
FINAL

SOIL MANAGEMENT PLAN

3144 Passyunk Avenue, Pennsylvania, PA

Prepared by HRP Philadelphia Holdings, LLC

June 15, 2020

HRP Philadelphia Holdings, LLC (“HRP”) has prepared this Soil Management Plan (the “Plan”) for review and approval by the Pennsylvania Department of Environmental Protection (“PADEP”) and the United States Environmental Protection Agency (“EPA”).

This Plan describes HRP’s anticipated pre-excavation characterization, soil grading, and soil reuse activities during redevelopment of the PES Facility, commonly referred to as the Philadelphia Refinery (the “Site”), and HRP’s approach for managing soils at the Site during redevelopment. The Site contains approximately 1,300 acres of land with an address of 3144 Passyunk Avenue, Philadelphia, Pennsylvania 19145. This Plan describes how onsite soils will be sampled prior to grading, relocation, and disturbance, and how decisions will be made about where such soils can be placed at the Site as part of the bulk movement of soil during redevelopment activities.

HRP has prepared this Plan not only to describe its approach to soil management in connection with its redevelopment activities but also to be consistent with Sunoco’s site-wide remediation activities pursuant to the following two agreements: (1) the Settlement Agreement and Covenant Not To Sue among EPA, Philadelphia Energy Solutions Refining and Marketing LLC (“PESRM”), and Philadelphia Energy Solutions LLC, Docket Number CERC/RCRA-03-2012-0224DC (“Settlement Agreement”), and (2) the Consent Order and Agreement among PADEP, Sunoco, Inc. (R&M) n/k/a Sunoco (R&M), LLC, and PESRM dated August 14, 2012 (“CO&A”).¹ The CO&A is commonly referred to as the Buyer/Seller Agreement and provides that Sunoco will have the sole authority to address “Pre-Existing Contamination” as that term is defined in the Buyer/Seller Agreement at the Site in accordance with the Pennsylvania Land Recycling and Environmental Remediation Standards Act (“Act 2”).² The Settlement Agreement recognizes that the Site is being addressed in accordance with the One Cleanup Program Memorandum of Agreement (the “MOA”) between PADEP and EPA dated April 21, 2004.³ Thus, HRP understands that PADEP is coordinating its review of Sunoco’s characterization and remediation activities at the Site with EPA, so that

¹ While we understand that Evergreen Resources Management Operations, a series of Evergreen Resources Group, LLC, is now managing the legacy remedial work for Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC (“Evergreen”) and Sunoco (R&M), LLC, for clarity, Sunoco, Inc. n/k/a ETC Sunoco Holdings LLC, Sunoco, Inc. (R&M) n/k/a Sunoco (R&M), LLC and Evergreen shall be referred to collectively as “Sunoco” in this Plan.

² Sunoco, Inc. (R&M) originally entered the Site in Pennsylvania’s Land Recycling Program in October 2006 through the submission of a Notice of Intent to Remediate (“NIR”).

³ Settlement Agreement, Para. 17.

Sunoco can integrate and harmonize remedial obligations under the corrective action program pursuant to the Resource Conservation and Recovery Act (“RCRA”) with the environmental work that it is performing under Act 2.⁴ Sunoco intends to utilize a combination of the statewide health and site-specific cleanup standards under Act 2 in implementing the Buyer/Seller Agreement. As part of its work under Act 2, Sunoco and PADEP have developed a specific target list of regulated substances as set forth in Table 1 that are the focal point of characterization and future remediation activities at the Site.

HRP and/or its affiliates anticipate acquiring the ownership interests in PES Holdings, LLC, which is the single owner of PESRM, the current owner of the Site. The “Effective Date” of this Plan is the date on which (1) HRP has acquired the ownership interests in PES Holdings, LLC, (2) this Plan, in a form acceptable to Sunoco and HRP, has been approved by PADEP and EPA, (3) PADEP shall have agreed to an amendment to the Buyer/Seller Agreement acceptable to Sunoco and HRP and consistent with this Plan, and (4) Sunoco and HRP shall have entered into a separate agreement further defining their rights and obligations relating to the Site. As of the Effective Date of this Plan, HRP⁵ will be required to follow the terms of the Soil Management Plan pursuant to Section 5.c of the Buyer/Seller Agreement. Final approval of this Plan is subject to PADEP’s, Sunoco’s, and HRP’s approval of an amendment to the Buyer/Seller Agreement,⁶ Sunoco’s and HRP’s approval of amendments to the vesting deeds, and Sunoco and HRP entering a separate agreement further defining their rights and obligations relating to the Site.

1. Background and Objectives

HRP intends to redevelop the Site into a state of the art, multimodal industrial park with ancillary rail infrastructure, energy infrastructure, marine capabilities, and commercial uses. A conceptual master plan for redevelopment of the Site is shown on Figure 1. HRP is aware of the known soil and groundwater impacts at the Site associated with the Site’s use for petroleum refining and,

⁴ See EPA Region 3/Pennsylvania Department of Environmental Protection “Streamlining the Process for the One Cleanup Program Under RCRA,” September 2005.

⁵ For ease of reference, we refer to HRP in this Plan; however, from and after the acquisition of PES Holdings, LLC by HRP and/or an affiliate thereof of HRP, HRP as used herein shall mean PESRM and any other person or entity which owns all or any portion of the Site, together with HRP and/or its affiliates which are responsible for the redevelopment and/or operations at the Site.

⁶ Section 17 of the Consent Order and Agreement dated January 15, 2020, by and among PADEP and PESRM provides that: “The Department acknowledges that PESRM or the New Facility Owner, as applicable, may seek redevelopment of the Facility for alternative purposes, including other commercial or industrial uses, and agrees to work as expeditiously as possible and in good faith with PESRM or the New Facility Owner in the approval, if required, of a commercially reasonable soil management work plan or similar approvals that permits and is otherwise consistent with any such redevelopment. Accordingly, the Department will not object to any amendments to the Consent Order and Agreement entered into on August 14, 2012, by and among the Department, Sunoco, Inc. (R&M), and PESRM (hereinafter, the “Buyer-Seller Agreement”), as necessary to effect the foregoing. Except as set forth above, nothing in this Consent Order and Agreement is intended, nor shall it be construed, to modify the Buyer-Seller Agreement, which shall remain in full force and effect, unless modified per its terms.”

accordingly, will use the Site only for non-residential purposes. This use restriction will be reflected in one or more environmental covenants for the Site. HRP's redevelopment approach introduces an opportunity to integrate cleanup activities with redevelopment of the Site. Specifically, many of the anticipated development components (e.g., building slabs, drive aisles, parking lots, new roadways, and other paved areas as described in cleanup plans to be submitted to PADEP) will serve as barriers to exposure and/or infiltration, and will be used to achieve the site-specific standard under Act 2 for soils at the Site. Table 2 lists examples of anticipated development components and the functions that they will serve in connection with use of the site-specific standard under Act 2 for soils at the Site.

A key element of HRP's redevelopment plan involves raising the ground surface elevations on the portion of the Site east of the Schuylkill River above base flood elevations. Some of the ground surface elevations at the Site are currently below base flood elevations while other areas are above base flood elevations. As such, HRP intends to move soils from locations with higher ground surface elevations to areas with lower ground surface elevations so that the final grades for all areas of the Site east of the Schuylkill River achieve the design standard of being above the base flood elevation ("BFE") as established by the Federal Emergency Management Agency ("FEMA"). Specifically, all parking lots will be above the BFE and all building floor slabs will be more than 4 feet above the BFE. All building floor slabs will also be above the 500-year floodplain. None of the soils that are moved as part of the regrading process will be placed in areas below the groundwater table. Key objectives of the Soil Management Plan are:

1. To retain and reuse all soils that are excavated or disturbed by HRP at the Site in order to balance grades and achieve elevations necessary for redevelopment.
2. To facilitate movement of soils by HRP within each of the portions of the Site on the east and west sides of the Schuylkill River, respectively (i.e. no movement of soils will occur between the east and west sides of the Schuylkill River).
3. To establish requirements for HRP's sample collection and analysis for determining the manner in which excavated soils will be placed and reused onsite and for ensuring that sufficient data for future work under Act 2 is available to substantially limit the need for additional sampling by Sunoco (i.e., for purposes of site characterization, risk assessments and cleanup plans).

HRP understands that Sunoco's anticipated cleanup approach for the Site may rely on the assumption that certain impacted soils would remain at depths where they would not be accessible by relevant receptors at the Site and/or would be subject to different cleanup standards under Act 2 for subsurface soils at nonresidential properties (i.e., soils at depths of greater than two feet below ground surface ("bgs")). To ensure that this Plan is fully aligned with Sunoco's anticipated cleanup approach, if such impacted soils are relocated by HRP to achieve

necessary redevelopment elevations, those soils will be placed in accordance with the reuse options specified in Table 3.

Based on the planned redevelopment of the Site, most soils at the Site will ultimately be located beneath a development component that will serve as an exposure barrier (i.e., placed under building pads, drive aisles, parking lots, roadways or other features that will function as exposure barriers). Accessible surface soils will only be present in limited areas of the Site (e.g., landscape areas). Surface soils in these accessible areas will consist of either (1) imported material or (2) soils from the Site that have been identified as appropriate for this use in accordance with Table 3. Imported soil used as surface soil will be either clean fill or regulated fill under PADEP's Management of Fill Policy (PADEP, 2020), as appropriate, and soils from the Site will only be considered appropriate for use as surface soil if a risk assessment demonstrates attainment of the site-specific standard. To the extent that soils are transported offsite for disposal, such soils will be managed in accordance with applicable legal requirements.

Anticipated cut and fill areas at the Site are shown on [Figure 2](#). HRP has taken care to avoid known areas of light nonaqueous phase liquid ("LNAPL") in the anticipated cut areas. Specifically, HRP's final cut and fill plan will be designed to leave a minimum two foot buffer between the bottom of cut areas and the top of known LNAPL plumes.

2. Sequencing and Coordination – Decommissioning and Bulk Soil Movement

Decommissioning, demolition, soil grading, and redevelopment will occur in phases across the Site. Timing of the soil pre-excitation sampling described in this Plan and subsequent bulk soil movement will be coordinated with decommissioning and demolition schedules in each phase. During decommissioning and demolition, areas of the Site that were previously inaccessible will become accessible (e.g., areas currently beneath process units). Sunoco has reviewed the extensive sampling activities that have been completed at the Site to date and has identified 17 areas where the presence of process units or other features have precluded sampling from being performed beneath those process units or other features. These areas are shown on [Figure 3](#) and have been divided into 20 cells. HRP will coordinate with Sunoco to allow Sunoco to visually inspect these areas as they become accessible.

Based on the results of its visual assessment, Sunoco will complete additional investigation and sampling in the areas shown on [Figure 3](#), as follows:

- Soil borings will be advanced in each cell in accordance with 25 Pa. Code 250.408. We expect the number of borings to be between one and four borings per cell, though the actual number of borings will be based on visual observations of the ground surface and visual and field screening observations during boring installation. Sunoco will make the determination of the location and number of soil borings in each cell based on the field conditions that are encountered. Borings will be completed to the observed groundwater table.

- In areas that will be filled by HRP (i.e., soil will be added) as part of redevelopment of the Site or will be left undisturbed, one surface soil sample and one subsurface soil sample will be collected from each soil boring. The depth of the subsurface sample will be selected based on visual observations and field screening results.
- In areas that will be cut by HRP (i.e., soil will be removed) as part redevelopment of the Site, one surface soil sample, one soil sample from the depth interval representing the new surface soil stratum that will be created by soil removal, and one soil sample from the depth interval representing the new subsurface soil stratum that will be created by soil removal will collected from each boring. The depth of the subsurface sample will be selected based on visual observations and field screening results.
- The soil samples will be analyzed for the regulated substances on the target compound list included in Table 1.

In areas where storage tanks are present that will be removed as part of decommissioning and demolition activities, HRP will proceed with closure and removal of storage tanks in accordance with requirements under 25 Pa. Code Chapter 245 and technical guidance issued by PADEP entitled Closure Requirements for Aboveground Storage Tank Systems (PADEP, 2017). HRP will also complete the appropriate soil assessment activities pursuant to PADEP's tank closure requirements.

In each phase of the redevelopment process, assessment of newly accessible areas by Sunoco as described above and soil characterization by HRP in connection with removal of storage tanks as described above will be completed prior to bulk soil movement in such areas so that the results of such assessment activities can be used in conjunction with planning for redevelopment and remediation. For example, information from the assessment activities may help inform whether newly accessible soils will need to be placed under caps as part of the redevelopment process. Information from the assessment activities may also help inform how soil from newly accessible areas will be reused at the Site.

If discrete regulated waste materials that are separate from soil or groundwater are identified during the pre-excavation characterization sampling described in this Plan, HRP will coordinate with Sunoco, PADEP, and EPA so that such waste materials (e.g., drums containing regulated waste or leaded tank bottoms) can be properly addressed in accordance with applicable requirements as described in Section V.A of the Pennsylvania Land Recycling Program Technical Guidance Manual (PADEP, 2019). HRP will use reasonable efforts to identify and address such waste materials prior to the start of bulk soil movement in any discrete area. HRP recognizes that such waste materials could also be discovered during soil movement. If this occurs, HRP will coordinate with Sunoco, PADEP, and EPA regarding the manner in which the waste materials will be addressed. HRP also understands that leaded tank bottoms are classified as a listed hazardous

waste. If leaded tank bottoms are discovered outside of tanks, HRP will promptly notify Sunoco so that Sunoco can handle the leaded tank bottoms in accordance with EPA's approved leaded tank bottom procedures for the Site.

3. Soil Pre-Excavation Characterization Sampling

Pre-excavation characterization of soils (i.e., sampling of soils in place before such soils are excavated or disturbed) is an important component of this Plan. Pre-excavation characterization of soils by HRP will allow the soils to be managed consistent with Sunoco's cleanup approach for the Site. For example, by characterizing soils before they are excavated or disturbed, HRP will manage soils with lead concentrations above the approved site-specific direct contact standard by placing them beneath development components that will serve as exposure barriers (e.g., building slabs, drive aisles, parking lots, new roadways, and other paved areas as described in cleanup plans to be submitted to PADEP) rather than placing such soils in areas where future users of the Site are likely to come into contact with such soils. Alternatively, pre-excavation characterization sampling by HRP may identify soils that should remain in place rather than being excavated and moved. The pre-excavation characterization process by HRP will provide important information that will be used in tandem with the extensive soil sampling results that have already been obtained by Sunoco to avoid encountering unanticipated conditions during the excavation process and to refine the grading plans for the Site to ensure that soils that are excavated can be reused on-site.

Prior to the start of mass grading activities, HRP will collect soil samples for laboratory analysis in the areas where soils are targeted to be cut (see [Figure 2](#)). As mentioned above, HRP has intentionally designed the cut/fill plan for the Site to avoid known areas of LNAPL, and HRP will ensure that any revisions to its cut/fill plan will likewise avoid known areas of LNAPL. For pre-excavation characterization sampling purposes prior to bulk soil movement, the soil that is proposed to be excavated will be divided into 3-dimensional "cells" of approximately 2,000 cubic yards each. [Figure 4](#) shows a conceptual layout of pre-characterized sampling cells.

HRP will submit one discrete and one composite soil sample from each cell for laboratory analysis. Consistent with the sampling protocols in PADEP's January 2020 Management of Fill Policy (PADEP, 2020), HRP will use discrete samples for analysis of volatile organic compounds ("VOCs") and composite samples for analysis of semi-volatile organic compounds ("SVOCs") and lead. This pre-excavation characterization sampling frequency and approach was selected by HRP to maintain general consistency with PADEP's January 2020 Management of Fill Policy (PADEP, 2020), while also taking into account the extensive soil sampling that has already been completed at the Site.⁷ Movement of impacted soil at the Site is not subject to either the Management of

⁷ There are several reasons why a pre-excavation characterization sampling frequency of one soil sample per 2,000 cubic yards is appropriate for the anticipated soil movement that is planned at the Site:

Fill Policy or General Permit No. WMGR096 (Beneficial Use of Regulated Fill) because the work will be undertaken entirely on-site (i.e., within a “project area”) and conditions at the Site are being addressed under Act 2. HRP selected this pre-excavation characterization sampling frequency to be generally consistent with the way that other similar soils are evaluated for use as either clean fill or regulated fill in Pennsylvania and to maintain consistency and alignment with Sunoco’s Act 2 activities. Pre-excavation characterization soil sampling results will be shared with Sunoco to be integrated into Sunoco’s Act 2 work as appropriate in accordance with 25 Pa. Code § 250.408.

A 4-point composite soil sample will be collected from each pre-characterization “cell” using a direct push drill rig or other similar sample collection method. Soil collected from the four composite soil sample locations will be screened in the field using a photoionization detector (“PID”), and a discrete soil sample will be collected from the location with the highest PID response. The discrete sample from each cell will be analyzed for the VOCs on the target compound list included in Table 1, and the composite sample from each cell will be analyzed for the SVOCs and metals on the target compound list included in Table 1. Based on initial pre-excavation sample results, some samples may also be analyzed via the Synthetic Precipitation Leaching Procedure (“SPLP”) to support the development of alternative standards for the soil-to-groundwater pathway, as needed.

In addition to the pre-excavation characterization soil samples described above, HRP will collect a discrete soil sample from the next two feet of soil underlying each cell in accordance with Act 2 to evaluate conditions in the stratum of soil that will be uncovered through excavation activities. This sampling will be performed so that the underlying soils in the cut areas (i.e., soils from approximately 0 to 2 feet below the bottom of a cut) are fully characterized for purposes of Act 2. The discrete soil samples will be analyzed for the regulated substances on the target compound list included in Table 1. Based on its plans for redeveloping the Site, HRP anticipates that most soils that are relocated at the Site will be placed under development components (e.g., building slabs, drive aisles, parking lots, new roadways, and other paved areas as described in cleanup plans to be submitted to PADEP) that will serve as barriers to exposure and/or infiltration. In addition, HRP anticipates that most soils that are uncovered through bulk soil removal will likewise ultimately be covered by development components. To the extent certain soils are identified as potentially suitable for use in an area not covered by a barrier, additional

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- a. Extensive analytical results are already available for soils at the Site based on previously completed sampling undertaken by Sunoco. The proposed pre-excavation characterization sampling will further characterize the soils to be relocated during redevelopment but will not constitute the complete data set of chemical sampling results available to understand the nature of soil impacts.
 - b. The number of pre-excavation characterization samples will be significant given the volume of soil to be managed, so there will be sufficient data to evaluate concentration statistics.
 - c. Because of the planned redevelopment of the Site, most soils that are moved will ultimately be located under development components that will serve as exposure barriers.

sampling, analysis, and risk assessment will be conducted by HRP to confirm that the soils do not pose an unacceptable risk and will attain the site-specific standard. Likewise, to the extent that soils that are uncovered through bulk soil removal will remain exposed upon completion of redevelopment and not covered by a barrier, additional sampling and analysis will be conducted of those soils by HRP to confirm that they may remain uncovered without posing unacceptable risks.

Pre-excavation characterization soil sampling results will be promptly provided to Sunoco for use in conjunction with its remediation activities under Act 2, including completion of remedial investigations and risk assessments after such soils are moved to their final location. As described in Section 2 of this Plan, if evidence of discrete regulated waste materials separate from soil or groundwater are identified during the pre-excavation characterization sampling, HRP will coordinate with Sunoco, PADEP and EPA so that such waste materials can be properly addressed in accordance with applicable requirements as described in Section V.A of the Pennsylvania Land Recycling Program Technical Guidance Manual (PADEP, 2019).

4. Development of Soil Categories

The pre-excavation characterization data will be used to divide the soils into categories that will dictate how the soils will be managed. The actual soil categories will depend on the pre-excavation characterization sampling results. However, Table 3 summarizes the soil categories which may be relevant to soil management at the Site in connection with the anticipated redevelopment activities. These categories use the various numeric values for soils that PADEP has developed based on direct contact and soil-to-groundwater pathways to implement the statewide health standard for soils under Act 2 as found in 25 Pa. Code Chapter 250, Tables 3 and 4. The lower of the direct contact and soil-to-groundwater numeric values are used to determine the medium specific concentrations (“MSCs”) for soils which in turn are dependent on whether the soils are present at residential or nonresidential properties, whether those properties are located overlying groundwater qualifying as used aquifers, and, for soils at nonresidential properties, whether the soils qualify as surface soils or subsurface soils. As used in Table 3, non-residential soil MSCs refer to the MSCs for surface soils at nonresidential properties overlying used aquifers, direct contact numeric values are the values for regulated substances set forth in Tables 3.A and 4.A of 25 Pa. Code Chapter 250, and soil-to-groundwater numeric values are the values for regulated substances set forth in Tables 3.B and 4.B of 25 Pa. Code Chapter 250.

Table 3 refers to two types of caps – caps that serve as exposure barriers and caps that serve as impervious barriers. As described in Table 2, building slabs, drive aisles, parking lots, new roadways, and other paved areas as described in cleanup plans to be submitted to PADEP constitute impervious barriers and also serve as exposure barriers. By contrast, caps consisting of soils and porous paving can serve as exposure barriers but not impervious barriers. Table 3 describes the use of the two different categories of caps in a manner that meets the requirements of Act 2 for purposes of attaining the site-specific standard under Act 2. HRP anticipates that most soils that are relocated at the Site will be placed under development components that will serve

as caps adequate as engineering controls. If soils are used as a cap, these soils will consist only of either (1) imported material, which will be either clean fill or regulated fill under PADEP's Management of Fill Policy (PADEP, 2020), or (2) soils from the Site that have been identified as appropriate for use as surface soil, using a risk assessment to demonstrate attainment of the site-specific standard.

5. Soil Relocation Planning

The existing soil characterization results, the characterization results associated with decommissioning activities, and the pre-excavation characterization results will be used to assign each "cell" of soil to a soil category. If the pre-excavation characterization results indicate that the cell qualifies for a different soil category than the existing soil characterization results, the more heavily impacted category will be assigned to that cell. For example, if the pre-excavation characterization results indicate a cell should be classified as containing soils in Category B, but the existing soil characterization results indicate that the soils in the same cell should be classified as Category E, the soils in the cell will be managed as Category E. Likewise, if during bulk soil movement, visual observations or field screening results indicate that a cell appears to be more heavily contaminated than anticipated based on the pre-excavation characterization results and the existing soil characterization results, the soils exhibiting visual or field screening evidence of greater contamination will be re-assigned to the most heavily impacted soil category or additional sampling will be conducted to re-assign a soil category, if warranted based on those sampling results. Because most soils will be located under development components that will serve as caps, this conservative approach to soil categorization is not expected to impede HRP's ability to manage soils at the Site.

After pre-excavation characterization data are evaluated and soil categories are assigned to each cell, color-coded plans will be prepared by HRP and promptly provided to Sunoco showing how the soil in each cut area is categorized. These plans will be used by HRP to manage movement of soil from cut to fill areas. Movement of impacted soils will be conducted by HRP under the oversight of a licensed environmental professional who will ensure that soils are managed consistent with this Plan. Figure 5 shows a conceptualized depiction of pre-excavation characterization sampling results.

When redevelopment is complete, HRP anticipates that most soils at the Site will be located under development components (e.g., building slabs, drive aisles, parking lots, new roadways, and other paved areas as described in cleanup plans to be submitted to PADEP) that will serve as barriers to exposure and/or infiltration. If certain soils at the Site are identified as potentially suitable for use in an area not covered by a barrier, additional sampling and analysis will be conducted to support a demonstration that such an area does not pose any unacceptable risk and will attain the site-specific standard consistent with the requirements of Act 2.

6. Additional Issues Relating to Redevelopment Process

(a) Remediation Equipment

Soil excavation and relocation has the potential to disrupt existing remediation equipment (e.g., monitoring wells, extraction wells, pipelines and treatment units) and existing utility infrastructure (e.g., stormwater infrastructure). HRP will make sure that necessary remediation equipment is protected, relocated, or replaced, as needed. HRP intends to decommission the existing wastewater treatment plants at the Site as new stormwater management infrastructure is constructed, in accordance with applicable local and state requirements. The transition to new stormwater infrastructure will be coordinated with the phasing of decommissioning, demolition, soil grading, and development, and HRP will coordinate this transition with Sunoco, which currently relies on operation of the wastewater treatment plants to process effluent from remediation systems.

(b) Potential Vapor Intrusion

While not the subject of this Plan, HRP recognizes the potential for regulated substances present in soil and groundwater and subsurface LNAPL to act as vapor intrusion sources into new buildings constructed at the Site. HRP will install vapor barriers or other vapor mitigation controls (such as subslab venting systems) as part of constructing any buildings or structures at the Site, or, alternatively, will conduct sampling and analysis to demonstrate that such controls are not needed to mitigate potential vapor intrusion into such buildings or structures in accordance with PADEP guidance.

7. Documentation and Next Steps

This Plan presents HRP's approach for soil management during redevelopment at the Site. At least 30 days prior to the start of any soil disturbance, excavation or grading activities, HRP will submit to Sunoco and PADEP the results (including but not limited to the laboratory data reports) of pre-excavation characterization sampling, updated redevelopment plans, and figures showing pre-excavation characterization sampling locations and soil categorization that is consistent with the approach described herein.

HRP will track and document movement of soil at the Site, including but not limited to cubic yards of soil moved, coordinates and depths of the existing locations of the soil to be moved, and coordinates of the new soil locations. Such documentation will enable pre-excavation characterization sampling results coupled with soil sampling results collected by Sunoco as part of evaluating areas of concern under Act 2 to be used to demonstrate conditions in areas where soils are moved and placed.

The development components that will serve as surface caps as described in Table 2 of the Plan and that are constructed during redevelopment will be documented as adequate engineering controls in a subsequent cleanup plan (or plans) for the Site. HRP understands that plans and descriptions of surface caps will need to be included in the cleanup plan(s) and that the cleanup

plan(s) will be subject to the Act 2 public involvement process and will coordinate with Sunoco concerning the same.

References

Commonwealth of Pennsylvania Department of Environmental Protection (2020). Management of Fill Policy; Document Number 258-2182-773.

Commonwealth of Pennsylvania Department of Environmental Protection (2019). Land Recycling Program Technical Guidance Manual; Document Number 261-0300-101.

Commonwealth of Pennsylvania Department of Environmental Protection (2017). Technical Document; Closure Requirements for Above Ground Storage Tank Systems; Technical Guidance Number 263-4200-001.

Commonwealth of Pennsylvania Department of Environmental Protection (2012). Consent Order and Agreement, in the Matter of: Sunoco, Inc. (R&M) – Seller, Philadelphia Energy Solutions Refining and Marketing LLC – Buyer, Buyer-Seller Agreement re: Philadelphia Refinery.

Langan Engineering & Environmental Services, Inc. (2015). Human Health Risk Assessment Report, Philadelphia Refinery, Philadelphia, Pennsylvania, and Belmont Terminal, Philadelphia, Pennsylvania, and Marcus Hook Industrial Complex, Marcus Hook, Pennsylvania.

TABLE 1

Philadelphia Refinery Target Compound List and Associated Act 2 Soil Cleanup Standards

Target Compound	EPA Analytical Method	CAS No.	Non-Residential Direct Contact Numeric Value (0-2 ft bgs)	Non-Residential Soil to Groundwater Numeric Value
Volatile Compounds				
Benzene	8260	71-43-2	290	0.50
1,2-Dibromoethane (EDB)	8260	106-93-4	3.7	0.0050
1,2-Dichloroethane (EDC)	8260	107-06-2	86	0.5
Ethylbenzene	8260	100-41-4	890	70
Isopropylbenzene (Cumene)	8260	98-82-8	10,000	2,500
Methyl Tertiary Butyl Ether	8260	1634-04-4	8,600	2
Naphthalene	8270	91-20-3	760	25
Toluene	8260	108-88-3	10,000	100
1,2,4-Trimethylbenzene	8260	95-63-6	560	35
1,3,5-Trimethylbenzene	8260	108-67-8	10,000	210
Xylenes (Total)	8260	1330-20-7	8,000	1,000
Semi-Volatile Compounds				
Anthracene	8270	120-12-7	190,000	350
Benzo(a)anthracene	8270	56-55-3	130	430
Benzo(a)pyrene	8270	50-32-8	12	46
Benzo(b)fluoranthene	8270	205-99-2	76	170
Benzo(g,h,i)perylene	8270	191-24-2	190,000	180
Chrysene	8270	218-01-9	760	230
Fluorene	8270	86-73-7	130,000	3,800
Phenanthrene	8270	85-01-8	190,000	10,000
Pyrene	8270	129-00-0	96,000	2,200
Metals				
Lead	6010/6020	7439-92-1	1,000	450

Notes:

1. The Act 2 Standards are subject to change, and the Standards in effect at the time of an Act 2 report submittal will apply.

TABLE 2
Development Component Functions

Development Component	Exposure Barrier	Impervious Barrier
<p>Surface Soil Layer Imported soil used in accessible areas at the ground surface will be subject to PADEP's Management of Fill Policy (PADEP, 2020). Before using site soil in accessible areas at the ground surface, a risk assessment will be conducted to demonstrate attainment of the site-specific standard.</p>	X	
<p>Building Slab Minimum section will consist of 4 inches of concrete over 4 inches of aggregate subbase</p>	X	X
<p>Parking Lot Minimum section will consist of 3.75 inches of concrete or asphalt over 4 inches of aggregate subbase</p>	X	X
<p>Roadway Minimum section will consist of 5 inches of concrete and/or asphalt over 4 inches of aggregate subbase</p>	X	X
<p>Drive Aisle Minimum section will consist of 5 inches of concrete or asphalt over 4 inches of aggregate subbase</p>	X	X

TABLE 3
Soil Reuse Categories

Category	Description	Reuse Options
A	Concentrations of target analytes below non-residential soil MSCs.	Soil can be reused: ¹ (1) in areas beneath a surface cap that provides an exposure barrier (e.g., building slabs, parking lots, roadways, or imported soil) that will serve as an engineering control under Act 2 or (2) in areas not beneath a surface cap (e.g., as backfill in utility corridors or in landscaped areas) as long as a risk assessment demonstrates attainment of the site-specific standard.
B	Concentrations of target analytes above nonresidential soil-to-groundwater numeric values but below the nonresidential direct contact numeric values/site-specific lead standard, where direct contact values are higher than the nonresidential soil-to-groundwater numeric values.	Soil can be reused: (1) in areas beneath an impervious surface cap (e.g., building slabs, parking lots, or roadways) that will serve as an engineering control under Act 2 at elevations above the groundwater table or (2) in areas not beneath a surface cap that are more than 500 ft. from a shoreline (i.e., the edge of the Schuylkill River) as long as a risk assessment demonstrates attainment of the site-specific standard.
C	Concentrations of target analytes above the nonresidential direct contact numeric values but below the nonresidential soil-to-groundwater numeric values, where the soil-to-groundwater numeric values are higher than the nonresidential direct contact numeric values.	Soil can be reused in areas beneath a surface cap that provides an exposure barrier (e.g., building slabs, parking lots, roadways, imported soil, or appropriate Site soil) that will serve as an engineering control under Act 2. ^{1,2}
D	Concentrations of target analytes above the nonresidential direct contact numeric values/site-specific lead standard (Langan, 2015) but below site-specific leaching based standards (to be calculated by HRP).	Soil can be reused in areas beneath a surface cap that provides an exposure barrier (e.g., building slabs, parking lots, roadways, imported soil, or appropriate Site soil) that will serve as an engineering control under Act 2. ^{1,2}
E	Concentrations of target analytes above the nonresidential direct contact numeric values/site-specific lead standard and above both nonresidential soil-to-groundwater numeric values and site-specific leaching-based standards (to be calculated by HRP).	Soil can be reused beneath an impervious surface cap (e.g., building slabs, parking lots, or roadways) that will serve as an engineering control under Act 2 at elevations above the groundwater table.

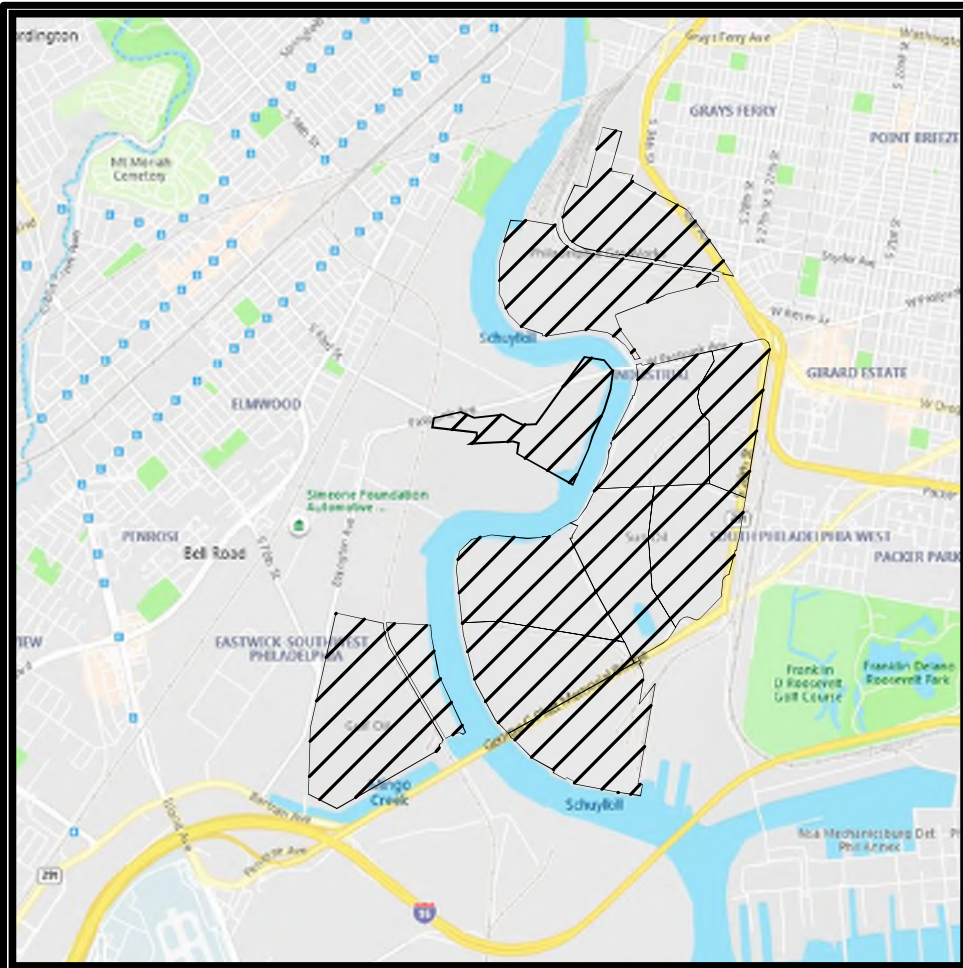
Notes:

1. Imported soil used as an exposure barrier will be subject to PADEP's Management of Fill Policy (PADEP, 2020).
2. Site soil will only be considered appropriate for use as an exposure barrier if a risk assessment demonstrates attainment of the site-specific standard.
3. Relocated soil will likely all be placed at elevations above the groundwater table because existing grades are above the groundwater table and the objective of soil relocation is to raise grades in areas of current relative lower elevation.

Figure 1

Conceptual Master Plan

CONCEPTUAL MASTER PLAN C FOR **PES REDEVELOPMENT** PHILADELPHIA, PENNSYLVANIA



LOCATION MAP

SITE DATA

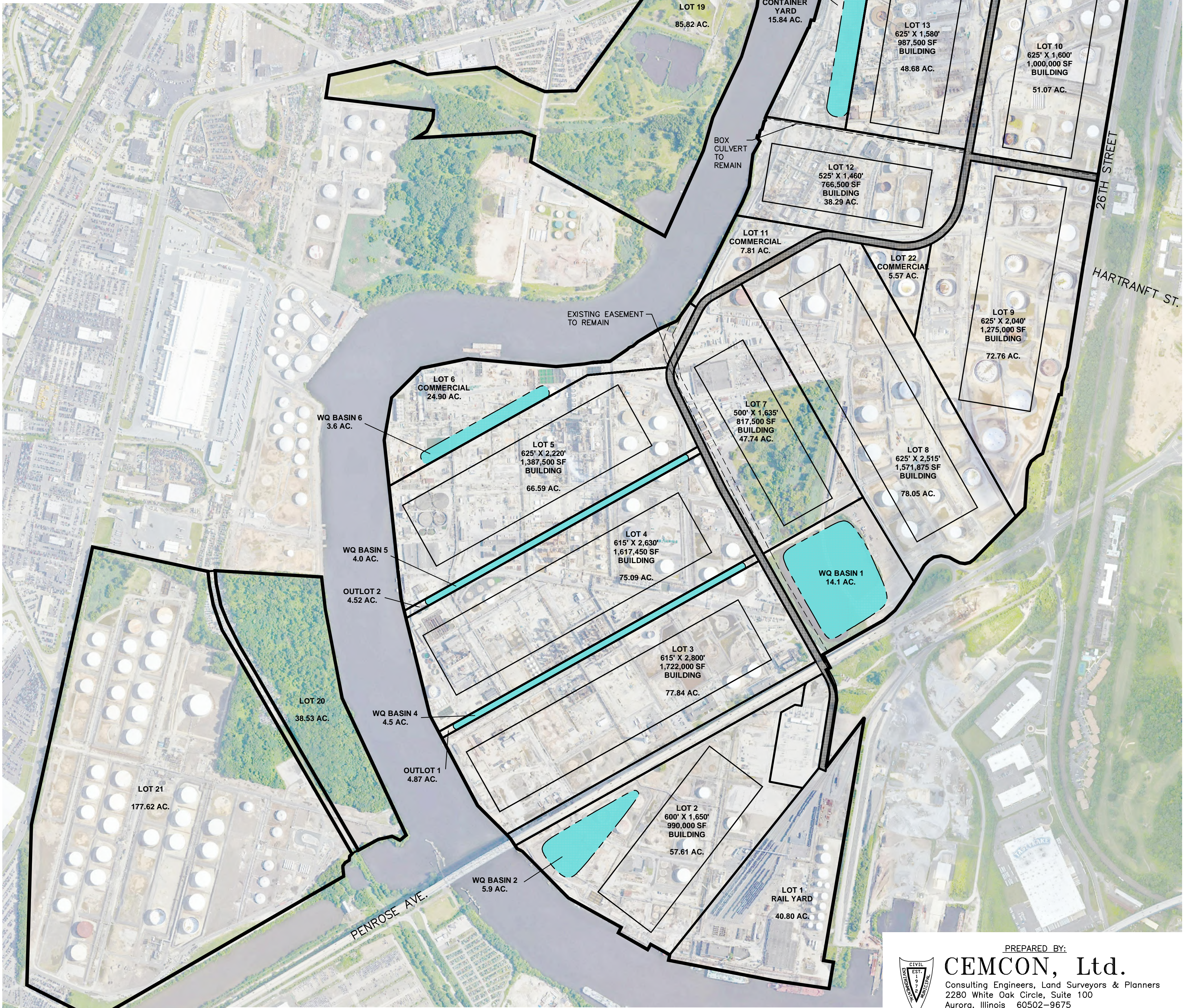
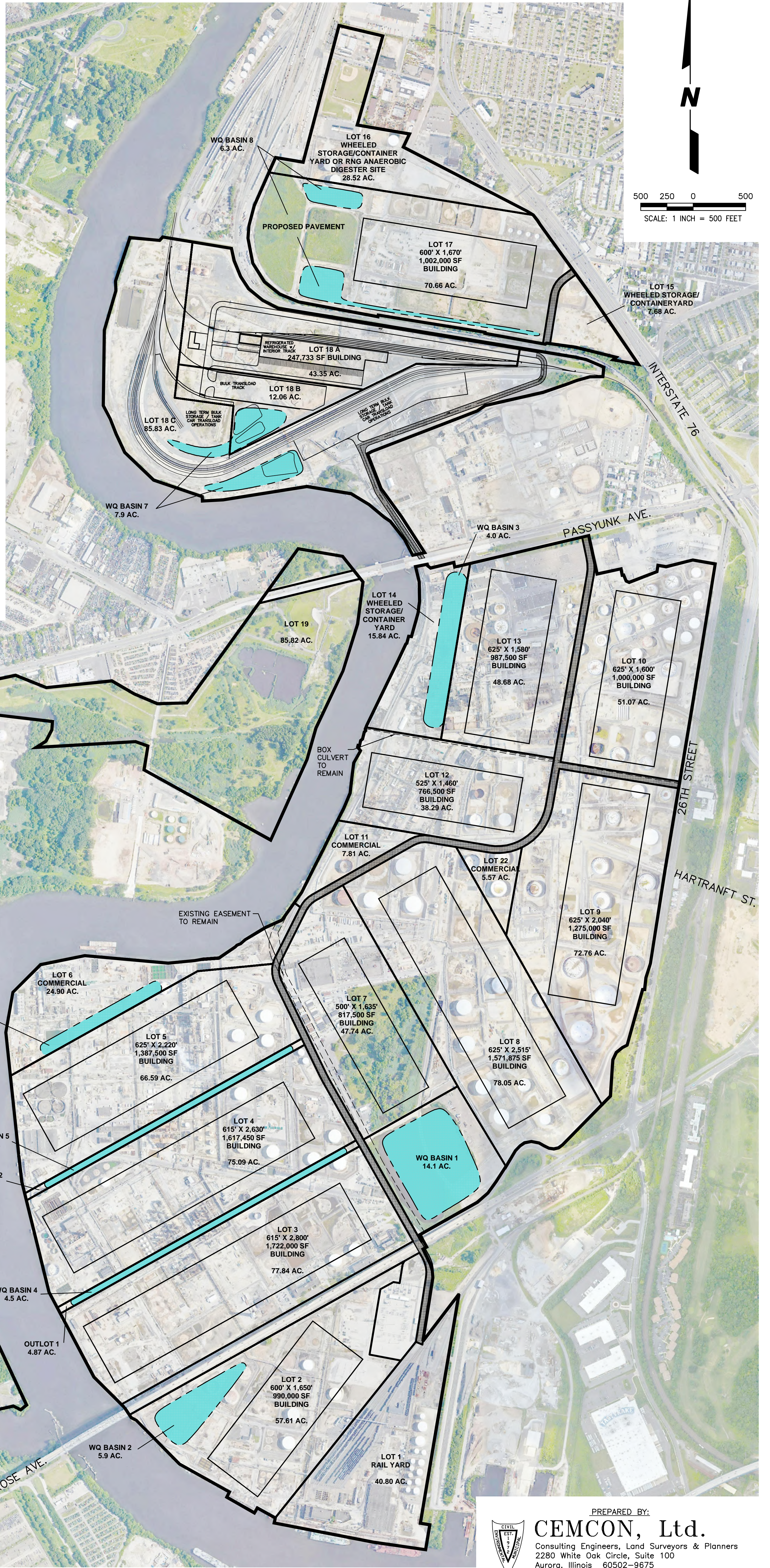
LOT NO	ACRES	BLDG. SQ. FT.	DEVEL. CATEGORY
LOT 1	40.80 AC.	-----	RAIL
LOT 2	57.61 AC.	990,000 SQ. FT.	LOGISTICS CENTER
LOT 3	77.84 AC.	1,722,000 SQ. FT.	LOGISTICS CENTER
LOT 4	75.09 AC.	1,617,450 SQ. FT.	LOGISTICS CENTER
LOT 5	66.59 AC.	1,387,500 SQ. FT.	LOGISTICS CENTER
LOT 6	24.90 AC.	-----	COMMERCIAL
LOT 7	47.74 AC.	817,500 SQ. FT.	LOGISTICS CENTER
LOT 8	78.05 AC.	1,571,875 SQ. FT.	LOGISTICS CENTER
LOT 9	72.76 AC.	1,275,000 SQ. FT.	LOGISTICS CENTER
LOT 10	51.07 AC.	1,000,000 SQ. FT.	LOGISTICS CENTER
LOT 11	7.81 AC.	-----	COMMERCIAL
LOT 12	28.29 AC.	766,500 SQ. FT.	LOGISTICS CENTER
LOT 13	48.68 AC.	987,500 SQ. FT.	LOGISTICS CENTER
LOT 14	15.84 AC.	-----	WHEELED STORAGE/CONTAINER YARD
LOT 15	7.68 AC.	-----	WHEELED STORAGE/CONTAINER YARD
LOT 16	28.52 AC.	-----	WHEELED STORAGE/CONTAINER YARD
LOT 17	70.66 AC.	1,002,000 SQ. FT.	LOGISTICS CENTER
LOT 18A	43.35 AC.	247,733 SQ. FT.	RAIL
LOT 18B	12.06 AC.	-----	RAIL
LOT 18C	85.83 AC.	-----	RAIL
LOT 19	85.82 AC.	-----	UNDEVELOPABLE
LOT 20	38.53 AC.	-----	UNDEVELOPABLE
LOT 21	177.62 AC.	-----	TANKAGE
LOT 22	5.57 AC.	-----	COMMERCIAL
OUTLOT 1	4.87 AC.	-----	-----
OUTLOT 2	4.52 AC.	-----	-----
WQ BASINS	40.9 AC.	-----	-----
ROW	21.83 AC.	-----	-----
TOTAL	1,330.83 AC.	13,385,058 SQ. FT.	-----

LINEAL FEET INTERIOR ROADWAY 15,228 L.F.

THE AREA FOR WQ BASINS NOS. 4 & 5 ARE INCLUDED IN OUTLOT NOS. 1 & 2 AREA, RESPECTIVELY.

DEVELOPMENT PHASING PLAN

PHASE	LOTS	MONTH STARTED POST CLOSING	CUMUL. ACREAGE	CUMUL. BLDG. SQ. FT.
1	1, 16, 17, 18	18	281.22	1,249,733
2	9, 10, 15	30	131.51	2,275,000
3	7, 8, 22	42	131.36	2,389,375
4	11, 12, 13, 14	54	110.62	1,754,000
5	5, 6	66	91.49	1,387,500
6	4	78	75.09	1,617,450
7	2, 3	90	135.45	2,712,000



PREPARED BY:
CEMCON, Ltd.
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2280 White Oak Circle, Suite 100
Aurora, Illinois 60502-9675
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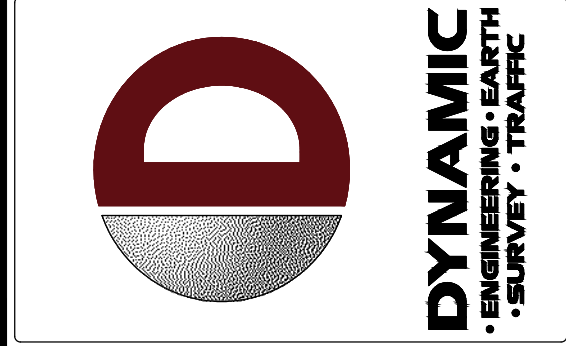
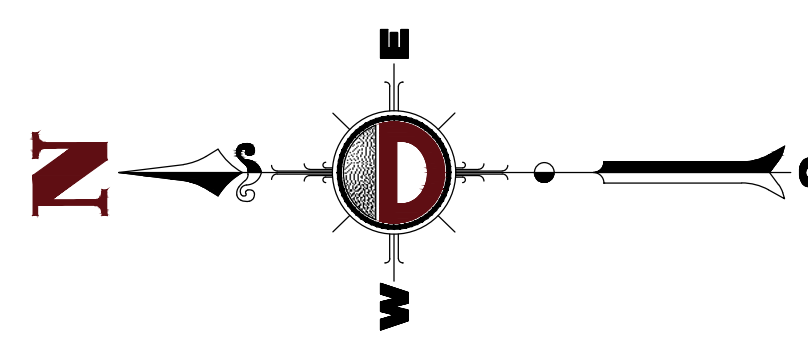
PREPARED FOR:
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401 N. MICHIGAN AVE., SUITE 1630
CHICAGO, ILLINOIS 60611
(312) 796-0920

DISC NO.: 842003 FILE NAME: 2020-03-23 CONCEPT C
DRAWN BY: KMS FLD. BK. / PG. NO.: -----
COMPLETION DATE: 03-23-20 JOB NO.: 842.003
XREF : PROJECT MANAGER : MMW

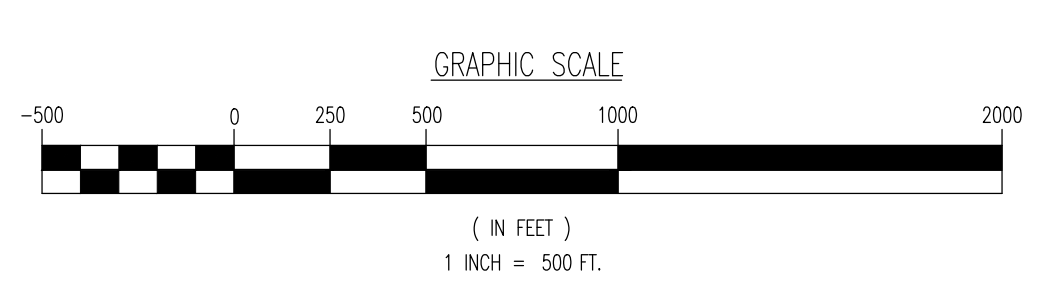
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Figure 2

Anticipated Cut Fill



NOTE: AREAS OF CUT AND FILL ARE SUBJECT TO CHANGE



REV.	DATE	COMMENTS

THIS PLAN SET IS FOR PERMITTING PURPOSES ONLY AND MAY NOT BE USED FOR CONSTRUCTION.

DRAWN BY: _____ CHECKED BY: _____ DESIGNED BY: _____

PROJECT: **HILCO REDEVELOPMENT PARTNERS
PHILADELPHIA ENERGY SOLUTIONS - SITE REDEVELOPMENT**

CITY OF PHILADELPHIA, PHILADELPHIA COUNTY, PENNSYLVANIA

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PROFESSIONAL ENGINEER
PENNSYLVANIA LICENSE No. 080629

ROBERT P. FREUD

PROFESSIONAL ENGINEER
PENNSYLVANIA LICENSE No. 75022

TITLE:
**DRAFT IN PROGRESS
SUBGRADE
CUT FILL EXHIBIT**

SCALE: (H) 1"=500'
(V) _____

DATE: 02/03/20

PROJECT No: 2715-99-003

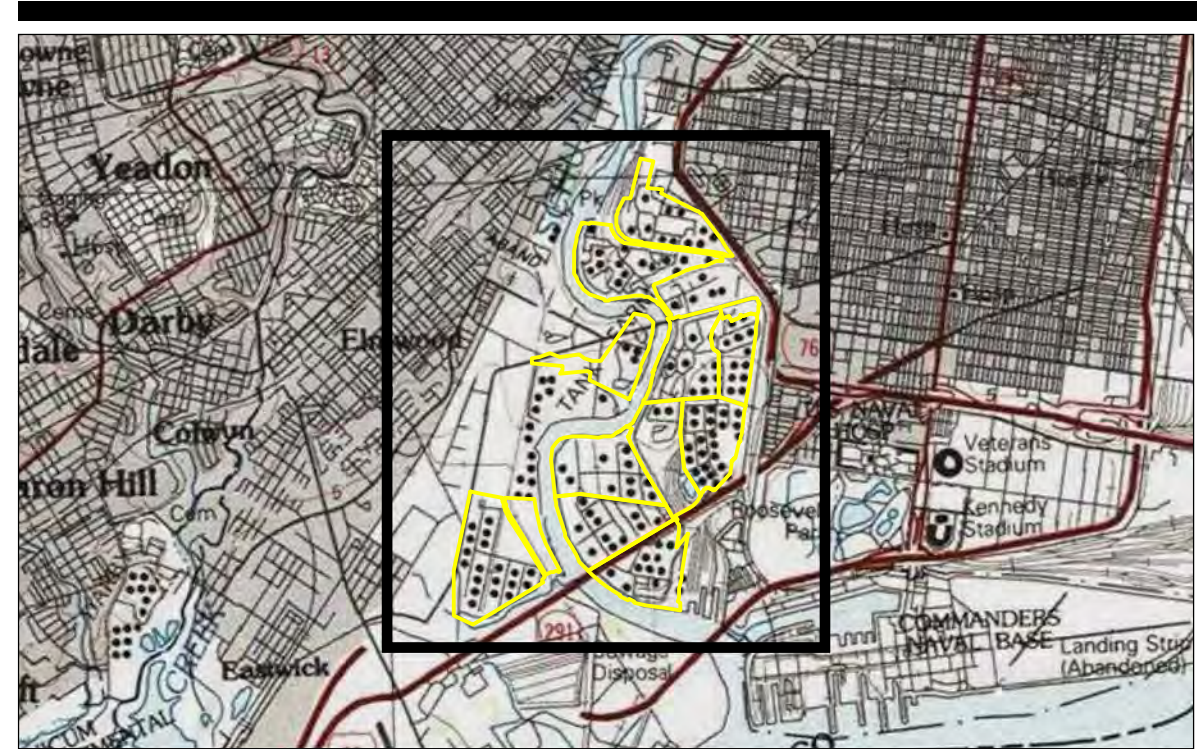
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Figure 3

Refinery Unit Locations and Soil Sample Results



Notes
 1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
 2. Sources: Stantec
 3. Aerial & Topo Source: Copyright© 2013 National Geographic Society, i-cubed
 FEMA Philadelphia County 2018 Aerial Imagery

- Legend**
- SHALLOW SOIL EXCEEDANCE OF THE PADEP NON-RESIDENTIAL, UNSATURATED STATEWIDE HEALTH STANDARD 0-2'
 - NO SHALLOW SOIL EXCEEDANCE OF THE PADEP NON-RESIDENTIAL, UNSATURATED STATEWIDE HEALTH STANDARD 0-2'
 - DEEP SOIL EXCEEDANCE OF THE PADEP NON-RESIDENTIAL, UNSATURATED STATEWIDE HEALTH STANDARD GREATER THAN 2'
 - NO DEEP SOIL EXCEEDANCE OF THE PADEP NON-RESIDENTIAL, UNSATURATED STATEWIDE HEALTH STANDARD GREATER THAN 2'
 - WELL LOCATION
 - DESTROYED WELL LOCATION
 - APPROXIMATE LOCATION OF PHILADELPHIA WATER DEPARTMENT SEWER
 - ▭ PROPOSED SOIL SAMPLING AREA WITHIN REFINERY UNIT
 - ▭ PROPOSED SOIL SAMPLING AREAS WITHIN DIVIDED REFINERY UNIT
 - ▭ AREA OF INTEREST (AOI)
 - ▭ PHILADELPHIA GAS WORKS PROPERTY BOUNDARY

0 400 800 Feet
 1:4,800 (At original document size of 36x48)

Figure No.
3
 Title
REFINERY UNIT LOCATIONS AND SOIL SAMPLE RESULTS

Client/Project
 PHILADELPHIA REFINERY OPERATIONS, A SERIES OF
 EVERGREEN RESOURCES GROUP, LLC
 PHILADELPHIA REFINING COMPLEX
 3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location
 City of Philadelphia, Philadelphia County, Pennsylvania
 Prepared by GWC on 4/12/2020
 Technical Review by JK on 4/21/2020
 Independent Review by ASD on 4/21/2020
 213402454



Figure 4

Conceptual Soil Pre-Characterization Sampling
Cell Layout

FIGURE 4
Conceptual Soil Pre-Characterization Sampling Cell Layout

Conceptual Plan View

1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16
17	18	19	20

Conceptual Vertical Cross-Section

0-3 ft bgs	1	2	3	4
3-6 ft bgs	21	22	23	24
6-9 ft bgs	41	42	43	44



-  Conceptual cut area
-  Conceptual precharacterization sample "cell"

Figure 5

Hypothetical Pre-Characterization Sampling
Results Summary

FIGURE 5
Hypothetical Pre-Characterization Sampling Results Summary

Conceptual Plan View



Conceptual Vertical Cross-Section

