



UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION III

STATEMENT OF BASIS

**Chemtrade Solutions LLC
(Formerly General Chemical Corp.)
Delaware Valley Works Facility
Claymont, Delaware**

EPA ID NO. DED154576698

Prepared by

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February 2024

Table of Contents

Section 1: Introduction.....	1
Section 2: Facility Background.....	2
Section 3: Conceptual Site Model	3
Section 4: Summary of Environmental Investigations	4
Section 5: Risk Assessment.....	8
Section 6: Interim Measures	8
Section 7: Corrective Action Objectives	9
Section 8: Proposed Remedy.....	13
Section 9: Evaluation of Proposed Remedy	16
Section 10: Financial Assurance	20
Section 11: Public Participation.....	20
Section 12: Signature.....	21
Section 13: Index to Administrative Record.....	22
Section 14: Attachments	22

List of Acronyms

ACO	Administrative Order on Consent
amsl	Above mean sea level
AOC	Area of Concern
AR	Administrative Record
BERA	Baseline Ecological Risk Assessment
BF3	Boron trifluoride
BHC	Benzene hexachlorides
bgs	Below ground surface
CAO	Corrective Action Objective
CMP	Cap Management Plan
COC	Constituent of Concern
COPC	Chemical of Potential Concern
DDD	Dichlorodiphenyldichloroethane
DDE	Dichlorodiphenyldichloroethylene
DDT	Dichlorodiphenyltrichloroethane

DMA	Dimethylarsinic acid
DNREC	Department of Natural Resources and Environmental Control
DVW	Delaware Valley Works
EC	Environmental Covenant
EJ	Environmental Justice
EPA	Environmental Protection Agency
FSA	Fluorosulfonic acid
GCC	General Chemical Corporation
HHRA	Human Health Risk Assessment
HSWA	Hazardous and Solid Waste Amendments
IC	Institutional Control
IM	Interim Measure
MCL	Maximum Contaminant Level
MMA	Monomethylarsonic acid
NPDES	National Pollutant Discharge Elimination System
PAH	Polycyclic aromatic hydrocarbons
RBC	Risk-Based Concentration
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
RG	Remediation Goal
RSL	Regional Screening Level
SB	Statement of Basis
SPSP	South Plant South Parcel
SVOC	Semi-Volatile Organic Compound
SWMU	Solid Waste Management Unit
TAL	Target Analyte List
TI	Technical Impracticability
TOC	Total Organic Carbon
UECA	Uniform Environmental Covenants Act
VOC	Volatile Organic Compound

Section 1: Introduction

The United States Environmental Protection Agency (EPA) has prepared this Statement of Basis (SB) to solicit public comment on its proposed remedy for the Delaware River shoreline and nearshore sediments and porewater, Solid Waste Management Unit (SWMU) 9 soil and groundwater, and the South Plant South Parcel (SPSP) groundwater at the Honeywell Delaware Valley Works Facility, also known as the former General Chemical Facility, located at 6300 Philadelphia Pike, Claymont, New Castle County, Delaware (Facility or DVW Facility). The EPA issued a Final Decision and Response to Comments (Final Decision) in 2016 in which it selected a Final Remedy for soils (only) at the SPSP. That Final Remedy consists of installation and maintenance of a low permeability cap.

The EPA's proposed remedy in this SB consists of the implementation of engineering controls described in detail below; land and groundwater use restrictions implemented by an enforceable document such as an order and/or an Environmental Covenant to control exposure to contaminated pore water/sediment, soil/waste, and groundwater; a Technical Impracticability Waiver; and long-term groundwater monitoring. This SB highlights key information relied upon by the EPA in proposing its remedy.

The Facility is subject to the EPA's Corrective Action Program under the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act (RCRA) of 1976, and the Hazardous and Solid Waste Amendments (HSWA) of 1984, 42 U.S.C. §§ 6901 et seq. The Corrective Action Program requires that owners and/or operators of facilities subject to certain provisions of RCRA investigate and address releases of hazardous waste and hazardous constituents, usually in the form of soil or groundwater contamination, that have occurred at or from their property. This Facility is considered a concern for Environmental Justice (EJ) and Climate Adaptation; therefore, EJ and Climate Adaptation information were considered during the RCRA Corrective Action decision-making process.

The EPA is providing a thirty (30) day public comment period on the EPA's proposed remedy described in this SB. The EPA will evaluate comments received after the public comment period has ended and may modify its proposed remedy based on such comments. If the final remedy is substantially unchanged from the one proposed, the EPA will issue a Final Decision and inform all persons who submitted written comments or requested notice of the EPA's final determination. If the final remedy is significantly different from the one proposed, the EPA will issue a public notice explaining the new remedy and will reopen the comment period. The EPA will respond in writing to all relevant comments received during the comment period.

Information on the Corrective Action program and the Government Performance and Results Act Environmental Indicator Determinations for the Facility can be found by navigating to <https://www.epa.gov/hwcorrectiveactioncleanups/hazardous-waste-cleanup-chemtrade-solutions-llc-formerly-general>.

The EPA has compiled an Administrative Record (AR) containing all documents, including data and quality assurance information, upon which the EPA's proposed remedy is based. See Section 11, Public Participation, below, for information on how you may review the AR.

Statement of Basis

Section 2: Facility Background

The DVW Facility was a chemical manufacturing plant located along the Delaware-Pennsylvania border between Claymont, Delaware and Marcus Hook, Pennsylvania as shown on **Figure 1**. The Facility consists of approximately one hundred acres divided by Philadelphia Pike (U.S. Route 13). The portion north of Philadelphia Pike is referred to as the “North Plant,” and the portion south of Philadelphia Pike, historically known as the “South Plant,” is further divided into northern and southern parcels (**Figure 2**).

The two plants were previously owned by Allied Chemical Corporation, which became Allied-Signal Inc., then AlliedSignal Inc. (AlliedSignal), and now Honeywell International, Inc. (Honeywell). General Chemical Corporation (GCC) acquired the Facility from Allied Signal in 1986. Allied Signal retained ownership of several contiguous parcels of property upon which chemical operations were conducted and continue today and SWMU 9 in the South Plant. In 2004, Honeywell re-acquired the North Plant from GCC. In 2014, Chemtrade acquired GCC and later sold the South Plant to Drawbridge Claymont, LLC (Drawbridge). Drawbridge currently owns and operates the South Plant. The North Plant remains owned by Honeywell and is currently vacant. The South Plant is currently owned and operated by Drawbridge Claymont, LLC (Drawbridge). SWMU 9 is located adjacent to the SPSP along the Delaware River and is owned by Honeywell.

The Facility began operations in 1913. Over its history, the DVW Facility manufactured various chemical products including pesticides (dichlorodiphenyltrichloroethane [DDT] and dichlorodiphenyldichloroethane [DDD]), organic and inorganic acids, and specialty chemicals including boron trifluoride (BF₃), a reaction catalyst used in a variety of process applications, and fluorosulfonic acid (FSA). Manufacturing operations ceased at the South Plant in 2004, and the South Plant North Parcel is currently being used by a trucking operation with on-site offices on a portion of the North Parcel. The northern portion of the SPSP was redeveloped as an active rail yard.

SWMU 9 is a former settling pond that encompasses 14.56 acres and is situated on the Delaware River. SWMU 9 was created by infilling marsh area and the near shore area of the Delaware River. Beginning in 1966, it was used for storage and dewatering of alum mud sludge. Alum mud was placed within containment berms and bulkheads, and water entrained in the mud was allowed to decant into the Delaware River. This practice continued into the 1980s, with air photos from 1982 and 1987 showing that SWMU 9 had reached its current configuration.

The shoreline and nearshore sediment areas along the Delaware River consist of the shoreline riverbank and shallow-water sediment cove area adjacent to the SPSP, and a shallow-water sediment area adjacent to the SWMU 9 parcel (**Figure 2**). A wooden bulkhead is present along the SWMU 9 shoreline fronting the Delaware River, and the cove area along the southern side of the South Plant has a steel sheetpile containment wall fronting it. The nearshore remedy area is defined by sediment sampling conducted to delineate to the established project remediation goals and by the limits of sediments not disturbed by previous or anticipated dredging (i.e., inward of the pierhead line).

In September 2000, the EPA issued an Administrative Order (Order) to GCC pursuant to Section 3008(h)

Statement of Basis

of RCRA which required a Facility-wide investigation and cleanup of the Facility. In addition, in 2000 Honeywell entered into a Facility Lead Corrective Action Agreement with the EPA, and on September 14, 2011, Honeywell entered into an Administrative Order on Consent (ACO) with the EPA.

Section 3: Conceptual Site Model

Topography

The topography of the SPSP varies between 9.6 feet above mean sea level (amsl) and 17.8 feet amsl in the northeast corner adjacent to the Marcus Hook Industrial Complex (formerly Sunoco) (located west of the SPSP and SWMU 9) and north of SWMU 9. The topography in this area has some mounds of soil and slopes to the southwest toward the sluiceway where the topography is between 10 feet to 11 feet amsl. The SPSP is generally flat west of the sluiceway and has decreased elevations from approximately 10 feet amsl down to zero amsl at the shoreline of the Delaware River. SWMU 9 topography varies greatly from the surrounding land (SPSP and Sunoco property) and is a discernable mound when viewed from a distance. SWMU 9 can be defined as having steep slopes on all sides of the area where the elevations of SWMU 9 vary from approximately 11 feet amsl in the northern area, increasing to approximately 45 feet amsl in the center of SWMU 9 and then decreasing to zero amsl on the eastern (Middle Creek), western (sluiceway) and southern (Delaware River) boundaries of SWMU 9.

Geology

The Facility is situated within the Coastal Plain Physiographic Province. The Coastal Plain consists of unconsolidated sediments from the Cretaceous, Tertiary, and Quaternary ages overlying pre-Cambrian bedrock. These unconsolidated sediments consist of gravel, sand, silt, and clay deposits. The DVW Facility lies approximately 1 mile east of the Fall Line, which marks the beginning of the Piedmont Physiographic Province. Local subsurface geology is known from boring logs provided by the RCRA Facility Investigation (RFI). The surficial unit over the majority of the DVW Facility consists of an historic fill material used to create grades for building and to level the Facility property. The historic fill typically ranges from 0 to 7 feet below ground surface (bgs). It is underlain by unconsolidated fluvial deposits of silty clay, which are in turn underlain by sand and gravel deposits of varying thickness. These unconsolidated overburden units extend downward to a saprolite/weathered bedrock (Wissahickon Schist). The bedrock dips downward and is reportedly encountered at depths ranging from approximately 16 feet bgs along Philadelphia Pike to as deep as 54 feet bgs along the Delaware River. Saprolitic materials have been identified at depths of 35 feet bgs and greater.

Hydrogeology

The principal water-bearing zone consists of unconsolidated sand and gravel units of the Coastal Plain Sediments. Characteristic of the Coastal Plain sediments of the region, the principal water-bearing zone at the DVW Facility consists of an unconsolidated sand and gravel which underlies historical fill materials and discontinuous silty-clay units. Groundwater occurs in these units under water table conditions and was encountered generally between 7 and 13 feet bgs during well installations. Where present, silty-clay units may create locally semi-confined conditions. Shallow water level data collected

Statement of Basis

in synoptic water level measurements during the prior RFI investigation work indicate groundwater flow direction to the south-southwest toward the Delaware River discharge boundary and deep water level data indicate flow to the east-northeast.

Section 4: Summary of Environmental Investigations

On November 11, 1980, Allied Chemical Corporation submitted a RCRA Part A Hazardous Waste Permit Application to the EPA for the DVW Facility. In June 1986, AlliedSignal completed a RCRA Facility Assessment (RFA) in which 14 SWMUs and one Area of Concern (AOC) were identified on what is now DVW Facility property. In 1999, the EPA Region 3 issued an ACO to GCC to conduct an RFI at the Facility which included land later sold to Honeywell.

SWMU 9

During the 2003 Phase I RFI, a total of 18 soil borings were installed throughout the SWMU. Soil samples were collected from three depth intervals and analyzed for Target Analyte List (TAL) metals. The analytical results were compared to the EPA Residential Risk-Based Concentrations (RBCs), Industrial RBCs, and Ecological Screening Values. Exceedances of the Residential RBCs and/or Ecological Screening Levels were observed throughout the SWMU for aluminum, antimony, arsenic, and iron.

In 2010 as part of the offshore sediment investigation, surface soil samples from the 0 to 0.5-foot depth interval were collected over much of the surface of SWMU 9 and analyzed for pesticides (benzene hexachlorides [BHCs], DDT, DDD, dichlorodiphenyldichloroethylene [DDE] (collectively referred to as DDx)), arsenic, and lead. Generally, DDx soil concentrations greater than 1 milligram per kilogram (mg/kg) were limited to immediately along the shoreline. The arsenic concentration distribution generally was similar to that of DDx (i.e., areas of elevated arsenic concentrations also had elevated DDx concentrations). During the 2010 investigation, groundwater samples were also collected from the monitoring wells along the Delaware River and analyzed for DDx, lead, and arsenic (dissolved and total).

A 2014-2015 RFI included the installation and sampling of one new groundwater monitoring well at SWMU 9. The 2015 RFI also included a geotechnical investigation.

In 2016, an additional investigation was conducted to supplement the previous investigations and to assess the impact of arsenic in groundwater. The 2016 additional investigation included the installation of one groundwater monitoring well at SWMU 9. Groundwater samples were collected for arsenic speciation analysis and slug tests were performed to evaluate hydraulic conductivity at the Facility.

In 2018, a geotechnical investigation was conducted to collect supplemental geotechnical and other data necessary to support the design of a corrective measure including a slope stability analysis. Six soil borings were advanced and one monitoring well was installed. Soil samples were analyzed for physical and engineering properties to support the corrective measure at the Facility.

In 2019, six soil borings were advanced in the southeastern portion of the Facility for the collection of

Statement of Basis

soil samples and four monitoring wells (two shallow and two deep) were installed between the Facility and the Sunoco property to the northeast.

Soil boring locations are shown on **Figure 3** and results are provided in **Appendix A**. Monitoring well locations are shown on **Figure 4** and results are provided in **Appendix B**.

South Plant South Parcel Groundwater

The following phases of groundwater investigation have been conducted at the South Plant which included investigations at the SPSP:

- 2003 Phase I RFI;
- 2007 Phase II RFI;
- 2010 Pathway Investigation; and
- 2016 Supplemental Pathway Investigation.

The 2003 Phase I RFI included sampling of 32 shallow groundwater monitoring wells (15 existing and 17 new) located in both the North and South Plants. Based upon review of the Phase I RFI results, a subsequent groundwater sampling effort was conducted under the 2007 Phase II RFI.

The presence of volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs) in groundwater at the South Plant appears to be localized and limited in extent. While certain VOCs and SVOCs were detected at concentrations exceeding corresponding Maximum Contaminant Levels (MCLs) or the EPA Region 3 Tap Water RBCs in limited locations, VOCs and SVOCs (to the extent detected) were generally found at low concentrations. Chlorinated VOCs appear to be locally limited to the extreme northwest corner of the South Plant North Parcel near monitoring well MW-106. DDx compounds were present at three scattered locations and generally detected at concentrations of less than 1 microgram per liter ($\mu\text{g/L}$). BHC compounds were locally present at six locations investigated; however, BHC compounds generally were present at only trace levels (less than 1 $\mu\text{g/L}$).

Dissolved arsenic, cadmium, chromium, copper, lead, nickel, thallium, vanadium, and zinc were detected at concentrations exceeding their respective MCLs in groundwater in the South Plant. With the exception of dissolved arsenic, all of the detected compounds exceeding screening levels were found to be localized and limited in extent. Dissolved arsenic was found in groundwater beneath several areas of the South Plant, including in groundwater near the Delaware River at the southern boundary of the South Plant.

In 2010, a pathway investigation was conducted to assess the potential impacts of arsenic in groundwater on adjacent Delaware River water quality. To further assess possible cross-media migration of arsenic from soils to groundwater, and subsequently to the Delaware River, calculations (originally developed in 2004) were updated to assess concentrations of dissolved arsenic in monitoring wells. Based on the designated uses for the Delaware River, which are listed as primary contact recreation, secondary contact recreation, and fish, aquatic life, and wildlife under Title 7 Delaware Administrative Code 7401 § 3, the water quality criteria for protection of human health (fish and water ingestion) are not applicable because the designated uses for the Delaware River do not include use as a public water supply source. Accordingly, the relevant water quality standard for arsenic is the Saltwater Continuous Chronic Criterion of 36 $\mu\text{g/L}$ (found in Title 7 Delaware Statement of Basis

Administrative Code 7401 § 4.5.9.3, Table 1). Based on this cross-media assessment, it was estimated that concentrations of dissolved arsenic migrating to the Delaware River from the diffuse discharge of groundwater from beneath the South Plant will result in concentrations of arsenic in surface water that are two orders of magnitude below the relevant water quality standard of 36 µg/L.

Monitoring well locations are shown on **Figure 4** and results are provided in **Appendix B**.

Shoreline and Nearshore Sediment Area

On September 19, 2008, the EPA collected Delaware River sediment samples within the tidal mudflats adjacent to the South Plant and SWMU 9. Sampling data indicated the presence of DDX, arsenic, and lead. Re-sampling of the sediment (0- to 6-inch depth interval [bioactive zone only]) in the vicinity of the previously the EPA sampled sediment locations was conducted on June 11, 2009.

Additional sampling of shoreline sediment, the stormwater sluiceway, groundwater, and surface soils was conducted in July 2010. During that event, 29 sediment samples were collected from the confluence box and down the sluiceway into the area between the dock and cove area. This investigation identified the presence of DDX, lead, and arsenic in the confluence box, sluiceway, and shoreline river sediment.

A series of six additional sediment sampling events were conducted from July 2012 through February 2015 to characterize and delineate DDX, lead, and arsenic in river sediments within the on-site nearshore study area extending outward (south/southeast) toward the pierhead line that defines the outer limit of the nearshore environment and west/southwest toward the existing facility pier. The corrective measures would extend to the pierhead line. These sediment sampling efforts also completed the on-site nearshore sediment delineation to the upstream property boundary. In addition to delineation of DDX, arsenic, and lead in sediments, additional sediment investigations were conducted to assess bathymetry and geotechnical properties of nearshore river sediments and shoreline soils.

In January 2016, the EPA requested that a supplemental sediment investigation be performed to complete the delineation of impacted surface sediments to the east (off-site) of the DVW Facility adjacent to the Sunoco Site. The supplemental study area extended approximately 1,000 feet eastward and adjacent to the Sunoco Site (**Figure 1**). A total of 30 surface sediment samples (0-6 inches) were collected; 15 primary samples were analyzed for DDT and its isomers, as well as Total Organic Carbon (TOC). Four sediment samples exhibited concentrations of DDX in excess of the sediment remedial goal.

A supplemental pathway investigation was also conducted in 2016 to evaluate groundwater impacts and potential nearshore discharge in the southern portion of the Facility to support the design for subsequent capping of the nearshore sediments. The purpose of the sampling and analysis was to collect data to assess the fate of arsenic in groundwater potentially discharging from the Facility to the nearshore sediments of the Delaware River. Results of the sampling for groundwater, porewater, sediment, and surface water were reported as follows:

- Dissolved arsenic concentrations in the sampled wells ranged from 1.15 to 154,000 µg/L. Total arsenic concentrations were consistent with dissolved concentrations in the sampled wells,

Statement of Basis

indicating arsenic in groundwater is present in the dissolved phase. The highest groundwater dissolved arsenic concentrations were detected in monitoring wells immediately upgradient of the cove, including MW-108R, MW-119, and MW-120. Dissolved arsenic concentrations in groundwater within SWMU 9 (MW-16, MW-17, and MW-122) were generally low (less than 27 µg/L) and characterized by a greater proportion of As(V).

- Porewater dissolved arsenic concentrations ranged from 40 to 417,000 µg/L and were generally highest in the cove sampling locations. Arsenic in porewater consists predominantly of As(III), which typically accounts for more than 80% of the dissolved arsenic in any given sample, with minor to trace amounts of As(V). Monomethylarsonic acid (MMA) and dimethylarsinic acid (DMA) were not detected in porewater. At three of the four in-water sampling locations in the cove (DVW-16-01, DVW-16-03, and DVW-16-08), deep porewater dissolved arsenic concentrations were higher than concentrations in co-located shallow porewater. The lower concentrations in shallow porewater compared to the deeper samples at most locations in the cove indicate dissolved arsenic is attenuated within the sediment. In contrast, at most of the porewater sampling locations offshore of SWMU 9 (DVW-16-04, DVW-16-05, DVW-16-06, DVW-16-07, DVW-16-08, DVW-16-09, and DVW-16-10), dissolved arsenic concentrations were much greater than those detected in the upland SWMU-9 wells. Deep porewater dissolved arsenic concentrations were also lower, by up to one to two orders of magnitude, than those observed in the cove. Arsenic speciation in shallow porewater in this area was generally more than 90% As(III). The elevated porewater arsenic concentrations compared to upland groundwater and the predominance of reduced As(III) indicate porewater arsenic concentrations are influenced by the presence of arsenic in the local sediments and local redox conditions rather than by migration of upland groundwater.
- Total arsenic concentrations in surface water ranged between 3.45 and 19.5 µg/L, and dissolved arsenic concentrations ranged between 1.67 and 5.98 µg/L. All surface water concentrations were below the chronic water quality standard of 36 µg/L.
- Total arsenic concentrations in sediment samples ranged from 48.7 to 1,830 mg/kg and were highest at sample locations located within the cove. These locations coincide with highest dissolved arsenic concentrations in pore water samples and are downgradient of monitoring wells which also have higher dissolved arsenic concentrations relative to other areas of the Facility.

In October 2018, additional nearshore data was collected, including along the Sunoco property to characterize sediment pore water for select pesticides and arsenic. These sampling results indicated elevated arsenic concentrations in pore water along the Sunoco property and the SPSP cove shoreline.

Spatial and depth distributions of arsenic concentrations and major ion chemistry of groundwater and porewater confirmed that groundwater discharge as a source of elevated arsenic to sediments is limited to the nearshore in the cove area adjacent to the SPSP south of the sluiceway discharge. Sediment and pore water sample locations are shown on **Figures 5** through **10** and results are provided in **Appendix C**. Results specific to the 2016 Supplemental Pathway investigation are provided in **Appendix D**.

Statement of Basis

Section 5: Risk Assessment

A Human Health Risk Assessment (HHRA) was conducted for SWMU 9 as part of the North Plant RFI. SWMU 9 soil samples were collected and analyzed for VOCs, SVOCs, pesticides, and metals. Detected concentrations were screened against the EPA Regional Screening Levels (RSLs) (November 2021) to determine chemicals of potential concern (COPCs). COPCs identified include VOCs, polycyclic aromatic hydrocarbons (PAHs), chlorinated and nitrogenated benzenes, DDX, and metals (in particular arsenic, mercury, and thallium). The HHRA examined site construction workers and adult and child trespassers as potential receptors. The results of the HHRA indicated that carcinogenic risk estimates exceeded the EPA risk threshold for current and for future construction workers at SWMU 9. Noncarcinogenic risk estimates exceeded the EPA threshold for future construction workers at SWMU 9. The risk drivers are arsenic and thallium. Residential exposure to soil and groundwater, and exposure to groundwater as a drinking water source was eliminated due to current and foreseeable future industrial land use conditions.

A baseline ecological risk assessment (BERA) was conducted only at SWMU 9 since there is little or no area of the remainder of the Facility that serves or could serve as habitat. Three potential ecological receptors were identified as having complete exposures to surficial soil contaminants: the short-tailed shrew, the American robin, and the raccoon.

Section 6: Interim Measures

The potential source of DDX, arsenic, and lead in nearshore river sediments was suspected to be impacted sediment in the storm water sewer system at both the North Plant and the South Plant. Stormwater is collected by a stormwater sewer collection system, which conveys stormwater by gravity beneath U.S. Highway 13 and into the stormwater sewer system that serves the former South Plant facility. From the storm sewer, stormwater is discharged to the Delaware River outfall via a sluiceway. The stormwater outfall is permitted under a National Pollutant Discharge Elimination System (NPDES) discharge permit.

Stormwater Sewer System

Honeywell completed a maintenance storm sewer cleaning project in August 2011 to remove accumulated sediment from the DVW Facility storm sewer system and a main trunk line leading from the North Plant across the South Plant North Parcel to the confluence box discharge point at the upper end of the sluiceway located on the Facility property. Approximately 10,480 linear feet of storm sewer lines were jet cleaned and video inspected. During the jetting process, approximately 254 tons of accumulated sediment and debris were removed. All solids collected from the cleaning operations were dewatered and mixed with a polymer to ensure passing a paint filter test for transportation and disposal. Solids characterized as hazardous based on TCLP analytical testing were transported to an approved disposal facility for incineration. Non-RCRA hazardous materials were transported and disposed of at an approved landfill between October 27, 2011 and April 3, 2012.

Statement of Basis

Upper Sluiceway

The upper sluiceway is defined as the portion of the Facility storm water conveyance system from the storm water confluence box to the existing weir structure (**Figure 2**). The IMs for the upper sluiceway were completed between December 2012 and June 2013. The scope of interim measures work consisted of removing soft sediment from the upper sluiceway and the subsequent installation of a cover system over the sluiceway base. The tasks completed included dewatering and flow control/diversion of the upper sluiceway, debris removal, removal and solidification of sediment from the subsurface concrete pipeline and subsequent video inspection, removal and solidification of soft sediment from the remaining portions of the upper sluiceway, and the placement of a geotextile fabric and minimum 6-inch thick AquaBlok® layer throughout the open channel portion of the upper sluiceway. The excavation of the soft sediment was considered complete once competent material was encountered that provided a suitable, stable base for the placement of the cover system.

Lower Sluiceway

The IM for the uppermost 500 feet of the lower sluiceway was completed in 2022. Sediment excavation from the lower sluiceway consisted of approximately 0.5 to 2.5 feet of soft sediment excavation within the limits of sluiceway work with an additional over-excavation allowance of 0.5 feet. The weir box and road crossing culvert within the lower sluiceway were cleared of visible sediment and debris. Following sediment removal, the sediment cover was placed consisting of an initial sand layer, geotextile layer, and a layer of AquaBlok® material. A geotextile layer was placed over the AquaBlok® material and armor stone was installed over the geotextile. In addition, the culvert within the lower sluiceway was removed and replaced with a layer of riprap stone to line the channel; the culvert will be replaced at a later date in coordination with current owner. The remediation of the remaining 335-foot portion of the Lower Sluiceway ("Segment 3" as shown on **Figure 2**) will be coordinated with the implementation of the shoreline and nearshore sediment corrective measures.

Section 7: Corrective Action Objectives

The EPA's Corrective Action Objectives (CAOs) are as follows:

SWMU 9 Soils

The EPA's CAOs for SWMU 9 soils are to prevent uncontrolled exposure due to direct contact of constituents of concern (COCs), mitigate particulate transport to Delaware River and sluiceway, and minimize cross media transfer from potential inhalation and ingestion of airborne particles from disturbance of COC-impacted soils.

The EPA's Direct Contact Industrial Soil RSL and Protection of Groundwater RSLs apply to all soils that could leach contaminants to groundwater.

Statement of Basis

Parameter Group	COPC	Direct Contact Industrial Soil RSL (mg/kg)	Protection of GW SSL	
			Risk Based Soil Screening Level (SSL) (mg/kg)	MCL Based Soil Screening Level (SSL) (mg/kg)
VOCs	Methylcyclohexane	NS	NS	NS
Metals	Aluminum	1100000	30000	NS
	Arsenic	3	0.0015	0.29
	Lead	800	NS	14
	Thallium	12	0.014	0.14
	Vanadium	5800	86	NS
Pesticides	Aldrin	0.18	0.00015	NS
	alpha-BHC	0.36	0.000042	NS
	beta-BHC	1.3	0.00015	NS
	gamma-BHC	2.5	0.00024	0.0012
	4,4'-DDD	9.6	0.0075	NS
	4,4'-DDE	9.3	0.011	NS
	4,4'-DDT	8.5	0.077	NS
	Dieldrin	0.14	0.000071	NS

Note: NS – No Standard

SWMU 9 and South Plant South Parcel Groundwater

The EPA expects final remedies to return usable groundwater to its maximum beneficial use, where practicable, within a timeframe that is reasonable. For projects where aquifers are either currently used for water supply or have the potential to be used for water supply, EPA will use the National Primary Drinking Water Standard Maximum Contaminant Levels (MCLs) promulgated pursuant to Section 42 U.S.C. §§ 300f et seq. of the Safe Drinking Water Act and codified at 40 C.F.R. Part 141.

The EPA has determined that restoration of groundwater to MCLs is technically impracticable at SWMU 9 and SPSP. Technical impracticability (TI) for contaminated groundwater refers to a situation where achieving groundwater cleanup standards associated with final cleanup standards is not practicable from an engineering perspective. The term “engineering perspective” refers to factors such as feasibility, reliability, scale or magnitude of a project, and safety. Restoration of groundwater at SWMU 9 and SPSP to MCLs has been deemed technically impracticable for the following reasons:

1. The large volume of the contaminated fill material. The distribution of arsenic in groundwater at the Facility does not appear to be from a release or particular unit but appears to be associated with the historical fill used along the Delaware River shoreline.
2. Hydrogeologic factors such as heterogeneous soil conditions consisting of fill material and low permeability materials with low groundwater seepage velocities, such as silts and clays.
3. Site-setting factors such as:

Statement of Basis

- a. The highly industrialized environment with significant surficial and subsurface infrastructure and
- b. The presence of offsite sources and regional characteristics that could render any restoration within the SPSP and SWMU 9 temporary, as these offsite sources could recontaminate the area.

Therefore, the standard in this proposed remedy is the levels established by DNREC’s surface water criteria to protect the Delaware River from groundwater discharging from the Facility. EPA’s Corrective Action Objectives for Facility groundwater are to control exposure to the hazardous constituents remaining in the groundwater; protect the current existing receptors, namely site workers, construction workers, trespassers and wildlife, from unacceptable concentrations from COC impacts; ensure that the dissolved groundwater plume is contained and will not migrate beyond the extent of the current groundwater plume; and ensure that no groundwater discharge concentrations would result in surface water concentrations that are above the Delaware surface water criteria. The TI Zone applies to the entirety of the SPSP and SWMU 9, and applies to COPCs including VOCs, SVOCs, metals, and pesticides.

Relevant groundwater-specific goals are provided by the EPA’s MCLs and, if an MCL does not exist for a specific compound, the EPA’s May 2023 RSLs for tap water would apply. The following groundwater MCLs and RSLs will be used as groundwater specific goals for the Facility COPCs at the point of compliance (shoreline monitoring wells):

Parameter Group	Constituent	May 2020 EPA MCL (µg/L)	May 2023 RSL (µg/L)
VOCs	1,1-Dichloroethane	NS	2.8
	1,2-Dichloroethane	5	0.17
	1,2-Dichloropropane	5	0.85
	1,4-Dichlorobenzene	75	0.48
	Benzene	5	0.46
	Chlorobenzene	100	78
	Chloroform	80	0.22
	cis-1,2-Dichloroethene	70	25
	Ethylbenzene	700	1.5
	Methylene Chloride	5	11
	Tetrachloroethene	5	11
	Trichloroethene	5	0.49
	Vinyl Chloride	2	0.019
	Xylenes	10000	190
SVOCs	2-Methylnaphthalene	NS	36
	Benzo(a)anthracene	NS	0.03
	Benzo(a)pyrene	NS	0.025

Statement of Basis

Parameter Group	Constituent	May 2020 EPA MCL (µg/L)	May 2023 RSL (µg/L)
	Benzo(b)fluoranthene	NS	0.25
SVOCs	Naphthalene	NS	0.12
	n-Nitrodiphenylamine	NS	12
Metals	Antimony	6	7.8
	Aluminum	NS	20000
	Barium	2000	3800
	Beryllium	4	25
	Cadmium	5	1.8
Metals	Cobalt	NS	6
	Copper	1300	800
	Iron	NS	14000
	Lead	15	15
	Manganese	NS	430
	Mercury	2	0.63
	Nickel	NS	390
	Selenium	50	100
	Silver	NS	94
	Thallium	2	0.2
	Vanadium	NS	86
	Zinc	NS	6000
Pesticides	4,4'-DDD	NS	0.032
	4,4'-DDE	NS	0.046
	4,4'-DDT	NS	0.23
Pesticides	Aldrin	NS	0.00092
	alpha-BHC	NS	0.0072
	beta-BHC	NS	0.025
	gamma-BHC	0.2	0.042
	Dieldrin	NS	0.0018
	Heptachlor	0.4	0.0014
Heptachlor Epoxide	0.2	0.0014	

Note: NS – No Standard

Pore Water and Sediment

The CAO for pore water/sediment is to achieve risk-based remediation goals for arsenic in pore water and DDx, arsenic, and lead in sediments. Site-specific sediment remediation goals were developed to be protective of potential human and ecological receptors that could be present in the Delaware River adjacent to the Facility. The risk-based remediation goals for total DDx, arsenic, and lead are:

Statement of Basis

Chemical	RG Range	Controlling Endpoint(s)
Total DDx (µg/gOC)	40-60	Benthic invertebrates, fish, humans
Arsenic (mg/kg)	130-170	Benthic invertebrates
Lead (mg/kg)	150	Fish

A risk-based screening level was developed to assess the potential significance of arsenic concentrations detected in sediment pore water in the nearshore area of the Delaware River. The risk-based remediation goal for arsenic in pore water is 1,253 ug/L, designed to be protective of the benthic community in surface sediment.

Section 8: Proposed Remedy

The EPA's proposed remedy includes an engineered cover system at SWMU 9; establishing a Technical Impracticability Zone and long-term groundwater monitoring for SWMU 9 and South Plant South Parcel groundwater; implementing use restrictions through Institutional Controls; and constructing and maintaining a sediment cap for the shoreline and nearshore sediment. Additional details are provided below. A description and analysis of the other alternatives considered by the EPA can be found in the Corrective Measures Study Reports prepared by Honeywell. EPA approved the SWMU 9 and SPSP Groundwater CMS on December 21, 2023 and approved the Nearshore Sediment CMS on June 26, 2023.

SWMU 9

The EPA's proposed remedy for SWMU 9 is to install and maintain a cover system (soil cap with marker fabric above the alum mud) that controls, minimizes, or eliminates post remedial action escape of hazardous waste, hazardous constituents, leachate, contaminated run-off, or hazardous waste decomposition products to the ground or surface waters or to the atmosphere, to the extent necessary to protect human health and the environment. The cap shall be designed and constructed to prevent infiltration to mitigate potential cross-media migration (soil to groundwater) of COCs. The cap shall be functionally equivalent to the performance standards documented in 40 CFR Section 265.310.

A Cap Management Plan (CMP) shall be submitted for EPA and the state of Delaware's Department of Natural Resources and Environmental Control's (DNREC) review and approval and, at a minimum will include the following: the procedures to maintain the cap over the contaminated soil; a schedule for inspections to be performed as part of cap maintenance, no less frequent than once a year; physical maintenance requirements of the capped areas to prevent degradation of the cap and unacceptable exposure to the underlying soil.

In addition to the cover system, stabilization of SWMU 9 soil and construction of other necessary erosion and stormwater control components will also be completed.

Statement of Basis

SWMU 9 and South Plant South Parcel Groundwater

EPA's proposed remedy for SWMU 9 and SPSP groundwater consists of establishing a Technical Impracticability (TI) Zone. The TI Zone is defined as groundwater within the area depicted on Figure 11 of this SB. The distribution of arsenic in groundwater at the Facility does not appear to be from a release or particular unit but appears to be associated with the historical fill used along the Delaware River shoreline. Further, as characterized during the RFI, the low hydraulic conductivity of the fill material results in low groundwater seepage velocities which, combined with the volume of fill present on the Facility, supports the conclusion that groundwater restoration is technically impracticable.

Further, the findings of the previous investigations characterized the extensive nature of the heterogeneous and contaminated fill in contact with groundwater, and estimates to achieve RSLs indicate that it is technically impracticable from an engineering perspective to restore groundwater at the Facility. Therefore, the following alternative remedial approach has been developed in consideration of the potential for exposure to groundwater and the means available with which to control it:

- Prevent/minimize potential exposure by contact or ingestion that presents unacceptable risk.
- Prevent migration and preferential flow of COCs to the Delaware River at levels resulting in risk above acceptable levels to human health or ecological receptors. Specifically, a remedy is proposed that combines:
 - Capping of SWMU 9 and SPSP soils to reduce infiltration into the underlying fill material (capping of SPSP soils is addressed by the remedy selected in the EPA's 2016 FDRTC for SPSP soils);
 - Treatment of groundwater via a reactive cap over the area of sediment where groundwater discharges to the Delaware River;
 - Conducting long-term groundwater monitoring; and
 - Implementing land and groundwater use restrictions through institutional controls to preclude use of groundwater at the Facility.

Delaware River Shoreline and Nearshore Sediment Area

The proposed shoreline (cove and SWMU 9) and nearshore sediment remedy consists of a multi-layer capping system consisting of an isolation layer, filter layer, and armor layer. A total of 12.4 acres of nearshore sediments would be capped (**Figure 2**) including an approximately 10.2-acre on-site area and an approximately 2.2-acre off-site area (i.e., the supplemental study area). This off-site portion of the cap may extend east of the DVW Facility property adjacent to the Sunoco property. Additionally, approximately 1.8 acres of shoreline fronting the South Plant and SWMU 9 will be regraded, capped, and armored. The sediment cap will generally consist of a base isolation layer of sand overlying the existing sediment surface. An intermediate gravel filter layer has been designated for certain cap types, depending on the size of the overlying erosion protection armor stone for a given area where the cap is to be placed. The erosion protection armor layer varies across the cap types, depending upon the modeled erosive forces for certain areas and inclinations of the sediment surface. In areas where dissolved arsenic has the potential to migrate up through the cap, the capping systems will include a

Statement of Basis

chemical isolation layer (e.g., zero valent iron amendment). It is currently estimated that the shoreline cap will be approximately 30 to 39-inches thick in the cove area and 33- to 42-inches for SMWU 9. It is currently estimated that the nearshore sediment cap thickness may range from approximately 18 to 66 inches thick, depending on the armor layer requirements.

These limits of impacted sediments were defined by delineation of COC concentrations to the established site-specific risk-based remediation goals and limits of the shallow nearshore environment. Arsenic and DDX have been delineated in the western and eastern portions of the study area, and to the limits of nearshore area defined by the pierhead line. This delineated area consists of the shoreline banks of the cove area and the SWMU 9 parcel, which are separated by the Facility sluiceway and discharge conveyance.

Remediation of Segment 3 of the Lower Sluiceway will be completed as part of the shoreline and sediment remedy implementation.

Data demonstrate that the Sunoco property may be contributing to sediment arsenic and lead in the nearshore remedy area. Therefore, EPA proposes that for any portion of the cap that may extend beyond the DVW Facility property, Honeywell will maintain cap integrity, but not conduct chemical monitoring or address lead or arsenic that may recontaminate the portions of the cap that lie beyond the DVW property.

Institutional Controls

The 2016 Baseline HHRA identified unacceptable risk regarding residential and non-residential exposure to groundwater, and therefore the exposure pathway will be eliminated for residents and non-residents using Institutional Controls (ICs), as well as health and safety controls for any potential construction worker exposure. Because contaminants remain in the soil and groundwater at the SPSP and SWMU 9 above levels appropriate for residential use, the EPA's proposed remedy requires land use restrictions to restrict activities that may result in exposure to those contaminants. The EPA proposes that the restrictions be implemented and maintained through ICs. ICs are non-engineered instruments such as administrative and/or legal controls that minimize the potential for human exposure to contamination and/or protect the integrity of the remedy by limiting land or resource use.

The EPA is proposing the following land and groundwater use restrictions be implemented:

- a. The SPSP and SWMU 9 shall be restricted to commercial and/or industrial purposes and shall not be used for residential purposes unless it is demonstrated to EPA, in consultation with DNREC, that such use will not pose a threat to human health or the environment or adversely affect or interfere with the selected remedy and the EPA, in consultation with DNREC, provides prior written approval for such use.
- b. All monitoring, maintenance and inspections of the SWMU 9 engineered cover system shall be conducted in compliance with an EPA/DNREC approved CMP.
- c. Groundwater at the Facility shall not be used for any purpose other than the operation, maintenance, and monitoring activities required by the EPA, unless it is demonstrated to the EPA that such use will not pose a threat to human health or the environment or adversely affect or interfere with the final remedy and the EPA provides prior written approval for such use.

Statement of Basis

- d. No new wells shall be installed on Facility property unless it is demonstrated to the EPA that such wells are necessary to implement the final remedy and the EPA provides prior written approval to install such wells.

The land and groundwater use restrictions necessary to prevent human exposure to contaminants at the Facility will be implemented through enforceable ICs such as an order and/or an Environmental Covenant pursuant to 7 Del. C. ch. 79, subchapter II, Uniform Environmental Covenants Act to be recorded with the deed for the Facility property. If the EPA determines that additional monitoring activities, institutional controls, or other corrective actions are necessary to protect human health or the environment, the EPA has the authority to require and enforce such additional corrective actions through an enforceable mechanism which may include an order or Environmental Covenant, provided any necessary public participation requirements are met. If any individual with an interest in the Facility property believes that information shows that any use restrictions proposed and later selected by the EPA are no longer necessary to protect public health and the environment, the individual may submit such information to the EPA for consideration. The EPA can change any such restriction if it determines it is no longer necessary, after any required public comment period.

Section 9: Evaluation of Proposed Remedy

This section provides a description of the criteria the EPA used to evaluate the proposed remedy consistent with the EPA guidance. The criteria are applied in two phases. In the first phase, the EPA evaluates three decision threshold criteria as general goals. In the second phase, for those remedies which meet the threshold criteria, the EPA then evaluates seven balancing criteria.

Threshold Criteria	Evaluation
1) Protect human health and the environment	<p><u>SWMU 9</u> The engineered cover system at SWMU 9 will protect human health and environmental exposure by preventing direct contact.</p> <p><u>Groundwater</u> Human health and environmental exposure for groundwater will be protected through restrictions on potable groundwater use. In addition, data demonstrate that groundwater discharge to surface water will not cause exceedances of DNREC's surface water criteria, and therefore does not pose an unacceptable risk to the Delaware River.</p> <p><u>Sediments</u> The proposed sediment remedy protects current and reasonably anticipated future receptors by isolating sediments and eliminating the exposure pathway for human and</p>

Statement of Basis

	<p>ecological receptors. The sediment capping achieves overall risk reduction objectives by reducing contaminant flux to the overlying water and reducing concentrations in pore-water and bulk solids at the sediment-water interface.</p>
<p>2) Achieve media cleanup objectives</p>	<p>The proposed remedies meet the media cleanup objectives based on assumptions regarding current and reasonably anticipated land and water resource use(s).</p> <p><u>SWMU 9</u> The engineered cover system at SWMU 9 will prevent direct contact to impacted soils and will reduce stormwater infiltration to impacted groundwater and prevent receptor direct contact exposure.</p> <p><u>Groundwater</u> The proposed remedy does not meet MCLs. Achieving groundwater MCLs is technically impracticable due to various contaminant-related, hydrogeologic, and site-setting factors. The proposed use restrictions at the Facility will eliminate future unacceptable exposures to groundwater. Groundwater monitoring of the onsite wells will continue long-term.</p> <p><u>Sediments</u> The proposed sediment remedy will achieve the site-specific risk-based remediation goals for arsenic in pore water (1,253 ug/L) and DDx, arsenic and lead in sediments (160 ug/gOC, 170 mg/kg and 150 mg/kg, respectively) to be protective of human health and ecological receptors.</p>
<p>3) Remediating the Source of Releases</p>	<p>In all proposed remedies, the EPA seeks to eliminate or reduce further releases of hazardous wastes and hazardous constituents that may pose a threat to human health and the environment. Controlling the sources of contamination relates to the ability of the proposed remedy to reduce or eliminate, to the maximum extent practicable, further releases.</p> <p><u>SWMU 9</u> The engineered cover system at SWMU 9 will reduce stormwater infiltration to impacted groundwater and prevent releases of particulates.</p>

Statement of Basis

	<p><u>Groundwater</u> The proposed use restrictions at the Facility will eliminate future unacceptable exposures to groundwater.</p> <p><u>Sediments</u> The completed sewer system and sluiceway IMs eliminated a source of the contamination entering the nearshore area via the sluiceway. The proposed sediment remedy will prevent exposure of human and ecological receptors to impacted sediments and prevent migration of dissolved phase arsenic through the sediment cap.</p>
Balancing Criteria	Evaluation
1) Long-term effectiveness	<p><u>SWMU 9</u> The long-term effectiveness of the engineered cover system will be maintained by the implementation of engineering controls.</p> <p><u>Groundwater</u> The proposed use restrictions at the Facility will eliminate future unacceptable exposures to groundwater.</p> <p><u>Sediments</u> The sediment cap will be designed to permanently establish a clean sediment surface and to withstand potential erosive forces that could disturb the surface of the cap. Long-term monitoring and maintenance will identify and address any disturbances to the cap.</p>
2) Reduction of toxicity, mobility, or volume of the Hazardous Constituents	<p><u>SWMU 9</u> The engineered cover system at SWMU 9 will reduce the mobility of soil contaminants.</p> <p><u>Groundwater</u> Groundwater use will be restricted to prevent exposure.</p> <p><u>Sediments</u> The completed IMs reduced the volume and mass of COCs representing a source to the nearshore sediments. The proposed sediment remedy will reduce the mobility of the COCs within the nearshore sediments through containment using isolation and reactive media to prevent migration to the sediment surface. The cap will provide long-term and</p>

Statement of Basis

	permanent risk reduction by protecting humans and ecological receptors from exposure to contaminants in underlying sediments.
3) Short-term effectiveness	<p><u>SWMU 9</u> The engineered cover system at SWMU 9 would provide immediate risk reduction. Exposure potential is increased in the short-term during construction.</p> <p><u>Groundwater</u> The use restrictions would become effective immediately upon implementation an enforceable mechanism such as an EC or order.</p> <p><u>Sediments</u> The short-term effects of capping are generally minimal. Resuspension of sediment or turbidity generated by the capping material during installation is limited and can be controlled by appropriate cap placement techniques. Short-term impacts to the river can be mitigated by well-established best management practices for turbidity control during cap placement. Given its location, it is expected that the short-term risks to the community associated with the on-site construction activities will be minimal.</p>
4) Implementability	The remedy is readily implementable at the Facility. The proposed capping remedies will use conventional techniques and readily available marine construction services. It is expected that federal and state permits will be required for construction. The proposed remedy also includes implementation of use restrictions through the enforceable mechanism.
5) Cost	The costs associated with this proposed remedy are associated with construction of the cover system at SWMU 9, construction of the cap for the shoreline and nearshore sediments and lower sluiceway segment 3, cap maintenance and monitoring and continued sampling and maintenance of the monitoring wells.
6) Community Acceptance	The EPA will evaluate community acceptance based on comments received during the public comment period and will address any comments in the Final Decision.
7) State/Support Agency Acceptance	State involvement has been solicited throughout the RCRA corrective action process and DNREC concurred with the proposed remedy.

Statement of Basis

Overall, based on the evaluation criteria, the EPA has determined the proposed remedy meets the threshold criteria and provides the best balance of tradeoffs with respect to the evaluation criteria.

Section 10: Financial Assurance

EPA will require Honeywell to provide financial assurance. The estimated cost of the for the nearshore sediment, shoreline, and lower sluiceway remedy is \$15,500,200. The estimated cost of the engineered cover system at SWMU 9 is \$7,075,000 with annual OM&M costs projected at \$167,500 through 30 years. The estimated total costs associated with the ICs is \$25,000. Long-term groundwater monitoring for 30 years is estimated at \$97,500. The financial assurance will be maintained in an instrument acceptable to the EPA and renewed annually. The amount of financial assurance is based on design, construction, permitting, and OM&M costs.

Section 11: Public Participation

The public may participate in the remedy selection process by reviewing this SB and documents contained in the AR for the Facility and providing comments. The AR contains all information considered by the EPA when proposing this remedy. The AR documents are available for public review at the location below:

U.S. EPA Region III
4 Penn Center
1600 JFK Boulevard
Philadelphia, PA 19103
Contact: Christine Kimak (3LD11)
Phone: 215-814-2798
Fax: (215) 814-3113
Email: kimak.christine@epa.gov

The public comment period will last thirty (30) calendar days from the date that the notice is published in a local newspaper. You may submit comments by mail, fax, or e-mail to Christine Kimak. The EPA will hold a public meeting to discuss this proposed remedy upon request. If you would like to request a public meeting, please contact Christine Kimak.

The EPA will respond to all relevant comments received during the comment period. If the EPA determines that new information warrants a modification to the proposed remedy, the EPA will modify the proposed remedy or select an alternative based on the new information and/or public comments. In the Final Decision, the EPA will announce the selection of its final remedy, respond to all relevant comments received, and explain the rationale for any changes to the proposed remedy. All persons who comment on this proposed remedy will receive a copy of the Final Decision. Others may obtain a copy by contacting Christine Kimak at the address listed above. The Final Decision will also be made publicly available on the EPA's website for the Facility.

Statement of Basis

Section 12: Signature

Dana Aunkst, Director
Land, Chemicals, and Redevelopment Division
US EPA, Region III

Date: _____

Statement of Basis

Section 13: Index to Administrative Record

RCRA Facility Assessment for Delaware Valley Works South Plant, 1986
Initial Administrative Order General Chemical Corporation, 2000
RCRA Facility Investigation Phase I Report, 2003
RCRA Facility Investigation Phase II Report, 2007
RFI Summary and Presumptive Remedy for Proposed Industrial Redevelopment Area, 2016
Corrective Measures Study, SWMU 9 and South Plan South Parcel Groundwater, 2022
Corrective Measures Study for Nearshore Sediments, 2023
Technical Guidance Document: Final Covers on Hazardous Waste Landfills and Surface Impoundments, 1989

Section 14: Attachments

Figure 1 – Site Location Map
Figure 2 – Nearshore Sediment Remedy Areas
Figure 3 – SWMU 9 Soil Boring Location Map
Figure 4 – South Plant South Parcel and SWMU 9 Monitoring Wells
Figure 5 – Surface Sediment Arsenic Concentrations
Figure 6 – Surface Sediment Lead Concentrations
Figure 7 – Surface Sediment Total DDx Concentrations – OC-Normalized
Figure 8 – Surface Sediment Total DDx Concentrations
Figure 9 – Surface Sediment Total Organic Carbon (TOC) Concentrations
Figure 10 – Sample Locations and Sampling Results – Supplemental Study Area Sediment Sampling
Figure 11 – Technical Impracticability Zones

Appendix A – SWMU 9 Soil Results
Appendix B – SWMU 9 and South Plant South Parcel Results
Appendix C – Sediment and Pore Water Results
Appendix D – 2016 Supplemental Pathway Investigation Results

Statement of Basis
