Superfund Proposed Plan

U.S. Environmental Protection Agency

Curtis Specialty Papers Superfund Site

Hunterdon County, New Jersey

May 2015

EPA ANNOUNCES PROPOSED PLAN

This Proposed Plan describes the remedial alternatives considered for the Curtis Specialty Papers Superfund site and identifies the preferred remedial alternative along with the rationale for this preference.

This Proposed Plan was developed by the United States Environmental Protection Agency (EPA), the lead agency for the site, in consultation with the New Jersey Department of Environmental Protection (NJDEP), the support agency. EPA is issuing this document as part of its public participation responsibilities under Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA) and Section 300.430(f)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP).

The nature and extent of the contamination at the site and the remedial alternatives summarized in this Proposed Plan are described in detail in the remedial investigation (RI) and feasibility study (FS) reports issued in September 2014 and April 2015, respectively. These and other documents are part of the publicly available administrative record file. EPA encourages the public to review these reports to gain a more comprehensive understanding of the site and the Superfund activities completed at the site.

EPA's preferred alternative builds upon cleanup actions conducted under CERCLA as the site investigation progressed. The major components of the preferred alternative are in-situ biological treatment (anaerobic biological oxidation, or ABOx) to remediate groundwater, institutional controls (ICs) to restrict groundwater use until cleanup standards are attained, monitoring, and review of site conditions every five years while cleanup standards are still exceeded to ensure that the remedy remains protective of human health and the environment.

The estimated total present worth cost of the preferred alternative is $1,239,000.

MARK YOUR CALENDAR

Public Comment Period - May 19 to June 18, 2015

EPA will accept written comments on the Proposed Plan during the public comment period. Written comments should be addressed to:

Alison Hess, Remedial Project Manager
U.S. Environmental Protection Agency
290 Broadway, 19th Floor
New York, NY 10007
Fax: (212) 637-4866
Email:hess.alison@epa.gov

Public Meeting - May 28, 2015 at 7:00 PM

EPA will hold a public meeting to explain the Proposed Plan and all of the alternatives presented in the Feasibility Study. Oral and written comments will also be accepted at the meeting. The meeting will be held at:

Milford Firehouse
21 Water Street
Milford, New Jersey

EPA's website for the Curtis Specialty Papers Site:

http://www.epa.gov/region2/superfund/npl/curtisspecialty

EPA's Proposed Plan:

http://www.epa.gov/region02/superfund/npl/curtisspecialty/ProposedPlan

Community Role in the Selection Process

This Proposed Plan is being issued to inform the public of EPA's preferred alternative and to solicit public comments pertaining to the remedial alternatives evaluated, including the preferred alternative. Changes to the preferred alternative, or a change from the preferred alternative to another alternative, may be made if public comments or additional data indicate that such a change would result in a more appropriate remedial action. The final decision regarding the selected remedy will be made after EPA has taken into consideration all public comments. EPA is soliciting public comments on the alternatives considered in the Proposed Plan, because EPA may select a remedy other than the preferred alternative. This Proposed Plan has been made available to the public for a public comment period that concludes on June 18, 2015.

A public meeting will be held during the public comment period to present the conclusions of the RI/FS, elaborate further on the reasons for recommending the preferred remedy, and receive public comments. The public meeting will include a presentation by EPA of the preferred alternative and other cleanup options. Information on the public meeting and submitting written comments can be found in the "Mark Your Calendar" text box on page 1.

Comments received at the public meeting, as well as written comments received during the comment period, will be documented in the Responsiveness Summary section of the Record of Decision (ROD). The ROD is the document that explains which alternative has been selected and the basis for the selection of the remedy.

SCOPE AND ROLE OF THE ACTION

This site is being addressed in its entirety as a single operable unit. The RI/FS was conducted for all contaminants, environmental media, and exposure pathways of concern. While the RI/FS was underway, several actions were taken to improve site safety and security and to address conditions that presented an immediate threat to human health and the environment. These actions are summarized on pages 4 to 6.

The response actions in this Proposed Plan were developed to address the present conditions at the site.

SITE BACKGROUND

The site is a former food-grade paper mill located along the Delaware River at 404 Frenchtown Road (County Route 619) in Hunterdon County, New Jersey. Security personnel and chain-link fencing currently restrict access to the site. The tax parcels that comprise the study area occupy approximately 109 acres in the Borough of Milford and Alexandria Township (Figure 1).

Paper production began in 1907 and ended in 2003. During these 96 years, four operational areas developed at the 86-acre site:

- Main Mill Area (MMA) – approximately 28 acres in Milford consisting of process and office facilities, a brick house, a cogeneration power plant, and loading/unloading areas.
- Coatings Facility Area (CFA) – approximately 5 acres in Milford consisting of the Coatings Facility, solvent recovery building, and supporting outbuildings (now mostly demolished).
- Wastewater Treatment Plant Area (WWTPA) – approximately 13 acres in Milford; two clarifier basins, a settling tank, and intake/outfall structures on the shoreline of the Delaware River.
- Coal Pile and Aeration Basin Area (CPABA) – approximately 40 acres in Alexandria Township currently undeveloped; historically a portion of the CPABA served as a staging area for coal that powered site operations.

Frenchtown Road borders the paper mill to the east, with residential and undeveloped properties along it. The Delaware River borders the paper mill to the west, with Pennsylvania on the other bank. Quequacommissacong Creek (Q Creek) borders the mill to the north. North of Q Creek is approximately 20 acres of property (called the "northern parcel") owned by each of the successive mill owner/operators but that was never developed and was not used for paper mill operations. Other properties north of Q Creek are residential and commercial/industrial. Farmland and the Crown Vantage Landfill border the site to the south.

A railroad right-of-way runs north to south through the site. Railroad sections to the north and south of the site have become part of a rails-to-trails program. According to current tax records of the Borough of Milford, the Belvidere and Delaware River Railroad owns the section of right-of-way that crosses the site.

Site owners and operators have changed through time among a number of entities, including Riegel Paper Corporation, Federal Paper Board Company, Inc., Riegel Products Corporation, James River Corporation, James River Paper Company, Inc., Crown Vantage and Curtis Papers, Inc. (including their predecessors, subsidiaries, and other related ventures). International Paper Company (IP) is the corporate successor to Federal Paper Board Company, Inc., and Georgia-Pacific Consumer Products LP (GP) is the successor to Fort James Operating Company and James River Paper Company, Inc.

Superfund History

In August 2008, EPA named IP and GP as potentially responsible parties associated with the site. In September 2008, the Curtis Specialty Papers site was proposed for inclusion on the National Priorities List (NPL) at the request of NJDEP. On September 23, 2009, EPA placed the Curtis Specialty Papers site on the NPL.

In June 2009, IP and GP entered into an Administrative Settlement and Order on Consent (AOC) with EPA to conduct a RI/FS at the site. In July 2009, IP and an indirect, wholly-owned subsidiary of Georgia-Pacific LLC (also the parent company of Georgia-Pacific Consumer Products LP) purchased the site. The AOC was amended in 2010 to add an early response action for pre-demolition activities. Under the terms of the AOC, IP and GP have completed numerous studies, investigations, removals, reports, and other actions.

A Community Advisory Group (CAG) has been meeting quarterly since September 2009. The local community is kept informed of the progress on the RI/FS and other Superfund actions through Community Notification flyers, presentations, and updates in accordance with the 2010 Community Involvement Plan for the site. The local community is interested in future use of the site.

Geology and Hydrology

The site is in the Piedmont Physiographic Province. The regional topography consists of flat, low-lying floodplains and steep valley walls. The relatively flat topography of the site steepens at slopes along Q Creek, the Delaware River, and the unnamed tributary. The site soil is classified as the Pope series, which consists of fine, sandy loam with medium organic content. The soil is deep, well-drained, and level with moderate soil water holding capacity, moderately rapid permeability, limited runoff potential, and slight erosion potential.

The bedrock underlying the site is the Jurassic and Triassic-age (225- to 190-million year old) Passaic Formation, which consists predominantly of grayish-red to reddish-brown shale, siltstone, very fine- to coarse-grained sandstone and a red-matrix conglomerate.

Two water-bearing units occur at the site: an overburden aquifer in the unconsolidated glacial drift and river alluvium and the Brunswick aquifer within the Passaic Formation. The depth to groundwater is approximately 14 to 29 feet. The groundwater elevations indicate groundwater flow is predominantly to the west toward the Delaware River. While the surface alluvium is permeable, the deposits are small in extent and scattered, and the overburden aquifer is not a major source of domestic water supply.

Groundwater from the Brunswick bedrock aquifer is a source of drinking water in the area. The Milford Water Department serves the Borough of Milford with two public water supply wells in the bedrock aquifer. Well 1 is approximately 3,600 feet north, 60 feet deep, and hydrogeologically upgradient of the site. Well 2 is approximately 880 feet north, 255 feet deep, and hydrogeologically upgradient of the site. The Milford Water Department has drilled two additional wells that are in the NJDEP permit review process. Well 3 is approximately 265 feet east, 420 feet deep, and hydrogeologically upgradient of the site. Well 4 is approximately 750 feet east, 220 feet deep, and hydrogeologically upgradient of the site. Residences and commercial businesses along Frenchtown Road near the site are connected to the public water supply.

The Delaware River near the site is a large non-tidal river with a dynamic seasonal flow pattern during the year (high flows after rain or snow melt events). The Lower Delaware is a federally-designated recreational river under the National Wild and Scenic Rivers Act, and the river reach adjacent to the site is designated as Special Protection Waters by the Delaware River Basin Commission. The Delaware River has a 50-foot riparian buffer zone. The most recent flood hazard area and floodway boundaries were drawn by the Federal Emergency Management Agency (FEMA) in September 2009, and most of the site is in the 100-year flood hazard area.

Q Creek originates upstream and flows east to west at the northern boundary of the paper mill before discharging into the Delaware River. Near the site, Q Creek typically has a shallow channel (except during high flow events) and steep banks. Near the confluence with the Delaware River, there is an alluvial fan of coarse sand and gravel. Q Creek is classified by NJDEP as a Trout Production (FW2-TP) – Category One waterway with a 300-foot riparian buffer zone on either side. The Borough of Milford wastewater treatment plant and its permitted outfall are on the north side of Q Creek near the confluence with the Delaware River.

The unnamed tributary is an intermittent drainage feature that originates off-site and collects rainwater and stormwater from Frenchtown Road, residential properties, and farmland. It runs east to west across the site and discharges the runoff into the Delaware River. NJDEP classifies the unnamed tributary as FW2-NT, indicating that it does not support trout populations, with a 50-foot riparian buffer zone on either side. A portion of the unnamed tributary channel onsite is a culvert pipe.

PRELIMINARY INVESTIGATIONS AND EARLY RESPONSE ACTIONS

Site characterization began as part of remedial activities related to releases such as spills during site operations (i.e., pre-2003). Responses to some spills resulted in a determination of No Further Action from NJDEP, while other spills required follow-up activities. The historical investigations and releases at the site as well as any associated response actions are summarized in the 2011 Site Characterization Summary Report.

EPA Removal Site Evaluation and Removal Action (2007 to 2008)

From 2007 to 2008, EPA collected 19 surface samples from locations where electrical transformers were either presently or historically located, and from areas where oil-stained soils were visible. In 2007, a EPA contractor sampled surface and subsurface soil, surface water, sediment, and soil gas. Additional Delaware River sediment samples were collected in 2008.

Also from 2007 to 2008, EPA conducted a removal action to dispose of approximately 30 pallets of containerized waste (i.e., drums, pails, small containers), vats, low-level radiation devices, and six 55-gallon galvanized steel drums left on-site when operations ceased in 2003.

These activities are summarized in the 2008 Removal Site Evaluation and the 2011 Site Characterization Summary Report.

Pre-RI/FS Activities and Oil-Containing Electrical Equipment Removal (2009)

Under the terms of the AOC, in 2009 IP and GP completed pre-RI/FS activities in and around the buildings at the site, such as identifying storage vessels, staging and storage areas, and discharge features. Also in 2009, IP and GP removed oil-containing electrical equipment identified during pre-RI/FS activities.

These activities are summarized in three reports issued in 2009: the Pre-Remedial Investigation/ Feasibility Study Building Survey Report, the Pre-Remedial Investigation/Feasibility Study Report, and the Early Response Action Report – Oil-Containing Electrical Equipment Removal.

Aeration Basin Closure (2010 to 2011)

In 2010 and 2011, IP and GP demolished the aeration basin in the southeast corner of the site. The basin had been excavated in the early 1990s and excess soil was used to construct a berm around the excavation. Infrastructure included an 80-millimeter (3-inch) high density polyethylene liner, mechanical aerators and mixers, an electrical shed, concrete pumping pit/lift station, valve pit, piping, and a perimeter fence. The demolition project involved characterizing water and sludge/sediment, dewatering the basin, clearing and preparing the area, removing the liner, demolishing ancillary structures, stabilizing sludge/sediment, transporting and disposing of off-site waste at permitted facilities, backfilling and final grading, and restoring the site. Six inches of topsoil and a native seed mix were placed throughout the disturbed area. The aeration basin area has returned to a vegetated, open habitat area.

These activities are summarized in the 2012 Aeration Basin Demolition Project Completion Report.

Miscellaneous Site Maintenance Projects (2010 to 2013)

In 2010, IP and GP demolished two small garages identified as Buildings 100 and 101 in the CFA to improve site security. Floor slabs were removed and the areas were regraded to match the surrounding grade, seeded, and mulched.

From 2011 to 2012, IP and GP closed the six production wells that had provided water for site operations. The wells were decommissioned, pumps and casings were removed, boreholes were filled and sealed with grout, and NJDEP Well Decommissioning Reports were filed for these wells.

In 2013, IP and GP demolished the above grade portion of four CPABA buildings and associated structures to improve site security and reduce the health and safety risks associated with abandoned structures. Buildings 114, 115, 116, and 117 were demolished to grade and underground storage tank (UST)-37, located adjacent to Building 114, was removed and the surrounding soil excavated. All asbestos-containing material (ACM), construction and demolition debris, liquid waste, petroleum-impacted soil, concrete and masonry materials, and scrap metal were properly disposed of.

These activities are summarized in the 2014 Miscellaneous Site Maintenance Project Completion Report.

Pre-Demolition Environmental Removal Activities (2011 to 2013)

In 2011 to 2013, IP and GP removed hazardous and regulated materials from the four operational areas of the site, including equipment oil, aboveground storage tank (AST) residuals, fly ash, lead-based paint, Galbestos, universal waste (batteries, mercury-containing devices, lamps, light ballasts, fire extinguishers, sprinkler heads, electronic waste, exit signs, containerized chemicals, and refrigerant-containing equipment); ACM, and process piping. All hazardous and regulated materials were properly disposed of off-site at licensed facilities.

These activities are summarized in the 2013 Pre-Demolition Environmental Removals Project Completion Report.

SAM and CFA Demolition (2012 to 2013)

In late 2011, the Delaware River basin and its tributaries, including Q Creek, experienced heavy rains and flooding, leading to the failure of a dam on Q Creek upstream of the site near Bridge Street in Milford. The rains and dam failure resulted in significant erosion of the banks of Q Creek, exposing USTs and piping and further deteriorating the structural integrity of certain buildings in the CFA. IP and GP proposed a Slope Area Mitigation project (SAM), including a drainage area velocity evaluation, to address the exposed discharge pipes and USTs and provide long-term stability for the eroded bank area of Q Creek at the site.

Planning began immediately for SAM activities, which were conducted from 2012 to 2013, including hydrologic and engineering analyses to understand erosive forces and flood stage conditions in Q Creek near the site; removal of CFA infrastructure (e.g., USTs, sumps, discharge pipes); soil excavation to establish stable slope conditions; and restoration. Some 10,679 cubic yards of soil in the CFA/Q Creek bank area were removed from the site, including soils impacted by toluene and polychlorinated biphenyls (PCBs). Post-excavation samples were collected and excavated areas were backfilled with three feet or more of clean cover, compacted, covered with at least 12 inches of topsoil, and seeded. To conduct the SAM activities, 11 buildings in the CFA were demolished to improve access to the bank of Q Creek. Building floor slabs were left in place unless they needed to be removed to accomplish SAM activities. The bank of Q Creek is now stable and restored with native vegetation.

These activities are summarized in the 2013 Slope Area Mitigation Project Completion Report and the 2014 Coatings Facility Area Demolition Project Completion Report.

Eastern Loadout and Vehicle Access Setup Activities (2014)

In 2014, IP and GP implemented eastern loadout and vehicle access setup (ELVAS) activities in a former electrical transformer area at the eastern perimeter of the MMA near Frenchtown Road. IP and GP dismantled infrastructure, including Building 109, which required removal of PCB-impacted soil, and regraded the area in preparation for future vehicle access and construction use.

These activities are summarized in the 2014 Eastern Loadout and Vehicle Access Setup Project Completion Report.

REMEDIAL INVESTIGATION

Site characterization activities outlined in the 2010 RI/FS Work Plan focused on three main objectives: 1) evaluating potential source materials, 2) characterizing the nature and extent of constituents of potential concern in groundwater and soil at the four operational areas of the site (i.e., MMA, WWTPA, CPABA, and CFA), and in floodplain/bank soil, sediment, and surface water in the Delaware River, Q Creek, and the unnamed tributary, and 3) performing work to support the human health and ecological risk assessments such as characterizing habitat and wildlife receptors, delineating wetlands and flood hazard areas, and identifying potential receptors and exposure pathways. Because the northern parcel was not used for mill operations, no investigatory or other work was performed at that parcel and it is not considered part of the site.

Cultural Resources

Activities conducted under CERCLA are required to comply with the National Historic Preservation Act of 1966. In addition, in 2003, the New Jersey State Historic Preservation Office determined that the site buildings are eligible for listing on the National Register of Historic Properties and together constitute the Curtis Paper Mill Historical District. As an early step in site characterization, IP and GP conducted architectural and pre-contact period cultural resource investigations, which are summarized in the 2010 Phase IA Cultural Resources Investigation Report, three 2010 Phase IB Cultural Resources Investigation Reports, and the 2011 Phase IB Cultural Resources Investigation Report.

Two special efforts on cultural resources are the 2013 Historic Industrial and Architectural Documentation of Former Curtis Specialty Papers Site, Milford, New Jersey (i.e., recordation report) and a set of three related documents (brochure, illustrated booklet, and teacher's guide) entitled, "The Milford Paper Mill: A Legacy of Achievement." This set of documents was released in draft for public input and is being finalized for use by the local community.

Reuse Assessment

To develop an understanding of the reasonably anticipated future use of the site, EPA requested that IP and GP perform a reuse assessment. The reuse assessment integrated several elements related to land use and planning, such as property ownership, physical constraints, zoning and local ordinance, regulatory constraints, and community input.

For the portion of the site within the Borough of Milford, the reasonably anticipated future use is industrial (i.e., the permitted and conditional industrial uses that are specified in the Code of the Borough of Milford for its Industrial Zones) or as specified in the redevelopment overlay in the Borough of Milford 2004 Redevelopment Plan. The redevelopment overlay uses are non-residential (approximately 21 acres), residential (13 acres), public (vacant brick house), mixed professional office and residential (2.8 acres), and conservation uses (balance of the property). Future development would be subject to the flood mapping (e.g., by FEMA in 2009) and associated floodplain regulations.

For the portion of the site within Alexandria Township, the reasonably anticipated future use is open space. The nearly 40 acres occurs within the 100-year flood hazard area. As specified in the Land Use Code of Alexandria Township, the CPABA occurs in a Floodplain District overlay, limiting permitted uses to agriculture, recreation, accessory residential, and accessory commercial. In addition, there is no public sewerage for this portion of the site property, and the use of septic systems would be severely limited under State law as a result of the proximity of the Delaware River.

The results of the reuse assessment were released in draft for public input. The Reuse Assessment Report was finalized in 2011.

RI Fieldwork

RI fieldwork was conducted in 2010 and was supplemented through 2014 with samples collected during early response actions and to support development of the 2015 FS Report. Table 1 summarizes the number of samples in the RI dataset that characterize the present site conditions.

Table 1: Site Characterization Dataset*								
Environmental Media	**MMA**	**WWTPA**	**Delaware River**	**CPABA**	**Unnamed Tributary**	**CFA**	**Q Creek**	**Background**
Upland surface soil	87	28	---	57	---	35	---	11
Upland subsurface soil	8	1	---	2	---	125	---	2
Floodplain/bank soil	---	---	---	---	38	---	22	---
Sediment	---	---	28	---	17	---	30	---
Surface water	---	---	10	---	5⁺	---	21	---
Sub-slab soil gas	---	---	---	---	---	3	---	---
Site-wide groundwater	16 monitoring wells ^							

Notes:
*Table 1 does not include samples collected of demolition debris (to evaluate for reuse on the site), topsoil, and imported fill analyzed as part of SAM and/or ELVAS activities.
⁺Portions of the unnamed tributary were dry during sampling activities in August 2007 and August 2010. Surface-water data are only available for upstream samples.
^Subsequent to the RI sampling, an additional five rounds of groundwater sampling were conducted in a subset of monitoring wells.

Groundwater

Analytical results from groundwater sampling identified two volatile organic compounds (VOCs) in the CFA at levels of concern: toluene and benzene. The high concentrations of toluene and benzene in groundwater correlated to locations of USTs, establishing that the toluene and benzene detected in UST contents and surrounding soil removed during the SAM activities were source materials for the groundwater contamination.

A comparison of groundwater sampling data collected before and after the SAM activities shows a substantial decline in the concentration of toluene at locations near the center of the plume due to the SAM activities (e.g., 284,000 micrograms per liter [ug/L] reduced to 82,500 mg/L, and 153,000 ug/L to 82,100 ug/L), although the concentration remains above the Safe Drinking Water Act maximum contaminant level (MCL) of 600 ug/L. The concentrations of benzene in groundwater started lower (e.g., 241 ug/L) and showed a similar substantial decline after the removal of the source materials, although levels remain above the MCL for benzene of 1 ug/L.

The VOC tetrachloroethylene (perc or PCE) was detected at low levels and at isolated locations in the MMA and WWTPA. In the MMA, PCE was detected at concentrations slightly above the MCL (from 6.4 ug/L to 10.6 ug/L, compared to the MCL of 5 ug/L). In the WWTPA, PCE was detected in one well at a concentration of 2.8 ug/L, which is below the MCL of 5 ug/L and above the State standard of 1 ug/L.

Soil

Soil samples collected in the MMA, WWTPA, and CPABA were generally consistent with background upland soil samples. Background is defined as naturally occurring or anthropogenic constituents or locations that are not influenced by releases from the site.

In the CFA, post-excavation soil sampling performed as part of the SAM activities showed non-detect or very low detections of the PCB mixture Aroclor 1260 for the majority of samples. There are two detections of note: one at 7.03 milligrams per kilogram (mg/kg) in upland soil, and one detection in floodplain/bank soil at 15.5 mg/kg. Both of these sample locations are covered by more than six feet of clean fill material, topsoil and native vegetation, and both are within the Q Creek riparian buffer zone.

Delaware River

Surface water and sediment samples collected by EPA in 2007 in the Delaware River were generally low or non-detect along and upriver of the site. PCBs were detected in one sediment sample adjacent to the site, at a lower concentration (0.053 mg/kg) than the upriver sediment samples. In Delaware River surface water, PCBs were not detected along or upriver of the site, except for one very low detection of Aroclor 1260 from a sample that was collected adjacent to the site in 2007 (estimated at 0.26 ug/L).

Q Creek

Aroclor 1260 was detected in Q Creek sediment samples collected by EPA in 2007 (from 0.12 to 3.3 mg/kg) and in one RI sediment sample collected in 2010 adjacent to the CFA (0.101 mg/kg). SAM activities in 2012 through 2013 permanently addressed potential sources of PCBs and related migration pathways to Q Creek sediment.

Unnamed Tributary

Analytical results of sediment samples and floodplain/bank soil samples from the unnamed tributary were generally very low or non-detect and consistent with concentrations observed upstream of the site. The portion of the unnamed tributary on the site was dry when RI field work was conducted, so surface water data are only available for upstream sample locations.

SUMMARY OF SITE RISKS

As part of the RI/FS, baseline risk assessments are conducted to estimate current and future risks to human and ecological receptors posed by hazardous substances at a site in the absence of any actions to control or mitigate exposures to the hazardous substances. The text boxes on page 10 present information on the process EPA uses for human health and ecological risk assessments conducted under CERCLA. Consistent with the NCP, the results of the baseline risk assessment are used to determine whether remediation is necessary and which pathways need to be remediated.

Human Health Risk Assessment

Potential current human receptors include off-site residents, recreators, and anglers. Potential future human receptors include commercial/industrial workers, groundskeepers, construction workers, and on-site residents. The media of interest evaluated include upland soil, ambient air, indoor air (evaluated through sub-slab soil gas samples), groundwater, and floodplain/bank soil, in addition to the sediment and surface water associated with Q Creek, the unnamed tributary, and the Delaware River. Fish consumption was evaluated for Q Creek and the Delaware River. Potential human health risks were evaluated for each exposure area associated with the four operational areas of the site and the three surface water receptor areas.

For almost all the exposure scenarios, the potential cancer risk and noncancer health hazards based on present site conditions are less than or within EPA acceptable levels (i.e., a cancer risk range of 10^{-4} to 10^{-6} and a hazard index [HI] of 1 or less).

The only exposure scenarios with potential risks/hazards due to site-related hazardous substances above EPA levels are exposure (through ingestion, dermal contact and inhalation while showering) to benzene and toluene in groundwater as a potable water supply for potential future on-site residents (adults and children).

The risks and hazards associated with the low-level, isolated detections of PCE in groundwater are within EPA's acceptable levels. The risks and hazards for future on-site residents exposed to soil in each of the four operation areas of the site are also within EPA's acceptable levels.

Detailed information regarding the site-specific human health risk assessment can be found in the 2013 Baseline Human Health Risk Assessment and Appendix L of the 2014 RI Report.

Ecological Risk Assessment

In the baseline ecological risk assessment, the locations of ecologically sensitive areas, chemicals of potential ecological concern, potentially complete exposure pathways, and the results of exposure modeling conducted during the screening level risk assessment, were used to evaluate four assessment endpoints (and associated measurement endpoints) that assess the potential risk to sustainability of the following: 1) mammals and birds that eat insects or worms, such as the short-tailed shrew and American robin; 2) mammals and birds that eat other animals, such as the red fox and red-tailed hawk; 3) mammals that eat fish, such as the mink; and 4) birds that eat aquatic insects, such as the tree swallow.

The risk characterization concluded that potential ecological risk is unlikely for each receptor, chemicals of potential ecological concern, and exposure area evaluated. Thus, the ecological risk assessment indicates that the present site conditions pose no unacceptable risks to ecological receptors.

Detailed information regarding the site-specific ecological risk assessment can be found in the 2012 Screening Level Ecological Risk Assessment and the 2013 Baseline Ecological Risk Assessment Report.

WHAT IS *HUMAN HEALTH* RISK AND HOW IS IT CALCULATED?

A Superfund baseline human health risk assessment is an analysis of the potential adverse health effects caused by hazardous substance releases from a site in the absence of any actions to control or mitigate these under current and future land uses. A four-step process is utilized to assess site-related human health risks for reasonable maximum exposure (RME) scenarios.

Hazard Identification: In this step, the chemicals of potential concern at a site in various media (*e.g.,* soil, surface water, and sediment) are identified based on such factors as toxicity, frequency of occurrence, fate and transport of the contaminants in the environment, concentrations of the contaminants in specific media, mobility, persistence, and bioaccumulation.

Exposure Assessment: In this step, the different exposure pathways through which people might be exposed to the contaminants identified in the previous step are evaluated. Examples of exposure pathways include incidental ingestion of contaminated soil. Factors relating to the exposure assessment include, but are not limited to, the concentrations that people might be exposed to and the potential frequency and duration of exposure. Using these factors, a reasonable maximum exposure scenario, which portrays the highest level of human exposure that could reasonably be expected to occur, is calculated.

Toxicity Assessment*:* In this step, the types of adverse health effects associated with chemical exposures and the relationship between magnitude of exposure and severity of adverse effects are determined. Potential health effects are chemical-specific and may include the risk of developing cancer over a lifetime or other non-cancer health effects, such as changes in the normal functions of organs within the body (*e.g.*, changes in the effectiveness of the immune system). Some chemicals are capable of causing both cancer and non-cancer health effects.

Risk Characterization: This step summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative assessment of site risks. Exposures are evaluated based on the potential risk of developing cancer and the potential for non-cancer health hazards. The likelihood of an individual developing cancer is expressed as a probability. For example, a 10^{-4} cancer risk means a one-in-ten-thousand excess cancer risk; or one additional cancer may be seen in a population of 10,000 people as a result of exposure to site contaminants under the conditions explained in the Exposure Assessment. Current guidelines for acceptable exposures are an individual lifetime excess cancer risk in the range of 10^{-4} to 10^{-6} (corresponding to a one-in-ten-thousand to a one-in-a-million excess cancer risk) with 10^{-6} being the point of departure. For noncancer health effects, a hazard index (HI) is calculated. An HI represents the sum of the individual exposure levels compared to their corresponding reference doses. The key concept for a noncancer HI is that a threshold level (measured as an HI of 1) exists below which noncancer health effects are not expected to occur.

WHAT IS *ECOLOGICAL* RISK AND HOW IS IT CALCULATED?

A Superfund baseline ecological risk assessment is an analysis of the potential adverse health effects caused by hazardous substance releases from a site in the absence of any actions to control or mitigate these under current and future land uses. The process used for assessing site-related ecological risks includes:

Problem Formulation: In this step, the contaminants of potential ecological concern at a site are identified. Assessment endpoints are defined to determine what ecological entities are important to protect. Then, the specific attributes of the entities that are potentially at risk and important to protect are determined. This provides a basis for measurement in the risk assessment. Once assessment endpoints are chosen, a conceptual model is developed to provide a visual representation of hypothesized relationships between ecological entities (receptors) and the stressors to which they may be exposed.

Exposure Assessment: In this step, a quantitative evaluation is made of what plants and animals are exposed to and to what degree they are exposed. This estimation of exposure point concentrations includes various parameters to determine the levels of exposure to a chemical contaminant by a selected plant or animal (receptor), such as area use (how much of the site an animal typically uses during normal activities); food ingestion rate (how much food is consumed by an animal over a period of time); bioaccumulation rates (the process by which chemicals are taken up by a plant or animal either directly from exposure to contaminated soil, sediment or water, or by eating contaminated food); bioavailability (how easily a plant or animal can take up a contaminant from the environment); and life stage (e.g., juvenile, adult).

Ecological Effects Assessment*:* In this step, literature reviews, field studies or toxicity tests are conducted to describe the relationship between chemical contaminant concentrations and their effects on ecological receptors, on a media-, receptor- and chemical-specific basis. In order to provide upper and lower bound estimates of risk, toxicological benchmarks are identified to describe the level of contamination below which adverse effects are unlikely to occur and the level of contamination at which adverse effects are more likely to occur.

Risk Characterization: In this step, the results of the previous steps are used to estimate the risk posed to ecological receptor. Individual risk estimates for a given receptor for each chemical are calculated and a hazard quotient (HQ), which is the ratio of contaminant concentration to a given toxicological benchmark. In general, an HQ above 1 indicates the potential for unacceptable risk. The risk is described, including the overall degree of confidence in the risk estimates, summarizing uncertainties, citing evidence supporting the risk estimates and interpreting the adversity of ecological effects.

FEASIBILITY STUDY

The FS is the mechanism for the evaluation of alternative remedial actions. During the FS phase, remedial action objectives (RAOs) are developed, preliminary remediation goals (PRGs) are identified, technologies are screened based on overall implementability, effectiveness and cost, and remedial alternatives are assembled and analyzed in detail with respect to the nine criteria for remedy selection under CERCLA.

Detailed information is available in the 2011 Technical Memorandum of Candidate Technologies, the 2013 Technical Memorandum on the Development and Screening of Alternatives, and the 2015 FS Report.

The RAOs below only address groundwater. The HHRA did not identify unacceptable human exposures to soils, even under a future unrestricted use scenario; however, the RI did sporadically detect several constituents in excess of New Jersey’s unrestricted use soil standards (i.e., the Residential Direct Contact Soil Remediation Standards). While these detections do not warrant a response action under CERCLA, EPA understands that NJDEP will require the imposition of an IC, in the form of a deed notice, on portions of the site property where levels of constituents are in excess of the Residential Direct Contact Soil Remediation Standards. Because additional actions are anticipated by the property owner, including demolition of additional structures and further post-demolition sampling, it is not possible to determine at this time if, and to what extent, an IC might be required. These determinations would be addressed between NJDEP and the property owner prior to the reuse of the site.

Remedial Action Objectives

RAOs describe what the proposed site cleanup is expected to accomplish. These objectives are based on available information and standards, such as applicable or relevant and appropriate requirements (ARARs), to-be-considered standards and guidance, and site-specific risk-based levels. The following RAOs have been developed to address the groundwater impacts at the site:

- Prevent ingestion of groundwater having constituent concentrations greater than their respective MCLs

- Reduce the cancer risk and noncancer health hazards due to exposure to toluene and benzene in groundwater to within or below EPA's acceptable levels of 10^{-6} to 10^{-4} for cancer and HI of 1 or less for noncancer

- Restore groundwater to unrestricted use by reducing concentrations of VOCs in groundwater, including benzene, toluene, and PCE.

Preliminary Remediation Goals

PRGs become final remediation goals when EPA makes a final decision to select a remedy for the site, after taking into consideration public comments. The PRGs for groundwater were developed to meet the site-specific RAOs.

Constituent in Groundwater	PRG (µg/L)
Benzene	1
Toluene	600
PCE	1

Remedial Alternatives

CERCLA § 121(b)(1), 42 U.S.C. § 9621 (b)(1), mandates that remedial actions be protective of human health and the environment, be cost effective, and use permanent solutions, alternative treatment technologies, and resource recovery alternatives to the maximum extent practicable. Section 121(b)(1) also establishes a preference for remedial actions which use, as a principal element, treatment to permanently and significantly reduce the volume, toxicity, or mobility of the hazardous substances, pollutants, and contaminants at a site. CERCLA § 121(d), 42 U.S.C. § 9621(d), further specifies that a remedial action must require a level or standard of control of the hazardous substances, pollutants, and contaminants, which at least attains ARARs under federal and state laws, unless a waiver can be justified pursuant to CERCLA § 121(d)(4), 42 U.S.C. § 9621(d)(4).

Remedial alternatives for the site are summarized below. Capital costs are those expenditures that are required to construct a remedial alternative. Operation and maintenance costs are those post-construction costs necessary to ensure or verify the continued effectiveness of a remedial alternative and are estimated on an annual basis. Present worth is the amount of money which, if invested in the current year, would be sufficient to cover all the costs over time associated with a project, calculated using a discount rate of seven percent and a 30-year time interval. Construction time is the time required to construct and implement the alternative and does not include the time required to design the remedy, negotiate performance of the remedy with the responsible parties, or procure contracts for design and construction.

Remedial Alternatives	
Alternative	**Description**
1	No Action
2	Institutional Controls
3	Physical/Chemical Treatment (Air Sparging/Soil Vapor Extraction) and Institutional Controls
4	In-situ Biological Treatment (Anaerobic Biological Oxidation) and Institutional Controls

Alternative 1: No Action

Capital Cost:	$0
Annual Operation & Maintenance (O&M) Cost:	$0
Present Worth Cost:	$0
Construction Time	0 months

The No Action alternative is required by the NCP and EPA guidance as a baseline with which to compare other remedial action alternatives. Alternative 1 is not protective of human health and the environment because it does not include any measures to prevent ingestion of contaminated groundwater, reduce cancer risks and noncancer health hazards, or restore the groundwater.

Because Alternative 1 would result in contaminants remaining above levels that allow for unrestricted use and unlimited exposure, a review of site conditions would be conducted at least once every five years, as required by CERCLA.

Alternative 2: Institutional Controls

Capital Cost:	$79,000
Annual O&M Cost:	$37,000
Present Worth Cost:	$532,000
Construction Time	1 year

In this alternative, institutional controls (ICs) would be used to control potential exposure routes to impacted groundwater. ICs would consist of a Classification Exception Area/Well Restriction Area (CEA/WRA) to restrict groundwater use and prevent future use of site groundwater for potable purposes. The CEA/WRA would be established pursuant to the substantive requirements of New Jersey Administrative Code (N.J.A.C.) 7:26C-7.3, and would remain in effect until RAOs and PRGs are achieved.

Because Alternative 2 would result in contaminants remaining above levels that allow for unrestricted use and unlimited exposure, a review of site conditions would be conducted at least once every five years, as required by CERCLA.

Alternative 3: Physical/Chemical Treatment (Air Sparging/Soil Vapor Extraction) and Institutional Controls

Capital Cost:	$761,000
Annual O&M Cost:	$75,000
Present Worth Cost:	$1,442,000
Construction Time:	15 years

This alternative involves physical/chemical treatment comprised of air sparging (AS) technology to remove VOCs from groundwater, and soil vapor extraction (SVE) technology to capture and remove vapors from the subsurface.

ICs in the form of a CEA/WRA would be established, as described under Alternative 2.

AS technology involves the injection of air into the subsurface through a network of sparge wells or trenches. Air bubbles released from sparge points rise up through the subsurface, contacting groundwater. This action results in a transfer of VOC mass from the dissolved (aqueous) phase to the vapor phase. The SVE technology involves inducing air flow in the subsurface with an applied vacuum. This vacuum creates a capture zone for the vapor-phase constituents.

Treatment and discharge of vapors would be aboveground by physical or chemical methods (e.g., activated carbon or catalytic oxidation) and would comply with effluent emissions requirements.

During remedial design, pilot testing would be conducted to maximize the air contact with impacted groundwater and identify the appropriate flow rates and the number and locations of sparge wells and vapor extraction wells, as well as the operating parameters for the aboveground vapor treatment system. For purposes of the FS Report, AS/SVE was assumed to be implemented in the area of highest concentration with eight sparge wells and four vapor extraction wells. A monitoring plan would be implemented to assess the effectiveness of the AS/SVE system in reducing VOC concentrations in groundwater and to optimize its performance.

This alternative would comply with EPA guidance for completion of groundwater remedies (e.g., May 2014 Groundwater Remedy Completion Strategy, OSWER Directive 9200.2-144).

Because Alternative 3 would result in contaminants remaining above levels that allow for unrestricted use and unlimited exposure, a review of site conditions would be conducted at least once every five years until the RAOs and PRGs are met.

Alternative 4: In-situ Biological Treatment (Anaerobic Biological Oxidation) and Institutional Controls

Capital Cost:	$444,000
Annual O&M Cost:	$87,000
Present Worth Cost:	$1,239,000
Construction Time:	10-15 years

In this alternative, in-situ biological treatment (anaerobic biological oxidation or ABOx) would be used to remove VOCs from the groundwater. A network of injection wells would be installed to deliver a sulfate solution to the subsurface.

ICs in the form of a CEA/WRA would be established, as described for Alternative 2.

The construction (clean-up) time is estimated to be 10 years for toluene and benzene in the CFA and 15 years for the low-level, isolated detections of PCE.

During remedial design, pilot testing would be conducted to assess injection hydraulics, sulfate concentrations, and the number and locations of the full-scale injection wells. For purposes of the FS Report, ABOx was assumed to be implemented in the area of highest concentration with quarterly injections over five years (20 total injection events). A monitoring plan would be implemented to assess the effectiveness of the biological treatment in reducing VOCs in groundwater and to optimize its performance.

This alternative would comply with EPA guidance for completion of groundwater remedies (e.g., May 2014 Groundwater Remedy Completion Strategy, OSWER Directive 9200.2-144).

Because Alternative 4 would result in contaminants remaining above levels that allow for unrestricted use and unlimited exposure, a review of site conditions would be conducted at least once every five years until RAOs and PRGs are met.

COMPARATIVE ANALYSIS OF ALTERNATIVES

In the FS, each alternative is assessed against the evaluation criteria for Superfund remedial alternatives and is compared to the other alternatives under consideration with respect to the Superfund evaluation criteria. A description of each criterion is provided in the text box on page 15. A summary of the comparative analysis of alternatives is provided in Table 5-1 of the 2015 FS Report.

Overall Protection of Human Health and the Environment

Alternative 1 would provide no additional protection to human health and the environment.

Alternative 2 would employ ICs to restrict the use of groundwater and thereby provide protection to human health and the environment for the first two RAOs. However, it would not achieve the third RAO of restoring groundwater to unrestricted use.

Alternatives 3 and 4 would provide the greatest protection to human health and the environment through active treatment and ICs, and would address all three RAOs.

Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

Appendix C of the 2015 FS Report includes a summary of the action-specific, location-specific and chemical-specific ARARs for the remedial alternatives evaluated.

Alternative 1 does not trigger any action-specific ARARs. Alternative 2 would comply with the action-specific ARARs for establishing the CEA/WRA. Alternatives 1 and 2 do not involve any location-specific ARARs. Alternatives 1 and 2 would not comply with chemical-specific ARARs.

Alternatives 3 and 4 would comply with action-specific, location-specific and chemical-specific ARARs. Alternative 4 is preferred to Alternative 3 because the chemical-specific ARARs are expected to be met in a shorter period of time.

Long-Term Effectiveness and Permanence

Alternative 1 would not provide long-term effectiveness or permanence because groundwater impacts would not be addressed.

Alternative 2 calls for ICs, which would provide long-term effectiveness and permanence with respect to the first two RAOs. Alternative 2 would not provide long-term effectiveness and permanence with respect to the third RAO.

Alternatives 3 and 4 would provide long-term effectiveness and permanence for all three RAOs by removing VOCs from the groundwater.

Reduction of Toxicity, Mobility, or Volume through Treatment

Alternatives 1 and 2 would not use treatment to reduce toxicity, mobility, or the volume of the impacted groundwater and would be considered the least effective alternatives for meeting this criterion.

Alternatives 3 and 4 would use treatment to reduce toxicity, mobility and volume of VOCs though treatment. Alternative 3 would utilize air sparging, extraction, and aboveground treatment of VOC vapors, transferring the contaminants to another medium that requires further treatment and disposal. Alternative 4 would use in-situ biological treatment in the subsurface . Therefore, Alternative 4 is considered marginally more effective than Alternative 3 in meeting this criterion.

Short-Term Effectiveness

Alternatives 1 and 2 would not pose potential additional risk or hazard to the community, the workers, or the environment. However, this alternative does not mitigate existing potential exposure pathways.

Alternatives 3 and 4 are effective in the short-term. Alternatives 3 and 4 would have minimal potential risks or hazards associated with well installation activities, which would be minimized using administrative and engineering controls, health and safety measures, and proper personal protective equipment. The effectiveness monitoring for Alternative 4 would ensure that biological degradation does not cause transient surface water quality issues. Alternative 3 would have additional potential risks or hazards associated with the installation of the aboveground collection and treatment facilities for the extracted vapors. In addition, Alternative 3 is estimated to take longer (15 years) than Alternative 4 (10 years) to meet the RAOs and achieve the PRGs for toluene and benzene. Therefore, Alternative 4 is preferred to Alternative 3 with respect to this criterion.

Implementability

Alternative 1 would require no resources or effort to implement.

Alternative 2 is considered the most implementable alternative as it is administratively and technically feasible and requires minimal resources and limited effort to implement.

Alternatives 3 and 4 are administratively and technically feasible; however, implementation of either alternative would take a greater level of effort than Alternative 2. Alternative 4 is considered more administratively and technically feasible to implement than Alternative 3 because it does not require the design, construction, and implementation of an aboveground treatment and discharge system.

EVALUATION CRITERIA FOR SUPERFUND REMEDIAL ALTERNATIVES

1. Overall Protection of Human Health and the Environment evaluates whether an alternative eliminates, reduces, or controls threats to public health and the environment through institutional controls, engineering controls, or treatment.

2. Compliance with Applicable or Relevant and Appropriate Requirements (ARARs) evaluates whether the alternative meets federal and state environmental statutes, regulations, and other requirements that pertain to the site, or whether a waiver is justified.

3. Long-term Effectiveness and Permanence considers the ability of an alternative to maintain protection of human health and the environment over time.

4. Reduction of Toxicity, Mobility, or Volume of Contaminants through Treatment evaluates an alternative's use of treatment to reduce the harmful effects of principal contaminants, their ability to move in the environment, and the amount of contaminant present.

5. Short-term Effectiveness considers the length of time needed to implement an alternative and the risks the alternative poses to workers, the community, and the environment during implementation.

6. *Implementability* considers the technical and administrative feasibility of implementing the alternative, including factors such as the relative availability of goods and services.

7. *Cost* includes estimated capital and annual operation and maintenance costs, as well as present-worth cost. Present-worth cost is the total cost of an alternative over time in terms of today's dollar value. Cost estimates are expected to be accurate within a range of +50 to -30 percent.

8. *State Acceptance* considers whether the State agrees with EPA's analyses and recommendations, as described in the RI/FS and Proposed Plan.

9. *Community Acceptance* considers whether the local community agrees with EPA's analyses and preferred alternative. Comments received on the Proposed Plan are an important indicator of community acceptance.

Cost

A table of the estimated capital, annual O&M, and present worth costs for each alternative is provided below.

Alter-native	Capital Costs	Annual O&M Costs	Present Worth
1	$0	$0	$0
2	$79,000	$37,000	$532,000
3	$761,000	$75,000	$1,442,000
4	$444,000	$87,000	$1,239,000

State Acceptance

NJDEP is reviewing the proposed remedy.

Community Acceptance

Community acceptance of the preferred alternative will be assessed in the ROD following review of the public comments received on the Proposed Plan.

PREFERRED ALTERNATIVE AND BASIS FOR SELECTION

EPA's preferred alternative is Alternative 4: In-situ Biological Treatment (Anaerobic Biological Oxidation) and Institutional Controls.

The major components of the preferred alternative are as follows:

- Establishing and maintaining ICs in the form of a CEA/WRA to restrict groundwater use and ensure that groundwater is not used for potable purposes until the RAOs and PRGs have been met;
- Installing additional monitoring wells (approximately three wells are assumed) to supplement the existing monitoring well network;
- Implementing an ABOx injection program;

- Monitoring groundwater to evaluate biological treatment effectiveness until the RAOs and PRGs are met; and

- Reviewing site conditions at least once every five years, as required by CERCLA, until the RAOs are met.

The preferred alternative satisfies the two threshold criteria and achieves the best combination of the five balancing criteria of the comparative analysis. This alternative is preferred because it will achieve the RAOs and PRGs in the shortest amount of time. It provides underground treatment of VOCs in groundwater that constitute potential risk and hazard drivers at the site. Effectiveness monitoring will provide data to optimize the treatment during remedy implementation and will ensure that the RAOs and PRGs are achieved.

Based on information currently available, EPA believes the preferred alternative meets the threshold criteria and provides the best balance of tradeoffs among the other alternatives with respect to the balancing criteria. EPA expects the preferred alternative to satisfy the following statutory requirements of CERCLA § 121(b): 1) be protective of human health and the environment; 2) comply with ARARs; 3) be cost effective; 4) utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and 5) satisfy the preference for treatment as a principal element. EPA will assess the two modifying criteria of State acceptance and community acceptance in the Record of Decision to be issued following the close of the public comment period.

FOR FURTHER INFORMATION

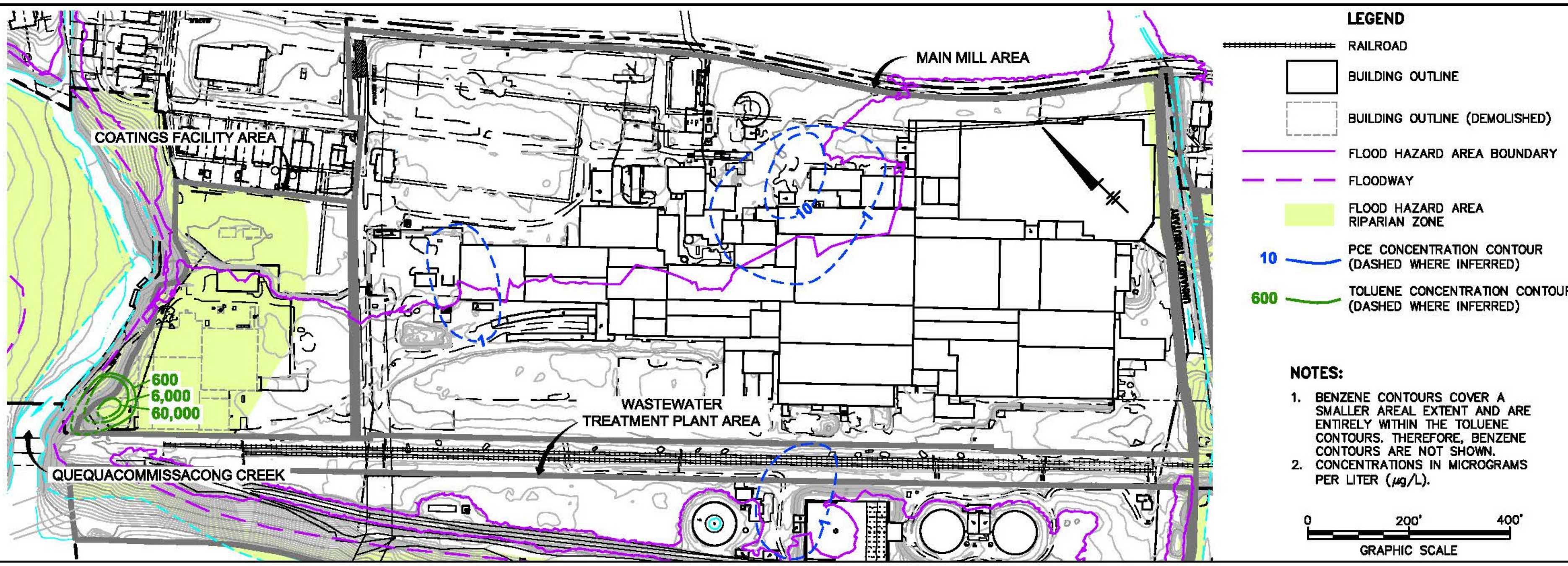
The administrative record file, which contains copies of the Proposed Plan and supporting documentation, is available at the following locations:

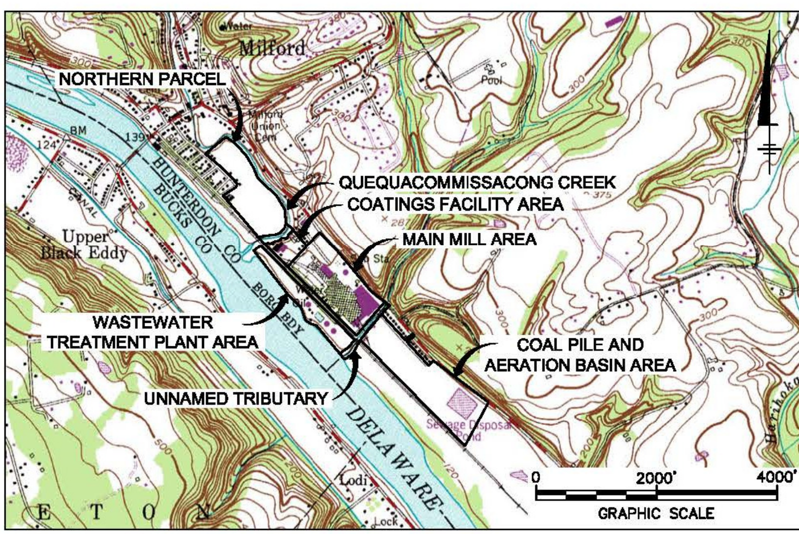
Milford Public Library
40 Frenchtown Road
Milford, New Jersey 08848
(908) 995-4072
Hours: Mon, 12:00 PM-7:00 PM; Tues, 11:00 AM-5:00 PM; Wed, 12:00 PM-8:00 PM; Thurs, 11:00 AM-8:00 PM; Fri, 10:00 AM-1:00 and 5:00 PM-8:00 PM; Sat, 10:00 AM-1:00 PM.

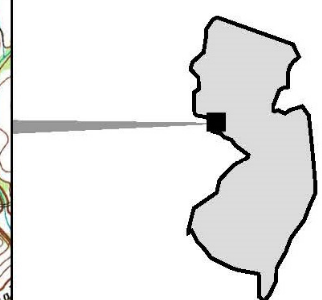
EPA Region 2, Superfund Records Center
290 Broadway, 18th Floor
New York, New York 10007-1866
(212) 637-4308
Hours: Mon – Fri, 9:00 AM-5:00 PM

In addition, select documents from the administrative record are available on-line at:

http://www.epa.gov/region2/superfund/npl/curtisspecialtypapers/







CURTIS SPECIALTY PAPERS SITE
PROPOSED PLAN

SITE PLAN | **1**