FIFTH FIVE-YEAR REVIEW REPORT FOR SCIENTIFIC CHEMICAL PROCESSING SUPERFUND SITE BERGEN COUNTY, NEW JERSEY

Prepared by

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Dec. 14, 2017
Date

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LIST OF ABBREVIATIONS & ACRONYMS

ARAR	Applicable or Relevant and Appropriate Requirement
CEA	Classification Exception Area
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
DDT	Dichlorodiphenyltrichloroethane
EPA	United States Environmental Protection Agency
FYR	Five-Year Review
HI	Hazard Index
ICs	Institutional Controls
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NJDEP	New Jersey Department of Environmental Protection
NPL	National Priorities List
O&M	Operation and Maintenance
OU	Operable Unit
PCBs	Polychlorinated biphenyls
PRP	Potentially Responsible Party
RAO	Remedial Action Objective
RI/FS	Remedial Investigation and Feasibility Study
ROD	Record of Decision
SCP	Scientific Chemical Processing
TBC	To be considered
ug/l	micrograms per liter
UU/UE	unlimited use and unrestricted exposure
VOCs	Volatile organic compounds

I. INTRODUCTION

The purpose of a five-year review (FYR) is to evaluate the implementation and performance of a remedy in order to determine if the remedy is and will continue to be protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in FYR reports such as this one. In addition, FYR reports identify issues found during the review, if any, and document recommendations to address them.

The U.S. Environmental Protection Agency (EPA) is preparing this FYR pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121, consistent with the National Contingency Plan (NCP)(40 CFR Section 300.430(f)(4)(ii)), and considering EPA policy.

This is the fifth FYR for the Scientific Chemical Processing (SCP) Superfund Site. The triggering action for this statutory review is the completion date of the previous FYR, which was 2013. The FYR has been prepared due to the fact that hazardous substances, pollutants or contaminants remain at the site above levels that allow for unlimited use and unrestricted exposure (UU/UE).

The remedial action for the site has been divided into three operable units (OUs). OU1 involved implementation of an interim remedy at the site to prevent exposure to soil and shallow groundwater on the former SCP facility property, and prevent further migration of the contamination off-property while a more permanent solution was evaluated. OU2 involved implementing the permanent on-property remedy. OU3 addresses off-property and deep groundwater contamination, and the remedy for this OU has not yet been implemented. This FYR addresses the final remedy for the SCP property, which is OU2.

The SCP Superfund Site FYR was led by Alice Yeh, Remedial Project Manager (EPA Region 2). Participants included Michael Scorca, Hydrologist (EPA Region 2); Marian Olsen, Human Health Risk Assessor (EPA Region 2); Michael Clemetson, Ecological Risk Assessor (EPA Region 2); Sophia Rini, Community Involvement Coordinator (EPA Region 2); and Steve Finn, SCP Facility Coordinator (Golder Associates). The review began on 3/31/2017.

Site Background

The SCP site lies at the corner of Paterson Plank Road (Route 120) and Gotham Parkway in Carlstadt, New Jersey. Peach Island Creek, a tributary to Berry's Creek, forms the site's northeastern border and a trucking company forms the site's southeastern border (see Figure 1). The site stratigraphy consists of the following units, in descending order with depth: earthen fill material (average thickness of approximately 8.4 feet across the site); peat (thickness ranging from 0 to approximately 1.8 feet across the site); gray silt (average thickness ranging from 0 to 10 feet across the site); varved clay (consisting of stratified glacial-lake deposits, average thickness of 0 to 20 feet), till (consisting of sand, clay and gravel, average thickness of approximately 20 feet across the site); and bedrock.

The site is underlain by three groundwater units, which are described as the "shallow aquifer," the "till aquifer" and the "bedrock aquifer" in descending order with depth. The natural water table is found in the shallow aquifer at a depth of approximately two feet below the land surface. The till aquifer consists of the water-bearing unit between the varved clay and the bedrock. The bedrock aquifer has the greatest yield of the three aquifers and is used regionally for potable and industrial purposes. Results of

hydrogeologic tests conducted during the RI indicate that the three aquifers are hydraulically connected. Chemical analyses of groundwater from the three aquifers provide further support to this finding.

The land on which the SCP site is located was purchased in 1941 by Patrick Marrone, who used the land for solvent refining and solvent recovery. Mr. Marrone eventually sold the land to a predecessor of Inmar Associates, Inc. Aerial photographs from the 1950s, 1960s and 1970s indicate that drummed materials were stored on the site. On October 31, 1970, the SCP Company leased the site from Inmar Associates. SCP used the site for processing industrial wastes from 1971 until the company was shut down by court order in 1980.

While in operation, SCP received liquid by-product streams from chemical and industrial manufacturing firms, and then processed the materials to reclaim marketable products which were sold to the originating companies. In addition, liquid hydrocarbons were processed to some extent, and then blended with fuel oil. The mixtures were typically sold back to the originating companies, or to cement and aggregate kilns as fuel. SCP also received other wastes, including paint sludge, acids and other unknown chemical wastes.

Currently, the land use at the site and in the vicinity of the site is classified as light industrial by the Borough of Carlstadt. The establishments in the immediate vicinity of the site include a bank, horse stables, warehouses, freight carriers and service sector industries. There is a residential area located approximately 1.2 miles northwest of the site.

FIVE-YEAR REVIEW SUMMARY FORM

SITE IDENTIFICATION		
Site Name: Scientific Chemical Processing		
EPA ID: NJD070565403		
Region: 2	**State:** NJ	**City/County:** Carlstadt, Bergen County

SITE STATUS	
NPL Status: Final	
Multiple OUs? Yes	**Has the site achieved construction completion?** No

REVIEW STATUS
Lead agency: EPA ***[If "Other Federal Agency", enter Agency name]*:**
Author name (Federal or State Project Manager): Alice Yeh
Author affiliation: EPA
Review period: 3/31/2017 - 12/29/2017
Date of site inspection: 9/15/2017
Type of review: Statutory
Review number: 5
Triggering action date: 2/28/2013
Due date *(five years after triggering action date)*: 2/28/2018

II. RESPONSE ACTION SUMMARY

Basis for Taking Action

A remedial investigation and feasibility study (RI/FS) of the site was completed by the potentially responsible parties (PRPs) in 1990. The RI focused on the most heavily contaminated zone at the site, which included the contaminated soil, sludge and shallow groundwater (down to the clay layer) on the SCP property itself (hereinafter referred to as the Fill Area). Data from the deeper groundwater, both on and off of the property, as well as from Peach Island Creek, which runs adjacent to the property, were also collected. Overall, the RI found that the Fill Area, the deeper groundwater both on- and off-property, and the water and sediment from Peach Island Creek were all contaminated with site-related contaminants. The contaminants of concern found in the soil and groundwater at the site include volatile organic compounds (VOCs) [such as benzene, benzidine, chloroform, trans 1,2-dichloroethylene, 1,1-dichloroethylene, 1,2-dichloroethane, 1,1,2,2-tetrachloroethane, tetrachloroethylene, methylene chloride, trichloroethylene and vinyl chloride], semi-volatile organic compounds (generally polynuclear aromatic hydrocarbons), polychlorinated biphenyls (PCBs), pesticides (such as aldrin, dieldrin and DDT) and metals (such as arsenic).

The baseline risk assessment identified the following pathways through which humans may potentially be exposed to site contaminants: direct contact with surface soil, inhalation of volatile organics, inhalation of suspended solids and ingestion of groundwater and surface water.

The cancer risks and non-cancer hazards at the site exceeded the risk range and goal of protection for non-cancer health effects of a Hazard Index (HI) equal to 1 for the following receptors: 1) site worker exposed through ingestion, inhalation and dermal contact with surface soil and groundwater (risks of 2.6×10^{-1} and HI = 5,042); 2) construction worker exposed through ingestion and dermal contact with subsurface soil (risks of 2.8×10^{-3} and HI = 31); and 3) adolescent trespasser exposed through ingestion, inhalation, and dermal contact (risks of 2.5×10^{-3} and HI = 234).

An RI/FS for OU3, off-property and deep groundwater contamination, was completed by the PRPs in 2012. The RI found two distinct areas of contamination in the OU3 groundwater. The primary contaminants of concern in the northern area are VOCs, predominantly tetrachloroethylene, trichloroethylene, cis-1,2-dichloroethene and vinyl chloride. The primary contaminant of concern that defines the contamination in the southern area is 1,4-dioxane, although other contaminants, including benzene and 1,1-dichloroethane, are also present at elevated concentrations.

The baseline human health risk assessment identified cancer risks and non-cancer hazards for OU3 exceeded the risk range and goal of protection for non-cancer health effects of an HI equal to 1 for the following receptors: 1) future adult resident exposed through ingestion of groundwater (risks of 3×10^{-3} and HI = 54); and 2) industrial worker exposed through ingestion of groundwater (risks of 9×10^{-4} and HI = 19).

An ecological risk assessment was determined to be unnecessary for OU2. The OU2 remedy specified that ecological risks would be addressed as part of the OU3 remedy. At that time, Peach Island Creek was to be addressed as part of the SCP site. Subsequently, the OU3 Record of Decision (ROD) documented that contamination in the creek, and any associated ecological risks, would be addressed as part of the Berry's Creek Study Area operable unit of the Ventron/Velsicol Superfund Site.

Response Actions

Initial Response

In 1983, the site was placed on the National Priorities List (NPL). Between 1983 and 1985, the New Jersey Department of Environmental Protection (NJDEP) required the site owner to remove approximately 250,000 gallons of wastes stored in tanks, which had been abandoned at the site.

In May 1985, EPA assumed the lead role in the response actions, and issued notice letters to over 140 PRPs. EPA offered the PRPs an opportunity to perform an RI/FS for the site, and in September 1985, EPA issued administrative orders on consent to the 108 PRPs who had agreed to conduct the RI/FS. Subsequently, in October 1985, EPA issued a unilateral order to 31 PRPs who failed to sign the consent order. The unilateral order required the 31 PRPs to cooperate with the 108 consenting PRPs on the RI/FS.

In the fall of 1985, EPA also issued an administrative order to Inmar Associates, one of the PRPs at the site, requiring the company to remove and properly dispose of the contents of five tanks containing wastes contaminated with PCBs and numerous other hazardous substances.

Inmar removed four of the five tanks in 1986. The fifth tank was not removed at the time due to the high levels of PCBs and other contaminants found in that specific tank, and the unavailability of disposal facilities capable of handling those wastes. The fifth tank and its contents were subsequently removed and disposed of by the PRPs in February 1998.

Remedy Selection

EPA issued a ROD for an interim remedy for the Fill Area (OU1) in September 1990. The goal of the interim remedy was to reduce contaminant migration from the site and prevent exposure to contamination at the site until a permanent remedy was implemented. Interim measures included:

- A vertical containment wall comprised of a soil-bentonite slurry with an integral high density polyethylene membrane surrounding the Fill Area and keyed into an underground clay layer;
- A sheet pile retaining wall along Peach Island Creek;
- A high density polyethylene horizontal infiltration barrier covering the property;
- An extraction system for shallow groundwater within the containment area with discharge to an above-ground storage tank for off-site disposal;
- A chain link fence around the property to restrict access; and
- Regularly scheduled groundwater sampling, plus monitoring of the interim remedy to assure it remained effective until a final remedy was selected.

While implementing the OU1 remedy, EPA continued to oversee additional RI/FS work which would provide information to select a final remedy for the Fill Area, as well as a remedy for the deep and off-property groundwater.

A ROD selecting the final remedy for the Fill Area (OU2) was signed in August 2002.

The Remedial Action Objectives (RAOs) for OU2 are to:

- Mitigate the direct contact risk and leaching of contaminants from soil, fill material and. sludge into the groundwater;

- Reduce the toxicity and mobility of the Hot Spot contaminants via treatment;
- Provide hydraulic control of the shallow aquifer by maintaining an inward groundwater gradient; and
- Perform remediation in such a manner that may allow site reuse for certain limited commercial purposes.

The major elements of the selected remedy included:

- Air stripping of the Hot Spot area until levels of VOCs are reduced to whichever is more stringent: the average VOC levels in Fill Area outside the Hot Spot, or to a level where interference with stabilization will not occur. VOCs released during treatment will be collected and treated on site, or adsorbed to assure no negative impacts to the surrounding community.
- Soil stabilization of the Hot Spot using cement and lime, so that the Hot Spot is solidified to performance standards to be developed during the design phase of the remedy. The solidification and stabilization will effect containment of PCBs and other nonvolatile or semi-volatile contaminants.
- Installation of a landfill cap over the entire Fill Area. The cap will consist of a two-foot thick "double containment" cover system which will be constructed over the entire area currently circumscribed by the existing slurry wall.
- Improvement of the existing, interim groundwater recovery system, which consists of aboveground piping, and recovery wells screened, in the Fill Area. The improvements will include the installation of new extraction wells along the perimeter of the site, construction of underground clean utility corridors for the wells, and piping and electrical system to allow more flexibility for future uses of the site. The extracted groundwater will either be collected in the existing aboveground tank for disposal, or pumped, via sewer connection, to the Bergen County publicly owned treatment works (POTW) for treatment.
- The existing sheet pile wall along Peach Island Creek, which protects the slurry wall along the riparian side of the Fill Area, will be improved and upgraded.
- Institutional controls restricting use of the property.

In September 2012, EPA selected a final remedy to address the deep and off-property groundwater contamination.

The RAOs for OU3 are to:

- Prevent exposure to contaminated groundwater above acceptable risk levels;
- Prevent or minimize future migration of contaminants of concern in the groundwater; and
- Restore groundwater quality to the lower of the federal drinking water standards or the New Jersey Groundwater Quality Standards.

The major components of the selected remedy are:

- Treating contaminated off-property and deep groundwater using in-situ treatment technologies, by injecting a substance or substances into the groundwater to cause or enhance the breakdown of the contaminants of concern to less toxic forms;
- Monitored natural attenuation both during and after active treatment; and
- Institutional controls to assure that the remedy remains protective until cleanup goals are achieved.

Status of Implementation

OU1

The interim remedy was constructed from August 1991 through June 1992 by the PRPs for the site pursuant to a unilateral administrative order dated September 28, 1990. Since its implementation in 1992, based on monthly inspections and water level measurements taken as part of the OU1 Operations and Maintenance (O&M) Plan, the interim remedy effectively mitigated the risks from direct contact with Fill Area contamination and the spread of Fill Area contamination to deeper groundwater and Peach Island Creek before being replaced/updated by the OU2 Fill Area final remedy.

OU2

The OU2 remedy was implemented by the PRPs, with EPA oversight, pursuant to a Consent Decree entered in September 2004. Design of the OU2 remedy began in June 2004 and was completed in June 2007. Construction of the remedy was initiated in April 2008.

Construction of the final cover system required the removal and disposal of the temporary cap which was put in place as part of the interim remedy. The final cover system consists of a five- to six-inch grading layer, a geosynthetic clay layer, a geomembrane layer, a drainage layer, an 18-inch thick (minimum) cover layer and finally a vegetative support layer on top. Treatment and stabilization activities for the Hot Spot area of contamination were initiated once the cap on the first half of the property was completed. However, performance standards for the treatment and stabilization were not met. As such, and as per the terms of the ROD, the Hot Spot area was excavated and disposed of at an EPA-approved off-site disposal facility. A total of about 3,400 tons of sludge and soil were excavated from this area, after which the cap over the entire property was completed. Access roads and a drainage ditch surround the perimeter of the capped area to allow for maintenance of the cap and drainage of water during storm events.

Implementation of the OU2 remedy included the installation of a new sheet pile wall adjacent to Peach Island Creek. The new wall was installed between the existing slurry wall and the old sheet pile wall, and was driven deeper than the original wall. The original wall was then partially removed (i.e., cut to the low water level). The OU2 remedy also included installation of an enhanced groundwater recovery system, which consists of ten one-foot diameter wells equipped with pneumatic operated submersible pumps, a water conveyance and storage system, and a monitoring system. The groundwater collected from the conveyance system is shipped off-site for disposal on a periodic basis. Implementation of the OU2 remedy was completed in October 2011.

OU3

EPA is overseeing the remedial design of the OU3 remedy by the potentially responsible parties. Implementation of the OU3 remedy has not yet begun and is not part of this review.

Institutional Controls (ICs)

Table 1: Summary of Planned and/or Implemented ICs

Media, engineered controls, and areas that do not support UU/UE based on current conditions	ICs Needed	ICs Called for in the Decision Documents	Impacted Parcel(s)	IC Objective	Title of IC Instrument Implemented and Date (or planned)
Soil, Groundwater	Yes	Yes	SCP Property	Restrict use of the property and ensure effectiveness of the remedy	Easement and Deed Notice by the Borough of Carlstadt to be executed as part of the final remedy
Groundwater	Yes	Yes	SCP Property and off-property	Restrict use of affected groundwater	Classification Exception Area/Well Restriction Area by NJDEP to be completed with southern area remedial action

Systems Operations/Operation & Maintenance

The O&M Plan for OU1 was intiated in 1992 and replaced by the OU2 O&M Plan completed in February 12, 2012.

The O&M Plan for OU2 includes, but is not limited to, the following major elements:

- Monthly water level measurements from seven exterior (i.e., outside of the slurry wall) and 12 interior piezometers, to assure that inward gradients in the shallow groundwater are maintained. Figure 1 shows the locations of the piezometers as well as the shallow groundwater wells.
- Annual sampling and analysis of four shallow off-property groundwater wells for volatile and semi-volatile organic compounds, pesticides, PCBs and metals.
- Monthly inspections of the general site conditions, including the access roads, sheet pile wall and fence, with additional inspections following any significant storm event and repairs as needed.
- Monthly inspection of the shallow groundwater collection system, with repair as needed.
- Quarterly inspections of the cover and surface water collection system, with additional inspections after significant storm events and repairs as needed.

All work is being conducted by the PRPs for the site through their contractor, Golder Associates, with EPA oversight. Golder submits O&M reports. The site is currently vacant and a fence surrounding the property remains in place.

In addition, surface water in Peach Island Creek had been tested at least annually from 1992 to 2013. The data clearly indicate that the sheet pile wall is effectively preventing contamination from migrating from the Fill Area to the creek. As such, surface water monitoring as part of the SCP site has been discontinued in 2013. Note that Peach Island Creek is tidally connected to Berry's Creek, and is currently part of the ongoing investigation being conducted at that Study Area. As was documented in

the previous FYR, contamination in Peach Island Creek will be addressed as part of the Berry's Creek Study Area operable unit of the Ventron/Velsicol Superfund Site.

Potential site impacts from climate change have been assessed, and the performance of the remedy is currently not at risk due to the expected effects of climate change in the region and near the site. A site inspection conducted by Golder on October 31, 2012, immediately after Superstorm Sandy, showed that although area roads were still locally flooded, the cover system, perimeter drainage channels and site access roads were free of standing water, and there was no evidence of erosion. Based on the presence of vegetative debris, it appears that flood waters temporarily encroached on a small portion of the site adjacent to Peach Island Creek, but no damage resulted to the remedy.

III. PROGRESS SINCE THE LAST REVIEW

The fourth FYR for the site was completed in February 2013. The 2013 FYR found the OU2 remedy to be protective of human health and the environment and did not identify any issues or recommendations.

In March 2014, a consent decree was finalized for the PRPs at the site to implement the remedial design and remedial action for OU3, under EPA oversight. The remedial design for the Northern Area of the site was approved in July 2017, and the remedial design for the Southern Area of the site is ongoing.

In March 2017, the Borough of Carlstadt signed an agreement with a solar panel company for the company to install a solar panel farm on the SCP site. The solar panel farm is in design, with the company coordinating closely with the PRPs implementing the remedy at the site to ensure that the solar panels do not impact the remedy.

IV. FIVE-YEAR REVIEW PROCESS

Community Notification, Involvement & Site Interviews

On October 2, 2017, EPA Region 2 posted a notice on its website indicating that it would be reviewing site cleanups and remedies at 31 Superfund sites in New York and New Jersey, including the SCP site. The announcement can be found at the following web address: https://wcms.epa.gov/sites/production/files/2017-10/documents/five_year_reviews_fy2018_final.pdf.

In addition to this notification, a public notice was made available via email to the Borough of Carlstadt on October 16, 2017 with a request that the notice be posted to the town's website and in appropriate municipal offices. The purpose of the public notice was to inform the community about the FYR and to list where the final report will be posted. The notice also included the Remedial Project Manager and the Community Involvement Coordinator address and telephone numbers for questions or comments related to the FYR process or the site. Once the FYR is completed, the results will be made available on EPA's SCP webpage at https://www.epa.gov/superfund/scp and at the local site repository located at the William E. Demody Free Public Library at 420 Hackensack Street in Carlstadt, New Jersey.

No interviews were conducted as part of this FYR.

Data Review

The OU2 groundwater extraction system has been in operation since 2009. The total volumes of groundwater removed in calendar years 2013 through 2016 are as follows:

- Approximately 77,015 gallons in 2013
- Approximately 37,788 gallons in 2014
- Approximately 28,300 gallons in 2015
- Approximately 22,271 gallons in 2016

Groundwater levels at the piezometers inside the slurry wall during this time (2013-2016) were fairly stable and were consistently almost three feet below the initial levels observed before the 2009 system startup. Variable groundwater levels observed at the piezometers outside the slurry wall were due to fluctuations in local groundwater levels. Groundwater levels inside the wall generally remained lower than levels outside the wall, indicating that inward gradients were generally maintained.

Groundwater is sampled annually at four shallow wells outside the property: MW-8S and MW-9S at the southern boundary, and MW-11S and MW-12S at the northern boundary (see Figure 1). The following table summarizes shallow groundwater sampling results:

Table 2 – Shallow Groundwater Sampling Results at Four OU2 Off-Property Wells

	2013	2014	2015	2016
VOCs	None above NJDEP groundwater quality standards, except Vinyl Chloride in MW-8S (1.93 ug/l vs GWQS = 1.0 ug/l)	None above NJDEP groundwater quality standards	None above NJDEP groundwater quality standards, except Vinyl Chloride in MW-9S (3.5 ug/l vs GWQS = 1.0 ug/l)	None above NJDEP groundwater quality standards, except Vinyl Chloride in MW-8S (4.1 ug/l vs GWQS = 1.0 ug/l)
Semi-volatile organic compounds	None above NJDEP groundwater quality standards, except Bis(2-ethylhexyl) Phthalate in MW-8S (3.1 ug/l vs GWQS = 3.0 ug/l)	None above NJDEP groundwater quality standards	None above NJDEP groundwater quality standards	None above NJDEP groundwater quality standards
PCBs	Not detected	Not detected	Not detected, except Aroclor 1242 in MW-9S (13 ug/l vs GWQS = 0.5 ug/l)*	Not detected
Pesticides	Not detected	Not detected	Not detected	Not detected

*Note that sample MW-9S was observed to contain suspended sediments and high turbidity. Since this is the only detection of PCBs in any of the shallow wells being monitored, this result may be considered an anomalous detection and not representative of shallow groundwater conditions.

In summary, the OU2 remedy has been operational since July 2011 and the data indicate that inward gradients are generally being maintained. Periodic fluctuations do occur, but with the fairly stable water

levels observed within the slurry wall, most of the variability results from fluctuations in local groundwater levels outside the wall. In addition, the shallow groundwater results in four off-property wells continue to indicate that the remedy is effective. No VOCs have been detected above NJDEP Ground Water Quality Criteria since 2006, except for minor exceedances of vinyl chloride in wells at the southern boundary.

Site Inspection

The inspection of the site was conducted on 9/15/2017. In attendance were Alice Yeh, Remedial Project Manager (EPA Region 2); Michael Scorca, Hydrologist (EPA Region 2); Michael Sivak, Passaic, Hackensack and Newark Bay Remediation Branch Chief (EPA Region 2); and Steve Finn, SCP Facility Coordinator (Golder Associates). The purpose of the inspection was to assess the protectiveness of the remedy.

Conditions observed indicate that the site is being properly operated and maintained. Further, the PRP contractor is at the site on at least a monthly basis.

V. TECHNICAL ASSESSMENT

QUESTION A: Is the remedy functioning as intended by the decision documents?

The OU2 remedy consists of containment of the site's Fill Area using a soil-bentonite slurry wall, a multi-layer cover system, an extraction system for shallow groundwater and a chain link fence surrounding the property. The remedy also included excavation of the most contaminated portion of the site, with off-site disposal of the excavated material.

Contaminant data collected from the off-property groundwater monitoring wells and water levels measurements indicate that the slurry wall and groundwater extraction and treatment system are effectively preventing off-site migration of contamination. Excavation of hot spot soils and infiltration barrier prevent continued release of source material into the groundwater. Therefore, it is concluded that the remedy continues to prevent direct contact with the contaminated groundwater and soils and inhibit the spread of contamination through the groundwater.

Furthermore, institutional controls in the form of an easement limiting use of the property were placed on the property by the PRPs. The easement provides for execution of a Deed Notice as part of the final remedy restricting the placement of groundwater wells on the property. A Classification Exception Area (CEA), part of the OU3 remedy, is planned for the site to restrict access to affected groundwater. Residents in the area primarily receive their drinking water from a municipal supply. The PRPs also continue to maintain fencing around the site to ensure no trespassing.

QUESTION B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?

- **Are the exposure assumptions and toxicity data used at the time of the remedy selection still valid?**

  a. Soil. The exposure assumptions and toxicity values that were used to estimate the

potential cancer risks and noncancer hazards in the risk assessment supporting the 2002 ROD for human health followed the Risk Assessment Guidance for Superfund used by EPA. There are no significant changes in exposure assumptions that would change the risk assessment. The process that was used in the human health risk assessment is still valid. In addition, given that soils are covered with a cap, the human exposure pathways have been interrupted.

b. Groundwater. The exposure assumptions and toxicity values that were used to estimate the potential cancer risks and noncancer hazards in the risk assessment supporting the 2002 ROD for human health followed the Risk Assessment Guidance for Superfund used by EPA. There are no significant changes in exposure assumptions that would change the risk assessment. Currently, the three aquifers underlying the site are identified as Class GW-2 waters, potable aquifers.

c. Vapor Intrusion. There are currently no buildings located on the site. The vapor intrusion pathway was evaluated based on the concentrations of volatile contaminants detected at the site, including trichloroethylene and tetrachloroethylene in the shallow and deep wells. While concentrations of VOCs in the deeper wells were above vapor intrusion screening guideline values, concentrations in the shallow wells were not. Consequently, it was concluded that the relatively clean shallow groundwater (5 to 10 feet below ground surface) would effectively block the potential migration of volatile contaminants from the deeper groundwater (more than 30 feet below ground surface) to the surface. As such, it was concluded that further analysis of the vapor intrusion pathway was not necessary.

d. Arsenic and PCBs. The toxicity values for arsenic and PCBs (non-cancer only) are currently being updated through the Integrated Risk Information System, EPA's consensus toxicity database. Any changes in the toxicity values for these chemicals will be evaluated in the next FYR.

- **Are the Cleanup Values Selected in the ROD Still Valid?**

a. Soil. The selected remedies for both OU1 and OU2 were designed to prevent exposure to contaminated soil and reduce the migration of hazardous substances, pollutants and contamination from the soil to the surrounding soil or groundwater. Cleanup criteria for the hot-spot excavation were based on mass removal of sludge and overburden materials contained within the Hot Spot limits. As such, specific applicable or relevant and appropriate requirements (ARARs) were not established for the soils at the site and no soil cleanup numbers were specified in the ROD.

b. Groundwater. No cleanup values for groundwater were specified in the OU2 ROD. The New Jersey Groundwater Quality Standards were selected as ARARs for the OU3 remedy. These standards remain valid.

- **Are the remedial action objectives (RAOs) still valid?**

The RAOs for OU2 were as follows:

- Mitigate the direct contact risk and leaching of contaminants from soil, fill material and sludge into the groundwater
- Reduce the toxicity and mobility of the Hot Spot contaminants via treatment
- Provide hydraulic control of the shallow aquifer by maintaining an inward groundwater gradient
- Perform remediation in such a manner that may allow site re-use for certain limited commercial purposes.

These RAOs are still valid given the current and future land uses envisioned for the site.

QUESTION C: Has any **other** information come to light that could call into question the protectiveness of the remedy?

No.

VI. ISSUES/RECOMMENDATIONS

There are no recommendations or follow-up actions stemming from this FYR, other than the ongoing implementation of the OU2 O&M plan, and the design and implementation of the OU3 remedy.

VII. PROTECTIVENESS STATEMENT

Protectiveness Statement(s)	
Operable Unit: OU2	*Protectiveness Determination:* Protective
Protectiveness Statement: The OU2 remedy for soil and shallow groundwater on the property is protective of human health and the environment.	

VIII. NEXT REVIEW

The next FYR report for the SCP Superfund Site is required five years from the completion date of this review.

APPENDIX A – REFERENCE LIST

U.S. Environmental Protection Agency (EPA). Five-Year Review Report. February 2013

EPA. Scientific Chemical Processing Record of Decision for Operable Unit 3. September 2012

EPA. Scientific Chemical Processing Record of Decision for Operable Unit 2. August 2002

Golder Associates. Operations and Maintenance (O&M) Report. Reporting Period: July 1, 2016 to December 31, 2016. 216 Paterson Plank Road Site – Operable Unit No. 2 (OU-2) Remedy. Borough of Carlstadt, Bergen County, New Jersey. March 8, 2017.

Golder Associates. Operations and Maintenance (O&M) Report. Reporting Period: January 1, 2016 to June 30, 2016. 216 Paterson Plank Road Site – Operable Unit No. 2 (OU-2) Remedy. Borough of Carlstadt, Bergen County, New Jersey. August 26, 2016.

Golder Associates. Operations and Maintenance (O&M) Report. Reporting Period: July 1, 2015 to December 31, 2015. 216 Paterson Plank Road Site – Operable Unit No. 2 (OU-2) Remedy. Borough of Carlstadt, Bergen County, New Jersey. August 11, 2016.

Golder Associates. Operations and Maintenance (O&M) Report. Reporting Period: January 1, 2015 to June 30, 2015. 216 Paterson Plank Road Site – Operable Unit No. 2 (OU-2) Remedy. Borough of Carlstadt, Bergen County, New Jersey. November 11, 2015.

Golder Associates. Operations and Maintenance (O&M) Report. Reporting Period: July 1, 2014 to December 31, 2014. 216 Paterson Plank Road Site – Operable Unit No. 2 (OU-2) Remedy. Borough of Carlstadt, Bergen County, New Jersey. April 24, 2015.

Golder Associates. Operations and Maintenance (O&M) Report. Reporting Period: January 1, 2014 to June 30, 2014. 216 Paterson Plank Road Site – Operable Unit No. 2 (OU-2) Remedy. Borough of Carlstadt, Bergen County, New Jersey. September 9, 2014.

Golder Associates. Operations and Maintenance (O&M) Report. Reporting Period: October 1, 2013 to December 31, 2013. 216 Paterson Plank Road Site – Operable Unit No. 2 (OU-2) Remedy. Borough of Carlstadt, Bergen County, New Jersey. February 7, 2014.

Golder Associates. Operations and Maintenance (O&M) Report. Reporting Period: July 1, 2013 to September 30, 2013. 216 Paterson Plank Road Site – Operable Unit No. 2 (OU-2) Remedy. Borough of Carlstadt, Bergen County, New Jersey. November 13, 2013.

Golder Associates. Operations and Maintenance (O&M) Report. Reporting Period: April 1, 2013 to June 30, 2013. 216 Paterson Plank Road Site – Operable Unit No. 2 (OU-2) Remedy. Borough of Carlstadt, Bergen County, New Jersey. July 31, 2013.

Golder Associates. Operations and Maintenance (O&M) Report. Reporting Period: January 1, 2013 to March 31, 2013. 216 Paterson Plank Road Site – Operable Unit No. 2 (OU-2) Remedy. Borough of Carlstadt, Bergen County, New Jersey. June 10, 2013.

Golder Associates. Operations and Maintenance (O&M) Report. Reporting Period: October 1, 2011 to December 31, 2012. 216 Paterson Plank Road Site – Operable Unit No. 2 (OU-2) Remedy. Borough of Carlstadt, Bergen County, New Jersey. March 7, 2013.

Golder Associates. Final Operations and Maintenance Plan. 216 Paterson Plank Road Site. Operable Unit No. 2 (OU-2) Remedy. Borough of Carlstadt, Bergen County, New Jersey. February 10, 2012.