NEW YORK STATE OF OPPORTUNITY. | Department of Environmental Conservation

STATEMENT OF BASIS CORRECTIVE MEASURES SELECTION

Bethlehem Steel (Tecumseh Redevelopment, Inc.)

OU-05 Slag Fill Area Zone 2

OU-08 Slag Fill Area Zones 4 and 5

Site No. 915009

EPA ID No. NYD002134880

City of Lackawanna, Erie County

November 2021

PREPARED BY

DIVISION OF ENVIRONMENTAL REMEDIATION

DECLARATION STATEMENT – STATEMENT OF BASIS CORRECTIVE MEASURES SELECTION

Bethlehem Steel (Tecumseh Redevelopment, Inc.)
OU-05 Slag Fill Area Zone 2
OU-08 Slag Fill Area Zones 4 and 5
State Superfund Project
Lackawanna, Erie County
Site No. 915009
EPA ID No. NYD002134880
November 2021

Statement of Purpose and Basis

This document presents the final corrective measures for a Class 2 inactive hazardous waste disposal site. The remedial program was chosen in accordance with the New York State Environmental Conservation Law and Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York (6 NYCRR) Part 373 (RCRA) and Part 375 (State Superfund) and is not inconsistent with the National Oil and Hazardous Substances Pollution Contingency Plan of March 8, 1990 (40CFR300), as amended.

This decision is based on the Administrative Record of the New York State Department of Environmental Conservation (the Department) for Operable Unit Numbers: 05 and 08 of the Bethlehem Steel site and the public's input to the proposed remedy presented by the Department. A listing of the documents included as a part of the Administrative Record is included in Appendix A of this final Statement of Basis.

Description of Selected Remedy

For OU: 05 - The elements of the selected remedy are as follows:

SWMU	Selected 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.

For OU: 08 - The elements of the selected remedy are as follows:

SWMU	Selected 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.

New York State Department of Health Acceptance

The New York State Department of Health (NYSDOH) concurs that the remedy for this site is protective of human health.

Declaration

The selected remedy is protective of human health and the environment, complies with State and Federal requirements that are legally applicable or relevant and appropriate to the remedial action to the extent practicable, and is cost effective. This remedy utilizes permanent solutions and alternative treatment or resource recovery technologies, to the maximum extent practicable, and satisfies the preference for remedies that reduce toxicity, mobility, or volume as a principal element.

11/16/2021
Date

Michael J. Ryan, P.E., Director
Division of Environmental Remediation

STATEMENT OF BASIS
CORRECTIVE MEASURES SELECTION

Bethlehem Steel (Tecumseh Redevelopment, Inc.)
OU-05 - Slag Fill Area Zone 2
OU-08 - Slag Fill Area Zones 4 and 5
City of Lackawanna, Erie County
Site No. 915009
EPA ID No. NYD002134880

SECTION 1: INTRODUCTION

The New York State Department of Environmental Conservation (Department), in consultation with the New York State Department of Health (NYSDOH), has selected 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 Statement of Basis (SB) identifies the remedy and discusses the reasons that the remedy has been selected. 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. This Statement of Basis under the RCRA program will also serve as the Record of Decision (ROD) under the State Superfund program. 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 sought input from the community on all final remedies. This was 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
Call (716) 823-0630

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 was held from May 5, 2021, through June 18, 2021.

A virtual public meeting was held on May 18, 2021, at 6:00 PM via WebEx (virtual platform). At the meeting, the findings of the RCRA Facility Investigation (RFI) and the Corrective Measures Study (CMS) were presented, along with a summary of the proposed remedies. After the presentation, a question-and-answer period was held, during which verbal or written comments were received on the Draft Statement of Basis.

Written comments were received through June 18, 2021, by:

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

The public was encouraged to review and comment on the proposed remedy. Comments are summarized and addressed in the Responsiveness Summary appended hereto (Appendix B).

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, Voluntary 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 steelmaking 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, which 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 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 9 through 13 depict aspects of the OU-05 remedy. The figures included in this document are enumerated in the following table:

Figure	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

Figure	Area of Interest
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 considered the current, intended, and reasonably anticipated future land use of the site and its surroundings while evaluating the remedies. For these Operable Units, alternatives that allow for industrial use, 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 were used.

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). This Statement of Basis under the RCRA program will also serve as the Record of Decision (ROD) under the State Superfund program. Portions of the former Bethlehem Steel property are also participating in the Brownfield Cleanup Program administered by the Department.

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
Phenolic Compounds
Polycyclic Aromatic Hydrocarbon Compounds (PAHs)
Arsenic
Barium
Cadmium
Cyanide
Lead
Mercury
Selenium

The contaminants of concern exceed the applicable SCGs for:

- soil
- groundwater

The 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 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 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 the selected 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 selected Corrective Measure is set forth in Exhibit E.

The selected remedies are referred to as the Final Corrective Measures and include:

OU-05

SWMU	Selected 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	Selected 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 selected 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 selected 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 will 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 will 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 will 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 will 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.

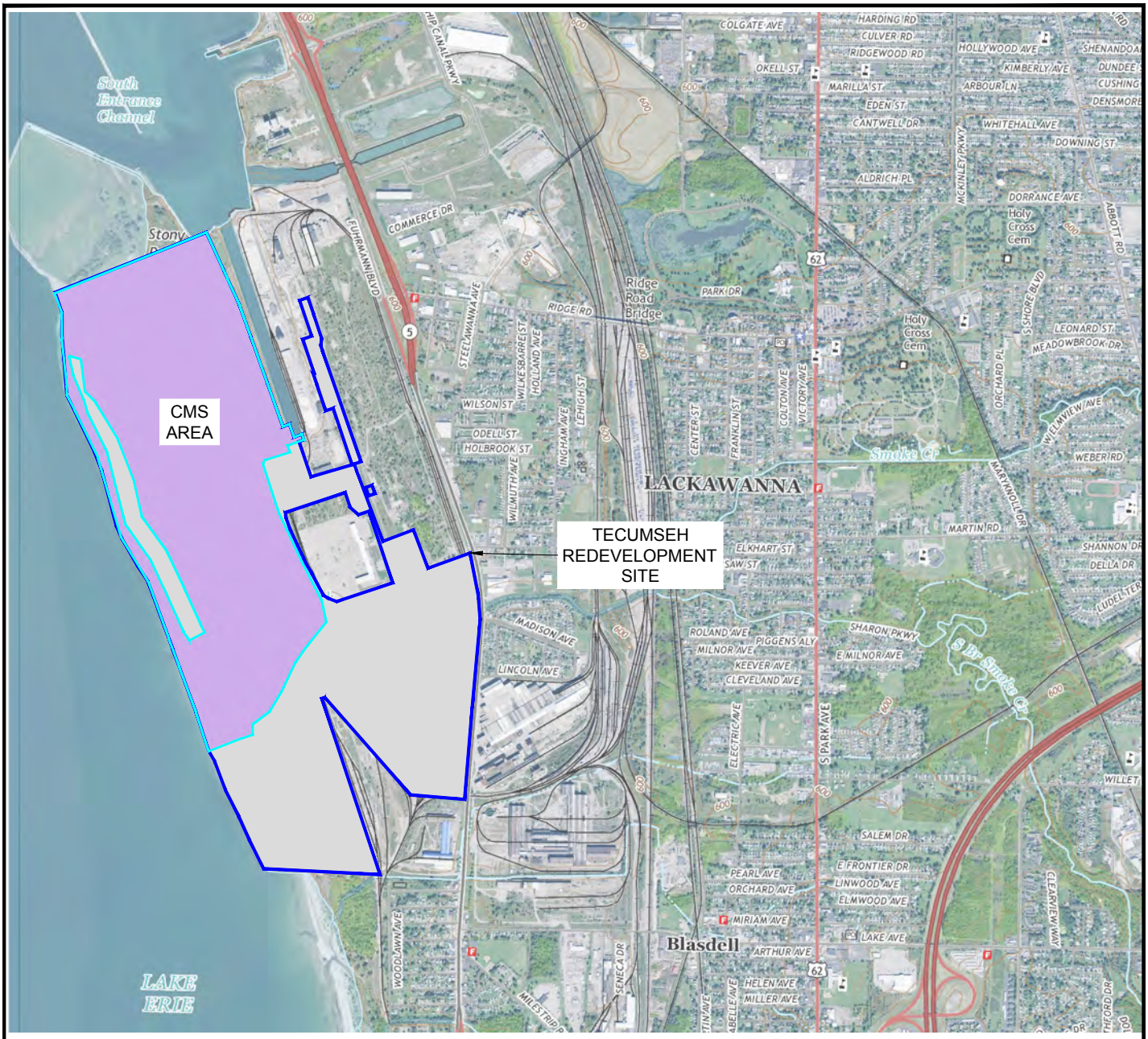
Engineering Controls: the engineered cap discussed in element 7, the shoreline revetment and stabilization discussed in element 6, the cover system discussed in element 8, and the stormwater controls discussed in element 9.

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 will 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.

LIST OF FIGURES



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

PROJECT NO.: 0071-019-111

DATE: MAY 2019

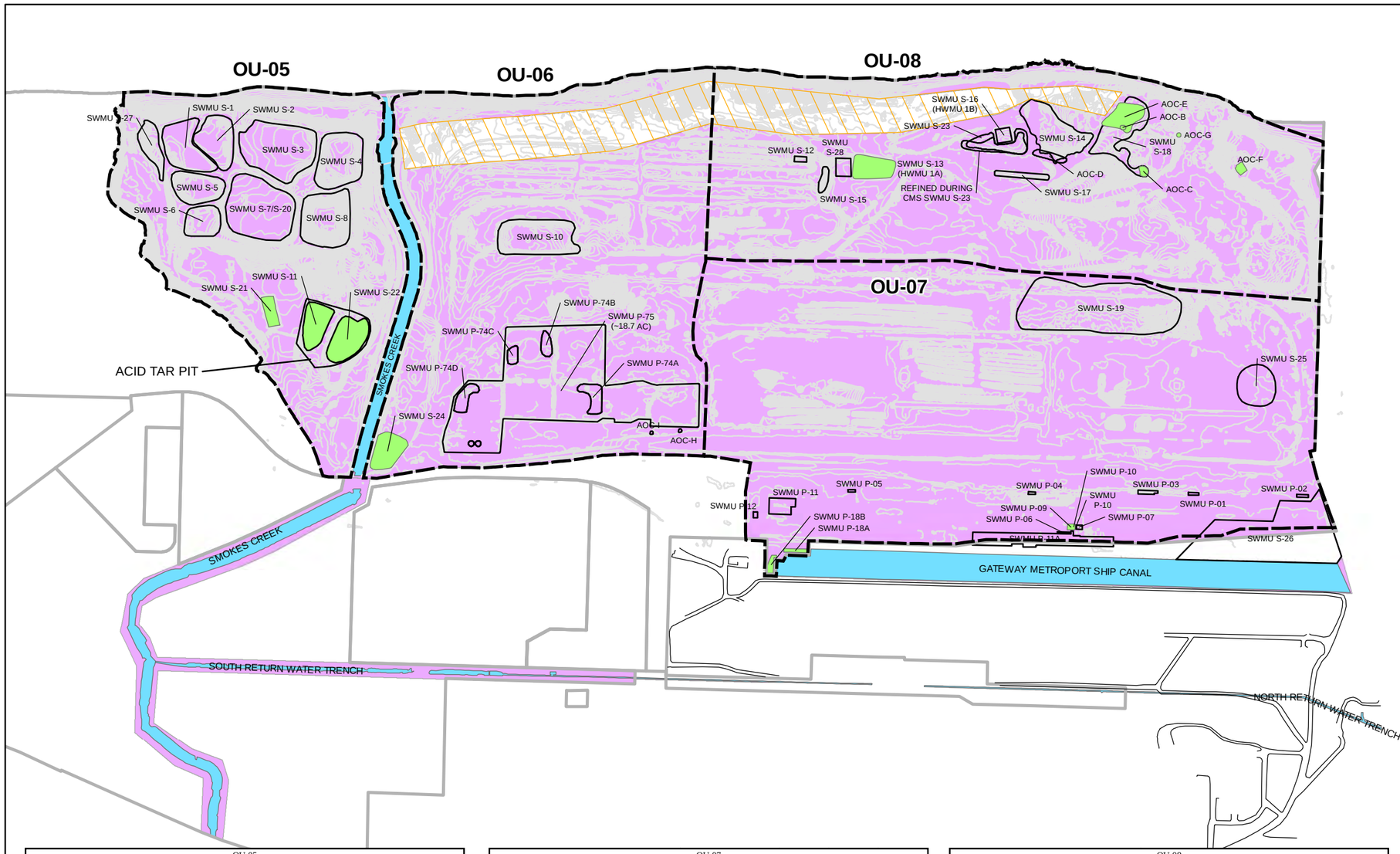
DRAFTED BY: RFL

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

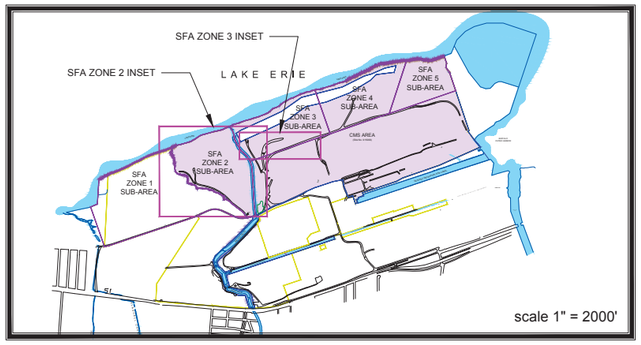
Tecumseh Redevelopment Site
Lackawanna, New York

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

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

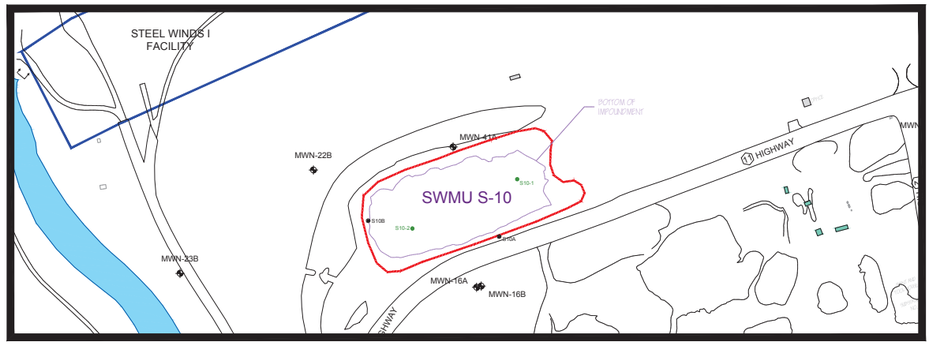
Document Path: E:\C Drive\p005664b\NYSDEC Tecumseh\MXDs\NYSDEC Tecumseh Base Map.mxd

SITE PLAN:

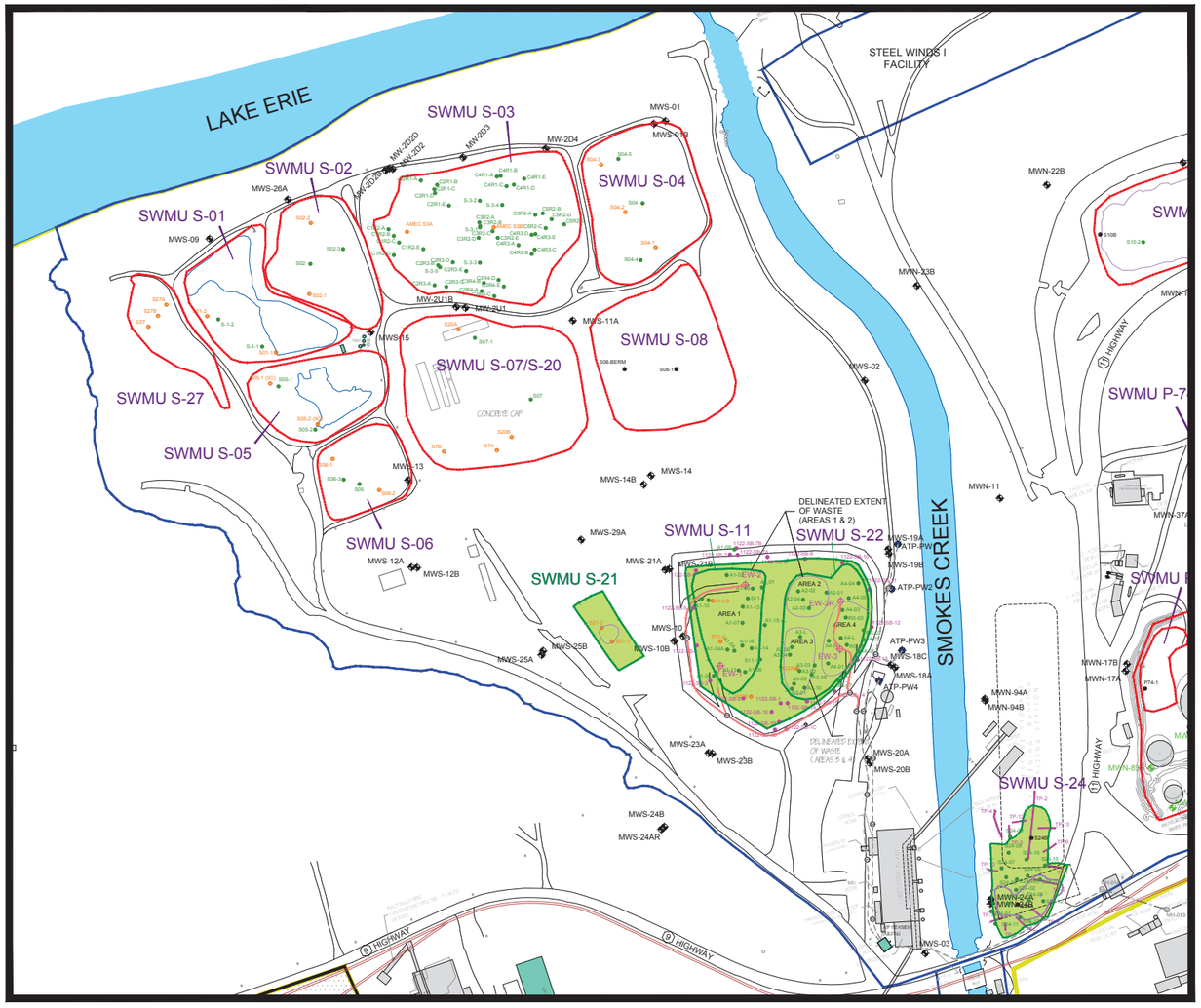


SFA ZONE 3 SWMU

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

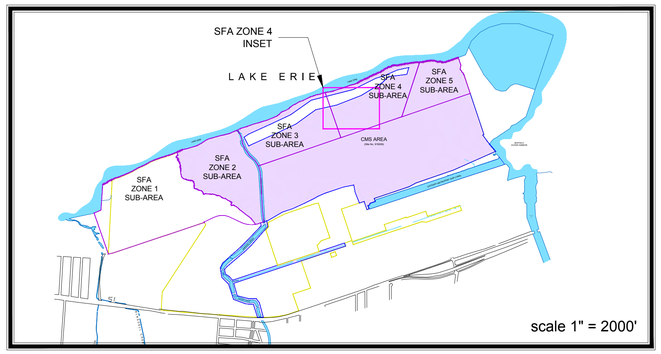
LACKAWANNA, NEW YORK

PREPARED FOR

TECUMSEH REDEVELOPMENT INC.

FIGURE 3

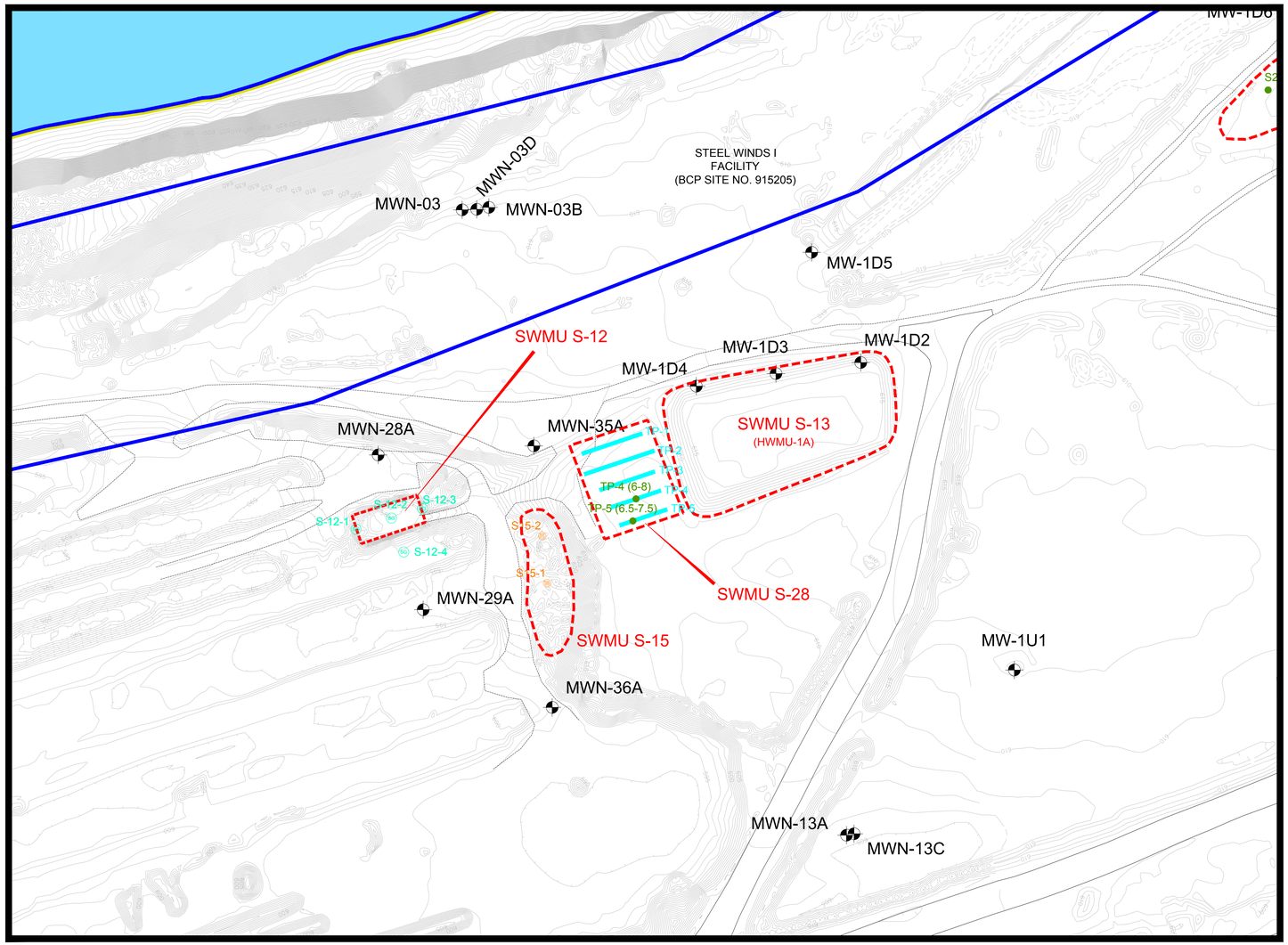
SITE PLAN:



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

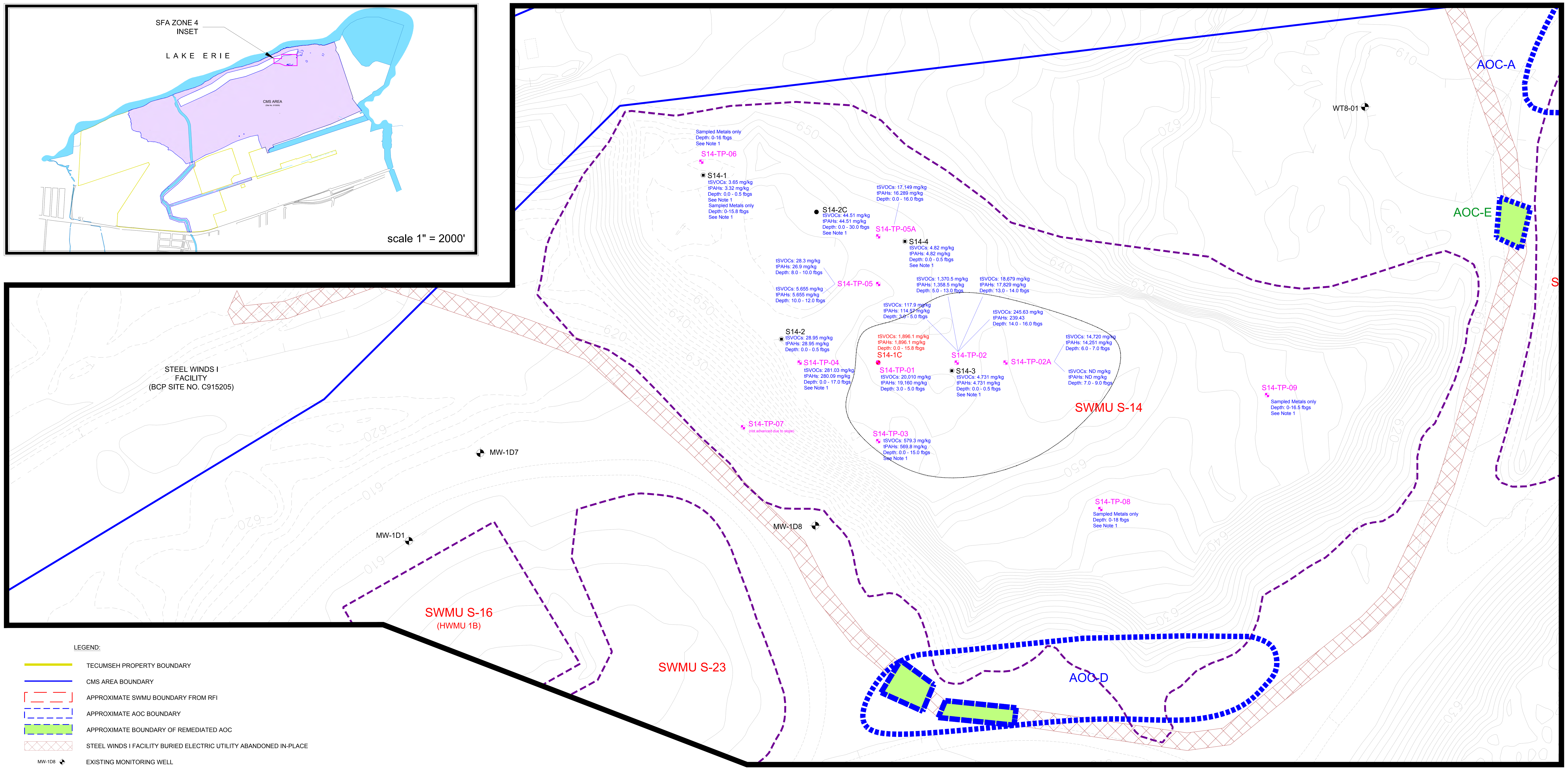
PREPARED FOR

TECUMSEH REDEVELOPMENT INC.

FIGURE 4

SITE PLAN:

SWMU S-14



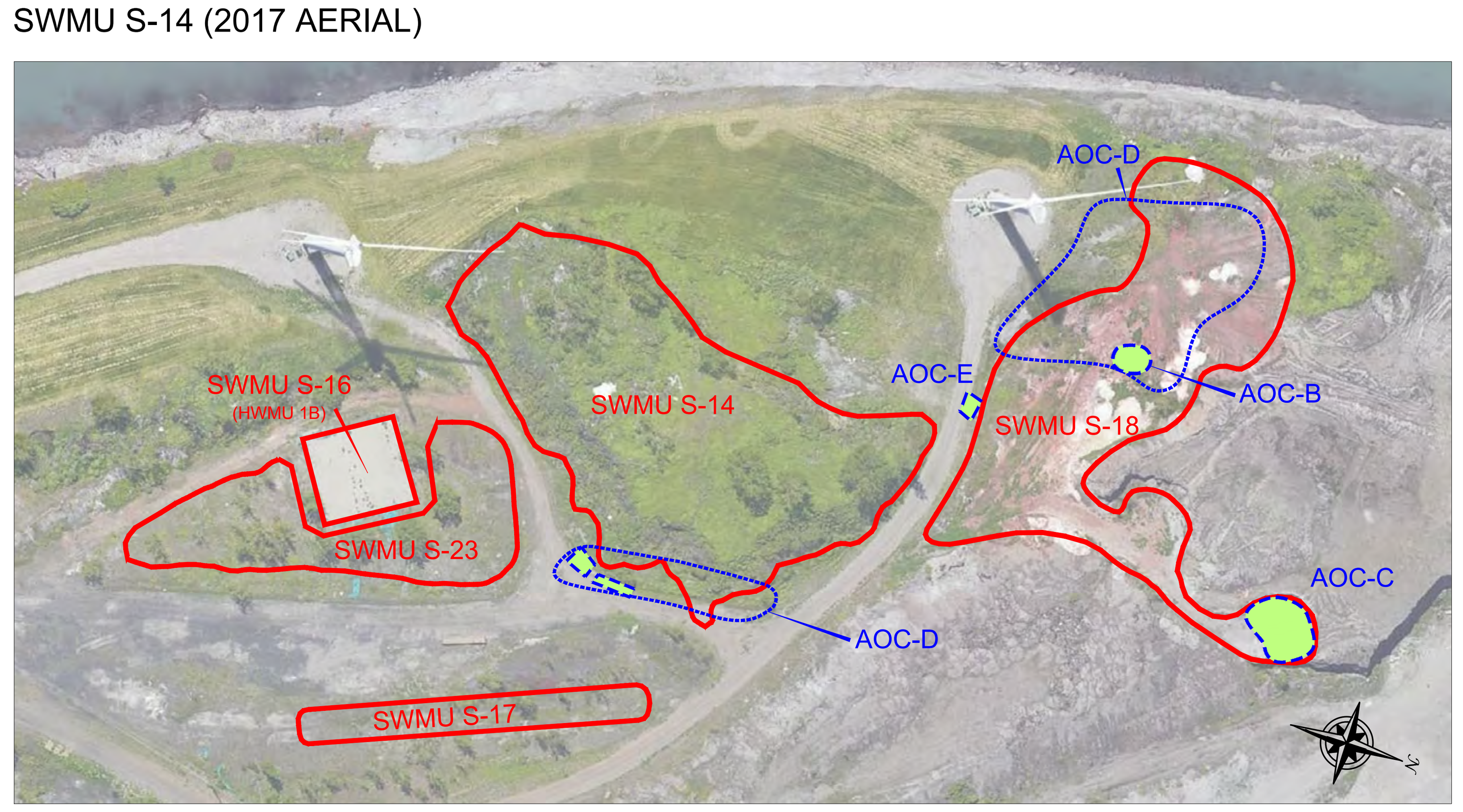
LEGEND:

- 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
- TOTAL SVOC (tSVOC) & PAH (tPAH) CONCENTRATIONS IN SOIL/FILL (MILLIGRAMS PER KILOGRAM) & SAMPLE INTERVAL (FEET BELOW GROUND SURFACE)

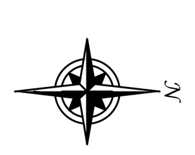
NOTES:
1. THERE WERE NO EXCEEDANCES OF THE SSAL OR INDUSTRIAL SOIL CLEANUP OBJECTIVES FOR METALS AT THE LOCATIONS NOTED.

REPRESENTATIVE PHOTOGRAPHS:

SWMU S-14 (2017 AERIAL)



SWMU S-14 (looking north)



30' 0' 30' 60'
SCALE: 1 INCH = 30 FEET
SCALE IN FEET
(approximate)

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

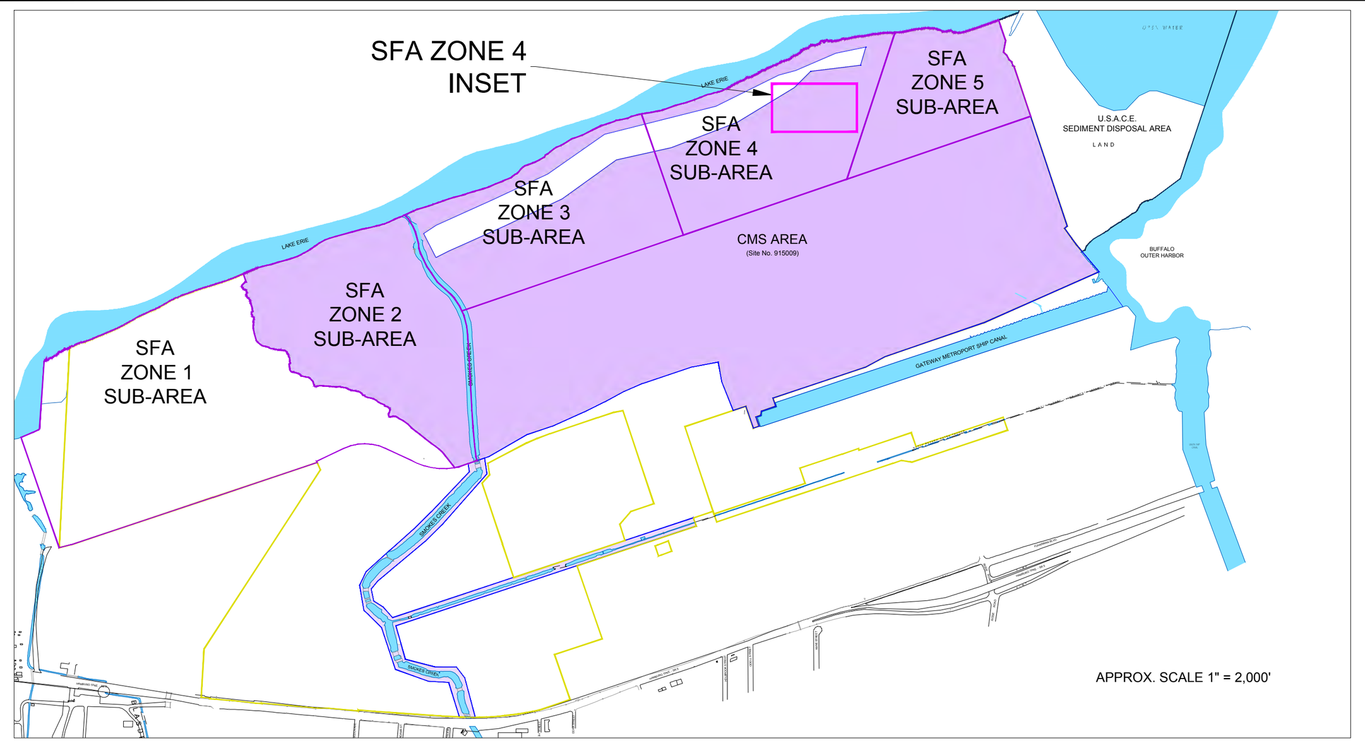
LACKAWANNA, NEW YORK

PREPARED FOR

TECUMSEH REDEVELOPMENT INC.

JOB NO.: 0071-017-111

FIGURE 5

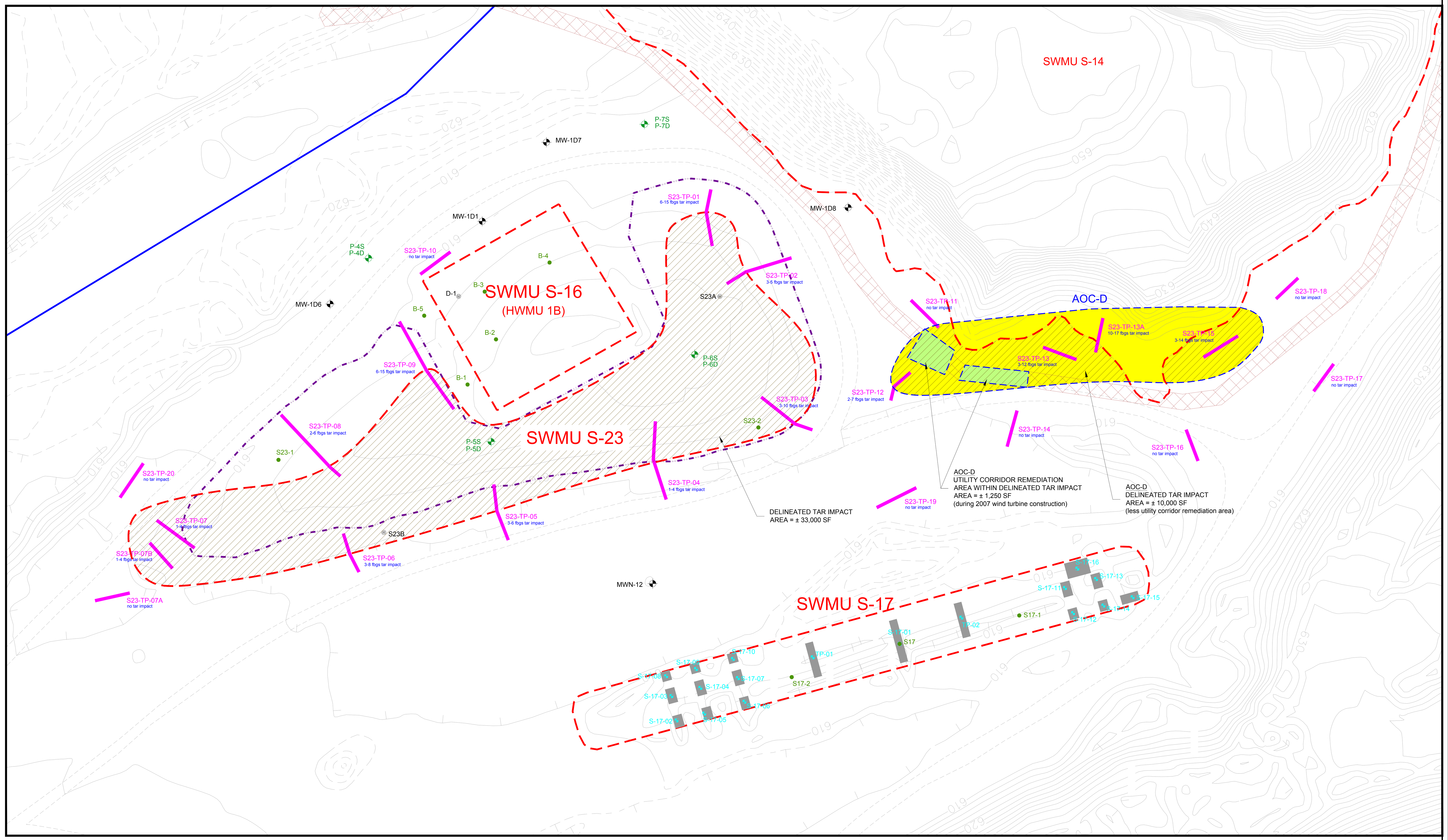


LEGEND:

- 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
- P-4S P-4D EXISTING PIEZOMETER
- S23B D-1 RFI WASTE SAMPLE
- S23-1 B-1 RFI BORING
- TP-2 RFI TEST PIT
- MWN-12 GROUNDWATER MONITORING WELL
- SFA BOUNDARY

40' 0' 40' 80'

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

APPROX. LIMITS S-17

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TURNKEY ENVIRONMENTAL RESTORATION, LLC

JOB NO.: 0071-017-111

REVISIONS

NO.	BY	DATE	REMARKS

SEAL

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

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

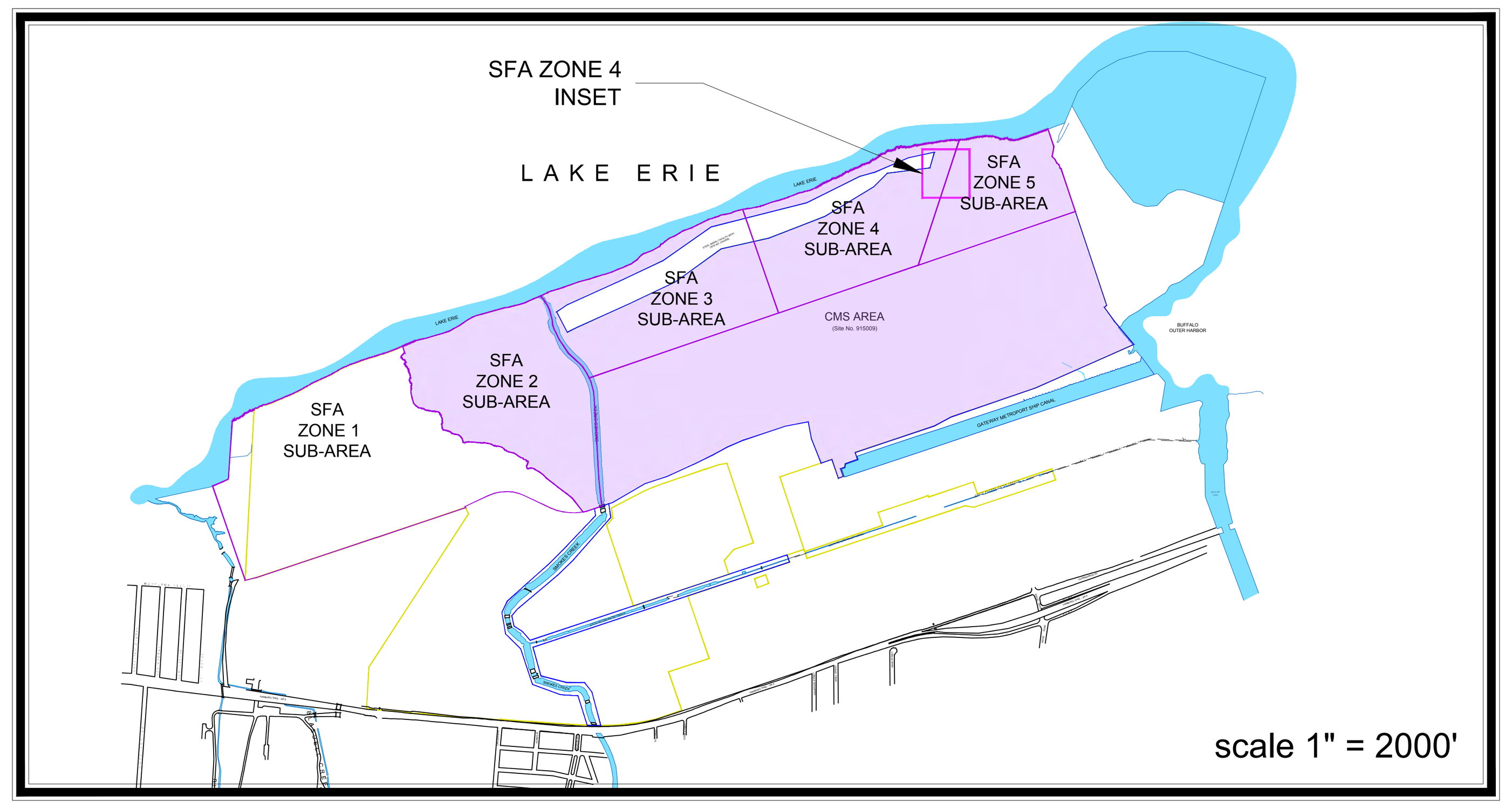
LACKAWANNA, NEW YORK

PREPARED FOR

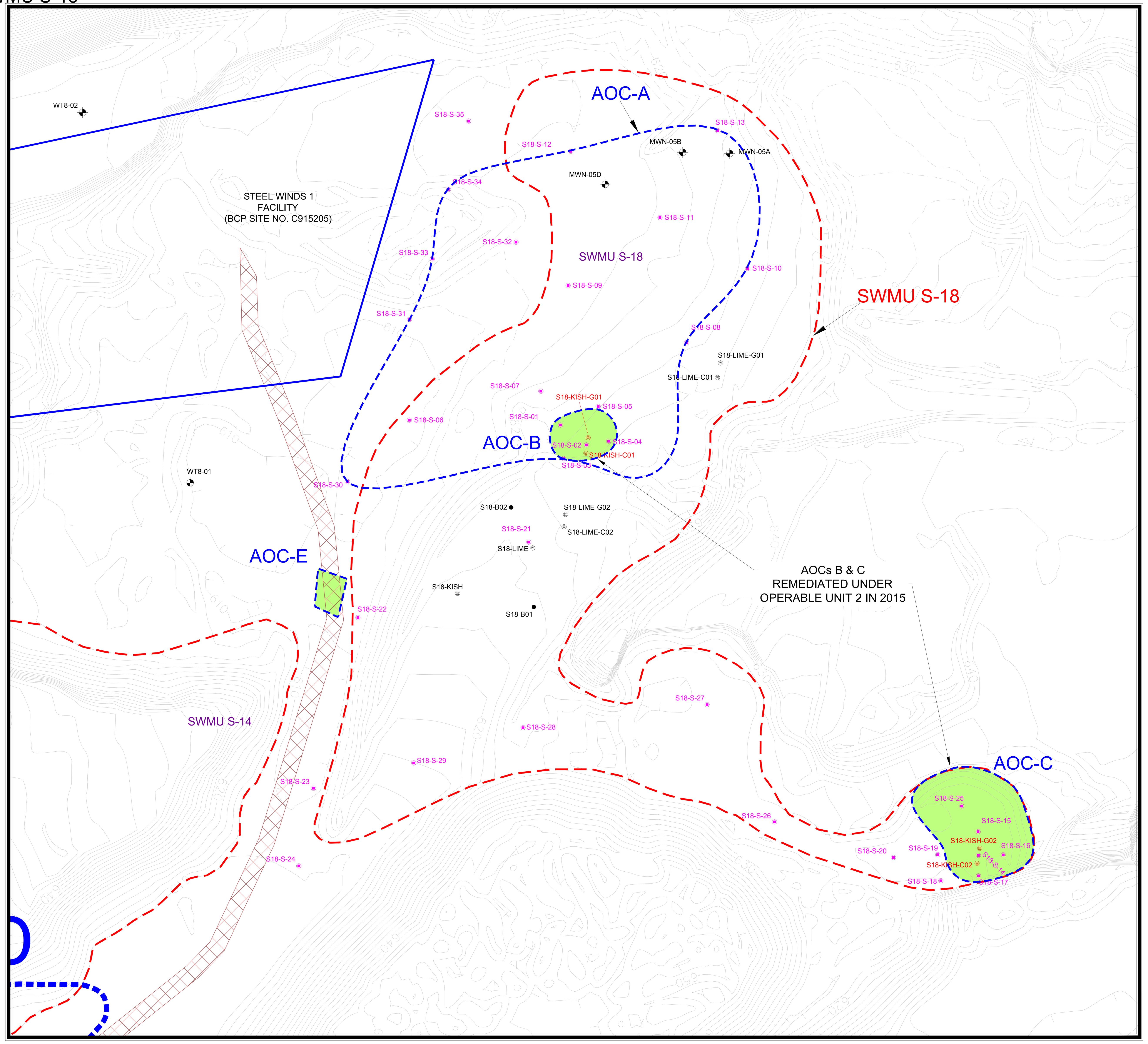
TECUMSEH REDEVELOPMENT INC.

FIGURE 6

SITE PLAN:



SWMU S-18

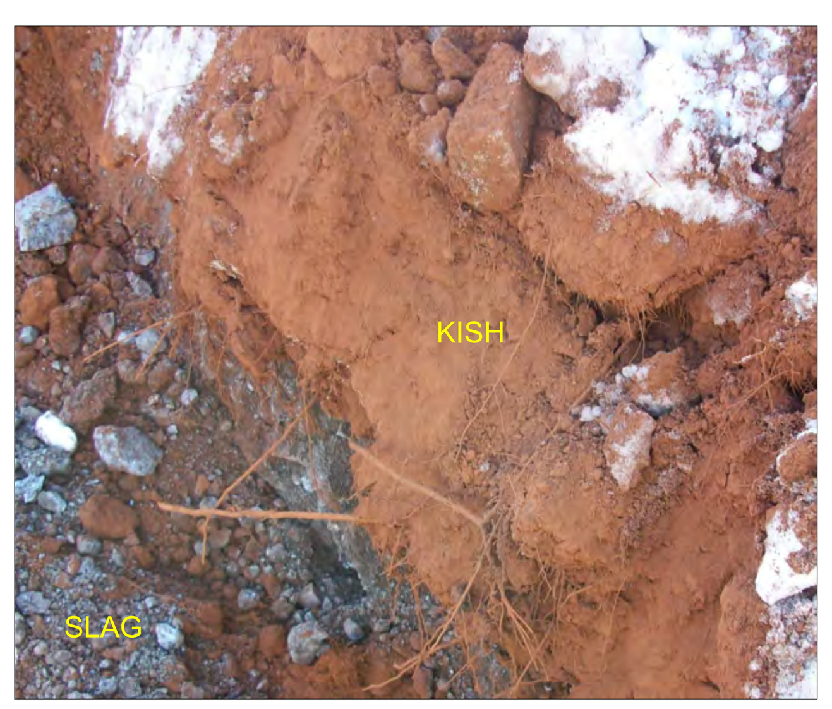


REPRESENTATIVE PHOTOGRAPHS:

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

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

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TURNKEY ENVIRONMENTAL RESTORATION, LLC

JOB NO.: 0071-017-111

REVISIONS

NO.	BY	DATE	REMARKS

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

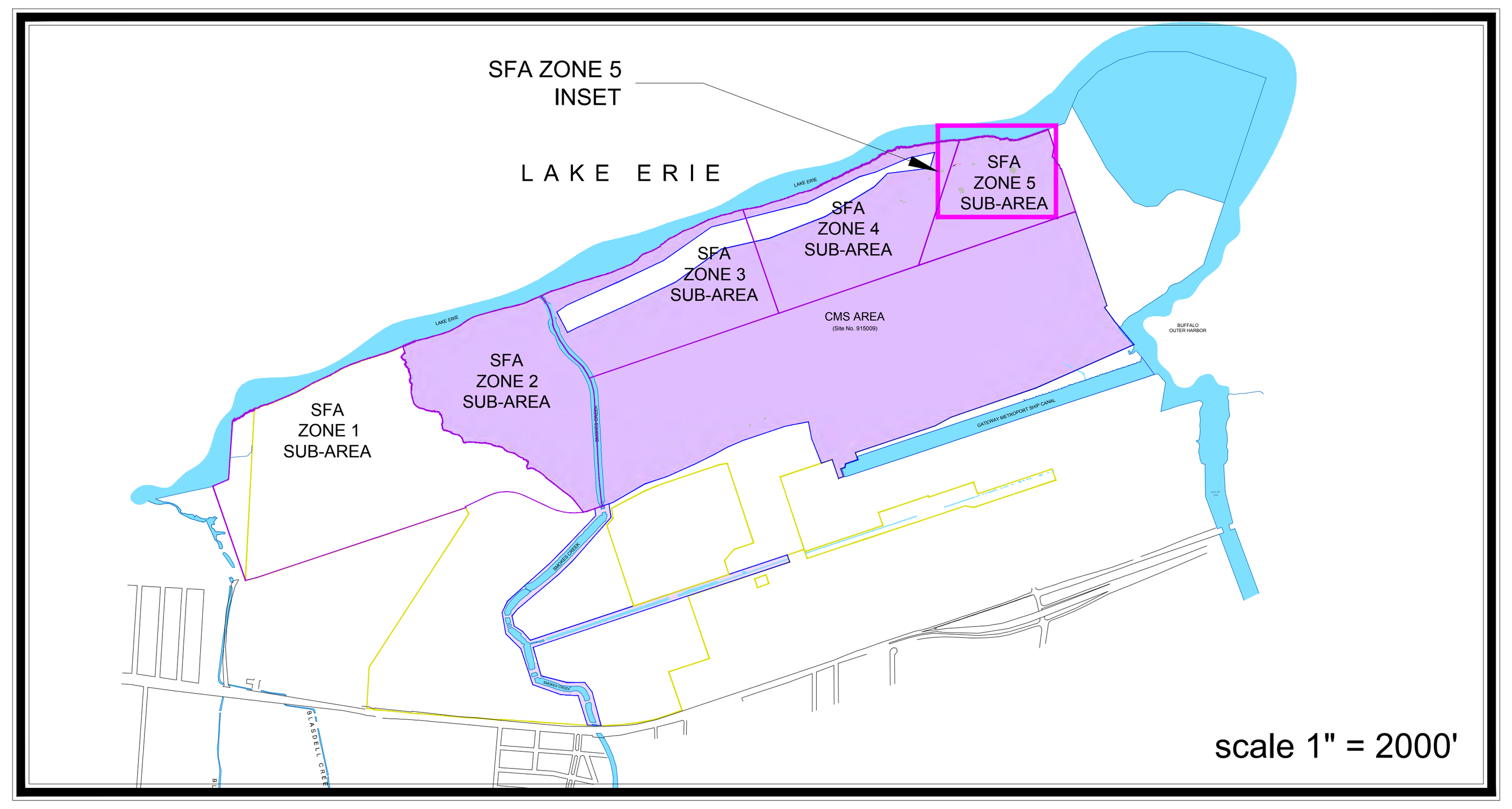
CMS AREA - FORMER BETHLEHEM STEEL SITE
LACKAWANNA, NEW YORK

PREPARED FOR

TECUMSEH REDEVELOPMENT INC.

FIGURE 7

SITE PLAN:



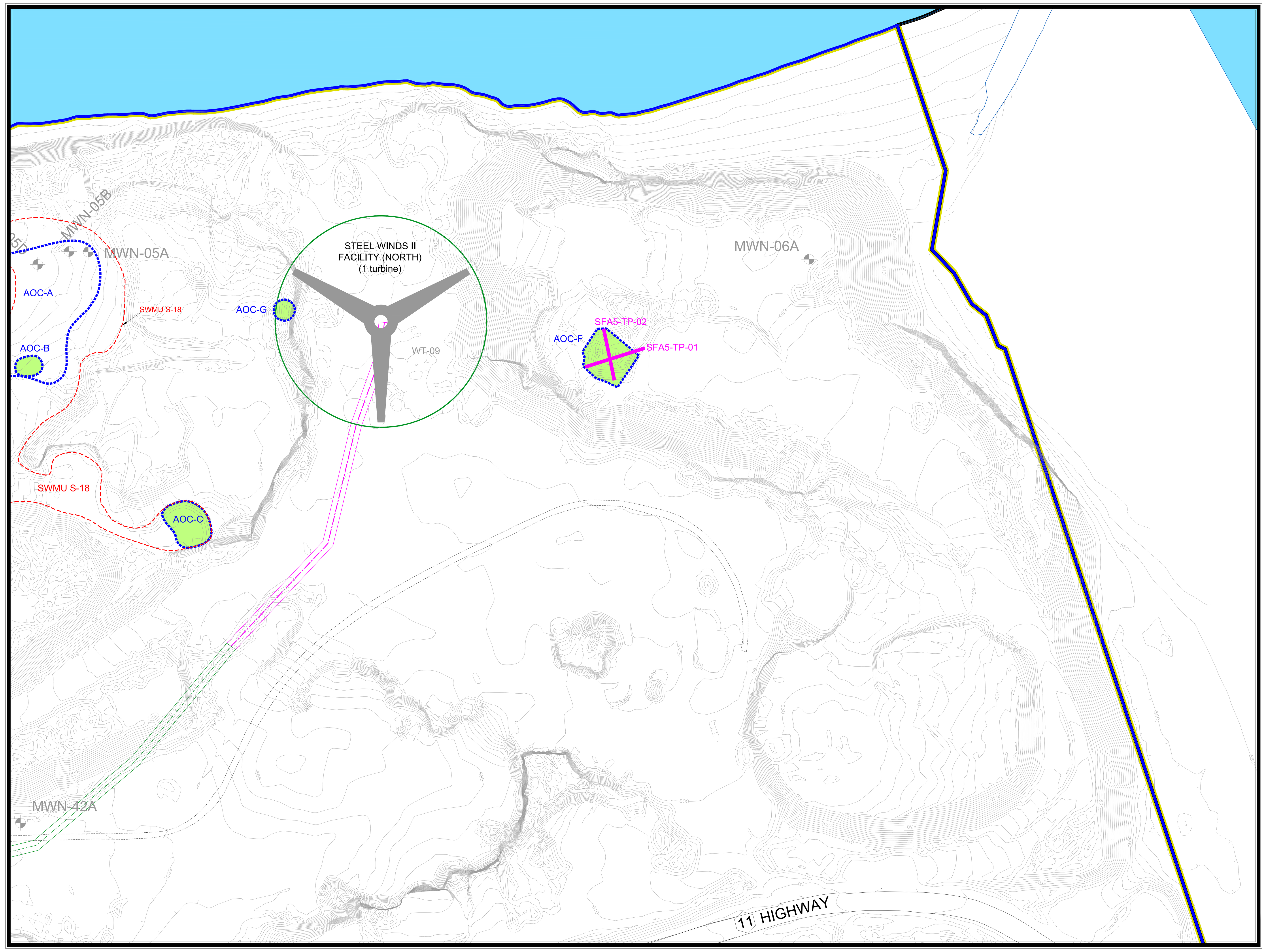
LEGEND:

- 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
- EXISTING MONITORING WELL
- 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



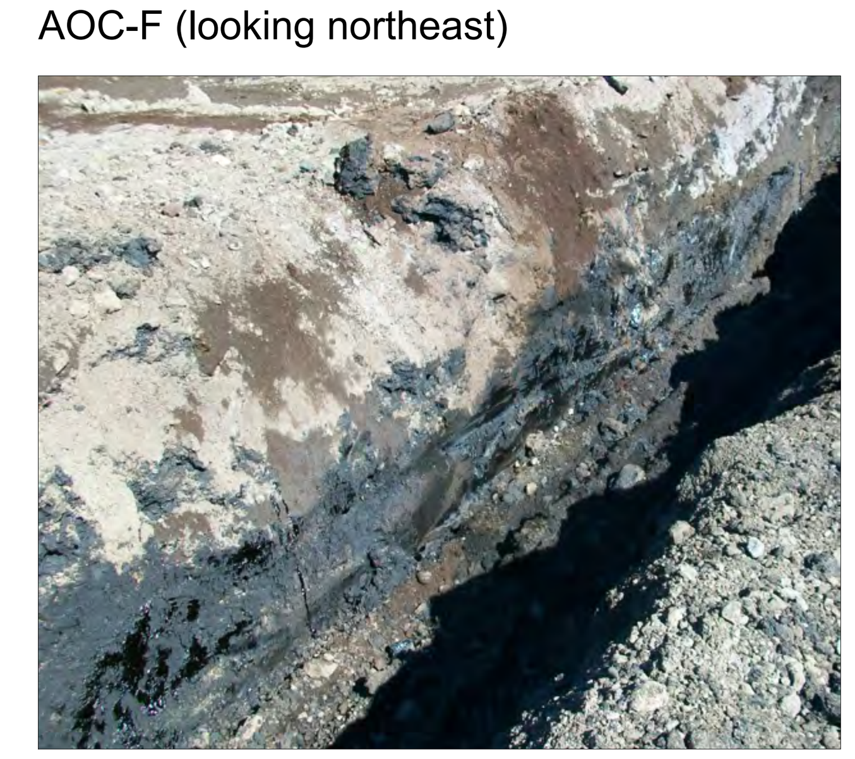
REPRESENTATIVE PHOTOGRAPHS:

SFA ZONE 5 (AERIAL)
GOOGLE EARTH MAY 2017

AOC-F (looking south)

AOC-F (looking southeast)

AOC-F (looking northeast)



BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TURNKEY ENVIRONMENTAL RESTORATION, LLC

JOB NO.: 0071-017-111

REVISIONS

NO.	BY	DATE	REMARKS

SEAL

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

DISCLAIMER:
PROPERTY OF BENCHMARK EES, PLLC. IMPORTANT: THIS DRAWING PRINT IS LOANED FOR MUTUAL ASSISTANCE AND AS SUCH IS SUBJECT TO RECALL AT ANY TIME. INFORMATION CONTAINED HEREON IS NOT TO BE DISCLOSED OR REPRODUCED IN ANY FORM FOR THE BENEFIT OF PARTIES OTHER THAN NECESSARY SUBCONTRACTORS & SUPPLIERS WITHOUT THE WRITTEN CONSENT OF BENCHMARK EES, PLLC.

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

CMS REPORT

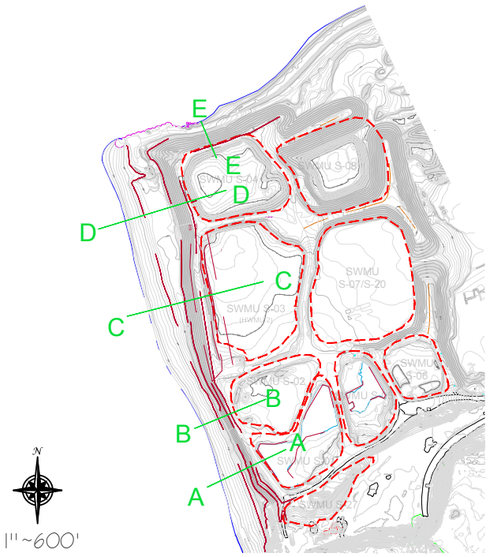
CMS AREA - FORMER BETHLEHEM STEEL SITE

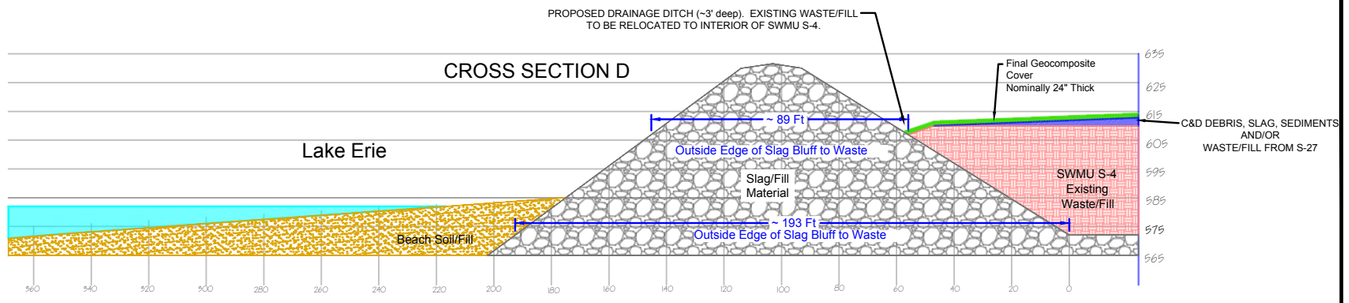
LACKAWANNA, NEW YORK

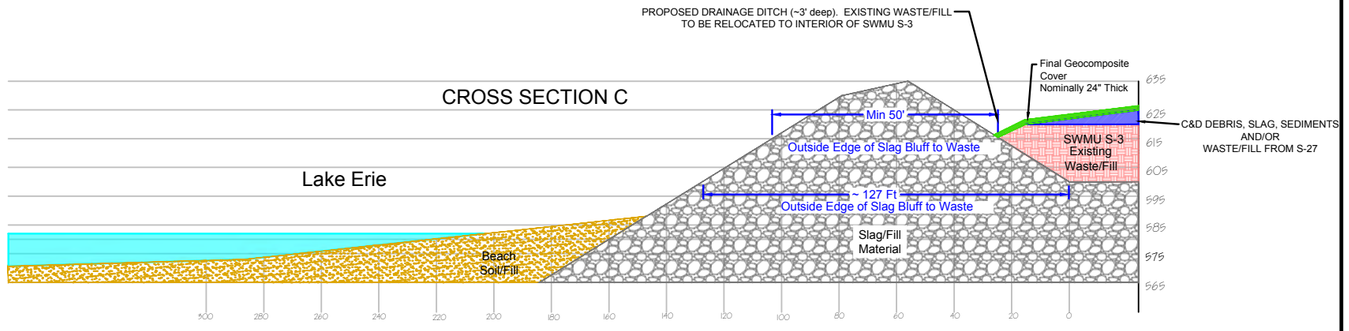
PREPARED FOR

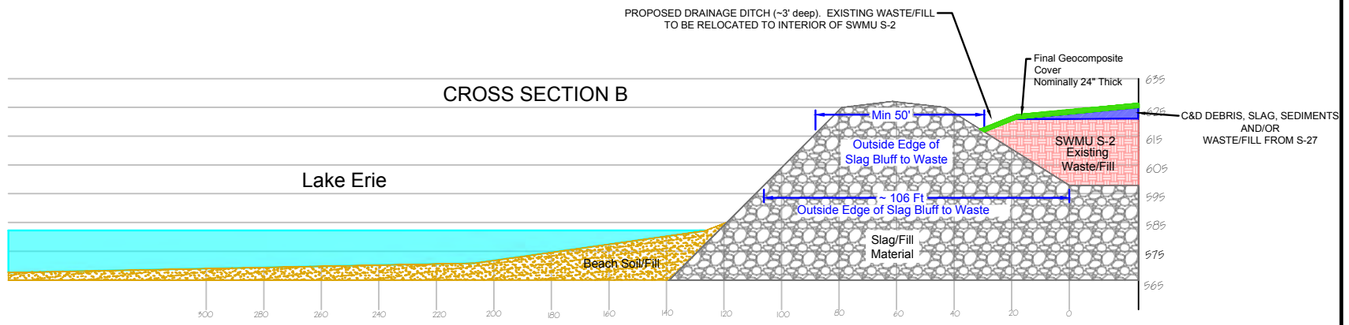
TECUMSEH REDEVELOPMENT INC.

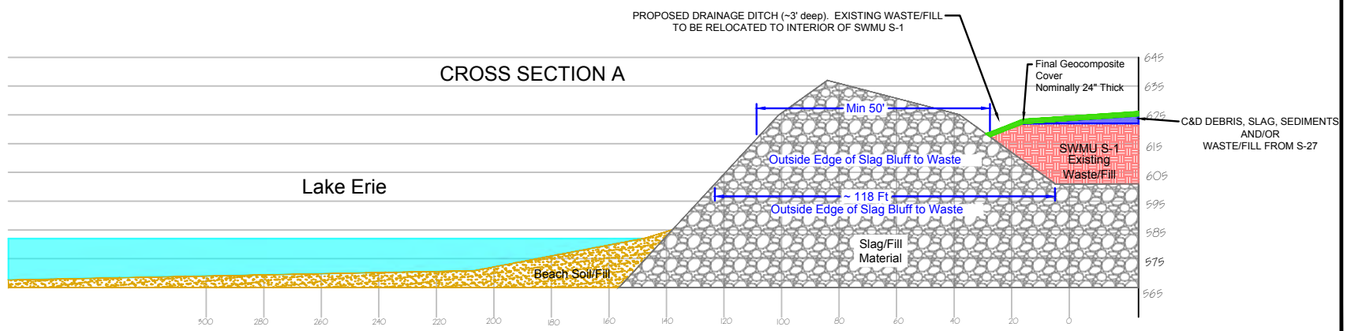
FIGURE 8











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

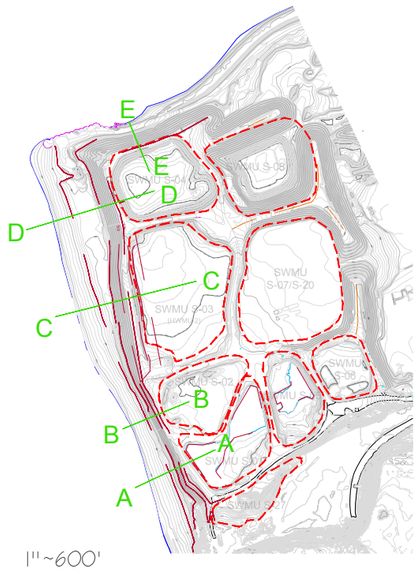
CROSS SECTIONS SFA ZONE 2 (WEST SLOPE)

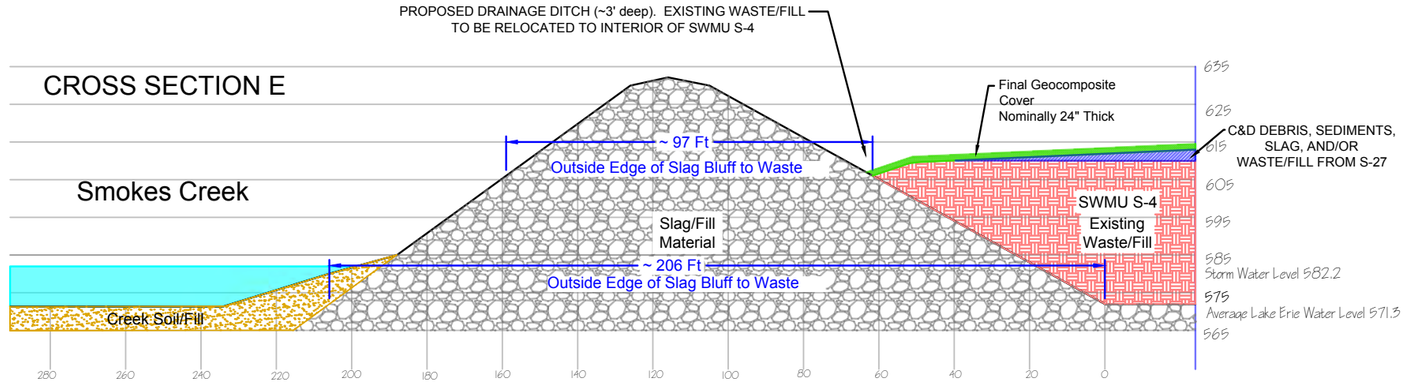
CMS REPORT

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.
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 (NORTH SLOPE)

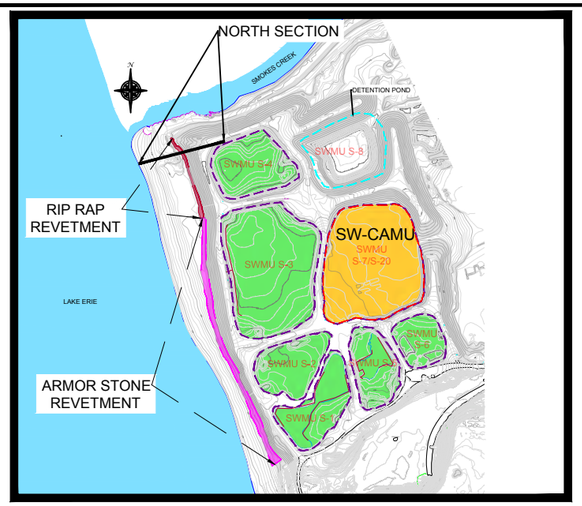
CMS REPORT

CMS AREA - FORMER BETHLEHEM STEEL SITE
LACKAWANNA, NEW YORK

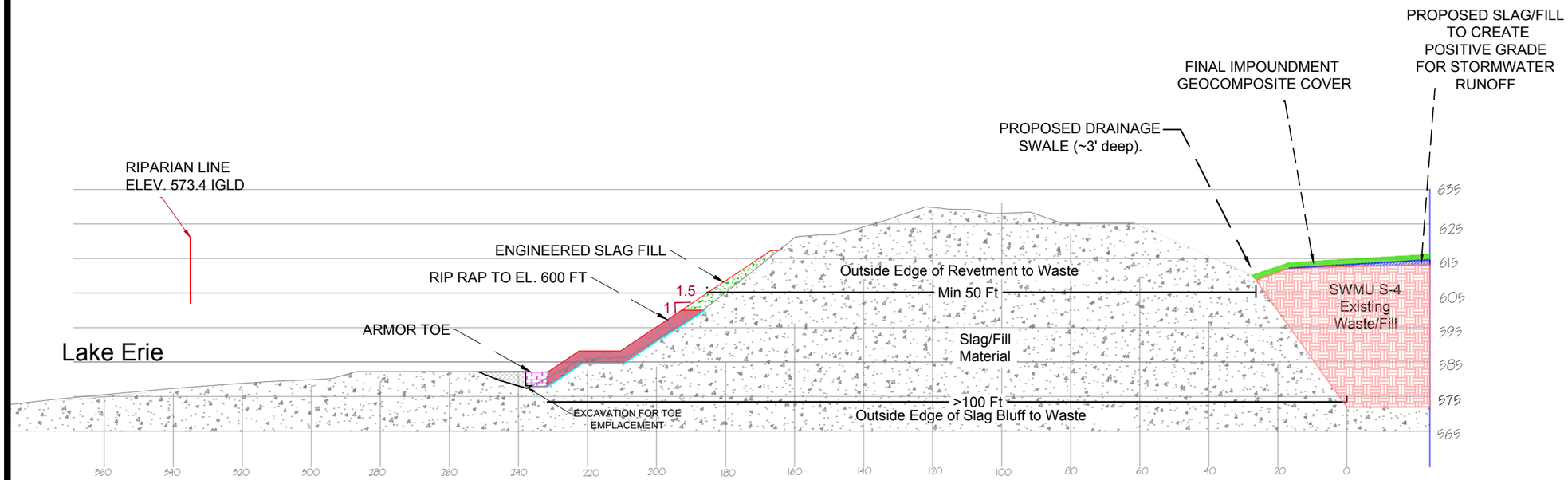
PREPARED FOR
TECUMSEH REDEVELOPMENT INC.

FIGURE 10

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



NORTH SECTION



DATE: MAY 2019
DRAFTED BY: RFL

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TURNKEY ENVIRONMENTAL RESTORATION, LLC

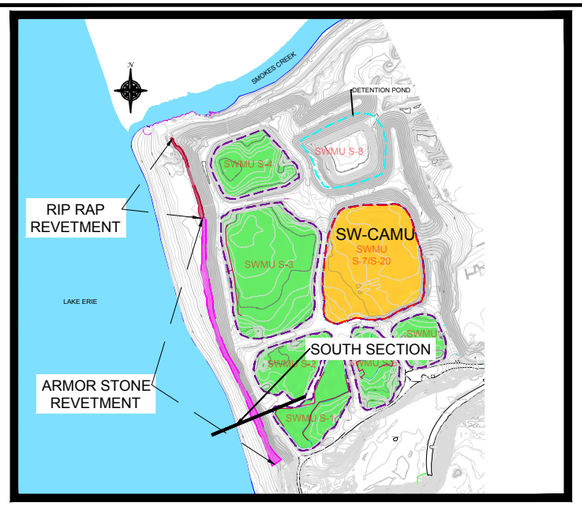
JOB NO.: 0071-019-111

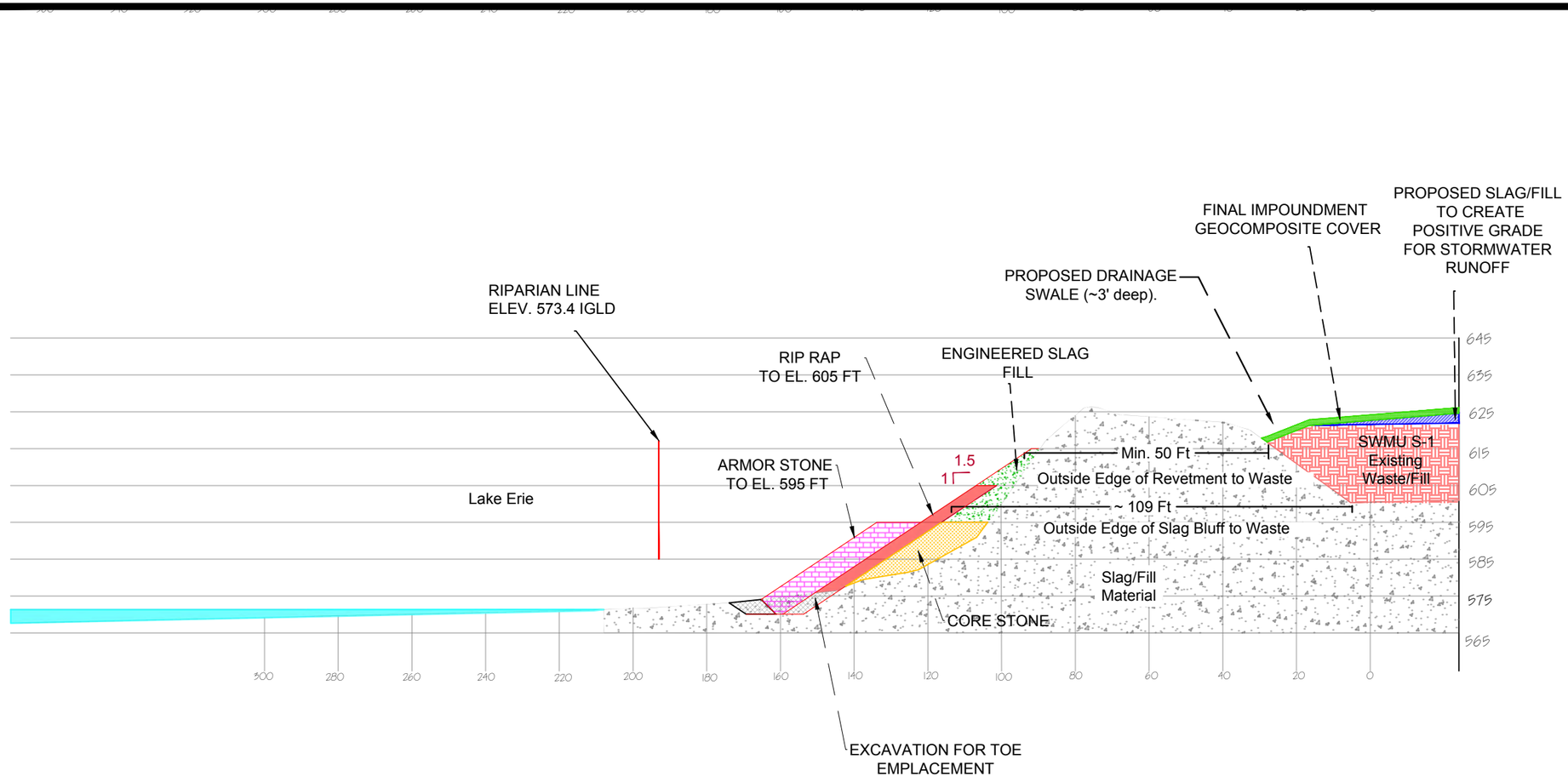
PROPOSED WESTERN REVETMENT
NORTHERN SECTION
CMS REPORT
TECUMSEH REDEVELOPMENT SITE
LACKAWANNA, NEW YORK
PREPARED FOR
TECUMSEH REDEVELOPMENT INC.

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

SEAL

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

STATEMENT OF BASIS

Exhibits A through E

Bethlehem Steel
(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

November 2021

Exhibit A **Nature and Extent of Contamination**

Exhibit B **Summary of the Cleanup Objectives**

Exhibit C **Description of Corrective Measures Alternatives**

Exhibit D **Corrective Measures Alternatives Costs**

Exhibit E **Summary of the Final Corrective Measures**

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).

A1. Soil

A1.1. 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 approximately 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 approximately 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 approximately 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 approximately 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 approximately 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 approximately 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 approximately 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 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).

A1.2. 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, which 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
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.

A2. Groundwater

A2.1 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
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

Detected Constituents	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)	Frequency Exceeding SCG
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, which are compared to the NYSDEC screening values.
c - groundwater standard applies to the sum of phenolic compounds
*Non-Enforceable Screening Level.

A2.2 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
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

Detected Constituents	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)	Location of Maximum Detection
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

Contaminant	Commercial Soil Cleanup Objective[1]	Industrial Cleanup Soil Objective[2]	Protection of Groundwater Soil Cleanup Objective[3]
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
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 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 Selected Final Corrective Measure(s)

The Department has selected the following remedy as the final corrective measures for the OU-05 and OU-08 SWMUs/AOCs at this facility:

Alternative 3 - Excavation, Solidification/Stabilization, Consolidation and/or Off-Site Disposal, along with Closure In-Place of OU-5 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.

The 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 truckloads) 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 were evaluated. A responsiveness summary has been prepared that describes public comments received and the manner in which the Department will address the concerns raised (Appendix ?).

Alternative 3 has been selected 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.

STATEMENT OF BASIS

Appendices A through B

Bethlehem Steel
(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

November 2021

Appendix A Administrative Record

Appendix B Responsiveness Summary

APPENDIX A

Administrative Record

ADMINISTRATIVE RECORD

Bethlehem Steel (Tecumseh Redevelopment, Inc.)

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

Site No. 915009
EPA ID No. NYD002134880

Lackawanna, Erie County

Canada and the United States of America. 1987. Niagara River Area of Concern (AOC), *Agreement between Canada and the United States of America on Great Lakes Water Quality,1978*, done at Ottawa on 22 November 1978, as amended on October 16, 1983, and on November 18, 1987.

City of Lackawanna. 2016. *Comprehensive Plan Update*. July 6. 2016.

City of Lackawanna. 2018. *Local Waterfront Revitalization Program, Preliminary Draft*. May 2018.

National Oceanic and Atmospheric Administration (NOAA). 2013. *Great Lakes Coastal Resilience Planning Guide*. Collaborative effort of the NOAA Digital Coast partnership and additional community-based partners from the Great Lakes. https://coast.noaa.gov/digitalcoast/training/gl-resilience.html

NOAA and the Coastal States Organization program to identify the most critical coastal habitat projects and data needs in each of the eight Great Lakes states, 2019.

New York State Department of Environmental Conservation (NYSDEC). 1998. *Division of Water Technical and Operational Guidance Series 1.1.1 Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations*. June 1998.

NYSDEC. 2009. *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.

NYSDEC. 2010. DER-10 *Technical Guidance for Site Investigation and Remediation*. Issued May 3, 2010.

NYSDEC. 2014. *New York's Great Lakes Basin: Interim Action Agenda*. Coordinated by New York State Department of Environmental Conservation Great Lakes Watershed Program In partnership with state and federal agencies, municipalities, academic institutions, non-profits, and community partners throughout NYS's Great Lakes basin. July 2014.

NYSDEC's Great Lakes Program, including Great Lakes Regional Collaboration Strategy, Be Green in the Great Lakes Project, Great Lakes Action Agenda, and Lake-wide Action and Management Plans, ongoing initiatives.

NYSDEC. 2021a. *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 5, 2021.

NYSDEC. 2021b. *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 5, 2021.

NYSDEC. 2021c. *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 5, 2021.

New York State Department of State. 1987. *Designated Habitat: Smoke Creek Shoals, Coastal Fish and Wildlife Habitat*. Department of State, Designated: October 15, 1987.

Pearsall, D., P. Carton de Grammont, C. Cavalieri , C. Chu, P. Doran, L. Elbing, D. Ewert, K. Hall, M. Herbert, M. Khoury, D. Kraus, S. Mysorekar, J. Paskus and A. Sasson. 2012. *Returning to a Healthy Lake: Lake Erie Biodiversity Conservation Strategy. Technical Report.* A joint publication of The Nature Conservancy, Nature Conservancy of Canada, and Michigan Natural Features Inventory. 340 pp. with appendices.

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

TurnKey Environmental Restoration, LLC, in association with Benchmark Environmental Engineering and Science, PLLC (TK-BM). 1994. *Groundwater Monitoring,*

Sampling, and Analysis Plan For HWMU-1 and HWMU-2. March 1994, revised May 2009 and December 2017.

TK-BM . 2009. *Corrective Measures Study Work Plan, Tecumseh Redevelopment Site, Lackawanna, New York*. May 2009.

TK-BM. 2011. *Corrective Measures Study Report (Final), Tecumseh Redevelopment Site, Lackawanna, New York*. December 2011, revised October 2014 and May 2019.

TK-BM. 2014. *Comprehensive Groundwater Quality Assessment Report. Tecumseh Redevelopment CMS Area, Lackawanna, New York*. May 2014.

TK-BM. 2019. *Hazardous Waste Management Units (HWMUs) 1 and 2 2019 Annual Groundwater Quality Monitoring Report. Tecumseh Redevelopment CMS Area, Lackawanna, New York*. November 2019.

TK-BM. 2020. *ATP SWMU Group ECM Annual Monitoring and Maintenance Summary Report. Tecumseh Redevelopment Inc. Lackawanna, New York*. May 2020.

U.S. Army Corps of Engineers. 2013. *Project Modifications for Improvement of the Environment*, Section 1135 of the 1986 Water Resources Development Act, as amended (P.L. 99-662), Scoping Information. May 7, 2013.

U.S. Environmental Protection Agency (USEPA). 1988. *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA* (EPA l540lG-891004).

USEPA. 1993. *Corrective Action Management Units (CAMUs) and Temporary Units (TUs)*. Promulgated on February 16, 1993. (EPA amended the 1993 CAMU rule in 2002).

USEPA. 1996. *A Guide to Developing and Documenting Cost Estimates During the Feasibility Study*. EPA 542-F-96-007. EPA Office of Solid Waste and Emergency Response. April 1996.

URS Consultants, Inc. 2004. *RCRA Facility Investigation (RFI) Report for the Former Bethlehem Steel Corporation Facility, Lackawanna, New York*. October 2004.

APPENDIX B
RESPONSIVENESS SUMMARY

RESPONSIVENESS SUMMARY

Bethlehem Steel (Tecumseh Redevelopment, Inc.)

Operable Units 1, 5, 6, 7, 8, 9 and 10
Resource Conservation and Recovery Act/State Superfund Project

Site No. 915009
EPA ID No. NYD002134880

City of Lackawanna, Erie County

The proposed Statements of Basis for the Bethlehem Steel site were prepared by the New York State Department of Environmental Conservation (the Department, or NYSDEC) in consultation with the New York State Department of Health (NYSDOH). The Statements of Basis outlined the remedial measures proposed for the Bethlehem Steel site for the contaminated soil, groundwater, watercourses and soil vapor on-site and off-site, the demolition of dangerous or unusable structures on-site, and the creation of public access.

The release of the proposed Statements of Basis (SB) was announced by sending a notice to the public contact list and informing the public of the opportunity to comment on the proposed amended remedy.

To limit the community spread of COVID-19, Governor Cuomo issued Executive Order 202.15 suspending in-person public meetings relating to proposed site remedies. Accordingly, a virtual public meeting was conducted on May 18, 2021. As part of its commitment to provide the public with ample opportunity to give input on the proposed remedies, the Department encouraged the public to provide comments either electronically or by mail to the Department's Project Manager, during the 45-day public comment period. The public comment period for the Proposed Amendment ended on June 18, 2021.

This responsiveness summary responds to all questions and comments raised during the public comment period. The following are the comments received, with the Department's responses:

COMMENT 1: The Erie County Department of Environment and Planning has reviewed the NYSDEC and New York State Department of Health Draft Statements of Basis (SB)

regarding the proposed remedy at the former Bethlehem Steel site in Lackawanna, dated May 5, 2021. Erie County is supportive of the site's remediation and transformation into a development ready site. The County along with partners at the City, State and Federal government have invested millions into the pre-development work and construction of roads and utility infrastructure to attract economic development to the Buffalo Erie County Industrial and Land Development Corporation (ILDC) owned parcels contiguous to the subject site. Erie County will continue to work collaboratively with current stakeholders as well as NYSDEC and Tecumseh to expand redevelopment within the Bethlehem Site.

The County's commitment to the redevelopment of sections of the former Bethlehem Steel site currently, and soon to be, in ILDC ownership is setting the stage for the redevelopment of other areas in Tecumseh ownership for economic development. The County desires that the parcels subject to the proposed remedy be made development ready to reduce the costs of future redevelopment, increase the likelihood the sites will be redeveloped and accelerate the site's productive re-use creating jobs and advancing regional economic development. Towards this end, Erie County appreciates NYSDEC's willingness to allow for consolidation of non-hazardous materials in an approved on-site Corrective Action Management Unit (CAMU) as this will facilitate the remediation and ultimate return of the site to productive reuse.

For over 100 years, City of Lackawanna residents lacked public access to their waterfront. The inclusion of both the proposed Shoreline Trail extension through the Tecumseh property and the proposed open space area at the delta of the Smokes Creek within the proposed remedy is supported by the County and consistent with multiple public planning efforts which have long called for public access to the City of Lackawanna waterfront.

To date, Erie County has had positive discussions with Tecumseh regarding the extension of the Shoreline Trail from Dona Street to Woodlawn Beach State Park, traversing Tecumseh property. Going forward, Erie County is committed to working with Tecumseh and NYSDEC on resolving key issues, responsibilities, and liability so that the vision of connecting the Shoreline Trail to the Lake Erie waterfront in the City of Lackawanna can become a reality. Coming to Agreement with Tecumseh and NYSDEC on acceptable operations, management, safety, and security responsibilities for these public recreational areas will be critical.

Erie County also is supportive of the proposed ecological and habitat restoration along Smokes Creek.

Implementation of the proposed site remedy as described in the SB would be a positive

step towards advancing the remediation of the site to address human health, restore the environment and promote economic and community development. The redevelopment will reconnect the community with its waterfront through new public access areas and create a site which is ready for private investment. Erie County is committed to continuing to work with the NYSDEC, Tecumseh, and City of Lackawanna on resolving key issues in the implementation of public access to the community's waterfront.

RESPONSE 1: Acknowledged. The Department appreciates the support and looks forward to working with stakeholders on this important remedial project.

COMMENT 2: The Buffalo and Erie County Industrial Land Development Corporation (ILDC) is redeveloping approx. 150 acres of the former Bethlehem Steel site and is in the process of purchasing an additional 90 acres of the site. As part of that effort the ILDC developed a masterplan and issued a GEIS for the site which outlines the redevelopment of business parks 1 and 2 as defined by the NYS Brownfield Cleanup Program. The plan outlines the road, utility corridors and parcel layout for the development of an Advanced Manufacturing Park on the former Bethlehem Steel site. In addition, the plan includes identifying corridors and constructing extensions to the Shoreline Trail to provide recreational opportunities for residents of the region within the proposed park.

As owner of a contiguous site the ILDC has reviewed and supports the remediation plan as outlined in the Draft Statements of Basis. The plan complements and supports the ILDC's efforts to create shovel ready sites for redevelopment and provides access and amenities to the public. With our partners the ILDC has and will be investing millions of dollars to construct the infrastructure necessary for redevelopment of the site which has laid dormant for decades. Key to that effort is the continued remediation of the overall site to set the stage for public and private investment.

The proposed Corrective Action Management Unit (CAMU) is a positive step towards ensuring a safe and economic method of cleaning up the site. The ILDC supports this effort and encourages Tecumseh and NYSEDC to continue to work together to remediate the site. It is imperative that the cleanup is completed through this plan and those burdens are not passed on to future owners, which would severely limit the redevelopment potential of the site. The utilization of the CAMU represents a significant cleanup cost savings, which as outlined in the plan will allow for the site to be remediated and be "development ready".

Throughout the ILDC's master planning process for the Advanced Manufacturing Park the issue of access to the Lake Erie shoreline and the Smokes Creek corridor were prominent comments received from the public and key stakeholders. Working with our

partners, the ILDC and Erie County completed a section of the Shoreline Trail along the eastern border of the property and is working on plans to extend the trail to Woodlawn Beach State Park.

The greenspace area proposed in the plan for the mouth of Smokes Creek and the Smokes Creek corridor aligns and compliments the current plans for the routing and extension of the Shoreline

Trail. The ILDC strongly supports this effort and has been working collaboratively with both Tecumseh Redevelopment and NYSDEC officials to advance public access opportunities on the site. The inclusion of public access opportunities in the plan represents a unique opportunity to reconnect the City of Lackawanna and its residents to the waterfront which they have not had in over 100 years.

Implementation of the proposed remediation plan would be positive step in the redevelopment and future of the former Bethlehem Steel site. The ILDC looks forward to working with all parties in implementing this plan and restoring the site to productive use.

RESPONSE 2: Acknowledged. The Department appreciates the support and looks forward to working with stakeholders on this important remedial project.

COMMENT 3: The City of Lackawanna Department of Development submitted: We appreciate that the State's Corrective Measures Remedial Action Plan, presented to the public for comment on May 18th, 2021, now substantially addresses our concerns, previously raised as Objections to the earlier Preferred Remedial Alternative submitted by the site owner in 2015.

A safe remediation of the whole of the site, within a reasonable time frame, with sufficient financial security in place, and then its return to productive re-use, remains of critical importance to the City of Lackawanna. This is because the former Bethlehem Site both occupies the City's waterfront (which was substantially altered to serve the former industry), and the land mass of the former Bethlehem Site comprises approximately 1/3 of the City's land mass. The combined loss of productive use of the lands around which the City's infrastructure was built, for over 40 years, has had a severe impact on the local community's ability to rebuild itself.

We had originally objected to the substantial solid waste management containment unit south of the mouth of Smoke's Creek, however the current plan, when implemented in accordance with the Order on Consent executed on September 24th, 2020 does hold the potential to create a regional amenity as mitigation to the imposition of the containment cell. We appreciate the Consent Order does include a public private

partnership to provide shoreline access to the community, and the current Site ownership team has provided a very substantial base plan for shoreline trails, and a passive park along an area of the waterfront, and that they have also been facilitating the creation, and extension of the Shoreline Trail. The site's recreational amenities for the enjoyment of nature, add value to the remainder of the site, and greatly benefits the surrounding community.

Our primary remaining areas of concern are that the complete remediation of areas where there are buried sources of contamination be completed while the CAMU is open. To ensure this will be looking to see that the final Remedial Action Plan have an objective enforceable time frame for completion, with adequate security to prevent the public benefits of the CAMU being allowed. from becoming illusory.

We do greatly appreciate the recent efforts of all to respond to the public's concerns, by providing a plan that helps a community to recover from the extreme blight and hardship created by the collapse of the industry their land, and population, had been dedicated to supporting.

Thank you for your efforts, and to the current Tecumseh team, and their parent company, which has provided substantial improvements to earlier plans, as a base for a more complete remedial alternative plan. We look forward to working with all to facilitate completion of the plan.

RESPONSE 3: Acknowledged. The Department appreciates the support and looks forward to working with stakeholders on this important remedial project.

TECUMSEH COMMENTS ON NYSDEC PROPOSED STATEMENT OF BASIS CORRECTIVE MEASURES SELECTION

COMMENT 4: The following comments are being provided to the New York State Department of Environmental Conservation (NYSDEC or Department) on the proposed Statements of Basis (PSBs) issued by the Department on May 5, 2021 related to proposed selection of corrective measures on and adjacent to a 489-acre portion of the former Bethlehem Steel site (the Site). The following comments are offered on behalf of Tecumseh Redevelopment Inc. (Tecumseh), the current owner of the Site and Respondent in the Order on Consent and Administrative Settlement with the Department effective September 24, 2020 (the Remedy Implementation Order, or the Order) that provides the framework for Tecumseh’s continued cleanup of the former Bethlehem Steel Corporation (BSC or Bethlehem Steel) Site under the New York State Inactive Hazardous Waste Disposal Site Remedial Program (the State Superfund Program) and

the New York State Hazardous Waste Management Program (the RCRA Program).

The following comments were prepared by Tecumseh with its technical consultants, Benchmark Civil/Environmental Engineers & Geologists, PLLC and TurnKey Environmental Restoration, LLC (Benchmark-TurnKey) consistent with the Remedy Implementation Order and with NYSDEC-issued Fact Sheets and invitations for public comment. Benchmark-TurnKey, headquartered in Lackawanna, performed all the environmental investigations; designed and implemented all interim and final remedial measures; and operated and monitored all remedial systems on the Site since 2003 when Tecumseh purchased the Site and certain surrounding property from Bethlehem Steel through a bankruptcy court proceeding. As such, Tecumseh and its team individually have nearly two decades of site-specific knowledge and experience regarding: the nature and extent of historic and current contamination; geology and hydrogeology; the applicable regulatory requirements; Tecumseh's legal obligations as an innocent land owner; status and performance of remedial actions and systems on the property; as well as other nearby environmental conditions in Western New York and on adjacent lands currently and formerly owned by Tecumseh and cleaned up or being cleaned up under the Department's Brownfield Cleanup Program (BCP). Tecumseh and the technical team prepared the Corrective Measures Study (CMS) Report and Comprehensive Groundwater Quality Studies accepted by the Department as final in August 2019 "as the foundation for developing remedies for operable unit areas".

Summary of Tecumseh's Remedial Accomplishments to Date

We note that neither the PSBs nor the Department's public presentation on May 18, 2021 include discussion of the substantial progress by Tecumseh to date to investigate and thoroughly characterize the nature and extent of contamination on the Site; design and implement five interim corrective measures (ICMs), an expedited final corrective measure for the Acid Tar Pits (ATP) Solid Waste Management Unit (SWMU) group, three final corrective measures for Operable Units (OUs)-02, -03, and -04 that collectively addressed 18 SWMUs, Areas of Concern (AOCs), and water bodies; continue to operate, maintain, and monitor those remedies; remove wastes and transformers, abate asbestos, and demolish structures on the Site; voluntarily enroll approximately 437 acres of Tecumseh property adjacent to the Site in the New York BCP and then complete the investigation, cleanup, sale/lease, and redevelopment, by other private entities, of commercial wind and solar electric generation and manufacturing facilities on approximately 195 acres.

The PSBs do not mention the significant remedial progress achieved on Site by Tecumseh in improving water quality in Smokes Creek by dredging the most contaminated sediment from the lower reach of Smokes Creek and eliminating the

source of contamination to the Creek from the ATP SWMU Group; substantially improving groundwater quality in OU-04, OU-05, OU-06, and OU-07 through waste removal, stabilization, and consolidation and through implementation of extensive groundwater pump and treat systems.

In summary, Tecumseh has spent the last 18 years and many millions of dollars on the investigation and remediation of contamination at this Site and on adjacent Tecumseh property – contamination that it did not cause.

RESPONSE 4: Noted as Tecumseh's opinion.

COMMENT 5: Overview of Tecumseh's Technical Comments

Summary of Tecumseh's position regarding the Department's proposed remedies. Most of the SWMU-specific Department-proposed remedies are generally consistent with the recommended corrective measures in the Final CMS Report, which we concur with and will implement. This is particularly true for OUs-05, -06, -07, and -08, with only a few associated remedial elements addressed herein. Most of the comments herein apply to the site-wide remedial measures presented in OU-1 and water course remedies in OU-9 that are not consistent with and are unnecessary additions to the recommended corrective measures presented in the Final CMS Report, which was developed for both protection of public health and the environment. These Department-proposed additional remedies are the focus of our comments, and in Tecumseh's view the Department's additional proposed remedies fall into the categories that (i) are not necessarily the legal responsibility of Tecumseh to implement; (ii) do not adequately consider Site-specific conditions, current, and/or reasonably anticipated future uses; (iii) are unnecessary for the protection of public health or the environment; (iv) have not been appropriately evaluated against reasonable alternatives including the no further action alternative; (v) do not have detailed cost estimates for implementation, maintenance, and for financial assurance purposes; and/or (vi) have not been appropriately evaluated against selection criteria in accordance with the Department's own regulations (at 6NYCRR section 375-1.8(f)) and policy (Chapter 4, Remedy Selection, in DER-10/Technical Guidance for Site Investigation and Remediation).

Specifically, with respect to the last point, the additional remedies that the Department is proposing beyond the remedies recommended in the CMS Report generally:

- Are unnecessary for protection of public health and the environment (see section 375-1.8(f), factor 1 -- one of the two threshold factors and the most important of the nine factors);

- Are unnecessary to achieve conformance with applicable standards, criteria, and guidance (see section 375-1.8(f), factor 2 -- the other threshold factor);

- Are functionally equivalent with respect to two of the seven balancing factors in section 375-1.8(f) as compared to Tecumseh's proposed remedies, with no substantial reduction of long-term effectiveness (balancing factor 3) or toxicity, mobility or volume (balancing factor 4);

- May have greater short-term impacts (balancing factor 5), be more difficult to implement (balancing factor 6), and are less consistent with current and reasonably anticipated future land uses (balancing factor 8); and

- Are significantly more costly and are therefore less cost-effective than Tecumseh's proposed remedies (see section 375-1.8(f), balancing factor 7).

Given that the Department's additional proposed remedies are unnecessary to meet threshold criteria; are generally no better than and in some cases are worse than the CMS recommended remedies considering several balancing factors; are more difficult to implement; and are significantly less cost-effective than the CMS-recommended remedies, choosing them appears to be a flawed and unbalanced remedy selection process that deviates from the Department's regulations and policy.

Summary of Tecumseh's Position Regarding the Department's Over-Generalization and Mischaracterization of Sampling Data and the Nature/Extent of Contamination

In Tecumseh's view, the Department has oversimplified the nature and extent of contamination on the Site with "broad brush" statements that erroneously create the impression that widespread contamination exists across the entire Site with the same contaminants present at high concentrations in all environmental media (soil, waste, slag, sediment, surface water, and groundwater). However, the CMS data shows much more scattered, localized contamination specific to defined SWMUs and in different environmental media in different OUs and SWMUs. The Department's presentation skews the data to the highest readings out of many thousands of analyses by giving equal weight to RFI data collected over three decades ago instead of relying on the more recent CMS data that much more accurately reflects current or near current environmental conditions, which have significantly improved across most of the Site due to remedial measures and natural attenuation. The Department's presentation of the data regarding the nature and extent of contamination thus creates an exaggerated perception of the potential threat that the Site may pose to public health and the environment. As examples: nine DEC-listed chlorinated volatile organic compounds (VOCs) are only present above groundwater quality standards in a handful of wells

related to two or three SWMUs; and polychlorinated biphenyls (PCBs) are present only in a couple of isolated soil samples proximate to a few former PCB transformers and are generally not present in surface water, groundwater, sediment on the Site. We chose not to provide more extensive comments on this subject except where directly related to Department-proposed remedial elements that we view as unnecessary.

RESPONSE 5: These concerns are addressed in responses below where they relate to specific Department-proposed remedial elements.

COMMENT 6: Organization of Tecumseh's Technical Comments

The organization of our comments is by Operable Unit as grouped in the three PSBs or Proposed Remedial Action Plans (PRAPs), then by SWMUs, water course, and/or remedial elements as presented in the PSBs.

RESPONSE 6: Noted.

COMMENT 7: Summary of the Legal Background and Tecumseh's Position Regarding Liability for Off-Site Contamination

At the outset, it is important to note that Tecumseh is an innocent landowner that (i) never operated the Site, (ii) never released or disposed wastes onto the Site or into or onto adjacent areas, and (iii) acquired the Site from BSC via bankruptcy proceedings that provided Tecumseh with certain liability protections with respect to off-site contamination. Accordingly, we are providing the following high-level legal summary to support Tecumseh's position that it does not have liability for off-site contamination, including the contamination in the off-site Gateway Metroport Canal (Canal) and the off-site portion of SWMU S-26.

These issues are discussed in detail in Exhibit A, Legal Background and Tecumseh's Position Regarding Liability for Off-Site Contamination.

- As an initial matter, the Remedy Implementation Order does not independently establish the extent of Tecumseh's liability, if any, for off-site contamination. Rather, the Order provides the framework for the conduct of Tecumseh's cleanup obligations under the State Superfund Program and the RCRA Program with respect to the Site and off-site areas only if and to the extent Tecumseh has legal liability.

- With respect to any off-site contamination that occurred before Tecumseh acquired the Site in 2003, the Asset Purchase Agreement (APA) with Bethlehem Steel and the Bankruptcy Court order approving same clearly establish that

Tecumseh does not have liability. Directly on-point case law involving a nearly identical fact pattern and the very same APA, Bankruptcy Court order, and bankruptcy principles supports this position.

- With respect to any off-site contamination that occurred after Tecumseh acquired the Site in 2003, the Department has not established any basis for Tecumseh's legal responsibility under the State Superfund Program or the RCRA Program. Furthermore, the Department would also need to satisfy basic due process and procedural requirements under those cleanup programs to properly establish that Tecumseh has legal liability for any such off-site contamination.

RESPONSE 7: The proposed Statements of Basis are remedy selections for the site based on investigation findings and, based on those findings, how the threats posed can be best addressed. Any potential liability for implementation is a question that would be addressed outside of the NYSDEC's selection of remedies for the site. Accordingly, Tecumseh's Summary of the Legal Background and Tecumseh's Position Regarding Liability for Off-Site Contamination discussed above and in Exhibit A have not been responded to in this Responsiveness Summary.

DEPARTMENT-PROPOSED OU-1 (SITE-WIDE), OU-9 (WATER BODIES), AND OU-10 (GROUNDWATER) REMEDIES

COMMENT 8: Gateway Metroport Canal Sediment Contamination and Proposed Dredging Remedy

The Gateway Metroport Canal (Canal) was constructed by the Lackawanna Iron and Steel Company between 1901 and 1903; operated by BSC from 1922 to 1985; and sold to Gateway Trade Center, Inc. (Gateway) and operated thereafter as the Gateway Metroport Canal and the Port of Buffalo since 1985. As discussed in detail below and in Exhibit A:

- Tecumseh never owned or operated the Canal or land surrounding it (and therefore the Canal is off-site).

- The contaminants in the sediment did not migrate to the Canal from Tecumseh property during its ownership.

Thus, Tecumseh's position is that it does not have liability for further investigation or dredging of sediment in the Canal.

With respect to the specific environmental conditions that are apparently the basis for

the Department's proposed dredging remedy, the maximum concentrations of contaminants in Canal sediment cited by the Department as exceeding Class C sediment guidance values (SGVs) were lead, silver, mercury, and total polycyclic aromatic hydrocarbons (PAHs). These contaminants are not even defined as "contaminants of interest" in groundwater on the Tecumseh property nearest to the Canal in the Coke Plant and Coke Plant By-Product Area as they are generally not present at elevated concentrations relative to groundwater quality standards nor mobile in the groundwater. Therefore, the groundwater data does not support the conclusion that migration via groundwater from Tecumseh property into the Canal is the source of the metal and PAH contaminants in the sediment.

Furthermore, the conditions at the Site do not support the conclusion that these metals and PAH contaminants were discharged to the Canal via surface water transport from Tecumseh property, as there are no point source storm water discharges and no direct storm water runoff to the Canal from the Tecumseh property west and south of the Canal. The much more likely storm water transport mechanism for these contaminants is runoff from the paved docks of the Gateway Metroport on the east side of the Canal where massive quantities of coal, coke, and petroleum coke have for decades and continue to be stored and handled.

A possible on-going source of the PAHs is from the diesel-powered lake freighters that frequent the Port as well as the many diesel-powered heavy machinery (e.g., cranes, wheel loaders, dozers, forklifts, and trucks) that are operated and fueled on the Port docks by Gateway and its contractors and tenants.

Historical atmospheric transport and deposition of particulate emissions from the coke ovens is another possible source of the PAH and possibly mercury impacts in the Canal, because of prior operation of the coke plant from the early 1900s until 2001. More recently, wind-blown atmospheric transport and deposition of fine coke and coal particulates from handling and open storage of massive amounts of these commodities on the docks of Gateway Metroport are also a more likely potential source of these sediment contaminants. None of these Canal sediment impacts are Tecumseh's responsibility.

RESPONSE 8: See Response 7 with regards to liability concerns. The Department disagrees with the second bullet "The contaminants in the sediment did not migrate to the Canal from the Tecumseh property during its ownership.". While it is acknowledged that other potential sources may exist in the Ship Canal, as Tecumseh stated in its August 2019 OM&M workplan for the OU-4 groundwater, "The primary performance objective for the groundwater corrective measure is to mitigate potential off-site groundwater contaminant migration from the Coke Plant By-Product Sub-Area toward

the adjacent Gateway Metroport Ship Canal." As reported in the January 2019 sampling report, several monitoring wells within the area discharging to the Ship Canal exhibited exceedances of groundwater quality standards for PAHs. Additionally, the 2004 Final RCRA Facility Investigation Report (RFI) reported groundwater exceedances of multiple PAH compounds by one or two orders of magnitude.

Additionally, as referenced in the 2004 RFI report, on the northern end of the Ship Canal, within Tecumseh's property, there is an old channel associated with a SPDES discharge area. This discharge area potentially acts as a migratory pathway for contamination and needs to be further investigated during the pre-design investigation (PDI). Soil contamination, outside of the RCRA interim correction measures areas, has not been fully delineated and therefore cannot be eliminated as a potential migratory pathway for contamination found in the ship canal.

COMMENT 9A: Smokes Creek Sediment Dredging and Waterbody Construction

The Department has not established — and the available data and facts do not support the conclusion – that further dredging of Smokes Creek is required to protect public health or the environment. The Department should therefore re-evaluate its position regarding the necessity of the proposed dredging and provide Tecumseh and the public with all relevant data regarding sediment sampling in Smokes Creek.

For example, the PRAP should describe the 2015 dredging performed by NYSDEC of the Upper Reach and provide post-dredging sampling data as the Department required of Tecumseh to do following ICM dredging of the Lower Reach in 2009. Moreover, it is reasonable to expect that there has been significant sediment deposition in both the Upper and Lower Reaches of the Creek, since last dredged in 2015 and 2009, respectively. Characterization of this recently deposited sediment is necessary prior to determining if further environmental dredging is necessary, and if so, to what extent. In addition, if dredging is warranted, the estimated quantities of dredged spoils to be removed will need to be established before reasonable, detailed remedial cost estimates can be developed to serve as the basis for any required financial assurance.

Furthermore, per NYSDEC's 2014 sediment screening guidance, performance of toxicity testing and benthic community analysis is required to assess whether the sediments are in fact toxic and require dredging.

As noted above, the Department should provide Tecumseh and the public with all relevant data regarding sediment sampling in Smokes Creek. Another example of this omission is on page 37 of the PSB, which states *"Only the most recent data is included in this section, as sediment samples from Smokes Creek that were collected in June*

2020 by USGS have not yet been analyzed and are therefore not included in this PRAP." This data should be available and provided.

COMMENT 9B: Smokes Creek Sediment Dredging and Waterbody Construction

With respect to non-remedial streambank enhancements in the Smokes Creek riparian zone discussed in the PSB, the Department should note that Tecumseh's obligation under the Remedy Implementation Order is limited to evaluating the feasibility, location(s) of and designs for such structural, environmental, and ecological enhancements (see Remedy Implementation Order at Section 13). Tecumseh will cooperate with the Department and other public entities with respect to evaluating and planning for such enhancements, but Tecumseh does not have an obligation to implement or fund the enhancements as proposed by the Department. Consistent with its commitment to work collaboratively with public entities with respect to the evaluation of non-remedial improvements and public access, Tecumseh has reached out to Erie County to garner input and insight from the County regarding its views on these matters.

In addition, the PSB states (see Section 7, Item 8 on page 26) "*Following dredging, Smokes Creek will be designed to improve hydraulic flow, reduce flooding*". Tecumseh is not aware that the need for such hydraulic improvements has been established and Tecumseh has not seen any data supporting that conclusion. Regardless, such floodway improvements should not be the subject of this PSB and are not necessarily Tecumseh's responsibility to implement. If hydraulic floodway improvements are necessary, they should be designed prior to dredging, not after. Furthermore, the nature and extent of these proposed floodway improvements must be clearly delineated to define the quantities and nature of sediment to be removed as these factors will significantly impact the cost of the work.

RESPONSE 9A: The Department disagrees with the statement, "The Department has not established -- and the available data and facts do not support the conclusion – that further dredging of Smokes Creek is required to protect public health or the environment. The Department should therefore re-evaluate its position regarding the necessity of the proposed dredging". Based upon the NYS Sediment Screening Guidance, "Screening refers to the action of comparing the concentration of contaminants in a sample to a set of numeric screening values, known as Sediment Guidance Values (SGVs). The SGVs identify thresholds for various contaminant concentrations in sediments that can be used as a basic screening tool to identify potential risk to aquatic life. Given no information other than the concentration of a contaminant in sediment, these values allow for a reasonable assessment of the potential for the contaminants to be harmful to aquatic life." Knowing the concentration of a contaminant in sediment allows a reasonable assessment to be made about the potential for the contaminant(s) to be harmful to

aquatic life. Since no toxicity testing has been conducted within Smokes Creek, the data provided to the department through various sampling events suffices as evidence to support the remedy proposed in the statement of basis. The Department agrees that additional data, including toxicity testing, must be collected during a PDI. Prior to the testing, a work plan must be submitted and approved by the Department, including the Division of Fish and Wildlife.

The decision to include only the most recent data collected in the Statement of Basis (e.g., post-2009 in the Lower Reach and post-2007 in the Upper Reach) versus including all historical data for Smokes Creek was to allow for ease of review for the public and because much of the sediment sampled during earlier sampling events may have been removed from Smokes Creek during ongoing maintenance dredging. The data that has been collected over the years is located on the DECinfo locator page (https://www.dec.ny.gov/data/DecDocs/915009/). The USGS data, that was collected June in 2020, is currently undergoing data validation and will be posted on the DECinfo locator webpage by Spring 2022.

RESPONSE 9B: As part of the remedial design, a climate vulnerability assessment must be conducted. Additionally, Tecumseh must assess the hydraulic capacity of Smokes Creek and its ability to protect the remedy in the future. Based upon past sediment build up events, it is likely that hydraulic dredging will need to be implemented regularly to protect the remedy implemented (e.g., protect the CAMU area, erosion control and ensure that any contaminated sediments left behind do not migrate). Additionally, as stated in the Statement of Basis, Smokes Creek has been historically dredged periodically for hydraulic purposes, this includes but is not limited to preventing flooding in upstream areas and to remove sediment build up at the mouth of the Creek. The last dredging event was completed by Tecumseh in the Winter of 2021. Given the cost and effort associated with long-term maintenance dredging of Smokes Creek to maintain hydraulic capacity, it is appropriate to incorporate a long-term solution for hydraulic capacity as part of this remediation. The Department notes that "non-remedial/streambank enhancements in the Smokes Creek riparian zone will be implemented and funded by others with the cooperation of Tecumseh to evaluate and plan for such enhancements."

COMMENT 10: Cover System

The CMS Report recommended approach for the cover system, specifically its geographic scope and the timing of implementation, satisfies the two threshold selection criteria in 375-1.8(f): it is protective of public health and the environment, and it satisfies the applicable standards, criteria, and guidance. As compared to the Department's proposed cover system -- which includes unnecessarily broad geographic coverage and

timing elements that make it impractical and wasteful – the CMS Report recommended approach is as good or better with respect to the balancing selection criteria in 375-1.8(f). Most notably, the CMS Report approach is more easily implementable, more practical, and much more cost-effective.

We note that the DEC's characterization of Site soils (see pg. 18 of the PSB), which serves as the basis for the Department's proposed remedy, is overly simplistic, positively biased, and does not align with the actual comprehensive data as presented in the CMS Report. The Department uses only the maximum concentrations of waste/fill sampled within the boundaries of discrete SWMUs apparently to justify covering the entire 489-acre Site with 12 inches of "clean" off-site soil. This is a significant mischaracterization, since the surface area of the SWMUs in OUs-06, -07, and -08 represents only about 5-10 % of the land area. Very few, if any, surface soil samples were collected from the much larger areas outside the SWMUs in these OUs.

As most of the SWMUs will either be excavated and consolidated into the CAMU, disposed off-site, or covered in place following implementation of those proposed remedies, there will be extremely limited potential exposures on the site to the contaminated waste/fill. The surface soil/slag remaining after implementation of the proposed SWMU remedies and following completion of slag reclamation to final grades should then be sampled and tested to determine what, if any, soil cover may be needed in each portion of each OU at that time. An exception is OU-05 that will receive a minimum of 12 inches of soil cover consistent with paragraph 6 on page 25 of the PSB. Soil cover on the remainder of the Site, if and where required, should be consistent with reasonable and appropriate planned use (primarily heavy industrial and multi-modal in OUs-06, -07, and -08), based on surface soil/slag sampling and analyses performed after remediation, slag reclamation, and final site grading is completed, and placed during redevelopment of portions of the Site around buildings, pavement, and other hardscape for appropriate storm water management.

It is further proposed that 12 inches of processed Beneficial Use Determination (BUD)-approved slag reclaimed from the Site, like that used and approved by the Department on over 100-acres of the adjacent BCP portion of the Tecumseh property, be considered as an alternative to soil for final cover.

RESPONE 10: The proposed Statements of Basis do not require placement of a cover over the entire 489-acre site; rather, only areas that exhibit exceedances of the commercial or industrial soil cleanup objectives in surface soils will be required to receive a cover. The remedies include a PDI, which will include, but is not limited to, additional soil sampling to determine the extent of areas where the upper one foot of exposed surface soil exceeds commercial or industrial soil cleanup objectives. Sampling results

will determine where a site cover is needed to allow for commercial or industrial use of the site. Workplan(s) for the PDI and cover system construction, including an appropriate schedule, shall be submitted to, and approved by the Department prior to investigation and/or installation. The status of future slag reclamation activities at the Tecumseh site is currently under Department review and will be addressed in the review and approval of the remedial workplan(s).

COMMENT 11: Soil Cleanup Objectives

The Department fails to consider the use of an appropriate, already-approved Site-specific action level (SSAL) for arsenic, which should form the as is for decisions about the need for placement of soil cover. According to the PRAP, "*the Department cannot accept Tecumseh's site-specific proposed SCO for arsenic (118 ppm) since it substantially underestimates potential arsenic human health risks and is therefore not appropriate for use in making risk management and remedial decisions. However, the Department considers the arsenic risk assessments performed by NYSDOH in conjunction with the NYS Soil Cleanup Objectives (16 ppm for commercial use) to be appropriately site-specific in terms of addressing arsenic exposures in the Lackawanna community and appropriately conservative with regard to the assumptions used to characterize those exposures. The proposed remedy is based on SCOs included in 6NYCRR Part 375-6 which are supported by the NYSDOH SCO risk assessments and the use of a background-based arsenic remedial goal.*" Appendix D of the PRAP presents arsenic remedial goals in other states, indicating that soil cleanup levels are state-specific with most based upon background concentrations, to provide justification for its industrial soil cleanup objective (SCO) of 16 ppm. We disagree with the Department's position on this point for the following reasons.

- From the October 2006 Assessment of Public Comment on the Draft 6 NYCRR Part 375 Environmental Remediation Programs:

  PART A: COMMENTS ON PART 375 GENERALLY

  COMMENT: A comment noted site background levels in heavily urban or industrialized areas may exceed the SCO cleanup levels in the tables requiring owners of "contaminated" sites to reduce exposures to surface soils simply because the levels have been determined by investigation while allowing owners of non-brownfield sites, where background levels likely exceed the SCO, to pursue their projects without investigation or remediation. The Department should allow site owners to develop site specific cleanup standards based on site background levels provided the owner can demonstrate that the higher levels truly represent background conditions.

RESPONSE: The proposed rule provides for the consideration of site background in each of the three remedial programs subject to these regulations. The use of background is set forth for the State Superfund Program (SSF), Brownfield Cleanup Program (BCP), and the Environmental Restoration Program (ERP) and is completely consistent with past practice. Site background levels will be determined through the application of Department guidance. The Department does not consider soils exhibiting levels less than background to be contaminated from activities at the site. The remedial program normally does not set cleanup levels below anthropogenic background concentrations. This is consistent with the United States Environmental Protection Agency's (USEPA) approach to cleanups and background.

- The SSAL for arsenic of 118 parts per million (ppm) has already been approved by NYSDEC for hundreds of acres of adjacent land in the BCP. In 2012, the Department approved the arsenic SSAL of 118 ppm for the Tecumseh Phase II BCP Site and that SSAL has since been used to drive "hotspot" removal of soil/slag/fill on all 35 Tecumseh BCP Sites on over 400 acres adjacent to the Site. Most recently, this SSAL was used for the Phase IA Business Park remediation in preparation for construction of the sugar refinery. The approved remedy on all Tecumseh Business Park BCP Sites was arsenic hotspot removal (>118 ppm) with deferred cover system placement during redevelopment. The NYSDEC Protection of Groundwater SCO for arsenic of 16 ppm may be an appropriate soil/fill SCO where soluble arsenic concentration in nearby groundwater is above the NYSDEC Class GA Groundwater Quality Standard (GWQS) of 25 ug/L; however, this is not the case on the CMS Area.

- As presented in Appendix P of the May 2019 CMS Report, arsenic is ubiquitous, with urban background soils in New York State frequently containing concentrations above the industrial SCO of 16 ppm, particularly at active and former industrial properties characterized by historic slag/fill deposition and coal burning. Accordingly, comparison of the arsenic data to site-specific background or average concentrations is considered appropriate for this Site.

- To determine the Site background concentration, all surface (0-2 fbgs) soil/fill arsenic data for the Phase II Business Park Area was tabulated and the 95% upper confidence limit (95% UCL) on the mean was calculated. Based on this analysis and further discussions with the NYSDEC, a site-specific SCO of 118 ppm (twice the 95% UCL) was established as the screening criteria for hotspot identification.

- Referencing Comment #60 in the Department's January 19, 2012 comment letter

on the May 2011 Remedial Investigation/Alternatives Analysis (RI/AA) Report prepared for the Tecumseh Phase II Business Park Site, "*Elevated arsenic concentrations above the commercial SCOs are ubiquitous at the Tecumseh Phase II Business Park. The mean arsenic is 41.9 ppm and 95% Upper Confidence Level (UCL) above the mean is 59.1 ppm. Arsenic only exceeds 100 ppm in eight of 65 total samples. Twice the 95% UCL is 118.2 ppm. Since only six samples exceed twice the 95% UCL, 5 times the 95% UCL is not appropriate for use as hotspot identification or an action level. Rather, decisions as to hotspot delineation or actionable source removal area are more appropriately twice the 95% UCL or 118.2 ppm. This number is consistent with NYSDEC's stance on hotspot delineation and potential removal in Tecumseh Phase I, the Railroad Relocation IRM and, most recently, the Tecumseh Phase III Business Park RI/AAR comments. Instances where this value is exceeded must be delineated and addressed accordingly.*"

- Tecumseh agrees that elevated arsenic is ubiquitous across the Site and has proposed to use an SSAL of 118 ppm as the criteria for identifying arsenic hotspot areas in the CMS Area, consistent with the Department-approved site-specific criteria used on the adjacent Business Park BCP parcels. None of the soil/fill samples collected on the CMS Site and analyzed for arsenic have exceeded this concentration of 118 ppm. However, if future sampling for arsenic in surface slag fill exceeds this proposed hotspot concentration, the slag/fill will be excavated and disposed in the SW-CAMU, when operational, or off-site at a permitted RCRA Subtitle D sanitary landfill.

- The primary pathway of potential exposure to inorganic arsenic at the former Bethlehem Steel site is inhalation of suspended soil particles (called particulates). Part 375 allows for alteration of the arsenic SCO for this exposure pathway. Table 5.3.6-1(e) of the 2006 TSD states that the carcinogenic SCOs for inhalation of arsenic are 13,000 ppm for commercial and 27,000 ppm for industrial. The arsenic industrial SCO was obtained by combining all potential exposure pathways (i.e., ingestion, dermal, and inhalation). It is understood that allowing elevated arsenic levels to remain uncovered for extended periods of time may be problematic where fate and transport mechanisms suggest potential for migration; however, the CMS Area has established vegetation where slag reclamation is not active and is not accessible to the public thereby eliminating exposure potential.

RESPONSE 11: The Department has reevaluated the derivation of the 118 ppm arsenic SSAL and believes that it is no longer appropriate. In Appendix P of the May 2019 CMS Report submittal, Tecumseh presented arsenic concentration data for over 300 surficial (generally 0-2 feet below ground surface) soil/fill samples obtained during various

investigations that have been performed on portions of the Tecumseh Site. Although discussion of the statistical analysis of the data was removed (as compared to the 2014 CMS report submittal), the average concentration of these arsenic data was 29 ppm, with a standard deviation of 33.5. It should be noted that the mean concentration of this surficial soil/fill sample data may be biased high (i.e., not representative of background conditions) because the soil sampling was likely focused on areas of suspected contamination. The proposed 118 ppm arsenic SSAL is approximately 3 standard deviations above the mean, which is why Tecumseh even noted that "None of the soil/fill samples collected on the CMS Site and analyzed for arsenic have exceeded this concentration of 118 ppm" (Appendix P of the May 2019 CMS Report submittal). The 118 ppm SSAL is also over 7 times the Part 375 SCO of 16 ppm for arsenic, which raises significant concerns as to its protectiveness.

Part 375 SCOs for metals are based upon rural background levels, although site-specific background levels can be developed for approval through the application of Department guidance. However, the procedures used to derive the background levels for arsenic in the vicinity of the Tecumseh CMS site were not developed in accordance with Department guidance documents (i.e., CP-51). The vast majority of the Tecumseh property east of the Hamburg Turnpike (NYS Route 5) was built from steel-making wastes and was heavily impacted by almost 100 years of steel-making operations. The samples used to assess background arsenic concentrations were collected solely on the Tecumseh property from man-made slag/fill material—they serve to define the mean arsenic concentration in surficial wastes at the site. No investigation was done to collect samples from offsite native soils to establish local arsenic concentrations and to demonstrate that arsenic levels at the Tecumseh site are truly consistent with local background arsenic levels.

Department guidance permits re-calculating soil cleanup objectives (SCOs) included in regulation in consideration of certain site-specific parameters, subject to approval by the Department. The parameter values that may be altered using site-specific information are those used in the calculation of SCOs for inhalation and protection of groundwater, and for protection of ecological resources from bio accumulative contaminants. For the protection of public health SCOs for the inhalation pathway, several parameters used in the calculations of the particulate inhalation and volatile inhalation pathways can be modified using site-specific information; however, no site-specific data was collected or presented for these parameters to modify the arsenic SCO. Additionally, the proposed SSAL is not appropriate for evaluation of direct contact or ingestion pathways. The cover system will need to meet commercial/industrial SCOs (16 ppm) to be protective.

For the protection of ecological resources SCOs, SCO values based on food chain

bioaccumulation may be modified by substituting site-specific measurements of soil organic carbon; however, no site-specific soil organic carbon data was collected or presented to modify the arsenic SCO. For the protection of groundwater SCOs, site-specific information may be used to identify a site-specific value for the fraction of organic carbon (f_{oc}) parameter used in the SCO calculation; once again, no site-specific fraction of organic carbon data was collected or presented to modify the arsenic SCOs. Arsenic has been detected in CMS area groundwater samples at concentrations above its NYSDEC Class GA Groundwater Quality Standard (GWQS) of 25 parts per billion (ppb); see Tables 4-31 through 4-36 in the May 2019 CMS Report submittal.

COMMENT 12: Remedial Action Objectives

Groundwater: Restoring groundwater to "pre-disposal/pre-release conditions" is not necessary to protect public health and the environment and is not possible to define or achieve due to the presence of massive quantities of dredged spoils deposited by the US Army Corps of Engineers beneath the Bethlehem Steel slag fill across much of the Site.

Surface Water: Restoring surface water in Smokes Creek to ambient water quality via remedial actions at the Site is not possible given the multiple point source wastewater and storm water discharges to the upper reach as well as multiple upstream point-source discharges and non-point sources of contaminants.

Sediment: Restoring sediment in Smokes Creek to "pre-release/background conditions" via remedial actions at the Site is not possible given the continuing releases of contaminants from multiple up-stream sources.

RESPONSE 12: The remedies in the Statement of Basis were selected based on their ability to satisfy the threshold criteria and provide the best balance of the balancing criterion (see Exhibit E). The statutory or regulatory remedial action goals, including restoration to pre-release conditions, for remedial actions undertaken pursuant to DER-10, Technical Guidance for Site Investigation and Remediation, are set forth in the applicable regulations identified in DER-10 Section 1.2 and apply to this site.

COMMENT 13: NRWT & SRWT

The North Return Water Trench (NRWT) and South Return Water Trench (SRWT) within the boundaries of the Tecumseh Phase IA BCP Site will be remediated pursuant to a separate Order on Consent. The following comments are for the remainder of the SRWT south of Times Square.

The SRWT does not have a specific NYSDEC waterbody classification as it is manmade;

however, surface water samples collected from the SRWT were compared against the NYS Class C Stream Standards protection for fish propagation in Fresh Waters, Ambient Water Quality Standards, and TOGS 1.1.1, which is inappropriate in Tecumseh's opinion. The standards at 6NYCRR Part 701 do not have an appropriate classification for a manmade storm water conveyance. If the Class C standard A(C) [aquatic(chronic)] is being referenced for cyanide then the mercury standard should also be Class C standard type A(C), which is 0.77 ppb. The maximum total mercury concentration of 0.7 ppb is below this standard; a dissolved mercury concentration would be lower. The maximum total cyanide concentration of 119 ppb cannot be compared to the free cyanide Class C standard of 22 ppb. Free cyanide is the form of cyanide that is bioavailable and known for its toxic effect on organisms. Surface water samples would need to be analyzed for free cyanide and dissolved mercury.

Per NYSDEC's 2014 sediment screening guidance, we propose to perform toxicity testing and benthic community analysis to assess whether the sediments are in fact toxic and require dredging. The site-specific TOC will be determined for use in revising the SGVs. Direct measurements of sediment impairment will be performed; specifically, toxicity testing and benthic community analyses. The "weight of evidence" approach will be used to interpret conflicting results; specifically, the Sediment Quality Triad decision matrix (Table 4 of the 2014 guidance), which will be used to determine what, if any, corrective actions are required in the SRWT. If and where sediment removal from the SRWT is determined necessary, we propose that the excavated sediment be dewatered and placed in the CAMU.

RESPONSE 13:

See Response 9 as it applies here since SRWT is a tributary of Smokes Creek.

The Department acknowledges that the portion of the NRWT that falls within the boundaries of the business park will be conducted under a separate consent order however as part of that remediation DEC requires a construction completion report detailing the actions taken.

COMMENT 14: Groundwater Quality and Groundwater Monitoring

In paragraph 11 (pg. 27) the Department proposes interim groundwater monitoring

"across the entire site and possibly off-site……to assess the effectiveness of the treatment systems and monitor groundwater conditions during pre-design investigations, remedial design, and implementation of the remedies."

Such proposed interim groundwater monitoring is unnecessary to design and implement

the proposed remedies and is contrary to the Remedy Implementation Order which states (Section II. G.) "*the Department agrees that additional investigation, evaluation or corrective measures studies will only be required if the Department determines that there is inadequate information to design remedial alternatives for any SWMU, AOC, waterbody or OU.*" Multiple rounds of comprehensive Site-wide groundwater quality sampling and analysis as recently as 2020 have adequately established current or baseline groundwater quality to design and implement the proposed remedies. Other than the continuation of currently established annual monitoring for HWMU-1, HWMU-2, ATP, and OU-4, we propose no additional interim groundwater monitoring. Longterm post-remediation groundwater monitoring should begin upon completion of final remedies in OUs as further described in this section.

One of the RAOs for Groundwater is to *"Restore groundwater aquifer to pre-disposal/prerelease conditions to the extent practicable."* The Department should explain and define how the impacts of US Army Corps of Engineers (USACE) dredge spoils are taken into consideration in the definition of pre-disposal/pre-release conditions. This is an important consideration because the Department expects operation of remedial systems to continue until RAOs have been achieved or the Department determines that continued operation is technically impracticable or not feasible.

As discussed in the 2019 CMS Report, historical documents indicate the USACE deposited massive volumes of contaminated dredge spoils in the near-shore open waters of Lake Erie off the former original Bethlehem Steel shoreline from circa 1900 to 1949 with the explicit authorization and approval by the State of New York. After the USACE's dumping of dredged spoils, Bethlehem Steel filled near-shore areas of Lake Erie with massive volumes of slag that was deposited on the Lake bottom (on top of the USACE dredged spoils) to create virtually all the land that comprises the 489-acre Site. (Bethlehem Steel's filling was also done with the explicit authorization and approval of the State of New York.) Thus, the USACE dredge spoils were intermingled with the native sand deposits beneath and adjacent to the slag/fill in the western portion of the CMS Area. The dredge spoils are contaminated with elevated levels of many of the same compounds of concerns detected in the SWMUs, including SVOCs, VOCs, and heavy metals. Due to the saturated condition of the dredge spoils, their proximity to Lake Erie, and the type and level of contamination, this material warrants special consideration as a source of groundwater contamination at the Site and as a potential source of surface water contamination off-site.

Most of the highest groundwater concentrations presented in the PRAP are within active pump and treat areas of known contamination; therefore, they do not reflect the remaining groundwater impacts to be addressed by this PRAP. Presenting a range and

average concentrations within areas not influenced by a collection and treatment system would more accurately represent the groundwater impacts to be addressed by the proposed remedy.

Total recoverable phenolics should be removed from Table 10 and the discussion in Exhibit A of the PSB. The Department stated in its February 7, 2019 letter commenting on the 2018 Annual Groundwater Quality Monitoring Report for HWMUs 1 and 2 that *The Department concurs with your assessment that the current TRP analytical method (EPA Method 9066 - colorimetric method) has limitations and is probably inappropriate for characterization of phenolic compounds in groundwater. DER-10 [paragraph 2.1(b)5] indicates that 'gas chromatography methods with a mass spectrometer detector system must be used for analysis of semi-volatile contaminants.'* Tecumseh and the Department agreed this is an inappropriate analytical method and groundwater samples are to be analyzed for phenolic compounds using EPA Method 8270.

Exhibit C of the PSB (see pages 53 and 54) states for Alternative 4 (Department proposed remedy) *"Groundwater will be monitored for site related contaminants to assess the effectiveness of the treatment systems. Sampling frequency will occur quarterly (for an estimated 90 wells….for the first 5 years then annually thereafter."* Monitoring at this scale and frequency is unnecessary and is not cost-effective, with an estimated 30-year analytical cost of approximately $7.3 million (excluding labor costs for sampling and reporting). Instead, we propose annual monitoring to begin in each OU upon substantial completion of remedy implementation as it has clearly been established from post-remediation groundwater quality monitoring of OU-4 and the ATP-ECM that groundwater quality changes very slowly due to groundwater velocities of only several feet annually. Furthermore, as summarized in attached Table 1, we propose to use 38 wells to monitor critical downgradient perimeter locations annually and another 37 wells to monitor less critical interior or upgradient locations every five years. The CMS demonstrated that generally, groundwater quality in the shallow slag/fill horizon is not substantially different than in deeper slag/fill or sand horizons. Therefore, we propose to monitor only the uppermost saturated zone and eliminate the deeper wells at each monitoring location. Our proposed list of monitoring wells and OU-specific sampling parameters, as summarized in attached Table 1, contains all the parameters present in each monitoring location that are present above groundwater quality standards. Our proposed long-term monitoring plan as summarized in Table 1 is equally effective to monitor the long-term effectiveness of remedies; conserves labor, transportation fuel, laboratory capacity, paper, and other natural resources; and saves approximately $6.4 million in unnecessary analytical costs as well as an additional undefined amount of sampling and reporting labor and expenses.

RESPONSE 14: The Department disagrees with Tecumseh's statement that groundwater data to date has "adequately established current or baseline groundwater quality to design and implement the proposed remedies". Data gaps have been identified by the Department that must be addressed through a Department approved groundwater monitoring plan to ensure an effective remedial design and protective remedy after system startup.

As previously noted in the Department's Final Draft CMS Report comment letter, dated December 11, 2018, due to the uncertain, undocumented nature of the former Bethlehem Steel Corporation (BSC) dumping of industrial wastes into Lake Erie, attempting to sort and separate the impacts of BSC wastes from any perceived USACE dredge spoil impacts are: (1) impracticable without a considerable expenditure of time and money to characterize the deposits in the CMS area on a micro-scale and (2) unproductive as analytical data (CMS Table 4-2) for the dredge spoils do not substantiate that they have significantly elevated concentrations of BTEX or metals, or even SVOCs. These dredge spoil samples meet the "Site Specific Soil/Fill Cleanup Objectives" listed in the Soil Fill/Management Plan (CMS Appendix D) and would be permitted to remain on site without cleanup. Furthermore, the most contaminated dredge spoil sample results are orders of magnitude lower than the most contaminated slag/fill sample results (see CMS Appendix N and various CMS Section 4 tables), particularly for total PAHs. Thus, groundwater contaminants of concern more likely originated from the overlying slag/fill unit, upgradient source areas, or concentrated wastes disposed by BSC directly on top of the sand/USACE dredge spoils unit prior to the slag/fill disposal. Nevertheless, periodic evaluation of the remedial progress made at achieving RAOs will be made by the Department by reviewing and comparing site-wide dredge spoil (soil and groundwater) results to applicable standards. Dredge spoil impacts in groundwater will be closely monitored by wells located near the USACE dredge spoils.

The OU1, 9, and 10 SB addresses site-wide groundwater exceedances, which includes areas with active treatment systems. The current on-site treatment systems have been noted in the appropriate SB section(s). However, groundwater data (see Exhibit A and Figure 10-3) demonstrate that exceedances occur outside the treatment target areas that must be addressed by the proposed remedy.

The discussion and evaluation of contamination present in site-wide groundwater in Exhibit A and Table 10 of the OU1, 9, and 10 SB is based upon data presented in Tecumseh's CMS Report, supplemented with data from the recent 2020 groundwater sampling event. EPA Method 9066 (colorimetric method) was utilized by Tecumseh and others in the past for analysis of Total Recoverable Phenolics in groundwater samples, and this data represents a valuable historical record for evaluation of the relative

concentrations of phenolic compounds in site-wide groundwater. The recently agreed upon change to EPA Method 8270 for analysis of phenolic compounds in groundwater does not negate evaluation of the available historical analytical data collected via a different analytical method.

The Department does not consider the proposed sample frequency for Alternative 4 unnecessary as data gaps have been identified. Not only has seasonal variation not been investigated, but a comprehensive groundwater sampling event (that includes both a consistent site-wide monitoring well and analyte list) has not been conducted, nor repeated for comparison of contaminant trends overtime to assess groundwater quality. Additionally, note that the $7.3 million cost estimate presented in the comment above for analytical costs associated with ongoing groundwater monitoring appears to be significantly higher than both Tecumseh's cost estimates as presented in Appendix Q of the CMS Report and the Department's independent cost estimates.

COMMENT 15: Monitoring Requirements of the Site Management Plan

Paragraph 2 of the discussion of the proposed Site Management Plan (see pages 29 and 30 of the PSB) requires monitoring of soil, bank soil, sediment, groundwater, and surface water (mass loading, discharge locations) within the mean high-water mark to assess the performance and effectiveness of the remedy. Such post-remedial investigations are costly, unnecessary to assess the effectiveness of the remedies, and inconsistent with Section II.G of the Remedy Implementation Order that states “the Department agrees that additional investigation, evaluation or corrective measures studies will only be required if the Department determines that there is inadequate information to design remedial alternatives for any SWMU, AOC, waterbody or OU.”

RESPONSE 15: Tecumseh incorrectly compares “additional investigation, evaluation or corrective measures studies” to address inadequate information (data gaps) needed to design remedial alternatives with long-term monitoring of the site to ensure the continued protectiveness of the implemented remedies. Site Management is a comprehensive approach that serves as the basis for maintaining the protection of public health and the environment through monitoring and the continued operation and maintenance of completed remedial actions and engineering controls as well as the maintenance and enforcement of institutional controls. The site management requirements are needed to support the establishment and long-term monitoring and maintenance of the remedies, which include on-site management of wastes in a corrective action management unit (CAMU).

COMMENT 16: SW-CAMU

The two-year start of the construction window for the CAMU should run from the Department's approval of the final design plans, not from the Department's issuance of the final Statement of Basis.

Maximum slope should be 25% per the Department's Part 360 regulations for landfills, not as "allowed in coordination with public access developments," since the design and construction of the public access improvements will likely not occur until after the design and construction of the CAMU.

RESPONSE 16: To utilize a CAMU, construction must begin within 24 months of the release of this SB (or such other time frame as the Department 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 must be disposed of off-site.

With respect to allowable slopes and coordination with public access developments, the Department is concerned that the timing proposed by Tecumseh to design the public access improvements after the design and construction of the CAMU may unnecessarily preclude the improvements desired by community stakeholders. The Department agrees to consider slopes up to the Part 360 maximum slope provided that discussions related to potential public access improvements are timely (prior to or concurrent with remedial design decisions which may impact access). The final maximum slope must be approved by the Department in writing.

COMMENT 17: Financial Assurance

Section 7, paragraph 13 of the PSB requires Tecumseh to post financial assurance in the amount of the cost projection for the remedies selected in any Statement of Basis. Consistent with the framework in the Remedy Implementation Order and the financial assurance requirements in 6NYCRR 373-2.8, the amount of the financial assurance should be based on a "detailed written estimate" of the costs of the remedies selected in the final SBs -- not any generic cost estimates developed for the SBs. Detailed cost estimates totaling $32.4 million for the corrective measures recommended for implementation in the Final CMS Report were already provided. Many of the recommended corrective measures in the final CMS are generally consistent with the PSBs for OU-05, -06, -07, and -08. The differences in costs relate primarily to OU-01, -09 and -10 for which the Department has not provided detailed cost estimates; this is the focus of these comments. Financial assurance must be based on probable and estimable detailed costs developed by Tecumseh for final remedies in the final SBs for which Tecumseh is legally responsible to implement.

Financial assurance to be provided by Tecumseh should only be required for remedies that are Tecumseh's responsibility to implement and maintain. For example, Tecumseh's position is that the Department-proposed dredging of the Gateway Metroport Canal is not Tecumseh's responsibility, and therefore should not be included in Tecumseh's financial assurance requirements.

Financial assurance to be provided by Tecumseh should initially only be required for remedies where the need for, the extent of, and the estimated costs can be defined. For example, the need for, extent of, and the estimated cost of dredging in Smokes Creek and the SRWT have not yet been clearly defined and therefore should not be included in Tecumseh's initial financial assurance. Similarly, the need for, extent of, and cost of soil or other cover have yet to be defined and therefore should not be included in the initial financial assurance.

Financial assurance should be established within 60 days after final remedy selection (per the Remedy Implementation Order) and after full disclosure of any detailed cost estimates prepared by the Department for Tecumseh's review, or should otherwise be based on Tecumseh's Department-approved estimates in the CMS Report. Financial assurance should be reviewed and updated annually to reflect remedial construction completed, changed future values of OM&M, as well as updated cost estimates based on remedial designs and Work Plans.

RESPONSE 17: See Response 7 with regards to liability concerns. The Department agrees that financial assurance provided by Tecumseh should be established within 60 days after final remedy selection (per the Remedy Implementation Order) and after full disclosure of any detailed cost estimates prepared by the Department for Tecumseh's review. Financial assurance will be reviewed and updated annually to reflect remedial construction completed, changed future values of OM&M, as well as updated cost estimates based on remedial designs and Work Plans submitted by Tecumseh for the Department's review and approval.

DEPARTMENT-PROPOSED OU-5 (SLAG FILL AREA ZONE 2) & OU-8 (SLAG FILL AREA ZONES 4 & 5) REMEDIES

Comment 18: Pre-Design Investigation (PDI)

We propose to delay the PDI of surface soil/fill until after SWMU wastes are fully excavated (i.e., post excavation sampling) and until slag reclamation activities and final grading in OU-8 are complete.

Response 18: Some pre-design soil/fill sampling will be necessary to refine the nature and extent of contamination at some OU-8 SWMUs to help clarify potential limits of excavation and to better estimate volumes. Delaying the OU-8 surficial soil/fill characterization until excavation activities and final grading in OU-8 are complete would be a reasonable proposal for inclusion in project work plans prepared for the Department's review and approval after the remedy is finalized. The status of future slag reclamation activities at the Tecumseh site is currently under Department review and will be addressed in the review and approval of the remedial workplan(s).

Comment 19: Off-Site Transportation of Waste

Rail for off-site transportation of waste/fill should only be considered where quantities are sufficient to be cost-effective and this will not create schedule delays. Compared to truck hauling, rail loading creates more short-term impacts from double handling wastes and stockpiling wastes between rail car deliveries.

Response 19: Acknowledged. Methods for off-site transportation may be proposed in project work plans prepared for the Department's review and approval after the remedy is finalized.

Comment 20: Stormwater Management

The PSB states that "*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*…" We propose to install an engineered stone or slag product in the bottom and sides of SWMU S-8 to promote infiltrating "clean" stormwater runoff from the CAMU and impoundments final vegetated soil cover systems. The infiltration of clean storm water into the groundwater will off-set the reduction of groundwater infiltration from the cover system, improve groundwater quality beneath SFA-Zone 2, and reduce flood flows in Smokes Creek.

Response 20: Stormwater controls will be evaluated as part of the Remedial Design Process to ensure the proposed controls minimize infiltration, retain stormwater, and discharge in controlled manner that is protective of the environment. The need to treat stormwater prior to discharge will be evaluated as part of this process.

DEPARTMENT-PROPOSED OU-6 (FORMER TANK FARM SUB-AREA) AND OU-7 (FORMER COAL, COKE AND ORE HANDLING AND COKE PLANT SUB-AREAS) REMEDIES

Tecumseh generally agrees with all proposed remedies and remedial elements except for the following:

Demolition

Comment 21: As the property owner, Tecumseh (not third parties) should determine which buildings and structures are to be razed to ground level and which will remain for potential use or reuse consistent with existing use, reasonably anticipated future uses and zoning, and Tecumseh's plans for the Site. Such demolition should also occur before placement of soil or other cover deemed appropriate.

Response 21: The Department agrees that Tecumseh is in a good position to evaluate the potential for individual structure rehabilitation. However, those structures which are inarguably beyond repair, or undevelopable for commercial or industrial purposes, or which the City of Lackawanna determines to be unsalvageable, inconsistent with zoning or a hazard to human health, the environment, or the aesthetic of the City's redevelopment plan (e.g., the former coke batteries, which have been partially razed, and stacks), must be razed without further delay according to State and local laws, including the City of Lackawanna Code that requires that "[a]ll demolition work to be performed under this chapter shall include the demolition and removal of all buildings, structures above and below grade level, above- and below-ground storage tanks, underground tunnels, floors and appurtenances thereto and foundations removed to virgin soil. No partial removal or partial demolition of any structure and its components may take place without the written approval of the Director of Development. All demolition work shall include the following:**(1)** Removal of all old materials and rubbish of every description from the site of the demolition work, including all basements and/or cellars.**(2)** All foundations, concrete floors located in basements, sub-basements, cellars, boiler rooms and crawl spaces, etc., shall be broken, removed and dispensed of in conformance with this chapter (i.e., code) requirements. Those areas made accessible by demolition activities shall be immediately investigated to determine potential source areas and next steps in Tecumseh's remedial effort. After potential source area identification and removal/treatment (if applicable), the Department agrees that appropriate cover should be established.

Cover System

Comment 22: The priority should be to place a cover system over OU-04 following any

demolition in the coke by-products sub-area to reduce storm water infiltration and thereby reduce and maintain collected and treated groundwater volumes.

Response 22: Before placing a cover system over OU-04, Tecumseh must complete soil/fill exploratory investigations in the OU-04 area (and throughout OU-07) to determine the presence of grossly contaminated material or material exceeding applicable SCOs. Once the investigation has been completed and the soil/fill in the OU-04 area has been remediated to the Department's satisfaction, Tecumseh may propose adding an impervious cap to the OU-04 groundwater collection area to improve the efficiency and effectiveness of the previously selected groundwater remedy. Such a cap should be consistent with future potential use and must not impede the implementation of adjacent or future remedies. A workplan for cover system construction shall be submitted to and approved by the Department prior to installation.

Comment 23: Soil cover elsewhere on the Site should be deferred until all groundwater remedies are in place and reuse or redevelopment is underway or has already occurred in each sub-area. By doing so, the cover system would not need to be removed, stockpiled, and replaced, and better, more permanent surface grading and storm water controls could be incorporated into the cover system design, consistent with the greater runoff from paving and building roofs from future redevelopment. Also see OU-01 comments above on soil cover and soil cleanup objectives.

Response 23: Tecumseh must implement a PDI to fill data gaps and inform the remedial designs, including determining the extent of site areas where the upper one foot of exposed surface soil exceeds applicable soil cleanup objectives (SCOs). Tecumseh shall expeditiously implement a cover system across areas of the site where a cover system is necessary to meet the requirements of the identified use (e.g., Industrial use in OU-07) and SCOs as set forth in 6 NYCRR Part 375-6.7(d). All OUs are to be addressed and preference should not be given to those OUs with established remedial systems. Additional installation of groundwater collection equipment and piping will be an inconsequential percentage of the total area requiring cover and therefore not a sufficient rationale to delay establishment of the cover system(s). Further, Tecumseh can and should make every effort to establish topography and grading to responsibly control and convey storm water consistent with the reasonably anticipated final configuration or use of the site.

<u>Proposed Remedy for SWMUs P-01 through P-06</u>

Comment 24: The proposed remedy for SWMUs P-01 through P-06 calls for residual solids to be removed and the concrete quench pits to be backfilled to grade with material meeting industrial cover requirements. The test data shows that the residual materials

meet the industrial SCOs and SSALs. The CMS called for these materials to remain in the pits. Removal of the residual materials before backfilling is unnecessary given that the residual solids meet the industrial SCOs.

Response 24: Out of an abundance of caution and considering the long operational history and potential for uncharacterized liquids and sediments in the pits and vaults, the Department is directing the removal of all liquid and clean out of all material present in the pits and vaults prior to breaking and backfilling in order to ensure source materials are addressed. Elevated groundwater contaminant concentrations detected at piezometer OU4PZ-6, believed to have been installed in the backfill of a former concrete Tar Decanter Sludge Pit (SWMU P-9) that was remediated as part of OU-2, illustrate that compartmentalized contamination can remain even after residuals are removed from underground concrete vaults (see *Summary Report Supplemental Work Plan for Operable Unit No. 4 (OU-4)* by TurnKey Environmental Restoration, LLC, February 5, 2021). Thus, the requirement to remove remaining liquid and sediment residuals prior to breaking up subsurface concrete foundations (which is required by the City of Lackawanna Building Codes).

SWMU S-26

Comment 25: SWMU S-26 is an approximately 7.5-acre area located adjacent to and northwest of the Canal generally occupying the area between former Coke Oven Battery Nos. 7 and 8 and the Canal. The Unit is split between two properties: approximately 3.3 acres (SWMU S-26 T) on the Tecumseh Site and 4.2 acres (SWMU S-26G) on the adjacent Gateway property as shown on Figure 1 with boring and monitoring well locations. Gateway purchased this portion of the property in 1985 from Bethlehem Steel along with the Canal. As such, Tecumseh never owned or contributed to the contamination existing on Gateway's property (i.e., SWMU S-26G). See Exhibit A, Legal Background and Tecumseh's Position Regarding Liability for Off-Site Contamination, for detailed discussion of Tecumseh's position with respect to SWMU S-26G.

Soil/fill in SWMU S-26T is primarily slag with coke fines, coal, brick, and other miscellaneous fill extending to a depth of 12 to more than 20 feet below ground surface (fbgs). Only boring S26-B-03 identified the presence of coal-tar at a depth of 4 to 7 fbgs. This boring was drilled and sampled proximate to an existing 60-inch diameter Industrial Water System pipeline that provides fire protection and cooling water for Republic Engineered Products (bar mill), Great Lakes Industrial Development (located in the former ArcelorMittal Cold Mill) and Metalico (located in the former ArcelorMittal Galvanizing Mill) off the Tecumseh property on the east side of Route 5. Beneath the soil/fill is an interbedded native soil/sediment unit of clayey silt and silty sand (occasionally with intermingled peat) underlain by a silty clay confining unit.

The analytical results from subsurface soil/fill samples obtained within the limits of S26T indicate semi-volatile organic compounds (SVOCs; primarily PAHs) as the only compounds exceeding their respective NYSDEC Part 375 industrial SCO with total PAH concentrations ranging between 0.35 and 2,900 mg/kg; excluding results from boring S26-B3. Results from boring S26-B-3 (6-8 fbgs) indicate that although coal tar is present (with total PAHs of 240,000 mg/kg), it is limited in vertical extent to that interval as evidenced by significantly reduced concentrations with depth; the soil/fill sample collected from 10-12 fbgs in this boring contained total PAHs of 2,200 mg/kg and a composite sample from 14 to 30 fbgs contained only 7.2 mg/kg total PAHs. The tar impacts at S26-B-03 are also limited in horizontal extent as evidenced by surrounding soil/fill samples collected from borings S26-B04, SB26-B-06, and SB26-B-07 with reported PAH concentrations two orders of magnitude less than S26-B-03. Although arsenic was the only metal detected above the Part 375 industrial SCO (S26-B-3 at 6 to 8 fbgs), the concentration of 40 mg/kg is well below the proposed site-specific SCO of 118 mg/kg.

Slag/fill groundwater from this area, represented by samples collected from wells MWN-07 and MWN-52A, contains no exceedances of the GWQSs for VOCs. While PAHs were detected in groundwater at concentrations exceeding GWQSs, these compounds are not considered mobile in groundwater.

Based on the foregoing, the CMS-recommended corrective measure that Tecumseh supports for SWMU S-26T is close in-place with the addition of a cover system on Tecumseh property consistent with the site-wide cover system, where deemed appropriate. That alternative remedy is equally protective of public health and the environment; equally compliant with SGVs/SCGs; is more cost-effective; is more easily implemented; has less short-term impacts; and is equally compliant with all the other balancing criteria. Tecumseh does not propose to implement any portion of the SWMU S-26 remedy on Gateway property (S-26G) as Tecumseh is not legally responsible for off-site contamination there, as set forth in detail in Exhibit A.

Response 25: See Response 7 with regard to liability concerns. The Department does not agree with Tecumseh's conclusions or rationale for closing the OU in place; empirical and anecdotal evidence suggests source material may be present. As detailed in Tecumseh's comment, the presence of coal tar has been documented at boring S26-B-3 in addition to analytical data showing the coincidental impact of PAHs to groundwater. Tecumseh shall investigate S-26 and remove grossly contaminated material or material exceeding applicable SCOs.

COMMENTS RECEIVED BY THE DEPARTMENT DURING THE VIRTUAL PUBLIC MEETING

Comment 26: What might have accounted for the higher 2017 concentration of benzene at the ATP?

Response 26: This is unknown, however with pre-design investigations and long-term monitoring requirements in the Statement(s) of Basis, the Department believes benzene contamination at the site will be adequately addressed by implementation of the remedies.

Comment 27: Should toilet facilities be provided at parking areas for bike trail users and walking visitors to the shore near Smokes Creek?

Response 27: Issues such as this will be decided in the future by a public/private collaboration between Tecumseh, the Department, and other public entities.

Comment 28: Is there an ecological risk assessment being performed at Lake Erie?

Response 28: A risk assessment was completed during the RFI (human health and ecological risk assessments) in October 2004, a more robust risk assessment will be completed by Tecumseh during the PDI.

Comment 29: When will it be clear what exactly Tecumseh is committed to?

Response 29: Tecumseh is committed to complying with the Order on Consent (legal agreement) executed in September 2020, which requires cleanup and public access. The SBs memorialize the remedies selected and will allow Tecumseh to develop more concrete plans. With the issuance of the SBs, Tecumseh can commence work finalizing design plans, subject to Department approval, to implement the required remedies. Implementation/remediation will take several years. Tecumseh will be required to submit a schedule for completion of the work for the Department's review and approval.

Comment 30: In the area on the east side of Route 5, north of the galvanize mill where there was a fire a few years ago, does Tecumseh own that area and is remediation required? Another commenter added – believes Great Lakes Steel owns this property.

Response 30: This property is not owned by Tecumseh nor is a part of the Bethlehem Steel site. However, a portion of the tax parcel was accepted into the BCP in June 2021 (2800 Hamburg Turnpike Site, Site No. C915371) and will be addressed by the Applicant through the BCP.

Comment 31: How long will it take for the public to have access to the Bethlehem site area?

Response 31: With the issuance of the SBs, Tecumseh can commence pre-design investigations and remedial design work, but it will be at least several years before public access in OU-5 occurs. However, bike path access may occur sooner based on Erie County's selected path forward.

Comment 32: With rising Lake Erie levels and the potential for increased precipitation with climate change– was this taken into consideration when designing/selecting remedy along Smokes Creek and the Lake Erie shoreline?

Response 32: Yes, the Department considers climate resiliency when developing all remedies. See Response 8 regarding Smokes Creek.

Comment 33: When is the sitewide groundwater (OU-10) corrective measures study to be completed?

Response 33: The Corrective Measures Study has been completed. With the issuance of the SB, pre-design investigations and remedial design of the OU-10 remedy can begin. Tecumseh will be required to submit plans and a schedule for implementation of the remediation work for the Department's review and approval.

Comment 34: Can we get a copy of the slide presentation?

Response 34: The slide presentation has been posted to the website.

Comment 35: What are the chemicals of emerging concern that are being looked at?

Response 35: Per- and Polyfluoroalkyl Substances (PFAS) and 1,4-dioxane. These are often associated with solvents and various processes; they are being found at sites across New York State.

Comment 36: Can the Department please comment about the area directly offshore into the Lake from the remediation area – could there ever be a marina there, for example?

Response 36: This would need to be evaluated as part of the future use of the site following remediation and is beyond the remedy selection process.

Comment 37: Has a remedial plan and contractor been chosen?

Response 37: The Department proposed a remedial plan in the Statements of Basis. Tecumseh is conducting remediation as a private party and would complete predesign

investigation/remedial design work and select a Contractor.

Comment 38: What is the plan if unexpected contamination is found?

Response 38: Tecumseh would be responsible for delineating the nature and extent of the contamination in a pre-design investigation and incorporating this information into the remedial design.