



Department of  
Environmental  
Conservation

# **STATEMENT OF BASIS CORRECTIVE MEASURES SELECTION**

Bethlehem Steel (Tecumseh Redevelopment, Inc.)  
OU-06 Former Petroleum Bulk Storage Sub-Area  
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

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-06 Former Petroleum Bulk Storage Sub-Area  
OU-07 Coal, Coke and Ore Handling and Storage Sub-Area,  
and Coke Plant and By-Products Facility Sub-Area  
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: 06, 07, and the Coke Plant and By-Products Facility Sub-Area 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: 06 - The elements of the selected remedy are as follows:

<b>SWMU</b>	<b>Selected Remedy</b>
P-8, P-74, P-75	Demolition to grade of any current buildings (excluding slabs and/or foundations), excavation/consolidation or excavation/off-site disposal of impacted soils.
S-10	Cover in place with material meeting industrial cover requirements.

For OU: 07 The elements of the selected remedy are as follows:

<b>SWMU</b>	<b>Selected Remedy</b>
P-01, P-02, P-03, P-04, P-05, P-06	Residual solids removal and backfill to grade with material meeting industrial cover requirements.
P-07, P-10, S-26	Characterization, excavation and disposal of materials followed by backfill to grade with material meeting industrial cover requirements.
P-11, P-11A, P-12, S-25	Characterization, excavation (as informed by the Pre-Design Investigation) and disposal of materials followed by backfill to grade with material meeting industrial cover requirements including a vegetated soil cover.
S-19	Regrading of existing materials to achieve a natural topography and meeting the industrial cover requirements.

### **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**

## **FINAL CORRECTIVE MEASURES SELECTION**

Bethlehem Steel (Tecumseh Redevelopment, Inc.)  
OU-06 Former Petroleum Bulk Storage Sub-Area  
OU-07 Coal, Coke and Ore Handling and Storage Sub-Area,  
and Coke Plant and By-Products Facility Sub-Area  
State Superfund Project  
Lackawanna, Erie County  
Site No. 915009

---

### **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 was 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  
Attn. Mr. Stanley Radon

Lackawanna Public Library  
560 Ridge Road  
Lackawanna, NY 14218  
Call (716) 823-0630

Access this 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](mailto: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, 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. The site is located along the west side of Route 5 in the City of Lackawanna, comprising a significant portion of the former Bethlehem Steel Corporation's Lackawanna facility and extending to the lake shore.

*Site Features* - The site is an irregularly shaped parcel which extends from south of Smokes Creek to the Buffalo Outer Harbor on the north side, and from the eastern shore of Lake Erie to the Gateway MetroPort Ship Canal (Ship Canal). The site consists of approximately 486 acres and comprises approximately two miles of shoreline along Lake Erie. Smokes Creek passes westward across the site where it discharges to Lake Erie. The Ship Canal, located towards the northern end of the site, extends approximately 3,000 feet southward into the site from the Buffalo Harbor. The western portion of the site was created by the placement of slag-fill materials from iron and steel making within an area that was formerly waters of Lake Erie. The site is mostly undeveloped, especially the western slag fill portion. OU-06 has one structure upon it, a former laboratory which is derelict at this time. The remainder of the OU-06 area is covered by remnant tank pads or flat to moderately undulating terrain comprised of slag fill. OU-07 encompasses the area formerly used for coal, coke and ore handling & storage, and the coke and coke gas by-products facilities. Although most of the coke batteries have been razed, the remnants of two remain in the northeast part of the OU. Much of the coke gas by-products processing infrastructure has also been removed, however a number of structures, pits, vaults, chimney stacks, cracking towers, piping, roadways and railroad tracks remain. The western half of the OU is currently used for coal storage and transloading. The eastern half of the OU is used on a limited basis for warehousing and maintenance shops. The OU-04 groundwater extraction and treatment system, including extraction wells, piping, treatment facility and infiltration galleries are located in the southeastern extent of OU-07. Cover throughout the OU consists of the structures, roadways, slag fill and sparsely vegetated (grasses, weeds and trees) spaces interspersed amongst the remnants of the Bethlehem Steel coking operations.

*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-specific remedial groundwater treatment systems. 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 undeveloped.

*Past Use of the Site* - The former Bethlehem Steel Corporation (BSC) property was used for iron, steel and coke production beginning early in the 20th century. Iron and steel-making operations ceased 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 although coking operations continued. In September 2001, BSC's coke oven operation was terminated. While some buildings remain, most structures have been razed. The western portion that includes approximately 2 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 deposited.

*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 depths ranging from about ten 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 and Solid Waste Management Unit (SWMU) Groups* - The site has been divided into Operable Units (OUs). An 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** (Slag Fill Area Zone 2, The Impoundments) is approximately 74.4-acres and encompasses Slag Fill Area Zone 2 (SFA-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). 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** (Slag Fill Area Zones 4 and 5 SWMU/AOC Group) 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. In addition, seven AOCs are also included within OU-08: AOC-A is a lead-impacted areas 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 has been prepared for OU-06 Former Petroleum Bulk Storage Sub-Area and OU-07 the Coal, Coke and Ore Handling and Storage Sub-Area, and the Coke Plant and By-Products Facility Sub-Area.

A site location and vicinity map is attached as Figure 1. A facility-wide map depicting the corrective measure study sub-areas (solid waste management units, water courses and areas of concern) is attached as Figure 2. Figure 3 is attached depicting the solid waste management units (SWMUs) and areas which compromise OU-06. Six additional figures are also attached depicting the solid waste management units (SWMUs) and areas which

comprise OU-07. The figures included in this document are enumerated in the following table:

Figure	Area of Interest
No. 1	Site Locality and Vicinity Map
No. 2	Facility-wide CMS study areas
No. 3	OU-06 SWMUs
No. 4	OU-07 Sub-Area SWMUs P-1 thru P-6
No. 5	OU-07 Sub-Area SWMUs P-7, P-9 and P-10
No. 6	OU-07 Sub-Area SWMUs P-11, P-11A and P-12
No. 7	OU-07 Sub-Area SWMUs P-18A and P-18B
No. 8	OU-07 Sub-Area SWMUs S-19 and S-25
No. 9	OU-07 Sub-Area SWMU S-26

## **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 soil remediation. For these Operable Units, alternatives that allow for industrial use of the OU are 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 the Site Investigation**

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-06 and OU-07 was derived from samples of:

- soil/fill/waste material contained in SWMUs
- surface/impounded water contained in SWMUs (OU-07 only)

### **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. For OU-06 data are available from the slag fill and solids. In OU-07, data are available from two primary media sources; the standing water and the residual or accumulated solids which are contained in the pits and vaults lying throughout the area of the former coke batteries and coke gas by-products facilities. It is believed that, within OU-07, solids remain in the bottom of the pits and vaults which were not cleaned out after Bethlehem Steel's operations ceased. The residual solids, left from the coking processes and other operations, have been found to be impacted which in turn impact the accumulated precipitation which is retained or impounded in the vaults, pits and subgrade structures. Fuel oil(s) have been identified as free products in OU-06. The contaminants which have been identified in OU-06 and OU-07 exceeding the respective SCGs are:



### Soil/Residual Solids

Acetone,	Benzo(ghi)perylene,	Phenanthrene,
Benzene,	Benzo(k)Fluoranthene,	Phenol,
Ethylbenzene,	Chrysene,	Pyrene,
Methylene Chloride,	Dibenz(a,h)anthracene,	PAHs(Total),
Toluene,	Dibenzofuran,	Arsenic,
Xylenes (Total),	Fluoranthene,	Cadmium,
Acenaphthene,	Fluorene,	Mercury,
Acenaphthylene,	Indeno(1,2,3-cd)pyrene,	Nickel,
Anthracene,	3-Methylphenol and	Selenium,
Benzo(a)anthracene,	4-Methylphenol,	and Silver
Benzo(a)pyrene,	2-Methylphenol,	
Benzo(b)fluoranthene,	Naphthalene,	

### Surface/Impounded Water

Benzene,	Phenanthrene,
Ethylbenzene,	Phenol,
Toluene,	Mercury (Total),
Xylenes (Total),	Mercury (Dissolved),
Fluorene,	and Cyanide
Naphthalene,	

The contaminant(s) of concern exceed the applicable SCGs for:

- soil/fill/waste material
- surface/impounded water

## **6.2 Interim and Final Corrective Measures**

Interim Corrective Measures (ICMs) are taken if, at any time during an investigation, it becomes apparent that corrective actions should be taken to immediately address the spread of contamination. The intent is to construct an ICM as close as possible to a component of a permanent system or final remedy.

### **6.2.1 Interim Corrective Measures**

The Department has determined that the following ICMs are protective to human health and the environment and should serve as part of the Final Corrective Measures at the facility.

The following ICMs have been completed within OU-06 and OU-07 based on conditions observed during the RFI:

### **OU-06**

**SWMU S-24** An Interim Corrective Measure (ICM) was performed to remove, transport, and consolidate waste from SWMU S-24 within the combined footprint of SWMUs S-11 & S-22 (OU-5 Agitator Sludge Area) and to construct a containment cell surrounding the consolidated waste deposition area. The total in-place volume of waste/fill material excavated from SWMU S-24 was approximately 24,500 cubic yards. A revised construction completion report (CCR) for this work was submitted to the Department in February 2013.

**OU-01C** An ICM was performed to remove a five-million-gallon storage tank in the former petroleum storage area that was used to store approximately 350,000 gallons of wastewater generated from various plant decommissioning activities. The wastewater was sent to the wastewater treatment facility at the Galvanizing Plant on the east side of NYS Route 5. The scrap metal was sent off-site for recycling. Approximately 87 tons of solid waste was removed and sent off-site for disposal. In a letter dated February 14, 2011, the Department confirmed that Tecumseh had satisfied the terms of the Order on Consent that required the treatment and discharge of wastewater and residual solids from the storage tank, and ultimately accepted the demolition and removal of the tank from Tecumseh's property, terminating Tecumseh's obligations under the Order.

### **OU-07**

**OU-04A** This ICM was a groundwater and NAPL pump and treat system installed in the Benzol Yard (SWMU P-11), located in the Coke Oven Area, near the south end of the Ship Canal. The system included multiple extraction wells, NAPL separation, air stripping of groundwater, and reinjection of treated water. This system began operating in 2005. A thermal oxidizer was initially used to treat vapor discharge from air stripper, but oxidizer use was discontinued due to the reduced loading into the system. Between 2005 and 2018, this interim measure reportedly removed and destroyed over 36,000 pounds of contaminants. In 2019, the treatment building was dismantled, and the extraction wells and treatment system were incorporated into the final OU-04 groundwater remedy.

**OU-04B** An ICM was performed to address source material located in the unsaturated soils and "smear zone" in the vicinity of SWMU P-11, also known as the Benzol Yard Source Control. A soil vapor extraction system was installed to collect and treat VOCs in 2019. The ICM will be managed in conjunction with the OU-04 remedy. Annual operation, maintenance and monitoring reports are submitted to the Department for review and evaluation. As of April 2020, this interim measure had recovered approximately 351 pounds of VOCs. A revised CCR was submitted on October 24, 2019 and approved by the Department on November 12, 2019.

### 6.2.2 Final Corrective Measures

Final corrective measures have been implemented or completed within OU-07, as detailed below. No Final Corrective Measures have been implemented within OU-06.

**OU-02** This OU and the June 2015 Statement of Basis addressed SWMUs P-9 (Tar Decanter Pit), P-18A & P-18B (Blast Furnace Hot & Cold Wells) and two AOCs (B & C) within S-18 (Lime and Kish Landfill R). SWMUs P-9 and P-18 A/B are located within the boundary of OU-07, the subject of this SB. The AOCs located in S-18 are located outside of the OU-07 bounds and not subject to this discussion. The SWMUs within OU-07 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. A revised CCR for OU-02 & OU-03 was submitted on July 26, 2016 and approved by the Department on August 12, 2016.

**OU-04** The March 2017 OU-04 Statement of Basis addresses 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 but lies within the bounds of OU-07. These other media will be addressed by the remedies selected for OU-07. The OU-04 area contains portions of the former coke oven area and SWMUs P-11 (former Benzol Plant) and P-11A (“old” former Benzol Plant). The Benzol Plants were used for the treatment and processing of liquid coke gas by-products. These SWMUs were found to be impacted with various organic compounds.

A Consent Order for Coke Oven Area Groundwater Corrective Action (File No. 16-55) was executed in September 2017 calling for augmenting the existing 11 ICM groundwater pumping wells in the Benzol Yard (SWMU P-11) with an additional 14 pumping wells plus an additional 27 pumping wells in the northern portion of the OU-4 Area in and around the “Old” Benzol Yard (SWWU P-11A). The existing Benzol Yard ICM groundwater treatment system and south infiltration gallery (i.e., OU-04A) was decommissioned following construction and start-up of the new OU-04 groundwater treatment system in March 2019. The OU-04 groundwater treatment building contains two parallel treatment systems or “trains” with the south groundwater treatment train consisting of an oil-water separator, bag filtration, and shallow tray air stripper; and an independent northern groundwater treatment train with a bag filter, a shallow tray air stripper, and a granular activated carbon adsorption system to treat the higher phenolic and naphthalene constituent concentrations. Treated groundwater is discharged back to the subsurface through infiltration galleries located adjacent to the treatment building in the west central portion of the OU. An amended CCR was submitted on August 13, 2019 and approved by the Department on September 11, 2019.

### **6.3: Summary of Environmental Assessment**

This section summarizes the assessment of existing and potential future environmental impacts presented by the site. Environmental impacts may include existing and potential future exposure pathways to fish and wildlife receptor, and groundwater resources.

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 site, specifically OU-06 and OU-07. 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 SWMU material, soil, and groundwater associated with OU-6. A brief summary of these assessments and investigations of OU-6 is included in **Exhibit A**. Evaluation of other environmental media and surrounding areas will be addressed through separate remedy selection actions.

The environmental assessments and investigations of OU-07 have evaluated soil/residual solids and surface water contained in SWMUs. A summary of the OU-07 assessments and investigations is included in **Exhibit A**. The findings of the OU-07 investigations indicate the presence of hazardous constituents in soil/residual solids and surface water/impounded water, and observations of potentially grossly contaminated soil. Evaluation of other environmental media and surrounding areas will be addressed through additional remedy-selected actions.

#### **Special Resources Impacted/Threatened:**

No Special Resources are known to exist within OU-06 or OU-07.

### **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.

The remedial action objectives (RAOs) for OU-06 are:

### **Soil**

#### **RAOs for Public Health Protection**

- Prevent ingestion or direct contact with contaminated soil.
- Prevent inhalation exposure to contaminants volatilizing from soil.

#### **RAOs for Environmental Protection**

- Prevent migration of contaminants that would result in groundwater, surface water or sediment contamination.

The RAOs for the OU-07 area are:

### **Soil/Residual Solids in Pits**

#### **RAOs for Public Health Protection**

- Prevent the ingestion and/or direct contact with contaminated soil.
- Prevent the inhalation of, or exposure from contaminants, volatilizing from contaminants in soil.

#### **RAOs for Environmental Protection**

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

## **Surface/Impounded Water in Pits and Subgrade Structures**

### **RAOs for Public Health Protection**

- Prevent contact with, or inhalation of contaminants from impacted water bodies.

### **RAOs for Environmental Protection**

- Prevent impacts to biota from ingestion/direct contact with surface water causing toxicity and impacts from bioaccumulation through the marine or aquatic food chain.

## **SECTION 7: SUMMARY OF THE OU-6 AND OU-07 REMEDIES**

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 Corrective Measures Study (CMS) report and further evaluated by the Department in the development of the remedy.

A summary of the remedial alternatives that were considered for OU-6 and OU-07 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 Building Demolition, Excavation and Site Cover and include:

## **OU-06**

<b>SWMU</b>	<b>Selected Remedy</b>
P-8, P-74, P-75	Demolition to grade of any current buildings (excluding slabs and/or foundations), excavation/consolidation or excavation/off-site disposal of impacted soils.
S-10	Cover in place with material meeting industrial cover requirements.

## **OU-07**

<b>SWMU</b>	<b>Selected Remedy</b>
P-01, P-02, P-03, P-04, P-05, P-06	Residual solids removal and backfill to grade with material meeting industrial cover requirements.
P-07, P-10, S-26	Characterization, excavation and disposal of materials followed by backfill to grade with material meeting industrial cover requirements.
P-11, P-11A, P-12, S-25	Characterization, excavation (as informed by the Pre-Design Investigation) and disposal of materials followed by backfill to grade with material meeting industrial cover requirements including a vegetated soil cover.
S-19	Regrading of existing materials to achieve a natural topography and meeting the industrial cover requirements.

The estimated present worth cost to implement the corrective measures is \$17,469,600. The cost to construct the corrective measures is estimated to be \$17,098,100 and the estimated average annual cost is \$12,500. The present value of the annual cost is estimated to be \$371,500.

The elements of the OU-6 and OU-07 Corrective Measures are as follows:

### **1. Remedial Design Program**

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 and mitigate vapor intrusion 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 exposure to those hazards;
- Characterizing the remedy 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.

## **2. Pre-Design Investigation**

A pre-design investigation (PDI) will be implemented to fill data gaps and inform the OU-06 and OU-07 remedial designs. The PDI will provide information on SWMUs and AOCs requiring additional investigation (e.g., SWMU-25) to complete the remedial design and implement a remedial action protective of human health and the environment. 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 7, to determine the extent of areas within OU-06 and OU-07 where the upper one foot of exposed surface soil exceeds industrial soil cleanup objectives, respectively, and a site cover may be needed to allow for industrial use of the site;



- 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;
- Pre-design investigations will be performed prior to any demolition activities to identify and quantify the presence of asbestos, lead-based paint, PCBs or other hazardous/regulated materials in order to inform the demolition design;
- Exploratory investigations (e.g., test pits/trenches or borings) will be performed to determine the presence of grossly contaminated materials; and
- The investigation of SWMUs P-07, P-10, S-25 and S-26.

### **3. Demolition**

The former facility buildings, structures and associated appurtenances will be razed to ground level. Prior to demolition, structures and components will be appropriately characterized to identify lead-based paint, asbestos, PCBs, hazardous materials, etc. to determine the appropriate disposal location - either off-site or in the on-site SW-CAMU discussed in the Statement of Basis for OU-1 (Site Wide Remedial Elements, OU-9 Water Courses and OU-10 Site-Wide Groundwater). Dust suppression will be utilized to control fugitive dust emissions, dust suppression fluid and storm water run-off control measures will be employed to minimize any short-term impacts from demolition activities. A comprehensive Community Air Monitoring Program (CAMP) will be developed and implemented during demolition activities. Hazardous soil and building materials will be sent to a RCRA-regulated facility for disposal. Pits, vaults and subgrade structures known or discovered during demolition activities will be cleaned and their bottoms broken and backfilled with Department-approved fill. Contractors responsible for demolition activities will be required to obtain a demolition permit, and any other applicable permits required, from the City of Lackawanna.

### **4. 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(a)(1);
- soil with visual waste material or non-aqueous phase liquids;

- excavation and removal of any underground storage tanks, fuel dispensers, underground piping or other structures associated with a source of contamination;
- soil containing arsenic exceeding 16 ppm or total SVOCs exceeding 500 ppm;
- soils which exceed the protection of groundwater soil cleanup objectives, as defined by 6 NYCRR Part 375-6.8 for those contaminants found in site groundwater above standards;
- soils that create a nuisance condition, as defined in Commissioner Policy CP-51 Section G; and
- soils 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 present within one foot of finished grade.

Approximately 76,300 cubic yards of contaminated materials will be excavated from the operable units. In addition to the anticipated volume of soil, a significant volume of soil may require to be removed if it is found to be grossly contaminated during the Pre-Design Investigation.

Solidification and/or stabilization will be implemented as necessary to treat excavated soils and residuals in contravention of the criteria listed above. Solidification and stabilization are processes that mix amendments with contaminated soil to physically and/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 these processes the contaminated soil will be excavated and mixed in a temporary mixing facility (e.g., a pug mill) with solidifying and/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 7 - Cover System, 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 Industrial standards.

## **5. Disposition of Excavated Material**

The 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 material 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 will be determined during the remedial design, the Department's preferred mode of transportation is rail since it reduces truck traffic, reduces greenhouse gases, utilizes rail facilities located on or near the site, and is consistent with previously received community comments.

## **6. Backfill**

- A. On-site soil which does not exceed the above excavation criteria may be used below the cover system described in remedy Element 7 - Cover System, to backfill the excavation to the extent that a sufficient volume of on-site soil is available to and 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 7 - Cover System.

## **7. Cover System**

A cover system will be required meeting the requirements of industrial use, where the upper one foot of exposed surface soil will exceed the industrial soil cleanup objectives (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

vegetative growth, 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 in lieu of soil and vegetative cover may be allowed where such surfaces 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, new building foundations and associated building slabs. To the extent practical, areas with one foot of cover will enhance habitat or be appropriately regraded to facilitate future use.

## **8. All Other Areas**

For areas of the Operable Units not previously investigated or lying outside of defined SWMUs, development and implementation of a sampling program will be required. This sampling program will be implemented to confirm the existence or adequacy of the site cover described above, or to identify source materials or grossly contaminated materials requiring removal under remedial element four.

## **9. 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.

## **10. 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 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.

## 11. Site Management Plan

Supplemental elements will be added to the site-wide Site Management Plan as required in Statement of Basis for OU-1 to address requirements of OU-06 and OU-07, including the following:

1. an Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for the site 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 controls described in remedial element 8, - Financial Assurance and element 9. - Institutional Controls (Environmental Easement).

Engineering Controls: the cover system as described in remedial element seven.

This plan includes, but may not be limited to:

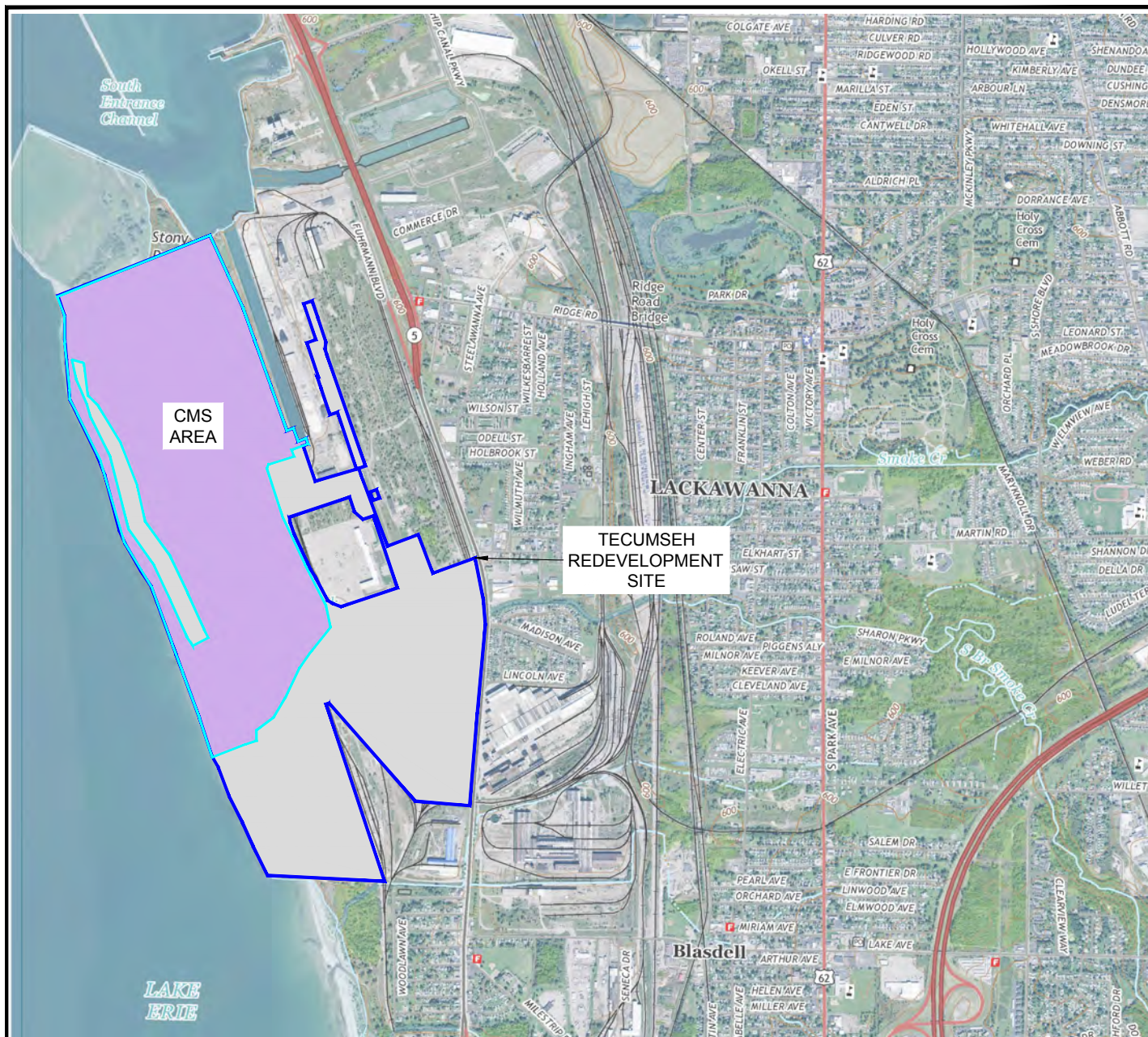
- an Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination;
- a provision for further investigation and remediation should redevelopment occur or if the subsurface is otherwise made accessible. The nature and extent of contamination in areas 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. Citizen Participation Plan (CPP) activities will continue through this process. Any necessary remediation will be completed prior to, or in association with, redevelopment.
- 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;
- a provision that should a building foundation or building slab, acting as cover, be removed in the future, a cover system consistent with that described in remedial element seven will be placed in any area(s) where the upper one foot of exposed surface soil exceeds the applicable soil cleanup objectives (SCOs)

- 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

- Figure 1 Site Locality and Vicinity Map
- Figure 2 Facility-wide CMS study areas  
(*Bethlehem Steel Operable Units*)
- Figure 3 OU-06 SWMUs  
(*Tank Farm Sub-Area SWMUS P-8, -74, & -75 & AOCS-H & I*)
- Figure 4 OU-07 Sub-Area SWMUs P-1 thru P-6  
(*Coke Plant & By-Products Facility Sub-Area SWMUS P-1 thru P-6 & P-11a*)
- Figure 5 OU-07 Sub-Area SWMUs P-7, P-9 and P-10  
(*Coke Plant & By-Products Facility Sub-Area SWMUS P-7, -9, & -10*)
- Figure 6 OU-07 Sub-Area SWMUs P-11, P-11A and P-12  
(*Coke Plant & By-Products Facility Sub-Area SWMUS P-11 & P-12*)
- Figure 7 OU-07 Sub-Area SWMUs P-18A and P-18B  
(*Coke Plant & By-Products Facility Sub-Area SWMU P-18 [A & B]*)
- Figure 8 OU-07 Sub-Area SWMUs S-19 and S-25  
(*Coal/Coke/Ore Handling & Storage Sub-Area SWMUS S-19 & -25*)
- Figure 9 OU-07 Sub-Area SWMU S-26  
(*Coke Plant & By-Products Facility Sub-Area SWMU S-26*)





2,500' 0' 2,500' 5,000'

SCALE: 1 INCH = 2,500 FEET  
SCALE IN FEET  
(approximate)



**LEGEND:**

- TECUMSEH PROPERTY
- CMS AREA

BASE MAP USGS QUAD BUFFALO SE 2016



2558 HAMBURG TURNPIKE  
SUITE 300  
BUFFALO, NY 14218  
(716) 858-0635

## FIGURE 1 SITE LOCATION MAP

CMS AREA - FORMER BETHLEHEM STEEL SITE  
LACKAWANNA, NEW YORK

PROJECT NO.: 0071-019-111

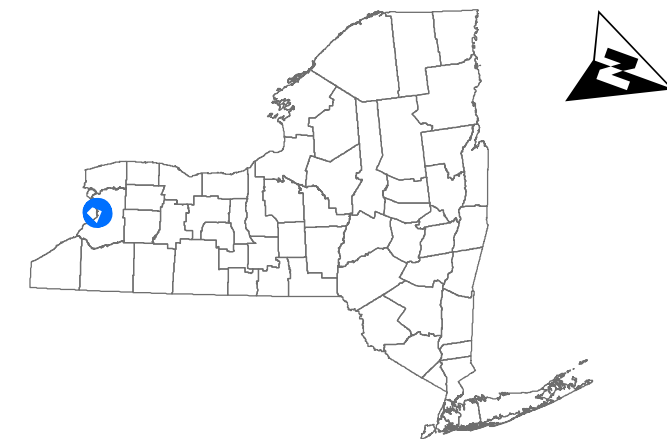
DATE: MAY 2019

DRAFTED BY: RFL

**DISCLAIMER:**

PROPERTY OF TURNKEY ENVIRONMENTAL RESTORATION, LLC. 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 TURNKEY ENVIRONMENTAL RESTORATION, LLC.





### LEGEND

- CMS Boundary (OU-01 & OU-10)
- Steel Winds Boundary
- OU-05
- OU-06
- OU-07
- OU-08
- OU-9 Boundaries

### Notes:

Extents of North and South Return Water Trenches are shown larger than actual size to increase visibility at the current scale



Figure 2



Bethlehem Steel Operable Units

Tecumseh Redevelopment Site  
Lackawanna, New York

**PARSONS**

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



A map of the CME AREA, which is a large purple-shaded region. A smaller, pink-shaded area within the purple region is labeled 'TANK FARM SUB-AREA INSET' with a line pointing to it. The area is bordered by a blue line representing water. To the south of the purple area are yellow-outlined rectangular shapes representing buildings or infrastructure. A scale bar at the bottom right indicates 'scale 1" = 2000'.

A photograph of a soil profile. A vertical ruler is placed against the soil face for scale. The soil shows a dark, silty layer with some roots and debris at the top. Below this, there is a layer of dark, silty material with some roots and debris. The bottom of the profile shows a lighter, more granular material. A yellow date stamp "23/07" is visible in the bottom right corner.

**TANK FARM SUB-AREA (AERIAL)**

**LEGEND:**

- TECUMSEH PROPERTY BOUNDARY
- RAILROAD TRACK
- EXISTING BUILDING / STRUCTURE
- DEMOLISHED BUILDING AND HISTORICAL SITE FEATURE
- CMS AREA BOUNDARY
- TANK FARM SWMU GROUP BOUNDARY
- APPROXIMATE BOUNDARY OF SWMU
- APPROXIMATE BOUNDARY OF REMEDIATED SWMU/AOC
- DELINEATED SLAG/FILL IMPACTS FROM 0-4 FBGS ( $\pm 31,500$  CY)
- DELINEATED SLAG/FILL IMPACTS FROM 4-8 FBGS ( $\pm 14,250$  CY)
- DELINEATED SLAG/FILL IMPACTS FROM 8 TO 12+ FBGS ( $\pm 14,400$  CY)
- EXISTING MONITORING WELL
- RFI BORING LOCATION
- RFI SURFACE SOIL LOCATION
- CMS TANK FARM TEST PIT (JULY/AUGUST & DECEMBER 2010) WITH NO VISUAL AND/OR OLFACTORY IMPACTS
- CMS TANK FARM TEST PIT (JULY/AUGUST & DECEMBER 2010) WITH MARGINAL VISUAL AND/OR OLFACTORY IMPACTS
- CMS TANK FARM TEST PIT (JULY/AUGUST & DECEMBER 2010) WITH HEAVY VISUAL IMPACTS (NAPL)
- DELINEATED SURFACE SOIL IMPACTS (S)
- SOLID WASTE MANAGEMENT UNITS
- UNIT DESCRIPTION
- P-08 Waste Oil Storage Tanks (In Tank Farm)
- P-74 (A, B, C, D) Solid Fuel Mix Storage Piles in Tank Farm
- P-75 Tank Storage Area for No. 6 Fuel Oil and Petroleum Tar (Tank Farm)

**NOTES:**

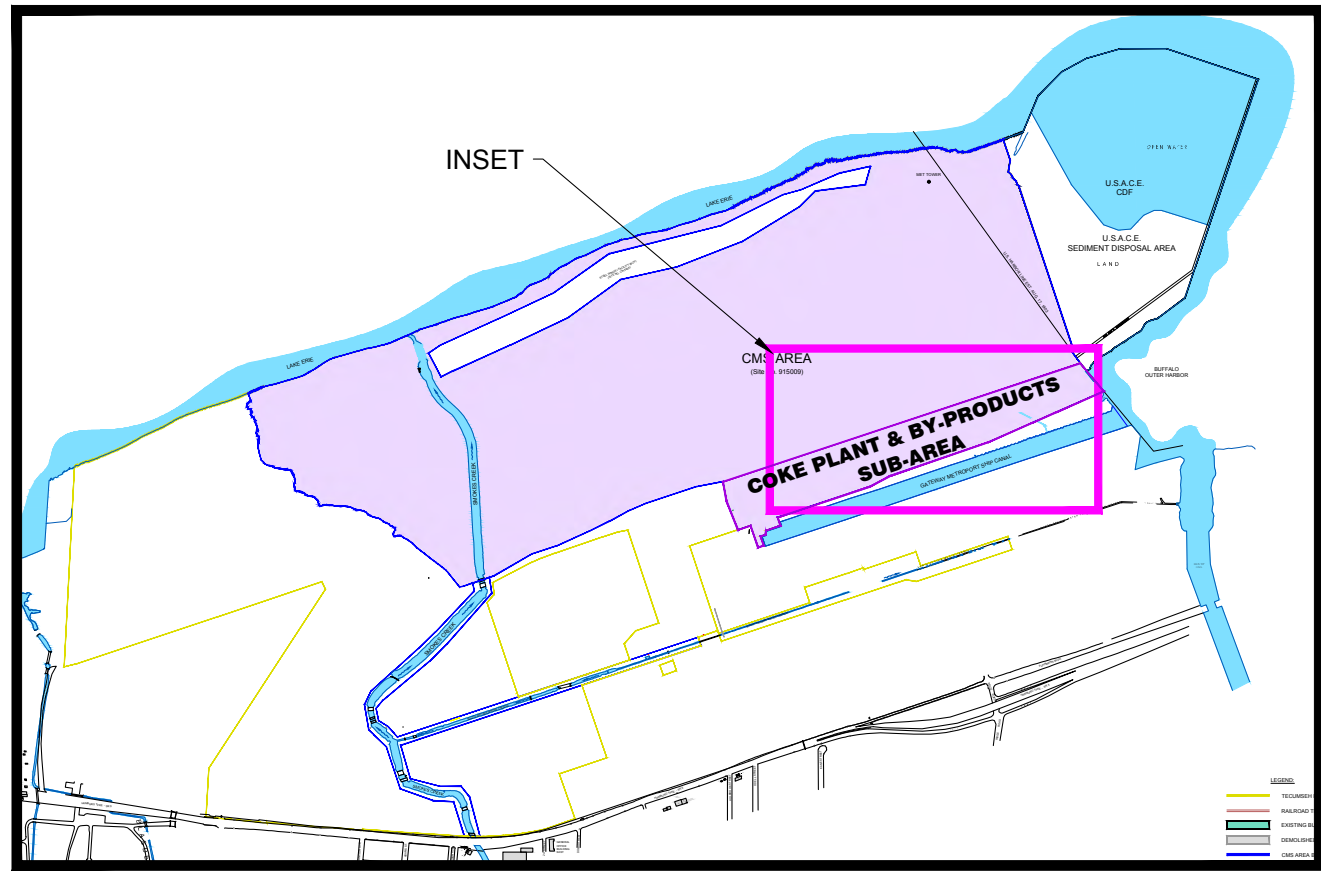
- Building locations are based on historical surveys and maps, all locations should be considered approximate.

BASE IMAGE GOOGLE EARTH MAY 2017

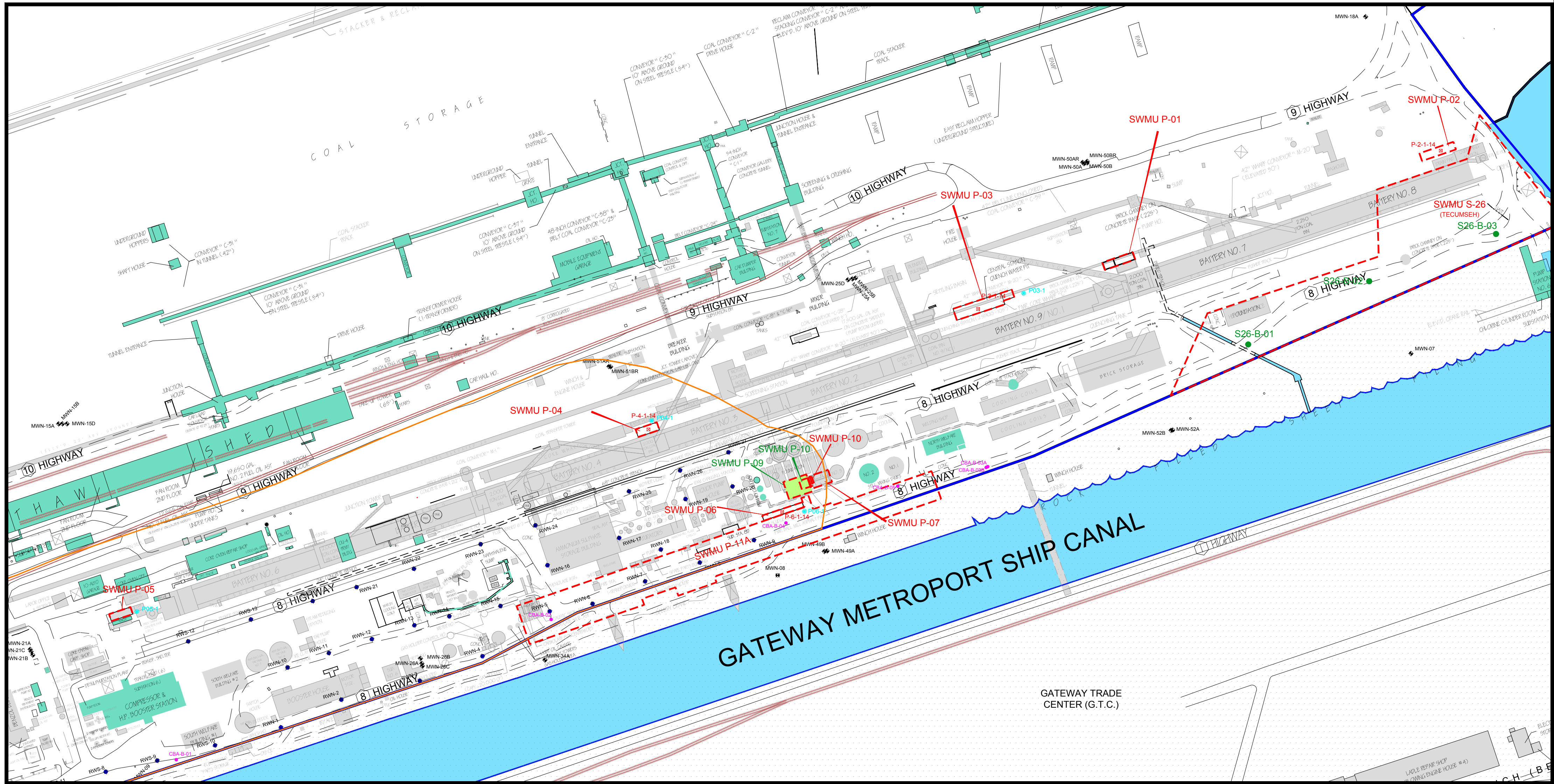
[illegible]

**FIGURE 3**





- LEGEND:
- TECUMSEH PROPERTY BOUNDARY
  - RAILROAD TRACK
  - EXISTING BUILDING / STRUCTURE
  - DEMOLISHED BUILDING AND HISTORICAL SITE FEATURE
  - CMS AREA BOUNDARY
  - OU-4 BOUNDARY
  - APPROXIMATE BOUNDARY OF SWMU
  - APPROXIMATE BOUNDARY OF AOC
  - APPROXIMATE BOUNDARY OF REMEDIATED SWMU
  - OU-4 GROUNDWATER RECOVERY WELL
  - BORING LOCATION
  - EXISTING MONITORING WELL LOCATION
  - SWMU P-1 TO P-6 IMPOUNDED WATER SAMPLE LOCATION
  - SWMU P1 AND P5 SOLID RESIDUAL SAMPLE LOCATION
  - RFI BORING
  - RFI SURFACE SAMPLE
  - COKE PLANT & BY-PRODUCTS SUB-AREA BOUNDARY



REPRESENTATIVE PHOTOGRAPHS:

COKE PLANT & BY-PRODUCTS SUB-AREA  
(AERIAL GOOGLE EARTH MAY 2017)



SWMU P-1 (looking east)



SWMU P-2 (looking north)



SWMU P-3 (looking north)



SWMU P-4 (looking north)



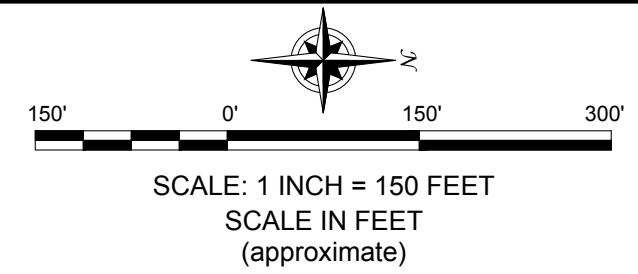
SWMU P-5 (looking south)



SWMU P-6 (looking west)



SOURCE FOR AERIAL IMAGES FOR P-1 THRU P-6 FROM BING MAPS CIRCA 2010



REVISIONS

NO.	BY	DATE	REMARKS

SEAL

COKE PLANT & BY-PRODUCTS FACILITY SUB-AREA  
SWMUS P-1 THRU P-6 & P-11A SAMPLE LOCATIONS

CMS REPORT  
CMS AREA - FORMER BETHLEHEM STEEL SITE  
LACKAWANNA, NEW YORK

PREPARED FOR  
TECUMSEH REDEVELOPMENT INC.

DRAWN BY: RFL  
DATE: APRIL 2019  
CHECKED BY: LR  
APPROVED BY: PHW  
BESSAMER, BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, P.L.L.C. & TURNKEY ENVIRONMENTAL RESTORATION & SCIENCE, P.L.L.C. AS CONSULTANTS TO TECUMSEH REDEVELOPMENT INC. FOR THE PREPARATION OF THIS REPORT. THE INFORMATION CONTAINED HEREIN IS NOT TO BE USED FOR ANY PURPOSE OTHER THAN THAT SPECIFICALLY INTENDED AND IS SUBJECT TO RECALL AT ANY TIME. INFORMATION CONTAINED HEREIN IS NOT TO BE USED FOR ANY PURPOSE OTHER THAN THAT SPECIFICALLY INTENDED AND IS SUBJECT TO RECALL AT ANY TIME. INFORMATION CONTAINED HEREIN IS NOT TO BE USED FOR ANY PURPOSE OTHER THAN THAT SPECIFICALLY INTENDED AND IS SUBJECT TO RECALL AT ANY TIME.



A map of the Coke Plant & By-Products Sub-Area. The map shows a large purple area labeled "CMS AREA (100% BY-PRODUCTS)". A smaller yellow area labeled "COKE PLANT & BY-PRODUCTS SUB-AREA" is located within the purple area. A line points from the word "INSET" to the yellow area. The map also shows a blue area representing water and a road. A scale bar indicates "scale 1" = 2000'".

## OPERABLE UNIT 4 (AERIAL)





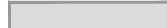














An aerial photograph of a remediated area. A black compass rose is in the top left corner. The image shows a mix of green vegetation, brownish soil, and some structures. A yellow rectangle is labeled 'P-10 REMEDIATED SOUTHERN PORTION' in black text. A red rectangle is labeled 'P-10 UNREMEDIATED NORTHERN PORTION' in red text. A small black rectangle is labeled 'P-9' in black text. A small red rectangle is labeled 'P-7' in red text. A scale bar at the bottom right indicates '200 ft'.

Site map of Gateway Trade Center (G.T.C.) showing various industrial structures, storage tanks, and remediation areas. The map includes labels for 'PRIMARY COOLERS', 'CIRC. LIQ. DECANter AST', 'HYDRATOR AST', 'CRYSTALLIZER / MARLEY PIT', 'PUMP STA. #1', 'LIQUOR PULPING DECANter ASTs', 'WASTE LIQUOR SUMP', 'TAR SLUDGE SETTLING BASIN', and 'STILL MIXING TANKS'. Remediation areas are highlighted in green (SWMU P-09, P-10 (PORTION OF P-10 REMEDIATED)) and blue (SWMU P-10 (PORTION OF P-10 REMAINING)). A black rectangle indicates the 'APPROXIMATE AREA OF SURFICIAL LOCALIZED TAR IMPACTS (± 4,990.8 SF x ± 1' DEEP = ± 185 CY)'. The map also shows 'NO. 1' through 'NO. 9' storage tanks and 'RWN-9' through 'RWN-27' monitoring points.

SWMU P-9 & PORTION OF P-10; LEFT: EXCAVATED TAR DECANTER PIT (P-9)  
RIGHT: BACKFILLED PIT AND AREA FINAL GRADED (PICTURES FROM 2015)



- LEGEND:

- |   |  |
|---|--|
|            | TECUMSEH PROPERTY BOUNDARY                                 |
|            | EXISTING BUILDING / STRUCTURE                              |
|            | DEMOLISHED BUILDING AND HISTORICAL SITE FEATURE            |
|            | CMS AREA BOUNDARY  |
|            | OPERABLE UNIT 4 BOUNDARY                                   |
|            | SWMU BOUNDARY REQUIRING ADDITIONAL ACTION                  |
|            | REMEDIATED SWMU  |
|            | PORTION OF SWMU P-10 REQUIRING ACTION                      |
|            | APPROXIMATE LIMITS OF SURFICIAL TAR IMPACTS                |
| MWN-15A    | EXISTING MONITORING WELL                                   |
| P-7 TP-01  | CMS TEST PIT LOCATION (2011)                               |
| P-9-2-14   | CMS TEST BORING LOCATION (2014)                            |
| SB-09      | RFI BORING   |
| SS-03      | RFI SURFACE SAMPLE   |
| RWN-20     | QU-4 GROUNDWATER RECOVERY WELL                             |
| RW-E       | BENZOL YARD RECOVERY WELL (12)                             |
|            | COAL/COKE/ORE STORAGE &<br>COAL HANDLING SUB-AREA BOUNDARY |

[illegible]



A map showing the Lake Erie CMB Area and the Coke Plant & By-Products Sub-Area. The map includes a scale bar indicating 1" = 2000'. The Lake Erie CMB Area is shaded in light blue, and the Coke Plant & By-Products Sub-Area is shaded in light yellow. The map also shows the shoreline of Lake Erie and the location of the CMB Area and Coke Plant & By-Products Sub-Area. An inset map shows the location of the study area within the larger context of the Lake Erie CMB Area.

LAKE ERIE

INSET

CMB AREA  
1000 to 15000

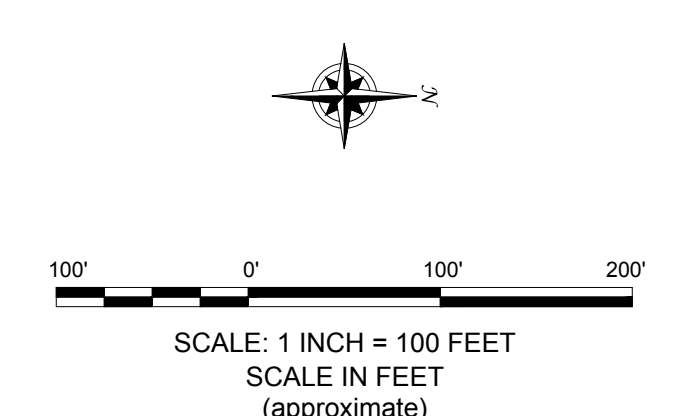
COKE PLANT & BY-PRODUCTS  
SUB-AREA

scale 1" = 2000'

The map displays the Gateway Metroport Ship Canal area, including the Gateway Trade Center (G.T.C.) and the Gateway Metroport Ship Canal. The map shows the property boundary of Tecumseh, existing buildings, and demolished structures. It also indicates the approximate boundary of the SWMU from RFI, the Benzol Plant ICM Force Main (Influent and Effluent), and the Benzol Plant ICM Force Main (Effluent). The map includes a legend with symbols for various features and monitoring points.

**LEGEND:**

- TECUMSEH PROPERTY BOUNDARY
- EXISTING BUILDING / STRUCTURE
- DEMOLISHED BUILDING AND HISTORICAL SITE FEATURE
- RAILROAD TRACK
- CMS AREA BOUNDARY
- APPROXIMATE BOUNDARY OF SWMU FROM RFI
- BENZOL PLANT ICM FORCE MAIN (INFLUENT)
- BENZOL PLANT ICM FORCE MAIN (EFFLUENT)
- EXISTING MONITORING WELL LOCATION
- BENZOL YARD RECOVERY WELL (12)
- BENZOL YARD PIEZOMETER (22)
- STAFF GAUGE LOCATION
- RFI BORING
- RFI SURFACE SAMPLE
- RFI SURFACE WATER SAMPLE
- OU-4 GROUNDWATER RECOVERY WELL (41)
- OU-4 PIEZOMETER (14)
- SOIL VAPOR EXTRACTION WELL (8)
- COKE PLANT & BY-PRODUCTS SUB-AREA

[illegible]

**FIGURE 6**

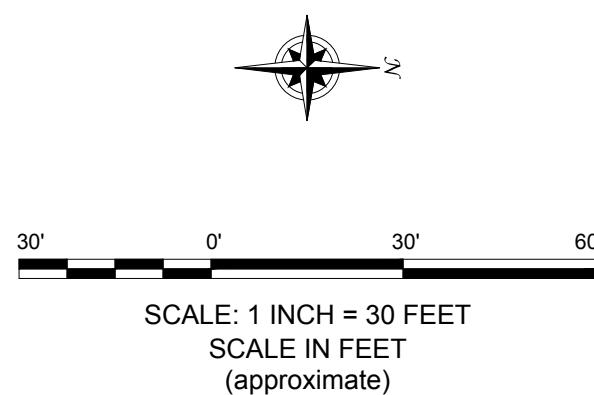


INSET

COKES AREA  
(200 +/- ACRES)

COKE PLANT & BY-PRODUCTS  
SUB-AREA

scale 1" = 2000'

[illegible]

This aerial photograph shows the industrial site with the SHIP CANAL. Two specific areas are highlighted with red labels and arrows: SWMU P-18A (cold well) and SWMU P-18B (hot well). The canal is a large body of greenish water on the right side of the image. The industrial structures and storage tanks are visible in the background and foreground.

WET WELL

HOT WELL (P-18B)

COLD WELL (P-18A)

SHIP CANAL

[illegible]



INSET

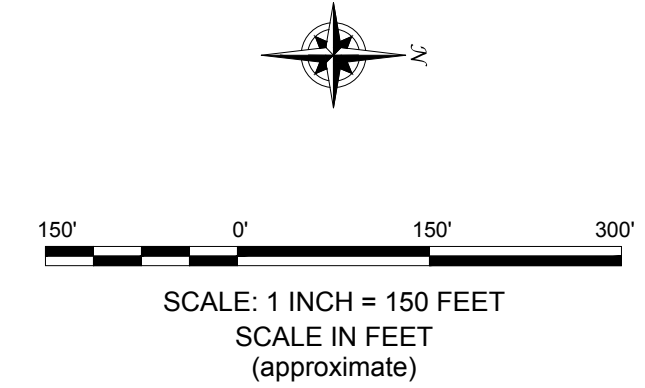
LAKE ERIE



Coal Access

**Coal Cone ORE STORAGE & COAL HANDLING SUB-AREA**

scale 1" = 2000'

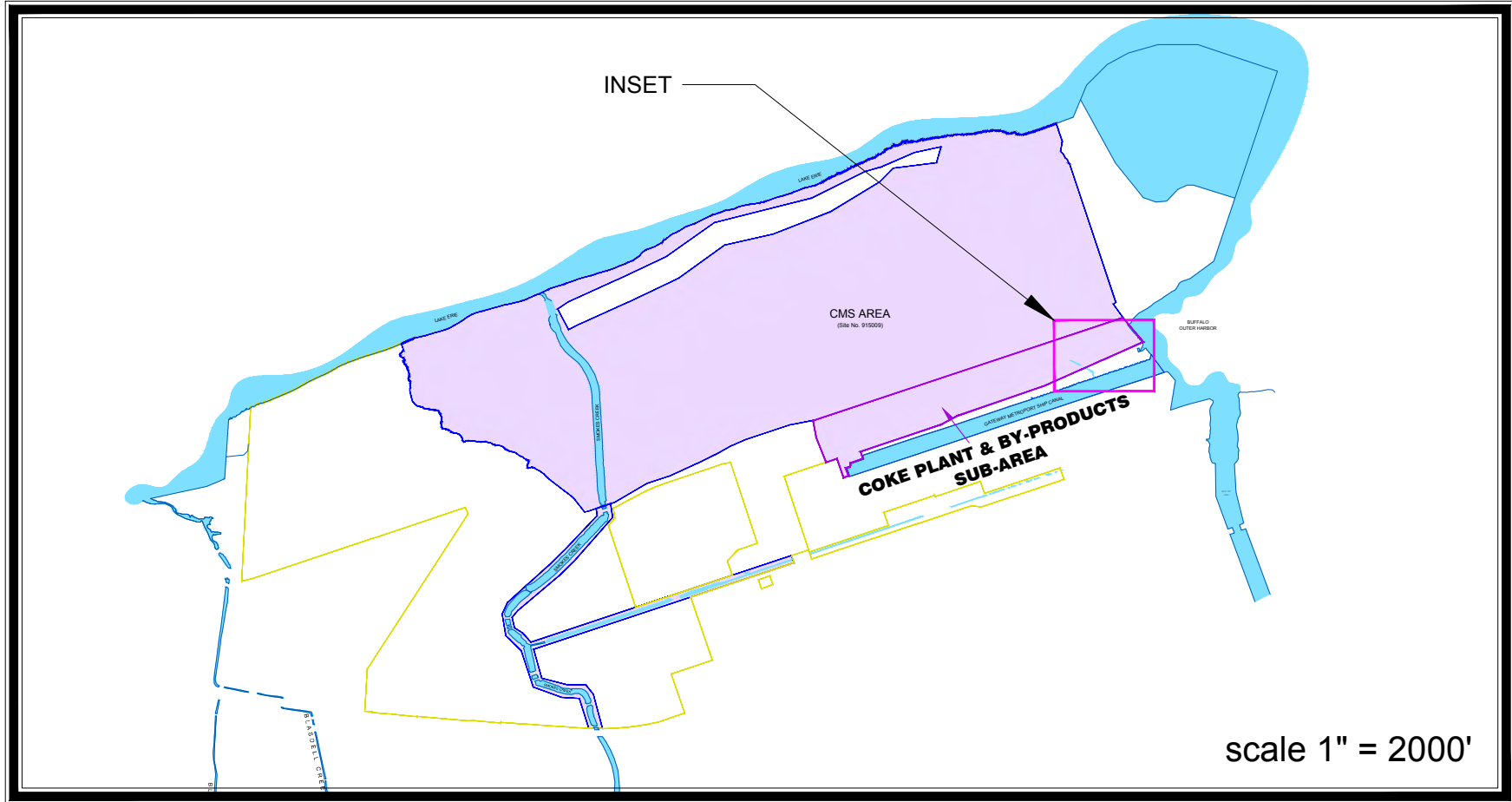
- SWMUs S-19 & S-25 (AERIAL)  
IMAGES FROM GOOGLE EARTH MAY 2017

[illegible]

<div>FIGURE 8</div>	<div>COAL/COKE/ORE HANDLING &amp; STORAGE</div> <div>SUB-AREA SWMUS S-19 &amp; -25 SAMPLE LOCATIONS</div> <div>CMS REPORT</div> <div>CMS AREA - FORMER BETHLEHEM STEEL SITE</div> <div>LACKAWANNA, NEW YORK</div> <div>PREPARED FOR</div> <div>TECUMSEH REDEVELOPMENT INC.</div>	<div>DRAWN BY: RFL</div> <div>DATE: APRIL 2019</div> <div>CHECKED BY: PHW</div> <div>APPROVED BY: PHW</div> <div>DISCLAIMER: BENCHMARK EES, PLLC. IMPORTANT: THIS DRAWING PRINT IS LOANED FOR MUTUAL ASSISTANCE AND AS SUCH IS SUBJECT TO RECALL. ALL INFORMATION CONTAINED HEREIN IS NOT TO BE DISCLOSED OR REPRODUCED IN ANY FORM OR BY ANY MEANS WITHOUT THE WRITTEN CONSENT OF BENCHMARK EES, PLLC.</div>	<div>SEAL</div>	<div>REVISIONS</div> <table><thead><tr><th>NO.</th><th>BY</th><th>DATE</th><th>REMARKS</th></tr></thead><tbody><tr><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td></tr></tbody></table>	NO.	BY	DATE	REMARKS																																	<div></div> <div></div>
		NO.			BY	DATE	REMARKS																																		
JOB NO.: 0071-017-111																																									

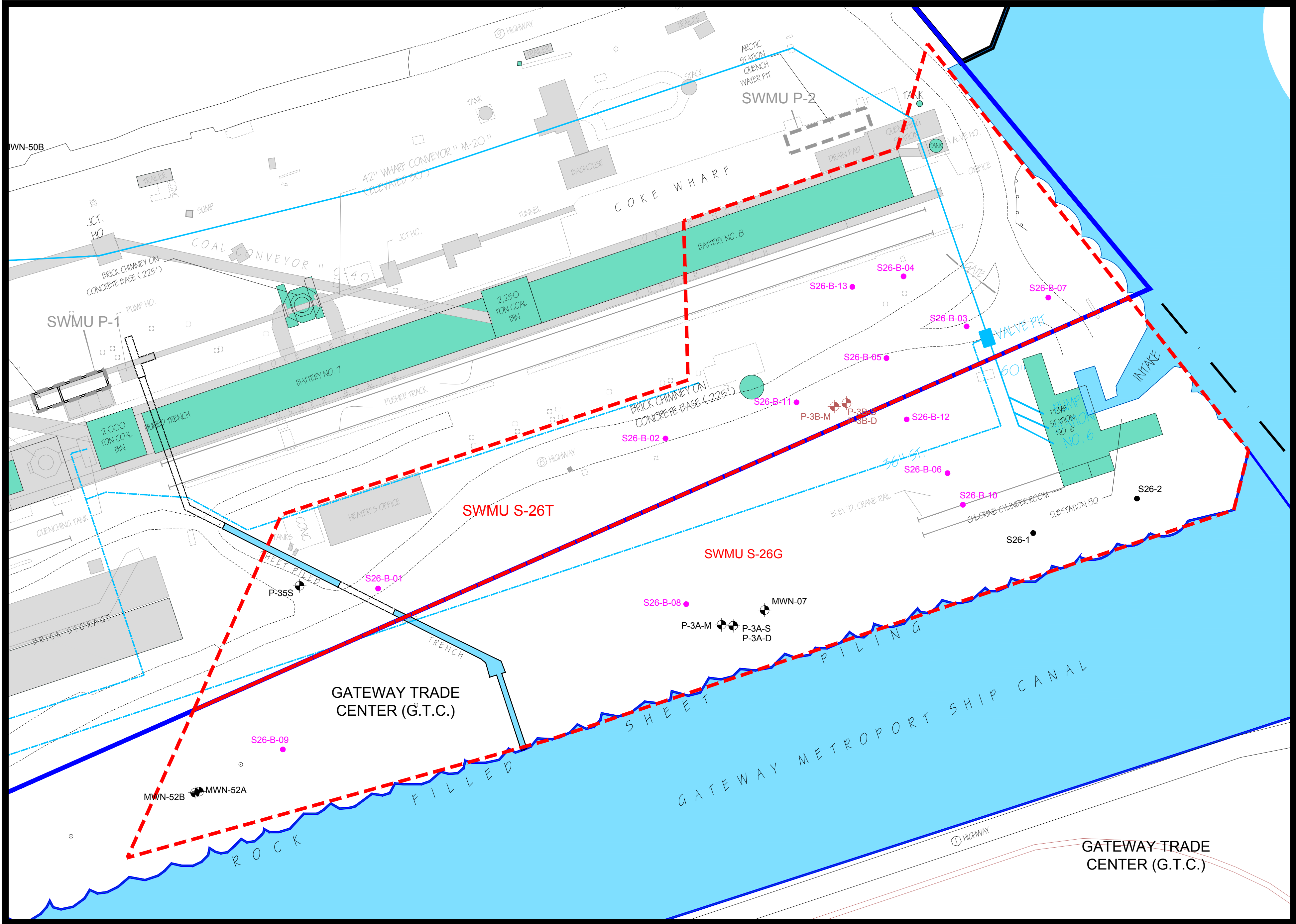


SITE PLAN:



- LEGEND:
- TECUMSEH PROPERTY BOUNDARY
  - DEMOLISHED BUILDING AND HISTORICAL SITE FEATURE
  - EXISTING BUILDING / STRUCTURE
  - CMS AREA BOUNDARY
  - SWMU BOUNDARY
  - COKE PLANT & BY-PRODUCTS SUB-AREA
  - APPROXIMATE ALIGNMENT OF PLANT WATER MAIN LINES
  - EXISTING MONITORING WELL (A= FILL, B= SAND)
  - EXISTING PIEZOMETER (S= FILL, M= SAND, D= OTHER)
  - ABANDONED/DESTROYED PIEZOMETER (S= FILL, M= SAND, D= OTHER)
  - RFI BORING (2)
  - CMS BORING (10)

SWMU S-26



REPRESENTATIVE PHOTOGRAPHS:

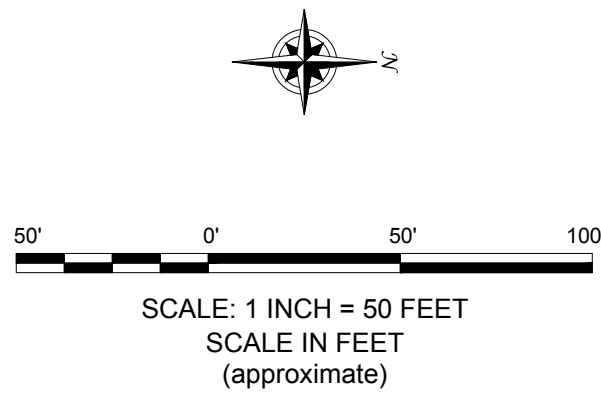
SWMU S-26 AERIAL  
GOOGLE EARTH MAY 2017



SWMU S-26 Drilling (looking SW)



SWMU S-26 1940s Oblique Aerial (looking SE)



<b>BENCHMARK</b> ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC		<b>TurnKey</b> Environmental Remediation, LLC		JOB NO.: 007-1-017-111
NO.		BY		DATE
REVISIONS		REMARKS		
DRAWN BY:		RFL		DATE: MARCH 2019
CHECKED BY:		PHW		APPROVED BY: PHW
DISCLAIMER: BENCHMARK ES, PLLC, IMPORTANT: THIS DRAWING PRINT IS LOANED FOR MUTUAL ASSISTANCE AND AS SUCH IS SUBJECT TO RECALL AND NOT TO BE DISCLOSED OR REPRODUCED IN ANY FORM OR BY ANY MEANS WITHOUT THE WRITTEN CONSENT OF BENCHMARK ES, PLLC.		COKE PLANT & BY-PRODUCTS FACILITY SUB-AREA SWMU S-26 BORING & MONITORING WELL LOCATIONS		PREPARED FOR: TECUMSEH REDEVELOPMENT INC.
SCALE: 1 INCH = 50 FEET SCALE IN FEET (approximate)		FIGURE 9		



# **STATEMENT OF BASIS**

## **Exhibits A through E**

---

Bethlehem Steel  
(Tecumseh Redevelopment, Inc.)

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

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

November 2021

<b>Exhibit A</b>	<b>Nature and Extent of Contamination</b>
<b>Exhibit B</b>	<b>Summary of the Cleanup Objectives</b>
<b>Exhibit C</b>	<b>Description of Corrective Measures Alternatives</b>
<b>Exhibit D</b>	<b>Corrective Measures Alternatives Costs</b>
<b>Exhibit E</b>	<b>Summary of the Final Corrective Measures</b>

---

## **EXHIBIT A**

### **NATURE AND EXTENT OF CONTAMINATION**

This section describes the findings of the RCRA Facility Investigation (RFI) and Corrective Measures Study (CMS) for environmental media that were evaluated for OU-06 and OU-07. As described in Section 6, samples were collected from various environmental media to characterize the nature and extent of contamination. Additional characterization will be performed to find and delineate grossly impacted soils throughout the OUs.

For each media sampled, a table summarizes the findings of the available investigation-derived data. The tables present the range of contamination found in the OU in the respective media and compares the data with the applicable Standards, Criteria and Guidance (SCGs). The contaminants generally fall within three categories; volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and inorganics (metals and cyanide). For comparison purposes, the SCGs are provided for each medium that allows for industrial use, which is the reasonably anticipated future use for the property within OU-06 and OU-07. This area has been codified “Heavy Industrial” by local City of Lackawanna Zoning Ordinance and a site-wide deed restriction exists limiting use of the site to industrial use(s). Protection of groundwater soil cleanup objectives (SCOs) are also presented for soil since soil contamination may impact groundwater.

#### **A1. SWMU(s)**

A SWMU includes any discernible unit at which solid wastes have been placed at any time, regardless 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. 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 and fill samples were collected between 1994 and 2011 to evaluate the nature and extent of soil contamination at many of the OU-06 and OU-07 SWMUs/AOCs. Surface soil samples were collected to assess direct human exposure. Subsurface soil samples were collected from varying depths to assess soil contamination impacts to groundwater.

As described in the RFI report, six SWMUs were identified within OU-06 and 17 SWMUs were identified within the OU-07 area. The SWMUs identified and investigated are described below and depicted in Figure 2. Past disposal and industrial practices at the facility are impacting soil/residual solids, surface/impounded water, and possibly soil

vapor within OU-07. There are currently numerous buildings and structures located within OU-07 in various states of disrepair and potentially undisclosed use. Therefore, evaluation and mitigation of soil vapor impacts in accordance with the requirements in the Statement of Basis for OU-1 (Site Wide Remedial Elements, OU-9 Water Courses and OU-10 Site-Wide Groundwater) will be deferred until buildings are identified for reuse or are newly constructed.

## **A2. OU-06**

### **A2.1 Tank Farm SWMU Sub-Area P-08, P-74, and P-75**

As depicted on Figure 3, the Tank Farm SWMU Group Sub-Area consists of SWMUs P-8 (Waste Oil Storage Tanks), P-74 (Solid Fuel Mix Storage Piles A, B, C, and D), and P-75 (Tank Storage Area for No. 6 Fuel Oil and Petroleum Tar). The former waste oil storage tanks (P-8) and waste piles (P-74) were removed by Bethlehem Steel Corp. (BSC) or more recently by Tecumseh as Interim Corrective Measures. This SWMU Group occupies a total of approximately 18.6 acres and contains petroleum residuals (primarily No. 6 fuel oil) in slag/fill. The slag deposited throughout the SWMU Group appears to have been placed in molten form based on the massive nature of the slag layers and the difficulty of excavation. PAHs are the primary compounds that exceed Soil Clean-up Objectives (SCOs) and the Commissioner's Policy - 51 (CP-51) total PAH concentration of 500 parts per million (ppm) in surface and subsurface slag/fill in all three SWMUs. Mercury concentrations exceeded the SCOs in five of the 28 slag/fill samples tested (one subsurface and four surface samples). Benzene did not exceed its SCO in any slag/fill samples, although several locations exceeded the Protection of Groundwater Soil Clean-up Objective. One slag/fill sample from the RFI (P75-B01; 4-6') exhibited hazardous waste characteristics for benzene (TCLP of 0.69 parts per billion, or ppb); however, two CMS slag/fill samples (i.e., P75-TP-53; 1-4 fbg and 4-6 fbg) from the same Sub-Area and depth were tested and did not exhibit hazardous waste characteristics for benzene.

### **A2.2 SWMU S-10**

A sparsely vegetated, 2.36-acre former slag quench pit excavated into the surrounding slag/fill measuring approximately 525 feet long, 225 feet wide, and five to 20 feet deep. The walls of this SWMU are nearly vertical except the northern end, which is a vehicle access ramp leading to the base of the depression. Benzo(a)pyrene was detected in one surface soil/fill sample at a concentration (1.4 ppm) slightly above the SCO (1.1 ppm). The contaminants in the waste ammonia liquor (WAL) and Benzol Plant process water previously used to quench molten slag at this SWMU have been detected in groundwater monitoring wells downgradient of SWMU S-10.

## **A3 OU-07**

### **A3.1 Quench Pit SWMU Sub-group P-01 thru P-06**

The following SWMU Group is depicted on Figure 4 - Coke Plant Sub-Area.

**SWMU P-1** is an open-topped concrete vault approximately 75 feet long by 14 feet wide by 8 feet deep. The reinforced concrete walls of P-1 are 18 inches thick. The top of the pit walls are approximately 3.5 feet above the surrounding grade. SWMU P-1 collected the Coke Oven Battery No. 7 Quench Water, settled coke fines and recirculated water back into the quench tower. Approximately 60,000 gallons of impounded water and approximately 105 CY of solid residuals are contained within this SWMU.

**SWMU P-2** is an open-topped concrete vault approximately 72 feet long by 16.5 feet wide by 10 feet deep. The reinforced concrete walls of P-2 are 12 inches thick. The tops of the pit walls are approximately 3.5 feet above surrounding grade. SWMU P-2 collected the Coke Oven Battery #8 quench water, settled coke fines and recirculated water back into the quench water supply. Approximately 24,000 gallons of impounded water is contained within this SWMU. Recoverable quantities of solid residuals were not identified during prior investigations.

**SWMU P-3** is an open-topped vault approximately 48 feet long by 15.5 feet wide by 12 feet 4 inches deep and typically contains about 10 feet of impounded water. The reinforced concrete walls of the pit are 18 inches thick. The quench pit was taken out of service in the early 1970s, around the time Battery No. 1 was replaced by Battery No. 9. The unit then served as a collecting pit for water from the wharf sump pump and it receives non-contact cooling water from a coal-handling fire pump and a low-flow continuous discharge from two small-diameter plant water lines. Approximately 20,000 gallons of impounded water is contained within this SWMU. Recoverable quantities of solid residuals were not identified during prior investigations.

**SWMU P-4** is an open-topped vault approximately 50 feet long by 16 feet wide with a typical water depth of approximately 9.5 feet. The reinforced concrete walls of the pit are 12 inches thick. The pit has been out of service since 1990. Approximately 10,500 gallons of impounded water is contained within this SWMU. Recoverable quantities of solid residuals were not identified during prior investigations.

**SWMU P-5** is an open-topped vault approximately 50 feet long, 15 feet wide, and 14 feet deep. The top of the concrete wall is about 2 feet above grade. Based on engineering drawings, the concrete thickness of the bottom of the pit is approximately 1.3 feet and the side walls of the pit are approximately 1.5 feet thick at the bottom, narrowing to 1-foot at the top. Historically, water present in the vault was from storm water and steam condensate from a water heater in the adjacent Coke Oven Office Building. Approximately

17,000 gallons of impounded water and approximately 90 CY of sediment are contained within this SWMU.

**SWMU P-6** was a lime sludge settling basin [also known as a weak ammonia liquor (WAL) pit] that was taken out of service in 1994. SWMU P-6 is constructed of reinforced concrete and is 95 feet long, 12 feet wide and 20 feet deep. The reinforced concrete walls are 12 inches thick and rise to approximately 3 feet above grade. The pit is divided into two sections of equal size by a steel plate dividing wall. Approximately 90,000 gallons of impounded water is contained within this SWMU. Recoverable quantities of solid residuals were not identified during prior investigations.

Grab samples of impounded water from SWMUs P-1 through P-6 were obtained in July 2014. Samples were tested for Priority Pollutant VOCs, SVOCs, total metals, cyanide, nitrogen (ammonia), and total phenolics. All detected concentrations were below 1 ppm except for ammonia and zinc in SWMU P-2. Solid residual samples from the pits were not collected during the RFI. Residual solids, where recoverable amounts were present (SWMUs P-2 and P-5), were collected during the July 2014 site reconnaissance. Testing included TCL VOCs, TCL SVOCs, TAL metals, and cyanide. The concentrations of detected compounds fall below the SCOs except for benzo(a)pyrene and arsenic. The RFI data included sampling of near surface slag/fill samples proximate to P-1 through P-6; there were no exceedances of the Part 375 SCOs.

### **A3.2 SWMU Subgroup P-07, P-09, P-10**

**SWMU P-7** was filled with slag in the 1960s. The pit is constructed of reinforced concrete and measures approximately 42 feet long, 28 feet wide and 21 feet deep. The walls and floor of the pit are approximately 18 inches thick. The pit was divided east and west, into two sections of equal size. SWMU P-7 was a lime sludge-settling basin that was taken out of service in 1960 and filled with slag to grade. Before being filled in and covered, the top of the pit wall was about 1 foot above grade. The southern one-third of the surface of the pit is now covered with asphalt. The remaining surface is covered with a mixture of gravel, soil, and slag. The estimated volume of the pit was 915 CY.

**SWMU P-9** was reportedly 54 feet long, 18 feet wide, and 18 feet deep. The pit has been filled in with slag to grade. The northern-most section is covered by an asphalt pad, which surrounds the former Ball Mill. The remaining surface is covered with a mixture of gravel and coal fines. The estimated volume of the pit is cited as 1,000 CY.

**SWMU P-10** covered an area measuring approximately 20 feet by 30 feet, where a tar spill occurred in the 1980s. In July 1994, this area was covered with an asphalt pad measuring 30 feet wide and 35 feet long, with an earthen berm on the north, south, and west sides.



A test pit investigation of SWMUs P-07 was performed in January 2011. Initially, surficial material was removed from both concrete structures of P-07 and P-09 in order to locate and survey the subsurface concrete walls of each SWMU. One test pit (P7-TP-01) was excavated near the center of SWMU P-07 pit. Two composite samples of pit residuals were collected for TCL VOC and TCL SVOC analysis. Surface fill samples collected during the RFI from SWMU P-7 indicated several individual PAHs above the Part 375 SCGs although the total PAH concentration was below the CP-51 total PAH guidance for non-residential sites of 500 ppm. Subsurface fill sample results reported during the 2011 CMS investigation, however, were all below Part 375 SCGs. RFI testing also included TCLP analysis of two subsurface fill samples which indicated that the residuals of SWMU P-07 do not exhibit hazardous waste characteristics. During the RFI, one surface fill sample (0 to 2 fbg) was collected from SWMU P-10 and analyzed for TCL VOCs, TCL SVOCs, TAL metals, and TCLP. Only total PAHs exceeded the CP-51 total PAH guidance for non-residential sites of 500 ppm. The fill sample did not exhibit hazardous waste characteristics. In July 2011 during additional site reconnaissance of nearby SWMUs, residual tar blebs were observed at the surface east of the decommissioned tar decanter tanks in the general vicinity of SWMUs P-7 and P-10. In October of 2015 approximately 1,200 CY of the hazardous waste/fill material in SWMU P-9 and a portion of the SWMU P-10 waste that overlaid SWMU P-9 was treated with Portland cement to reduce the TCLP benzene concentrations to below 0.5 ppb. Once the treatment objective was met, the treated waste/fill was consolidated with other waste/fill in the ATP containment cell for final disposal as part of OU-2. The SWMU was backfilled with Department-approved material to existing grade.

### **A3.3 SWMUs P-11, P-11A, and P-12 formerly Benzol Plant Storage Group**

**SWMU P-11 and P-11A**, also known as the Benzol Plant Tank Storage Sub-Area, is located within the Benzol Plant facility (see Plate 4-10 P-11A, Plate 4-12 P-11, P-12). The Benzol Plant, located at the southern end of the Coke Division facility, measures approximately 300 feet wide (east to west), 425 feet long (north to south), and covers approximately 3 acres. The surface of this portion of the Coke By-Products Sub-Area is generally flat and covered with coal, coke fines, and slag. All of the Above-ground Storage Tanks (ASTs) associated with this Unit have reportedly been removed. Two below-grade structures remain; the South Sump and Pit No. 17.

**SWMU P-12** is a 30- by 40-foot rectangular area that was used to temporarily store 368 tons of oil-contaminated soil generated during the cleanup of a 1987 "debenzolized" wash oil excursion and is located in an area just outside the southeast corner of the former Benzol Plant enclosure. SWMU P-12 is an at-grade area enclosed on its north, west, and east sides by a 5-foot concrete wall and on the south side by an asphalt road that is approximately 6 inches higher than the SWMU P-12 surface. Although the SWMU is surrounded by the walls and an adjacent road, surface water can run off the area to the

southeast, where it drains around the wall and back into the southeastern portion of the Benzol Plant and eventually infiltrates into the ground. Two slag/fill samples from P-12 were analyzed during the RFI, both from the 0-0.5 fbgs interval; none of the parameters exceeded Part 375 SCOs. The samples were also analyzed via TCLP and did not exhibit hazardous waste characteristics. One Synthetic Precipitation Leaching Potential (SPLP) sample analyzed for benzene exceeded the ambient groundwater standard, indicating the potential benzene to leach from SWMU P-12 into groundwater.

SWMUs P-11, P-11A and P-12 are part of the larger Coke Plant By-Products SWMU Group and have been addressed as Operable Unit 4 (OU-4) as discussed in Section 6.2. The final remedy for the groundwater associated with this SWMU Group is to pump contaminated groundwater from the area of the Benzol Yard (P-11 and P-12) and the general area of the Old Benzol Yard (P-11A), treat the groundwater, maintain hydraulic control over the OU-4 area (i.e., maintain an inward gradient from the Gateway MetroPort Ship Canal toward the collection wells, westerly), and treat the source areas.

RFI slag/fill and groundwater sampling and analysis occurred between 1995 and 1998. Slag/fill samples were generally collected from the smear zone or below the water table except for one surficial sample, P11-1 (0-0.5 fbgs). There were no exceedances of the Part 375 SCOs at P-11-1 (0-0.5 fbgs), SB-09 (6-8 fbgs), SB-10 (4-6 fbgs), SB-11 (4-6 fbgs), RW-1 (2-4 fbgs), RW-2 (2-4 fbgs), and RW-3 (1-3 fbgs). The sample from P-11-1 (0-0.5 fbgs) did not exhibit hazardous waste characteristic by TCLP testing. Two slag/fill samples from SWMU P-12 were analyzed during the RFI, both from the 0-0.5 fbgs interval; none of the parameters exceeded Part 375 SCOs. The samples were also analyzed by TCLP and did not exhibit hazardous waste characteristics. One sample analyzed for benzene exceeded the Protection of Groundwater SCO, indicating the potential for benzene to leach from SWMU P-12 into groundwater.

### **A3.4 SWMU P-18A/B – Blast Furnace Cooling Tower and Cold and Hot Wells**

**SWMU P-18** was the Scrubber Water Cooling Tower, Hot and Cold Well complex located at the south end of the Gateway MetroPort Ship Canal. The Hot and Cold Wells consisted of water-filled pits constructed with steel sheet pile. The sheet piles were driven into bedrock and the interiors of the wells were excavated to a depth of about 39 feet below surrounding grade. The Hot Well outline was an irregular shape, about 130 feet across the longest dimension, 16 feet across the narrowest section, and water depth was approximately 10 feet. The Cold Well was rectangular, about 173 long, 23 feet wide, and water depth was approximately 9 to 12 feet. The Hot and Cold wells were dredged, and the spoils solidified and placed in the OU-02 ATP cell. The wells were then filled to grade with Department-approved material.

### **A3.5 SWMU S-19 – Murphy’s Mountain, Landfill AA**

**SWMU S-19** is located west of the Coke Oven coal storage area and east of BSC Highway 11. The SWMU was constructed as a wind break from steel-making slag reclamation debris mixed with varying amounts of construction and demolition debris. It was an elongate-shaped pile approximately 15 feet high, 1,300 feet long (north to south), and 350 feet wide (east to west). The remaining footprint of SWMU S-19 covers an area of approximately 10 acres and is sparsely vegetated with grasses and small bushes. The feature has subsequently been mined or reclaimed with only a general footprint of the original mound remaining.

Analytical testing of slag/fill samples from SWMU S-19 collected during the RFI did not identify any exceedances of the Part 375 SCOs except for benzo(a)pyrene at one surface (0-0.5 fbgs) and one subsurface location (4-14 fbgs) and arsenic in one of nine slag samples tested. TCLP analytical results from the RFI indicated that the waste/fill samples do not exhibit hazardous characteristics. Synthetic Precipitation Leaching Potential (SPLP) results from three surface samples indicate an exceedance of the Protection of Groundwater SCO for methylene chloride. SPLP results in one subsurface (8-10 fbgs) sample exceeded Protection of Groundwater SCOs for ethylbenzene, toluene and xylene. Additional sampling was not included in the CMS Work Plan nor was any performed during the CMS.

### **A3.6 SWMU S-25 – Landfill/Impoundment under North End of Coal Pile**

**SWMU S-25** is an unmarked circular area approximately 260 feet wide by 275 feet long (approximately 1.4 acres). The approximate location of S-25 is the northern end of the current coal storage area, west of Coke Oven Battery No. 8. The SWMU is visible on aerial photographs taken in 1951, 1955 and 1959. Although the SWMU was described by the USEPA in the RFA as “pits”, close inspection of the photographs and consultation with former BSC employees familiar with operations in that area by EPA have led to the conclusion that SWMU S-25 was, in fact, a pile, roughly circular in shape, surrounded by a depression, where materials were removed for reclamation of metallica. The pile is not observed in aerial photographs after 1961.

The RFI included collection and testing of four slag/fill samples from this Unit. Analytical testing of slag/fill samples from this Unit did not exhibit any exceedances of the Part 375 SCOs. Additional investigation was not included in the CMS Work Plan nor was any performed during the CMS.

### **A3.7 SWMU S-26 – Fill Area near Coke Battery No. 8**

**SWMU S-26** is a 7-acre area located at the northwest corner of the Ship Canal. Formerly a part of the Bethlehem Steel Corporation’s operations, the western half of the SWMU is

owned by Tecumseh and the eastern half by Gateway Trade Center (Gateway). In general, SWMU S-26 occupies the area between Coke Oven Battery Numbers 7 and 8 and the Ship Canal. The northwestern portion of SWMU S-26 underlies a portion of Coke Oven Battery No. 8 and a roadway. The northeastern portion of the SWMU is covered with slag fill and is generally flat. A pump station (formerly BSC Pump House No. 6) is located at the extreme northeastern portion of SWMU S-26 and removes water from the Buffalo Outer Harbor for use as process water by BSC's Lackawanna Coke Division, BSC's Galvanized Products Division and by an off-site bar mill owned by Republic Steel.

The analytical results from subsurface soil/fill samples obtained within the limits of S-26 indicate SVOCs (primarily PAHs) as the only compounds exceeding their respective Part 375 SCO with total PAH concentrations ranging between 0.35 and 2,900 ppm; excluding results from boring S26-B-3 at which coal tar was observed. Results from boring S26-B-3 (6-8 fbgs) indicate that although coal tar is present, it is limited in vertical extent to that interval. The coal tar impacts at S26-B-03 are also limited in horizontal extent as evidenced by surrounding soil/fill samples collected with reported PAH concentrations two orders of magnitude less than S26-B-03. Arsenic was the only metal detected above the Part 375 SCO.

#### **A4. Soil**

Soil samples were collected at the site during the RFI, from on-site and off-site locations to further delineate the source area. Surface soil samples were collected from a depth of 0-2 inches to assess direct human exposure. Subsurface soil samples were collected from a depth of 2 – 20 feet to assess soil contamination impacts to groundwater. Soil samples were collected in the vicinity of the source areas and beneath the former on-site building in OU-06. Coking process residuals present in pits are also included herein as soils because of their low volume and their anticipated dewatering or solidification and subsequent dry disposal.

The results indicate that soils at the site exceed the Industrial SCO and/or Protection of Groundwater SCO for volatile and semi-volatile organics, arsenic and mercury. The Pre-Design Investigation will be used to determine if other soils within the OUs are impacted with these or other contaminants. Through the additional investigation and subsequent design of the remedy, any impacted soils and or source areas will be addressed and cleaned up to eliminate the potential threat to the waters of Lake Erie from impacted groundwater.

**Table 1 – Soil Operable Unit 06 (P-8, P-74, P-75)**

Detected Constituents	Concentration Range Detected (ppm)	Restricted Use SCG <sup>1</sup> (ppm)	Frequency Exceeding Restricted SCG	Protection of Groundwater SCOs <sup>2</sup> (ppm)	Frequency Exceeding Groundwater SCOs
<b>VOCs</b>					
Benzene	nd-500	89	1 of 28	0.06	5 of 28
Toluene	nd-18	1000	0/28	0.7	5 of 28
Xylene	nd-140	1000	0/28	1.7	12 of 28
<b>SVOCs</b>					
Naphthalene	nd-6500	1000	5 of 28	12	5 of 28
Total PAHs	nd-500	na	na	na	na
<b>Metals</b>					
Arsenic	nd-90.3	16	5 of 28	16	5 of 28
Mercury, total	0.021-22.9	5.7	5 of 28	0.73	11 of 28

<sup>1</sup>6 NYCRR Part 375-6.8 (b): Restricted Use Soil Cleanup Objectives for Industrial Use

<sup>2</sup>6 NYCRR Part 375-6.8 (b): Restricted Use Soil Cleanup Objectives for Protection of Groundwater

nd = non-detect

na = not applicable

The primary soil contaminants are polycyclic aromatic hydrocarbons (PAHs) and Mercury associated with residues from the operation of the former Steel Mill. The primary soil contamination is associated with SWMUs P-8 (Waste Oil Storage Tanks), P-74 (Solid Fuel Mix Storage Piles A, B, C, and D), and P-75 (Tank Storage Area for No. 6 Fuel Oil and Petroleum Tar).

Based on the findings of the RCRA Facility Investigation, the presence of PAHs and Mercury has resulted in the contamination of soil. The OU contaminants identified in soil which are considered to be the primary contaminants of concern, to be addressed by the remedy selection process are, PAHs, Arsenic and Mercury.

**Table 2. Soil Operable Unit 07 (P-1 thru P-6 - Quench Pits)**

<b>Parameter</b>	<b>Detected Range</b>	<b>Industrial SCOs<sup>1</sup> (ppm)</b>	<b>Frequency Exceeding Industrial SCOs</b>	<b>Protection of Groundwater SCOs<sup>2</sup> (ppm)</b>	<b>Frequency Exceeding Groundwater SCOs</b>
<b>TCL VOCs (ppm)</b>					
Acetone	0.044-0.12	1,000	0 of 2	0.05	<b>1 of 2</b>
2-Butanone	ND-0.02	1,000	0 of 2	--	--
Methylene Chloride	0.004-0.26	1,000	0 of 6	0.05	<b>1 of 6</b>
<b>TCL SVOCs (ppm)</b>					
Benzo(a)anthracene	0.78-5.1	11	0 of 8	1	<b>4 of 8</b>
Benzo(a)pyrene	0.57-6.2	1.1	<b>4 of 8</b>	22	0 of 8
Benzo(b)fluoranthene	0.62-6.2	11	0 of 8	1.7	<b>4 of 8</b>
Benzo(k)Fluoranthene	0.24-3.4	110	0 of 8	1.7	<b>2 of 8</b>
Chrysene	0.88-5	110	0 of 8	1	<b>4 of 8</b>
Dibenzo(a,h)anthracene	0.17-0.71	1.1	0 of 8	1,000	0 of 8
Dibenzofuran	1.6-2	1,000	0 of 2	210	0 of 2
Indeno(1,2,3-cd)pyrene	0.48-3.2	11	0 of 8	8.20	0 of 8
3-Methylphenol and 4-Methylphenol	1.3-3.2	1,000	0 of 8	0.33	<b>5 of 8</b>
2-Methylphenol	0.16-1.7	1,000	0 of 8	0.33	<b>4 of 8</b>
Naphthalene	0.78-14	1,000	0 of 8	12	<b>1 of 8</b>
Phenol	0.37-2.8	1,000	0 of 8	0.33	<b>6 of 8</b>
Total PAHs	0.29-79	<500	0 of 8	--	--
<b>Inorganic Compounds (ppm)</b>					
Arsenic	2.6-26	16	<b>2 of 8</b>	16	<b>2 of 8</b>
Cadmium	1.4-3.4	60	0 of 8	7.5	0 of 8
Chromium	1.5-216	6,800	0 of 8	--	--
Copper	100-160	10,000	0 of 2	1,720	0 of 2
Lead	1.8-250	3,900	0 of 8	450	0 of 8
Manganese	780-2300	10,000	0 of 2	2,000	<b>1 of 2</b>
Mercury	0.18-3.3	5.7	0 of 8	0.73	<b>2 of 8</b>
Nickel	6-63	10,000	0 of 8	130	0 of 8
Zinc	500-820	10,000	0 of 2	2,480	0 of 2

<sup>1</sup>6 NYCRR Part 375-6.8 (b): Restricted Use Soil Cleanup Objectives for Industrial Use<sup>2</sup>6 NYCRR Part 375-6.8 (b): Restricted Use Soil Cleanup Objectives for Protection of Groundwater



Solid residual samples from the pits were not collected during the RFI. Residual solids, where recoverable amounts were present (SWMUs P-2 and P-5), were collected during the July 2014 site reconnaissance. Testing included TCL VOCs, TCL SVOCs, TAL metals, and cyanide. The concentrations of detected compounds fall below the applicable Industrial SCOs except for benzo(a)pyrene and arsenic. When considering the Protection of Groundwater SCO, exceedances were observed for the VOCs Acetone and Methylene Chloride, a number of SVOCs and the metals Manganese and Mercury. The RFI data included sampling of near surface slag/fill samples proximate to P-1 through P-6; there were no exceedances of the Part 375 SCOs.

**Table 3 - Soil Operable Unit 07 (P-7, P-9, and P-10 – Settling Basins)**

Parameter	Detected Range	Industrial SCOs <sup>1</sup> (ppm)	Frequency Exceeding Industrial SCOs	Protection of Groundwater SCOs <sup>2</sup> (ppm)	Frequency Exceeding Groundwater SCOs
<b>TCL VOCs (ppm)</b>					
Benzene	0.003-270000	89	<b>1 of 4</b>	0.06	1 of 4
Toluene	0.002-110000	1,000	<b>1 of 4</b>	0.70	1 of 4
Xylenes, Total	0.002-95000	1,000	<b>1 of 4</b>	1.60	1 of 4
<b>TCL SVOCs (ppm)</b>					
Acenaphthene	0.035-280000	1,000	<b>1 of 4</b>	98	<b>1 of 4</b>
Acenaphthylene	0.46-4600000	1,000	<b>1 of 4</b>	107	<b>1 of 4</b>
Anthracene	0.34-4000000	1,000	<b>1 of 4</b>	1,000	<b>1 of 4</b>
Benzo(a)anthracene	0.4-3500000	11	<b>3 of 4</b>	1	<b>3 of 4</b>
Benzo(a)pyrene	0.37-3100000	1.1	<b>3 of 4</b>	22	<b>2 of 4</b>
Benzo(b)fluoranthene	0.5-2900000	11	<b>3 of 4</b>	1.7	<b>3 of 4</b>
Benzo(ghi)perylene	0.14-900000	1,000	<b>1 of 4</b>	1,000	<b>1 of 4</b>
Benzo(k)fluoranthene	0.19-26	110	0 of 4	1.7	<b>2 of 4</b>
Chrysene	0.42-3200000	110	<b>1 of 4</b>	1	<b>3 of 4</b>
Dibenz(a,h)anthracene	ND-2.7	1.1	<b>1 of 4</b>	1,000	0 of 4
Dibenzofuran	0.32-3100000	1,000	<b>1 of 2</b>	210	<b>1 of 4</b>
Fluoranthene	1.2-9600000	1,000	<b>1 of 4</b>	1,000	<b>1 of 4</b>
Fluorene	0.4-4100000	1,000	<b>1 of 4</b>	386	<b>1 of 4</b>
Indeno(1,2,3-cd) pyrene	0.13-880000	11	<b>3 of 4</b>	8.20	<b>3 of 4</b>
3-Methylphenol and 4-Methylphenol	1.2-280000	1,000	<b>1 of 4</b>	0.33	<b>3 of 4</b>
2-Methylphenol	0.28-91000	1,000	<b>1 of 4</b>	0.33	<b>1 of 4</b>

Parameter	Detected Range	Industrial SCOs <sup>1</sup> (ppm)	Frequency Exceeding Industrial SCOs	Protection of Groundwater SCOs <sup>2</sup> (ppm)	Frequency Exceeding Groundwater SCOs
Naphthalene	2.8-22000000	1,000	1 of 4	12	3 of 4
Phenanthrene	1.4-15000000	1,000	1 of 4	1,000	1 of 4
Phenol	1.3-240000	1,000	1 of 4	0.33	3 of 4
Pyrene	58-7800000	1,000	1 of 4	1,000	1 of 4
Total PAHs	9-84360000	<500	2 of 4	--	--
<b>Inorganic Compounds (ppm)</b>					
Chromium	184-343	6,800	0 of 2	--	--
Lead	18.1-192	3,900	0 of 2	450	0 of 2
Mercury	ND-0.65	5.7	0 of 2	0.73	0 of 2
Nickel	6.8-61.6	10,000	0 of 2	130	0 of 2
Cyanide	6.8-52.2	10,000	0 of 2	40	1 of 2

<sup>1</sup>6 NYCRR Part 375-6.8 (b): Restricted Use Soil Cleanup Objectives for Industrial Use

<sup>2</sup>6 NYCRR Part 375-6.8 (b): Restricted Use Soil Cleanup Objectives for Protection of Groundwater

Surface fill samples collected during the RFI from SWMU P-7 indicated several individual PAHs above the Part 375 SCOs although the total PAH concentration was below the CP-51 total PAH guidance of 500 ppm for non-residential sites. Subsurface fill sample results reported during the 2011 CMS investigation, however, were below Part 375 SCOs. RFI testing also included TCLP analysis of two subsurface fill samples which indicated that the residuals of SWMU P-07 do not exhibit hazardous waste characteristics. During the RFI, one surface fill sample (0 to 2 fbgs) was collected from SWMU P-10 and analyzed for TCL VOCs, TCL SVOCs, TAL metals, and TCLP. Only total PAHs exceeded the CP-51 total PAH guidance of 500 ppm for non-residential sites. The fill sample did not exhibit hazardous waste characteristics. Exceedances are present with the SWMU group for both Industrial use and Protection of Groundwater SCOs for VOCs, SVOCs, and Cyanide.

**Table 4 - Soil Operable Unit 07 (P-11 and P-12 – Benzol Plant Tank/Storage Areas)**

<b>Parameter</b>	<b>Detected Range</b>	<b>Industrial SCOs<sup>1</sup> (ppm)</b>	<b>Frequency Exceeding Industrial SCOs</b>	<b>Protection of Groundwater SCOs<sup>2</sup> (ppm)</b>	<b>Frequency Exceeding Groundwater SCOs</b>
<b>TCL VOCs (ppm)</b>					
Benzene	0.0018-2800	89	<b>8 of 17</b>	0.06	<b>12 of 17</b>
Ethylbenzene	0.005-170	780	0 of 14	0.1	<b>10 of 14</b>
Toluene	0.001-1700	1,000	<b>2 of 17</b>	0.70	<b>10 of 17</b>
Xylenes, Total	0.0013-1100	1,000	<b>5 of 17</b>	1.60	<b>11 of 17</b>
<b>TCL SVOCs (ppm)</b>					
Naphthalene	0.032-1100	1,000	<b>1 of 14</b>	12	<b>10 of 14</b>
Total PAHs	6-7	<500	0 of 3	--	--
<b>Inorganic Compounds (ppm)</b>					
Arsenic	5.4-30.5	16	<b>1 of 3</b>	16	<b>1 of 3</b>
Cadmium	1.4-8.9	60	0 of 3	7.5	<b>1 of 3</b>
Mercury	1.5-4.2	5.7	0 of 3	0.73	<b>3 of 3</b>

<sup>1</sup>6 NYCRR Part 375-6.8 (b): Restricted Use Soil Cleanup Objectives for Industrial Use

<sup>2</sup>6 NYCRR Part 375-6.8 (b): Restricted Use Soil Cleanup Objectives for Protection of Groundwater

RFI slag/fill and groundwater sampling and analysis occurred between 1995 and 1998. Slag/fill samples were generally collected from the smear zone or below the water table except for one surficial sample. There were no exceedances of the Part 375 SCOs in the P-11 samples and those samples did not exhibit hazardous waste characteristic via TCLP. Two slag/fill samples from SWMU P-12 were analyzed during the RFI, both from the 0-0.5 fbg interval; none of the parameters exceeded Part 375 SCGs. The samples were also analyzed via TCLP and did not exhibit hazardous waste characteristics. One sample analyzed for benzene exceeded the Protection of Groundwater SCO, indicating the potential for benzene to leach from SWMU P-12 into groundwater. Samples collected from the SWMUs during the CMS exceeded applicable SCOs for VOCs, SVOCs, and Metals, for both Industrial use and the Protection of Groundwater.

**Table 5 - Soil Operable Unit 07 (P-18A/B – Blast Furnace Wells)**

<b>Parameter</b>	<b>Detected Range</b>	<b>Industrial SCOs<sup>1</sup> (ppm)</b>	<b>Frequency Exceeding Industrial SCOs</b>	<b>Protection of Groundwater SCOs<sup>2</sup> (ppm)</b>	<b>Frequency Exceeding Groundwater SCOs</b>
<b>TCL SVOCs (ppm)</b>					
Benzo(a)anthracene	0.24-20	11	<b>1 of 7</b>	1	<b>5 of 7</b>
Benzo(a)pyrene	0.15-4.2	1.1	<b>1 of 7</b>	22	0 of 7
Benzo(b)fluoranthene	0.14-11	11	0 of 7	1.7	<b>2 of 7</b>
Benzo(k)Fluoranthene	0.37-2.9	110	0 of 7	1.7	<b>1 of 7</b>
Chrysene	0.13-7.7	110	0 of 7	1	<b>4 of 7</b>
Dibenzo(a,h)anthracene	0.18-1.2	1.1	<b>1 of 7</b>	1,000	0 of 7
Indeno(1,2,3-cd)pyrene	0.24-5.3	11	0 of 7	8.20	0 of 7
Phenol	0.57-1	1,000	0 of 7	0.33	<b>2 of 7</b>
Total PAHs	1.1-129	<500	0 of 7	--	--
<b>Inorganic Compounds (ppm)</b>					
Arsenic	26.1-91	16	<b>7 of 7</b>	16	<b>7 of 7</b>
Cadmium	4.7-20.3	60	0 of 7	7.5	<b>4 of 7</b>
Lead	2200-14000	3,900	<b>6 of 7</b>	450	<b>7 of 7</b>
Mercury	0.44-0.59	5.7	0 of 7	0.73	0 of 7
Nickel	15.1-39.5	10,000	0 of 7	130	0 of 7
Selenium	ND-9.9	6,800	0 of 7	4	<b>1 of 7</b>
Silver	1.4-37.2	6,800	0 of 4	8.3	<b>3 of 4</b>
Cyanide	11-314	10,000	0 of 7	40	<b>3 of 7</b>
pH SOL	9.7-10.3	--	--	--	--

<sup>1</sup>6 NYCRR Part 375-6.8 (b): Restricted Use Soil Cleanup Objectives for Industrial Use

<sup>2</sup>6 NYCRR Part 375-6.8 (b): Restricted Use Soil Cleanup Objectives for Protection of Groundwater

Residuals dredged from the hot and cold wells comprising SWMU 18 A/B exhibited exceedances for SVOCs, and Inorganics, the material has been solidified and placed in the on-site ATP containment cell and will be managed in perpetuity with the wastes contained therein.

**Table 6 - Soil Operable Unit 07 (S-19 and S-25 – Slag Fill/Debris and Metallics Recovery Piles)**

Parameter	Detected Range	Industrial SCOs <sup>1</sup> (ppm)	Frequency Exceeding Industrial SCOs	Protection of Groundwater SCOs <sup>2</sup> (ppm)	Frequency Exceeding Groundwater SCOs
<b>TCL VOCs (ppm)</b>					
<b>TCL SVOCs (ppm)</b>					
Benzo(a)anthracene	0.037-2.3	11	0 of 8	1	<b>2 of 8</b>
Benzo(a)pyrene	0.77-1.8	1.1	<b>2 of 6</b>	22	0 of 6
Benzo(b)fluoranthene	0.042-2	11	0 of 6	1.7	<b>1 of 6</b>
Benzo(k)Fluoranthene	0.18-0.89	110	0 of 6	1.7	0 of 6
Chrysene	0.044-2.5	110	0 of 8	1	<b>2 of 8</b>
Indeno(1,2,3-cd) pyrene	0.17-0.68	11	0 of 6	8.20	0 of 6
Total PAHs	0.42-30	<500	0 of 8	--	--
<b>Inorganic Compounds (ppm)</b>					
Arsenic	1.5-54.6	16	<b>1 of 6</b>	16	<b>1 of 6</b>
Cadmium	0.69-7.9	60	0 of 4	7.5	<b>1 of 4</b>
Chromium	710-1580	6,800	0 of 8	--	--
Lead	711-199	3,900	0 of 8	450	0 of 8
Nickel	31.8-389	10,000	0 of 6	130	<b>1 of 6</b>
Selenium	1.8-20.3	6800	0 of 6	4	<b>2 of 6</b>
Silver	2.6-10	6800	0 of 4	8.3	<b>2 of 4</b>
pH SOL	8.9-10.3	--	--	--	--

<sup>1</sup>6 NYCRR Part 375-6.8 (b): Restricted Use Soil Cleanup Objectives for Industrial Use

<sup>2</sup>6 NYCRR Part 375-6.8 (b): Restricted Use Soil Cleanup Objectives for Protection of Groundwater

Analytical testing of slag/fill samples from SWMU S-19 collected during the RFI identified two exceedances of the Part 375 SCOs for benzo(a)pyrene at one surface (0-0.5 fbgs) and one subsurface location (4-14 fbgs). Arsenic exceeded the SCO in one of the slag samples tested. TCLP analytical results from the RFI indicated that the waste/fill samples do not exhibit hazardous characteristics. The RFI included collection and testing of four slag/fill samples from SWMU S-25. Results indicate exceedances of the Protection of Groundwater SCO for benzo(a)anthracene, benzo(b)fluoranthene, chrysene, and additionally metals cadmium, nickel, selenium and silver.

**Table 7 - Soil Operable Unit 07 (S-26 – Fill Area Near Coke Battery No. 8)**

<b>Parameter</b>	<b>Detected Range</b>	<b>Industrial SCOs<sup>1</sup> (ppm)</b>	<b>Frequency Exceeding Industrial SCOs</b>	<b>Protection of Groundwater SCOs<sup>2</sup> (ppm)</b>	<b>Frequency Exceeding Groundwater SCOs</b>
<b>TCL VOCs (ppm)</b>					
Acetone	0.016-0.17	1,000	0 of 12	0.05	<b>5 of 12</b>
Benzene	0.0027-62	89	0 of 12	0.06	<b>5 of 12</b>
Ethylbenzene	0.02-2.6	780	0 of 12	1	<b>1 of 12</b>
Methylene Chloride	0.0037-0.12	1,000	0 of 12	0.05	<b>4 of 12</b>
Toluene	0.0077-3.8	1,000	0 of 12	0.70	<b>1 of 12</b>
Xylenes, Total	0.0013-18	1,000	0 of 12	1.60	<b>1 of 12</b>
<b>TCL SVOCs (ppm)</b>					
Acenaphthene	0.024-440	1,000	0 of 19	98	<b>6 of 19</b>
Acenaphthylene	0.027-390	1,000	0 of 19	107	<b>1 of 19</b>
Anthracene	0.074-940	1,000	0 of 19	1,000	0 of 19
Benzo(a)anthracene	0.046-1400	11	<b>13 of 19</b>	1	<b>16 of 19</b>
Benzo(a)pyrene	0.031-1000	1.1	<b>16 of 19</b>	22	<b>12 of 19</b>
Benzo(b)fluoranthene	0.038-1400	11	<b>13 of 19</b>	1.7	<b>16 of 19</b>
Benzo(ghi)perylene	0.026-840	1,000	0 of 19	1,000	0 of 19
Benzo(k)Fluoranthene	0.045-410	110	<b>1 of 19</b>	1.7	<b>12 of 19</b>
Chrysene	0.033-1300	110	<b>3 of 19</b>	1	<b>16 of 19</b>
Dibenz(a,h)anthracene	0.024-200	1.1	<b>12 of 19</b>	1,000	0 of 19
Dibenzofuran	0.036-2000	1,000	<b>1 of 19</b>	210	<b>1 of 19</b>
Fluoranthene	0.063-4900	1,000	<b>1 of 19</b>	1,000	<b>1 of 19</b>
Fluorene	0.052-1400	1,000	<b>1 of 19</b>	386	<b>1 of 19</b>
Indeno(1,2,3-cd) pyrene	0.036-740	11	<b>12 of 19</b>	8.20	<b>13 of 19</b>
Naphthalene	0.023-210000	1,000	<b>7 of 19</b>	12	<b>10 of 19</b>
Phenanthrene	0.035-7700	1,000	<b>1 of 19</b>	1,000	<b>1 of 19</b>
Pyrene	0.054-3400	1,000	<b>1 of 19</b>	1,000	<b>1 of 19</b>
Total PAHs	0.349-239360	<500	<b>12 of 19</b>	--	--



Parameter	Detected Range	Industrial SCOs <sup>1</sup> (ppm)	Frequency Exceeding Industrial SCOs	Protection of Groundwater SCOs <sup>2</sup> (ppm)	Frequency Exceeding Groundwater SCOs
<b>Inorganic Compounds (ppm)</b>					
Arsenic	2.2-40.4	16	<b>1 of 11</b>	16	<b>1 of 11</b>
Chromium	4.3-1400	6,800	0 of 11	--	--
Lead	4.8-230	3,900	0 of 11	450	0 of 11
Mercury	0.18-4	5.7	0 of 11	0.73	<b>3 of 11</b>

<sup>1</sup>6 NYCRR Part 375-6.8 (b): Restricted Use Soil Cleanup Objectives for Industrial Use

<sup>2</sup>6 NYCRR Part 375-6.8 (b): Restricted Use Soil Cleanup Objectives for Protection of Groundwater

The analytical results from subsurface soil/fill samples obtained within the limits of S-26 indicate SVOCs (primarily PAHs) as the compounds exceeding their respective Part 375 SCOs with total PAH concentrations ranging between 0.35 and 2,900 ppm; excluding results from boring S26-B-3 at which coal tar was observed. Arsenic was detected above the Part 375 SCO. Mercury was present in three samples above the Protection of Groundwater SCO.

The primary soil contaminants are SVOCs and metals associated with residuals from the operation of the former coke ovens located in the former coking operation and the coke gas byproducts area.

Metals contamination is associated with historic fill activity at the site. Disposal of slag, ash, clinker, and coal has resulted in inorganic soil contamination above the industrial SCGs. The contaminants identified in soil which are considered to be the primary contaminants of concern, to be addressed by the remedy selection process are, VOCs, SVOCs and metals.

#### **A5. Surface/Impounded Water**

Surface water is present within OU-07 as impounded water retained in the pits and vaults of the former coking and coke gas byproducts processes. OU-06 contains no impoundments. The samples were collected to assess the surface water conditions present within the pits.

**Table 8 – Surface/Impounded Water, OU-07 (P-1 thru P-6 – Quench Pits)**

Parameter	Detected Range	Class D Ambient Water Quality Standards (ppb)	Frequency Exceeding Ambient Water Quality Standards
<b>TCL SVOCs (ppb)</b>			
Fluorene <sup>2</sup>	4.9-14	4.8	<b>2 of 4</b>
Phenanthrene <sup>2</sup>	16-49	4.5	<b>2 of 4</b>
Phenol <sup>1</sup>	74-42000	5	<b>2 of 4</b>
<b>Inorganic Compounds (ppb)</b>			
Mercury <sup>1</sup>	0.2-1	0.0007	<b>2 of 10</b>
Cyanide <sup>1</sup>	1-270	22	<b>1 of 10</b>

<sup>1</sup>New York State Class D Ambient Water Quality Standards from 6 NYCRR Part 703

<sup>2</sup>New York State Class D Ambient Water Quality Guidance Values

<sup>3</sup>New York State Class D Ambient Water Quality Standards based on unavailable general chemistry data (i.e., pH, temperature, hardness)

<sup>4</sup>New York State Class D Ambient Water Quality Standard not available for this substance

Grab samples of water from SWMUs P-1 through P-6 were obtained in July 2014. Samples were tested for Priority Pollutant VOCs, SVOCs, total metals, cyanide, nitrogen (ammonia), and total phenolics. Exceedances of the Ambient Water Quality Standards were observed for the SVOCs Fluorene, Phenanthrene, Phenol and metals Mercury and Cyanide.

**Table 9 – Surface/Impounded Water, OU-07 (P-11 and P-12 – Benzol Plant Tank/Storage Areas)**

Parameter	Detected Range	Class D Ambient Water Quality Standards (ppb)	Frequency Exceeding Ambient Water Quality Standards
<b>TCL VOCs (ppb)</b>			
Benzene <sup>1</sup>	29000-750000	10	<b>4 of 4</b>
Ethylbenzene <sup>2</sup>	39-600	150	<b>1 of 4</b>
Toluene <sup>1</sup>	2300-270000	6,000	<b>1 of 4</b>
Xylenes, Total <sup>2</sup>	360-160000	590	<b>1 of 4</b>
<b>TCL SVOCs (ppb)</b>			
Fluorene <sup>2</sup>	ND-1400	4.8	<b>1 of 2</b>
Naphthalene <sup>2</sup>	660-25000	110	<b>2 of 2</b>
Phenanthrene <sup>2</sup>	ND-80	4.5	<b>1 of 2</b>
Phenol <sup>1</sup>	ND-390	5	<b>1 of 2</b>

Parameter	Detected Range	Class D Ambient Water Quality Standards (ppb)	Frequency Exceeding Ambient Water Quality Standards
<b>Inorganic Compounds (ppb)</b>			
Mercury, Total <sup>1</sup>	ND-27.1	0.0007	<b>1 of 2</b>
Mercury, Dissolved <sup>1</sup>	4.6	0.0007	<b>1 of 1</b>
Cyanide <sup>1</sup>	25-970	22	<b>2 of 2</b>

<sup>1</sup>New York State Class D Ambient Water Quality Standards from 6 NYCRR Part 703

<sup>2</sup>New York State Class D Ambient Water Quality Guidance Values

<sup>3</sup>New York State Class D Ambient Water Quality Standards based on unavailable general chemistry data (i.e., pH, temperature, hardness)

<sup>4</sup>New York State Class D Ambient Water Quality Standard not available for this substance

The primary surface water contaminants are VOCs, SVOCs and Metals. The primary surface water contamination is located within the pits of the former coal and coking operations.

Based on the findings of the RCRA Facility Investigation the presence of VOCs, SVOC, and Metals has resulted in the contamination of surface or impounded water. The site contaminants that are considered to be the primary contaminants of concern which will drive the remediation of surface water to be addressed by the remedy selection process are, BTEX compounds. If the Pre-Design Investigation reveals additional impacts to impounded water, those constituents will be included in the discharge requirements of any treatment facility operated for the implementation of the remedy or disclosed in the characterization reports if disposed offsite.

## EXHIBIT B

### SUMMARY OF THE CLEANUP OBJECTIVES

The goal for the corrective measure program is to achieve restricted (industrial) use of the site and to restore groundwater quality to meet applicable SCGs, to the extent feasible. 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-06 and OU-07 at this facility through the proper application of scientific and engineering principles.

The established cleanup objectives for OU-06 and OU-07 at this facility are:

Compound	Soil Cleanup Objective <sup>1</sup> (ppm or mg/kg)	Groundwater Cleanup Objective <sup>2</sup> (ppb or ug/L)
<b>VOCs</b>		
Benzene	89/0.06	1
Chlorobenzene	1000/1.1	5
1,2-Dichlorobenzene	1000/1.1	3
Cis-1,2-Dichloroethene	1000/0.25	5
Trans-1,2-Dichloroethene	1000/0.19	5
Ethylbenzene	780/1	5
Styrene	NV/NV	5
Toluene	500/0.7	5
1,2,4-Trichlorobenzene	NV/NV	5
Trichloroethene	400/0.47	5
1,2,4-Trimethylbenzene	380/3.6	5
1,3,5-Trimethylbenzene	380/8.4	5
Vinyl Chloride	27/0.02	2
Xylenes, total	1000/1.6	5
<b>SVOCs</b>		
Acenaphthene	1000/98	20
Benzo(a)anthracene	11/1	0.002
Benzo(a)pyrene	1.1/22	ND
Benzo(b)fluoranthene	11/1.7	0.002
Benzo(k) fluoranthene	110/1.7	0.002
Biphenyl	NV/NV	5
Bis(2-ethylhexyl)phthalate	NV/435	5
Chrysene	110/1	0.002
2,4-Dimethylphenol	NV/NV	1
Indeno(1,2,3-cd)pyrene	11/8.2	0.002

<b>Compound</b>	<b>Soil Cleanup Objective<sup>1</sup> (ppm or mg/kg)</b>	<b>Groundwater Cleanup Objective<sup>2</sup> (ppb or ug/L)</b>
2-Methylphenol	1000/0.33	1
4-Methylphenol	1000/0.33	1
Naphthalene	1000/12	10
Phenol	1000/0.33	1
Total PAHs	500 <sup>3</sup>	NV
<b>PFAS</b>		
Perfluorooctanoic acid (PFOA)	0.500	0.010
Perfluorooctanesulfonic acid (PFOS)	0.440	0.010
<b>Metals</b>		
Arsenic	16/16	25
Barium	10,000/820	1000
Lead	3900/450	25
Mercury, total	5.7/0.73	0.7
Selenium	6,800/4	10
<b>Other</b>		
Asbestos		*

1. 6NYCRR Part 375: Industrial Soil Cleanup Objectives (ISCOs)/Protection of Groundwater SCOs
2. 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).
3. 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).

\* 7,000,000 fibers (longer than 10 um)/L

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

ppb: parts per billion, which is equivalent to micrograms per liter, ug/L, in water.

ppt: parts per trillion, which is equivalent to nanograms per liter, ug/L, in water.

SPLP = Synthetic Precipitation Leaching Procedure.

ND = Not Detected.

NV = No Value.

## EXHIBIT C

### DESCRIPTION OF REMEDIAL ALTERNATIVES

The following alternatives were considered based on the cleanup objectives (see Exhibit B) to address the contaminated media identified in OU-06 and OU-07 as described in Exhibit A:

The detailed analysis of the alternatives is provided in the Corrective Measures Study Report.

#### **Alternative 1: No Further Action**

The No Further Action Alternative recognizes the remediation of the OU-06 and OU-07 completed by the ICM(s) 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 ICM(s) described in Section 6.2 and Site Management and Institutional Controls and Engineering Controls are necessary to confirm the effectiveness of the ICM. This alternative maintains engineering controls which were part of the ICM 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 IRMs.

*Present Worth:* ..... \$371,500  
*Capital Cost:* ..... \$0  
*Annual Costs:* ..... \$12,500



**Alternative 3: Pit clean-out and consolidation in SW-CAMU (SWMU Group P-1 to P-6, P-7 and P-10), Vegetated Soil Cover (SWMUs P-11, P-11A, P-12 and S-25), Cover in Place (SWMU S-10 and S-19) and Excavation and Relocation to CAMU (SWMUs P-8, P-74,P-75 and S-26)**

This alternative includes excavation of petroleum-impacted slag/fill that is visually stained and/or contains NAPL from the unsaturated zone (depth of impact varies between 0 and 16 fbg) as well as slag/fill with total PAH concentrations greater than 500 ppm. It is estimated that 22,000 to 55,000 CY of impacted slag exist throughout the SWMU over an approximate 4-acre area. Approximately 1,170 CY of mercury-impacted slag/fill would be excavated and disposed off-site; four of the five sub-areas impacted by mercury are co-located with PAH-impacted slag/fill. Excavation of the slag/fill, while technically feasible, will be extremely difficult due to the massive and cemented nature of the slag. Based on recent experience during the ATP-ECM excavation effort, concrete busters or explosives would likely be required to remove the cemented slag and an estimated 12 months would be required to excavate the slag from the SWMU, transport it and consolidate it into the SW CAMU. Excavated slag that contains free-NAPL product would be stabilized with high carbon content fly ash or another stabilizing agent (e.g., Portland cement, lime kiln dust, mill scale). The petroleum-impacted slag waste would be consolidated into the SW-CAMU where the groundwater would not be impacted by the waste as it would be stabilized and encapsulated (geo-composite soil liner, leachate collection system and low-permeability geo-composite cap). The excavation in the Tank Farm would be regraded and partially backfilled with BUD-approved slag or other non-impacted on-site slag/fill (i.e., meeting ISCOs and site -specific SCOs), assume 10,000 CY of import required. Accounting for contingency and excavation inefficiencies, the volume for ex-situ treatment and disposal of petroleum- and PAH-impacted slag/fill is estimated to range between 25,000 and 70,000 CY. Accounting for contingency and excavation inefficiencies, the volume for off-site disposal of mercury-impacted slag/fill is estimated at 1,800 CY.

The on-site impoundments will require removal of approximately 200,000 gallons of water followed by treatment in an on-site water treatment system. Following treatment of the evacuated water, samples would be collected prior to; discharge to the City of Lackawanna POTW, injection in the OU-04 Groundwater Treatment system infiltration galleries, or off-site disposal, as may be appropriate. Following the removal of water, approximately 200 CY of residual solids will be excavated from the pits and subsequently dried and/or solidified. The drying and solidification of residual solids will require the development and implementation of a stockpiling, dewatering fluids treatment, nuisance control, and Storm Water Pollution Prevention Plans, amongst others, to ensure safe handling of the excavated residuals. Following solidification, the soils will be consolidated in the on-site SW-CAMU. After pressure washing of the pit walls and floor, the pit bottoms will be mechanically broken to preclude future impoundment of precipitation and to allow

for the movement of groundwater into or out of the pits. The sidewall elevations will then be reduced to grade and each pit backfilled with Department-approved material to an elevation consistent with the restoration plan for that area.

This alternative calls for the demolition and removal of those structures located in the vicinity of the SWMUs and the larger OU-06 and OU-07 areas which are not identified for reuse in the future. Characterization of the materials comprising and contained in the structures will be required before demolition and removal as described in remedial element three. Following demolition of the structures and appurtenances, waste may be placed in the on-site SW CAMU or removed from the site for disposal. After removal of structures and infrastructure, backfill of subgrade features will be completed with Department-approved materials

This alternative would entail grading the sides to eliminate the potential safety hazards using slag to flatten the side slopes. Confirmation sampling will be conducted before grading activities, with analytical results verifying attainment of remediation goals. Clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d) will be brought in to replace the excavated soil and establish the designed grades at the site. A cover will be required to allow for industrial use of the site in areas where the upper one foot of exposed surface soil will exceed the applicable soil cleanup objectives.

The costs associated with this alternative are estimated to be:

<i>Present Worth:</i> .....	\$17,469,600
<i>Capital Cost:</i> .....	\$17,098,100
<i>Annual Costs:</i> .....	\$12,500

#### **Alternative 4: Restoration to Pre-Disposal or Unrestricted Conditions**

This alternative achieves all the SCGs discussed in Section 6.1.1 and Exhibit A and soil meets the unrestricted soil clean objectives listed in Part 375-6.8 (a). This alternative would include the demolition and off-site disposal of the on-site buildings, excavation and off-site disposal of all waste and soil contamination above the unrestricted soil cleanup objectives. The remedy will not rely on institutional or engineering controls to prevent future exposure. There is no Site Management, no restrictions, and no periodic review. This remedy will have no annual cost, only the capital cost.

<i>Present Worth:</i> .....	\$35,021,800
<i>Capital Cost:</i> .....	\$35,021,800
<i>Annual Costs:</i> .....	\$0

## 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	12,500	371,500
Alternative 3: Pit clean-out and consolidation in SW-CAMU (SWMU Group P-1 to P-6, P-7 and P-10), Vegetated Soil Cover (SWMUs P-11, P-11A, P-12 and S-25), Cover in Place (SWMU S-10 and S-19) and Excavation and Relocation to CAMU (SWMUs P-8, P-74,P-75 and S-26)	17,098,100	12,500	17,469,600
Alternative 4: Excavation and Off-Site Disposal	35,021,800	0	35,021,800

- 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.

<sup>1</sup> Annual costs associated with OM&M of the SW-CAMU are accounted for under OU-05.

## **EXHIBIT E**

### **SUMMARY OF THE SELECTED FINAL CORRECTIVE MEASURE(S)**

The Department has selected the following remedy as the final corrective measures for the SWMUs that fall within OU-06 and OU-07:

**Alternative 3: Pit clean-out and consolidation in SW-CAMU (SWMU Group P-1 to P-6, P-7 and P-10), Vegetated Soil Cover (SWMUs P-11, P-11A, P-12 and S-25), Cover in Place (SWMU S-10 and S-19) and Excavation and Relocation to CAMU (SWMUs P-8, P-74,P-75 and S-26)**

The elements of the corrective measures are briefly described in Section 7 and the alternatives used to select the final corrective measures are presented in Exhibit C.

#### **Basis for Selection**

The alternatives were evaluated 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**

Alternative 1 is not considered protective of human health or the environment because it does not eliminate direct exposure to SWMU waste material or effectively control the migration of contaminants from the SWMUs. Alternative 1 does not treat the source of the contamination. The migration and subsequent discharge of precipitation to adjacent surface water has the potential to adversely affect human as well as ecological receptors. Since Alternative 1 fails to satisfy this threshold selection criterion, it is eliminated from further consideration.

Alternatives 2 is protective of human health as the potential for contact with impacted residual solids is eliminated by backfilling with Department-approved fill, however, the environmental impact pathway is not removed, and the potential remains for contaminants to enter groundwater. Alternatives 2 does not provide a means for

eliminating or reducing leaching of contaminants to groundwater and in turn does not protect Lake Erie as an ecological and drinking water resource. Alternative 2 is therefore eliminated.

Alternatives 3 and 4 are protective of human health and the environment because each alternative provides effective means to eliminate direct contact with and exposure to contaminated SMWU waste material and removes said waste from the SWMU. 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 retained for further evaluation.

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

Alternatives 3 and 4 both meet the cleanup standards identified for OU-06 and OU-07. Under Alternatives 3 and 4 the top 1-foot of soil/fill outside the SWMUs and CAMU will meet the Soil Cleanup Objectives for Industrial Use identified in Exhibit B. In both alternatives, the impacted surface water and solid residuals will be removed from the SWMUs and disposed of. Following cleaning and any physical alterations of structures, the features will be filled with Department-approved site-derived aggregate materials or materials meeting the industrial use criteria of 6 NYCRR Part 375-6.8(b). Under Alternative 3, an engineered cap consisting of 2-feet of various components will be installed over the SWMUs and CAMU. 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. 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

Long-term effectiveness is best accomplished by those alternatives involving excavation of the contaminated overburden soils (Alternatives 3 and 4). 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.

Alternative 4 results in removal of all of the chemical contamination at the site and removes the need for property use restrictions and long-term monitoring; however, wastes would be relocated to an off-site TSDF which would include leachate collection and low-permeability bottom liners. Alternative 3 would result in the removal and consolidation on-site of most of the contaminated soil at the site, but it also requires an environmental easement and long-term monitoring.

Under Alternative 3 a cover system will be constructed and remain in place. The need for monitoring and maintenance is required for the lifespan of the cover system. Under Alternative 4 SWMU waste would be relocated to a permitted facility where these concerns would be eliminated for the site.

#### 4. Reduction of Toxicity, Mobility or Volume

Under Alternatives 3 and 4 toxicity may be reduced through 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 would be projected to be proportionate to the reduction in infiltration. Under Alternatives 3 and 4 SWMU waste consolidated from the CMS area may be treated prior to disposal, additionally, under Alternative 3 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 unit with leachate collection.

Under Alternatives 3 and 4 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 in an area not in close proximity to residential areas or receptors not directly involved with site operations.

Under Alternative 4 the volume of CMS area waste to be transported increases. Transportation will continue over an extended period of time and has the potential to be in close proximity to residential and commercial increasing exposure risks. Alternative 4 would result in the greatest short-term CO<sub>2</sub>, particulate, and greenhouse gas emissions from heavy equipment involved with excavation, transportation, and placement of the waste/fill in an Off-Site TSDF. Alternative 3 would result in slightly less emissions due to shorter transportation.

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

## 6. Implementability

Alternative 3 has no technical or administrative implementability issues. Under Alternative 4 disposal of CMS area wastes may be limited based on capacity of surrounding disposal facilities. Care must be taken to prevent the release of asbestos during excavation, transportation, and interment associated with Alternatives 3 and 4. Under Alternative 4, administrative implementability issues include the need for off-site disposal approval by the TSDF and potential complications from material exhibiting elevated radiological readings which may protract identifying an appropriate out-of-state disposal facility. Alternatives 3 and 4 are favorable in that they are readily implementable.

## 7. Cost-Effectiveness

Alternative 3 costs \$17,098,100 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 is projected to cost \$35,021,800 and is the most cost prohibitive.

## 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. Alternative 3 would comply with the reasonably anticipated, continued industrial use of the OU. Alternative 4 would result in unrestricted use of the OU, which could result in higher uses such as residential or commercial.

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

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. If the selected remedy differs significantly from the proposed remedy, notice to the public will be issued describing the differences and reasons for the changes.

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

# **STATEMENT OF BASIS**

## **Appendices A through B**

---

Bethlehem Steel  
(Tecumseh Redevelopment, Inc.)

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

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-06 - Former Petroleum Bulk Storage Sub-Area

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

City of 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 1540IG-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.

**RESPONSE 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 fbg) 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 SCO 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 disposed 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.

#### Proposed Remedy for SWMUs P-01 through P-06

**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 GWQSSs for VOCs. While PAHs were detected in groundwater at concentrations exceeding GWQSSs, 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.