

SUPERFUND PRELIMINARY CLOSE OUT REPORT
Havertown PCP Superfund Site
Havertown, Delaware County, Pennsylvania
EPA ID# PAD002338010

I. INTRODUCTION

This Preliminary Close Out Report (PCOR) documents that construction activities at the Havertown PCP Superfund Site (Site) were completed in accordance with the *Close-Out Procedures for National Priorities List Sites* (OSWER Directive 9320.2-09A-P, January 2000).

The U.S. Environmental Protection Agency (EPA) and the Pennsylvania Department of Environmental Protection (PADEP), conducted a pre-final inspection on July 7, 2010 and determined that the remedy was constructed in accordance with approved design plans and specifications. Additional construction activities are not anticipated. The remedy constructed is expected to achieve performance standards and site completion.

II. SUMMARY OF SITE CONDITIONS

Background

The Havertown PCP Superfund Site encompasses approximately 12 acres located in Haverford Township, Delaware County, Pennsylvania (10 miles west of Philadelphia). It is surrounded by a mixture of private homes, schools, commercial establishments, industrial companies and parks. Naylor's Run, a creek that flows in a southeasterly direction through the site, drains the entire Havertown PCP site.

The site was formerly used as a wood-treatment facility operated by National Wood Preservers (NWP) on property owned by Clifford Rogers. Due to the facility's methods of waste disposal, the property's soil and the groundwater are contaminated. The contaminated groundwater in the shallow zone migrates to the east underneath Eagle Road.

The Havertown PCP Site was first developed as a railroad storage yard and later became a lumberyard. In 1947 the wood-preserving facility was constructed and operated by Mr. Samuel T. Jacoby. In 1963, the existing facility was purchased by the Harris Goldstein family.

In 1962, the Pennsylvania State Department of Health became aware of contaminants in Naylor's Run, and linked the source of contamination to National Wood Preservers waste disposal practices.

The majority of the activities resulting in pollution to the water bearing strata (aquifer) beneath the site occurred during the years of 1947 to 1963. Approximately one million gallons of spent wood preservatives are believed to have been dumped into a 26-foot deep well on property adjacent to the NWP property which was leased from Clifford Rogers to Shell Oil Company. This disposal practice appears to be the major source of contamination to Naylor's Run.

In 1972 the Pennsylvania Department of Environmental Resources (PADER) identified contaminated groundwater discharging from a storm sewer into Naylor's Run. PADER ordered NWP, Philadelphia Chewing Gum Company (owners of the property down gradient from NWP), Shell Oil Company (lessee adjacent to Clifford Rogers property), and Mr. Clifford Rogers (owner of property leased to NWP) to clean up Naylor's Run, since they occupy land where contaminated groundwater exists. The above parties appealed to the State Environmental Hearing Board, and later to the Commonwealth Court of Pennsylvania. The court sustained Philadelphia Chewing Gum and Shell Oil Company's appeals and ordered the cleanup to be executed by NWP and Mr. Rogers. Implementation and maintenance of the cleanup actions by NWP and Mr. Rogers were inadequate, however, and failed to address all of the environmental concerns both on and off the site.

In response to a request from PADER in 1976, the EPA initiated cleanup activities under Section 311 of the Clean Water Act. Cleanup activities occurred in two phases. The first phase established containment operations at Naylor's Run. Filter fences were installed to remove PCP contaminated oil from the surface water. These fences were located just downstream from the outfall of the 24-inch storm sewer pipe and a 12-inch sanitary sewer was sealed; however, contaminated groundwater still discharged into Naylor's Run from the 24-inch storm sewer pipe.

In 1982, EPA ended containment operations in Naylor's Run, when NWP agreed to maintain in-stream treatment measures pursuant to a consent agreement with EPA. However, subsequent inspections revealed NWP was not properly maintaining the filter fences.

The Havertown PCP Site was listed on the National Priorities List by the EPA in December 1982. Subsequently, PADER signed an agreement with EPA to conduct a Remedial Investigation/Feasibility Study (RI/FS) at the site.

Because of continuing releases of pentachlorophenol (PCP)-contaminated oil into Naylor's Run, in 1988, EPA's Emergency Response Team installed a catch basin in Naylor's Run to trap the discharge from the storm pipe.

According to the Remedial Investigation performed by PADER in 1988, at least six wood-treatment chemical solutions had been used at the NWP facility since its construction. The primary contaminants of concern at the site are the result of wood-treatment operations at NWP,

they are: PCP, chlorinated dioxins and dibenzofurans (typical low-level contaminants in the manufacture of PCP), fuel oil and mineral spirits components, heavy metals, certain volatile organic compounds, and phenols. All these materials are primary constituents or impurities of the various wood-treatment solutions used at NWP since operation began in 1947.

Remedial Construction Activities

In order to facilitate an effective remediation of the site, EPA divided the cleanup into two operable units (OUs) and a third was added later in the process.

Remedy Selection – OU1

OU1 focused on addressing on-site soils, staged waste materials, and the storm sewer effluent at the catch basin in Naylor's Run. The Record of Decision (ROD) was signed on September 11, 1989. The Remedial Action Objectives (RAOs) identified in the OU1 ROD are as follows:

- Prevent wind entrainment of, and access to, the contaminated on-site soils in excess of safe levels.
- Reduce PCP oil discharge to Naylor's Run from the storm sewer to less than 5 milligrams per liter (mg/l).
- Reduce the concentration of benzene and other VOCs by 17%.
- Dispose of all contaminated waste materials properly.

The remedial action chosen to meet these RAOs consisted of the following elements:

- No-action for on-site soils with a five-year program for monitoring soils to determine the appropriateness of doing further cleanup actions.
- Installation and operation of an oil/water separator for the storm drain effluent to Naylor's Run with continued monitoring.
- Landfilling of on-site waste and off-site treatment of the aqueous waste.

Remedy Implementation – OU1

The OU1 ROD identified remedies for the three areas of contamination it was to address: on-site soil, surface water, and disposal of the contaminated drums on-site. The No-Action alternative for on-site soils was originally chosen, as it achieved the remedial objectives. The potential threat to the public's health associated with contaminated dust and infiltration of contaminants into the environment was believed to pose no significant risk to human health.

A five year monitoring program for the soils was implemented and results were reviewed annually. The soil contamination consisted of arsenic, pentachlorophenol, polynuclear aromatic

hydrocarbons, and dioxin. The sampling program was designed to determine if the soils, in their exposed conditions, presented a direct contact threat to people working on or crossing the site.

During the monitoring program for soils, EPA identified that the contamination was more extensive than originally determined. Therefore, the soil contamination was addressed in 1996-1997 by a Superfund Non-Time Critical Removal Action which provided for a synthetic geomembrane cap to be installed on three acres of the site. The installation of the cap removed the potential for exposure to soils contaminated with arsenic and dioxin by providing a synthetic geomembrane barrier and a minimum of 18 inches of soil cover over the areas of contamination. In the fall of 1997, EPA covered the capped area with an additional four to ten feet of fill and planted the fill with a mixture of seed mulch and fertilizer. The area currently is covered with grasses and can be used for the construction of a light industrial type building with certain restrictions.

The recommended alternative for cleaning up the contaminated waste staged on site was to landfill the soil and oily debris, as well as off-site treatment of aqueous waste. Off-site treatment of the liquid waste was recommended because it could be more readily implemented and would not require discharging of effluent to Naylor's Run. EPA successfully removed and disposed of approximately 245 55-gallon drums of waste during the first phase of the cleanup. Also during the first phase, a tanker was emptied of approximately 4,721 gallons of liquid waste and 100 gallons of sludge which was properly disposed. The second phase included removal and disposal of 30 55-gallon drums.

The installation of an oil/water separator at the point where contamination discharges into Naylor's Run was chosen as the best alternative to address the contamination of surface water. During the installation of the oil/water separator, 11,850 pounds of solid waste and 395 gallons of liquid waste were generated and properly disposed of. After installation in 1991, the separator was maintained and sampled on a regular basis to ensure that it continued to be effective in reducing the discharge of oil from the storm drain. The unit was removed in 2002, after the OU2 remedy was constructed and placed into operation.

An Interim Remedial Action Report was finalized in two parts for OU1. Part I, which included the clean up of the NWP's facility, was dated June 1991 and Part II, which included the oil/water separator installation, was dated February 1992.

Remedy Selection – OU2

OU2 focused on the existing shallow groundwater aquifer, and the interim ROD for this OU was signed on September 30, 1991. The RAOs for this ROD are as follows:

The groundwater extraction and treatment system consisted of four recovery wells, one collection trench, and an on-site treatment system. The treatment system consists of two major parts: (1) a pre-treatment system (for breaking the oil-water emulsion, removal of metals, and removal of suspended solids); and, (2) an organics removal/treatment system.

In April 2006, EPA added two additional extraction wells to the existing groundwater extraction and treatment facility by converting two monitoring wells. The new extraction wells capture water from the deeper aquifer, which has resulted in an increase in the mass of contamination going to the treatment facility for processing.

An Interim Remedial Action Report was finalized on June 4, 2003 for OU2.

Remedy Selection – OU3

The final phase, OU3, addressed contaminated groundwater throughout the Site and contaminated soils found in the Recreation and Open Space (ROS) area of the Site. The ROD for OU3 was signed on April 16, 2008 and it is the final ROD for the Site. RAOs for this ROD are as follows:

Groundwater

- Mitigate contamination to Applicable or Relevant and Appropriate Requirements (ARARs) and/or risk-based cleanup levels to protect human health and the environment.
- Discharge treated groundwater to the surface water (Naylor's Run) in concentrations that meet NPDES requirements.
- Prevent exposure to contaminated groundwater in the future.
- Prevent discharge of groundwater to surface water at concentrations of contaminants that would result in exceedances of water quality criteria.
- Contain the contamination plume in the source area and the ROS area to prevent further off-site migration and to ensure that downgradient groundwater is not impacted.
- Restore groundwater quality at the Site.

Soil

- Eliminate current exposure of human and ecological receptors to contaminated soils.
- Prevent further migration of contaminants in soil to groundwater.
- Prevent transport of contaminants in surface soils via surface water runoff.
- Prevent potential future exposure to contaminants through ingestion and dermal contact by human and ecological receptors.

- Design and implement an interim remedial action to protect human health and the environment by removing free product and contaminated groundwater from the shallow groundwater aquifer.
- Collect data on the aquifer and contaminant response to remedial measures.
- Restore contaminated groundwater to beneficial use and to further reduce human health risk levels in surface water.

The remedial action chosen to meet these RAOs for the interim action for OU2 consisted of the following elements:

- Installation of free product recovery wells on the NWP property.
- Rehabilitation of the existing storm sewer line to reduce infiltration of contaminants from the groundwater to the storm sewer.
- Installation of a groundwater collection drain adjacent to the existing storm sewer line under the backyards of residential properties to collect groundwater for treatment at a treatment plant.
- Installation of a groundwater treatment plant at NWP to fully treat the groundwater prior to discharge back to Naylor's Run.

Remedy Implementation – OU2

In the second ROD for the site dated September 30, 1991, EPA selected an interim remedy for the contaminated shallow groundwater (OU2). This remedy consisted of the installation of free product recovery wells on the NWP property; the rehabilitation of the existing storm sewer line; the installation of a groundwater collection drain adjacent to the existing storm sewer line under the backyards of residential properties; and the construction of a groundwater treatment plant at NWP.

The OU2 work was delayed while EPA focused on a Removal Action in 1993 to remove tanks and drums contaminated by hazardous waste from the facility and secured the wood treatment property buildings. This removal action was followed by the non-time critical removal action that capped the NWP property soil.

Phased construction of the OU2 remedy was started in 1997, with the treatment building construction and installation of both the extraction wells and groundwater collection trench. From 2000-2001 a treatability study was conducted along with plant design, storm drain repairs and construction of transport lines. The plant went on-line in June 2001, with the discharge going to the temporary pre-treatment facility used during the design/construction of the permanent facility. The treatment plant was fully on-line in August 2001 with the discharge going to Naylor's Run and sampling in accordance with EPA's National Pollutant Discharge Elimination System (NPDES) permit equivalency.

The remedial action chosen to meet these RAOs consisted of the following elements:

- Installation of an additional groundwater recovery well and associated piping in the Source area of the Site.
- Operate and maintain the existing groundwater treatment facility. Upgrade or retrofit the existing groundwater treatment facility to increase the capacity of the facility to process 60 to 70 gallons per minute of contaminated water.
- Treat collected groundwater as necessary to meet discharge requirements.
- In-situ flushing in the Source area of the Site, with treated water from the groundwater treatment facility.
- Excavation of an area approximately 50 ft. by 50 ft. around wells SW-8 and SW-9 in the ROS area, and a narrow zone along the abandoned sewer line about 200 ft. long and 20 ft. wide. The portion of the abandoned sewer line which has not been sealed will be removed. All excavated material will be properly disposed of off-site.
- Backfilling of the excavated area with clean fill, restoration of sidewalks, curbs, utilities, etc. and planting of appropriate vegetation.
- Installation of three groundwater recovery wells and associated piping in the ROS area to extract groundwater and transport it to the Site's groundwater treatment facility for remediation.
- Demonstrate recovery of benthic macroinvertebrate and fish communities, to examine the efficacy of the ROS area excavation and groundwater treatment to reduce or eliminate the contaminant releases that are the major source of risk to aquatic organisms in Naylor's Run.
- Perform groundwater monitoring.
- Institutional controls to protect the integrity of the remedy and to prevent the installation of groundwater wells, through groundwater use restrictions and notices for the Site and surrounding area, as appropriate.

Remedy Implementation – OU3

In November 2008, work was initiated to increase the capacity of the existing groundwater treatment facility. EPA redesigned the pre-treatment portion of the groundwater extraction facility to increase the amount of water treated by the facility. This portion of the remedial action was completed in February 2009. The facility can now treat 70 gallons per minute of contaminated groundwater.

On November 17, 2009, remedial construction began on the next phase of the remedy implementation using American Recovery and Reinvestment Act (ARRA) funding. Prior to the start of the contaminated soil excavation, a temporary bridge had to be constructed to access the area. Excavation of contaminated soil and the abandoned sanitary sewer line in the Recreation and Open Space (ROS) area of the Havertown PCP Superfund Site began on January 26, 2010

and was completed on March 18, 2010. Approximately 3,000 cubic yards of soil was excavated along with the portion of the abandoned sewer line that was not filled with grout in May 2004 during the RI. The excavation was conducted in a residential area originating between two homes then continuing through the backyards and into the ROS area. The ROS area is bordered by two creeks and excavation continued to the creek banks. Constant dewatering of contaminated groundwater was required during the excavation. Figure 1 illustrates the area of excavation. Restoration of the ROS area included capping the sheet piling, placing riprap on the banks of Naylor's Run, installing a drainage swale, and placing topsoil and seeding. The restoration of the residential area included replacing a driveway, grading and seeding the yards and landscaping the area.

During the ROS area excavation, a second pipe was found directly below the abandoned sanitary sewer line. The second pipe was removed along with the portion of the original pipe that was not filled with grout during the RI. (The original pipe investigation and action is documented in the OU3 RI.) An additional investigation was conducted to determine if the second pipe followed the abandoned sanitary sewer to the groundwater collection trench. The second pipe was also found at the groundwater collection trench and was plugged to ensure contaminated groundwater could not flow through the pipe.

The construction of three monitoring wells and three additional extraction wells in the ROS area was started during the week of March 29, 2010. The wells were developed and a pump test was completed during the week of April 19, 2010.

The force main construction began in April and continued through June 2010.

The transportation and disposal of the excavated soil began on May 24, 2010 and was completed on June 22, 2010. The soil was transported to Horizon Environmental, Inc. in Quebec, Canada, which is a hazardous waste landfill permitted by the Canadian Government. The soil was manifested through Enpro Services of Vermont, Inc. acting as an intermediary arranging for export. A total of approximately 4,421 tons of contaminated soil was shipped off-site for disposal.

Construction of the mix tank and injection wells for the in-situ flushing of the groundwater occurred in July 2010.

The Ecological Study called for as part of OU3 was initiated in May 2009 with a baseline sampling event. The Ecological Study was implemented to demonstrate recovery of benthic macroinvertebrate and fish communities, and to examine the efficacy of the ROS area excavation and groundwater treatment to reduce or eliminate the contaminant releases that are the major source of risk to aquatic organisms in Naylor's Run. Sampling and reporting will continue as outlined in the Ecological Study Work Plan for Havertown PCP Superfund Site.

A pre-final inspection was conducted on July 7, 2010. The inspection was attended by representatives of the EPA, PADEP, Tetra Tech, Kemron, U.S. Environmental and Kelly Electric. A punch list of items requiring completion was developed as a result of the pre-final inspection. Most of these tasks have since been completed. The only remaining tasks requiring completion are to replace the fences taken down during construction, submit the as-built drawings and to hydroseed the yards if the hand seeding does not grow sufficiently.

Institutional Controls

As called for in the OU3 ROD, an Institutional Control Implementation and Assurance Plan (ICIAP) has been drafted for the Site. The ICIAP describes the implementation, monitoring, and assurance procedures to be carried out for institutional controls at the Havertown PCP Site. The ICIAP provides the following information.

- Site Details
- Contaminant Details
- IC Properties
- IC Instrument Categories
- IC Implementation
- IC Monitoring
- IC Enforcement
- IC Modification and Termination

Upon finalization, a copy of the ICIAP will be available in the Site Files.

Redevelopment Potential

The Site is comprised of many different parcels of property. The majority of the parcels are either already developed or have portions which are developed. For example, Zac's Burgers operates on the former Shell property, Swiss Farms Convenience Store operates on a portion of the former Clifford Rogers property and the former Philadelphia Chewing Gum property is currently being planned for redevelopment by the Township of Haverford. Refer to the ICIAP for further information.

III. DEMONSTRATION OF CLEANUP ACTIVITY QUALITY ASSURANCE AND QUALITY CONTROL

Clean-up construction quality assurance and quality control for the other previously completed portions of the remedial action are documented in the June 1991, February 1992, and the June 4, 2003 Interim Remedial Action Reports. The reports are located in the Site file.

EPA and the State reviewed the OU3 remedial action contract and construction for compliance with quality assurance and quality control (QA/QC) protocols. Construction activities at the site were determined to be consistent with the ROD and the Remedial Design plans and specifications. The construction contractor, Kemron Environmental Services (Kemron), adhered to the approved Construction Quality Assurance Plan (CQAP), which is part of the Remedial Design document. The CQAP incorporated all EPA and State requirements. All confirmatory inspections, independent testing, audits, and evaluations of materials and workmanship were performed in accordance with the construction drawings, technical specification and CQAP. Construction quality assurance was performed by the appropriate contractor with Tetra Tech, NUS (Tt) ensuring that the tests were performed properly. During construction activities, an oversight engineer from Tetra Tech, NUS and either the EPA RPM and/or OSC were on-site daily. A construction meeting was held approximately every week with EPA, Tt, Kemron and State regulators to review construction progress and evaluate and review the results of QA/QC activities associated with OU3.

The Quality Assurance Project Plan (QAPP) incorporated all EPA and State QA/QC procedures and protocol. EPA analytical methods were used for all confirmation and monitoring samples during RA activities. Sampling of soil and water followed the EPA protocol *Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods*. EPA and the State determined that analytical results are accurate to the degree necessary to assure satisfactory execution of the RA.

QA sampling was conducted for the soils excavated from the ROS area. The sampling procedures are outlined in the Site Sampling and Analysis Plan (SAP). Analysis was conducted on-site to determine if PCP levels on the side walls of the excavation met the action levels. If the results were above the action level, the excavation was extended four feet laterally and sampled again until the action level was met. In accordance with the SAP, confirmatory samples were sent to the lab for analysis of PCP and dioxin. A few confirmatory samples were above the action level and the excavation was extended until subsequent confirmatory samples were below the action level. There was one deep sample (CS12DL8-2010), indicated on Figure 1, that the lab samples identified as still above the action level. This area was not excavated further because the sample was below the groundwater level and the sample location was approximately eight feet below grade.

The cleanup action levels for the contaminated soil in OU3 were stated as follows in the ROD:

**REMEDIAL GOAL OBJECTIVES
FOR OU3B SOILS**

COC	Units	Remedial Goal Objective	Basis for Remedial Goal Objective
Benzo(a)pyrene	mg/kg	1.3	Site-Specific Risk-Based Value
Dieldrin	mg/kg	1.1E-02 ¹	Statewide Health Standards Soil to Groundwater
PCP	mg/kg	0.5 ¹	Statewide Health Standards Soil to Groundwater
Total 2,3,7,8-TCDD TEQ	mg/kg	1.2E-04	Statewide Health Standards Direct Contact
Aluminum	mg/kg	6.2E+03	Site-Specific Risk-Based Value
Iron	mg/kg	1.5E+04	Site-Specific Risk-Based Value
Manganese ²	mg/kg	1.6E+02	Site-Specific Risk-Based Value

¹Soil to groundwater value based on 1/10 the generic value for saturated soils.

²The site-specific risk-based value presented is for the risk for construction workers, which is the most stringent. The site-specific risk-based value for child and adult resident are 5.7E+02 mg/kg and 5.5E+03 mg/kg, respectively.

IV. ACTIVITIES AND SCHEDULE FOR SITE COMPLETION

Construction completion at the Site shall be documented by the signature of this Preliminary Close-Out Report. All preliminary construction completion requirements for the Site have been met as specified in OSWER Directive 9320.2-09A-P. The following activities necessary to achieve site completion are expected to be completed according to the following schedule:

TASK	ESTIMATED COMPLETION	RESPONSIBLE ORGANIZATION
Fourth Five-Year Review Report	September 2010	EPA
Complete Punch List Items	October 8, 2010	Kemron
Complete Final Inspection	October 15, 2010	EPA
Finalize Institutional Control and Assurance Plan	December 2010	EPA
Approve Interim Remedial Action Report for OU3	January 2011	EPA
Deletion from NPL	December 2029	EPA

V. SUMMARY OF REMEDIATION COSTS

Operable Unit One

The original cost estimates in the OU1 ROD for capital costs were \$18,800 for the no action remedy for the soil, \$155,400 for the oil/water separator and \$161,200 for the staged waste material. The remedial action costs plus 10 years of O&M costs were \$686,547, as documented for the Superfund State Contract for OU1.

The non-time critical removal action to cap the contaminated soil on the NWP and neighboring properties cost \$5,775,520.

Operable Unit Two

The original capital cost estimate to implement the remedial action described in the OU2 ROD was \$4,997,000. The actual cost to complete the work was \$8,806,103. The RA Report for OU2 documents the reasons for this cost over run which include an increase in the period of performance, changes in design based on field conditions, waste disposal costs, and access issues.

Operable Unit Three

The original present worth cost estimate to implement the remedial actions described in the OU3 ROD was \$8,895,000. The cost estimate detailed in the OU3 ROD includes a capital cost of \$5,432,000 and an annual O&M cost of \$279,000.

In the OU3 ROD it was determined that the existing groundwater extraction and treatment facility would need to be upgraded to treat 70 gallons per minute. This work was completed as part of the OU2 long-term remedial action to optimize the treatment facility. This upgrade cost \$752,000, which included a building expansion, procurement and installation of all pre-treatment equipment, engineering design and construction management.

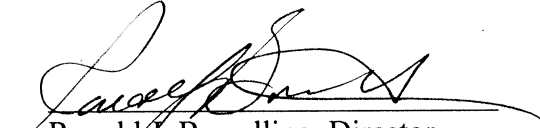
Actual RA construction cost for the remainder of OU3 was approximately \$3,625,000. This includes \$3,200,000 funded with ARRA funding and \$425,000 funded through a Special Account. The O&M costs are still what were estimated in the ROD, \$279,000 per year.

VI. FIVE-YEAR REVIEW

Pursuant to CERCLA section 121 (c) and as provided in the current guidance on Five Year Reviews [*Comprehensive Five-Year Review Guidance, OSWER Directive 9355.7-03B-P, June 2001*], EPA must conduct a statutory Five-Year Review because hazardous substances remain

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on-site above health-based levels. The first Five-Year Review for the Site was signed on July 3, 1997. The second Five-Year Review was dated August 10, 2000 and the third was dated August 19, 2005. EPA is currently preparing the fourth Five-Year Review which we expect to issue shortly.



Ronald J. Borsellino, Director
Hazardous Site Cleanup Division

9/16/10
Date

