U. S. EPA Superfund Program

Proposed Plan for Interim Remedial Action

Chem-Fab Superfund Site
Operable Unit 3

A. INTRODUCTION

Dates to Remember

May 10, 2023 to
June 9, 2023
Public Comment Period on
EPA's Proposed Plan

May 31, 2023,
6:00pm to 7:30pm
Public Meeting
Doylestown Borough Hall
10 Doyle Street
Doylestown, PA 18901

The United States Environmental Protection Agency (EPA) is issuing this Proposed Remedial Action Plan (Proposed Plan) to present the Preferred Alternative for an interim remedial action to address soil gas, soil, sediment, and surface water contamination (Operable Unit 3 or OU3) at the Chem-Fab Superfund Site (Site). This Proposed Plan provides the rationale for proposing the Preferred Alternative and includes a summary of alternatives evaluated for interim cleanup at OU3 of the Site. EPA is the lead agency for Site activities, and the Pennsylvania Department of Environmental Protection (PADEP) is the support agency.

EPA, in consultation with PADEP, will select an interim remedy for OU3 after reviewing and considering all information submitted during the 30-day public comment period held between May 10, 2023 and June 9, 2023.

The Site is located in Doylestown Borough, Bucks County, Pennsylvania. The Site was proposed for the National Priorities List (NPL) in September 2007 and added to the NPL in March 2008. The National Superfund Database Identification Number for the Site is PAD002323848. EPA has organized the Site into three Operable Units (OUs):

- Operable Unit One (OU1) addresses contaminated soils outside the footprint of the buildings currently on the former Chem-Fab facility property (the Property) located at 300-360 North Broad Street, Doylestown.

- Operable Unit Two (OU2) addresses contaminated groundwater at the Site.

- Operable Unit Three (OU3) addresses contaminated soil gas, remaining contaminated soil not addressed under OU1, and contaminated sediment and surface water at the Site.

EPA, in consultation with PADEP, evaluated several alternatives for addressing contamination at OU3. A summary of EPA's Preferred Alternative for each affected media within OU3 is provided in Table 1, below.

Table 1: EPA's Preferred Alternative (Summary)

OU3 Media	Preferred Alternative	Estimated Present Value Cost
Soil Gas	SG - 3: Vapor Intrusion Mitigation (Existing and New Installation), Monitoring and Institutional Controls	$293,000
Soil	Soil - 4: Excavation, Off-Site Disposal and Institutional Controls	$7,162,000
Sediment	Sd - 3: Excavation, Stabilization and Off-Site Disposal	$567,000

Although this Proposed Plan describes EPA's Preferred Alternative, EPA and PADEP welcome the public's comments on each of the alternatives presented in this Proposed Plan. The public comment period ends on June 9, 2023. After the close of the public comment period and consideration of comments, EPA will document selection of the remedial action in an Interim Record of Decision (ROD). The public's comments and EPA's responses will be documented in the Responsiveness Summary section of the Interim ROD. Therefore, the public is encouraged to review and comment on all alternatives presented in this Proposed Plan. EPA, in consultation with PADEP, may modify the Preferred Alternative or select another interim response action presented in this Proposed Plan based on new information or public comments.

EPA is issuing this Proposed Plan as part of its public participation responsibilities under Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA), 42 U.S.C. § 9617, and Section 300.430(f)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 C.F.R. §300.430(f)(2).

This Proposed Plan highlights key information that can be found in greater detail in the Feasibility Study (FS) and other documents contained in the Administrative Record file supporting selection of this interim remedial action. EPA and PADEP encourage the public to review these documents to gain a more comprehensive understanding of the Site and Superfund activities that have been conducted at the Site.

The Administrative Record file for this action can be accessed at: www.epa.gov/superfund/chemfab, or at the following locations:

Bucks County Free Library 150 South Pine Street Doylestown, PA 18901 (215) 348-9081	EPA Administrative Records Room Four Penn Center 1600 John F. Kennedy Boulevard Philadelphia, PA 19103 Phone: (215) 814-2396 **By appointment only**

B. SITE BACKGROUND

1. Site Location and Description

The Chem-Fab Site is located (1) on property at and around 300-360 N. Broad Street in Doylestown, Montgomery County, Pennsylvania, upon which industrial and disposal operations occurred in the past (Property) and (2) on other properties to which contamination from such operations has migrated or otherwise come to be located. The Site layout is provided in *Figure 1*. The Property is a one-acre parcel and currently contains a small office park which hosts several commercial tenants. There are three buildings on the Property:

- Building A: This is a one-story office building housing several commercial tenants. Building A is situated where the former manufacturing building at the Site was located and is identified as "Former Chem-Fab Manufacturing Building" on *Figure 1*.

- Building B: This structure is labeled "Former Chem-Fab Storage Building" on *Figure 1*.

- Building C: This structure is labeled "Former Chem-Fab Residential Home" on *Figure 1*.

The Property was farmland prior to its use for commercial/industrial purposes. From the mid-1960s to the early 1990s, Chem-Fab, Inc. (Chem-Fab) operated an electroplating and metal etching facility on the Property. Chem-Fab's operations generated wastes that included metals; volatile organic compounds (VOCs) such as 1,1,1-trichloroethane (1,1,1- TCA), methylene chloride, and trichloroethylene (TCE); ferric chloride; mineral spirits; chromic acid rinse water and sludge; chromic acid; sulfuric acid; sodium bisulfate; and sodium hydroxide. While perfluoroalkyl substances (PFAS) usage has not been documented at the Chem-Fab facility, PFAS usage is often associated with chromium plating operations. The Chem-Fab facility was cited several times during the 1960s and 1970s by both the Bucks County Department of Health and the Pennsylvania Department of Environmental Resources, now the Pennsylvania Department of Environmental Protection (PADEP), for spills and releases of industrial wastes from above-ground storage tanks (ASTs), underground storage tanks (USTs), and the catch basin, all located on the Property, to Cooks Run, a nearby creek. These releases included chromic acid rinse water spills from broken valves on pretreatment tanks and overflows of the catch basin.

In the late 1970s, Chem-Fab was acquired by Boarhead Corporation, a business established by Manfred DeRewal, Sr. (DeRewal) to acquire property. Boarhead Corporation also owned a property located approximately 20 miles from the Chem-Fab Site, which is currently the Boarhead Farms Superfund Site. DeRewal also owned DeRewal Chemical Company Inc. (DCC), which removed, transported, and disposed of chemical waste generated by other companies. During the 1970s, DCC disposed of chemical wastes at locations which included the future Boarhead Farms Superfund Site, a rented warehouse property on Ontario Street in Philadelphia, and the Wissinoming Industrial Park in Philadelphia. During this period, liquid wastes, including hundreds of thousands of gallons of ammonia, hydrochloric acid, and pickle liquor waste, were transported from various industrial entities to Chem-Fab for disposal. In addition to Chem-Fab, two other entities associated with DeRewal -- a gallium reclamation business and a computer assembly outfit -- operated at the Property during the 1980s and 1990s, respectively.

2. Previous Environmental Investigations and Actions

In August 1987, the EPA performed a Preliminary Assessment and Site Inspection (PA/SI) at the Doylestown Groundwater Site and the Chem-Fab Site. During the PA/SI, water samples from residential wells and the municipal well located in the vicinity of the Chem-Fab Site were found to contain levels of VOCs, including TCE and tetrachloroethylene (PCE), exceeding drinking water standards. In October 1987, EPA conducted a Removal Action which included the delivery of bottled water and carbon filtration units to affected residences and connection of affected residences to public water supplies.

In September 1994, EPA conducted a removal assessment at the Property. EPA found improperly and incompatibly stored drums of hazardous material, including flammable liquids and acids. Samples from these drums indicated the presence of acids, TCE, and chromium. EPA also found a 50-foot long UST which contained approximately 6,000 gallons of liquid and sludge and appeared to be leaking into the ground. Samples from the UST were found to contain hexavalent chromium. Samples taken from a sump located inside the warehouse indicated the presence of TCE.

In 1994-1995, EPA conducted a second Removal Action at the Chem-Fab Site. During that response, EPA removed 117 drums and 8,400 gallons of liquid wastes, including chromium-contaminated wastes from the UST as well as other solid wastes and fuel oils. During the response action, EPA found label information on drums and other containers indicating the presence of xylene, toluene, hydrochloric acid, sulfuric acid, nitric acid, caustic soda, methyl isobutyl ketone, polymeric isocyanate, benzene sulfonic acid, nickel rinse waste, methylene chloride, ferric chloride, chromate waste acid, and anhydrous ammonia.

In 1998, PADEP assumed the lead role in further assessing the Chem-Fab Site. Beginning in 1999, PADEP began an investigation of the soils and groundwater in the vicinity of the Property. PADEP found hexavalent chromium (Cr-VI) and VOCs in the soils and in the groundwater on the Property and on an adjacent property. Visible chromium contamination was found in the drainage ditch on the adjacent property. In 2004, PADEP issued a Statement of Decision selecting a groundwater remedy for the Site. The selected remedy was groundwater monitoring, extraction and ex-situ treatment, in-situ treatment, and reinjection. However, implementation of the remedy was delayed due to technical issues and lack of funding. PADEP continued its investigation and requested that EPA list the Site on the NPL. EPA proposed the Chem-Fab Site to the NPL in September 2007. The Site was formally added to the NPL in March 2008.

In September 2009, EPA initiated a fund-lead Remedial Investigation and Feasibility Study (RI/FS) to comprehensively characterize the nature and extent of contamination at the Site and to evaluate alternatives for addressing threats to human health and the environment presented by such contamination. The Remedial Investigation (RI) Report, which was completed in July 2019, described additional soil, sediment, surface water, and groundwater sampling conducted by EPA for the purpose of characterizing the nature and extent of contamination at the Site. As part of the RI, EPA also conducted vapor intrusion (VI) sampling in the homes of residents living down-gradient from the Property and in the commercial spaces at the Property. The VI sampling found significant levels of VOCs in the sub-slab and indoor air of Building A on the Property.

As a result, in November 2012, EPA initiated a third Removal Action intended to reduce VOCs in suites inside Building A. This Removal Action involved the installation of portable air purifiers into selected suites within the impacted building.

Additional indoor air sampling was conducted and, in 2015, the portable air purifiers were replaced with a sub-slab vapor mitigation system installed by EPA to reduce VOC concentrations in the indoor air. In January 2016, sampling was performed to confirm that the treatment system had reduced levels of VOCs in the indoor air and sub-slab to acceptable levels. EPA continues to conduct performance monitoring and sampling to ensure the VI mitigation system meets performance standards and the risks to workers at the former Chem-Fab facility are addressed.

In December 2012, EPA issued an Interim ROD for Operable Unit 1 (OU1) of the Site. The selected remedy consisted of removing and disposing contaminated soils outside the footprint of the buildings on the Property. Due to funding issues, this action was implemented as the fourth Removal Action, selected in September 2013 and implemented between March and August of 2014.

In 2015, EPA conducted a fifth Removal Action involving construction of a waterline to a residence with contaminated well water. EPA had previously detected Site-related VOC contamination in this potable well above regulatory levels.

In July 2017, EPA issued an Interim ROD for Operable Unit 2 (OU2). The selected remedy consisted of extraction and treatment of highly contaminated groundwater beneath the Property and an adjacent parcel (the Area of Highest Contamination or AOHC). The groundwater extraction and treatment system is currently being constructed by EPA.

Data from the 2019 RI Report was used to evaluate risks to human health and ecological receptors, described in the Human Health Risk Assessment (HHRA) and Refined Ecological Risk Assessment (RERA) as well as addenda to these documents. These risk assessment documents led to the development of the FS Report, which was finalized April 2023, and which identified Remedial Action Objectives and developed and evaluated alternatives for addressing risks associated with contamination at OU3. The FS and other documents in the Administrative Record file form the basis for this Proposed Plan.

C. SITE CHARACTERISTICS

1. Current Use

See Section B (Site Background) for a description of the Chem-Fab Site, including the Property. The Property is currently zoned for commercial use and contains a small office park. The Property contains vegetation, paved and gravel driveways and parking areas, and a concrete pad in the rear of Building A. The Property is bordered to the north by North Broad Street and to the west by an active self-storage facility. A large, forested area containing a small creek (Cooks Run) and isolated forested wetlands areas is situated to the west of the self-storage facility. Ground elevations in the area range from approximately 340 to 360 feet above mean sea level (msl), with the ground sloping gently to the west towards Cooks Run. A drainage swale is present on the self-storage facility property that empties into Cooks Run. A map of the Property and surrounding areas is provided as *Figure 1.*

The following sections summarize EPA's current information regarding environmental conditions at the Site. The RI Report, which can be found in the Administrative Record file, provides additional details on the nature and extent of contamination at the Site.

2. Soil

Soils at the Chem Fab Site are associated with the Doylestown Series and Abbottstown Series; both soil types are considered to be poorly to moderately permeable and allow for slow to moderate runoff. Across much of the Site, the afore-mentioned soil series are overlain by fill material. The fill material consists of various unconsolidated local soils and gravel compacted and was likely used to level and develop the Property to its current state.

Between 1999 and 2007, PADEP conducted investigations to assess the soils, groundwater, and surface water at and in the vicinity of the Property. PADEP's investigations revealed high levels of soil contamination on the Property and the presence of Site-related contamination in the groundwater beneath, and migrating from, the Property.

During the course of its investigation, PADEP collected 261 soil samples from 168 locations at and around the Property between 1999 and 2007. Soil at the Property was found to be contaminated with 47 chemicals above EPA Regional Screening Levels (RSLs). The most significant exceedances included Cr-VI, PCE, and TCE. Cr-VI, PCE, and TCE were found at concentrations up to 781 mg/kg, 190 mg/kg, and 4,000 mg/kg, respectively. The area of highest soil contamination roughly corresponds to the area where the above-ground tank farm was previously located. The former Chem-Fab facility had six ASTs as well as a 10,000 gallon UST. Drums of hazardous waste were also found in this area during the 1994 EPA Removal Action.

As stated in Section B, in 2014 EPA excavated and disposed of contaminated soils outside the footprint of the buildings at the Property. The area is now covered with asphalt and serves as a parking lot for the commercial entities on the Property.

Characterization of the nature and extent of contamination in soils associated with OU3 began with PADEP investigations and continued when EPA began the RI in 2009. Major Contaminants of Concern (COCs) for soil found during the RI align with previous PADEP investigations and include Cr-VI and other metals and VOCs. Contamination in soil beneath the buildings on the Property is likely due to direct contamination from previous operations or disposal practices. Contamination in soil elsewhere at the Site is likely due to contact with contaminated overburden groundwater or contaminated groundwater discharge.

3. Surface Water and Sediment

Cooks Run is the sole named water body located within a 1-mile radius of the Property. Surface drainage from the Property generally flows to the west and southwest toward Cooks Run via overland flow. A surface swale is also present on the eastern border of the self-storage facility and empties into Cooks Run. Cooks Run also receives groundwater from areas where the stream directly intersects the local groundwater table, as well as from nearby groundwater upwelling, which flows into Cooks Run in the form of overland flow. Cooks Run is a tributary of Neshaminy Creek, which eventually flows into the Delaware River.

In addition to Cooks Run, surface water is also present adjacent to the Property in the form of forested wetlands and two ponds located south of the self-storage facility. One of the ponds is associated with an adjacent water treatment facility unrelated to the OU2 interim remedy, and the second is a stormwater management pond associated with a housing development. The forested area to the east of Cooks Run includes scattered forested wetlands. These wetlands include isolated pools as well as areas associated with periodic inundation from Cooks Run.

As part of the RI, EPA collected samples to assess the nature and extent of contamination in surface water at the Site. These sampling events also included installation of piezometers and staff gauges to evaluate groundwater upwelling and discharge to Cooks Run and the ponds associated with the water treatment facility and housing development. Data from these sampling events indicate that surface water is contaminated with Site-related chemicals and that groundwater upwelling likely contributes to surface water contamination.

During the RI, sediment samples were collected along Cooks Run and in the drainage swale on the self-storage property. Contamination found in the sediment is consistent with Site-related contamination and includes VOCs and metals.

4. Site Geology/Hydrogeology

Overburden material, consisting of soils and saprolite, ranges in thickness from 4 to 13 feet across the Site. Based on previous investigations, a weathered bedrock zone, consisting of very loose, dry, reddish-brown silt and trace fine to coarse sand, directly overlies the competent bedrock. Depending on the degree of weathering, very stiff reddish-brown clay may also be present.

The Stockton Formation beneath the Site is composed of interbedded sandstones, shale, and shale with siltstone noted sporadically beneath the Site but primarily to the northwest. Rapid lithologic changes are characteristic of the Stockton Formation. Single beds may grade along strike from fine-grained to coarse-grained within a few yards. The Stockton formation has a calculated thickness of approximately 3,000 feet and contains a system of extensive fracturing, generally oriented parallel and perpendicular to the strike of the bedrock units. Fracture sets at the Site (which are parallel to bedrock strike and dip) strike from northeast to southwest (approximately N30°E), with a dip of approximately 10 degrees to the northwest.

Groundwater is present both in the overburden soils and in the bedrock beneath the Site. The predominant hydraulic gradient direction in the vicinity of the Property is to the west toward Cooks Run. The contaminant plume, however, is migrating to the southwest along strike within the bedrock. Site hydrogeology has been divided into three layers: the unconfined overburden aquifer (approximately 5 to 15 feet below ground surface (bgs)); the unconfined shallow bedrock aquifer (approximately 15 to 100 feet bgs); and the semiconfined bedrock aquifer (greater than 100 feet bgs). With respect to the semiconfined bedrock aquifer, the hydraulic gradient runs to the southwest beneath the Site and then turns to the west. Due to the fractured nature of the Stockton Formation, predicting accurate groundwater flow directions is very difficult. EPA expects that groundwater does have a southwesterly flow component. The contaminant plume appears to be migrating through fractures and bedding planes.

5. Groundwater Contamination

A network of ninety-two (92) monitoring wells has been installed by EPA and PADEP to characterize the contamination and hydrogeologic conditions at the Site. Groundwater at the Site contains many of the constituents found in soil at the Property including, among other contaminants, Cr-VI, PCE, TCE, and chemicals associated with the degradation of PCE and TCE. Cr-VI has been detected at concentrations up to 233,000 ug/L in the groundwater. PCE and TCE have been detected in the groundwater at concentrations up to 4,330 ug/L and 35,000 ug/L, respectively. The compound 1,4-dioxane was detected at a maximum concentration of 40 µg/L. Per- and Polyfluorinated Substances (PFAS) were also detected in the groundwater. Perfluorooctanic acid (PFOA) has been detected at concentrations up to 0.211 ug/L and perfluorooctane sulfonic acid (PFOS) has been detected at concentrations up to 1.9 ug/L. PFAS are a class of emerging contaminants which EPA began sampling for at the Site in 2014.

Groundwater contamination extends from the Property in a southwest direction beneath the adjacent self-storage facility and into neighboring properties in Doylestown Township. The groundwater contamination also flows slightly westward in the dip direction towards Cooks Run, which is a tributary of the Neshaminy Creek. Although the highest levels of contamination reside in the overburden and shallow bedrock zones, Site-related contamination has appeared in Doylestown Municipal Water Authority Well #13, which is located less than a quarter mile southwest of the Property and was historically pumped in the deeper portion of the aquifer. Additionally, contamination in the overburden layer appears to be discharging in the drainage swale surrounding the self-storage facility adjacent to the Property. PADEP enclosed the swale in 2006 to prevent people from coming into contact with the contamination. Additional information regarding groundwater contamination can be found in the Administrative Record for the OU2 Interim ROD.

6. Soil Gas and Indoor Air

In April 2010, EPA conducted a VI sampling assessment at nine residential properties and one elementary school near the Property. No VOCs were detected in the indoor air samples collected from the elementary school. VOCs were detected in sub-slab samples taken from five residential properties but no VOCs were found above screening criteria in indoor air samples taken at these properties. EPA returned in 2011, 2017, and 2018 to conduct additional vapor intrusion sampling in residential properties near the Property and did not find Site-related contamination above screening levels during these sampling events.

In October 2011 and January 2012, EPA conducted sub-slab and indoor air sampling in the three buildings on the Property. No VOCs were detected at significant levels in the former residential building (Building C). VOCs were detected in the indoor air of the former manufacturing building (Building A) and in the sub-slab of Building A and the former storage building (Building B). In August 2012, EPA reassessed the indoor air of Building A. VOCs were again identified in portions of the building. As a result, EPA initiated a Removal Action intended to reduce VOCs in the building. To accomplish this, EPA installed portable air purifiers into selected suites within the impacted building. EPA then collected additional data to evaluate the efficacy of such units in reducing VOC levels within the building.

In July 2015, EPA conducted tests to support the design and construction of a permanent depressurization system to address high VOC concentrations in the sub-slab of Building A and replace the portable air purifying units. The depressurization system was constructed in late 2015. In January 2016, EPA confirmed through sampling that the system reduced VOCs in the indoor air and sub-slab to acceptable levels. EPA has continued to sample the indoor air of Building A and monitor the system to ensure it is operating as designed.

EPA has conducted periodic resampling in Building B where VOCs were detected in the sub-slab to assess the indoor air quality and to evaluate sub-slab conditions. VOCs in the indoor air continue to be at acceptable levels; however, levels in the sub-slab continue to exceed EPA screening levels.

D. SCOPE AND ROLE OF RESPONSE ACTION

EPA has organized the Site into three Operable Units:

- OU1 addresses contaminated soil on the former Chem-Fab facility property located at 300-360 North Broad Street, Doylestown which are outside the footprint of the current buildings on the property.

- OU2 addresses contaminated groundwater at the Site.

- OU3 addresses contaminated soil gas, remaining contaminated soil not addressed under OU1, and contaminated sediment and surface water at the Site.

This Proposed Plan for interim action addresses contamination and exposure to receptors within OU3 and will be consistent with a final action for OU3, which will be proposed following completion of additional investigations into PFAS contamination in the affected media in OU3.

Figure 1 shows the location of the Property, adjacent commercial property, and surrounding lands. Areas of impacted soil gas are shown in *Figure 2*. Areas of contaminated soil associated with OU3 are shown in *Figure 3*. Areas of contaminated sediment and surface water are shown in *Figure 4*.

EPA characterizes waste on-site as either principal threat waste or low-level threat waste. The concept of principal threat waste and low-level threat waste, as developed by EPA in the NCP, is applied on a site-specific basis when characterizing source material. "Source material" is defined as material that includes or contains hazardous substances or pollutants or contaminants that act as a reservoir for migration of contamination to groundwater, to surface water, to air, or that act as a source for direct exposure. Principal threat wastes are those source materials considered to be highly toxic or highly mobile and which would present a significant risk to human health or the environment should exposure occur. Contamination associated with OU3 is not expected to have the toxicity and mobility characteristics of principal threat waste.

E. SUMMARY OF SITE RISKS

EPA performed human health and ecological risk assessments for the Site and developed several documents describing the risks associated with contamination at OU3, including the 2019 Final Human Health Risk Assessment (HHRA), Final Screening Level Ecological Risk Assessment (SLERA), and Final Refined Ecological Risk Assessment (RERA). These documents, including addenda, may be found in the Administrative Record file for the Site.

1. Human Health Risk Assessment

WHAT IS HUMAN HEALTH RISK AND HOW IS IT CALCULATED?

A Superfund human health risk assessment estimates the "baseline risk." This is an estimate of the likelihood of developing cancer or non-cancer health effects if no cleanup action were taken at a site. To estimate baseline risk at a Superfund site, EPA undertakes a four-step process:

1. Analyze Contamination
2. Estimate Exposure
3. Assess Potential Health Dangers
4. Characterize Site Risk

In Step 1, EPA looks at the concentration of contaminants found at a site as well as past scientific studies on the effects these contaminants have had on people (or animals, when human studies are unavailable). A comparison between site-specific concentrations and concentrations reported in past studies helps EPA to determine which concentrations are most likely to pose the greatest threat to human health.

In Step 2, EPA considers the different ways that people might be exposed to the contaminants identified in Step 1 at a site, the concentrations that people might be exposed to, and the potential frequency and duration of exposure. Using this information, EPA calculates a "reasonable maximum exposure" (RME) scenario, which portrays the highest level of exposure that could reasonably be expected to occur.

In Step 3, EPA uses the information from Step 2, combined with information on the toxicity of each chemical, to assess potential health risks. EPA considers two types of risk: cancer and non-cancer risk. The likelihood of any kind of cancer resulting from a Superfund site is generally expressed as an upper bound probability; for example, a "1 in 10,000 chance." In other words, for every 10,000 people that could be exposed, one extra cancer may occur as a result of exposure to site contaminants. An extra cancer case means that one more person could get cancer than would normally be expected to from all other causes. For non-cancer health effects, EPA calculates a "hazard index." The key concept here is that a "threshold level" (measured usually as a hazard index (HI) of less than 1) exists below which non-cancer health effects are no longer predicted.

In Step 4, EPA determines whether site risks are great enough to cause health problems for people at or near the Superfund site. The results of the three previous steps are combined, evaluated, and summarized. EPA adds up the potential risks from the individual contaminants and exposure pathways and calculates a total site risk for human health.

The HHRA was completed in 2019 and was subsequently updated via two addenda to (1) incorporate additional data collected, and (2) update risk assessment methods and toxicity information. Results of the HHRA and the addenda were used to identify affected media, COCs, and potential exposure pathways that may result in unacceptable human health risks.

Because the Site presents a mixture of land use and potential human exposure scenarios, the Site was divided into three exposure areas in order to efficiently conduct the HHRA--the Property, the neighboring self-storage facility, and downgradient areas. The 2019 HHRA evaluated risks to the following potential receptors under current land use: indoor and outdoor workers, trespassers, recreational users, visitors, and residents. The 2019 HHRA also evaluated risks to the following potential receptors under future land use scenarios: construction workers, indoor and outdoor workers, trespassers, recreational users, visitors, and residents. Workers and students at the downgradient elementary school were also evaluated.

To focus the HHRA on contaminants that could pose a health risk, the data were first screened to select Chemicals of Potential Concern (COPCs) based on the lower bound of EPA's acceptable risk range for cancer risk of 1×10^{-6} and non-cancer hazard quotient (HQ) of 0.1. According to the NCP, the acceptable carcinogenic risk range for site-related exposure is 1×10^{-6} to 1×10^{-4}. Noncarcinogenic risk was assessed using the concept of HQs and HIs. An unacceptable risk under reasonable maximum exposure (RME) conditions was determined when (a) the individual or cumulative incremental lifetime cancer risk (ILCR) exceeded 1×10^{-4} or (b) the target-organ/critical effect-specific HI exceeded 1.

Quantitative estimates of non-carcinogenic and carcinogenic risks (HIs and ILCRs, respectively) were developed for potential human receptors directly contacting Site environmental media. COPCs were further refined in the risk assessment process to determine if these contaminants are attributed to the Site, and to identify which compounds contribute to unacceptable risk. Human Health COCs were identified based on how significantly they contributed to unacceptable risk at the Site and are presented in the "Contaminants of Concern" section below.

2. Ecological Risk Assessment

A SLERA was conducted and followed by a RERA in 2019. Two addenda to the RERA incorporated additional data collected and updated risk assessment methods and toxicity information. These documents form the basis for identification of affected media, COCs, and potential exposure pathways that may result in unacceptable ecological risks.

The SLERA consisted of an initial problem formulation, comparison of maximum detections to benchmarks protective of the assessment endpoints, and an initial food web analysis. The food web analysis estimated maximum daily doses and compared the doses to no observed adverse effects levels (NOAELs). The SLERA divided the Site into three terrestrial habitat exposure areas and five aquatic habitat exposure areas. Chemicals of potential ecological concern (COPEC) were identified for each exposure area.

In the RERA, the 95% upper confidence limits (UCL) of the mean concentration of each COPEC with six or more detections was calculated. Then the maximum detections and 95% UCLs were compared to the benchmarks and were used to calculate daily doses. The daily doses were compared to both NOAELs and lowest observed adverse effects levels (LOAELs). The spatial extent to which COPEC concentrations exceed benchmarks or could pose a risk to upper trophic level receptors was evaluated. Lastly, Site data was compared to background data to assess the extent to which background conditions could be contributing to risk. The results of these evaluations generated a refined list of COPECs.

The COPECs were further refined into a list of ecological COCs by screening out COPECs that detected at concentration below levels found in background and COPECs that were not associated with the Site. COPECs found in the ponds at the water treatment facility and at the downgradient residential development were also screened out as these contaminants are unlikely to have resulted from Site operations.

3. Contaminants of Concern

Human health and Ecological COCs for OU3 media were generated based on the above-described risk assessments and are identified in Table 2, below.

Table 2: Human Health and Ecological Contaminants of Concern

OU3 Media	COC (Human Health)	COC (Ecological)
Soil Gas	1,1,2,2-tetrachloroethane; 1,1-dichloroethane (1,1-DCA); 1,2-DCA; chloroform; PCE; trans-1,2-dichloroethene (trans-1,2-DCE); TCE; and vinyl chloride	N/A
Soil	Arsenic, Cr-VI, cobalt, and manganese	cadmium, total chromium, lead, mercury, and zinc
Sediment	Cr-VI, cobalt, and manganese	antimony, barium, cadmium, total chromium, cobalt, copper, lead, manganese, mercury, nickel, silver, and zinc
Surface Water	Cr-VI, TCE, cobalt, and manganese	aluminum, total chromium, cobalt, copper, Cr-VI, iron, lead, manganese, mercury, nickel, TCE, and zinc

The primary human health COCs for OU3 include Cr-VI, PCE, TCE, and chemicals associated with the degradation of PCE and TCE. The designation of these COCs is based on their exceedances of their respective standards for human exposure and overall contribution to human health risk.

WHAT ARE THE PRIMARY "CONTAMINANTS OF CONCERN"?

EPA and PADEP have identified three primary contaminants of concern, *i.e.*, those contaminants that pose the greatest potential risk to human health at the Site.

Hexavalent Chromium (Cr-VI): EPA has detected hexavalent chromium in soil at concentrations up to 104 mg/kg. Chromium is a metal that is used for many industrial processes, including steel-making and chrome plating. People can be exposed to chromium through breathing, eating, or drinking and through skin contact with chromium or chromium compounds. Hexavalent chromium is considered to be the most toxic form of chromium. Short-term high level exposure to hexavalent chromium can result in adverse effects at the point of contact, such as ulcers of the skin, respiratory problems, and irritation of the gastrointestinal tract. Hexavalent chromium is a known human carcinogen by the inhalation route of exposure.

Trichloroethene (TCE): EPA has detected trichloroethene in soil at concentrations up to 15 mg/kg. TCE is a halogenated organic compound historically used as an industrial solvent and a degreaser. Exposure to this compound has been associated with deleterious health effects in humans, including anemia, skin rashes, diabetes, liver conditions, and urinary tract disorders. TCE is carcinogenic to humans by all routes of exposure.

Tetrachloroethene (PCE): EPA has detected tetrachloroethene in soil at concentrations up to 49 mg/kg. PCE is a halogenated organic compound historically used as an industrial solvent and a degreaser. Exposure to PCE has been associated with skin irritation, dizziness, nausea, and liver and kidney damage. PCE is likely to be carcinogenic in humans by all routes of exposure.

It is the lead agency's current judgment that implementation of the Preferred Alternative identified in this Proposed Plan, or one of the other active measures considered in the Proposed Plan, is necessary to protect public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

F. REMEDIAL ACTION OBJECTIVES

1. OU3 RAOs

EPA guidance states that "[a]n interim action is limited in scope and only addresses areas/media that also will be addressed by a final site/operable unit ROD."[1] The interim action discussed in this Proposed Plan is not intended to reduce all contamination in all media types at OU3 of this Site; the RAOs are designed to support a final remedial action that will comply with CERCLA requirements for cleanup of contaminated soil gas, soil,

[1] "A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents" (Office of Solid Waste and Emergency Response) (July 1999), at p. 8-2.

sediment, and surface water. In addition, the interim action discussed herein is intended to address contaminated OU3 media for the contaminants evaluated thus far to mitigate Site-related exposure. Therefore, the RAOs reflect this limited scope.

RAOs are site-specific and are determined by the nature and extent of chemical contamination, current and potentially threatened resources, and the potential for human and environmental exposure. The RAOs for soil gas, soil, and sediment are identified in Table 3, below. It should be noted that RAOs have not been specifically developed for surface water because surface water contamination is highly connected with contamination in sediment and groundwater. EPA expects that remediation of sediments and groundwater will contribute to surface water remediation.

Table 3: Remedial Action Objectives

OU3 Media	Remedial Action Objectives
Soil Gas	• Prevent exposure via inhalation of indoor workers or commercial occupants of the buildings at the Property to 1,1-DCA; chloroform; TCE; and trans-1,2-DCE at concentrations that would result in a non-cancer HI greater than 1 and cancer risk greater than 1.0×10^{-04}. • Prevent exposure via inhalation of future residents at the Property to 1,1,2,2-tetrachloroethane; 1,1-DCA; 1,2-DCA; chloroform; PCE; trans-1,2- DCE; TCE; and VC at concentrations that would result in a non-cancer HI greater than 1, and cancer risks greater than 1.0×10^{-04}.
Soil	• Prevent exposure, via ingestion and dermal contact, to arsenic, cobalt, Cr-VI, and manganese in soil at concentrations that would result in a non-cancer HI greater than 1, and a cancer risk greater than 1.0×10^{-04}. • Prevent unacceptable risks to ecological receptors (*e.g*., plants, invertebrates, foraging animals) exposed directly to soil COCs or indirectly via bioaccumulation of soil COCs. • Minimize or eliminate contaminant migration from soil to groundwater. • Reduce or eliminate the risk from direct contact with contaminated soils within the footprint of the buildings on the Property.
Sediment	• Prevent exposure, via ingestion and dermal contact, to cobalt, Cr-VI, and manganese in sediment at concentrations that would result in a non-cancer HI greater than 1, and cancer risk greater than 1.0×10^{-04}. • Prevent unacceptable risks to ecological receptors (*e.g.,* benthic invertebrates, birds, and mammals) exposed directly to sediment COCs and indirectly via bioaccumulation of sediment COCs.

2. OU3 Preliminary Remedial Goals

In order to achieve the RAOs, Preliminary Remedial Goals (PRGs) for the Human Health and Ecological COCs were developed. PRGs are the target concentration of a COC in an exposure area that will yield the specified target risk in an individual who is exposed at random within the exposure area. Thus, if an exposure area has an average concentration above the PRG, some level of remediation is needed. PRGs are used to support development of alternatives and are not considered Remedial Action Levels (RALs).

In addition to PRGs for human health and ecological protection, the RI also identified COCs for the soil-to-groundwater pathway that pose an unacceptable risk to human health. These soil-to-groundwater COCs include Cr-VI, cobalt, manganese, PCE, TCE, and cis-1,2-dichloroethylene (cis-1,2-DCE). Concentrations of PCE; TCE; and cis-1,2-DCE in Site soils exceeded their respective soil-to-groundwater migration pathway PRGs, which are based on Safe Drinking Water Act Maximum Contaminant Levels.

Table 10 presents Site COCs in soil gas, soil, and sediment and their respective human health, ecological, and soil-to-groundwater PRGs. It also presents the background threshold values (BTVs) for each of these contaminants. In cases where the background BTV is higher than or equal to the concentration protective of human health, ecological health, and soil-to-groundwater migration, the BTV is used as the PRG.

3. OU3 Areas of Remediation

EPA has determined that areas of OU3 with concentrations of contaminants exceeding the PRGs require remediation. A total of seven areas of remediation where contaminants exceeding their respective PRGs were identified in the Remedial Alternatives Evaluation Technical Memorandum. These areas had one or more impacted OU3 media (soil gas, soil, or sediment). EPA identified these areas based on data collected during the RI. Additional data collected during the Remedial Design will be used to further define the areas which will be remediated as part of the Remedial Action.

Figure 2 shows areas of impacted soil gas requiring remediation. These areas include Buildings A and B on the Property. Building A had historical concentrations of VOCs in the subsurface soil, sub-slab soil gas, and indoor air exceeding the PRGs. It should be noted that since the VI mitigation system was installed in Building A, concentrations in the indoor air have not exceeded the PRGs. Also, historical concentrations of contaminants in the subsurface soil underneath Building A were not validated and have only been considered on a qualitative basis. Building B has had concentrations of VOCs in the sub-slab in excess of the PRGs but has not shown concentrations in the indoor air in excess of the PRGs. Building A is approximately 12,000 square feet (ft) in size and Building B is approximately 3,000 square feet in size.

Figure 3 shows estimated areas of impacted soil requiring remediation. These areas include soil under Building A, surface soil near the north drainage ditch area on the self-storage facility and an area west of Cooks Run, and subsurface soil on the southeast portion of the self-storage facility. The two areas of surface soil combine to include approximately 55,000 square ft down to 4 ft bgs. The subsurface soils on the self-storage facility includes approximately 45,000 square ft down to 12 ft bgs. The actual extent of the areas requiring remediation will be defined as part of the Remedial Design.

Figure 4 shows estimated areas of impacted sediment requiring remediation. These include the areas along Cooks Run to the west and southwest of the Site. There are approximately 70,000 square feet of sediments that will require remediation down to 0.5 ft bgs. The actual extent of the areas requiring remediation will be defined as part of the Remedial Design.

4. Other Remediation Considerations

As identified in the ecological risk assessment documents, surface water and groundwater samples were collected and have shown the presence of PFAS compounds. Screening of PFAS compounds against existing ecological risk benchmarks and literature values indicate that PFOA and PFOS in the surface water do not pose an ecological risk. To date, no soil or sediment samples have been collected and analyzed for PFAS compounds. The potential for PFAS contamination in these media will be considered in the evaluation of remedial alternatives. Once a sampling method for soil and sediment is validated, future PFAS sampling in OU3 media will support a Final Remedial Action for OU3.

As described in the "Site Characteristics" section above, there is a known connection between contaminated groundwater, subsurface soil, surface water, and sediment. It is possible that subsurface soil, surface water, and sediment could be recontaminated from Site-impacted groundwater caused by seasonal fluctuations in the water table. The water table is relatively shallow (the Site overburden water table is observed as high as 3.5 ft bgs), and the groundwater is hydraulically connected to the Site surface water, sediment channels, and saturated soils. For OU2, a groundwater extraction and treatment system (GETS) is currently being installed to extract groundwater from the overburden contaminated groundwater zone (3 to 13 ft bgs) and shallow and intermediate contaminated groundwater zones (30 to 80 ft bgs). While the extent of impacts from groundwater fluctuations contaminating subsurface soils, sediment, and surface water is unknown, it is expected that improving conditions in the groundwater resulting from the active remediation of the groundwater zones will reduce the likelihood of this occurring. The potential for groundwater fluctuations and contamination present in groundwater impacting the other media is considered in the evaluation of alternatives that addresses subsurface soil and sediment.

The EPA Climate Change Adaptation Plan[2] examines how EPA programs may be vulnerable to a changing climate. Under the Superfund Program, existing processes for planning and implementing Site remedies provide a robust structure that allows consideration of climate change effects. EPA performed a preliminary vulnerability assessment as part of the FS in accordance with EPA policy guidelines to identify

[2] https://www.epa.gov/system/files/documents/2021-09/epa-climate-adaptation-plan-pdf-version.pdf.

potential vulnerabilities associated with climate change and measures to increase the resilience of remedial alternative components. The results of the preliminary vulnerability assessment have been incorporated into the evaluation of the alternatives.

G. SUMMARY OF REMEDIAL ALTERNATIVES

1. The Alternatives

The remedial alternatives evaluated for interim action at OU3 are presented in Table 4, below. The Preferred Alternatives for each media are **bolded**.

Table 4: Remedial Alternatives	
OU3 Media	**Alternative Description**
Soil Gas	SG – 1: No Action
	SG – 2: VI Mitigation (Existing), Monitoring, and Institutional Controls (ICs)
	SG – 3: VI Mitigation (Existing and New Installation), Monitoring, and ICs
Soil	Soil – 1: No Action
	Soil – 2: Covers, Monitoring, and ICs
	Soil – 3: In Situ Chemical Reduction, Stabilization, Monitoring, and ICs
	Soil – 4: Excavation, Off-Site Disposal, and ICs
Sediment	Sd – 1: No Action
	Sd – 2: Covers, Monitoring, and ICs
	Sd – 3: Excavation, Stabilization, Off-Site Disposal, and ICs

2. Common Elements for Action Alternatives

Elements common to each alternative other than the No Action alternatives are identified in Tables 5 and 6, below.

Table 5: Soil Gas Common Elements (SGCE)	
SGCE 1	**Vapor Mitigation in Building A at the Property.** VI mitigation in this building was achieved through construction of a sub-slab depressurization system by EPA via a Removal Action in 2015. This existing system will satisfy this Common Element. The existing system must be operated and maintained in order to reduce indoor VOC contamination to acceptable levels for as long as the system is needed.[3] This Common Element includes all actions necessary to operate and maintain a VI system in Building A.

[3] In May 2017, EPA issued an Administrative Order (EPA Docket No. CERC-03-2017-014-DC) (2017 Order) requiring the owner of the Property Owner to operate and maintain the system.

SGCE 2	**Institutional Controls to Ensure That Indoor Air at the Property Does Not Contain Unacceptable Levels of VOCs.** Controls are needed to ensure that the current and future owners of the Property refrain from undertaking any activities which could cause indoor air at any building existing now or in the future to contain VOCs at levels that would result in a non-cancer HI greater than 1 and cancer risk greater than 1.0×10^{-04}. The ICs included in this Common Element would: • Prohibit activities which could adversely impact the integrity or operation of any existing or future VI system at the Property. • Prohibit construction of new buildings for commercial use that would permit VOCs to enter the buildings at unacceptable levels. • Prohibit activities which could alter or damage existing or new commercial building foundations so as to permit VOCs to enter the buildings at levels that would result in a non-cancer HI greater than 1 and cancer risk greater than 1.0×10^{-04}. • Prohibit internal changes to existing and new commercial buildings (*e.g.*, movement of walls) without taking steps to ensure that indoor VOC levels do not rise above levels that would result in a non-cancer HI greater than 1 and cancer risk greater than 1.0×10^{-04}.
SGCE 3	**Monitoring VI Systems.** For all VI systems at the Property now or in the future as part of the OU3 remediation, monitor the operation of such systems to evaluate system efficacy. This monitoring includes, but is not limited to: • Checking system gauges to ensure that adequate pressure is maintained within the system. • Evaluating fans to ensure proper operation. • Inspecting pipes and connections moving air from beneath the building to the discharge point. • Checking sub-slab sampling ports to ensure the sub-slab continues to be depressurized. • Sampling indoor air to ensure indoor air quality is maintained.

Table 6: Soil Common Elements (SCE)	
SCE 1	**Institutional Controls to Prevent Contact With, and Migration of, Contaminated Soils Beneath all Buildings at the Property.** Soil beneath the former manufacturing building (Building A) is heavily contaminated with COCs. Soil sampling has not been conducted under the other buildings on the Property due to difficulties accessing that soil. ICs would be implemented to prohibit removal of, or excavation through or below, the foundation of the buildings on the Property without:

	• ensuring that persons properly trained and equipped to excavate into hazardous substances are used. • ensuring that adequate steps are taken to prevent human exposure to contaminated soils. • ensuring that adequate steps are taken to prevent contaminated soils from migrating.

3. Summary of Soil Gas Alternatives

a. Alternative SG - 1: No Action

Consideration of this alternative is required by the NCP. Alternative SG - 1 requires no additional remedial action to be taken at the Site to address soil gas contamination. The No Action alternative serves as a basis against which the effectiveness of all the other proposed alternatives can be compared. Under this alternative, continued operation and maintenance (O&M) of the existing VI mitigation system would occur solely under existing enforcement agreements overseen by the Removal Program and soil gas contamination other than that addressed under such agreements would be subject to natural processes only.

b. Alternative SG - 2: VI Mitigation (Existing), Monitoring, and ICs

This alternative consists of SGCE1, SGCE2, and SGCE3 and adds annual indoor and sub-slab sampling for Building B in order to evaluate the risks to workers in Building B. No other actions would be taken with respect to Building B under this alternative.

c. Alternative SG - 3: VI Mitigation (Existing and New Installation), Monitoring, and ICs

This alternative consists of SGCE 1, SGCE2, and SGCE3 and adds installation, operation, and maintenance of a VI mitigation system for Building B. Because an active VI mitigation system would be in place to prevent exposure to the workers inside both buildings, annual sampling of the indoor air and sub-slab would not be required under this alternative. Monitoring would consist solely of the requirements under SGCE3 for both VI systems and periodic sampling of the indoor air and sub-slab once every five years.

4. Summary of Soil Alternatives

a. Alternative Soil - 1: No Action

Consideration of this alternative is required by the NCP. Alternative Soil - 1 requires no additional remedial action to be taken at the Site to address soil contamination at OU3. The No Action alternative serves as a basis against which the effectiveness of all the other proposed alternatives can be compared. Under this alternative, the Site would remain in its present condition, and soil contamination would be subject to natural processes only.

b. Alternative Soil - 2: Covers, Monitoring, and ICs

This alternative includes SCE1 and adds:

- An engineered cover over:
    - contaminated surface soil near the north drainage ditch area on the self-storage facility (the pink box on *Figure* 3 which is adjacent to North Broad Street),
    - contaminated soil west of Cooks Run (the pink box on *Figure* 3 located west of Cooks Run), and
    - contaminated subsurface soil on the southeast portion of the self-storage facility (the purple box on *Figure* 3).
- Inspections and maintenance of these covers.
- In addition to the ICs identified in SCE1, ICs to prevent activities which may damage the integrity or effectiveness of these covers.
- Monitoring to evaluate the effectiveness of the covers at preventing migration of contamination present in the underlying soil to groundwater.

There would be no change in the concentrations of COCs in the soil because no treatment or removal would occur. Rather, this alternative would eliminate direct exposure to contamination by providing a physical barrier to the contamination and would prevent infiltration of rainwater into contaminated soils.

c. Alternative Soil - 3: In-Situ Chemical Reduction, Stabilization, Monitoring, and ICs

This alternative includes SCE1 and adds:

- Performance of a treatability study to assist in the selection of chemical amendments to chemically reduce and stabilize inorganic COCs in Site soils which do not increase the likelihood that any PFAS contamination present in soils will leach into the groundwater. The treatability study would also need to ensure that the selected amendments do not have a detrimental effect on potential ecological receptors.

- Application of chemical amendments to:

    - contaminated soil near the north drainage ditch area on the self-storage facility (the pink box on *Figure* 3 which is adjacent to North Broad Street),

    - contaminated soil west of Cooks Run (the pink box on *Figure* 3 located west of Cooks Run), and

    - contaminated subsurface soil on the southeast portion of the self-storage facility (the purple box on *Figure 3*).

- Operational and performance monitoring to evaluate the effectiveness of the chemical amendments.

- ICs to prohibit activities which may disturb stabilized contaminated soils.

d. Alternative Soil - 4: Excavation, Off-Site Disposal, and ICs

This alternative includes SCE1 and adds:

- Excavation, and off-Site disposal of:

    - contaminated soil near the north drainage ditch area on the self-storage facility (the pink box on *Figure* 3 which is adjacent to North Broad Street),

    - contaminated soil west of Cooks Run (the pink box on *Figure* 3 located west of Cooks Run), and

    - contaminated subsurface soil on the southeast portion of the self-storage facility (the purple box on *Figure 3*).

Sampling during the RI indicates that contamination in these soils is less than 20 times the Toxicity Characteristic Leaching Procedure (TCLP) screening level for relevant COCs. Therefore, it is likely that the excavated soils would not be considered hazardous waste and could be disposed of at a Resource Conservation and Recovery Act (RCRA) Subtitle D landfill. If any excavated soil is determined to be hazardous waste, it would either be treated to meet RCRA Subtitle D disposal requirements or would be sent to a Subtitle C disposal facility. Additional sampling may be needed during the Remedial Design phase to further delineate excavation areas and depths. Contaminated soils would be excavated to predetermined depths, then confirmation sampling would be performed to ensure RAOs are met. After confirmation sampling from the excavated areas confirms that RAOs are met, the excavated areas would be backfilled with approved backfill material, compacted, and revegetated. If confirmation samples show that RAOs have not been met, additional soil would be excavated until such RAOs are achieved.

5. Summary of Sediment Alternatives

a. Alternative Sd - 1: No Action

Consideration of this alternative is required by the NCP. Under this alternative, no additional remedial action would be taken at the Site to address sediment contamination at OU3. The No Action alternative serves as a basis against which the effectiveness of all the other proposed alternatives can be compared. Under this alternative, the Site would remain in its present condition, and sediment contamination would be subject to natural processes only.

b. Alternative Sd - 2: Covers, Monitoring, and ICs

Under Alternative Sd – 2, an engineered cover would be placed over the sediment remediation areas identified in *Figure 4* to prevent contact with, and migration of, contaminated sediments. These covers would be inspected and maintained over time. Monitoring would be performed to evaluate the effectiveness of the covers in inhibiting the mobility of contaminated sediment throughout the floodplain area. ICs would be implemented to prohibit activities which could damage the integrity or effectiveness of the covers.

The covers would consist of an engineered, semi-permeable clay layer. Implementation of this alternative would require diverting surface water to sectionally install the covers along the banks of the creek and within the drainage area to the south of the self-storage property. This alternative would not prevent future deposition of contaminated sediments or potential contamination of covered sediments from groundwater discharge. There would be no change in the concentrations of COCs in the sediment because no treatment or removal would occur. Rather, this alternative would eliminate direct exposure to contamination by providing a physical barrier to the contamination and would prevent migration of contamination from sediments beneath the covers to surface water.

c. Alternative Sd - 3: Excavation, Stabilization, Off-Site Disposal, and ICs

This alternative includes excavating, and disposing off-Site, contaminated sediment located in remediation areas identified in *Figure 4* to meet RAOs. Contamination in some sediment samples has been found to exceed 20 times the TCLP screening level for total chromium and lead. Therefore, excavated material determined to be characterized as hazardous waste would be stabilized with an amendment to meet hazardous waste characteristic limits as well as land disposal requirements (LDRs) prior to disposal at an appropriate RCRA disposal facility. Special measures or equipment suitable for wetland settings may be needed to access sediment and allow excavation equipment to maneuver efficiently without getting stuck. Implementation of this alternative may also require temporary diversion of Cooks Run creek in order to access areas of excavation and erosion and sediment control measures. Confirmation sampling would be collected from the excavation areas to confirm that sediment RAOs have been met. If confirmation samples show that the remaining sediment does not meet RAOs, additional sediment would be excavated until RAOs are met. Given the potential for recontamination of sediment from contaminated groundwater, ICs would be necessary to restrict access to the areas with continued sediment contamination.

H. EVALUATION OF ALTERNATIVES

In this section, the remedial alternatives summarized above are compared to each other using the criteria set forth at 40 C.F.R. § 300.430(e)(9)(iii). In the remedial decision-making process, EPA profiles the relative performance of each alternative against the evaluation criteria, noting how each compares to the other options under consideration. A detailed analysis of alternatives can be found in the Feasibility Study, which is in the Administrative Record file for the Site.

These evaluation criteria relate directly to requirements of Section 121 of CERCLA, 42 U.S.C. § 9621, for determining the overall feasibility and acceptability of a remedy. The nine criteria fall into three groups described as follows and in Table 7, below:

Threshold criteria must be satisfied in order for a remedy to be eligible for selection.

Primary balancing criteria are used to weigh major tradeoffs between remedies.

Modifying criteria are formally taken into account after public comment is received on the Proposed Plan.

Table 7: Evaluation Criteria for Superfund Remedial Alternatives	
Threshold Criteria	**1. Overall Protection of Human Health and the Environment** considers whether an alternative eliminates, reduces, or controls threats to public health and the environment through institutional controls, engineering controls, or treatment.
	2. Compliance with ARARs evaluates whether an alternative attains applicable or relevant and appropriate requirements under federal environmental laws and state environmental or facility siting laws that are not waived.
Primary Balancing Criteria	**3. Long-term Effectiveness and Permanence** considers the ability of an alternative to maintain protection of human health and the environment over time.
	4. Reduction of Toxicity, Mobility, or Volume of Contaminants through Treatment evaluates an alternative's use of treatment to reduce the harmful effects of principal contaminants, their ability to move in the environment, and the amount of contamination present.
	5. Short-term Effectiveness considers the length of time needed to implement an alternative and the risks the alternative poses to workers, residents, and the environment during implementation.
	6. Implementability considers the technical and administrative feasibility of implementing the alternative, including factors such as the relative availability of goods and services.

	7. Cost includes estimated capital and annual operation and maintenance costs, as well as present worth cost. Present worth cost is the total of an alternative over time in today's dollar value. Cost estimates are expected to be accurate within a range of +50 to -30 percent.
Modifying Criteria	**8. State/Support Agency Acceptance** considers whether the State agrees with EPA's analyses and preferred alternative, as described in the FFS and Proposed Plan.
	9. Community Acceptance considers whether the local community agrees with EPA's analyses and preferred alternative. Comments received on the Proposed Plan are an important indicator of community acceptance.

Comparative Analysis of Proposed Remedial Alternatives

1. Overall Protection of Human Health and the Environment

a. Soil Gas

Alternative SG – 1 does not include remedial measures to prevent current and future receptors from exposure to contaminated soil gas. Sub-slab sampling results in both Building A and Building B indicate the presence of soil gas contamination and indoor air sampling in Building A has indicated that vapor intrusion was occurring prior to installation of the VI mitigation system. If action is not taken, there would be no way to monitor if the existing VI mitigation system continues to be effective[4] and no ICs would be in place to prevent interference with the mitigation system. The No Action alternative would allow vapors in the sub-slab of Building B to migrate unrestricted to the indoor air if Site conditions change and expose workers inside that building. Therefore, this alternative would not be protective of human health and the environment. Because the soil gas No Action alternative would not be protective of human health and the environment and fails the threshold criteria, it is eliminated from further consideration under the remaining eight criteria.

Alternative SG – 2 would provide adequate protection of human health and the environment based on current conditions. With respect to Building A, this alternative would prevent exposure to workers and visitors in Building A via continued O&M and monitoring of the existing VI mitigation system and ICs to ensure that the system remains protective. With respect to Building B, where soil gas beneath the building is contaminated but contaminants are not currently entering the building at unacceptable levels, this alternative would be protective for as long as monitoring continues to show that VOCs are not entering Building B at unacceptable levels. If VOCs were to enter Building B at unacceptable levels, workers in and visitors to Building B may be exposed to contamination between the time that vapor intrusion begins to occur at unacceptable levels and the time when indoor air sampling is performed to detect this exposure and any future action is taken to mitigate these impacts.

[4] Although the Removal Program's order requires the current owner of the Property to operate and maintain the VI system in Building A, it does not require collection and analysis of indoor air samples.

Alternative SG – 3 would be protective of human health and the environment by preventing exposure to workers and visitors in Building A and Building B via continued operation and maintenance and monitoring of the existing VI mitigation system in Building A; installation, O&M, and monitoring of a vapor mitigation system in Building B; and ICs to ensure that both systems remain protective.

b. Soil

Alternative Soil – 1 does not include measures to prevent current and future receptors from exposure to contaminated soil. In addition, contaminated soil would continue to be a source of groundwater contamination through the soil-to-groundwater migration pathway. The lack of ICs may put future workers and residents at risk to contaminant exposure underneath the buildings on the Property if the buildings were removed. Therefore, this alternative would not be protective of human health and the environment. Because the soil No Action alternative would not be protective of human health and the environment, it is eliminated from further consideration under the remaining eight criteria.

Alternatives Soil – 2, Soil – 3, and Soil – 4 would provide adequate protection of human health and the environment. Alternative Soil – 2 would ensure protectiveness by constructing a physical barrier between contaminated materials and human and ecological receptors. The cover also mitigates soil-to-groundwater migration by preventing infiltration of rainwater into contaminated soils. Monitoring and ICs ensure the alternative remains protective. Alternative Soil – 3 would ensure protectiveness by treating the contaminated materials to reduce the toxicity and mobility of the contamination. Monitoring and ICs ensure this alternative remains protective. Alternative Soil – 4 would ensure protectiveness by completely removing contaminated soils through excavation and off-Site disposal. Additional monitoring and ICs would not be required to ensure continued protectiveness because all materials which could cause unacceptable exposure to human or ecological receptors or would be a continued source to groundwater contamination would be removed.

c. Sediments

Alternative Sd – 1 does not include measures to prevent current and future receptors from exposure to contaminated sediments. In addition, contaminated sediments would continue to be a source of surface water contamination and exposure to receptors via surface water exposure pathways. The lack of ICs would allow future human and ecological receptors to be exposed. Therefore, this alternative would not be protective of human health and the environment. Because the sediment No Action alternative would not be protective of human health and the environment, it is eliminated from further consideration under the remaining eight criteria.

Alternatives Sd – 2 and Sd – 3 would provide adequate protection of human health and the environment. Alternative Sd – 2 would ensure protectiveness by constructing a physical barrier between contaminated materials and human and ecological receptors, which also limits the mobility of contamination in the sediment. The ICs would support protectiveness by restricting access and prohibiting activities that might impair the integrity of the covers. Alternative Sd – 3 would ensure protectiveness by completely removing contaminated sediments through excavation and off-site disposal. Given the possibility of recontamination of sediment from contaminated groundwater, ICs could be used to restrict access to the areas with continued sediment contamination.

2. Compliance with ARARs

Section 121(d) of CERCLA and Section 300.430(f)(1)(ii)(B) of the NCP, 40 C.F.R § 300.430(f)(1)(ii)(B), require that remedial actions at CERCLA sites at least attain legally applicable or relevant and appropriate Federal and State environmental requirements, standards, criteria and limitations, which are collectively referred to as ARARs, unless such ARARs are waived under CERCLA Section 121(d)(4).

Applicable requirements are those substantive environmental standards, requirements, criteria, or limitations promulgated under Federal or State environmental or siting laws that specifically address a hazardous substance, pollutant or contaminant, remedial action, location, or other circumstance at the Site. Relevant and appropriate requirements, while not being directly applicable, address problems or situations sufficiently similar to those encountered at the Site that their application is well-suited to the particular circumstance.

Section 121(d)(4)(A) of CERCLA provides that EPA may select an action that does not meet an ARAR if the selected action "is only part of a total remedial action that will attain such level or standard of control when completed." The actions described in this Proposed Plan are interim remedial actions for OU3 at the Site. These interim actions seek to prevent exposure to the currently known COCs. Any action selected via this process will support implementation of a final remedial action for OU3. The final remedial action will be selected to address risks presented by PFAS, which have not yet been fully characterized at the Site. Any ARARs setting cleanup levels for PFAS in soils or sediments will therefore be waived.

All alternatives other than the No Action alternatives will meet the threshold criteria of compliance with ARARs that are not waived. Major ARARs associated with the alternatives include:

- Water Quality Standards and Criteria regulations
- Wetlands Protection and Mitigation regulations
- Floodplain Management regulations
- Erosion and Sedimentation Controls regulations
- Fugitive Air Emissions regulations
- Construction standards for covers
- Hazardous Waste Disposal regulations

It should be noted that Alternative Sd – 2 would require measures to mitigate for permanent loss to storage capacity of the wetlands due to the increased elevations due to the placement of the cover. The ARARs memorandum and the FS both provide additional information about the ARARs and can be found in the AR. The Final ARARs will be described in further detail in the OU3 Interim ROD.

3. Long-Term Effectiveness and Permanence

a. Soil Gas

The existing VI mitigation system that is part of Alternatives SG – 2 and SG – 3 is expected to achieve high long-term effectiveness and permanence for Building A assuming the ICs are complied with and the system is properly monitored and maintained.

Alternative SG – 3 is also expected to achieve high long-term effectiveness and permanence with respect to Building B assuming the newly installed vapor mitigation system is properly operated, maintained, and monitored, and that ICs prohibiting activities which might impair this system are complied with. Alternative SG – 2 is not as effective and permanent in the long term with respect to Building B as SG – 3 because additional actions would need to be taken if unacceptable levels of VOCs move from the sub-slab into the building.

The Climate Change Vulnerability Assessment which was performed as part of the FS found that there may be an increased risk of power interruption and water damage to components of the VI mitigation systems contemplated in SG – 2 and SG - 3 from increased extreme weather due to climate change.

b. Soil

With respect to the soils beneath Building A and Building B, each of the remaining soil alternatives would be effective for as long as the ICs (1) protecting the building foundations (which effectively serve as a cover) while they are in use are complied with, and (2) requiring adequate controls to prevent contact with and migration of contaminated soils during demolition of the foundations are complied with.

For the remaining contaminated soils at OU3, Alternative Soil – 4 would achieve the greatest long-term effectiveness and permanence of the soil alternatives because it does not rely on continued O&M of remedy components and permanently removes contamination from the Site. Alternative Soil – 2 would achieve long-term permanence assuming the covers are properly maintained, monitoring is performed, and ICs are complied with. Alternative Soil – 3 would achieve long-term permanence assuming the selected chemical amendments are able to remain effective over time. Alternative Soil – 3 may require multiple additions of amendments and would require continued monitoring to ensure continued effectiveness.

c. Sediments

Alternative Sd – 3 would achieve the greatest long-term effectiveness and permanence of the sediment alternatives because it permanently removes contamination from the Site and therefore would not require O&M of the remedy to remain effective. Alternative Sd – 2 would achieve long-term effectiveness and permanence assuming the covers are properly maintained and monitoring is performed.

A Preliminary Climate Change Vulnerability Evaluation which was performed as part of the FS determined that there may be an increased risk of damage to the cover for Sd – 2 from increased extreme weather resulting from climate change. Mitigative measures to be considered include construction of weather-resistant equipment housing and anchoring equipment housing to higher ground to avoid issues with more intense storms and stormwater runoff.

4. Reduction of Toxicity, Mobility, or Volume through Treatment

a. Soil Gas

Neither Alternative SG – 2 nor SG – 3 would reduce the toxicity, mobility, and volume of soil gas contamination through treatment. The existing sub-slab depressurization system in Building A pulls contaminated soil gas from beneath the slab of the building and vents it safely to the atmosphere, reducing the volume of soil gas contamination directly beneath the building and preventing it from moving into the indoor air space where workers can be exposed. The sub-slab depressurization system constructed for Building B under Alternative SG – 3 would have the same effect. However, neither of these systems would treat the VOC contamination in the soil gas.

b. Soil

Alternative Soil – 3 includes treatment of the contaminated soil to reduce the toxicity, mobility, or volume of the COCs in the soil. A treatability study would be required to select a chemical amendment which would not increase the toxicity or mobility of any potential PFAS contamination in the soils or have detrimental effects to potential ecological receptors.

Alternative Soil – 4 may include treatment to reduce the toxicity, mobility, or volume if excavated soil is determined to be hazardous waste and requires treatment prior to disposal in an appropriate RCRA disposal facility. If excavated soil is determined to be non-hazardous, treatment prior to disposal will not be required.

c. Sediments

Alternative Sd – 2 does not include treatment. Alternative Sd – 3 includes treatment to reduce the toxicity, mobility, or volume of sediments prior to disposal at an appropriate RCRA disposal facility.

5. Short-Term Effectiveness

a. Soil Gas

Alternatives SG – 2 and SG – 3 both would pose minimal short-term impacts to the workers inside the buildings and the workers implementing the response actions. In Building A, continued O&M of the existing VI mitigation system and performance monitoring does not pose risks to either the workers inside the building or the workers conducting the O&M or performance monitoring. In Building B, installation of the VI mitigation system under SG – 3 may require limited excavation to install pipes to direct contaminants in the soil from beneath the foundation to the roof line. The use of proper PPE and VOC screening instrumentation as part of a site-specific health and safety plan would ensure risk to workers is minimized.

b. Soil

Alternatives Soil – 2, Soil – 3, and Soil – 4 all contain ICs addressing risks from soil contamination beneath the buildings on the Property. There would be no short-term impacts associated with implementation of these ICs.

With respect to the remaining contaminated soils, Alternatives Soil – 2, Soil – 3, and Soil – 4 would pose short-term impacts to the surrounding community due to increased vehicle traffic and noise during construction activities. EPA anticipates that construction activities would last less than one year for each of these alternatives. To minimize the short-term impacts to the surrounding community, exclusion zones would be established in order to prevent the public from accessing contaminated soils during construction. Erosion and sediment controls would be utilized to prevent run-off from the Site and impact to sensitive areas. Air monitoring would be conducted to ensure dust and particulate matter from the Site is minimized. A site-specific health and safety plan would specify how workers would be protected against potential dermal contact and inhalation of vapors during construction activities. Alternatives Soil – 2 and Soil – 3 would require post-construction O&M and monitoring, which would require workers to return to the Site, but EPA does not expect that these activities would present significant risks to the workers or the surrounding community. All O&M and monitoring activities would be conducted under a site-specific health and safety plan as well.

c. Sediments

Alternatives Sd – 2 and Sd – 3 would pose construction-related short-term impacts to the surrounding community similar to those for the soil alternatives. Similar mitigative steps would be taken to minimize the short-term impact to the surrounding community and workers implementing the response actions, including development of a site-specific health and safety plan, use of engineering and administrative controls, and air monitoring.

In addition, Alternatives Sd – 2 and Sd – 3 involve work in wetlands areas which may require special measures and equipment to access the areas for remediation.

Implementation of Alternative Sd – 2 would require temporarily diverting the creek to sectionally install the engineered cover along the banks of the creek and within the drainage area to the south of the self-storage property. This measure may impact ecological habitat, including stream banks, wetlands, and vernal ponds, during implementation and it will take some time for these features to be restabilized and fully functional. Areas disturbed during the remedial action would be restored upon completion of the cover. Alternative Sd – 3 would also require diversion of the creek to excavate contaminated sediments. Vernal ponds may need to be drained in order to access contaminated sediments. These measures would impact ecological habitat temporarily and would include restoration after completion of excavation work.

6. Implementability

a. Soil Gas

Alternative SG – 2 would be more easily implemented than Alternative SG – 3 because Alternative SG – 2 would not require installation of a VI mitigation system in Building B. However, the technology required to design and construct a VI mitigation system is established and relatively simple to implement. Also, once the VI mitigation system in Building B is constructed, the monitoring requirements for SG – 3 would be more easily implemented than for SG – 2 because they will only require annual checks on the system performance and less frequent sampling of the sub-slab and indoor air.

b. Soil

Alternative Soil – 3 would be the most complex soil alternative to implement because of the possibility that PFAS is present and may be mobilized by amendments added to the soil to treat the COCs. During the Remedial Design, treatability studies would be conducted to determine which amendments would meet the RAOs and not mobilize PFAS contamination if present. Alternative Soil – 4 would be the most easily implemented soil alternative because the response action is straightforward and would not require O&M or monitoring. The technology for Alternative Soil – 2 is also straightforward, but it is slightly more difficult to implement because of the long-term O&M and monitoring requirements.

c. Sediments

Alternative Sd – 3 would be the most readily implemented because of the straightforward nature of excavation and off-site disposal. Sediments might need to be stabilized prior to off-site disposal, but stabilization of sediments is an uncomplicated process and stabilization amendments are readily available. The technology for Alternative Sd – 2 is also well-known. However, Alternative Sd – 2 would require long-term O&M and monitoring, which makes this alternative less implementable than Alternative S – 3. Sd – 2 will also be more challenging to implement because of the ARARs associated with implementing a cover remedy in a floodplain. EPA expects that significant measures would be needed to ensure the loss of storage capacity associated with the impermeable covers. The significant alteration of the wetland associated with this alternative would make wetland restoration efforts challenging.

7. Cost

Cost information for all Alternatives is presented in Table 8, below. Detailed cost estimates and associated assumptions are included in the FS.

Table 8: Cost

Media	Alternative	Description	Capital Cost	O&M Cost (30 year)	Present Worth Cost
Soil Gas	SG – 2	VI Mitigation (Existing), Monitoring, and ICs	$73,000	$235,000	$308,000
	SG – 3	VI Mitigation (Existing and New Installation), Monitoring, and ICs	$119,000	$174,000	$293,000
Soil	Soil – 2	Cover, Monitoring, and ICs	$623,000	$253,000	$876,000
	Soil – 3	In Situ Chemical Reduction, Stabilization, Monitoring, and ICs	$7,088,000	$178,000	$7,266,000
	Soil – 4	Excavation, Off-Site Disposal, and ICs	$7,162,000	$0	$7,162,000
Sediment	Sd – 2	Cover, Monitoring, and ICs	$434,000	$207,000	$641,000
	Sd – 3	Excavation, Stabilization, Off-Site Disposal, and ICs	$567,000	$0	$567,000

8. State Acceptance

EPA has consulted with PADEP in preparation of the RI/FS and this Proposed Plan. EPA will evaluate state acceptance after the public comment period for the Proposed Plan ends. State comments and EPA's response to any such comments will be available in the Responsiveness Summary of the Interim ROD.

9. Community Acceptance

EPA will evaluate community acceptance of the Preferred Alternative after the public comment period ends. Community comments and EPA's response to any such comments will be available in the Responsiveness Summary section of the Interim ROD.

I. PREFERED ALTERNATIVE

EPA's Preferred Alternative for interim action at OU3 at the Chem-Fab Site is identified in Table 9, below.

Table 9: EPA's Preferred Alternative	
OU3 Media	**Preferred Alternative Description**
Soil Gas	SG – 3: VI Mitigation (Existing and New Installation), Monitoring, and ICs
Soil	Soil – 4: Excavation, Off-Site Disposal, and ICs
Sediment	Sd – 3: Excavation, Stabilization, Off-Site Disposal, and ICs

a. Soil Gas

Alternative SG – 3 meets the threshold criteria of overall protection of human health and the environment and compliance with ARARs. Alternative SG – 3 would also provide greater long-term effectiveness and permanence than Alternative SG – 2 and the long-term monitoring requirements of SG – 3 would be more easily implemented than for Alternative SG – 2. Finally, Alternative SG – 3 is more cost-effective than Alternative SG – 2.

b. Soil

Alternative Soil – 4 meets the threshold criteria of overall protection of human health and the environment and compliance with ARARs. Alternative Soil – 4 would provide greater long-term protectiveness and would be more easily implemented than the other alternatives because it would not require O&M and monitoring. Alternative S – 4 may also reduce the toxicity, mobility, and volume of the contamination through treatment if contaminated soils require treatment prior to off-site disposal. Alternative Soil – 4 costs more than Alternative Soil – 2, but the benefits from the long-term effectiveness and permanence and implementability of Alternative Soil – 4 outweigh the additional cost.

c. Sediments

Alternative Sd – 3 meets the threshold criteria of overall protection of human health and the environment and compliance with ARARs. Alternative Sd – 3 would provide greater long-term protectiveness and is more easily implemented than Alternative Sd – 2 because it would not require O&M and monitoring and would not require the extensive mitigative measures to address ARARs associated with alternative Sd – 2. Alternative Sd – 3 may reduce the toxicity, mobility, and volume of the contamination through treatment if the contaminated sediments do not pass standards for disposal at a RCRA Subtitle D facility. Finally, Alternative Sd – 3 is more cost effective than Alternative Sd – 2.

J. STATUTORY DETERMINATIONS

Based on the information available at this time, EPA believes the Preferred Alternative (SG – 3: VI Mitigation (Existing and New Installation), Monitoring, and ICs; Soil – 4: Excavation, Off-Site Disposal, and ICs; and Sd – 3: Excavation, Stabilization, Off-Site Disposal, and ICs) meets the threshold criteria and provides the best balance with respect to the balancing criteria. EPA expects the Preferred Alternative will satisfy the following statutory requirements of CERCLA § 121: (1) be protective of human health and the environment; (2) comply with ARARs (or justify a waiver); (3) be cost-effective; (4) utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and (5) satisfy the preference for treatment as a principal element or explain why the preference for treatment will not be met.

K. COMMUNITY PARTICIPATION

EPA encourages the public to gain a more comprehensive understanding of the Chem-Fab Site and the action proposed in this Proposed Plan and to submit comments for consideration by EPA. A public comment period will open May 10, 2023 and close June 9, 2023. All comments must be postmarked by June 9, 2023. Written comments, questions about the Proposed Plan or public meeting, and requests for information can be sent to:

Huu Ngo (3SD21)
Remedial Project Manager
Environmental Protection Agency
Region III
Four Penn Center
1600 John F. Kennedy Boulevard
Philadelphia, PA 19103
(215) 814-3187
ngo.huu@epa.gov

John Brakeall (3RA22)
Community Involvement Coordinator
Environmental Protection Agency
Region III
Four Penn Center
1600 John F. Kennedy Boulevard
Philadelphia, PA 19103
(215) 814-5537
brakeall.john@epa.gov

Public Meeting – A public meeting will be held to discuss the Proposed Plan on May 31, 2023 from 6:00 p.m. to 7:30 p.m. The public meeting will be held at Doylestown Borough Hall, 10 Doyle Street, Doylestown, PA 18901.

The public meeting can also be joined virtually, by computer or phone:
To join virtually on your web browser, please visit: http://www.microsoft.com/en-us/microsoft-teams/join-a-meeting. Enter the Meeting ID and passcode below.
Meeting ID: 223 559 165 552 Passcode: GcncQX
To join via phone, call (202) 991-0477 and enter the conference ID when prompted: 976 650 232#

It is important to note that although EPA is proposing a Preferred Alternative for interim action for OU3 at the Site, the OU3 interim action has not yet been selected. All relevant comments received will be considered and addressed by EPA before the final interim action for OU3 is selected for the Site.

Detailed information on the material discussed herein may be found in the Administrative Record file for the Site, which includes the Feasibility Study and other information used by EPA in the decision-making process. EPA encourages the public to review the Administrative Record file in order to gain a more comprehensive understanding of the Site and the Superfund activities that have taken place there. Copies of the Administrative Record file are available for review at: www.epa.gov/superfund/chemfab, or at the following locations:

Bucks County Free Library 150 South Pine Street Doylestown, PA 18901 (215) 348-9081	EPA Region 3 Administrative Records Room Four Penn Center 1600 John F. Kennedy Boulevard Philadelphia, PA 19103 Phone: (215) 814-2396 **By appointment only**

Following the conclusion of the public comment period and review and consideration of all information submitted, EPA, in consultation with PADEP, will select an interim remedy for OU3. EPA, in consultation with PADEP, may modify the Preferred Alternative or select another response action presented in this Proposed Plan based on new information or public comments.

EPA will prepare a Responsiveness Summary which will summarize and respond to comments received during the public comment period. EPA will then prepare a formal decision document, the Interim ROD, which selects the interim remedial action for OU3 of the Site. The Interim ROD will include the Responsiveness Summary. Copies of the Interim ROD for OU3 will be available for public review in the Administrative Record following finalization of the Interim ROD.

Tables

Table 10
Preliminary Remediation Goals for Soil, Sediment, and Indoor Air
Chem Fab Superfund Site, Doylestown, Pennsylvania

Contaminant of Concern	Human Health Protective Concentration [1]	Ecological Protective Concentration	Soil-to-Groundwater Migration Protective Concentration	Background Threshold Value
Soil (mg/kg)				
Arsenic	2.2	Not an ecological COC	Not a migration COC	**45.6**
Cadmium	Not a human health COC	0.92	Not a migration COC	**1.4**
Cobalt	5.7	Not an ecological COC	0.589	**25.3**
Chromium, hexavalent	0.8	Not an ecological COC	0.0433	**2.3**
Chromium, total	Not a human health COC	29	Not a migration COC	**44.1**
cis-1.2-Dichloroethene	Not a human health COC	Not an ecological COC	**1.2**	Not detected
Lead	Not a human health COC	18	Not a migration COC	**66.9**
Manganese	165	Not an ecological COC	301	**2,770**
Mercury	Not a human health COC	0.00086	Not a migration COC	**0.12**
Tetrachloroethene	Not a human health COC	Not an ecological COC	**0.129**	Not detected
Trichloroethene	Not a human health COC	Not an ecological COC	**0.102**	Not detected
Zinc	Not a human health COC	53	Not a migration COC	**94.4**
Sediment (mg/kg)				
Acetophenone	Not a human health COC	N/A	--	Not detected
Antimony	Not a human health COC	**7.1**	--	Not detected
Barium	Not a human health COC	**212**	--	139
Benzaldehyde	Not a human health COC	N/A	--	Not detected
Beryllium	Not a human health COC	N/A	--	0.79
Cadmium	Not a human health COC	**2.2**	--	0.52
Chromium, hexavalent	**3.1**	Not an ecological COC	--	0.48
Chromium, total	Not a human health COC	5.1	--	**22.7**
Cobalt	33	**16**	--	9.7
Copper	Not a human health COC	**69**	--	22.1
Lead	Not a human health COC	**68**	--	61.5
Manganese	811	711	--	**788**
Mercury	Not a human health COC	**0.44**	--	Not detected
Nickel	Not a human health COC	**33**	--	19.3
Silver	Not a human health COC	**1.5**	--	Not detected
Thallium	Not a human health COC	N/A	--	0.9
Zinc	Not a human health COC	**236**	--	163
Indoor Air (mg/m^3)				
1,1,2,2-Tetrachloroethane	**2.5E-04**	--	--	--
1,1-Dichloroethane	**9.2E-03**	--	--	--
1,2-Dichloroethane	**5.7E-04**	--	--	--
Chloroform	**6.4E-04**	--	--	--
Tetrachloroethene	**5.8E-03**	--	--	--
Trichloroethene	**4.2E-04**	--	--	--
trans-1,2-Dichloroethene	**4.2E-02**	--	--	--
Vinyl chloride	**8.8E-04**	--	--	--

Notes:

[1] Lowest protective concentration among all potential receptors.

Bold font indicates value selected as preliminary remediation goal for media of concern.

mg/kg = milligrams per kilogram   mg/m^3 = milligrams per cubic meter

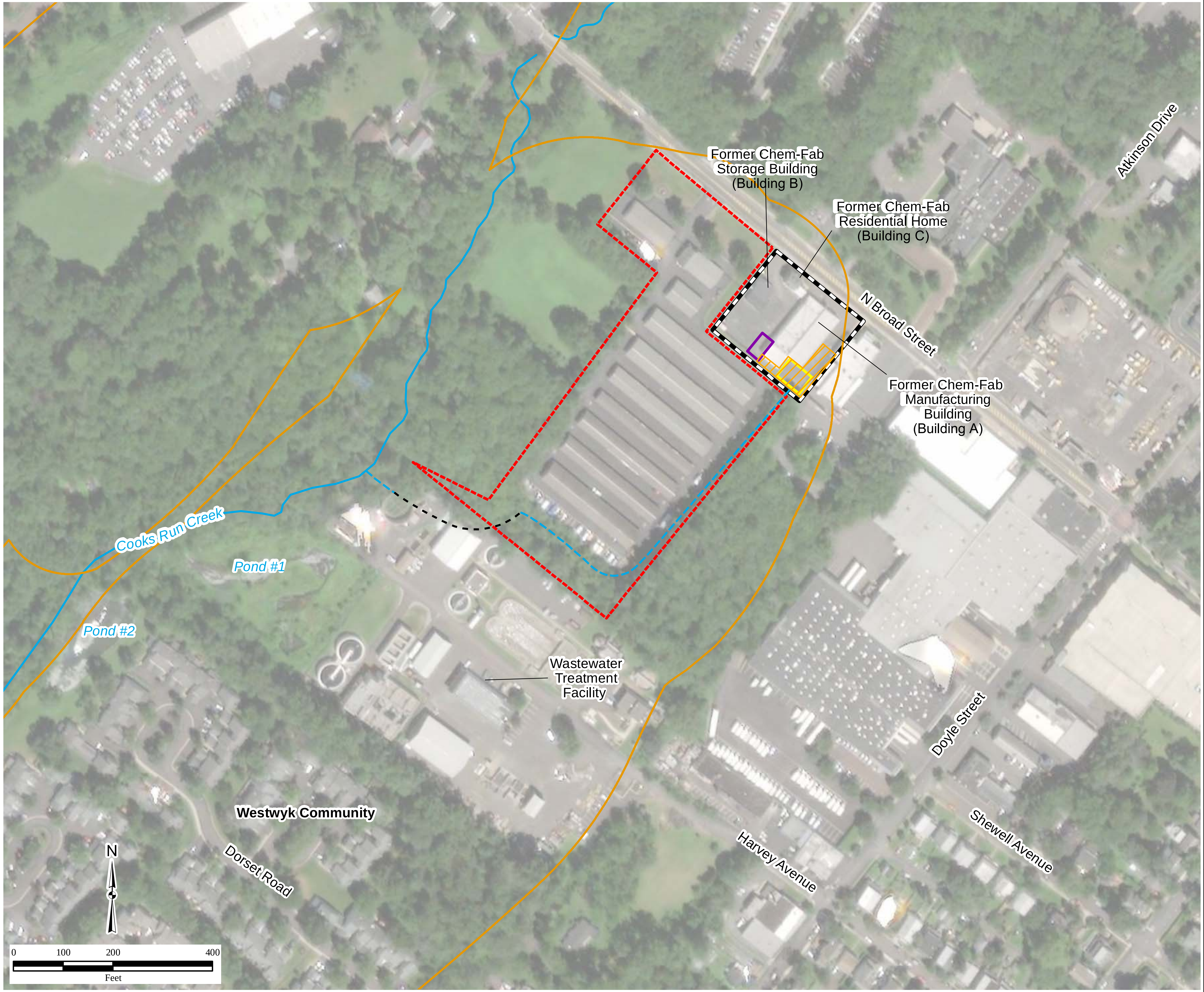
N/A = no ecotoxicity information available, protective concentration cannot be determined

COC=contaminant of concern

Source: HGL, 2022b

Figures

Figure 1
Site Layout



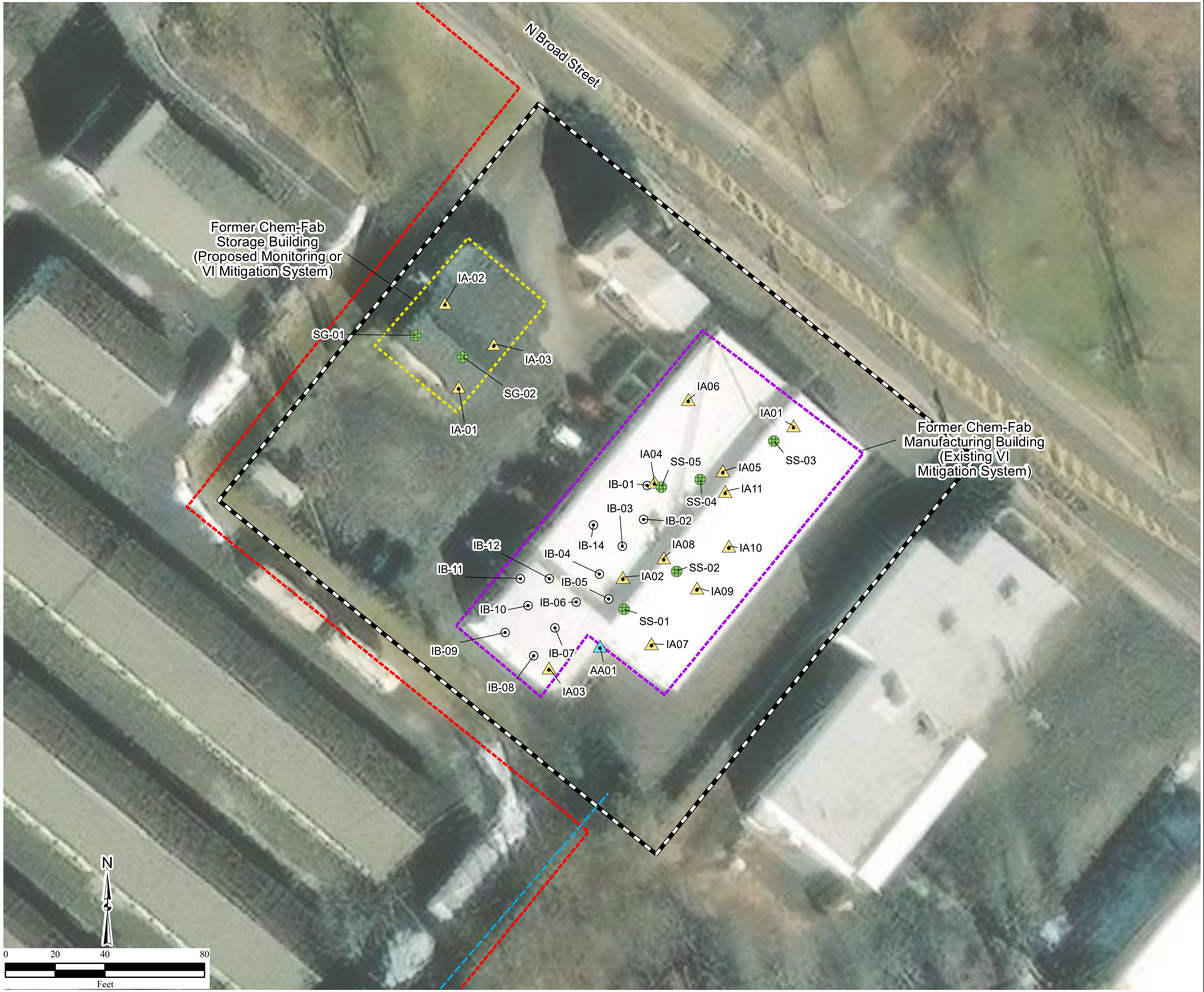
Legend

- Creek
- Drainage Swale
- Underground Pipe (inferred)
- OU2 Plume
- 2014 Interim Remedial Action Excavation Area
- Former 10,000 Gallon UST
- Former AST Farm
- Former Chem-Fab Facility
- Self-Storage Property

Notes:
AST=aboveground storage tank
OU=operable unit
UST=underground storage tank

\\gst-srv-01\HGLGIS\Chem-Fab_MSIW\RI_Report
(1-02)Site_Layout.mxd
6/7/2019 TB
Source: HGL, URS, EA, AECOM
ArcGIS Online Imagery

Figure 2: Soil Gas Remediation Areas



Legend

- Ambient Air Sample
- Indoor Air Sample
- Soil Gas Sample
- Soil Sample
- Drainage Ditch
- Building with Proposed Monitoring or VI Mitigation System
- Building with Existing VI Mitigation System
- Former Chem-Fab Facility
- Self-Storage Facility Boundary

Notes:
VI=Vapor Intrusion

\\srv-gst-01\HGLGIS\Chem-Fab_MSIW\FS\(1-12b)VI_System.mxd
3/8/2023 JG
Source: HGL
ArcGIS Online Imagery

HGL HydroGeoLogic, Inc.

Figure 3
Areas of Soil Remediation

Legend

- Creek
- Drainage Ditch
- Investigation During SCR Identified Metals and VOCs in Soil Beneath Main Manufacturing Building Above Site PRGs
- Shallow Surface Soils (0-4 ft bgs) Above PRGs
- Subsurface Soils (4-12 ft bgs) Above PRGs
- Former Chem-Fab Facility
- Self-storage Facility Boundary

Notes:
BTV=Background Threshold Value
ft bgs=feet below ground surface
PRG=Project Remediation Goal
SCR=Site Characterization Report
VOCs=Volatile Organic Compounds

\\Srv-gst-01\hglgis\Chem-Fab_MSIW\FS
()Soil_Remediation.mxd
4/25/2023 JM
Source: HGL
ArcGIS Online Imagery

HGL—Feasibility Study
Chem-Fab Superfund Site, Doylestown, PA

Figure 4
Area of Sediment Remediation

Legend

- Creek
- Drainage Ditch
- Sediment Excavation/Sediment Cover Extent (1.6 acres)
- Self-storage Facility Boundary
- Former Chem-Fab Facility

\\Srv-gst-01\hglgis\Chem-Fab_MSIW\FS
()Sediment_Remediation.mxd
4/25/2023 JM
Source: HGL
ArcGIS Online Imagery