THIRD FIVE-YEAR REVIEW REPORT FOR ROEBLING STEEL SUPERFUND SITE BURLINGTON COUNTY, NEW JERSEY

Prepared by

U.S. Environmental Protection Agency
Region 2
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Approved by:

Date: FEB. 7, 2014

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Executive Summary

This is the third five-year review for the Roebling Steel site (site) located in Florence Township, Burlington County, New Jersey. The purpose of this five-year review is to review information to determine if the remedy is and will continue to be protective of human health and the environment. The triggering action for this statutory five-year review was the completion date of the previous five-year review (January 21, 2009).

The site is being addressed in five remedial phases or operable units, each covered by a Record of Decision (ROD). Operable Unit 1 (OU1), addressed the removal of drums, transformers, tanks, baghouse dust, chemical piles, tires, and contaminated park soil. Operable Unit 2 (OU2) addressed contaminated soil in another park. Operable Unit 3 (OU3) involves the cleanup of the slag area by installing a soil cap that will support a stormwater management system and shoreline stabilization. Operable Unit 4 (OU4) involves removal and disposal of underground storage tanks, above-ground tanks, pits, sumps, underground piping, process dust, friable asbestos abatement, decontamination and demolition of buildings, and the restoration of the historic Main Gate House. Operable Unit 5 (OU5) involves the remediation of site-wide soils, river and creek sediments, and groundwater. The remedies for OU1 and OU2 have been completed. These remedies do not require five-year reviews due to complete removal of the contamination. The remedies for OU3, OU4 and OU5 are not yet fully implemented.

The remedies for OU3, OU4 and OU5 will be protective of human health and the environment upon completion. In the interim, remedial and removal activities conducted to date have adequately addressed all exposure pathways that could result in unacceptable risks in these areas.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site Name: Roebling Steel		
EPA ID: NJD073732257		
Region: 2	**State:** NJ	**City/County:** Florence Township, Burlington County

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

REVIEW STATUS
Lead agency: EPA
Author name (Federal or State Project Manager): Tamara Rossi
Author affiliation: EPA Region 2
Review period: January 21, 2009 – January 21, 2014
Date of site inspection: November 21, 2013
Type of review: Statutory
Review number: 3
Triggering action date: January 21, 2009
Due date *(five years after triggering action date)*: January 21, 2014

Issues/Recommendations
OU(s) without Issues/Recommendations Identified in the Five-Year Review:
OU3, OU4 and OU5
Issues and Recommendations Identified in the Five-Year Review:

Five-Year Review Summary Form (continued)

Protectiveness Statement(s)		
Operable Unit: OU3	*Protectiveness Determination:* Will be Protective	*Addendum Due Date (if applicable):* Click here to enter date.
Protectiveness Statement: The remedy for OU3 is expected to be protective of human health and the environment upon completion. In the interim, remedial activities completed to date have adequately addressed all exposure pathways that could result in unacceptable risks in these areas.		
Operable Unit: OU4	*Protectiveness Determination:* Will be Protective	*Addendum Due Date (if applicable):* Click here to enter date.
Protectiveness Statement: The remedy for OU4 is expected to be protective of human health and the environment upon completion. In the interim, remedial activities completed to date have adequately addressed all exposure pathways that could result in unacceptable risks in these areas.		
Operable Unit: OU5	*Protectiveness Determination:* Will be Protective	*Addendum Due Date (if applicable):* Click here to enter date.
Protectiveness Statement: The remedy for OU5 is expected to be protective of human health and the environment upon completion. In the interim, remedial activities completed to date have adequately addressed all exposure pathways that could result in unacceptable risks in these areas.		

Roebling Steel Superfund Site
Florence Township, Burlington County, New Jersey
Third Five-Year Review Report

Introduction

The purpose of a five-year review 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 and is functioning as intended by the decision documents. The methods, findings, and conclusions of reviews are documented in the five-year review. In addition, five-year review reports identify issues found during the review, if any, and document recommendations to address them.

This is the third five-year review for the Roebling Steel site (site) located in Florence Township, Burlington County, New Jersey. This five-year review was conducted by the United States Environmental Protection Agency (EPA) Remedial Project Manager (RPM) Tamara Rossi. The review was conducted pursuant to Section 121 (c) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended, 42 U.S.C. §9601 *et seq.* and 40 CFR 300.430(f)(4)(ii), and in accordance with the *Comprehensive Five-Year Review Guidance*, OSWER Directive 9355.7-03B-P (June 2001). This report will become part of the site file.

The triggering action for this statutory review is the completion date of the previous five-year review (January 21, 2009). A five-year review is required at this site due to the fact that hazardous substances, pollutants or contaminants remain at the site above levels that allow for unlimited use and unrestricted exposure. The site consists of five OUs, some of which are addressed in this five-year review.

- Operable Unit 1 (OU1), addressed the removal of drums, transformers, tanks, baghouse dust, chemical piles, tires, and contaminated park soil.
- Operable Unit 2 (OU2) addressed contaminated soil in another park.
- Operable Unit 3 (OU3) includes the cleanup of the slag area by installing a soil cap that will support a stormwater management system and shoreline stabilization.
- Operable Unit 4 (OU4) includes removal and disposal of underground storage tanks, above-ground tanks, pits, sumps, underground piping, process dust, friable asbestos abatement, decontamination and demolition of buildings, and the restoration of the historic Main Gate House.
- Operable Unit 5 (OU5) includes the remediation of site-wide soils, river and creek sediments, and groundwater.

The remedies for OU1 and OU2 have been completed and these remedies do not require five-year reviews. The remedies for OU3, OU4 and OU5 are not yet fully implemented or are long-term operation and maintenance. These OUs are the subject of this five-year review.

Site Chronology

See Table 1 for the site chronology.

Background

Physical Characteristics

The site is a 200-acre inactive facility that was used from 1906 until 1982, primarily for the production of steel products. The site is located in Florence Township, Burlington County, New Jersey and is bordered on the north and east by the Delaware River and Crafts Creek, respectively (Figure 1). The site topography is essentially flat, except for a hill on the southern boundary of the slag disposal area that rises to Riverside Avenue and drops down a steep slope down to the banks of the Delaware River. The site is situated between 15 and 35 feet above mean sea level, in the Delaware River drainage basin, and is mostly above the 100-year flood plain except for two portions of the slag disposal area.

Geology/Hydrogeology

The site is underlain by a sequence of fill material, sands, clays, silts and gravel. These deposits, excluding the fill material, appear to correlate to the Raritan and Magothy Formations, which outcrop along the eastern bank of the Delaware River throughout much of southern New Jersey. These two formations contain major aquifers within the Atlantic Coastal Plain in New Jersey. These sandy aquifers are separated by intervening confining units composed of silt and clay. The stratigraphic units underlying the site are upper sand, upper clay, intermediate sand, lower sand, and lower clay.

Land and Resource Uses

In its current state, this is an inactive facility that was used from 1906 until 1982, primarily for the production of steel products. Prior to its inactivity, the facility contributed substantial tax revenues to Florence Township. The site, zoned as "general manufacturing" is bordered by the residential areas of the Village of Roebling to the west and southwest, the Delaware River to the north, Crafts Creek to the east, and residential/industrial development to the south. Projected future land use of the site includes mixed commercial and recreational uses. In 2001, Florence Township, the owner of the property, through the Burlington County Land Use Planning Office, completed a reuse conceptual plan for redevelopment of the property.

The groundwater underlying the site is at the margin of the Potomac-Raritan-Magothy aquifer, designated by the State of New Jersey as a Class 2A drinking water aquifer. The Village of Roebling and Florence Township obtain their potable water from public supply wells located about two miles west of the site. The City of Burlington, approximately six miles downstream from the site, obtains potable water from both the Delaware River and shallow groundwater wells. The Delaware River, in the vicinity of the site, is part of the freshwater portion of the estuary located in the Delaware River Basin Commission Water Quality Zone 2, between the head of tide at Trenton, New Jersey and northeast Philadelphia, Pennsylvania.

Ecological resources include areas of the Delaware River and Crafts Creek that support a diverse aquatic and wetlands community, including an important recreational fishery in the Delaware River. The river also represents a significant habitat for the endangered shortnose sturgeon *(Acipenser brevirostrum)*,

which is known to occur in this section of the river. Additionally, a pair of federally protected and state-endangered bald eagles *(Haliaeetus leucocephalus)* have established a nest within 0.75 miles of the site.

History of Contamination

In 1904, the John A. Roebling's Sons Company in Trenton, New Jersey, expanded its operations and purchased land in Kinkora, later known as Roebling. Riparian rights to fill in the river were obtained by John A. Roebling's Sons Company so that as the plant required additional structures, there would be room for expansion. The John A. Roebling's Sons Company owned and operated the steel wire manufacturing plant until its sale to Colorado Fuel & Iron Company, later known as CF&I Steel Corporation, (CF&I) in 1952. From 1978 through 1988, the site supported a variety of other industrial activities, including a polymer-reclamation facility, a storage facility for vinyl products, a warehouse facility, a facility for repairing and refurbishing refrigerated trailers and shipping containers, a storage facility for insulation, and an equipment storage facility for a construction company.

Steel production resulted in the generation of significant quantities of waste materials in both liquid and solid forms. The lack of properly operated environmental control facilities at the site resulted in several regulatory agencies issuing notices of noncompliance to site owners and operators.

Liquid Wastes

The majority of liquid wastes were discharged to Crafts Creek and the Delaware River. The facility contained an underground piping system of storm, sanitary, acid and oil lines, and seven discharge outfalls to the Delaware River and Crafts Creek. The discharge outfalls carried storm water, cooling water, spent acid, acid rinse waters, oily wastewaters, and effluent from the wastewater treatment plant (post-1973) to the Delaware River and Crafts Creek.

Wire was cleaned using hydrochloric or sulfuric acids to remove scale. The principal acid contamination was caused by dumping tubs of spent acid used in the cleaning departments into the sewer system without neutralization.

Large volumes of surface water and groundwater were used for plant operations. As a result of the different mill processes used at various times in each building, process water would be contaminated with iron, lead, zinc, oil, chloride, phosphate, sulfate, soap, and spent pickle acid.

Solid Wastes

Slag material was generated as a means to separate the metal impurities from the molten steel and was disposed of in the slag area along the Delaware River. The slag area was used primarily for the disposal of slag. Materials disposed in the landfill included: spent refractory brick, baghouse dust, well scale, furnace scale, and decommissioned process equipment.

Records were kept of the annual quantities of lead used at the site. For example, in 1965 the processes in the galvanizing, patenting, and wire mill buildings used lead, exceeding a million pounds per year. Waste lead was removed as dross, accumulated in drones and sold to off-site smelters. In addition, lead was released into the atmosphere as volatilized gases and found in residues on process equipment.

Air Pollutants

No dust control system was used during the operation of the open hearth furnaces at the site. Dust would be released within the buildings, and, of course, directly out of the stacks. When the electric arc furnaces replaced the open hearth furnaces in 1968, dust control facilities were used.

Initial Response

The site was proposed for the National Priorities List (NPL) in December 1982, and finalized on the NPL in September 1983. In May 1985, EPA began a remedial investigation and feasibility study (RI/FS) to characterize the nature and extent of the contamination present at the site. Interim measures were taken to maintain control of the site through fencing and warning signs, site security, and early response actions to stabilize the site. In December 1985, the State of New Jersey removed picric acid and other explosive chemicals from one of the on-site laboratories. EPA performed a removal action between October 1987 and November 1988, that included the removal of lab pack containers and drums containing corrosive and toxic materials, acid tanks, and compressed gas cylinders.

Basis for Taking Action

EPA conducted field investigations in multiple phases from 1985 to 1998. The purpose of these investigations was to determine the nature and extent of contamination of the entire site. The investigation results were finalized in the reports listed below and defined the following operable units:

OU1	Focused feasibility study (FFS) dated January 1990
OU2 and OU3	FFS dated June 1991
OU4	FFS dated July 1996
OU3 and OU5	RI/FS dated May 2002/July 2002

On-site buildings contained liquid and solid wastes, process dust and exposed asbestos. Site-wide surface and subsurface soils were contaminated with inorganics (antimony, arsenic, cadmium, chromium, and lead). River and creek sediments were contaminated with inorganics (arsenic, chromium, copper, iron, lead, and nickel) and polycyclic aromatic hydrocarbons (PAHs). Groundwater data showed sporadic concentrations of inorganics (arsenic, lead and zinc) which exceeded drinking water standards in a small number of wells.

Based upon the investigation results, baseline risk assessments were conducted to estimate the risks associated with current and future site conditions. The baseline risk assessment estimates the human health and ecological risk which could result from the contamination at the site in the absence of any actions to control or mitigate the contamination under current and future land uses. A qualitative assessment was performed for lead in addition to a quantitative risk assessment. The Human Health Risk Assessments found elevated risk for trespassers from dermal contact and inhalation exposures to drums, process dusts, tanks and building materials, as well as ingestion of contaminated soil by recreational children. These risks lead to the remediation of site drums, tanks and debris, and soils in the nearby recreational parks. There was also unacceptable risk to current off-site and future off-site child residents, future on-site adult residents, and future construction workers; these risks were primarily due to dermal contact and ingestion of manganese, antimony, and arsenic in soils, ingestion of trichloroethylene (TCE)

and arsenic in groundwater, and ingestion of mercury and copper from fish in Crafts Creek. Lead was also found to contribute to unacceptable health risks, with surface soil concentrations averaging 7,161 milligrams per kilogram (mg/kg), and subsurface concentrations averaging 1,838 mg/kg.

The ecological risk assessment evaluated the contaminants associated with the site in conjunction with the site-specific biological species/habitat information. The primary areas of concern were Crafts Creek and the Delaware River Back Channel, which support a diverse aquatic and wetlands community. Results of the ecological risk assessment determined that arsenic, chromium, copper, iron, lead, manganese, nickel and PAHs in the sediments are impacting or pose risks to ecological receptors in these environments.

Remedial Actions

Remedy Selection

OU1

The first ROD (OU1 ROD) for the site was signed in March 1990, and was the first of several anticipated remedial actions that continued the removal or remediation of contaminated source areas. The major components of the selected remedy for OU1 included the removal and off-site treatment and disposal of remaining drums, transformers containing oil contaminated with polychlorinated biphenyls (PCBs), the contents of exterior abandoned tanks, a baghouse dust pile, chemical piles, tire piles, and contaminated soil at the Northwest Park. Upon completion, the OU1 remedy would not require a five-year review.

OU2 and OU3

A second ROD was signed in September 1991. The remedial action objectives (RAOs) of the OU2 and OU3 ROD are:

- Reduce exposure risks through incidental ingestion, inhalation and dermal contact with the slag material and contaminated park soil.

- Minimize the potential migration of contaminants into the air, groundwater and surface water.

The major components of the selected remedy included the Southeast Park (OU2) and Slag Area (OU3). The selected remedy for OU2 included excavation of approximately 160 cubic yards of contaminated soil; off-site disposal of the contaminated soil; and backfilling and revegetation of the excavated area. Upon completion, the OU2 remedy would not require a five-year review. The selected remedy for OU3 included treatment of slag material; capping and vegetation of the 34-acre Slag Area; shoreline stabilization and stormwater management system; and long-term monitoring and institutional controls to ensure the effectiveness of the remedy. The 1991 remedy for the OU3 Slag Area was later amended in the September 2003 ROD.

OU4

A third ROD was signed in September 1996, to address the remediation of all the buildings at the site, remediation and restoration of the Main Gate House, and other historic preservation mitigation measures (OU4). The RAOs of the OU4 ROD are:

- Prevent human exposure (through ingestion, inhalation, and/or dermal contact) to contaminants in dusts and on building surfaces, where chemical concentrations exceed risk-based remediation goals.

- Removal of contamination sources to prevent further migration of contaminants to other media including soil and/or sediments, surface water and/or ground water via precipitation run-off and/or percolation. This includes contaminated buildings (and contents from the tanks, pits, sumps, and underground piping) that are in danger of deterioration and collapse, thereby posing a threat of migration of contaminants into the environment.

- Ensure that remedial actions are undertaken with due regard for the historic and cultural resource protections that apply under federal and State historic preservation laws and regulations.

The major components of the selected remedy for OU4 include the following:

- Primary (gross) decontamination, demolition, and on-site management of selected demolition debris for contaminated buildings that are structurally unsound (Group A Buildings), and decontamination of contaminated buildings that are structurally sound (Group B Buildings).

- Removal and off-site disposal of contaminated process dust, and liquid and solid wastes from the equipment, aboveground tanks, pits, and sumps. Removal and decontamination of equipment, tanks, and scrap metal prior to recycling.

- Abatement of friable asbestos in all buildings.

- Closure of contaminated underground storage tanks and drainage of underground piping systems.

- Historic preservation mitigation measures for the buildings, machinery, and curation of archives.

- Implementation of institutional controls to ensure the effectiveness of the remedy, such as deed restrictions to limit future uses of the buildings that remain.

OU3 Amended Remedy and OU5

A fourth ROD was signed in September 2003, to address remediation of site-wide soil, sediments in the Delaware River and Crafts Creek, and groundwater and amend the 1991 OU3 remedy. The RAOs for the ROD are:

Soils:

- Prevent human exposure to contaminated site-wide soils and slag material based on current and

anticipated future uses.

- Reduce risk to ecological receptors from exposure to contaminated soils and slag material to acceptable levels.

- Minimize contaminant migration from the soils and slag material to the groundwater and surface waters to levels that ensure the beneficial reuse of these resources.

- Comply with Applicable or Relevant and Appropriate Requirements (ARARs) and To-Be-Considered (TBCs) guidelines consistent with current and anticipated future use, or request waivers.

Sediments:

- Reduce risk to ecological receptors from exposure to contaminated sediments to acceptable levels.

- Comply with ARARs and TBCs consistent with current and anticipated future use, or request waivers.

Groundwater:

- Restore the groundwater to drinking water standards within a reasonable time frame and reduce further contamination of groundwater.

- While the RAO was to restore the aquifer to drinking water quality, EPA Region 2 has determined that it is technically impracticable to restore the groundwater to meet ARARs and invoked a Technical Impracticability Waiver for this site.

The major components of the selected remedy for OU5, which took into consideration the amendment of the OU3 remedy, included:

Soils:

- Capping of site-wide contaminated soil, including the Slag Area. Two distinct capping options are considered based on the physical characteristics of different portions of the site, and the current and potential future uses of each portion, Option (a) soil/asphalt, and Option (b) soil only.

- The cap will support a stormwater management system and erosion controls along the shoreline.

- Implementation of a long-term maintenance and monitoring program to ensure the integrity of the capped areas.

- Institutional controls to restrict future excavations through the soil cap and limit future land uses.

Sediments:

- Dredging of the contaminated sediments found in the Delaware River and Crafts Creek.

- Dewatering and capping of the dredged sediments on-site.

- Backfill by placement of a sandy loam soil with organic matter and restoration of dredged areas by re-establishing wetlands.

Groundwater:

- Implementation of a long-term groundwater sampling and analysis program to monitor the contaminant concentrations in the groundwater at the site, to assess the migration and attenuation of these contaminants in the groundwater over time.

- Institutional controls to restrict the installation of wells and the use of contaminated groundwater in the vicinity of the site.

Remedy Implementation

The remedial design/remedial action (RD/RA) was conducted in conformance with the RODs for the various OUs and implemented in a phased approach (Figure 2). EPA has completed major removal and remedial actions at the site, thereby significantly reducing the potential for exposure to hazardous materials on or off the site.

A removal action was conducted between October 1987 and November 1988. The total quantity of material removed off-site for treatment, disposal, and/or recycling was the following: 300 lab pack containers of chemicals; 3,200 full and empty drums; 120 cubic yards of crushed and emptied drums; three pounds of metallic mercury; over 35 tons of baghouse dust; one drum of hazardous waste-containing cyanide; 10 compressed gas cylinders; 3,000 gallons of sulfuric acid and 2,150 gallons of phosphoric acid; and 239,000 pounds of base neutral solids in drums.

OU1

The OU1 RA was completed in September 1991 and continued the removal of contaminated source areas. The total quantity of material removed off-site for treatment, disposal, and/or recycling was the following: 263 overpacked drums and 663 crushed drums; 45,864 gallons of transformer oil and 860,709 pounds of transformer carcasses; 266,843 gallons of tank liquids and 1,351 tons of tank sludges; 800 tons of baghouse dust; 251 tons of chemical piles and asbestos; 126 tons of burnt tires; 261 tons of recyclable tires; and excavation of park soil (640 cubic yards).

OU2

The OU2 RA was completed in March 1995. Approximately 640 cubic yards of park soil contaminated with inorganics was excavated to residential soil levels that allow for unrestricted use. The park area was restored with clean soil and vegetation.

OU3

OU3 RD and construction activities are ongoing. Shoreline stabilization of the Slag Area is a remedy component of both the 1991 ROD and 2003 ROD Amendment. OU3 RD and construction activities for

the shoreline stabilization component were completed in July 2006 and November 2006, respectively. Construction activities included grading the shoreline slopes, placement of a geotextile fabric and placement of riprap rock to construct the revetment. Installation of the 3,000 linear feet of shoreline revetment stabilizes the Slag Area and better prepares the Slag Area to receive the dredged sediments. The Slag Area was used for placement of dredged river and creek sediments. Dredging activities have been completed and the capping of the placed sediments in the Slag Area is underway.

OU4 (Buildings)

OU4 RD activities for the remediation of the buildings and sources of contamination were initiated in June 1997 and completed in June 2000. The remedial design consisted of friable asbestos removal, building demolition and building decontamination. The OU4 RA for the buildings and sources of contamination was completed in May 2011.

Work conducted between 1998 and 2008 related to building demolition and remediation of sources of contamination was extensive, and is described in the 2008 OU4 Remedial Action Report. Work conducted between 2009 and 2011 related to building demolition and remediation of sources of contamination is described in the 2013 Addendum to the OU4 Remedial Action Report. A total of 19 buildings and structures were demolished including segregating demolition debris, recycling steel debris, and disposal of all wastes generated as a result of construction activities. Sources of contamination removed included friable pipe insulation, underground chemical lines, underground storm sewer piping, an underground water tunnel and oil-contaminated soil.

OU4 (Main Gate House)

The OU4 RA includes restoration of the Main Gate House and Ambulance Garage consistent with the National Historic Preservation Act. The design documents were completed in March 2005. The design consisted of three main components: rehabilitation of the exterior structures to create a weather-tight building and demolition of nonhistoric buildings; rehabilitation of the interior such that it would support a functioning museum and the construction of connector structures that link the buildings; and remediation of the surrounding soils within the area of the future museum. The contaminated soil would be covered with two feet of soil, sidewalks and a parking area. The remedial design also included the repair and stabilization of the gantry crane and flag pole, and the installation of selected artifacts on foundations. Construction work on the Main Gate House and soil capping seven acres around the Main Gate House museum building was conducted between December 2005 and June 2009.

OU4 (Historic Equipment and Machinery)

Historic preservation mitigation measures are planned to address the machinery and equipment located within and adjacent to Buildings 92 and 93. Buildings 92 and 93 provide temporary protection of the items and will be demolished after historic preservation mitigation measures are completed.

OU5

The OU5 RA for the soil component has been completed in two areas of the site.

Soil capping of five acres and construction of the New Jersey Transit River Line station at Roebling was

completed in June 2005. A deed notice was placed on the New Jersey Transit River Line station portion of the site to limit any alteration, improvement or disturbance of site soils.

Soil capping of six acres, stabilization of 1,300 linear feet of shoreline, and habitat restoration activities at the Isolated Parcel were completed in March 2012. The Isolated Parcel is located on the eastern end of the site.

The soil remedy of remaining site soils is planned to be performed in conjunction with the redevelopment of the property.

Institutional Controls

Institutional controls for OU3, OU4 and OU5, such as deed restrictions, will be completed when remedial actions are fully implemented. The OU4 ROD required that deed restrictions limit future uses of the buildings that remain, if any. The OU3 and OU5 ROD required that deed restrictions limit future excavations through the soil cap, limit future land uses, and restrict the installation of wells and the use of contaminated groundwater in the vicinity of the site. A deed notice was placed on the New Jersey Transit River Line station portion of the site to limit any alteration, improvement or disturbance of site soils.

System Operations/Operation and Maintenance

The operation and maintenance (O&M) requirements will be necessary for several components of the remedy upon completion and implemented through different plans. These will include long-term monitoring and maintenance of soil capped areas, shoreline revetment and wetland restoration in Crafts Creek and the Delaware River Back Channel. New Jersey Transit implements an O&M plan for maintenance of the soil cap at the River Line Roebling station and Florence Township's Roebling Museum implements an O&M plan for the maintenance of the Main Gate House building facilities and adjacent soil-capped area.

Progress Since the Last Five-Year Review

The second five-year review for the site was completed by EPA in 2009. It concluded that OU3, OU4 and OU5 will be protective of human health and the environment upon completion, and in the interim, exposure pathways that could result in unacceptable risks are under control since site security and fencing are in place to restrict trespassers from entering the site. All immediate threats at the site have been addressed, and upon completion, the remedy is expected to be protective of human health and the environment. No issues or recommendations were identified except that the remedial actions need to be fully implemented. Progress on the remedial actions for OU3, OU4 and OU5 that need to be fully implemented is described below.

<u>OU4</u>

The Main Gate House restoration and soil capping of seven adjacent acres was completed in June 2009.

Demolition and decontamination of approximately 19 buildings, demolition of concrete building foundations and equipment footings, remediation of oil-contaminated soil, removal of underground

chemical lines, removal of storm sewer piping to the main outfall in the Delaware River and removal of the underground water tunnel was completed in May 2011.

A design for historic preservation mitigation measures is planned to address the machinery and equipment located within and adjacent to Buildings 92 and 93.

OU3 and OU5

OU5 Soil - Soil capping of six acres, stabilization of 1,300 linear feet of shoreline, and habitat restoration activities at the Isolated Parcel were completed in March 2012. A design for the soil remedy of remaining site soils is planned to be performed in conjunction with the redevelopment of the property.

OU5 Sediment – The design for sediment placement and capping the Slag Area was completed in September 2010 and the design for sediment dredging and shoreline stabilization of the main plant area was completed in December 2010.

The dredging of Crafts Creek and the Delaware River Back Channel sediments was completed in June 2013. This work involved dredging, transporting, dewatering and on-site placement of approximately 240,000 cubic yards of contaminated sediments. The wetland areas in Crafts Creek and the Delaware River Back Channel have been restored. These dredged areas were backfilled with sandy soil and replanted with vegetation. Installation of riprap for shoreline stabilization is near completion. The shoreline was graded and stabilized with rock to prevent shoreline erosion and recontamination of restored river and creek sediment areas.

OU3 Slag Area - The design for sediment placement and capping of the Slag Area was completed in September 2010. The Slag Area soils and placed dredged sediment will be covered with a two-foot soil cap consisting of 18-inches of common fill and 6-inches topsoil and vegetation. The Slag Area cap was designed so that the contours would be suitable for a passive recreational park. Capping activities are in progress.

OU5 Groundwater - A design investigation for the groundwater remedy is planned to develop a groundwater baseline for assessing potential groundwater impacts to surface water and identity future monitoring needs.

Five-Year Review Process

Administrative Components

The five-year review team included Tamara Rossi (EPA RPM), Jeff Josephson (EPA Section Chief), Chloe Metz (EPA Technical Support Section), Mindy Pensak (EPA Ecological Risk Assessor), Sharissa Singh, (EPA Geologist), Becky Ofrane (EPA Human Health Risk Assessor) and Patricia Seppi (EPA Community Involvement Coordinator). This is a Fund-lead site.

Community Involvement

The EPA Community Involvement Coordinator (CIC) for the Roebling Steel site, Patricia Seppi, posted

a notice on the EPA and Florence Township websites on January 15, 2014, notifying the community of the initiation of the five-year review process. The notice indicated that EPA would be conducting a five-year review for the site to ensure that the implemented remedy remains protective of public health and the environment and is functioning as designed. Once the five-year review is completed, the results will be made available at the local site repositories listed below. In addition, efforts will be made to reach out to local public officials to inform them of the results.

Roebling Public Library	Florence Township Municipal Building
1350 Hornberger Avenue	711 Broad Street
Roebling, New Jersey 08554	Florence, New Jersey, 08518

Document Review

The documents, data and information which were reviewed in completing this five-year review are summarized in Table 2.

Data Review

No monitoring data was generated that would determine effectiveness of the remedies. However, post-excavation soil sampling and sediment delineation sampling was conducted to determine if the contaminants were effectively removed from areas of concern and to document post-excavation soil conditions. The analytical results for the post-excavation samples collected from the excavation bases and sidewalls are included in the OU4 RA reports listed in Table 2. All activities completed to date have met soil, sediment and building related cleanup levels. Additionally, waste characterization sampling was performed to identify the nature and characteristics of the hazardous and non-hazardous wastes present at the site for proper off-site disposal and/or recycling. No soil vapor intrusion activities have been conducted at the site.

Site Inspection

The inspection of the site was conducted on November 21, 2013. The following parties were in attendance:

Tamara Rossi, EPA Remedial Project Manager
Jeff Josephson, EPA Section Chief
Mindy Pensak, EPA Ecological Risk Assessor
Sharissa Singh, EPA Geologist
Becky Ofrane, EPA Human Health Risk Assessor
Thomas Roche, U.S. Army Corps of Engineers
Joel Czachorowski, Sevenson Environmental Services

The purpose of the inspection was to assess the protectiveness of the remedies, including the integrity of site capping, shoreline revetment, and wetland restoration of dredged areas. No issues were identified during the site inspection. The inspection found that all the areas were in good condition and the site was properly maintained and secured with fencing and security guards.

Interviews

No interviews were conducted during the five-year review process, however EPA attends weekly construction progress meetings held by EPA, U.S. Army Corps of Engineers and the environmental remediation contractors. In addition, EPA distributed community updates and held a Community Information Session in June 2013 to provide a status update and address questions on remedial action status at the site. EPA routinely coordinates with the Florence Township, the property owner, during all remedial activities at the site and responds to comments from nearby residents. Concern has been expressed regarding dust control at the site. Dust control measures and continuous perimeter air monitoring are in place and site personnel continue to adjust their dust control efforts to take into consideration extreme weather conditions. To date, the air monitoring results are below the standard for particulate matter.

Institutional Controls Verification

Additional institutional controls for OU3, OU4 and OU5, such as deed restrictions, will be completed when remedial actions are fully implemented. A deed notice was placed on the New Jersey Transit River Line station portion of the site to limit any alteration, improvement or disturbance of site soils remains in place and is effective.

Technical Assessment

Question A: Is the remedy functioning as intended by the decision documents

The RAOs for each OU are listed in Section 4. The remedies for OU3, OU4, and OU5 are not yet fully implemented. To date the OU3 Slag Area has been stabilized and dredged sediments have been dewatered and graded in the placement area. OU3 capping activities are ongoing. To date, 71 buildings and structures have been demolished consistent with the OU4 ROD. The Main Gate House restoration has been completed and historic preservation mitigation measures related to equipment stored in Buildings 92 and 93 remain to be completed consistent with the OU4 ROD and the National Historic Preservation Act. To date, OU5 soils and sediment areas have been remediated and the long-term groundwater monitoring plan is under development. Once redevelopment plans are completed for remaining soil areas of the site, the final cap will be placed. A deed restriction has been placed on the OU5 area where the New Jersey Transit River Line station was built. Upon completion of remaining work, groundwater and land use restrictions will be placed on the property.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and Remedial Action Objectives (RAOs) used at the time of the remedy still valid?

There are no changes in the physical conditions of the site or site uses that would affect the protectiveness of the selected remedy. The exposure assumptions and the toxicity values that were used to estimate the potential risks and hazards to human health followed the general risk assessment practice at the time the risk assessment was performed. Although the risk assessment process has been updated in recent years and specific parameters and toxicity values have changed, the risk assessment process that was used is still consistent with current practice and the need to implement a remedial action remains valid.

Potential risks from exposure to site soils are driven by lead. Site-wide capping will protect human health and the environment from these potential risks. Once the remedy for site soils has been fully implemented, the site soils and slag area have been capped, and the institutional controls are put in place, EPA anticipates that these activities will adequately address exposure pathways to residually contaminated lead soils on site.

Since it has been determined that it is technically impracticable to achieve drinking water standards and that groundwater is not likely to be restored to potable use, groundwater ARARs are not applicable. The evaluation of the groundwater pathway in this five-year review focused on the possibility of vapor intrusion if buildings were to be constructed over the contaminated groundwater once the site is redeveloped. Soil vapor intrusion was not evaluated in the original risk assessment. This pathway was evaluated for this five-year review to determine if vapor intrusion concerns are present. Although there are sporadic low-level detections of VOCs in the groundwater, the primary site-related contaminants in groundwater are metals. Therefore, the potential for vapor intrusion is not likely. However, as additional groundwater data are collected, the potential for vapor intrusion will be re-evaluated and included in the operation and maintenance plan.

The receptors, exposure pathways and assumptions, along with the assessment and measurement endpoints and toxicity values used to evaluate ecological risk remain appropriate. Sediment remedial decisions and remedial action objectives were based upon conservative screening values and site specific bioassays and thus the remedy remains protective of aquatic receptors. Terrestrial portions of the site have been or will be capped with a minimum of two feet of soil cover, which will address ingestion and direct contact pathways to exposure to surface soil contaminants. In addition, sediments have been dredged to prevent direct pathways in Crafts Creek and the Delaware River Back Channel.

Remedial action objectives developed for OU3, OU4 and OU5 remain protective.

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

There is no other information that calls into question the protectiveness of the remedy.

Technical Assessment Summary

According to the data reviewed, the site inspection, and meetings, the activities completed to date at OU3, OU4 and OU5 are consistent with the RODs. EPA anticipates that these remedies will function as intended once they have been implemented.

Issues, Recommendations and Follow-up Actions

The final OU3, OU4 and OU5 remedial actions need to be fully implemented. Additional institutional controls (deed restrictions) will be needed. These are part of the ongoing remedial activities at this site. No issues, recommendations or follow-up actions were identified as part of this five-year review.

Protectiveness Statement

Protectiveness Statement(s)		
Operable Unit: OU3	*Protectiveness Determination:* Will be Protective	*Addendum Due Date (if applicable):* Click here to enter date.
Protectiveness Statement: The remedy for OU3 is expected to be protective of human health and the environment upon completion. In the interim, remedial activities completed to date have adequately addressed all exposure pathways that could result in unacceptable risks in these areas.		
Operable Unit: OU4	*Protectiveness Determination:* Will be Protective	*Addendum Due Date (if applicable):* Click here to enter date.
Protectiveness Statement: The remedy for OU4 is expected to be protective of human health and the environment upon completion. In the interim, remedial activities completed to date have adequately addressed all exposure pathways that could result in unacceptable risks in these areas.		
Operable Unit: OU5	*Protectiveness Determination:* Will be Protective	*Addendum Due Date (if applicable):* Click here to enter date.
Protectiveness Statement: The remedy for OU5 is expected to be protective of human health and the environment upon completion. In the interim, remedial activities completed to date have adequately addressed all exposure pathways that could result in unacceptable risks in these areas.		

Next Review

The next five-year review report for the Roebling Steel Superfund site is required five years from the completion date of this review.

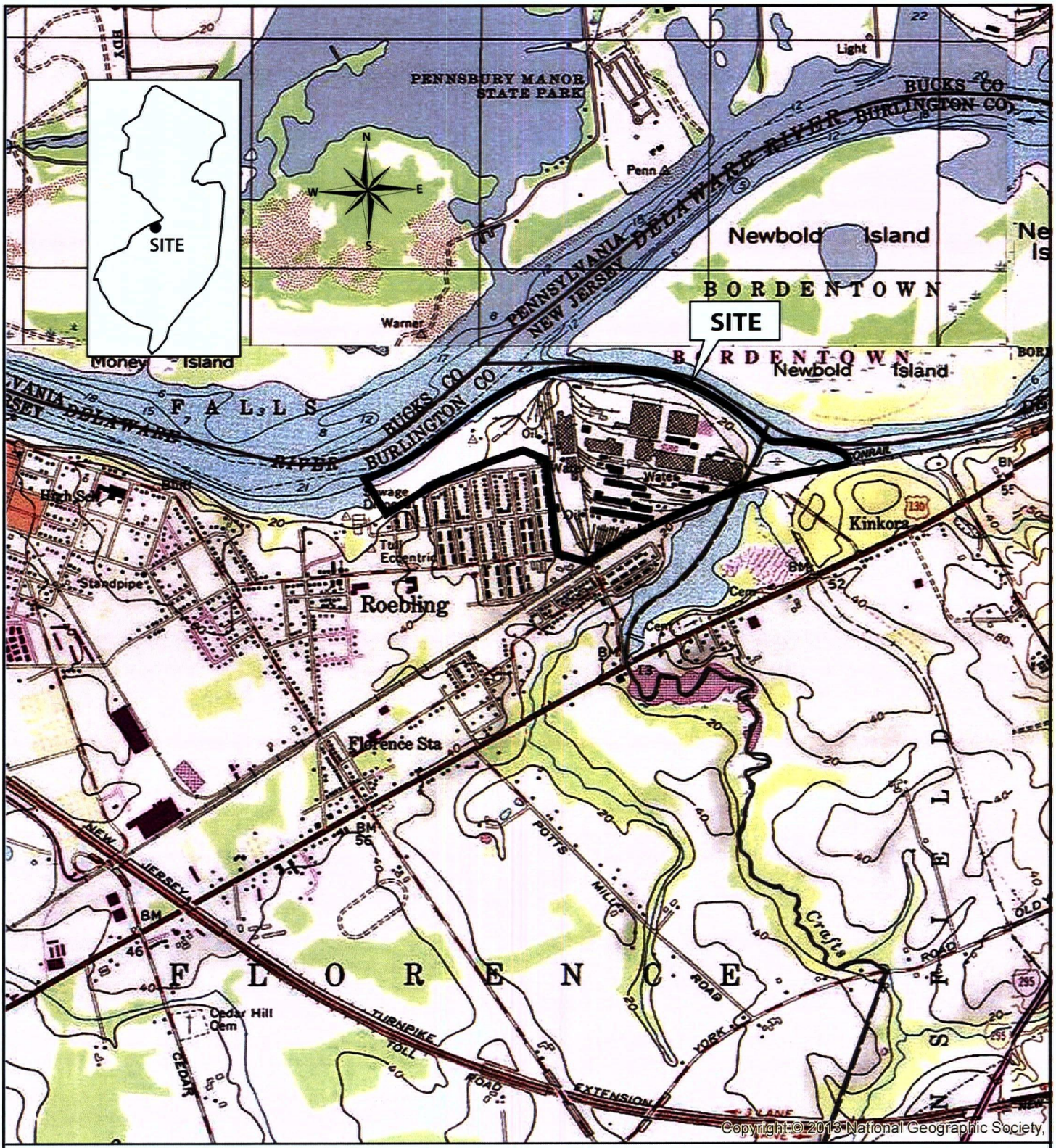
Tables

Table 1: Chronology of Site Events

Event	Date(s)
Facility operated for production of steel products	1906-1982
Final listing on EPA National Priorities List	1983
NJDEP removal action	1985
Completion of EPA removal action 1 (source removal)	1989
OU1 Record of Decision (source removal and northwest park soil)	1990
Completion of OU1 remedial action (source removal)	1992
Completion of EPA removal action 2 (OU1 northwest park soil)	1991
OU2 ROD (southeast park soil)	1991
OU3 ROD (Slag Area)	1991
Completion of OU2 remedial action (southeast park soil)	1995
OU4 ROD (buildings and Main Gate House)	1996
Start of OU4 remedial action for building demolition and removal of contamination sources associated with the buildings	1999
Completion of EPA removal action 3 (OU4 asbestos mitigation)	1999
OU5 ROD (soil, sediment and groundwater) and amendment to OU3 ROD	2003
Completion of the initial five-year review	2004
Start of OU4 remedial action for the Main Gate House and the remediation of the surrounding soil	2005
Start of OU3 remedial action for shoreline stabilization at the Slag Area	2006
Start of OU5 remedial action for remediation of soils and shoreline stabilization at the Isolated Parcel	2008
Completion of the second five-year review	2009

Completion of OU4 remedial action for the Main Gate House and the remediation of the surrounding soil	2009
Start of OU3 remedial action for remediation of soils at the Slag Area	2010
Start of OU5 remedial action for remediation of river and creek sediments	2010
Completion of OU4 remedial action for building demolition and removal of contamination sources associated with the buildings	2011
Completion of OU5 remedial action for remediation of soils and shoreline stabilization at the Isolated Parcel	2012

Table 2: Documents, Data and Information Reviewed in Completing the Five-Year Review	
Document Title, Author	**Submittal Date**
OU1 Record of Decision, EPA	March 1990
OU2 and OU3 Record of Decision, EPA	September 1991
OU4 Record of Decision, EPA	September 1996
OU5 Record of Decision and OU3 ROD Amendment, EPA	September 2003
Five-Year Review Report, EPA	January 2004
OU3 Revetment Report, WRS	January 2008
Second Five-Year Review Report, EPA	January 2009
OU4 Addendum Sampling Trip Report, Tank Farm Storage AOC, Weston	March 2009
OU4 Removal of Oil-Contaminated Soil at the Former Bldg No. 115A AOC, Weston	November 2010
OU5 Final Isolated Parcel Remedial Action Report, Weston	April 2012
OU4 Landfill AOC Investigation and Sampling Report, Weston	May 2012
OU4 Former Bldg No. 2/ Pad 2 AOC Investigation and Sampling Report, Weston	May 2012
OU4 Removal of the Underground Water Tunnel, Weston	September 2012
OU4 Addendum to the Removal of Storm Sewer Outfall No. 4, Weston	September 2012
OU4 Addendum to Remedial Action Report, Weston	March 2013



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Feet

SOURCE:
USGS TOPOGRAPHIC 7½ MINUTE SERIES QUADRANGLES
TRENTON WEST, NJ. BRISTOL, PA. TRENTON EAST, NJ.

U.S ENVIRONMENTAL PROTECTION AGENCY

Roebling Steel Superfund Site

CDM Smith

FIGURE 1
SITE LOCATION MAP

CDM Smith

Roebling Steel Superfund Site
Remediation Areas
Florence Township, Burlington County, New Jersey

Figure 2