly investigated pursuant to a plan approved by the Department. Based on the investigation results and the Department determination of the need for a remedy, a Remedial Action Work Plan (RAWP) will be developed for the final remedy for the OU, or part thereof, including removal and/or treatment of any source areas to the extent feasible. Citizen Participation Plan (CPP) activities will continue through this process. Any necessary remediation will be completed prior to, or in association with, redevelopment.
   - with respect to areas anticipated to be made available for passive recreational use, the necessary institutional and engineering controls will be effectively implemented, maintained, monitored and enforced through the site management plan. These areas would require the top one foot to meet commercial SCOs.
   - descriptions of the provisions of the site-wide environmental easement including any land use, groundwater and surface water use restrictions;
   - a provision for evaluation of the potential for soil vapor intrusion for any occupied buildings on the site, including provision for implementing actions recommended to address exposures related to soil vapor intrusion;
   - provisions for the management and inspection of the identified engineering controls;
   - maintaining site access controls and Department notification; and
   - the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls.

2. a Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but may not be limited to:

    - monitoring of soil and groundwater to assess the performance and effectiveness of the remedy;
    - a schedule of monitoring and frequency of submittals to the Department;
    - monitoring for vapor intrusion for any buildings on the site, as may be required by the Institutional and Engineering Control Plan discussed above.

3. an Operation and Maintenance (O&M) Plan to ensure continued operation, maintenance, optimization, monitoring, inspection, and reporting of any mechanical or physical components of the remedy. The plan includes, but is not limited to:

    - procedures for operating and maintaining the remedy;
    - compliance monitoring of treatment systems to ensure proper O&M as well as providing the data for any necessary permit or permit equivalent reporting;
    - maintaining site access controls and Department notification; and
    - providing the Department access to the site and O&M records.

PROPOSED STATEMENT OF BASIS

Exhibits A through E

Bethlehem Steel
(aka Tecumseh Redevelopment, Inc.)

OU-05 - Slag Fill Area Zone 2
and
OU-08 - Slag Fill Area Zones 4 and 5

City of Lackawanna, Erie County
Site No. 915009
EPA ID No. NYD002134880

May 2021

Exhibit A – NATURE AND EXTENT OF CONTAMINATION

Exhibit B – SUMMARY OF THE CLEANUP OBJECTIVES

Exhibit C – DESCRIPTION OF CORRECTIVE MEASURES ALTERNATIVES

Exhibit D – PROPOSED CORRECTIVE MEASURES ALTERNATIVES COSTS

Exhibit E – SUMMARY OF THE PROPOSED FINAL CORRECTIVE MEASURES

Appendix A – ADMINISTRATIVE RECORD

Exhibit A

Nature and Extent of Contamination

This section describes the findings of the RCRA Facility Investigation (RFI) and Corrective Measures Study (CMS) for all environmental media that were evaluated at the OU-05 and OU-08 SWMUs/AOCs. A SWMU includes any discernible unit at which solid wastes have been placed at any time, irrespective of whether the unit was intended for the management of hazardous or solid wastes. Such units include any area at the facility where solid wastes have been routinely and systematically released. An AOC is an area at the facility, or an off-site area, which is not at the time known to be SWMU, where hazardous wastes and/or constituents are present or are suspected to be present as a result of a release from the facility. Solid wastes are defined in 6 NYCRR Part 371.1(c) and hazardous wastes are defined in 6 NYCRR Part 371.1(d).

During the RFI and CMS, surface and subsurface soil/fill/waste (hereafter referred to as "soil") samples were collected between 1994 and 2011 to evaluate the nature and extent of soil contamination at the OU-05 and OU-08 SWMUs/AOCs. Surface soil samples were collected to assess direct human exposure. Subsurface soil samples were collected from varying depths to assess the nature and extent of soil contamination and possible impacts to groundwater.

Tables 1 and 2 summarize the findings of the investigations for soil in the OU-05 SWMUs and OU-08 SWMUs/AOCs, respectively, presenting the range of contamination found and comparing the data with the applicable SCGs. The contaminants are arranged into three categories: volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and inorganics (metals and cyanide). For comparison purposes, the SCGs are provided for unrestricted use, commercial use (OU-05 only), industrial use (OU-08 only), and the protection of groundwater. Protection of Groundwater SCGs are presented because soil contamination is currently present in and may impact groundwater. Asbestos wastes are also present at OU-08 SWMU S-12, former Asbestos Landfill L. A full summary of data can be found in the CMS Report (May 2019) and RFI Report (2004).

Soil

OU-05

OU-05 is comprised of the SWMUs commonly referred to as The Impoundments (S-1, S-2, S-3, S-4, S-5, S-6, S-7/20, S-8, and S-27). The Impoundment SWMUs comprise approximately 21-acres and are primarily located in the western portion of OU-05.

SWMU S-1 is located in the southwestern portion of OU-05 along the slag bluff just above the Lake Erie shore. The unit is an approximate 2-acre bermed surface impoundment with a maximum depth of 24 feet. The unit received wastewater treatment sludges containing iron oxides, rolling oils, lubricants, and water. S-1 contains approximately

81,500 cubic yards of waste material. Seasonally ponded water has been observed at the surface and contains black oily mill scale and sludge.

Surface and sub-surface samples were collected during the RFI. Surface samples were collected from a depth of 0-6 inches and sub-surface samples were collected up to a depth of 24 feet. VOCs were detected above unrestricted SCGs in sub-surface SWMU waste material and both unrestricted and protection of groundwater SCGs in surface SWMU waste material. Polycyclic aromatic hydrocarbons (PAHs) were detected above unrestricted and protection of groundwater SCGs in both surface and sub-surface SWMU waste material. PAHs were detected above commercial SCGs in surface SWMU waste material. For several results, the estimated quantitation limit exceeds the unrestricted, commercial, and protection of groundwater SCGs. Metals were detected above unrestricted and commercial SCGs in both surface and sub-surface SWMU waste material. Metals were detected above protection of groundwater SCGs in sub-surface SWMU waste material.

SWMU S-2 is located in the western portion of OU-05 along the slag bluff just above the Lake Erie shore. The unit is an approximate 2-acre bermed surface impoundment with a maximum depth of 27 feet. The unit received Basic Oxygen Furnace (BOF) and blast furnace final thickener sludges consisting primarily of iron oxides. The unit also received iron hydroxide sludges, oil, and grease from the treatment of wastewater associated with the Cold Mill pickling operations. S-2 contains approximately 96,200 cubic yards of waste material.

Surface and sub-surface samples were collected during the RFI. Surface samples were collected from a depth of 0-6 inches and sub-surface samples were collected up to a depth of 27.3 feet. Total xylenes were detected above unrestricted SCGs in one sub-surface boring. PAHs were detected, but below SCGs in both surface and sub-surface SWMU waste material. For several results, the estimated quantitation limit exceeds the unrestricted, commercial, and protection of groundwater SCGs. Metals were detected above unrestricted, commercial, and protection of groundwater SCGs in both surface and sub-surface SWMU waste material.

SWMU S-3 is located in the western portion of OU-05 along the Lake Erie Shore. The unit is commonly referred to as the Ammonia Still Lime Sludge (ASLS) Storage Area and was initially designated as Hazardous Waste Management Unit (HWMU) 2 before being de-listed by the USEPA in 1995. The unit is an approximate 3.5-acre bermed surface impoundment with an average depth of 22 feet. The unit received BOF and blast furnace sludges consisting primarily of iron oxides. The unit received lesser amounts of Ammonia Still Lime Sludge (K060), iron hydroxides, oil, grease, and Smokes Creek dredge spoils. S-3 contains approximately 120,000cubic yards of waste material.

Surface samples were collected during the RFI from a depth of 0-6 inches. PAHs were identified above protection of groundwater SCGs in one surface SWMU waste material sample. Metals exceeded unrestricted, commercial, and protection of groundwater SCGs in surface SWMU waste material.

SWMU S-4 is located in the northwest portion of OU-05 along the Lake Erie shore. The unit is an approximate 2.5-acre bermed surface impoundment with a maximum depth of 38-feet. The unit received Smokes Creek dredge spoils. Smokes Creek was known to have received waste pickle liquor, oil, cleaning and coating solutions from the galvanizing mill, settling pit overflows from the forming mills, and effluents from the south return water trench, slabbing mill return trench and multiple on-site wastewater treatment facilities. S-4 contains approximately 150,000 cubic yards of waste material.

Surface and sub-surface samples were collected during the RFI. Surface samples were collected from a depth of 0-6 inches and sub-surface samples were collected up to a depth of 36 feet. VOCs were detected above unrestricted and protection of groundwater SCGs in sub-surface waste material. The method quantitation limit for several samples was above the unrestricted and protection of groundwater SCGs for VOCs. Naphthalene was detected above unrestricted and protection of groundwater SCGs in sub-surface waste material. The method quantitation limit for several samples was above the unrestricted, commercial, and protection of groundwater SCGs for PAHs. Metals exceeded unrestricted, commercial, and protection of groundwater SCGs in both surface and sub-surface waste material.

SWMU S-5 is located in the southern portion of OU-05 and bordered to the west by SWMUs S-1 and S-2, to the east S-6, and to the north S-7/20. The unit is an approximate 1.5-acre bermed surface impoundment with a maximum depth of 21 feet. The unit primarily received wastes containing iron oxides, rolling oils, lubricants and water. Additional wastes believed to have been deposited include BOF sludges, iron hydroxides, oil, and grease. Ponded water has been observed at the surface and contains black oily mill scale and sludge. S-5 contains approximately 54,000 cubic yards of waste material.

Surface and sub-surface samples were collected during the RFI. Surface samples were collected from a depth of 0-6 inches and sub-surface samples were collected up to a depth of 21.5 feet. VOCs were detected above unrestricted and protection of groundwater SCGs in sub-surface waste material. PAHs were detected above unrestricted and protection of groundwater SCGs and naphthalene was detected above commercial SCGs in sub-surface waste material. For the surface sample results, the estimated quantitation limit exceeds the unrestricted and protection of groundwater SCGs. Cadmium was detected above unrestricted and commercial SCGs in both surface and sub-surface waste material.

SWMU S-6 is located in the southern portion of OU-05 and bordered by SWMUs S-5 to the west and S-7/20 to the north. The unit is an approximate 1.5-acre bermed surface impoundment with a maximum depth of 34 feet. The unit received BOF sludges, iron oxides, oil, and grease. S-6 contains approximately 66,300 cubic yards of waste material.

Surface and sub-surface samples were collected during the RFI. Surface samples were collected from a depth of 0-6 inches and sub-surface samples were collected up to a depth of 33.7 feet. Benzene and total xylenes were detected above unrestricted SCGs

and benzene was detected above the protection of groundwater SCGs in sub-surface waste material. Naphthalene was detected above unrestricted and protection of groundwater SCGs in sub-surface waste material. At one sub-surface sample location, the method quantitation limit exceeded the unrestricted, commercial, and protection of groundwater SCGs. Metals were detected exceeding unrestricted, commercial, and protection of groundwater SCGs in both surface and sub-surface waste material.

SWMU S-7/20 is located in the central portion of OU-05 and bordered by SWMUs S-3 to the west, S-8 to the north, and S-5 and S-6 to the south. The unit is an approximate 4-acre bermed surface impoundment with a maximum depth of 41 feet. The unit received BOF sludges, iron oxides, oil, and grease. S-7/20 contains approximately 283,000 cubic yards of waste material

Surface and sub-surface samples were collected during the RFI. Surface samples were collected from a depth of 0-6 inches and sub-surface samples were collected up to a depth of 41.5 feet. 2-butanone was detected above unrestricted SCGs in one sub-surface waste sample. Naphthalene was detected above unrestricted and protection of groundwater SCGs in sub-surface waste material. The method quantitation limit for one sub-surface sample result exceeded the unrestricted, commercial, and protection of groundwater and another sub-surface sample result exceeded the unrestricted SCGs. Metals were detected exceeding unrestricted, commercial, and protection of groundwater SCGs in surface and sub-surface waste material.

The proposed final corrective measure for SWMU S-7/20 is described in the Statement of Basis for OU-1 Site Wide Remedial Elements, OU-9 Water Courses and OU-10 Site-Wide Groundwater.

SWMU S-8 is located in the northern portion of OU-05 and bordered by SWMUs S-4 to the west and S-7/20 to the south. The unit was constructed as a surface impoundment for waste storage using slag/fill but was never put into use. The unit consists of steeply sloped slag material to a height of about 50-feet covering an approximate area of 3-acres.

Surface samples were collected during the RFI of the slag/fill at the bottom of the empty SWMU and berm from a depth of 6 inches. PAHs were detected exceeding unrestricted and protection of groundwater SCGs. Metals were detected exceeding unrestricted, commercial, and protection of groundwater SCGs in the soil/fill.

SWMU S-27 is located in the southwestern portion of OU-05 and approximately 1 acre in size. Scattered debris, including metal and tires, are found throughout the unit. The unit received sludges, iron oxides, rolling oils, lubricants and water from multiple on-site wastewater treatment facilities. S-27 contains an estimated 24,000 cubic yards of waste material.

Surface samples were collected during the RFI to a depth of 6 inches. PAHs and metals were detected exceeding unrestricted, commercial, and protection of groundwater SCGs.

The method quantitation limit in one sample location exceeded unrestricted SCGs for benzo(a)pyrene and the unrestricted and protection of groundwater SCGs for chrysene.

Table 1 - Soil (OU5)

Detected Constituents	Concentration Range Detected (ppm)[a]	Unrestricted SCG[b] (ppm)	Frequency Exceeding Unrestricted SCG	Restricted Use SCG[c] (ppm)	Frequency Exceeding Restricted Use SCG	Restricted Use SCG[d] (ppm)	Frequency Exceeding Restricted Use SCG
VOCs							
Benzene[efi]	ND - 9.5	0.06	6 of 37	44	0 of 37	0.06	6 of 37
Ethylbenzene[f]	ND - 2.5	1	2 of 37	390	0 of 37	1	2 of 37
Toluene[efi]	ND - 12	0.7	5 of 37	500	0 of 37	0.7	5 of 37
Trichloroethene[efi]	ND - 3	0.47	1 of 37	200	0 of 37	0.47	1 of 37
Xylenes(mixed)[f]	ND - 12	0.26	7 of 37	500	0 of 37	1.6	4 of 37
SVOCs							
3-Methylphenol/4-Methylphenol[efij]	ND - 20	0.33	4 of 36	500	0 of 36	0.33	4 of 36
Acenaphthene[ef]	ND - 170	20	1 of 36	500	0 of 36	98	1 of 36
Acenapthylene	ND - 200	100	1 of 36	500	0 of 36	107	1 of 36
Anthracene	ND - 460	100	1 of 36	500	0 of 36	1000	
Benzo(a)anthracene[efhi]	ND - 630	1	5 of 36	5.6	1 of 36	1	5 of 36
Benzo(a)pyrene[efhi]	ND - 330	1	3 of 36	1	3 of 36	22	1 of 36
Benzo(b)fluoranthene[efhi]	ND - 490	1	3 of 36	5.6	1 of 36	1.7	3 of 36
Benzo(ghi)perylene	ND - 170	100	1 of 36	500	0 of 36		
Benzo(k)fluoranthene[efhi]	ND - 150	0.8	2 of 36	56	1 of 36	1.7	2 of 36
Chrysene[efij]	ND - 7.1	1	2 of 36	56	0 of 36	1	2 of 36
Dibenzo(a,h)anthracene[hj]	ND - 38	0.33	2 of 36	0.56	1 of 36	1000	
Fluoranthene	ND - 1,500	100	1 of 36	500	1 of 36	1000	
Fluorene[ef]	ND - 710	30	2 of 36	500	1 of 36	386	1 of 36
Indeno(1,2,3-cd)pyrene[efhi]	ND - 210	0.5	2 of 36	5.6	1 of 36	8.2	1 of 36
Naphthalene[efi]	ND - 1,600	12	8 of 36	500	2 of 36	12	8 of 36
Phenanthrene	ND - 1,900	100	2 of 36	500	1 of 36	1000	1 of 36
Phenol[efij]	ND - 12	0.33	1 of 36	500	0 of 36	0.33	1 of 36
Pyrene	ND - 1,200	100	1 of 36	500	1 of 36	1000	
Total PAHs[k]	ND - 10,200	500 ppm per CP-51[k]					
Metals							
Arsenic[f]	ND - 74.4	13	21 of 36	16	19 of 36	16	19 of 36
Barium[f]	ND - 824	350	1 of 36	400	1 of 36	820	1 of 36
Cadmium[ehi]	ND - 49.9	2.5	30 of 36	9.3	17 of 36	7.5	
Cyanide[f]	ND - 32.2	27	2 of 36	27	2 of 36	40	0 of 36
Lead	ND - 3,960	63	32 of 36	1,000	10 of 36	450	

Detected Constituents	Concentration Range Detected (ppm)[a]	Unrestricted SCG[b] (ppm)	Frequency Exceeding Unrestricted SCG	Restricted Use SCG[c] (ppm)	Frequency Exceeding Restricted Use SCG	Restricted Use SCG[d] (ppm)	Frequency Exceeding Restricted Use SCG
Mercury	ND - 5.6	0.18	15 of 36	2.8	1 of 36	0.73	
Selenium[efi]	ND - 14.2	3.9	8 of 36	1,500	0 of 36	4	8 of 36

NOTES:

ND - parameter not detected above the sample quantitation limit

a - ppm: parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;

b - SCG: Part 375-6.8(a), Unrestricted Soil Cleanup Objectives.

c - SCG: Part 375-6.8(b), Restricted Use Soil Cleanup Objectives for the Protection of Public Health for Commercial Use, unless otherwise noted.

d - SCG: Part 375-6.8(b), Restricted Use Soil Cleanup Objectives for the Protection of Groundwater. Data is presented for parameters where OU-05 groundwater impacts exceed the applicable Standards, Criteria, and Guidance

e - the sample quantitation limit at a minimum of one sample result exceeded the unrestricted Soil Cleanup Objectives

f - SCG exceeded for this compound in groundwater samples (Table 3 below); also exceeds Protection of Groundwater SCG in soil.

g - A minimum of one sample result rejected at value exceeding applicable Soil Cleanup Objectives

h - the sample quantitation limit at a minimum of one sample result exceeded the Restricted Commercial Soil Cleanup Objectives

i - the sample quantitation limit at a minimum of one sample result exceeded the Restricted Protection of Groundwater Soil Cleanup Objectives

j - quantitation limit at a minimum of one sample result exceeds the maximum reported result

k - Site-specific soil cleanup objectives based upon the Department's October 21, 2010 Final Soil Cleanup Guidance (CP-51) - 500 ppm subsurface soil cleanup level for Total Polycyclic Aromatic Hydrocarbons (PAHs) (at least one foot of soil cover must meet applicable SCOs).

OU-08

SWMU S-12, also known as Asbestos Landfill L, is a formerly permitted asbestos landfill located in the south-central portion of SFA Zone 4 that operated from 1980 until 1983 and reportedly contains approximately 450 CY of bagged asbestos waste (Figure 3). It is a depressional area, surrounded on three sides by slag berms, measuring approximately 100 feet long by 40 feet wide with a bottom (base of waste/fill) elevation of 578 feet, which is approximately 3 feet above the water table. The existing cover system consists of a 1- to 3-foot thick cover of fine slag across the top of the landfill surface. This landfill was never properly closed.

No RFI or CMS soil/waste/fill samples were collected at SWMUs S-12 or S-13. SWMU S-12 is an Asbestos Landfill that reportedly contains approximately 450 CY of bagged asbestos waste

SWMU S-13, also known as the Tar Sludge Surface Impoundment or Hazardous Waste Management Unit (HWMU) 1A, is also located in the south-central portion of SFA Zone 4 (Figure 3). SWMU S-13 is a closed landfill with a multi-layered RCRA final cover system that was used for disposal of an estimated 5,600 CY of coal tar tank bottoms, ammonia absorber acid, and tar decanter sludge. The Unit measures approximately 290 feet long, 160 feet wide, by 13 feet deep and rises to a maximum height of approximately 8 feet above surrounding grade. The ground surface around the landfill is at an approximate

elevation of 609 feet and groundwater is found approximately 34 feet below ground surface (fbgs). The Unit was operated by Bethlehem Steel as a permitted HWMU from 1978 to 1982 for disposal of an estimated 5,600 CY of coal tar tank bottoms, ammonia absorber acid, and tar decanter sludge. The decanter tank tar sludge meets the definition of a listed hazardous waste (K087) and contains elevated concentrations of VOCs (BTEX) and SVOCs (including naphthalene and PAHs). Unit closure with a multi-layered RCRA final cover system was completed by Bethlehem Steel in October 1988 under a Consent Agreement with USEPA and NYSDEC approval. No waste/fill characterization data were collected from this Unit as part of the RFI or CMS. Post-closure inspections, maintenance, and groundwater monitoring has been performed since closure. Groundwater beneath this Unit contains benzene, toluene, xylenes, 1,2,4- and 1,3,5-trimethylbenzene, naphthalene, PAHs, and phenolic compounds at concentrations above groundwater quality standards; these impacts may be attributable to materials within SWMU S-13, but could also be due to upgradient sources.

SWMU S-14, also known as General Rubble Landfill N, is located in the northwestern portion of SFA Zone 4 between SWMUs S-23 and S-18 (Figure 4). This SWMU is an above-grade mound with steeply sloping sides that reportedly contains approximately 57,000 CY of brown, fine- to coarse-grained sand and gravel-like material with intermixed scrap metal, construction debris (i.e., bricks, concrete, plastic pipe), wood, slag, and glass. It is roughly oval shaped measuring approximately 450 long at the base/300 feet long at the top, 130 feet wide, with a maximum elevation of 655 feet and a base elevation of nominally 610 to 620 feet. SWMU S-14 overlies approximately 50 feet of slag/fill and groundwater is found approximately 35 to 45 fbgs from the apparent base of the mound. It is estimated that approximately 16,000 CY of waste/fill has total PAH concentrations exceeding the CP-51 total PAH guidance for non-residential sites of 500 mg/kg. Tar-impacted AOCs-D and -E are located adjacent to SWMU S-14 and it is anticipated that this SWMU may also have tar impacts.

Three areas of tar-impacted slag were identified in November 2006 during utilities trenching activities for the Steel Winds I project between wind turbines WT-7 and WT-8. The two located on the eastern edge of SWMU S-14, measuring approximately 20 feet wide by 25 feet long by 6 inches thick and approximately 15 feet wide by 50 feet long by 3 inches, were designated AOC-D. The other tar-impacted area, measuring approximately 30 feet wide by 20 feet long by 3 feet thick, was located between SWMUs S-14 and S-18 and was designated AOC-E. Approximately 545 tons of tar-impacted material was excavated and transported offsite in 2007 for reuse as an alternate waste fuel by co-combustion with coal. Further investigation/delineation of tar-impacted slag at AOC-D was performed during the CMS and suggests an additional waste volume of approximately 2,500 CY may still be present at depths up to 17 fbgs; however, delineation of the western limits of the AOC-D waste/fill was precluded by the presence of a sheer-walled monolith of slag/fill and debris on the eastern side of SWMU S-14. Tar-impacted waste/fill could extend beneath S-14.

Benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene,

naphthalene, phenanthrene, and pyrene were also detected at concentrations exceeding their individual ISCOs. Tar-impacted AOC-D is located adjacent to SWMU S-14 and it is anticipated that SWMU S-14 may also have tar impacts (i.e., VOCs and SVOCs).

SWMU S-15, also known as the General Rubble Landfill O, is located in the south-central portion of SFA Zone 4 between SWMUs S-12 and S-28 (Figure 3). The site received wastes from approximately 1970 to 1983. This SWMU is a small, roughly oval sparsely vegetated fill pile approximately 150 long, 60 feet wide, and 1.5 to 4 feet above surrounding grade containing approximately 1,000 CY of slag and scrap material from steel production as well as brick rubble, scrap billets, steel and iron buttons, and some tires. The base overlies approximately 50 feet of slag/fill and groundwater is found at approximately 25 fbgs. The two surficial slag/fill samples collected from this SWMU during the RFI did not exhibit chemical concentrations above ISCOs. The primary hazard at this SWMU is physical due to the exposed debris.

SWMU S-16, also known as the Lime Stabilized Spent Pickle Liquor (SPL) Sludge Landfill or HWMU 1B, and SWMU S-23, also known as the Tar Pit Adjacent to SWMU S-16, are located in the north-central portion of SFA Zone 4 (Figure 5). Due to their proximity and therefore interdependent disposition, SWMUs S-16 and S-23 can essentially be considered a single SWMU group. During Steel Winds I utility excavation work in 2006, tar waste was identified in shallow slag/fill immediately north of the RFI-defined limits of SWMU S-23. AOC-D was created to identify this location which contained similar waste material (e.g., tar-impacted slag). AOC-D is therefore included with discussion of this SWMU group.

SWMU S-16 covers approximately 0.25 acres and contains an estimated 5,900 to 12,000 CY of stabilized SPL sludge, steel-making slag, and blast furnace slag; the unit's base is estimated at 28 feet below surrounding grade (582 feet elevation). It was a permitted facility used to neutralize SPL (Waste Code K062) generated during the 1973 to 1982 time period by pouring ~60 million gallons of acidic SPL on the basic in-situ slag, which is over 40 feet thick at this location. Heavy metals, especially chromium and lead, and oil and grease are typical constituents of concern in SPL. An interim 30-mil reinforced polyvinyl chloride (PVC) cover was placed over SWMU S-16 by Bethlehem Steel in June 1986 to limit surface water infiltration, but the cover was destroyed by a severe wind event in late 2005 and this Unit was never properly closed.

SWMU S-23 is an irregularly shaped Unit surrounding SWMU S-16 on three sides that was historically used to dispose coal tar by-products from coke plant operations and tar tank cleaning, which were typically mixed with coke breeze prior to disposal in a slag pit. The pit was subsequently covered with gravel/slag to a maximum elevation of approximately 8 feet above surrounding grade. The CMS estimated that approximately 7,500 CY of waste/fill is present between 1 and 17 fbgs that may be impacted with benzene, toluene, and xylenes, total PAH concentrations exceeding the CP-51 total PAH guidance for non-residential sites of 500 mg/kg, naphthalene, and phenolic compounds. Nearby AOC-D contains an estimated 2,500 CY of similar tar-impacted slag that may be present at depths up to 17 fbgs and could extend beneath S-14. Groundwater is mounded

beneath these SWMUs and is typically found at elevations ranging from 575 to 579 feet elevation.

SWMU S-17, also known as the Vacuum Carbonate Blowdown Landfill Q, covers approximately 0.2 acres and is located just east of SWMUs S-16/S-23/S-14 (Figure 5). It consists of two parallel, northwest-southeast oriented trenches (identified as east and west) measuring approximately 300 feet long, 6 to 10 feet wide, and 2 to 4 feet deep terminating in the north at the base of a slag pile. A former railroad bed separates the east and west trenches with a second railroad bed bordering the eastern trench. The railroad beds are elevated approximately 3 to 4 feet above grade (surrounding grade is ~610 feet elevation). The western side of this unit is bounded by piles of slag gravel elevated approximately 3 to 10 feet above grade. From the early 1960s to 1983, rail tank cars of spent carbonate waste containing thiocyanate, cyanide, and selenium liquid from a coke oven gas desulfurization (Koppers) process were transported to SWMU S-17 where several million gallons of these liquid wastes were placed in the trenches. The limited waste/fill characterization samples collected during the RFI exhibited toluene, PAH compounds, cadmium, and mercury concentrations above applicable ARARs. Groundwater beneath this Unit is found at approximately 575 feet elevation and has not been adequately characterized. SWMU S-17 is approximately 0.2 acres and the limited waste/fill characterization samples collected during the RFI exhibited toluene, PAH compounds, cadmium, and mercury concentrations above applicable ARARs. It is assumed that ~1,000 CY of slag may be impacted and require remediation.

SWMU S-18, also known as the Lime Dust and Kish Landfill R, is an irregularly shaped area located in the northwesternmost corner of SFA Zone 4 and south-central portion of SFA Zone 5 (Figure 6). From 1966 to 1983, the Unit received surficially deposited Basic Oxygen Furnace (BOF) operations and waste residuals including lime dust (calcium oxide), Kish (consisting primarily of carbon fines), and lead-bearing dust from alloying operations. This Unit consists of exposed piles of these waste materials, disposed on the slag/fill surface, that rise 1 to 9 feet high above the surrounding grade and extend up to 2 fbgs. Groundwater is found approximately 35 to 45 feet below the bottom of these piles.

CMS sampling identified three lead-impacted AOCs (designated A through C) within SWMU S-18. In 2015, all known hazardous waste materials in SWMU-18 AOCs B and C were treated, excavated, and consolidated into the ATP containment cell for final disposal as part of OU-02. Remaining AOC-A is estimated to contain 1,800 CY of Kish waste/fill impacted with lead at concentrations above the 6NYCRR Part 375 Industrial Soil Cleanup Objective (ISCO), but not exhibiting hazardous waste characteristics. An estimated 2,400 CY of spent lime is also present, yielding a total estimated volume of 4,200 CY of residual non-hazardous fill materials at SWMU S-18.

SWMU S-28, also known as the Drum Landfill, is located in the south-central portion of SFA Zone 4 adjacent to the south side of SWMU S-13 and slightly north of SWMU S-15 (Figure 3). RFI test trenches did not discover any buried drums at the site, which was reportedly taken out of service before it was used for drum disposal, and waste/fill samples did not demonstrate any significant contamination. Based on the findings of the

RFI investigation, SWMU S-28 does not pose a significant threat to public health and the environment.

AOC-F, located in the northwest portion of SFA Zone 5, was an approximately 80 feet wide by 90 feet long by 4 feet deep deposit of tar-impacted slag identified during Iron City slag reclamation activities in 2010 (Figure 7). Approximately 1,065 CY of tar-impacted slag material was excavated and transported via tandem dump truck to the ATP-ECM Containment Cell for disposal.

AOC-G, located in the southwest portion of SFA Zone 5, was a localized deposit of tar-impacted slag identified during Steel Winds II wind turbine WT-9 foundation excavation activities in 2011 (Figure 7). Approximately 1.5 CY of tar-impacted slag material was excavated and transported via tandem dump truck to the ATP-ECM Containment Cell for disposal.

Based on the findings of the RFI and CMS, the past disposal of hazardous waste and other steel manufacturing related waste materials in OU-08 SWMUs/AOCs has resulted in the contamination of soil. In addition, soils containing compounds at concentrations exceeding the SCOs for the Protection of Groundwater (indicating potential leaching of contaminants from soil to groundwater) are also of concern if the same compounds are detected in groundwater at concentrations exceeding SCGs. Based upon these criteria, the site contaminants identified in soil that are considered to be the primary contaminants of concern, to be addressed by the remedy selection process, are: BTX, 2-methylphenol, 4-methylphenol, naphthalene, phenol, total PAHs, arsenic, cadmium, lead, mercury, and selenium. Table 2 lists the contaminants detected in RFI and CMS soil and fill samples that have exceeded unrestricted and restricted use SCGs.

The SWMUs identified will be addressed in the remedy selection process with the exception of OU-08 SWMU S-13 (HWMU 1A) and AOCs-B, -C, -E, -F, and -G which have already been addressed by ICMs/final remedies as noted above.

Table 2 - Soil (OU-8)

Detected Constituents	Concentration Range Detected (ppm)[a]	Unrestricted Use SCG[b] (ppm)	Restricted Use SCG[c] (ppm)	Restricted Use SCG[d] (ppm)	Location of Maximum Detection
VOCs					
Benzene[f]	ND - 48	0.06	89	0.06	SWMU S-23
Toluene[f]	ND - 42	0.7	1,000	0.7	SWMU S-23
Xylenes (mixed)[f]	ND - 42	0.26	1,000	1.6	SWMU S-23
SVOCs					
Acenaphthene[f]	ND - 410	20	1,000	98	SWMU S-14
Acenaphthylene	ND - 1,400	100	1,000	107	SWMU S-23
Anthracene	ND - 1,300	100	1,000	1,000	SWMU S-23

Detected Constituents	Concentration Range Detected (ppm)[a]	Unrestricted Use SCG[b] (ppm)	Restricted Use SCG[c] (ppm)	Restricted Use SCG[d] (ppm)	Location of Maximum Detection
Benzo(a)anthracene[f]	ND - 1,100	1	11	1	SWMU S-23
Benzo(a)pyrene[f]	ND - 840	1	1.1	22	SWMU S-14
Benzo(b)fluoranthene[f]	ND - 950	1	11	1.7	SWMU S-23
Benzo(k)fluoranthene[f]	ND - 490	0.8	110	1.7	SWMU S-23
Chrysene[f]	ND - 780	1	110	1	SWMU S-14
Dibenz(a,h)anthracene	ND - 110	0.33	1.1	1,000	SWMU S-14
Fluoranthene	ND - 3,500	100	1,000	1,000	SWMU S-23
Fluorene	ND - 1,600	30	1,000	386	SWMU S-23
Indeno(1,2,3-cd)pyrene[f]	ND - 280	0.5	11	8.2	SWMU S-23
2-Methylphenol[f]	ND - 17	0.33	1,000	0.33	SWMU S-23
4-Methylphenol[f]	ND - 190	0.33	1,000	0.33	SWMU S-23
Naphthalene[f]	ND - 11,000	12	1,000	12	SWMU S-23
Phenanthrene	ND - 5,500	100	1,000	1,000	SWMU S-23
Phenol[f]	ND - 270	0.33	1,000	0.33	SWMU S-23
Pyrene	ND - 2,300	100	1,000	1,000	SWMU S-23
Total PAHs	ND - 19,160	500 ppm per CP-51[e]			SWMU S-23
Metals					
Arsenic[f]	ND - 84.9	13	16	16	SWMU S-18
Cadmium	ND – 8.5	2.5	60	7.5	SWMU S-17
Lead	ND - 24,200	63	3,900	450	SWMU S-18
Mercury	ND - 44.7	0.18	5.7	0.73	SWMU S-17
Selenium[f]	ND - 315	3.9	6,800	4	SWMU S-18

NOTES

ND = Not Detected
a - ppm: parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil.
b - SCG: Part 375-6.8(a), Unrestricted Soil Cleanup Objectives.
c - SCG: Part 375-6.8(b), Restricted Use Soil Cleanup Objectives for the Protection of Public Health for Industrial Use (ISCO).
d - SCG: Part 375-6.8(b), Restricted Use Soil Cleanup Objectives for the Protection of Groundwater.
e - Site-specific soil cleanup objectives based upon the Department's October 21, 2010 Final Soil Cleanup Guidance (CP-51) - 500 ppm subsurface soil cleanup level for Total Polycyclic Aromatic Hydrocarbons (PAHs) (at least one foot of soil cover must meet ISCOs).
f - SCG exceeded for this compound in groundwater samples (Table 4 below); also exceeds Protection of Groundwater SCG in soil.

Groundwater

OU-05

Groundwater samples have been collected from overburden and bedrock monitoring wells to assess groundwater conditions. As groundwater data has been collected for more than 20 years, only data from the past 5 years is presented and discussed within this section to describe current site conditions. Table 3 lists the contaminants in OU-05 groundwater exceeding SCGs. A full summary of data can be found in the CMS Report (TK-BM 2019) and other historical reports.

The results indicate that contamination in overburden groundwater beneath OU-5 exceeds the SCGs for pH (>12.5), VOCs, SVOCs, and inorganics. The one bedrock well south of Smokes Creek exceeds SCGs for VOCs, SVOCs, and inorganics. The most notable exceedances of groundwater SCGs are benzene, xylene, total phenolic compounds, PAHs, and cyanide. A summary of the detected results that exceed applicable SCGs is presented in Table 3.

Sampling of monitoring wells downgradient of the Impoundment SWMUs indicated that benzene, ethylbenzene, toluene, xylenes, PAHs, phenolic compounds, arsenic, barium, and selenium exceed groundwater quality standards. These contaminants were detected in the SWMU waste material at levels exceeding the protection of groundwater SCGs. It is likely that the groundwater exceedances are attributable to waste disposed of in the impoundments combined with possible upgradient impacts associated with the OU-03 SWMUs.

Cyanide was detected in monitoring well MWS-02 ranging from 92 to 6,440 parts per billion (ppb) over the past four sampling events, exceeding the groundwater quality standard of 200 ppb. Historically there have been no soil/fill samples collected in the vicinity of MWS-02 to identify possible sources. Soil/fill will be investigated as part of the Pre-Design Investigation conducted under remedial element 1.

Two sampling events (2018 and 2020) analyzed emerging contaminants in groundwater. For Per- and Polyfluoroalkyl substances (PFAS), Perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS) were reported at concentrations of up to 134 and 18.8 parts per trillion (ppt), respectively, exceeding the 10 ppt screening levels for groundwater for each compound. Perfluoropentanoic Acid [PFPeA] exceeded the 100 ppt screening level at 210 ppt. The total concentration of PFAS, including PFOA and PFOS, were reported at concentrations of up to 564.96 ppt, above the 500 ppt screening level for total PFAS in groundwater.

Groundwater samples analyzed for 1,4-dioxane had a maximum concentration of 215 ppb, significantly higher the screening level of 1 ppb in groundwater. The maximum concentration was detected at monitoring well MWS-10B, located adjacent to the containment cell slurry wall associated with OU-03. 1,4-dioxane was detected in monitoring wells downgradient of the Impoundments SWMUs, but it is likely attributable to upgradient concentrations associated with OU-03 historic contamination outside the containment cell slurry wall.

A groundwater pump and treat system exists between the OU-03 containment cell slurry wall and Smokes Creek. Groundwater is captured via four pumping wells and treated along with leachate collected from within the containment cell before being discharge to the POTW.

Table 3 - Groundwater (OU-05)

Detected Constituents	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)	Frequency Exceeding SCG
VOCs			
1,1-Dichloroethane	ND - 7.6	5	2 of 48
1,2,4-Trimethylbenzene	ND - 6.2	5	1 of 47
1,2-Dichloroethane	ND - 110	0.6	12 of 48
Acetone	ND - 84	50	2 of 48
Benzene	ND - 7000	1	37 of 59
Carbon disulfide	ND - 480	60	2 of 48
Chloromethane (Methyl chloride)	ND - 6.9	5	1 of 30
cis-1,2-Dichloroethene	ND - 9.4	5	1 of 41
Ethylbenzene	ND - 20	5	3 of 59
Styrene	ND - 9.2	5	1 of 33
Toluene	ND - 140	5	8 of 59
trans-1,2-Dichloroethene	ND - 7.4	5	1 of 36
Trichloroethene	ND - 7.2	5	2 of 48
Xylenes (mixed)	ND - 600	5	15 of 59
SVOCs			
2,4-Dimethylphenol	ND - 38	1[c]	9 of 48
3-Methylphenol/4-Methylphenol	ND - 4000	1[c]	14 of 48
Acenaphthene	ND - 30	20	1 of 59
Benzo(a)anthracene	ND - 0.74	0.002	20 of 59
Benzo(a)pyrene	ND - 0.45	0	10 of 59
Benzo(b)fluoranthene	ND - 0.6	0.002	14 of 59
Benzo(k)fluoranthene	ND - 0.2	0.002	12 of 59
Biphenyl	ND - 11	5	1 of 58
Bis(2-ethylhexyl)phthalate	ND - 5.8	5	1 of 58
Chrysene	ND - 0.59	0.002	16 of 59
Fluorene	ND - 58	50	1 of 59
Indeno(1,2,3-cd)pyrene	ND - 0.35	0.002	10 of 59
Naphthalene	ND - 530	10	13 of 59
Pentachlorophenol	ND - 2.1	1[c]	3 of 52
Phenol	ND - 17000	1[c]	10 of 48

Detected Constituents	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)	Frequency Exceeding SCG
Total Recoverable Phenolics	ND - 17	1	4 of 11
Phenolic compounds (total phenols)	ND - 21038	1	18 of 48
Metals			
Antimony, Total	ND - 3.14	3	2 of 22
Antimony, Dissolved	ND - 5.84	3	1 of 1
Arsenic, Total	ND - 118	25	2 of 43
Arsenic, Dissolved	ND - 128	25	1 of 5
Barium, Total	ND - 9015	1000	2 of 44
Beryllium, Total	ND - 3.95	3	1 of 22
Chromium, Dissolved	ND - 166.2	50	2 of 5
Chromium, Total	ND - 260.6	50	3 of 43
Cyanide, Total	ND - 6440	200	15 of 30
Iron, Total	ND - 801000	300	13 of 22
Manganese, Total	ND - 111900	300	6 of 22
Selenium, Total	ND - 17.9	10	1 of 22
pH			
Elevated pH	4.48 - 12.75	12.5	1 of 62
1,4-Dioxane			
1,4-Dioxane	ND - 215	1*	9 of 19
PFAS			
Perfluoropentanoic Acid (PFPeA)	0.00314 - 0.21	0.100*	1 of 8
Perfluorooctanoic Acid (PFOA)	ND - 0.134	0.010*	6 of 8
Perfluorooctanesulfonic Acid (PFOS)	ND - 0.0188	0.010*	2 of 8
PFAS, Total	0.0213 - 0.56496	0.500*	1 of 8

NOTES
ND - parameter not detected above method detection limit
NS - no SCG for parameter
a - ppb: parts per billion, which is equivalent to micrograms per liter, ug/L, in water.
b - SCG: Standard Criteria or Guidance - Ambient Water Quality Standards and Guidance Values (TOGs 1.1.1), 6 NYCRR Part 703, Surface water and Groundwater Quality Standards, and Part 5 of the New York State Sanitary Code (10 NYCRR Part 5) except for 1,4-dioxane and perfluorinated compounds, that are compared to the NYSDEC screening values
c - groundwater standard applies to the sum of phenolic compounds
*Non-Enforceable Screening Level.

OU-08

Groundwater samples have been collected during the RFI and CMS over the time period from 1999 to 2019 from overburden and bedrock monitoring wells within OU-08 to assess groundwater conditions. Table 4 lists the contaminants detected in 2017-2019 groundwater samples that have exceeded groundwater SCGs (TK-BM 2011; TK-BM 2019). The most recent results indicate that contamination in overburden groundwater beneath the OU-08 SWMUs/AOCs exceeds the SCGs for VOCs, SVOCs, and inorganics;

PFAS were also detected in overburden groundwater at concentrations slightly in excess of screening levels. In addition, because of the highly alkaline nature of the slag fill, the pH of overburden groundwater in OU-08 is frequently greater than 12.5 (i.e., exhibits the characteristic of corrosivity). Contaminant levels in the most recent bedrock groundwater samples (2012) exceeded the SCG for one inorganic (barium). Groundwater beneath OU-08 is also impacted by upgradient sources to the east in OU-07 (primarily SWMUs P11 [Benzol Plant Tank Storage Area] and P-11A [Old Benzol Plant Storage Area]) and possibly to the southeast in OU-06 (Former Petroleum Bulk Storage Sub-Area). These upgradient impacts likely include benzene, ethylbenzene, toluene, xylenes (collectively known as BTEX), naphthalene, and phenolic compounds.

In the SWMUs located in the southern portion of OU-08 (i.e., S-12, S-13, S-15, and S-28), benzene, toluene, xylenes, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, biphenyl, chrysene, 2,4-dimethylphenol, 2-methylphenol, 4-methylphenol, naphthalene, phenol, arsenic, and selenium have been identified in groundwater at concentrations above groundwater quality standards. These compounds are likely attributable to waste disposed at SWMU S-13 (HWMU 1A), combined with possible upgradient source contributions.

Groundwater beneath SWMUs S-14, S-16 (HWMU 1B)/S-23, S-17, and S-18 and AOCs-A and -D contains BTEX, styrene, 1,2,4-trimethylbenzene, 1,2,4-trichlorobenzene, 1,2-dichlorobenzene, chlorobenzene, trichloroethene, cis- and trans-1,2-dichloroethene, vinyl chloride, acenaphthene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, biphenyl, bis(2-ethylhexyl)phthalate, chrysene, 2,4-dimethylphenol, indeno(1,2,3-cd)pyrene, 2-methylphenol, 4-methylphenol, naphthalene, phenol, and barium at concentrations above groundwater quality standards. PFOA and PFOS were also detected in overburden monitoring well MW-1D2 downgradient of SWMU S-13 (HWMU 1A) at concentrations slightly in excess of screening levels.

Table 4 - Groundwater (OU-08)

Detected Constituents	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)	Location of Maximum Detection
VOCs			
Benzene	ND - 54	1	MWN-05B / SWMU S-18
Chlorobenzene	ND - 49	5	MWN-05B / SWMU S-18
1,2-Dichlorobenzene	ND - 26	3	MWN-05B / SWMU S-18
Cis-1,2-Dichloroethene	ND - 14	5	MW-1D7 / SWMUs S-16 and S-23
Trans-1,2-Dichloroethene	ND - 15	5	MW-1D7 / SWMUs S-16 and S-23
Ethylbenzene	ND - 25	5	MW-1D1 / SWMUs S-16 and S-23
Styrene	ND – 5.5	5	MW-1D1 / SWMUs S-16 and S-23
Toluene	ND - 39	5	MWN-05B / SWMU S-18
1,2,4-Trichlorobenzene	ND - 16	5	MWN-05B / SWMU S-18

Detected Constituents	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)	Location of Maximum Detection
Trichloroethene	ND - 8.5	5	MW-1D1 / SWMUs S-16 and S-23
1,2,4-Trimethylbenzene	ND - 51	5	MW-1D1 / SWMUs S-16 and S-23
1,3,5-Trimethylbenzene	ND - 8.1	5	MW-1D2 / SWMU S-13
Vinyl Chloride	ND - 3.4	2	MW-1D7 / SWMUs S-16 and S-23
Xylenes (mixed)	ND - 86	5	MW-1D1 / SWMUs S-16 and S-23
SVOCs			
Acenaphthene	ND - 21	20	MWN-05B / SWMU S-18
Benzo(a)anthracene	ND - 0.27	0.002	WT8-02 / SWMU S-14
Benzo(a)pyrene	ND - 0.3	ND	WT8-02 / SWMU S-14
Benzo(b)fluoranthene	ND - 0.49	0.002	WT8-02 / SWMU S-14
Benzo(k)fluoranthene	ND - 0.21	0.002	WT8-02 / SWMU S-14
Biphenyl	ND - 8.4	5	MW-1D1 / SWMUs S-16 and S-23
Bis(2-ethylhexyl)phthalate	ND - 8.6	5	MWN-12 / SWMUs S-17 and S-23
Chrysene	ND - 0.32	0.002	WT8-02 / SWMU S-14
2,4-Dimethylphenol	ND - 1.5	1	MW-1D6 / SWMUs S-16 and S-23
Indeno(1,2,3-cd)pyrene	ND - 0.26	0.002	WT8-02 / SWMU S-14
2-Methylphenol	ND - 2.6	1	MW-1D3 / SWMU S-13
4-Methylphenol	ND - 110	1	MWN-05B / SWMU S-18
Naphthalene	ND - 1,000	10	MWN-05B / SWMU S-18
Phenol	ND - 130	1	MWN-05B / SWMU S-18
PFAS			
Perfluorooctanoic acid (PFOA)	0.0109	0.010*	MW-1D2 / SWMU S-13
Perfluorooctanesulfonic acid (PFOS)	0.0278	0.010*	MW-1D2 / SWMU S-13
Metals			
Arsenic	ND - 34	25	MWN-03B / SWMUs S-13 and S-15
Barium	ND - 17,980	1,000	MWN-05B / SWMU S-18
Selenium	ND – 17.4	10	MWN-35A / SWMU S-15

NOTES

ND = Not Detected
a - ppb: parts per billion, which is equivalent to micrograms per liter, ug/L, in water.
b - SCG: Standard Criteria or Guidance - Ambient Water Quality Standards and Guidance Values (TOGs 1.1.1), 6 NYCRR Part 703, Surface Water and Groundwater Quality Standards, and Part 5 of the New York State Sanitary Code (10 NYCRR Part 5).
*Non-Enforceable Screening Level.

A site-wide deed restriction currently exists for the Bethlehem Steel site, prohibiting groundwater use for potable purposes. There are no known private potable water supply wells in the immediate vicinity of the site and the site and surrounding communities are served by a public water supply that is not affected by site contamination. Groundwater contamination beneath OU-05 and OU-08 will be addressed separately in the OU-10 Site Wide Groundwater remedy.

Exhibit B

SUMMARY OF THE CLEANUP OBJECTIVES

The goal for the corrective measure program is to achieve restricted (commercial) use within the OU-05 boundary, restricted (industrial) use within the OU-8 boundary, and restricted Protection of Groundwater cleanup objectives where applicable. At a minimum, the corrective measures shall eliminate or mitigate all significant threats to public health and the environment presented by the contamination identified in OU-05 and OU-08 through the proper application of scientific and engineering principles.

The established cleanup objectives for OU-05 and OU-08 are:

Contaminant	Commercial Soil Cleanup Objective[1]	Industrial Cleanup Soil Objective[2]	Protection of Groundwater Soil Cleanup Objective[3]
Volatiles[4]			
Benzene	44	89	0.06
Ethylbenzene	390	780	1
Toluene	500	1,000	0.7
Trichloroethene	200	400	0.47
Xylene (mixed)	500	1,000	1.6
Semivolatiles[4]			
Acenaphthene	500	1,000	98
Acenapthylene	500	1,000	107
Anthracene	500	1,000	1,000
Benz(a)anthracene	5.6	11	1
Benzo(a)pyrene	1	1.1	22
Benzo(b)fluoranthene	5.6	11	1.7
Benzo(g,h,i)perylene	500	1,000	1,000
Benzo(k)fluoranthene	56	110	1.7
Chrysene	56	110	1
Dibenz(a,h)anthracene	0.56	1.1	1,000
Fluoranthene	500	1,000	1,000
Fluorene	500	1,000	386
Indeno(1,2,3-cd)pyrene	5.6	11	8.2
m-Cresol (3-methylphenol)	500	1,000	0.33
Naphthalene	500	1,000	12
o-Cresol (2-methylphenol)	500	1,000	0.33
p-Cresol (4-methylphenol)	500	1,000	0.33
Phenanthrene	500	1,000	1,000
Phenol	500	1,000	0.33

Contaminant	Commercial Soil Cleanup Objective[1]	Industrial Cleanup Soil Objective[2]	Protection of Groundwater Soil Cleanup Objective[3]
Pyrene	500	1,000	1,000
Total PAHs[5]	500	500	
Metals[4]			
Arsenic	16	16	16
Barium	400	10,000	820
Cadmium	9.3	60	7.5
Total Cyanide	27	10,000	40
Lead	1,000	3,900	450
Total Mercury	2.8	5.7	0.73
Selenium	1,500	6,800	4

NOTES

1. Part 375-6.8(b), Restricted Use Soil Cleanup Objectives for the Protection of Public Health for Commercial Use
2. Part 375-6.8(b), Restricted Use Soil Cleanup Objectives for the Protection of Public Health for Industrial Use
3. Part 375-6.8(b), Restricted Use Soil Cleanup Objectives for the Protection of Groundwater where applicable
4. Soil cleanup objectives (SCOs) represented in parts per million (ppm)
5. Site-specific soil cleanup objectives based upon the Department's October 21, 2010 Final Soil Cleanup Guidance (CP-51) - 500 ppm subsurface soil cleanup level for Total Polycyclic Aromatic Hydrocarbons (PAHs) (at least one foot of soil cover must meet applicable SCOs)

Exhibit C

Description of Remedial Alternatives

The following alternatives were considered based on the remedial action objectives (see Section 6.5) to address the contaminated media identified in OU-05 and OU-08 as described in Exhibit A:

Alternative 1: No Further Action

The No Further Action Alternative recognizes the remediation of the OU-05 and OU-08 completed by the expedited and final corrective measures described in Section 6.2. This alternative leaves the OUs in their present condition and does not provide any additional protection of the environment.

The costs associated with this alternative are estimated to be:

Present Worth: $0
Capital Cost:..... $0
Annual Costs:..... $0

Alternative 2: No Further Action with Site Management

The No Further Action with Site Management Alternative recognizes the remediation of the OUs completed by the ECMs described in Section 6.2 and Site Management and Institutional Controls and Engineering Controls are necessary to confirm the effectiveness of the ECMs. This alternative maintains engineering controls which were part of the ECM and includes institutional controls, in the form of an environmental easement and site management plan, necessary to protect public health and the environment from contamination remaining at the site after the ECMs.

The costs associated with this alternative are estimated to be:

Present Worth: $415,000
Capital Cost:..... $0
Annual Costs:..... $27,000

Alternative 3: Excavation, Solidification/Stabilization, Consolidation and/or Off-Site Disposal, along with Closure In-Place of OU-05 SWMUs S-1, S-2, S-3, S-4, S-5, and S-6 and OU-08 SWMUs S-16, S-23, and AOC-D

Under this alternative, SWMU waste material along the western edges of OU-05 SWMUs S-1, S-2, S-3, and S-4 and the northern edge of SWMU S-4 will be pulled back from the slag bluffs to achieve a minimum separation distance of 50-feet from the SWMU waste material to the outside edge of the slag bluffs (currently ranging from 30 to 40 feet). A

shoreline revetment along the western slag bluff will be installed consisting of large armor stone or concrete at the toe of the slag bluff. Additional rip rap will be installed above the shoreline revetment. The slag bluffs will be graded to achieve, at a maximum, a 1.5-horizontal to 1 vertical slope.

Approximately 24,000 to 94,000 CY of waste material from OU-05 SWMUs S-27 and S-7/20 will be excavated and consolidated within the remaining Impoundment SWMUs (S-1, S-2, S-3, S-5, and S-6). There will be no additional consolidation in SWMU S-4, since the 1.5H:1V slope stability is contingent upon no additional loading in S-4. SWMU waste in the Impoundment SWMUs would be dewatered to increase structural integrity prior to further consolidation of waste from all of SWMU S-27 and portions of SWMU S-7/20. Construction and demolition (C&D) debris will be imported from around the site, in addition to the SWMU waste material, to facilitate re-grading in order to accommodate installation of an engineered cap. A geo-composite cover system would be placed over the SWMU waste material in SWMUs S-1, S-2, S-3, S-4, S-5, and S-6 and include the following elements from bottom to top: 6-inch geotextile cushion, 40-mil HDPE geomembrane, geosynthetic drainage layer, 12-inch barrier protection soil layer, and 6-inch topsoil layer. The topsoil would be seeded with a grass/pollinator seed mix, fertilized, and mulched to promote vegetative growth.

This alternative would include excavating and moving the asbestos waste from OU-08 SWMU S-12 to the CAMU, in compliance with the New York State Department of Labor's Industrial Code Rule 56 (12 NYCRR Part 56). Excavation and subsequent handling would be accomplished mechanically under a steady wetting of the waste and may be augmented by additional short-term controls (e.g., tent, air handling, dust suppression techniques) to remove the bagged asbestos prior to transportation. Personal protective equipment (PPE), including respirators, and personal decontamination procedures would be employed to protect workers and the community air monitoring plan implemented to protect the public. Solidification/stabilization technologies could be implemented to minimize the potential release of asbestos fibers during excavation and handling of the waste. The SWMU and surrounding area would subsequently be sampled to confirm that the asbestos removal meets applicable regulations, backfilled, and re-graded to remove slip/trip fall hazards.

This alternative includes mechanical excavation of approximately 16,000 CY of PAH-impacted waste/fill for consolidation from OU-08 SWMU S-14 into the CAMU as a scheduled corrective measure. The approximately 41,000 CY of unimpacted slag estimated to be present in the SWMU would be reclaimed and recycled in accordance with a Department-approved soil/fill management plan and Iron City's Beneficial Use Designation (BUD) over a number of years, possibly beyond the proposed 7-year CMS implementation period. Any impacted slag or waste encountered after the CAMU is closed would require off-site transportation and disposal in a commercial TSDF. Any excavation below the surrounding grades would be graded to a maximum slope of 3H:1V for safety.

This alternative includes salvaging scrap metal materials, excavating, and consolidating the C&D debris from OU-08 SWMU S-15 into one or more of the SFA Zone 2

Impoundments prior to placement of the final cover system, and off-site recycling of waste tires. The steel slag/fill could be reclaimed and reused commercially under the existing BUD for structural fill or replacement aggregate in road or parking lot construction. Once completed, this SWMU area would be available for slag reclamation or redevelopment.

Alternative 3 includes grading and capping of the waste in OU-08 SWMUs S-16 and S-23 with a geo-composite cover system (similar to that of the Impoundments) to mitigate potential leaching of deposited tar constituents to groundwater. This alternative includes grading the waste/fill and surrounding slag/fill to provide positive surface drainage from the low- permeability cover system. The non-hazardous tar waste from AOC-D would be excavated and consolidated in the SWMU S-23 footprint proximate to SWMU S-16 to provide a more confined area for the RCRA cover system and to provide materials to improve the grades so that positive drainage will be provided. The excavation of AOC-D will include backfilling the excavation to the surrounding grade with processed BUD-approved slag or another non-impacted on-site slag/fill. The geo-composite cover system would include the following elements from bottom to top: 6-inch geotextile cushion, 40-mil HDPE geomembrane, geosynthetic drainage layer, 12-inch barrier protection soil layer, and 6-inch topsoil layer. The topsoil would be seeded, fertilized, and mulched to promote vegetative growth. Maintenance of the final cover system is included for the 30-year post-closure care period. Groundwater monitoring would be conducted on a CMS Area-wide basis in accordance with Department-approved Long-term Groundwater Monitoring Plan. Warning signage around the perimeter of the landfill would be replaced as warranted.

This alternative includes mechanical excavation of mercury-impacted slag/fill from OU-08 SWMU S-17 for off-site disposal as non-hazardous waste at a NYS commercial TSDF; mercury impacted waste/fill with TCLP mercury >0.2 mg/L will require solidification/ stabilization to meet off-site TSDF disposal criteria. The volume of mercury-impacted slag/fill is not known; however, for costing purposes, 1,000 tons was assumed. Once the mercury-impacted slag/fill is removed and the post-excavation sampling confirms the removal is complete, the area would then be graded. The elevation of this area is nominally 610 feet. The area resides in the Iron City slag recovery zone and would be made available for slag reclamation and/or redevelopment.

The remainder of the untreated waste/fill in OU-08 SWMU S-18 (AOC-A; estimated 4,200 CY) that does not exhibit hazardous waste characteristics (TCLP lead <5 mg/L), but contains total lead in excess of the ISCO, as well as lime waste, would be excavated and transported to the CAMU for placement within the cell (i.e., sandwiched between the low-permeability cap and liner with leachate collection). Lead impacted waste/fill with TCLP lead >5 mg/L will require solidification/stabilization prior to placement in the CAMU. Perimeter and bottom samples will be collected from the area to assure that all remaining subsurface slag/fill materials contain lead at concentrations less than the ISCO. This SWMU is adjacent to the Iron City slag reclamation area. The ground surface elevation after removal of the waste will be approximately 610 feet. Slag reclamation is permitted to proceed to 585 feet. Thus, after the waste has been removed, this Sub-Area may be subject to slag reclamation and/or redevelopment. Post-excavation backfilling of the area

will not be necessary. Grading will be completed using existing materials to reduce the slopes to less than 3H:1V to remove physical safety hazards, and to reduce erosion potential.

RFI slag/fill characterization test pits did not identify any buried drums at OU-08 SWMU S-28. Two samples collected to evaluate a bluish-gray fill material layer encountered in the three easternmost test pits identified only 3 PAH compounds (benzo(a)anthracene, benzo(a)pyrene, and chrysene) at concentrations marginally above their respective ISCOs or Protection of Groundwater SCOs. These compounds are not detected constituents of concern in groundwater monitoring wells downgradient of the site. There were no exceedances of the site-specific SCOs for arsenic and PAHs. Since sampling data indicates negligible impacts at SWMU S-28, no further action is recommended for this SWMU. SWMU S-28 falls within 100 feet of the SWMU S-13 cap and future slag reclamation at S-28 should be prohibited to prevent undermining the S-13 cap.

Under this alternative, a cover system would be installed across the remaining area of OU-05 and OU-8 where the top 1-foot of soil/fill exceeds SCOs identified in Exhibit B for commercial use and industrial use, respectively.

Under this alternative a system of perimeter drainage swales and culverts will be installed in OU-5 to convey stormwater run-off to SWMU S-8 for controlled retention and release.

Under this alternative, construction of a Corrective Action Management Unit (CAMU) described in OU-01 would be completed within the boundary of SWMU S-7/20. The SW-CAMU is further discussed in remedial element 7 of the Statement of Basis for OU-01 Site Wide Remedial Elements, OU-09 Water Courses, and OU-10 Site Wide Groundwater.

The costs associated with this alternative are estimated to be:

Present Worth: $18,674,000
Capital Cost:..... $18,033,000
Annual Costs:..... $42,000

Alternative 4: Excavation and Off-Site Disposal

Under this alternative, waste material in OU-05 SWMUs S-1, S-2, S-3, S-4, S-5, S-6, S-7/20, and S-27 and OU-08 SWMUs S-12, S-14, S-15, S-16, S-17, S-18, S-23, and AOC-A and AOC-D would be excavated and disposed of off-site at a permitted facility.

The costs associated with this alternative are estimated to be:

Present Worth: $117,600,000
Capital Cost:..... $117,600,000
Annual Costs:..... $0

Note: Off-site disposal of any material exhibiting elevated radiological readings, if encountered, could significantly increase the estimated costs shown above.

Exhibit D

Corrective Measure Alternative Costs

Corrective Measure Alternative	Capital Cost ($)	Annual Costs ($)	Total Present Worth ($)
Alternative 1: No Further Action	0	0	0
Alternative 2: No Further Action with Site Management	0	27,000 (415,000)	415,000
Alternative 3: Excavation. Solidification/Stabilization, Consolidation and/or Off-Site Disposal, along with Closure In-Place of SWMUs S-1, S-2, S-3, S-4, S-5, S-6, S-16, S-23, and AOC-D	18,033,000	42,000 (641,000)	18,674,000
Alternative 4: Excavation and Off-Site Disposal	$117,600,000	0	$117,600,000

- Capital Cost (e.g., engineering cost, development of site management plan, installation of the monitoring network, or installation of a future soil vapor intrusion mitigation system, etc.) is the cost to engineer and construct the remedy.

- Annual Cost is average annual Site Management cost (e.g., operation, maintenance, monitoring, and periodic review) over the duration of the operation of the remedy; it does not vary for different years. The number in parentheses is the present worth of the annual costs computed for the expected duration of the operation of the remedy or 30 years, whichever is less (assumed 30 years; i=5%).

- Present Worth is calculated by adding the capital cost to the present worth of the annual costs computed for the expected duration of the operation of the remedy or 30 years, whichever is less.

- 5% interest rate was used to calculate present worth.

- Capital and annual costs for the construction and operation and maintenance of the CAMU is included in costs

- Alternative 2 costs are presented as a portion of the costs listed under the similar OU-10 alternative to provide comparison to the other alternatives

Exhibit E

SUMMARY OF THE PROPOSED FINAL CORRECTIVE MEASURE(S)

The Department is proposing the following Alternatives as the final corrective measures for the OU-05 and OU-08 SWMUs/AOCs at this facility. The proposed final corrective measures are based on the results of the RFI, CMS, and the evaluation of alternatives. The elements of these alternatives are described in Section 7.

Basis for Selection

The alternatives were considered based on the cleanup objectives (see Exhibit B) to address the contaminated media identified as described in Exhibit A. The detailed analysis of the alternatives is provided in the final CMS (2019) Report and as modified herein.

Threshold Criteria

The first two evaluation criteria are termed threshold criteria and must be satisfied in order for an alternative to be considered for selection.

1. Protection of Human Health and the Environment

Alternatives 3 and 4 are protective of human health because each alternative provides effective means to eliminate direct contact and exposure to contaminated SMWU waste material and slag/fill. Alternatives 3 and 4 provide a means for eliminating or reducing the leaching of contaminants to groundwater in turn protecting the Lake Erie drinking water resource.

Alternatives 3 and 4 are protective of the environment as the pathway for direct contact and exposure of ecological receptors to SWMU waste material is eliminated. Alternatives 3 and 4 provide a means for eliminating or reducing leaching of contaminants to groundwater and in turn protect Lake Erie and Smokes Creek as an ecological resource.

Under Alternative 3, the potential leaching of contaminants to groundwater is greatly reduced through waste screening and treatment requirements prior to consolidation in the CAMU. Additionally, under Alternative 3, the potential for leaching of contaminants to groundwater from consolidation of waste in the CAMU is eliminated through the enhanced liner and leachate collection system. Under Alternative 4 potential leaching of contaminants to groundwater is greatly reduced through waste screening and treatment requirements prior to off-site disposal into an engineered landfill.

Alternatives 1 and 2 are not considered protective of human health or the environment because they do not eliminate direct exposure to SWMU waste material or effectively control the migration of contaminants from the site. Alternative 1 is not protective of public health and the environment for SWMU S-12 since the landfill was never properly closed; the existing cover is eroded and may eventually result in direct exposure and/or release

of asbestos from the Unit; steep downward slopes are present at the landfill perimeter; and no fencing or signage is present to warn trespassers of these hazards. Alternatives 1 and 2 do not treat the source of the contamination. This migration and subsequent discharge to adjacent surface water has the potential to adversely affect human as well as ecological receptors. Since Alternatives 1and 2 fail to satisfy this threshold selection criterion, they are eliminated from further consideration.

2. Compliance with Standards, Criteria, and Guidance (SCGs)

Alternatives 3 and 4 both meet the cleanup standards identified for OU-05 and OU-08. Under Alternatives 3 and 4, the top 1-foot of soil/fill outside the SWMUs and CAMU will meet the Soil Cleanup Objectives (SCOs) for commercial or industrial use identified in Exhibit B. Under Alternative 3, an engineered cap consisting of 2-feet of various components will be installed over the OU-05 SWMUs and CAMU and OU-08 SWMUs S-16 and S-23. Under Alternative 4, SWMU waste would be excavated and disposed off-site at a permitted facility with an equivalent engineered cap. Alternatives 3 and 4 eliminate the nuisance condition associated with tires and other solid waste debris consistent with SCGs as well as any potential contribution to groundwater contamination. Action-Specific SGVs/SCGs for these alternatives would be associated with dust and odor control, erosion and sediment control, transportation and disposal of remediation wastes, and restoration. Alternatives 3 and 4 would reduce contaminant loadings to groundwater and surface water by over 99% and residual groundwater impacts would be monitored for natural attenuation and eventual compliance with SCGs as part of the OU-10 Site-Wide Groundwater remedy.

Balancing Criteria

3. Long-term Effectiveness and Permanence

Under Alternatives 3 and 4, long-term effectiveness is achieved through equivalent measures. Under Alternative 3, Impoundment SWMUs closed in-place will have an engineered cap meeting the requirements of 6 NYCRR Part 360 similar to a permitted off-site facility. The CAMU will have an engineered cap, liner, and leachate collection system meeting the requirements of 6 NYCRR Part 360 similar to an off-site facility. Under Alternative 4, wastes would be relocated to an off-site TSDF which would include leachate collection and low-permeability bottom liners.

Under Alternative 3, long-term permanence of the waste closed in-place and consolidated would remain near the eastern shore of Lake Erie. Shoreline revetment would reduce impacts from storms and subsequent wave action. The existing condition for OU-08 SWMUs S-16 and S-23 and AOC-D (i.e., no cover) has an estimated infiltration rate of 480,000 gallons per year. Placement of a geosynthetic cover over the waste would be expected to reduce the infiltration to approximately 860 gallons per year which in turn is expected to reduce loadings of COCs to groundwater and surface water from SWMUs S-16 and S-23 waste/fill by over 99%. Under Alternative 4, SWMU waste would be relocated to a permitted facility where these concerns would be eliminated.

Both disposal options would provide similar levels of acceptable long-term effectiveness and permanence. Consolidation of the material onsite, or at an approved commercial facility would result in the permanent containment of contaminated materials. Alternative 3 provides a level of permanence and long-term protection equivalent to Alternative 4, but at a significantly lower cost.

4. Reduction of Toxicity, Mobility or Volume

Under Alternatives 3 and 4, toxicity may be reduced though treatment prior to consolidation or disposal in the CAMU or off-site at a permitted facility.

Under Alternative 3, a reduction of mobility will be achieved through the installation of an engineered cap in the Impoundment SWMUs and CAMU that will greatly reduce infiltration, leaching and stormwater erosion migration of contaminants from the SWMU and consolidated CMS area waste. The amount of rainfall infiltration would be reduced through the waste/fill by over 99%; the reduction in groundwater loadings is projected to be proportionate to the reduction in infiltration. Under Alternative 3, SWMU waste consolidated from the CMS area may be treated prior to disposal; additionally, the engineered liner and leachate collection system will eliminate contaminant mobility to the surrounding environmental media.

Under Alternative 4, contaminant mobility will be eliminated by the placement of SWMU waste into a lined and capped off-site unit with leachate collection.

Consolidation within the containment system onsite, or removal to a commercial facility off site would reduce the mobility of COCs, potentially through treatment to remove hazardous characteristics. The reduction in mobility would be the same for consolidation onsite, and removal to an approved commercial facility. Under Alternatives 3 and 4, the volume of SWMU waste will not be reduced. There may be an increase in volume under Alternatives 3 and 4, as treatment of the waste material may require the addition of amendments to solidify or stabilize the waste.

5. Short-term Impacts and Effectiveness

Under Alternatives 3 and 4, disturbance of SWMU waste and slag/fill may result in nuisance conditions (dust and odors) and possible contaminant release and exposure. The use of administrative controls, personal protective equipment (PPE), and dust/odor suppression techniques will mitigate nuisance conditions and exposures. Under Alternative 3, excavation, consolidation, and disposal of CMS area wastes will be conducted on-site in areas removed from residential areas or receptors not directly involved with site operations.

Under Alternatives 3 and 4, excavation of the OU-08 SWMU S-12 asbestos waste would be a complicated procedure with potential for release of currently bagged asbestos fibers to workers, the public, and surrounding soil/fill during the excavation, handling, and transport of the asbestos fill. The use of appropriate engineering controls and PPE during short-term excavation and handling, will minimize any release of asbestos into the air and surrounding environment. Human health impacts would be manageable as there is no direct exposure to the public in this location of the Site.

Under Alternative 4, the volume of CMS area waste to be transported increases. An estimated 1.4 million tons of waste/fill would be excavated from OU-05 and OU-08, resulting in approximately 70,000 tandem truckloads (assumes approximately 20 tons per truckload) of hazardous and non-hazardous material being shipped off-site through the surrounding residential neighborhood, resulting in a round trip total of nearly 150,000 truck trips to/from the Site. In addition, a substantial number of truckloads of clean soil for backfill and final cover purposes may also be required. Transportation will continue over the projected 10-year construction period estimated to be necessary to implement this alternative in close proximity to residential and commercial properties in the area, increasing exposure risks and quality of life impacts. Alternative 4 would result in the greatest short-term traffic, noise, CO_2, particulate, and greenhouse gas emissions from heavy equipment involved with excavation, transportation, and placement of the waste/fill in an Off-Site TSDF. The entire site (all OUs) would take decades (estimated at 70 years) to complete based on the large volume of contaminated materials that would require offsite disposal.

Alternative 3 would result in slightly less emissions due to shorter transportation, which would not cause traffic or noise impacts to public roadways in the area. The onsite consolidation areas will be operated (open) for a period of 5-6 years to allow for consolidation of SWMUs waste/fills, followed by final cover construction in year 7. Impact to the community will be limited as community air monitoring will be completed, and dust suppression and typical landfill construction and operation techniques will be employed. Off-site truck traffic will increase due to the need to import soil and other materials (~2,000 truck loads) for the final cover system

Additional steel and slag reclamation would reduce the mining and use of iron ore and limestone stone materials that the reclaimed slag would replace, as well as reduce greenhouse gas emissions from iron ore and gravel mining and steel manufacturing (as supplanted by steel scrap reclaimed and recycled).

Both Alternative 3 and 4 permanently remove the mercury contaminated waste from the site providing long-term effectiveness and permanence.

The time needed to complete the remediation is the shortest for Alternative 3. Alternatives 3 and 4 are comparable in short term effectiveness. Consolidation and containment onsite would provide the highest level of short-term effectiveness. The dominant short-term impact of off-Site disposal of excavated sediments and soils is truck traffic, which presents potential issues for noise, dust/exhaust, traffic congestion, and safety concerns for the

local community. For consolidation and containment onsite, truck traffic would be generally routed along onsite haul roads from the location of the dredging/excavation activities at the Site via easily constructed/accessible non-residential roads suitable for truck traffic. Therefore, this disposal option would have limited direct impact on the local community since the haul route(s) would be short and no residential roads would be used. The remaining alternatives pose increased short-term risks to the public during excavation, grading, treatment, and other site activities through the generation of dust and water quality impacts at point of dredging; these effects can be reduced through the implementation of standard dust and turbidity mitigation construction practices. In order to minimize potential short-term impacts, the area would be secured and access would be restricted to authorized personnel only. Workers can potentially be exposed to contaminated media during excavation and/or treatment activities involved. Risks can be minimized by implementing health and safety procedures and preventive measures including the use of appropriate personal protective equipment. All site workers would be OSHA certified and would be instructed to follow OSHA
protocols.

Overall, alternatives 3 and 4 involve consolidation or offsite disposal of materials with treatment to remove hazardous characteristics and the use of engineering and institutional controls including clean covers, an easement and long term site management which has been demonstrated to be highly effective at protecting human health and the environment at remediated sites across New York State.

6. Implementability

Alternative 3 has no technical or administrative implementability issues.

Technical implementability issues associated with Alternative 4 include the need for traffic coordination as well as implementation of odor, noise, and dust controls. Truck and traffic coordination issues would pose a significant challenge. Based on the calculated waste volumes and a 10-year construction period, coordination of 25 truckloads of material leaving the Site per day, six days a week, 50 weeks a year, for the entire construction period, with additional trucking of backfill material being brought on-site for select closure of some of the SWMUs. The off-site disposal transportation activities would account for approximately 150,000 truck round trips to/from the Site. The need for dewatering of the waste material and/or admixing of soils to achieve landfill solids requirements would pose additional implementability difficulty especially during the spring and fall months when precipitation is heaviest. Administrative implementability issues may be encountered in securing approval for disposal of the material at an off-site facility due to the extremely large volume of material and its physical nature. Contracts with multiple off-site disposal facilities may be required to avoid exceeding annual tonnage limitations and potential concerns relative to landfill stability if the waste material represents a significant percentage of daily disposal volume. Both disposal options are readily implementable technically and administratively. However, due to the shorter travel distances involved,

consolidation onsite is more implementable than consolidation at an off-Site commercial facility.

7. Cost-Effectiveness

Both alternatives require long-term monitoring and maintenance to ensure their long-term effectiveness and have the potential for implementability issues that could increase the capital cost of these alternatives. Alternative 3 costs $18,674,000 and is the most cost-effective alternative that provides protection of human health and environment and meets the other threshold and balancing criteria. Alternative 4 costs $117,600,000 and is the most cost prohibitive. Alternative 4 is an order of magnitude more expensive than alternative 3. There are major issues with the implementability of alternative 4 based solely on the magnitude of the removal needed, which results in an infeasible present worth.

8. Land Use

When cleanup to pre-disposal conditions is determined to be infeasible, the Department may consider the current, intended, and reasonable anticipated future land use of the site and its surroundings in the selection of the soil remedy.

The anticipated future use in OU-05 is to provide for passive recreation (commercial SCGs) and access to the lakefront. The OU-08 area has been designated “Heavy Industrial” by local City of Lackawanna Zoning Ordinance and a site-wide deed restriction currently exists limiting use of the OU-08 area to industrial applications. The OU-08 SWMUs/AOCs also fall within a City of Lackawanna Building Code Article 11 “Wind Energy Conversions Systems” permanent building exclusion zone. Alternatives 3 and 4 would both result in conditions consistent with these reasonably anticipated future land uses.

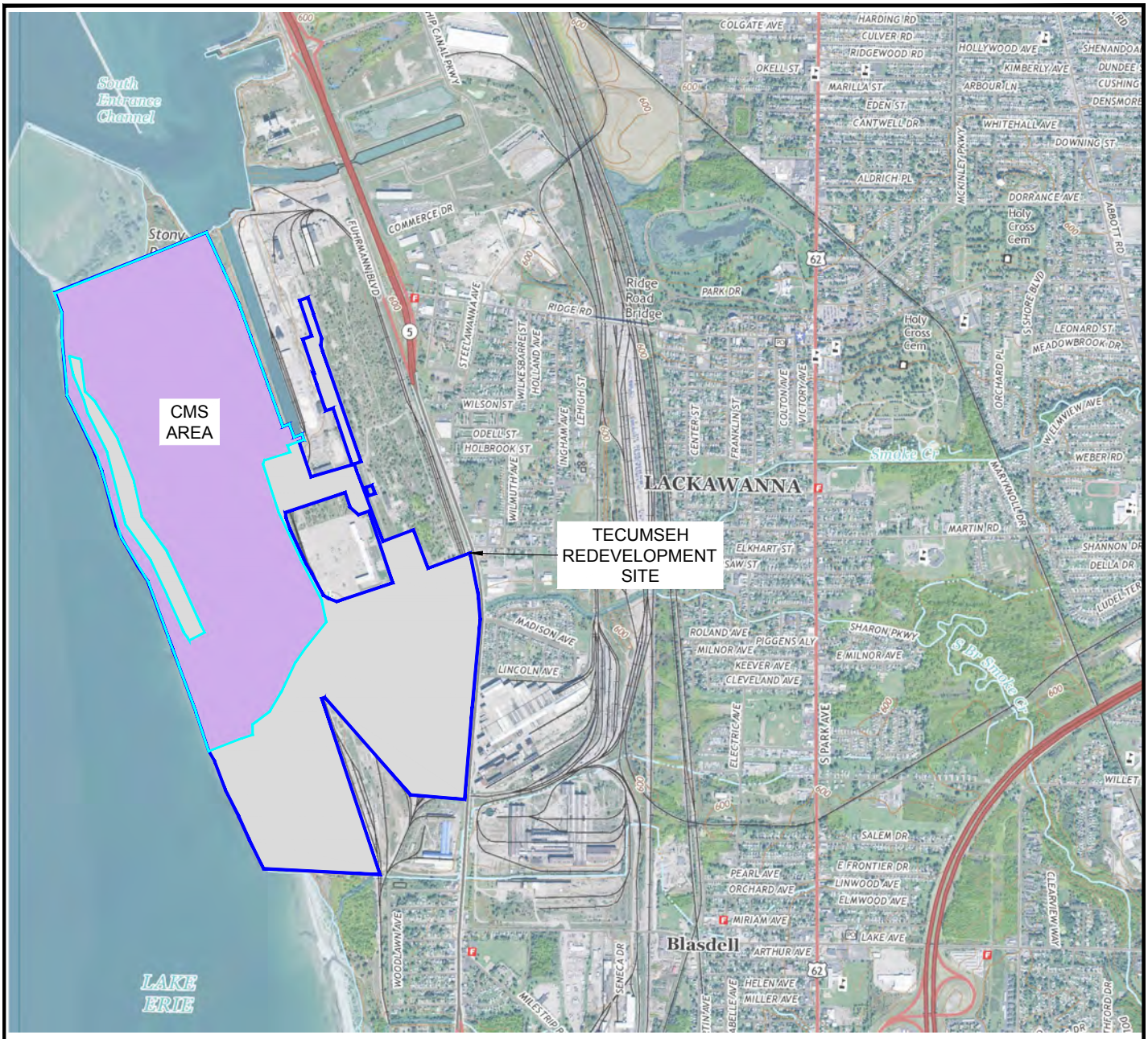
The final criterion, Community Acceptance, is considered a "modifying criterion" and is taken into account after evaluating those above. It is evaluated after public comments on the Proposed Remedial Action Plan have been received.

9. Community Acceptance

Concerns of the community regarding the investigation, the evaluation of alternatives, and the proposed Statement of Basis are evaluated. A responsiveness summary will be prepared that describes public comments received and the manner in which the Department will address the concerns raised. If the selected remedy differs significantly from the proposed remedy, notices to the public will be issued describing the differences and reasons for the changes.

Alternative 3 has been proposed because, as described above, it satisfies the threshold criteria and provides the best balance of the balancing criterion. Based upon the above

analysis, consolidation and containment onsite is the preferred disposal option. This preference is based on consideration of the primary and balancing criteria and the cost disparity between consolidation locally and at a commercial facility. On-Site management would be a proven and reliable technology for waste management.



TURNKEY ENVIRONMENTAL RESTORATION, LLC
2558 HAMBURG TURNPIKE
SUITE 300
BUFFALO, NY 14218
(716) 856-0635

PROJECT NO.: 0071-019-111

DATE: MAY 2019

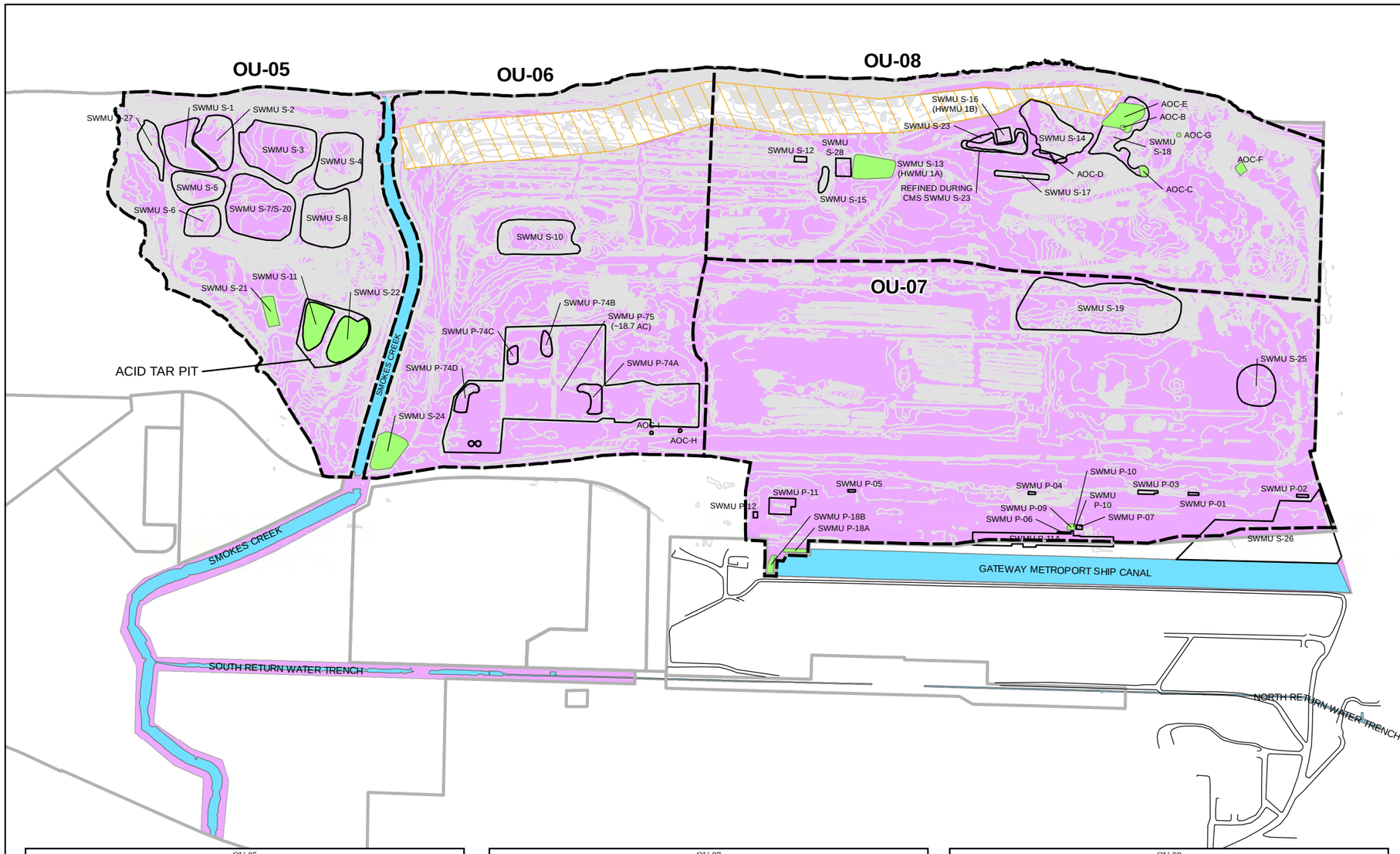
DRAFTED BY: RFL

FIGURE 1

SITE LOCATION MAP

CMS AREA - FORMER BETHLEHEM STEEL SITE

LACKAWANNA, NEW YORK



OU-05

Site Sub-Area	SWMUs	Estimated Acres	Estimated Depth (ft)	Estimated Slag/Fill Volume (CY) and Potential			
				SW-CAMU	Close In-Place	OFF-SITE TSDF	Slag/Scrap Reclaimed
SFA -Zone 2 SWMUs	S-1	1.87	27.0		81,500		
	S-2	1.62	36.8		96,200		
	S-3	3.72	20.0		120,000		
	S-4	2.44	38.1		150,000		
	S-5	1.46	22.9		54,000		
	S-6	0.99	41.5		66,300		
	S-7/20	**3.83**	45.8	283,000			
	S-8	2.7		None			
	S-27	0.86	17.3	24,000			

OU-06

Site Sub-Area	SWMUs	Estimated Acres	Estimated Depth (ft)	Estimated Slag/Fill Volume (CY) and Potential			
				SW-CAMU	Close In-Place	OFF-SITE TSDF	Slag/Scrap Reclaimed
Tank Farm SWMUs	Group P-8, 74, 75	18.7	2.4	70,000		1,800	
SFA Zone 3 - SWMUs	S-10 (Slag Quench Area J)	2.8		None			

OU-07

Site Sub-Area	SWMUs	Estimated Acres	Estimated Depth (ft)	Estimated Slag/Fill Volume (CY) and Potential			
				SW-CAMU	Close In-Place	OFF-SITE TSDF	Slag/Scrap Reclaimed
Coke Plant SWMUs	GROUP P-1 to P-6	0.2		None			
	P-7 & P-10	0.02	31.0	1,000			
	OU-4 (P-11, P-11A, & P12)	2.5		None			
	S-26	3.3		None			
North Coal Field	S-19 (Murphy's Mountain Landfill AA)	8	4.0	10,000			41,000
	S-25	1.4		None			

OU-08

Site Sub-Area	SWMUs	Estimated Acres	Estimated Depth (ft)	Estimated Slag/Fill Volume (CY) and Potential			
				SW-CAMU	Close In-Place	OFF-SITE TSDF	Slag/Scrap Reclaimed
SFA Zone 4 - SWMUs	S-12 (Asbestos Landfill L)	0.071	3.9	450			
	S-13 (HWMU-1A)	0.95	15.0		23,000		
	S-14 (General Rubble Landfill N)	2.51	14.1	16,000			41,000
	S-15 (General Rubble Landfill O)	0.15	4.1	1,000			
	S-16 (HWMU-1B) (Lime Stabilized Spent Pickle Liquor Sludge)	0.25	14.9		6,000		
	S23 & AOC-D Tar pit	0.85	7.3		10,000		
	S-17 (Vacuum Carbonate Blowdown Landfill Q)	0.2	3.1			1,000	
	S-18 (Lime Dust and Kish Landfill R) & AOC-A	2.24	1.2	4,200			
	S-28 (Drum Landfill)	0.29		None			

OU Boundaries
Steel Winds Boundary
Property Boundaries
SWMU Boundaries
SWMUs with Corrective Measures Implemented
OU-9 Boundaries
CMS Boundary (OU-01 & OU-10)

Notes:

OU-01 - SITE WIDE
OU-02 AOC-B, AOC-C, P-9, P-18A, P-18B, P-76
OU-03 ACID TAR PIT SWMUs S-11, S-21, S-22 AND S-24
OU-04 COKE OVEN BY-PRODUCTS SUB AREA GROUNDWATER
OU-05 SFA ZONE 2 SWMUs
OU-06 TANK FARM SWMUs
OU-07 COKE OVEN BY-PRODUCT SWMUs
OU-08 SFA ZONES 4 & 5
OU-09 WATER COURSES
OU-10 SITE-WIDE GROUNDWATER

0 500 1,000 2,000
Feet

Figure 2

NEW YORK STATE OF OPPORTUNITY
Department of Environmental Conservation

Bethlehem Steel Operable Units

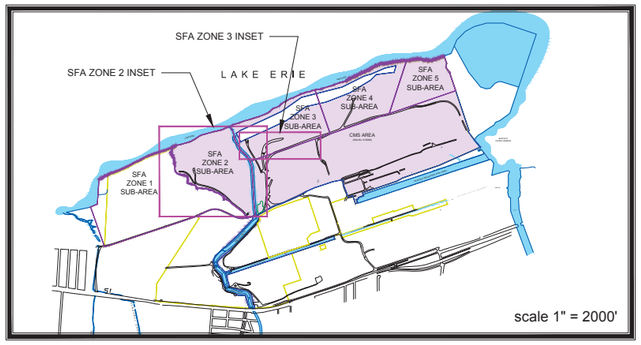
Tecumseh Redevelopment Site
Lackawanna, New York

PARSONS
301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, NY 13212 * 315-451-9560

Plotted By: Sisson, Evan
Plot Date: 2/17/2021

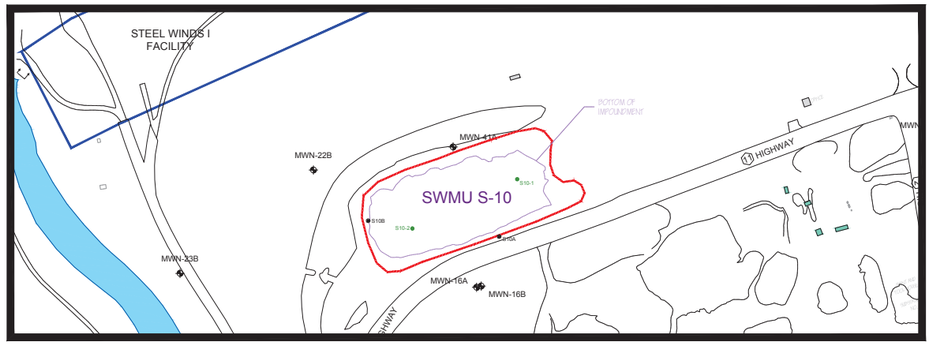
Document Path: E:\C Drive\p005664b\NYSDEC Tecumseh\MXDs\NYSDEC Tecumseh Base Map.mxd

SITE PLAN:

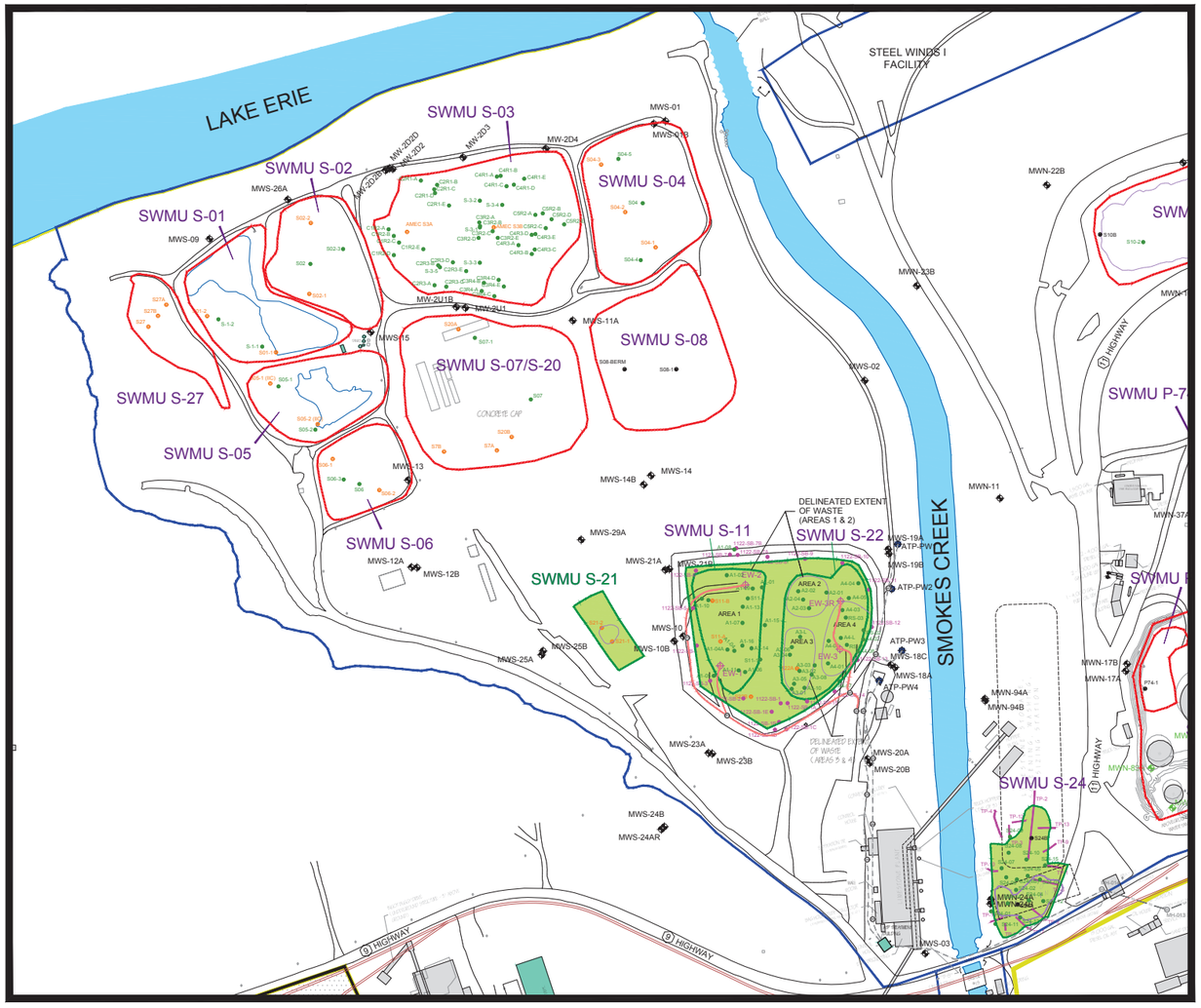


SFA ZONE 3 SWMU

APPROXIMATE SCALE 1" = 180'



SFA ZONE 2 SWMUs



SFA ZONE 2 SWMUS (AERIAL)

AERIALS FROM GOOGLE EARTH MAY 2017

SFA ZONE 3 SWMU (AERIAL)

LEGEND:

- TECUMSEH PROPERTY BOUNDARY
- EXISTING BUILDING / STRUCTURE
- DEMOLISHED BUILDING AND HISTORICAL SITE FEATURE
- RAILROAD TRACK
- CMS AREA BOUNDARY
- ATP-ECM CONTAINMENT CELL (SLURRY WALL) BOUNDARY
- APPROXIMATE SWMU BOUNDARY FROM RFI
- APPROXIMATE LIMITS OF TAR-LIKE MATERIAL FROM RFI (SWMU S-24)
- REDEFINED APPARENT BOUNDARY OF SWMU FROM CMS
- MWN-15A — EXISTING MONITORING WELL LOCATION
- 1122-SB-9 — ATP DELINEATION SOIL BORING
- SB-09 — RFI SOIL BORING
- SS-03 — RFI SURFACE SOIL SAMPLE
- TP-2 or — RFI TEST PIT
- A3-05A — RFI PIEZOMETER
- S01-1 — RFI WASTE SAMPLE
- TP-13 — FOCUSED CMS TEST TRENCH
- MANHOLE
- ATP LEACHATE EXTRACTION PIPING
- ATP FORCE MAIN
- SANITARY SEWER PIPE
- EW-3 — ATP LEACHATE EXTRACTION WELL
- ATP-PW4 — ATP EXTERIOR GROUNDWATER EXTRACTION WELL
- SFA BOUNDARY

N

180' 0' 180' 360'

SCALE: 1 INCH = 180 FEET
SCALE IN FEET
(approximate)

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TURNKEY ENVIRONMENTAL RESTORATION, LLC

JOB NO.: 007-017-111

REVISIONS

NO.	BY	DATE	REMARKS

SEAL

DRAWN BY: RFL
DATE: APRIL 2019
CHECKED BY: PHW
APPROVED BY: PHW

SFA ZONES 2 & 3 SWMUs AND SAMPLE LOCATIONS

CMS REPORT

CMS AREA - FORMER BETHLEHEM STEEL SITE

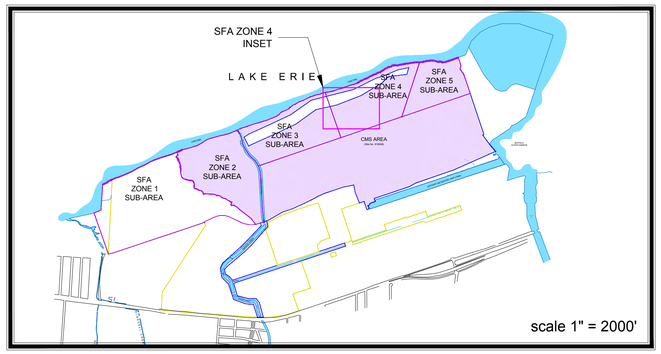
LACKAWANNA, NEW YORK

PREPARED FOR

TECUMSEH REDEVELOPMENT INC.

FIGURE 3

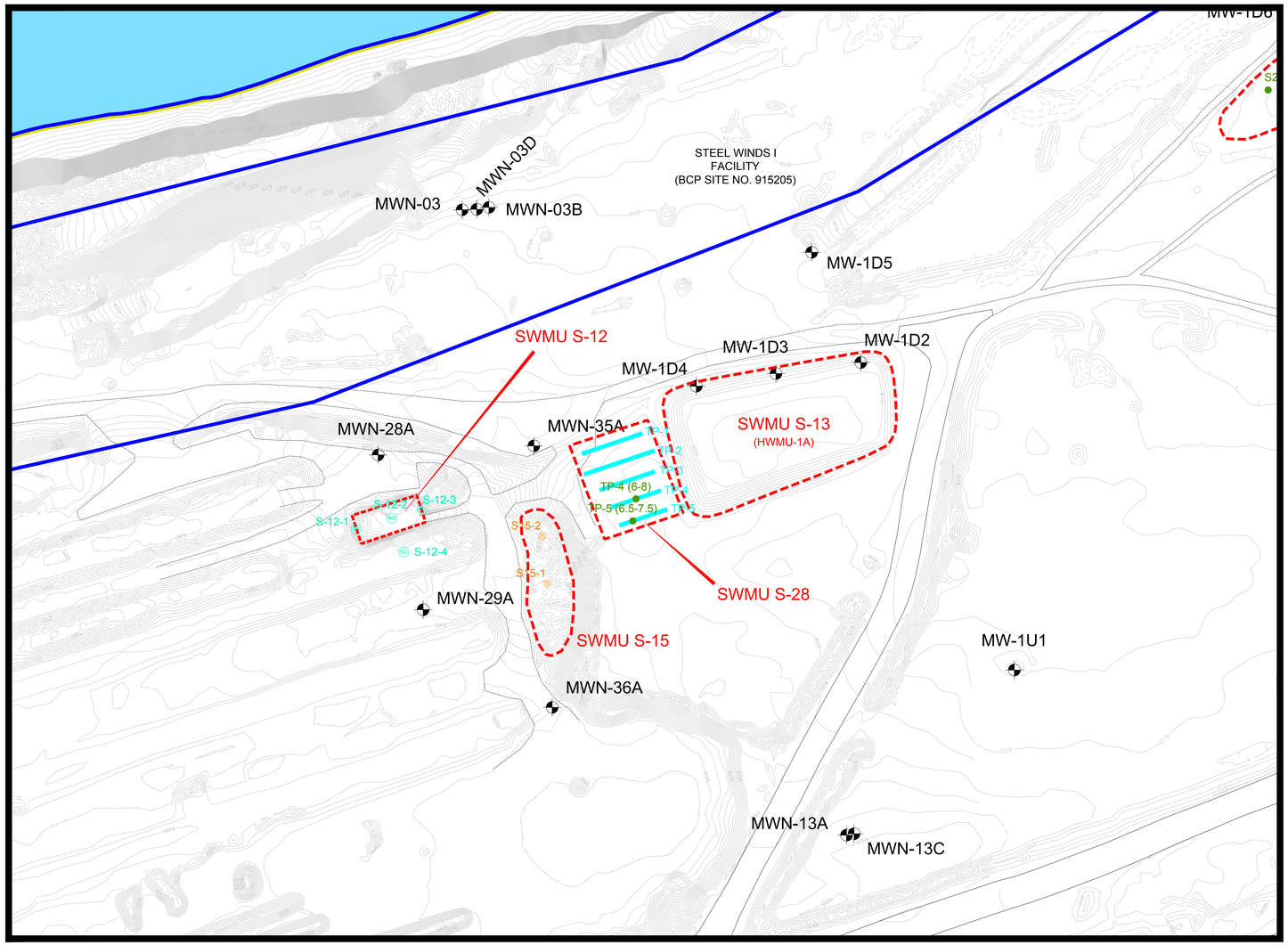
SITE PLAN:



LEGEND:

- TECUMSEH PROPERTY BOUNDARY
- CMS AREA BOUNDARY
- APPROXIMATE SWMU BOUNDARY FROM RFI
- MWN-15A — EXISTING MONITORING WELL
- SB-09 — RFI SOIL BORING
- TP-2 — RFI TEST PIT
- S-12-3 — RFI SOIL GAS
- S01-1 — RFI WASTE SAMPLE
- SFA BOUNDARY

SFA ZONE 4 SWMUs



REPRESENTATIVE PHOTOGRAPHS:

SFA ZONE 4 SWMUs (AERIAL)

IMAGE GOOGLE EARTH MAY 2017

SWMU S-12 (looking south, May 2011)

SWMU S-15 (looking east, May 2011)

SWMU S-13 mound in background (looking north, May 2011)

N

80' 0' 80' 160'

SCALE: 1 INCH = 80 FEET
SCALE IN FEET
(approximate)

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TURNKEY Environmental Restoration, LLC

JOB NO.: 0071-017-111

REVISIONS

NO.	BY	DATE	REMARKS

DRAWN BY: RFL
DATE: APRIL 2019
CHECKED BY: PHW
APPROVED BY: PHW

SEAL

SFA ZONE 4 SWMUs S-12, -13, -15, & -28 SAMPLE LOCATIONS

CMS REPORT

CMS AREA - FORMER BETHLEHEM STEEL SITE

LACKAWANNA, NEW YORK

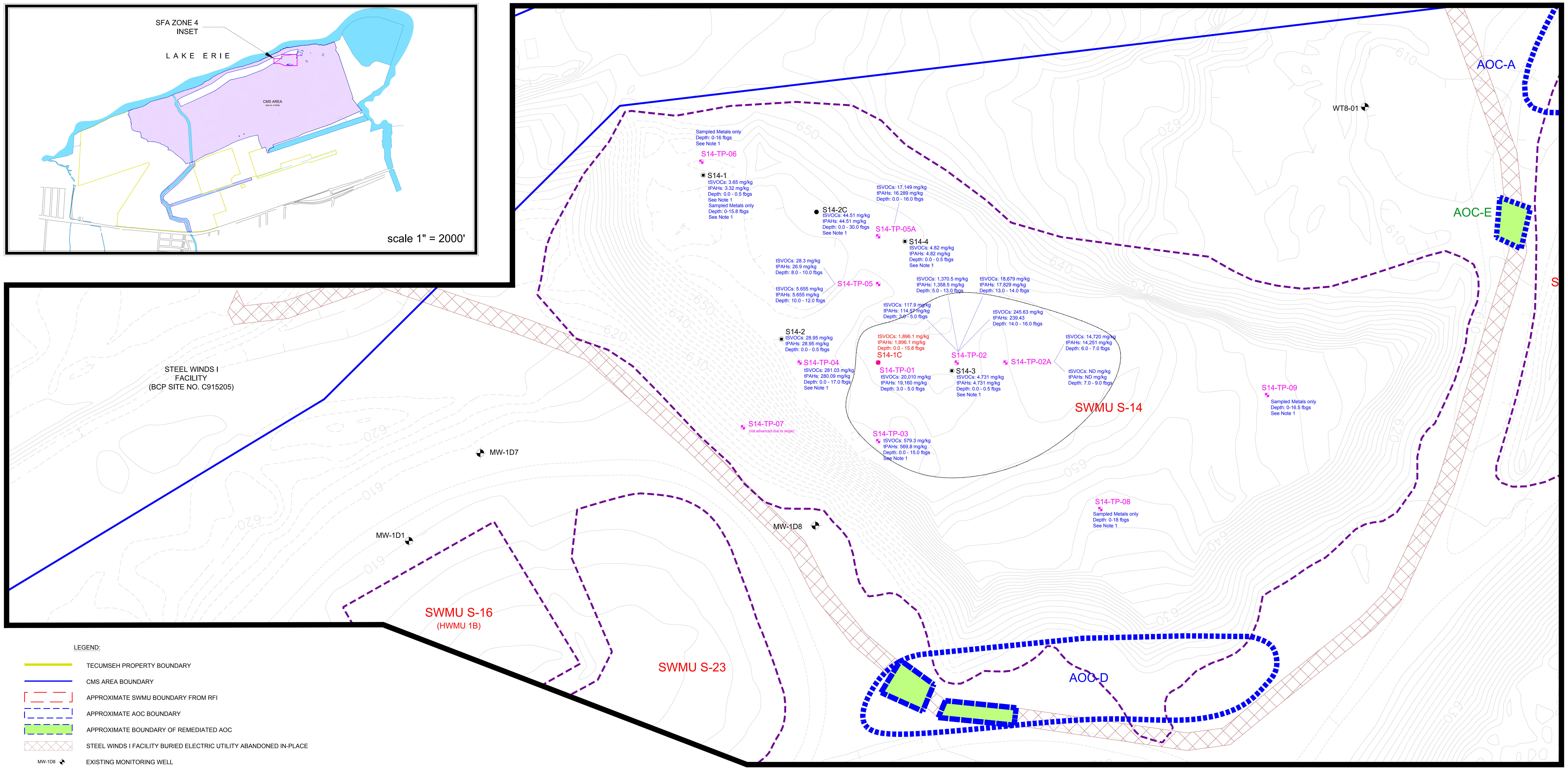
PREPARED FOR

TECUMSEH REDEVELOPMENT INC.

FIGURE 4

SITE PLAN:

SWMU S-14



LEGEND:

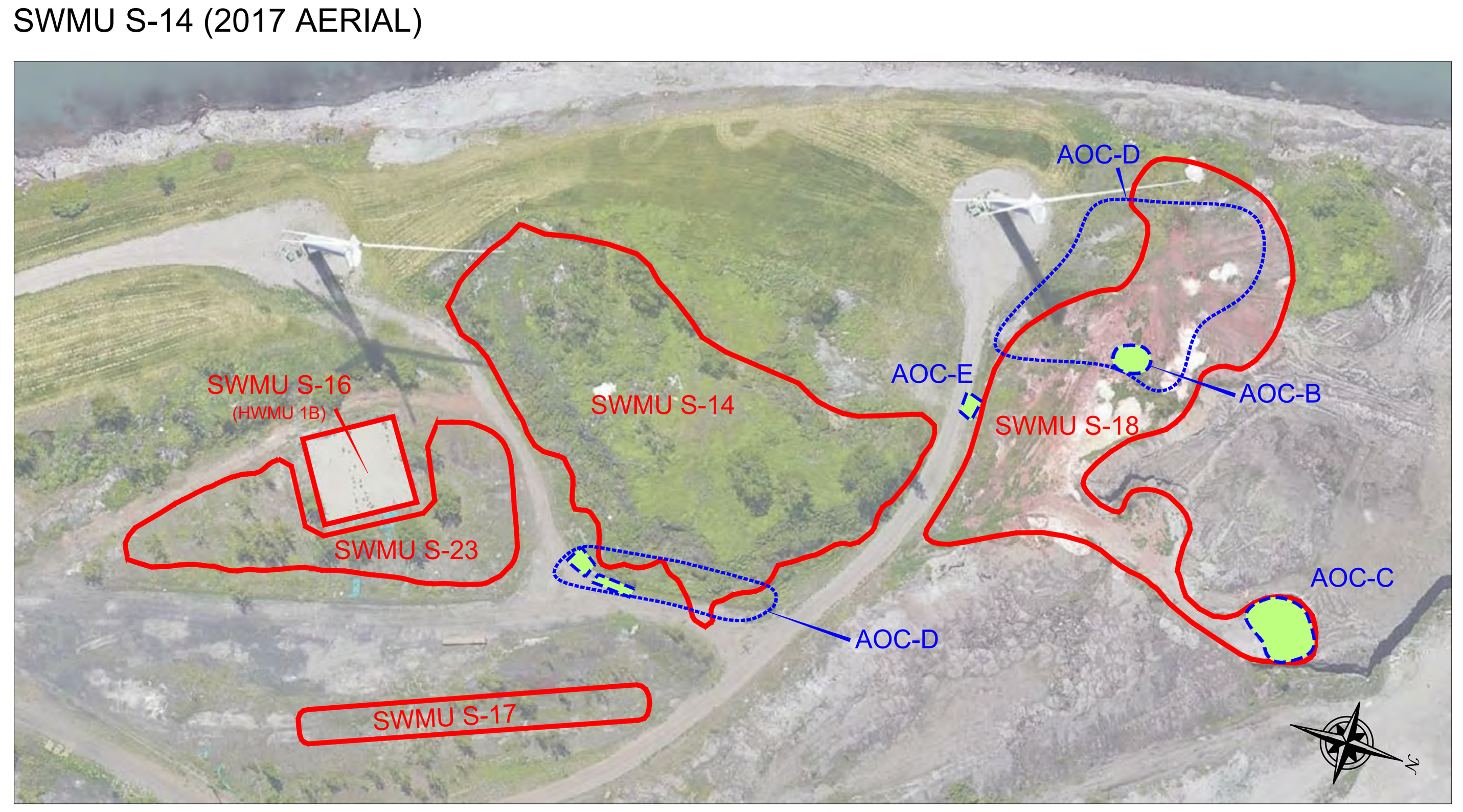
- TECUMSEH PROPERTY BOUNDARY
- CMS AREA BOUNDARY
- APPROXIMATE SWMU BOUNDARY FROM RFI
- APPROXIMATE AOC BOUNDARY
- APPROXIMATE BOUNDARY OF REMEDIATED AOC
- STEEL WINDS I FACILITY BURIED ELECTRIC UTILITY ABANDONED IN-PLACE
- MW-1D8 — EXISTING MONITORING WELL
- S14-1 — RFI SURFACE SOIL SAMPLE
- S14-2 — RFI BORING
- S14-1C — RFI BORING WITH tPAHs > 500 ppm
- S14-TP-01 — CMS TEST PIT LOCATION
- tSVOCs: 3.65 mg/kg, tPAHs: 3.32 mg/kg, Depth: 0.0 - 0.5 fbgs — TOTAL SVOC (tSVOC) & PAH (tPAH) CONCENTRATIONS IN SOIL/FILL (MILLIGRAMS PER KILOGRAM) & SAMPLE INTERVAL (FEET BELOW GROUND SURFACE)

NOTES:
1. THERE WERE NO EXCEEDANCES OF THE SSAL OR INDUSTRIAL SOIL CLEANUP OBJECTIVES FOR METALS AT THE LOCATIONS NOTED.

SCALE: 1 INCH = 30 FEET
SCALE IN FEET
(approximate)

REPRESENTATIVE PHOTOGRAPHS:

SWMU S-14 (2017 AERIAL)



SWMU S-14 (looking north)

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC
TURNKEY ENVIRONMENTAL RESTORATION, LLC

JOB NO.: 0071-017-111

REVISIONS

NO.	BY	DATE	REMARKS

SEAL

DRAWN BY: RFL
DATE: MARCH 2019
CHECKED BY: PHW
APPROVED BY: PHW

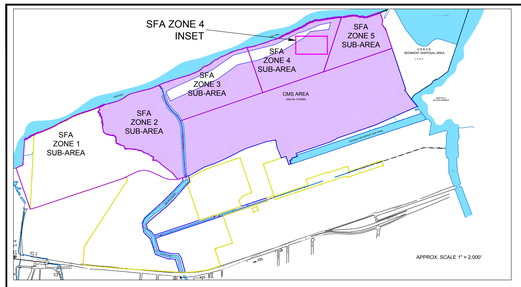
SFA ZONE 4 SWMU S-14 SAMPLE LOCATIONS & ANALYTICAL RESULTS

CMS REPORT

CMS AREA - FORMER BETHLEHEM STEEL SITE
LACKAWANNA, NEW YORK

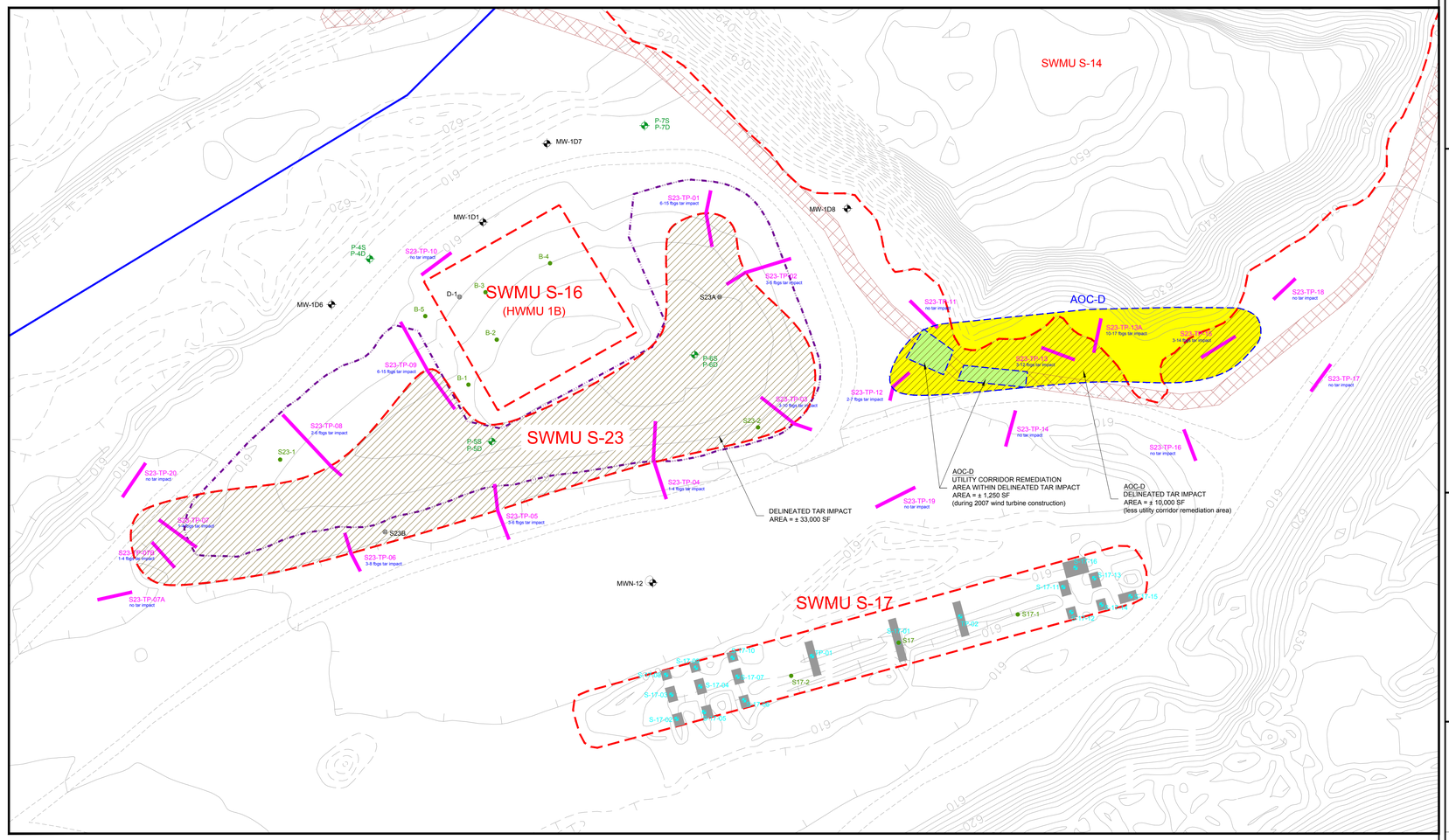
PREPARED FOR
TECUMSEH REDEVELOPMENT INC.

FIGURE 5



LEGEND:

- CMS AREA BOUNDARY
- APPROXIMATE BOUNDARY OF SWMU
- APPROXIMATE BOUNDARY OF AOC-D
- APPROXIMATE BOUNDARY OF REMEDIATED AOC
- APPROXIMATE LIMITS OF TAR-IMPACTED SOIL/FILL
- STEEL WINDS I FACILITY BURIED ELECTRIC UTILITY ABANDONED IN-PLACE
- CMS TEST PIT LOCATION WITH TAR IMPACT INTERVAL (IF PRESENT)
- FORMER (RFI) BOUNDARY OF SWMU S-23
- EXISTING PIEZOMETER (P-4S P-4D)
- RFI WASTE SAMPLE (S23B D-1)
- RFI BORING (S23-1 B-1)
- RFI TEST PIT (TP-01)
- GROUNDWATER MONITORING WELL (MWN-12)
- SFA BOUNDARY



SCALE: 1 INCH = 40 FEET
SCALE IN FEET
(approximate)

REPRESENTATIVE PHOTOGRAPHS:

SWMU GROUP S-16, 23 & AOC-D (AERIAL)

SOURCE: GOOGLE EARTH MAY 2017

SWMU S-16 (looking east)
photo May 2011

SWMU S-17 (looking north from south end)
photo May 2011

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TURNKEY ENVIRONMENTAL RESTORATION, LLC

JOB NO.: 0071-017-111

REVISIONS

NO.	BY	DATE	REMARKS

DRAWN BY: RFL
DATE: APRIL 2019
CHECKED BY: PHW
APPROVED BY: PHW

SEAL

SFA ZONE 4 SWMUs S-16, -17, & -23 AND AOCs-D & -E SAMPLE LOCATIONS & TAR-IMPACT OBSERVATIONS

CMS REPORT

CMS AREA - FORMER BETHLEHEM STEEL SITE

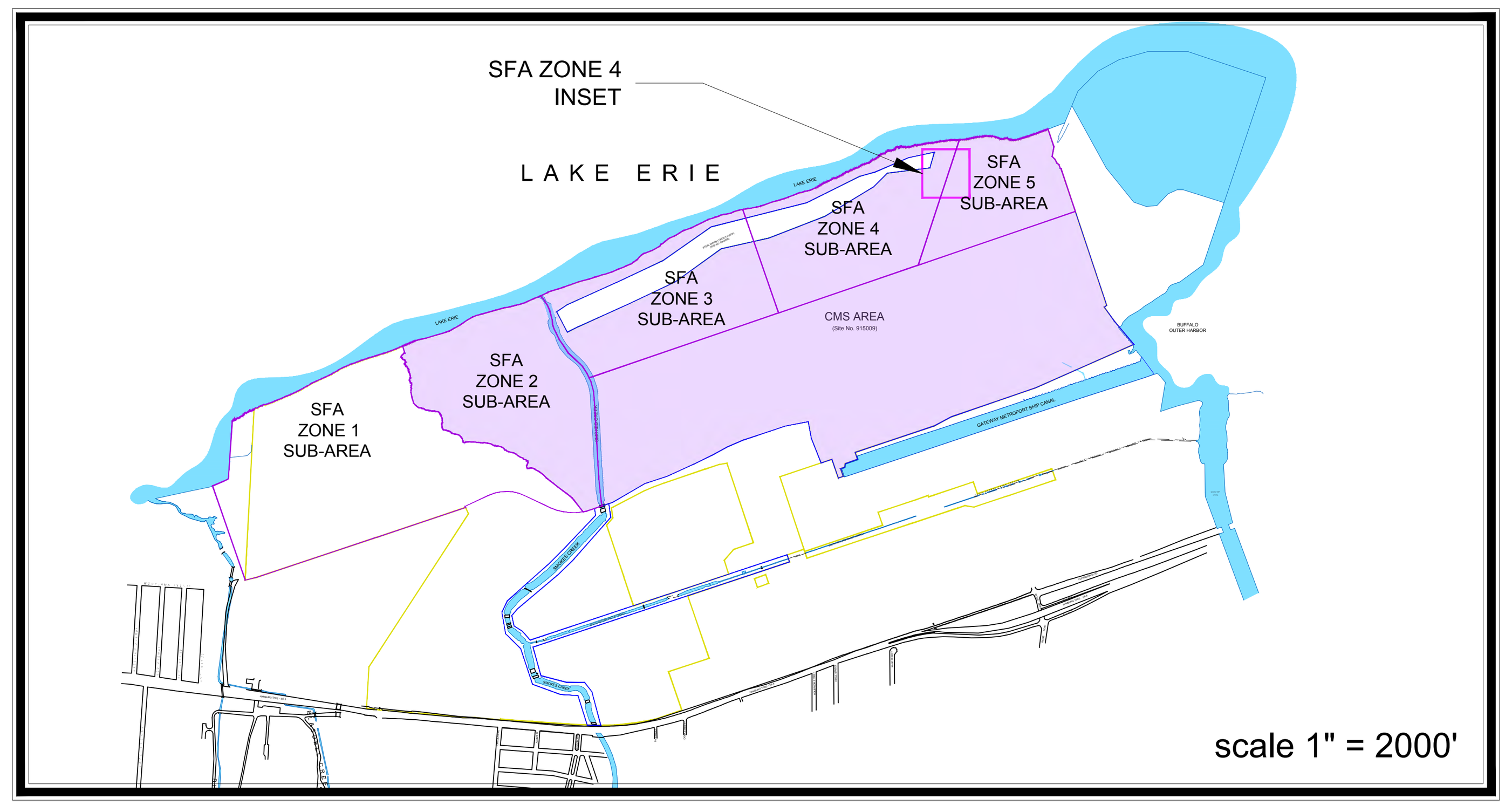
LACKAWANNA, NEW YORK

PREPARED FOR

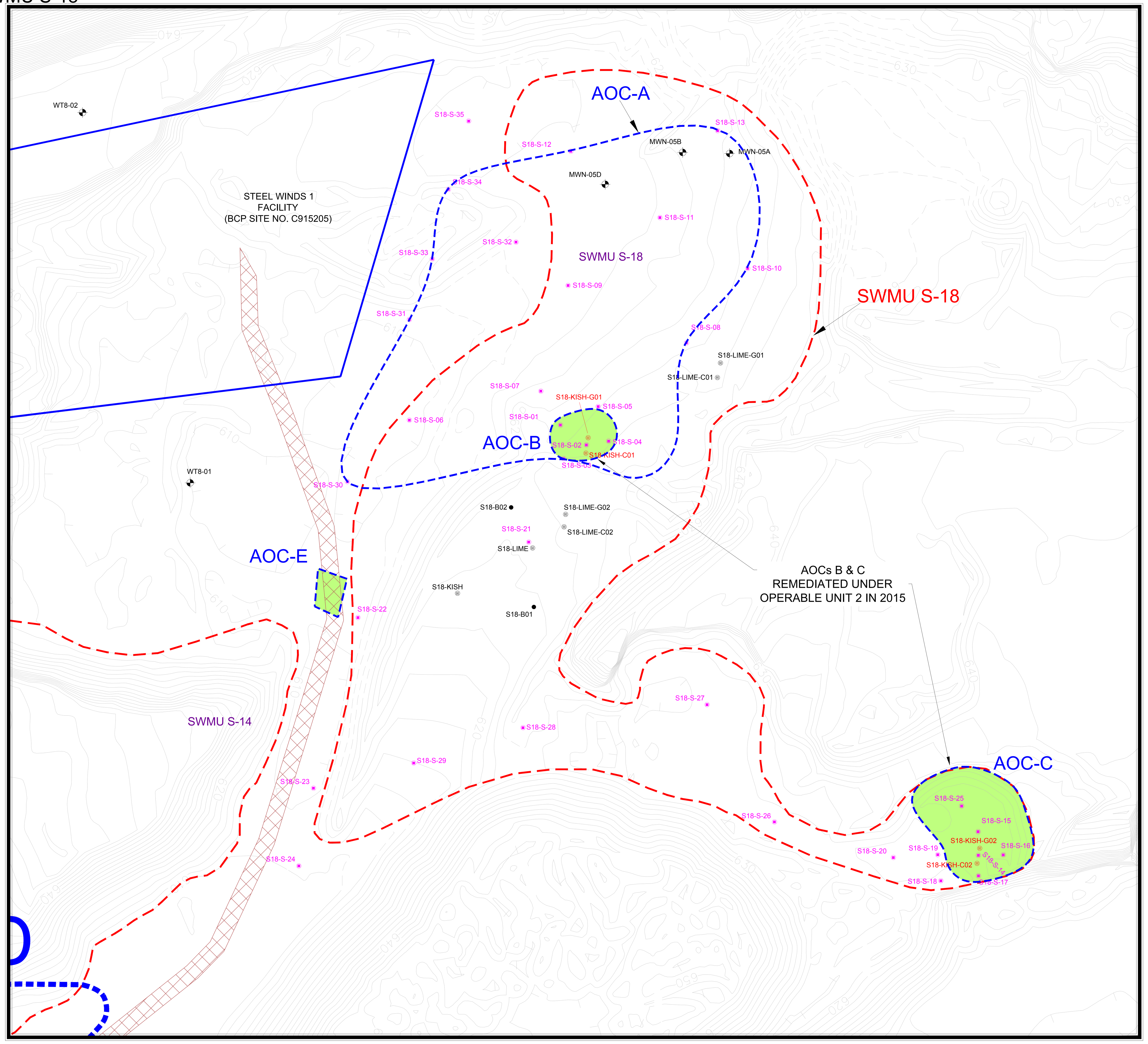
TECUMSEH REDEVELOPMENT INC.

FIGURE 6

SITE PLAN:



SWMU S-18

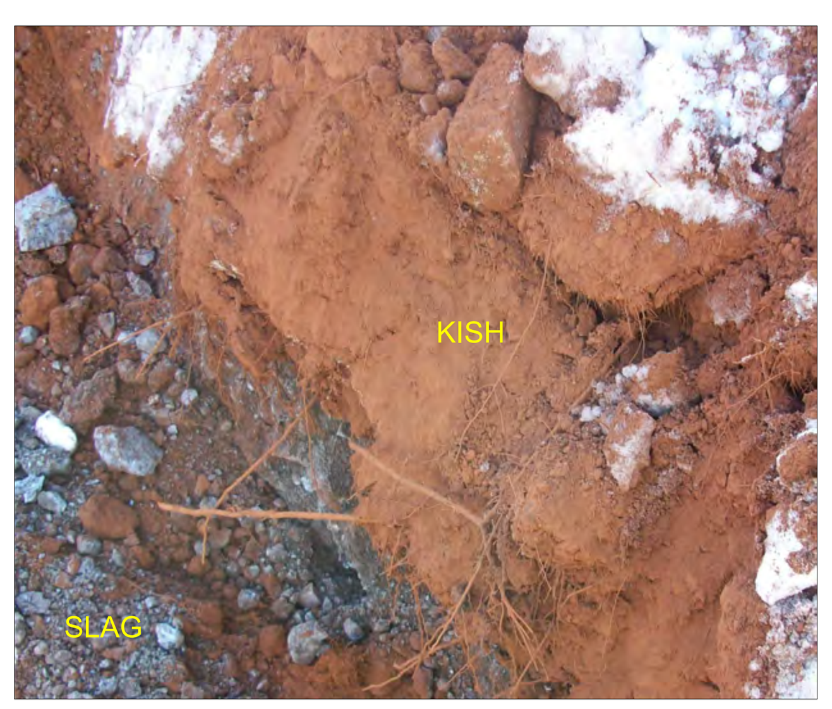


REPRESENTATIVE PHOTOGRAPHS:

SWMU S-18 (AERIAL)

GOOGLE EARTH MAY 2017

SWMU S-18 (typical profile)



AOC-C

CEMENT MIXED WITH RESIDUAL WASTE MATERIAL
LOOKING WEST 2015

SWMU S-18 (KISH)

LEGEND:

- CMS AREA BOUNDARY
- APPROXIMATE BOUNDARY OF SWMU
- APPROXIMATE BOUNDARY OF AOC
- APPROXIMATE BOUNDARY OF REMEDIATED AOC
- STEEL WINDS I FACILITY BURIED ELECTRIC UTILITY ABANDONED IN-PLACE
- MW-10B — EXISTING MONITORING WELL
- S18-KISH / S18-LIME — RFI WASTE PILE SAMPLE
- S18-B01 — RFI BORING
- S18-KISH-C01 / S18-KISH-G01 — RFI WASTE PILE SAMPLE EXHIBITING HAZARDOUS WASTE CHARACTERISTIC FOR LEAD
- S18-S-01 — CMS SOIL SAMPLE LOCATION
- SFA BOUNDARY

40' 0' 40' 80'

SCALE: 1 INCH = 40 FEET
SCALE IN FEET
(approximate)

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TURNKEY ENVIRONMENTAL RESTORATION, LLC

JOB NO.: 0071-017-111

REVISIONS

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SEAL

DRAWN BY:	RFL
DATE:	MAY 2019
CHECKED BY:	PHW
APPROVED BY:	PHW

SFA ZONE 4 SWMU S-18 AND AOCs-A, -B, & -C
SAMPLE LOCATIONS, LEAD-IMPACT DELINEATION & REMEDIATION

CMS REPORT

CMS AREA - FORMER BETHLEHEM STEEL SITE

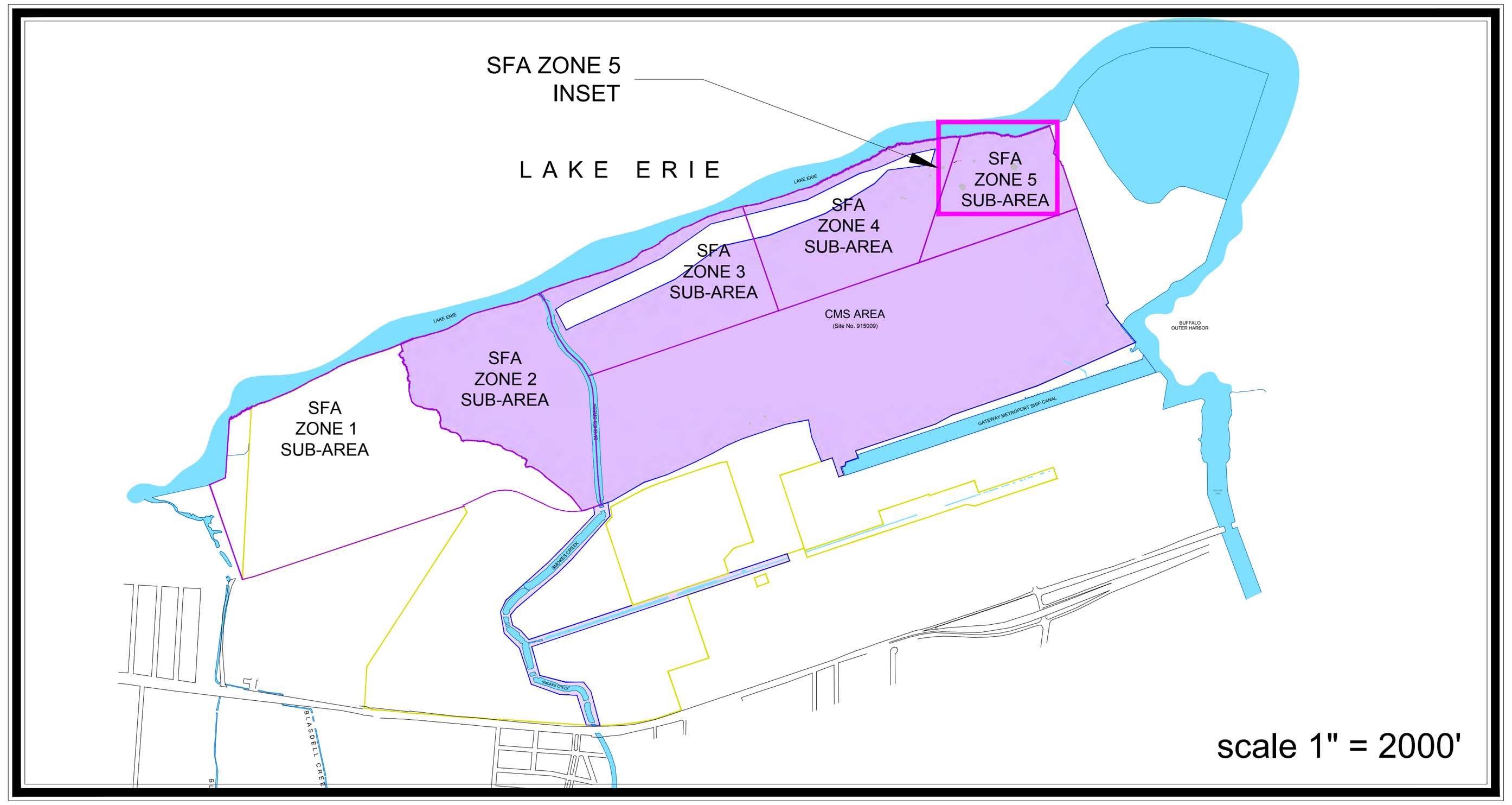
LACKAWANNA, NEW YORK

PREPARED FOR

TECUMSEH REDEVELOPMENT INC.

FIGURE 7

SITE PLAN:



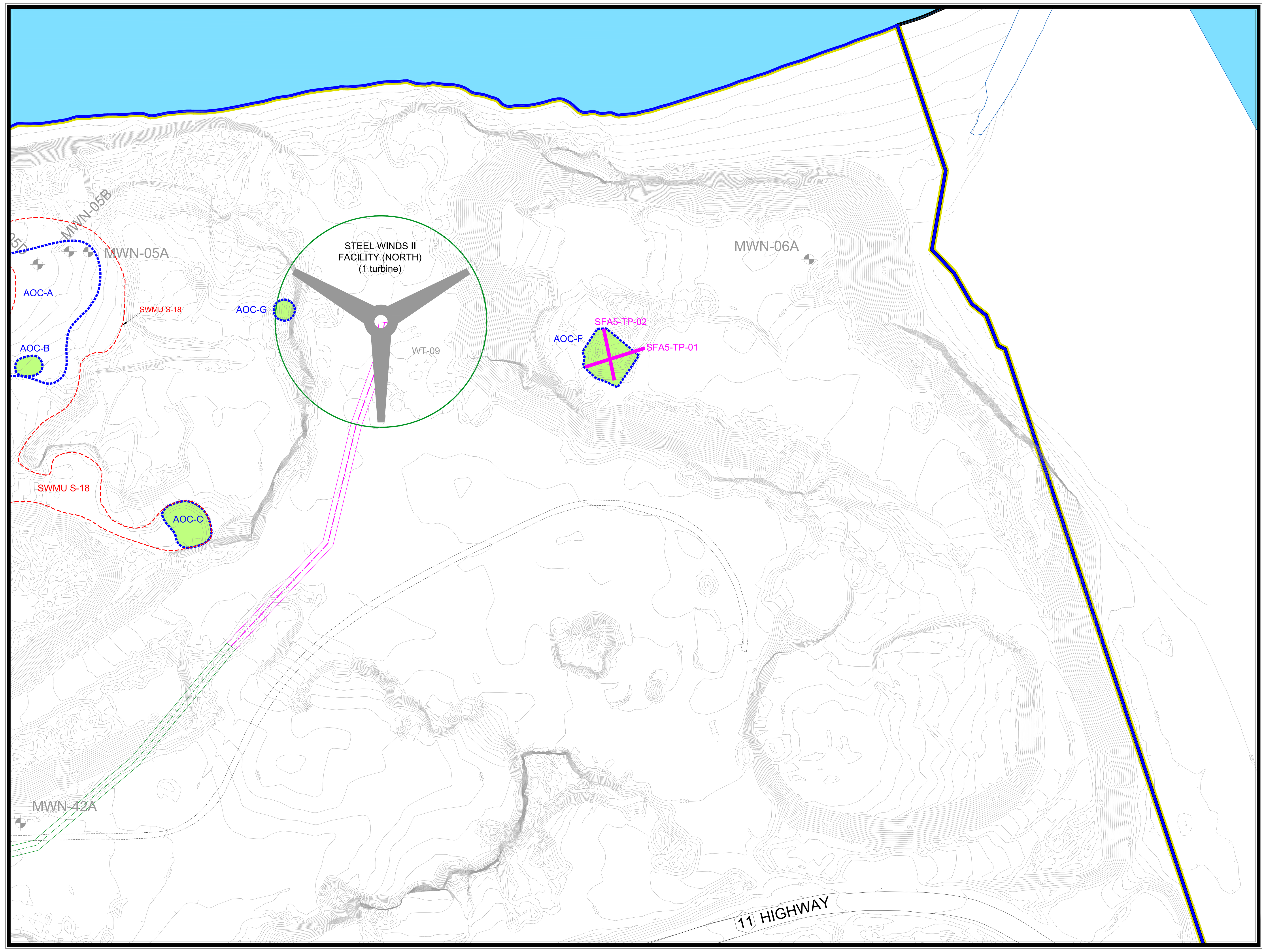
LEGEND:

- TECUMSEH PROPERTY BOUNDARY
- CMS AREA BOUNDARY
- APPROXIMATE BOUNDARY OF SOLID WASTE MANAGEMENT UNIT (SWMU) FROM RFI
- APPROXIMATE BOUNDARY OF AOC
- APPROXIMATE BOUNDARY OF REMEDIATED AOC
- PLANNED STEEL WINDS II ABOVE GROUND ELECTRICAL EASEMENT
- PLANNED STEEL WINDS II BURIED ELECTRICAL EASEMENT
- MWN-15A — EXISTING MONITORING WELL
- SFA5-TP-01 — CMS INVESTIGATION TEST PIT TO DELINEATE TAR-IMPACTED SLAG PRIOR TO REMOVAL
- SFA BOUNDARY

100' 0' 100' 200'

SCALE: 1 INCH = 100 FEET
SCALE IN FEET
(approximate)

SFA ZONE 5 - AOCs-F & -G



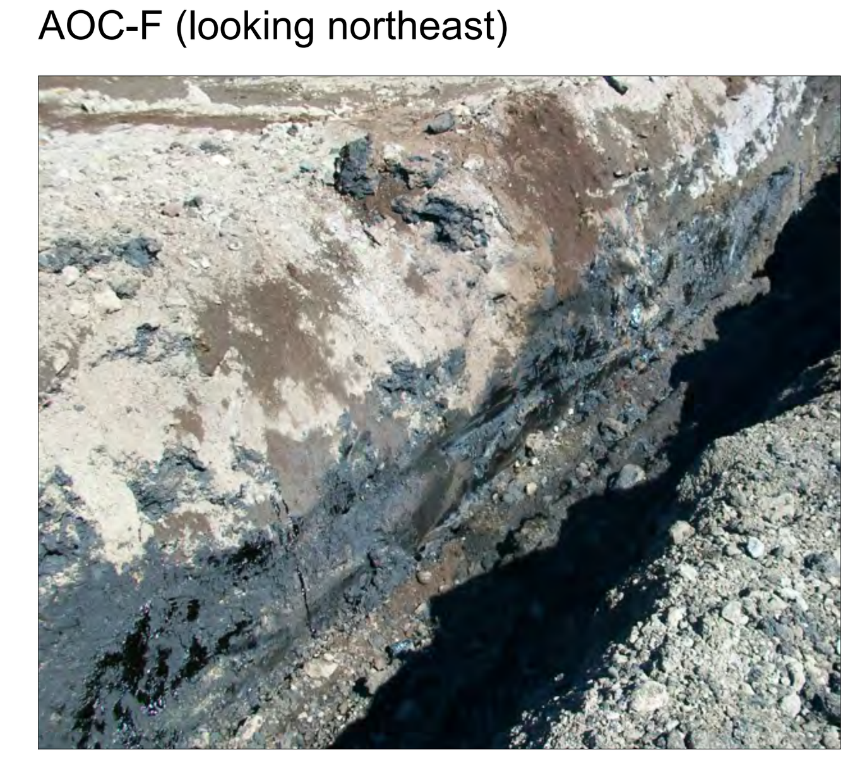
REPRESENTATIVE PHOTOGRAPHS:

SFA ZONE 5 (AERIAL)
GOOGLE EARTH MAY 2017

AOC-F (looking south)

AOC-F (looking southeast)

AOC-F (looking northeast)



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JOB NO.: 0071-017-111

REVISIONS

NO.	BY	DATE	REMARKS

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DATE:	APRIL 2019
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APPROVED BY:	PHW

SFA ZONE 5 AOCs-F & -G TEST PIT LOCATIONS & REMEDIATED AREAS

CMS REPORT

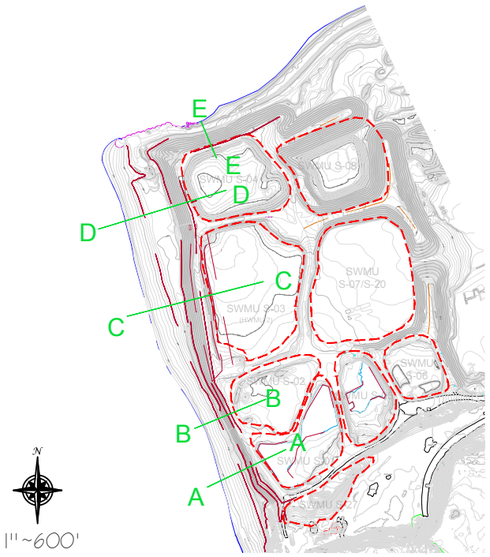
CMS AREA - FORMER BETHLEHEM STEEL SITE

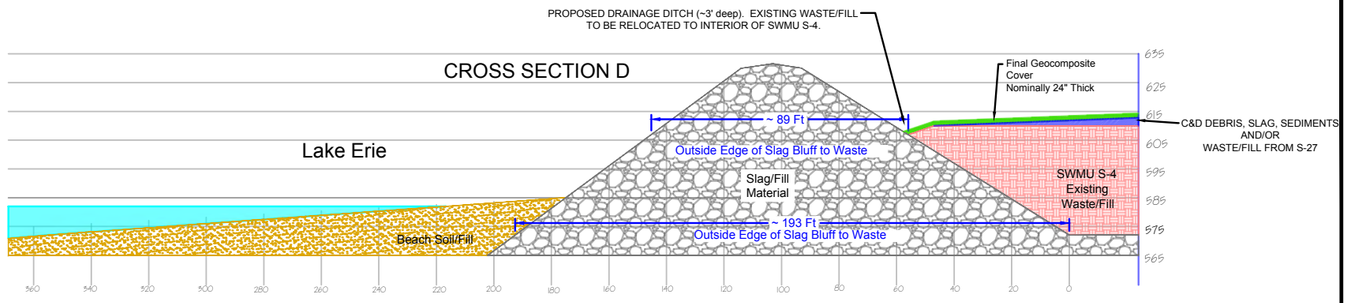
LACKAWANNA, NEW YORK

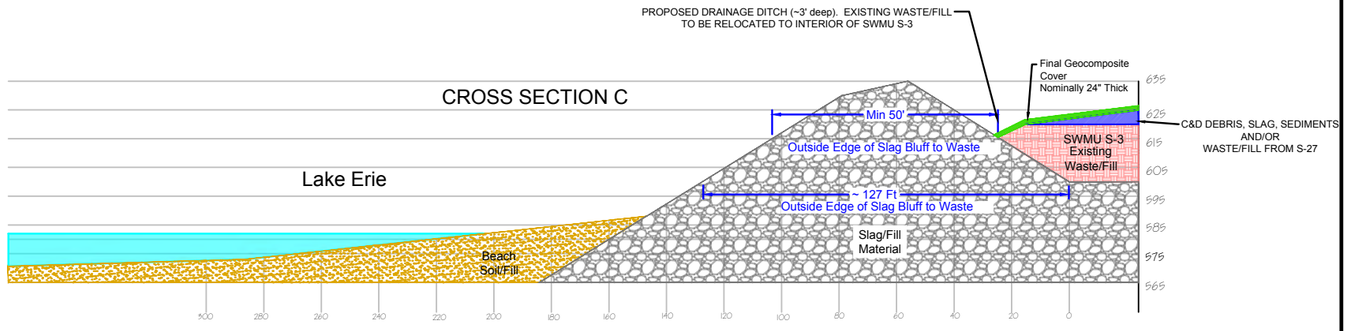
PREPARED FOR

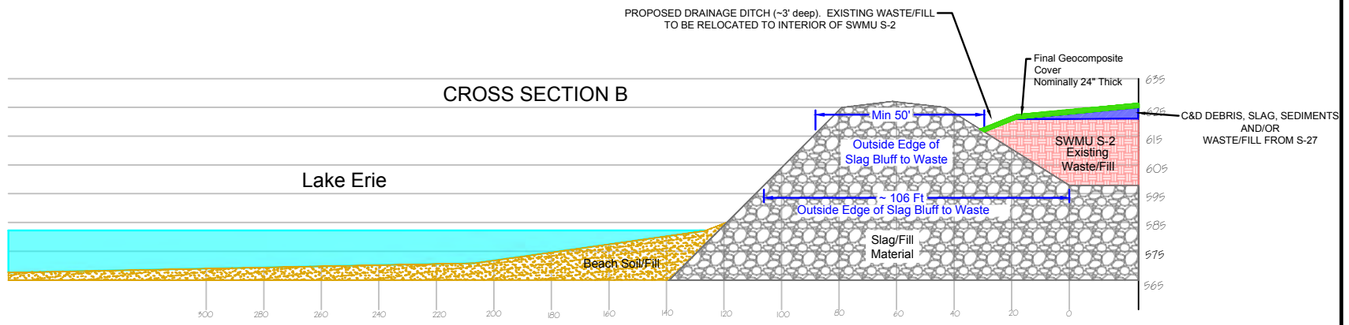
TECUMSEH REDEVELOPMENT INC.

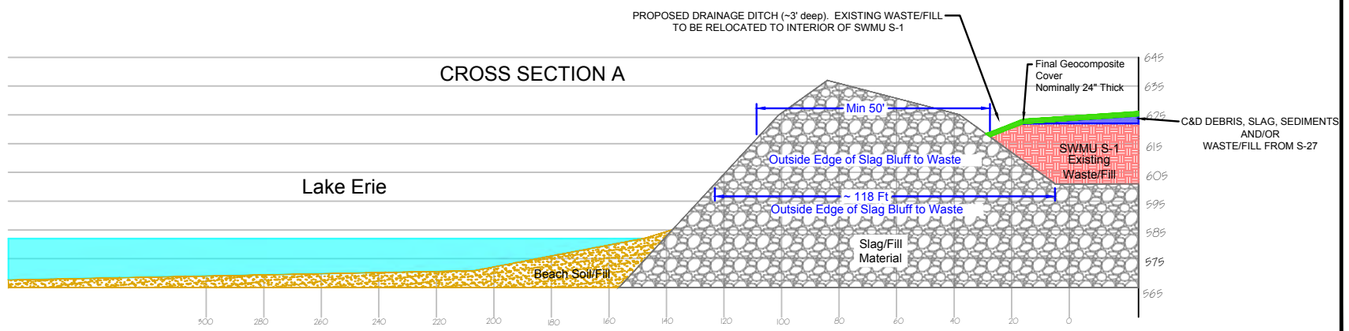
FIGURE 8











Notes:

1) Elevation data developed from 2007 Aerial Survey.
2) Inside slope of slag bluff below top of waste in SWMUs S-1 to S-4 was extrapolated using the inside slope of SWMUs S-4 and S-8.
3) The western and northern perimeter of the SWMUs S-1, S-2, S-3 and S-4 will be designed such that no additional material will be placed on the slag bluff. Existing waste will be cut and pulled back from the perimeter of these SWMUs.

DATE: APRIL 2019
DRAFTED BY: RFL

TURNKEY ENVIRONMENTAL RESTORATION, LLC.
2558 HAMBURG TURNPIKE
SUITE 300
BUFFALO, NY 14218
(716) 856-0635

BENCHMARK ENVIRONMENTAL ENGINEERING SCIENCE, PLLC
2558 HAMBURG TURNPIKE
SUITE 300
BUFFALO, NY 14218
(716) 856-0599

JOB NO.: 0071-019-111

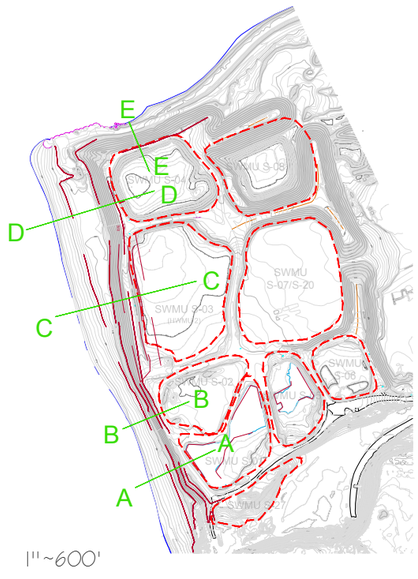
CROSS SECTIONS SFA ZONE 2 (WEST SLOPE)

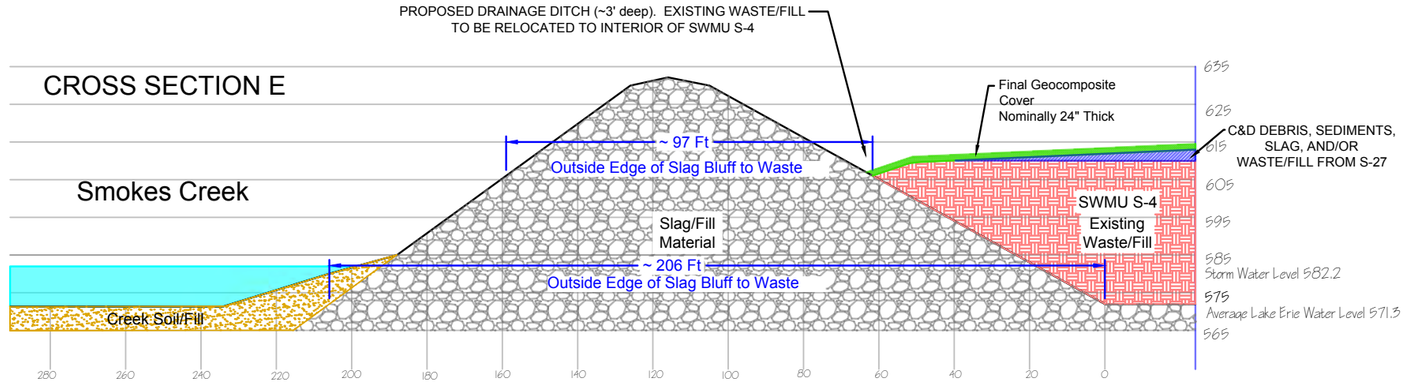
CMS REPORT

CMS AREA - FORMER BETHLEHEM STEEL SITE
LACKAWANNA, NEW YORK

PREPARED FOR
TECUMSEH REDEVELOPMENT INC.

FIGURE 9





Notes:

1) Elevation data developed from 2007 Aerial Survey.
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DATE: APRIL 2019
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TURNKEY ENVIRONMENTAL RESTORATION, LLC
2558 HAMBURG TURNPIKE
SUITE 300
BUFFALO, NY 14218
(716) 856-0635

BENCHMARK ENVIRONMENTAL ENGINEERING SCIENCE, PLLC
2558 HAMBURG TURNPIKE
SUITE 300
BUFFALO, NY 14218
(716) 856-0599

JOB NO.: 0071-019-111

CROSS SECTIONS SFA ZONE 2 (NORTH SLOPE)

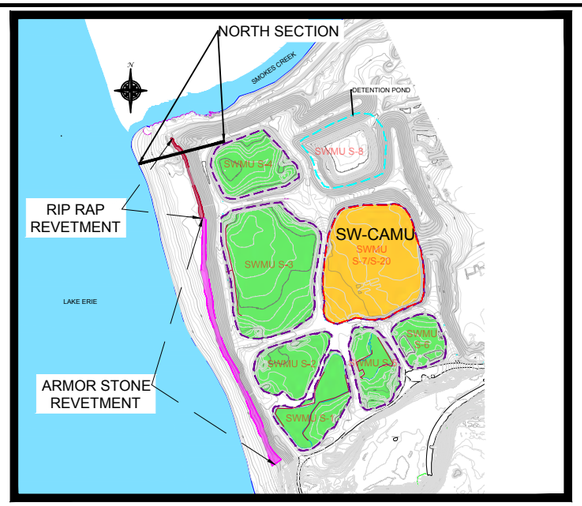
CMS REPORT

CMS AREA - FORMER BETHLEHEM STEEL SITE
LACKAWANNA, NEW YORK

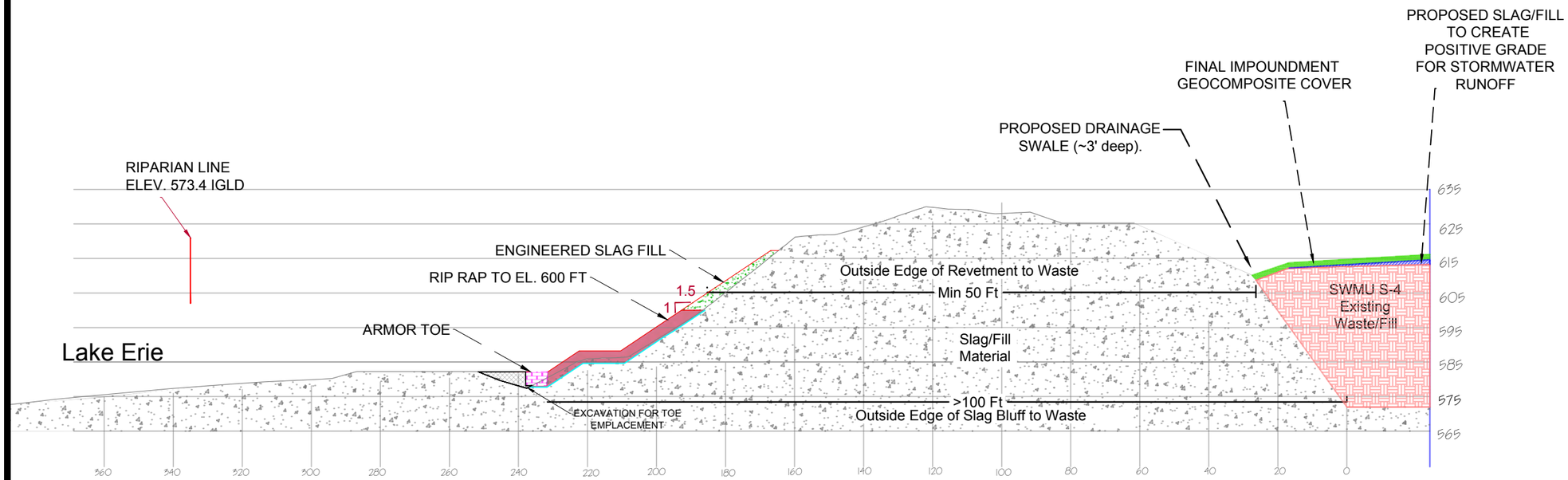
PREPARED FOR
TECUMSEH REDEVELOPMENT INC.

FIGURE 10

F:\CAD\TurnKey\Tecumseh Redevelopment\CMS\2019 CMS Report\Figure 5-4 Revetment North.dwg



NORTH SECTION



DATE: MAY 2019
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BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TURNKEY ENVIRONMENTAL RESTORATION, LLC

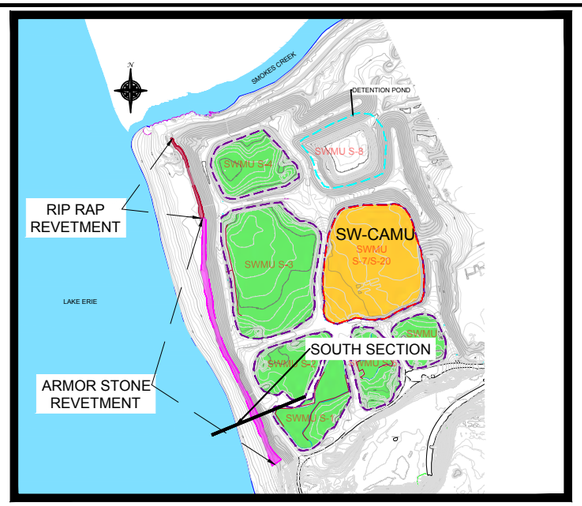
JOB NO.: 0071-019-111

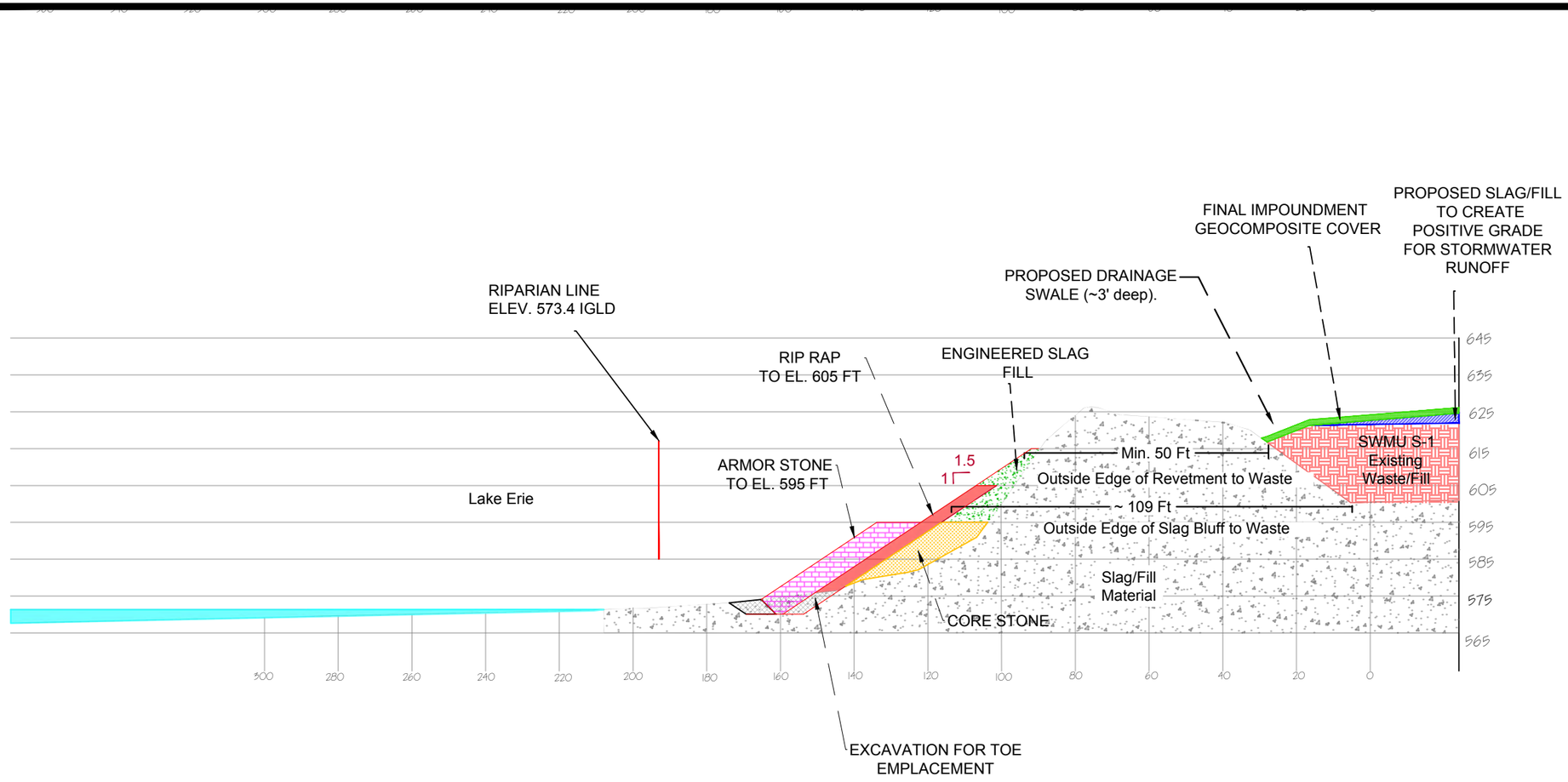
PROPOSED WESTERN REVETMENT
NORTHERN SECTION
CMS REPORT
TECUMSEH REDEVELOPMENT SITE
LACKAWANNA, NEW YORK
PREPARED FOR
TECUMSEH REDEVELOPMENT INC.

FIGURE 11

F:\CAD\TurnKey\Tecumseh Redevelopment\CMS\2019 CMS Report\Figure 5-5; Revetment South.dwg

SOUTH SECTION





DATE: MAY 2019
DRAFTED BY: RFL

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TURNKEY ENVIRONMENTAL RESTORATION, LLC

JOB NO.: 0071-019-111

PROPOSED WESTERN REVETMENT
SOUTHERN SECTION
CMS REPORT
TECUMSEH REDEVELOPMENT SITE
LACKAWANNA, NEW YORK
PREPARED FOR
TECUMSEH REDEVELOPMENT INC.

FIGURE 12

LEGEND:

- TECUMSEH PROPERTY BOUNDARY
- SW-CAMU
- SWMU TO BE CLOSED AND CAPPED IN-PLACE
- SWMU LIMITS
- MAJOR CONTOUR (10')
- MINOR CONTOUR (2')
- APPROXIMATE AREA OF WASTE PULL BACK

N

100' 0' 100' 200'

SCALE: 1 INCH = 100 FEET
SCALE IN FEET
(approximate)

BENCHMARK ENVIRONMENTAL ENGINEERING SCIENCE, PLLC
IN ASSOCIATION WITH
TURNKEY ENVIRONMENTAL RESTORATION, LLC
2558 HAMBURG TURNPIKE, SUITE 300, BUFFALO, NY 14218, (716) 856-0599
JOB NO.: 0071-019-111

REVISIONS

NO.	BY	DATE	REMARKS

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DRAWN BY:	RFL
DATE:	MAY 2019
CHECKED BY:	
APPROVED BY:	PHW

DISCLAIMER:
REPORTING BY BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC & TURNKEY ENVIRONMENTAL RESTORATION, LLC WAS PREPARED FOR THE EXCLUSIVE USE OF TECUMSEH AS ASSISTANCE AND AS SUCH IS SUBJECT TO RECALL AT ANY TIME. THE INFORMATION CONTAINED HEREIN IS NOT TO BE DISCLOSED OR INTRODUCED INTO EVIDENCE BY ANY PERSON OR OTHER THAN NECESSARY SUBCONTRACTORS & OF PARTIES OTHER THAN TECUMSEH WITHOUT THE WRITTEN CONSENT OF BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC & TURNKEY ENVIRONMENTAL RESTORATION, LLC.

SFA ZONE 2: RECOMMENDED IMPOUNDMENTS CLOSURE AND SW-CAMU PRELIMIMINARY GRADING PLAN

CMS REPORT
TECUMSEH LACKAWANNA, SITE
LACKAWANNA, NEW YORK

PREPARED FOR
TECUMSEH REDEVELOPMENT INC.

FIGURE 13

APPENDIX A

ADMINISTRATIVE RECORD

ADMINISTRATIVE RECORD

Bethlehem Steel
(aka Tecumseh Redevelopment, Inc.)

OU-05 - Slag Fill Area Zone 2
and
OU-08 - Slag Fill Area Zones 4 and 5

City of Lackawanna, Erie County
Site No. 915009
EPA ID No. NYD002134880

New York State Department of Environmental Conservation, Order on Consent – File No. 03-73: Corrective Measures Study, June 2009.

September 24, 2020 the Department and Tecumseh signed an Order on Consent (the "Order") to complete comprehensive investigation; evaluation; and implementation of Corrective Measures/Remedial Actions, Closure and Post-Closure Care requirements of the Site to protect public health and the environment and to allow, when and where appropriate, the continued use of the Site and its redevelopment by Tecumseh and/or third parties.

New York State Department of Environmental Conservation, Proposed Statement of Basis Proposed Remedy Operable Unit Five (OU-05) Slag Fill Zone 2 and OU08: Slag Fill Area - Zones 4 and 5 SWMU/AOC Group, Site No. 915009, EPA ID No. NYD002134880, Lackawanna, Erie County, May 2021.

New York State Department of Environmental Conservation, Proposed Statement of Basis Corrective Measures Selection: Bethlehem Steel Operable Units One (OU-01) Sitewide Remedial Elements, Operable Unit Nine (OU-09) Water Courses, and Operable Unit 10 (OU-10) Sitewide Groundwater, Site No. 915009, EPA ID No. NYD002134880, Lackawanna, Erie County, May 2021.

New York State Department of Environmental Conservation, Proposed Statement of Basis Proposed Remedy OU-06 Former Petroleum Bulk Storage Sub-Area and OU-07 Coal, Coke and Ore Handling and Storage Sub-Area, and Coke Plant and By-Products Facility Sub-Area, Site No. 915009, EPA ID No. NYD002134880, Lackawanna, Erie County, May 2021.

TurnKey Environmental Restoration, LLC in association with Benchmark Environmental Engineering and Science, PLLC (TK-BM). Corrective Measures Study Work Plan, Tecumseh Redevelopment Site, Lackawanna, New York. May 2009.

TurnKey Environmental Restoration, LLC in association with Benchmark Environmental Engineering and Science, PLLC (TK-BM). Corrective Measures Study Report (Final), Tecumseh Redevelopment Site, Lackawanna, New York. December 2011, revised October 2014 and May 2019.

TurnKey Environmental Restoration, LLC in association with Benchmark Environmental Engineering and Science, PLLC (TK-BM). Comprehensive Groundwater Quality Assessment Report. Tecumseh Redevelopment CMS Area, Lackawanna, New York. May 2014.

TurnKey Environmental Restoration, LLC in association with Benchmark Environmental Engineering and Science, PLLC (TK-BM). Groundwater Monitoring, Sampling, and Analysis Plan For HWMU-1 and HWMU-2. March 1994, revised May 2009 and December 2017.

TurnKey Environmental Restoration, LLC in association with Benchmark Environmental Engineering and Science, PLLC (TK-BM). Hazardous Waste Management Units (HWMUs) 1 and 2 2019 Annual Groundwater Quality Monitoring Report. Tecumseh Redevelopment CMS Area, Lackawanna, New York. November 2019.

TurnKey Environmental Restoration, LLC in association with Benchmark Environmental Engineering and Science, PLLC (TK-BM). ATP SWMU Group ECM Annual Monitoring and Maintenance Summary Report. Tecumseh Redevelopment Inc. Lackawanna, New York. May 2020.

Tecumseh Redevelopment, Inc. RCRA Facility Investigation (RFI) Report for the Former Bethlehem Steel Corporation Facility, Lackawanna, New York, Parts I through VII. October 2004.