Eighteen Mile Creek Superfund Site
Operable Unit 2 – Creek Corridor
Niagara County, New York

August 2016

EPA ANNOUNCES PROPOSED PLAN

This Proposed Plan identifies the remedial alternatives considered to address soil and sediment contamination in the Creek Corridor, a discrete portion of the Eighteen Mile Creek Superfund Site (Site) in Lockport, New York, and identifies the preferred remedial alternative with the rationale for this preference.

This Proposed Plan was developed by the U.S. Environmental Protection Agency (EPA), the lead agency for the Site, in consultation with the New York State Department of Environmental Conservation (NYSDEC). EPA is issuing this Proposed Plan as part of its public participation responsibilities under Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA, also known as Superfund), as amended, and Section 300.430(f) and 300.435(c) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP).

The nature and extent of contamination for the Creek Corridor of the Site is described in the Supplemental Remedial Investigation (RI) Report, completed by EPA in August 2016. Additional supporting information can also be found in various NYSDEC studies and reports. The remedial alternatives summarized in this plan are described in EPA's Supplemental Feasibility Study (FS) Report, dated August 2016, in addition to the NYSDEC Remedial Alternatives Report for the Flintkote Property and the Feasibility Study Report for the Eighteen Mile Creek Corridor and Upland Properties, dated October 2005 and September 2009, respectively.

In order to satisfy federal regulations pertaining to selecting a remedy under CERCLA, EPA obtained additional information that has been included in the Administrative Record file of this action, as well as other documents. EPA encourages the public to review these documents to gain a more comprehensive understanding of the Site and the Superfund activities that have been conducted.

The purpose of this Proposed Plan is to inform the public of EPA's preferred alternative and to solicit public comments pertaining to all of the remedial alternatives evaluated, including the preferred alternative. The preferred alternative includes the following: bank-to-bank excavation of contaminated sediment from the Creek Corridor; stabilization of Creek bank soil; excavation of contaminated soil/fill at the White Transportation, United Paperboard Company, and Upson Park properties; a combination of excavation and capping of contaminated soil/fill at the former Flintkote Plant property; off-site disposal of excavated soil/fill and sediments; and institutional controls.

Changes to the preferred alternative, or a change from the preferred alternative to another remedial alternative described in this Proposed Plan, may be made if public comments or additional data indicate that such a change will 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. For this reason, EPA is soliciting public comments on all of the alternatives considered in the Proposed Plan and on the detailed analysis section of the Supplemental FS Report because EPA may select a remedy other than the preferred alternative.

MARK YOUR CALENDAR

PUBLIC COMMENT PERIOD:
August 31, 2016 – September 30, 2016
EPA will accept written comments on the Proposed Plan during the public comment period.

PUBLIC MEETING: September 7, 2016 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 the 4-H Training Center, Niagara County Fairgrounds, located at 4487 Lake Avenue, Lockport, NY.

COMMUNITY ROLE IN SELECTION PROCESS

EPA relies on public input to ensure that the concerns of the community are considered in selecting an effective remedy for each Superfund site. To this end, this Proposed Plan has been made available to the public for a public comment period which begins on August 31, 2016 and concludes on September 30, 2016.

A public meeting will be held during the public comment period at the 4-H Training Center, Niagara County Fairgrounds, 4487 Lake Avenue in Lockport in on September 7 at 7:00 p.m. At that meeting, EPA will present the conclusions of the Supplemental RI/FS, elaborate further on the reasons for recommending the preferred alternative, and receive public comments.

Comments received at the public meeting, as well as written comments, will be documented in the Responsiveness Summary Section of the Record of Decision (ROD), where significant comments will be responded to. The ROD is a document that formalizes the selection of the remedy.

Written comments on the Proposed Plan should be addressed to:

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INFORMATION REPOSITORIES

Copies of the Proposed Plan and supporting documentation are available at the following information repositories:

Lockport Public Library
23 East Avenue, Lockport, New York 14094
Telephone: (716) 433-5935
Hours of operation:
Mon. –Thurs.: 9 AM – 9 PM
Fri.: 9 AM – 6 PM, Sat.: 9 AM – 5 PM
Sun.: 12:30 PM – 5 PM

USEPA – Region II
Superfund Records Center
290 Broadway, 18th Floor
New York, New York 10007-1866
(212) 637-4308
Hours: Monday – Friday: 9 AM to 5 PM

EPA's website for the Eighteen Mile Creek Site:
www.epa.gov/superfund/eighteenmile-creek

SCOPE AND ROLE OF ACTION

Site remediation activities are sometimes separated into different phases, or operable units (OUs), so that remediation of different aspects of a site can proceed separately, resulting in a more efficient and expeditious cleanup of the entire site. EPA is addressing the Eighteen Mile Creek Site in three OUs. A Site location map is provided as Figure 1.

This Proposed Plan addresses OU2, commonly referred to as the Creek Corridor, which is the approximately 4,000-foot segment of Eighteen Mile Creek (Creek) that extends from the New York State Barge Canal (Canal) to Harwood Street in the City of Lockport. OU2 addresses the contaminated soil at the following adjacent properties: the former Flintkote Plant property; Upson Park; the White Transportation property; and the former United Paperboard Company property. OU2 also addresses contamination within the Creek Channel, which is defined as the sediment within the discrete segment of the Creek. The Creek Channel also includes sediment within the Millrace, which is a small segment of the Creek that splits and flows around an area of soil and fill on the Former Flintkote Plant property. The area of soil and fill is known as the Island. An OU2 Site map is provided as Figure 2.

OU1 addresses the risks associated with the residential soil contamination at nine residential properties located on Water Street and the threats posed from the deteriorating building at the former Flintkote Plant. In September 2013, EPA issued a ROD for OU1. Pursuant to the ROD, the residents at the five occupied residential properties have been permanently relocated, the residences have been acquired, and the structures have been demolished. In addition, the building at the former Flintkote Plant has been demolished. As indicated in the OU1 ROD, the portion of that remedial action involving the soil excavation at the nine residential properties will be performed during cleanup of the sediments in the Creek Corridor to prevent the sediment and soil in the Creek from re-contaminating the above-referenced residential properties.

OU3 addresses the groundwater within the Creek Corridor, as well as contaminated sediments in the Creek that are not addressed by OU2, down to its location of discharge into Lake Ontario in Olcott, New York.

SITE BACKGROUND

Site Description

The Site is located in Niagara County, New York and includes contaminated sediments, soil, and groundwater in and around the Creek.

The headwaters of the Creek consist of an East and West Branch which begin immediately north of the Canal. Water from the Creek's East Branch originates at the spillway on the south side of the Canal, where it is directed northward underneath the Canal and the Mill Street Bridge through a culvert. Water from the West Branch originates from the dry dock on the north side of the Canal and then flows northward. The East and West Branches converge just south of Clinton Street in Lockport and then flow north beneath Clinton Street on the former United Paperboard Company property. There is a dam located in the Creek Channel behind the former United Paperboard Company building, referred to as the Clinton Street Dam, and the ponded water behind the dam is commonly referred to as Mill Pond. On the former Flintkote Plant property, the Creek Channel splits and forms the Millrace, which flows around the Island. Most of the flow follows the channel on the west side of the Island. The Creek flows north for approximately 15 miles and discharges to Lake Ontario in Olcott, New York.

Site Geology and Hydrology

The Creek Channel varies in size from tens of feet wide or less to the south, to more than 50 feet wide in Mill Pond and is located within a well-incised, steeply sloped channel for a portion of its length within the Creek Corridor. In many areas, the Creek Channel bed along the center of the channel is comprised mostly of coarse sand and various sizes of gravel, stone, and rubble. Water depth in the Creek Channel varies from a few inches in the southern-most point of the West Branch to around 10 feet in the center of Mill Pond.

The Creek draws much of its flow from the Canal, but it also receives contributions from upstream areas within the watershed of the Creek and surface runoff during precipitation events or spring snow melts. Drainage within the watershed can be described generally as flowing to the north.

The Creek Corridor has four distinct geologic units. These units, in order of increasing depth, are summarized as follows:

- Topsoil described as a dark brown silty soil with varying amounts of natural organic matter (e.g., leaves and rootlets).

- Fill material consisting primarily of various colored ash and cinder material containing glass, coal, coke, slag, buttons, metal, ceramic, rubber and brick. Where encountered, the thickness of the fill material ranges from approximately 1 to 25 feet;

- A glaciolacustrine deposit consisting primarily of mottled, brown to reddish brown, silty clay and clayey silt containing traces of fine grained sand and fine gravel. This deposit directly overlies bedrock, and where encountered, ranges in thickness from 0.1 to more than 28 feet; and

- Light to dark gray dolostone bedrock with interbedded gray clay underlying the southern portion of the site, and marbleized red and white sandstone underlying the northern portion of the Site. Depth to bedrock at the Site ranges from 1.6 to more than 28 feet, with the greater depths generally associated with the thicker fill areas.

Groundwater underlying the Creek Corridor area occurs in both the soil and fill material above the bedrock (the overburden) and the upper fractured bedrock, and flows toward the Creek along some portion of the Corridor.

Site History

The Creek Corridor has a long history of industrial use dating back to the 19th Century when it was used as a source of hydropower. Various plants operated at the properties within the Creek Corridor.

The former United Paperboard Company property is located at 62 and 70 Mill Street and operated between the late 1880s and early 1890s as a lumber company, and then as a paper company from the late 1890s until at least 1948. The industrial history of the property after 1948 is unknown. The portion of the property near the Clinton Street/Mill Street intersection is currently occupied by Duraline Abrasives and contains one warehouse building on 62 Mill Street. Ash is observed at the surface in many locations on the property.

The White Transportation property consists of four adjoining parcels at 30 through 40 Mill Street. The property was used to store tractor-trailer trucks and other equipment associated with trucking from 1948 until the late 1990s, when operations ceased. When White Transportation closed, tractor-trailers were located throughout the property, many of which contained drums and miscellaneous debris. The trailers and related drums have been removed, but miscellaneous debris remains scattered throughout the property and slag material is observed at the surface.

Upson Park is about 5.9 acres in size and is located on Clinton Street. In the mid-1880s, the Upson Park property was used by a canal boat building company. By 1892 the canal boat company was no longer in operation, but a pulp mill and pulp company were operating on the property. The pulp mill operated until sometime between 1919 and 1928, while the pulp company operated until at least 1948. The history of the property after that time is unknown. Ash similar to that at other properties within the Creek Corridor is observed at the surface along the Creek. Upson Park is a public park along the Canal used for walking, picnicking and other passive recreational activities.

The former Flintkote Plant property is approximately six acres in size and consists of two adjoining parcels at 198 and 300 Mill Street. The former Flintkote Company began operations as a manufacturer of felt and felt products in 1928, when the property was purchased from the Beckman Dawson Roofing Company. In 1935, Flintkote began production of sound-deadening and tufting felt for installation and use in automobiles. Manufacturing of this product line continued until December 1971, when operations ceased and the plant closed. Aerial photographs suggest that by 1938, fill was disposed in the section of 300 Mill Street between the Creek and the Millrace in an area known as the Island.

SUMMARY OF PREVIOUS NYSDEC INVESTIGATIONS

In 1999, NYSDEC conducted an investigation of the former Flintkote Plant property. The results of the investigation are presented in a September 2000 report entitled, "*Site Investigation Report, Former Flintkote Plant Site.*" The investigation revealed that the former Flintkote Plant property received various wastes, refuse, and debris over the years. Much of the waste material was visible at the surface and along the embankments of the Creek, which runs through the former Flintkote Plant property, and the Millrace. The subsurface investigation revealed that most of the waste material at the former Flintkote Plant property is ash containing glass, coal, coke, slag, ceramic, bottles, brick, buttons, and wood.

In 2003, Niagara County, under NYSDEC's Environmental Restoration Program, conducted an additional investigation at the former Flintkote Plant property. As part of this study, soil, fill, groundwater, surface water, sediment, and waste samples were collected from the property to characterize the nature and extent of contamination. The sampling revealed the presence of approximately 46,500 cubic yards of ash fill at the property and elevated concentrations of polychlorinated biphenyls (PCBs), metals, and semi-volatile organic compounds (SVOCs) including polynuclear aromatic hydrocarbons (PAHs) in the soil and sediment in the building's basement. Moreover, a trench and sump which extended below the basement floor were found to contain contaminated sediment. The field activities and findings of both the 1999 and 2003 investigations are described in Niagara County's July 2005 "*Site Investigation Report.*" These investigations, however, did not characterize the soil or determine the extent of suspected contamination beneath the large abandoned former Flintkote building, because the building was dilapidated, unsafe for personnel to enter, and too confining to employ drilling equipment. In March 2006, NYSDEC selected a remedy under state law for the entire former Flintkote Plant property. With the placement of the Eighteen Mile Creek Site on the National Priorities List (NPL) in 2012, which included the former Flintkote Plant property, that state remedy has not been implemented, and EPA and NYSDEC expect that the 2006 remedy will be superseded by NPL remedies. As discussed previously, EPA issued a ROD requiring the demolition of the building at the former Flintkote Plant property in September 2013, and that portion of the remedy has been completed.

In April 2005, NYSDEC initiated an investigation of the former United Paperboard Company property, Upson Park, the White Transportation property, and the Creek Channel. The results of the investigation are presented in a September 2006 report entitled, "*Remedial Investigation Report*," the July 2009 reports entitled, "*Supplemental Remedial Investigation (SRI) Report*" and "*Additional Investigation Addendum to the Supplemental Remedial Investigation Report.*" These investigations documented the presence of fill on these properties, with surface and subsurface soil and fill contaminated with PCBs, metals and SVOCs.

In March 2010, NYSDEC selected a remedy under state law that included the former United Paperboard Company property, the White Transportation property, Upson Park, the Creek Channel, and the Millrace. For the reasons cited above, the State remedy has also not implemented that remedy. The March 2010 NYSDEC remedy also included the Water Street residential properties. As discussed previously, EPA selected a remedy for the Water Street properties in September 2013, and a portion of the remedy has been completed. As discussed above, EPA plans to address the residential property soil remediation portion of the OU1 remedy concurrent with the implementation of an OU2 Creek Corridor remedy.

RESULTS OF EPA's SUPPLEMENTAL REMEDIAL INVESTIGATION

EPA commenced its supplemental investigation of OU2 in 2014, which resulted in the Supplemental Remedial Investigation Report, dated August 2016. This report provides the analytical results of additional soil, fill, sediment, and groundwater samples collected to further characterize the nature and extent of contamination at this OU.

Soil
Soil sampling activities were conducted in phases between 2014 and 2016. At the former Flintkote Plant property, in addition to drilling soil borings in 2014, test pits were excavated after EPA removed the building in 2015. EPA collected surface and subsurface samples of soil and fill from vaults inside the footprint of the building and beneath the building foundations that were not previously accessible for sampling. The sampling revealed maximum concentrations of PCBs, lead, and the PAH (benzo(A)anthracene) at 33 ppm, 2,480 ppm, and 4.6 ppm, respectively.

At Upson Park, soil samples were collected to further delineate an area with elevated PCB concentrations. The sampling revealed maximum concentrations of PCBs and lead, at 250 ppm and 2,080 ppm, respectively.

In addition, surface soil samples were collected at the former Flintkote Plant property, Upson Park, and the former United Paperboard Company property in support of the invertebrate bioaccumulation studies as part of the ecological risk assessment. The results of this study are described in the baseline ecological risk assessment section on page 8. Additional soil sampling was not conducted at the White Transportation Company property as part of EPA's Supplemental RI, due to lack of suitable ecological habitat.

Sediment
To support the Baseline Ecological Risk Assessment (BERA), sediment samples were collected from the Creek Corridor in areas with elevated chemical concentrations in sediment identified during previous NYSDEC investigations which indicated that there was the potential for both acute and chronic toxicity impacts. Toxicity testing was performed to determine if ecological impacts exist. Acid volatile sulfides/simultaneously extracted metals (AVS/SEM) and organic carbon in sediment were also measured to help assess the bioavailability of divalent metals including cadmium, copper, lead, nickel, zinc, monovalent silver, and mercury. Surface sediment (0 to 0.5 feet beneath the sediment water interface) and surface water samples were collected in the Creek Channel at the same locations to assess the correlation of chemical parameters with toxicity testing and provide additional data for the BERA. The results of the BERA are described in the ecological risk assessment section on page 8.

Fish
Fish were collected from the Creek Corridor and background locations in May 2015. Fish tissue samples were used to assess the bioaccumulation exposure pathway from the sediment to fish in support of the baseline human health risk assessment (BHHRA) and BERA. The target fish species were forage sunfish for the BERA and adult largemouth bass (game fish) for the BHHRA. Fewer fish tissue samples were collected than originally planned due to insufficient numbers of suitable species present for game fish and forage fish. As a result, the range of fish species collected for analysis was expanded to include silver redhorse, smallmouth bass, and walleye for fillet analysis. The fish analysis indicated that concentrations of PCBs, mercury, lead, and the pesticide dichloro-diphenyl-trichloroethane (DDT) in fish were at a maximum concentration of 0.83 ppm, 0.18 ppm, 0.78 ppm, and 0.11 ppm, respectively.

The New York State Department of Health (NYSDOH) issued a fish consumption advisory for Eighteen Mile Creek in 1994 after the State found elevated levels of PCBs during sampling. The NYSDOH advisory, which is still in effect, recommends that men, women, and children should not eat any fish from Eighteen Mile Creek.

Surface Water
Surface water samples collected within the Creek Corridor as part of EPA's Supplemental RI did not reveal the presence of PCBs. However, other contaminants such as metals, pesticides, and SVOCs were detected.

Groundwater
As part of EPA's Supplemental RI, additional shallow groundwater monitoring wells were installed within the Creek Corridor to further characterize the volatile organic compound (VOC) contamination and identify gradient and flow directions of groundwater. Groundwater monitoring well installation and sampling results are provided in EPA's Supplemental RI Report. As discussed in the Scope and Role of Action section, groundwater is not the subject of this Proposed Plan and will be addressed in OU3.

PRINCIPAL THREAT WASTE

EPA's findings to date indicate the presence of principal threat wastes at the former Flintkote Plant property and Upson Park, associated with elevated concentrations of PCBs. Based upon EPA's guidance, principal threats at industrial sites include soils contaminated at concentrations greater than or equal to 500 ppm PCBs. For residential areas, principal threats will generally include soils contaminated at concentrations greater than 100 ppm PCBs. At the former Flintkote Plant property, currently zoned for industrial use, PCBs were detected at a maximum concentration of 626 ppm. At Upson Park, currently an open recreation space area, PCBs were detected at a maximum concentration of 390 ppm. A detailed explanation of principle threat wastes can be found in the box, "What is a Principle Threat?"

WHAT IS A "PRINCIPAL THREAT?"

The NCP establishes an expectation that EPA will use treatment to address the principal threats posed by a Site wherever practicable (NCP Section 300.430(a)(1)(iii)(A)). The "principal threat" concept is applied to the characterization of "source materials" at a Superfund site. A source material is material that includes or contains hazardous substances, pollutants, or contaminants that act as a reservoir for migration of contamination to ground water, surface water, or air, or acts as a source for direct exposure. Contaminated ground water generally is not considered to be a source material; however, Non-Aqueous Phase Liquids (NAPLs) in groundwater may be viewed as source material. Principal threat wastes are those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained, or would present a significant risk to human health or the environment should exposure occur. The decision to treat these wastes is made on a site-specific basis through a detailed analysis of the alternatives using the nine remedy selection criteria. This analysis provides a basis for making a statutory finding that the remedy employs treatment as a principal element.

RISK SUMMARY

As part of the Supplemental RI for OU2, EPA conducted a BHHRA and a BERA to estimate the current and future effects of contaminants on human health and the environment. A baseline risk assessment is the analysis of the potential adverse human health and ecological effects caused by hazardous substance releases from a site, assuming no further actions to control or mitigate exposure to these hazardous substances are taken.

In addition, in December 2015, the NYSDOH, under a cooperative agreement with the U.S. Department of Health and Human Services, Agency for Toxic Substances and Disease Registry conducted a public health assessment for the Site. A copy of the public health assessment is available in the Administrative Record for this action.

Human Health Risk Assessment

The BHHRA evaluated potential health effects that could result from exposure to sediment, soil and fill, surface water and fish at OU2. The BHHRA evaluated potential risks to receptors under current and future land use scenarios. The current NYSDOH fish consumption advisory for the Eighteen Mile Creek was not considered in the assessment since the BHHRA does not consider such an institutional control in the development of potential exposure scenarios.

The former Flintkote Plant property, the White Transportation property, and the former United Paperboard Company property are zoned as commercial/industrial use. The Creek Channel abuts these properties. Upson Park, a park land used for recreational purposes, also abuts the Creek Channel. The Creek Channel is not used for commercial purposes but is accessible for recreational uses, such as fishing. The City of Lockport, in its Comprehensive Plan and Tourism Focus Area Nomination Study, also identified additional park land and mixed waterfront uses as potential future use changes for the properties addressed by this action at the Site.

Consistent with EPA policy and guidance, cancer risks and noncancer health hazards were evaluated for the reasonable maximum exposed (RME) individual and the central tendency exposed (CTE) individual. The RME is considered the maximum exposure that is reasonably estimated to occur at a site and is not a worst-case scenario. The CTE, which is the average exposure to an individual, is not provided in this Proposed Plan, as the RME is the basis for decisions under Superfund. However, this additional characterization of CTE is included in the BHHRA for OU2, which is available in the Administrative Record of this action.

A four-step human health risk assessment process was used for assessing Site-related cancer risks and noncancer hazards. The four-step process is comprised of: Hazard Identification of Chemicals of Potential Concern (COPCs), Exposure Assessment, Toxicity Assessment, and Risk Characterization. For additional information, refer to the box, "What is Human Health Risk and How is it Calculated".

Potential current and future receptors who may be exposed to the Creek Channel include the following: anglers who may fish in the Creek Channel and consume their catch or share it with family members; recreational users who may contact surface soil and sediment in the Creek Channel; and recreational users and outdoor workers who may be exposed to surface soil and sediment at Upson Park.

Potential current and future receptors who may be exposed to the former United Paperboard Company property, the White Transportation property, or the former Flintkote Plant property include the following: construction workers who may contact exposed soils at depths during future construction; site visitors/trespassers and outdoor workers who may contact exposed surface soil; future workers who may be exposed to dust through inhalation of particulates in indoor air derived from surface soil; and future residents who may contact subsurface soils brought to the surface during construction without appropriate management of the soil.

The following tables summarize the noncancer hazards and cancer risks exceeding the cancer risk range (10^{-4} to 10^{-6}) or a Hazard Index (HI) greater than 1 for the receptors described above. Each table also identified the COCs for the pathways. A more detailed discussion of the exposure pathways and estimates of risk can be found in the BHHRA for OU2 in the Administrative Record of this action.

WHAT IS HUMAN HEALTH RISK AND HOW IS IT CALCULATED?

Human Health Risk Assessment: 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 releases under current- and anticipated future-land uses. A four-step process is utilized for assessing site-related human health risks for reasonable maximum exposure (RME) scenarios.

Hazard Identification: In this step, the chemicals of potential concern (COPCs) at the site in various media (*i.e.*, soil, fish, surface water, and air) are identified based on such factors as toxicity, frequency of occurrence, and 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 in air, water, soil, etc. that were identified in the previous step are evaluated. Examples of exposure pathways include incidental ingestion of and dermal contact with contaminated soil and ingestion of and dermal contact with contaminated fish. Factors relating to the exposure assessment include, but are not limited to, the concentrations in specific media that people might be exposed to and the frequency and duration of that exposure. Using these factors, a "reasonable maximum exposure" RME 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 noncancer health hazards, 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 risks and noncancer health hazards.

Risk Characterization: This step summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative assessment of site risks for all COPCs. Exposures are evaluated based on the potential risk of developing cancer and the potential for noncancer 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 identified in the Exposure Assessment. Current Superfund regulations for exposures identify the range for determining whether remedial action is necessary as an individual excess lifetime cancer risk of 10^{-4} to 10^{-6}, corresponding to a one-in-ten-thousand to a one-in-a-million excess cancer risk. For noncancer health effects, a "hazard index" (HI) is calculated. The key concept for a noncancer HI is that a "threshold" (measured as an HI of less than or equal to 1) exists below which noncancer health hazards are not expected to occur. The goal of protection is 10^{-6} for cancer risk and an HI of 1 for a noncancer health hazard. Chemicals that exceed a 10^{-4} cancer risk or an HI of 1 are typically those that will require remedial action at a site and are referred to as chemicals of concern, or COCs, in the final remedial decision document or Record of Decision.

Table 1. Summary of noncancer hazards and cancer risks associated with the consumption of fish (ingestion of fish) from the Creek Channel under current and future scenarios.

Receptor	Hazard Index	Cancer Risk
Recreational User – Consuming Fish Tissue		
Young Child	14.0	3.8×10^{-5}
Adolescent	8.6	4.8×10^{-5}
Adult	7.7	7.1×10^{-4}
COCs in fish were PCBs and mercury.		

Table 2. Summary of noncancer hazards and cancer risks associated with exposure to surface and subsurface soil at Upson Park under current and future scenarios. The exposures pathways direct contact (dermal contact and ingestion) and inhalation of particulates and volatilized chemicals).

Receptor	Hazard Index	Cancer Risk
Recreational User – Exposed to Surface Soils		
Young Child	7.1	2.4×10^{-5}
Adolescent	3.1	2.1×10^{-5}
Outdoor Worker – Exposed to Surface Soils		
Adult	3.2	4.9×10^{-5}
Construction Worker – Exposed to Subsurface Soils		
Adult	7.9	4.6×10^{-6}
COC was PCBs.		

Table 3. Summary of noncancer hazards and cancer risks associated with exposure to surface soils and sediment at the former Flintkote Plant property under current and future scenarios. The exposures pathways direct contact (dermal contact and ingestion) and inhalation of particulates and volatilized chemicals).

Receptor	Hazard Index	Cancer Risk
Visitor/Trespasser – Exposed to Surface Soils		
Young Child	3.1	1.4×10^{-4}
Adolescent	1.8	1.3×10^{-5}
Outdoor Worker – Exposed to Surface Soils		
Adult	2.8	1.5×10^{-4}
Construction Worker – Exposed to Subsurface Soils		
Adult	8.1	3.4×10^{-6}
COCs in soils and sediments for the visitor/trespasser were PCBs and PAHs (bennzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoroanthene, and dibenzo(ah)anthracene. The risk drivers for the construction worker was antimony and PCBs.		

Table 4. Summary of noncancer hazards and cancer risks associated with surface and subsurface soil at the United Paperboard Company property. The exposures pathways include direct contact (dermal contact, ingestion, and inhalation of particulates and volatilized chemicals).

Receptor	Hazard Index	Cancer Risk
Visitor/Trespasser – Exposed to Surface Soils		
Young Child	2.1	7.3×10^{-6}
Adolescent	1.2	8.5×10^{-6}
Indoor Worker – Exposed to Dust Particulates		
Adult	1.5	2.3×10^{-5}
Outdoor Worker – Exposed to Surface Soils		
Adult	1.9	2.9×10^{-5}
Construction Worker – Exposed to Subsurface Soils		
Adult	10.0	6.0×10^{-6}
COC was PCBs.		
Future Resident – Exposed to Soils Brought to Surface During Construction If not Properly Managed		
Young Child	59	6.0×10^{-4}
Adult	5.7	8.1×10^{-5}
COCs were benzo(A)pyrene, PCBs, antimony, and copper.		

Lead

In addition to the risks discussed above, lead is evaluated based on comparison of the concentrations to specific screening levels for residential and industrial properties. Lead above EPA's residential lead screening level (400 ppm) was found in soil at the former United Paperboard Company property. Concentrations above EPA's commercial/industrial lead screening level (800 ppm) were found at the Creek Channel, the White Transportation property, and the former Flintkote Plant Company property. Exposure to these concentrations may result in an increased potential for adverse health effects. The evaluation of lead data at the White Transportation property yielded an average concentration less than the residential screening level of 400 ppm. However, sampling results in one area of the property along the Creek bank revealed lead concentrations of 3,750 ppm, 2,590 ppm, and 1,030 ppm; resulting in an average surface lead concentration for that area of 2,457 ppm, exceeding the residential and industrial soil screening levels for lead.

Ecological Risk Assessment

In 2015, as part of the Supplemental RI/FS, EPA initiated an ecological risk assessment, consisting of a screening-level evaluation and BERA to evaluate whether adverse effects to ecological receptors (*i.e.*, organisms and their respective habitats) are occurring or may occur as a result of exposure to contaminants present at OU2. As described in the Site Background section above, the area comprising OU2 consists of a mix of partially paved commercial properties that abut the heavily vegetated Creek Channel along with the Creek Channel.

As part of the BERA, additional sampling and testing was conducted at the Site to investigate bioaccumulation of contaminants from soil and sediment into invertebrates that reside in those media. These data were used to develop site-specific bioaccumulation factors to invertebrates, which were subsequently used in food chain modeling to calculate the risk to upper trophic level receptors. In addition, sediment and surface water toxicity tests were conducted to determine the potential for both chronic (growth and reproduction) and acute (survival) impacts to aquatic and benthic organisms. Surface water toxicity tests indicated that contaminant levels in surface water in the Creek Channel are not great enough to adversely affect aquatic life. Sediment toxicity tests identified one location with contaminant levels great enough to adversely affect benthic aquatic organisms. This additional sampling and toxicity tests are described further in the EPA's Supplemental Remedial Investigation section above.

An ecological risk assessment quantifies risk to different potentially exposed ecological receptors as a Hazard Quotient (HQ). If an HQ is calculated to be equal to or less than 1, then no adverse health effects are expected as a result of exposure. If the HQ is greater than 1, then adverse health effects are possible. The results of both the food chain modeling used to calculate risks to wildlife, along with screening of media to assess the risk to benthic and plant communities, identified contaminants of concern based upon the calculation of an HQ, as described in the text box, "What is Ecological Risk and How is it Calculated". The contaminants that resulted in the greatest HQs for the greatest number of ecological receptors were PCBs, copper, lead, and PAHs. Copper and lead were found to pose a potential risk to terrestrial plants, soil invertebrates, benthos, and terrestrial and aquatic dependent wildlife. PCBs were found to pose the greatest potential risk to aquatic-dependent receptors, with HQs that were several orders of magnitude greater than 1 for the tree swallow and little brown bat, and one to two orders of magnitude greater than 1 for benthos.

Conclusion

It is the lead agency's current judgment that the Preferred Alternative identified in this Proposed Plan, or one of the other active measures considered in the Proposed Plan, is necessary to protect public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

REMEDIAL ACTION OBJECTIVES

Remedial action objectives (RAOs) are specific goals to protect human health and the environment. These objectives are based on available information and standards such as applicable or relevant and appropriate requirements (ARARs), to-be-considered (TBC) guidance, and site-specific risk-based levels. There are no federal or New York state cleanup standards for PCB-contamination in sediment.

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

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

Problem Formulation: In this step, the contaminants of potential ecological concern (COPECs) at the 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 receptors. Individual risk estimates for a given receptor for each chemical are calculated as 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.

The following RAOs have been established for OU2:

- Reduce the cancer risks and noncancer health hazards for people eating fish from Eighteen Mile Creek by reducing the concentration of PCBs and other Site-related contaminants in fish;
- Reduce and/or eliminate risks to ecological receptors by reducing exposure to contaminated soil/fill and sediments;
- Reduce or eliminate potential human exposure to contaminated soil/fill at the former Flintkote Plant property, the White Transportation property, and former United Paperboard Company property to levels that are protective of commercial/industrial use and protective of the environment;
- Reduce or eliminate exposure to contaminated soil/fill at Upson Park to levels that are protective of recreational use, and protective of the environment;
- Reduce or eliminate the migration of contamination in soil/fill from the Flintkote Plant property, the White Transportation property, the former United Paperboard Company property, and Upson Park to adjacent properties, the Eighteen Mile Creek, and groundwater; and
- Reduce or eliminate the potential for migration of contaminants from the Creek to adjacent properties.

PRELIMINARY REMEDIATION GOALS

Table 5 identifies the Preliminary Remediation Goals (PRGs) for soil/fill at OU2 of the Site.

Table 5. PRGs for Primary COCs for Soil/Fill

Properties: • Former Flintkote Plant • Former United Paperboard Company • White Transportation	
Chemicals of Concern	PRG
PCBs – surface (0 to 2 feet)	1 ppm
PCBs – subsurface	10 ppm
Lead	1,000 ppm

(**Table 5.** Continued)

Property: • Upson Park	
Chemicals of Concern	PRG
PCBs – surface and subsurface	1 ppm
Lead	400 ppm

Source: 6 NYCRR Part 375, Environmental Remediation Programs, Subpart 375-6

As indicated in the Scope and Role of Action section, a separate investigation is underway for OU3, addressing contaminated sediments not addressed by this action (OU2), in the remainder of the Creek from the north end of the Creek Corridor in Lockport to the Creek's location of discharge into Lake Ontario in Olcott, New York. Investigations to date have identified that the highest levels of PCBs in sediments are found within the Creek Corridor, such that the Creek Corridor may be acting as a source of PCBs to the lower reaches of the Creek. Because further studies are required to fully understand the nature and extent of contamination in Eighteen Mile Creek, this OU2 action is not expected to fully address the fish consumption RAO.

For this Proposed Plan, EPA has identified a Sediment Action Level of 1 ppm for PCBs in sediments as the concentration triggering the bank-to-bank excavation of all sediment in the Creek Channel. As part of the OU3 remedial investigation, a comprehensive evaluation will be conducted of the entire length of the Creek, including the Creek Channel, to develop final remediation goals for contaminated sediments; therefore, this action is considered an interim remedy for sediments.

SUMMARY OF REMEDIAL ALTERNATIVES

Section 121(b)(1) of CERCLA, 42 U.S.C. §9621(b)(1), mandates that remedial actions must be protective of human health and the environment, cost-effective, comply with ARARS, and utilize permanent solutions and alternative treatment technologies and resource recovery alternatives to the maximum extent practicable. Section 121(b)(1) also establishes a preference for remedial actions that employ, as a principal element, treatment to reduce permanently and significantly the volume, toxicity, or mobility of the hazardous substances, pollutants, and contaminants at a site. Section 121(d), further specifies that a remedial action must attain a level or standard of control of the hazardous substances, pollutants, and contaminants that 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).

Detailed descriptions of all of the remedial alternatives for addressing the contamination associated with OU2 can be found in the EPA and NYSDEC FS Reports, dated August 2016 and September 2009, respectively. In this Proposed Plan, as discussed below, EPA has considered alternatives for soil contamination at the four properties along the Creek Corridor separately from the alternatives to address the sediments in the Creek Channel itself.

The construction time for each alternative reflects only the actual time required to construct or implement the action and does not include the time required to design the remedy, negotiate the performance of the remedy with any potentially responsible parties, or procure the contracts for design and construction.

While principal threat wastes have been identified at Upson Park and on the former Flintkote Plant property, the soil volumes at these properties are relatively small. On-site treatment of these contaminated soils was evaluated in the FS, but with the exception of potential stabilization measures for lead, the FS did not recommend in-situ stabilization measures for PCBs due to the heterogeneous nature of the subsurface soil/fill. Ex-situ measures were not presented in this Proposed Plan, because it would not be cost effective given the small volume, and because there is limited land available for placement of an on-site treatment facility that is not within the floodplain of Eighteen Mile Creek.

Additionally, because each of the soil remedial alternatives evaluated will result in some contaminants remaining at the OU2 properties above levels that would allow for unrestricted use and unlimited exposure, a review of conditions at the Site will be conducted no less often than once every five years. If justified by the review, additional response actions might be implemented.

Remediation of the Properties

Remedial alternatives were developed to address soil contamination, including floodplain soil, at the former Flintkote Plant, the White Transportation property, the former United Paperboard Company property, and Upson Park. For the purposes of evaluating alternatives, each property is designated with the following property-specific identification:

A: former Flintkote Plant
B: White Transportation
C: former United Paperboard Company
D: Upson Park

Common Elements

With the exception of the no action alternative, all of the soil alternatives include common components as follows:

Bank Stabilization:
To ensure the stabilization of banks between the properties and the Creek Channel, contaminated soil/fill between the access roads and the top of the embankment adjacent to the Creek Channel would be covered in place with a demarcation layer and two-foot thick stone and clean soil. This cover system would extend approximately ten feet beyond the top of the embankment, and would be constructed flush with the surrounding topography to promote precipitation runoff. The Creek bank would be restored through the placement of stone, topsoil, biodegradeable erosion control fabric and live plantings. During the remedial design, the composition and thickness of the individual capping materials would be evaluated to promote reliability and efficacy of the cover system.

Institutional Controls:
Since contaminated soil above levels that allow for unrestricted use/unlimited exposure would remain on the properties following remediation, institutional controls would be implemented and may include environmental easements/restrictive covenants, deed notices, and/or zoning restrictions to limit future use of the properties.

Long-Term Monitoring:
Long-term monitoring would be conducted periodically to visually inspect the cover system, restoration success, and ensure remedy effectiveness. Fish tissue monitoring for human health and ecological exposure will be included in the monitoring plan.

Site Management Plan:
A Site Management Plan would be developed to provide for the proper management of the remedy and any use restrictions at the properties post-construction. Because each of the alternatives evaluated would result in soil contamination remaining at the OU2 properties, particularly at depth, that would not allow for unrestricted use and unlimited exposure, the Site Management Plan would include measures to prevent the transfer of deeper soil to the surface during post-construction activities. The Site Management Plan would also provide for the proper implementation, management, and maintenance of institutional controls.

Cultural Resource Investigation:
Based on the results of the Stage lA Cultural Resource Investigation conducted by EPA as part of the Supplemental RI for OU2, a Phase IB field reconnaissance survey would be conducted, including shovel testing along the Creek Channel, to further identify and record archeological features and deposits.

Soil Alternatives

Alternative S1: No Action
The NCP requires that a "No Action" alternative be developed as a baseline for comparison with the other alternatives. Under this alternative, EPA would take no action to prevent exposure to the soil contamination and the contaminated soil would be left in place. This alternative would not include the maintenance of any existing measures at the former Flintkote Plant property, (i.e., temporary fencing and limited gravel cover installed subsequent to the demolition of the building pursuant to the OU1 ROD).

S1A: former Flintkote Plant

Capital Cost:	$0
Annual O&M Costs:	$0
Present-Worth Cost:	$0
Construction Time:	Not Applicable

S1B: White Transportation

Capital Cost:	$0
Annual O&M Costs:	$0
Present-Worth Cost:	$0
Construction Time:	Not Applicable

S1C: former United Paperboard Company

Capital Cost	$0
Annual O&M Costs:	$0
Present-Worth Cost:	$0
Construction Time:	Not Applicable

S1D: Upson Park

Capital Cost:	$0
Annual O&M Costs:	$0
Present-Worth Cost:	$0
Construction Time:	Not Applicable

Alternative S2: Limited Action
This alternative would provide institutional controls and minimal engineering controls to prevent exposure to contaminated soils and would include long-term monitoring. Physical barriers, such as fencing with warning signs, would be installed at the property to limit exposure to contaminated soil/fill. Long-term maintenance would be required and would include periodic inspections and repairs (as appropriate) of the fencing and warning signs.

S2A: former Flintkote Plant

Capital Cost:	$77,000
Annual O&M Costs:	$112,000
Present-Worth Cost:	$189,000
Construction Time:	2.5 Months

S2B: White Transportation

Capital Cost:	$50,000
Annual O&M Costs:	$109,000
Present-Worth Cost:	$159,000
Construction Time:	2.5 Months

S2C: former United Paperboard Company

Capital Cost:	$115,000
Annual O&M Costs:	$116,000
Present-Worth Cost:	$231,000
Construction Time:	2.5 Months

S2D: Upson Park

Capital Cost:	$98,000
Annual O&M Costs:	$114,000
Present-Worth Cost:	$212,000
Construction Time:	2.5 Months

Alternative S3: Capping

This alternative would provide engineering and institutional controls to prevent exposure to contaminated soil and to prevent erosion of contaminated soil/fill into the Creek Channel. The cap would consist of a demarcation layer and a two-foot soil cover for soil/fill exceeding the PRGs identified in Table 5.

Under this alternative, some soil/fill may require excavation and off-site disposal to facilitate the construction of access roads (gravel and/or paved) that would be utilized to facilitate implementation of proposed remedial activities for the Creek. The layout of these roads would be determined during the remedial design. The access roads would remain in place following remediation of the Creek, except at Upson Park, and form part of the bank stabilization cover system. Existing roadways, parking lots, and access roads would be asphalt paved following the construction of the soil cover. Excavated soil/fill would be transported off-Site for proper disposal at a RCRA or TSCA regulated landfill, as appropriate, based on the concentrations of contaminants in the excavated soil/fill. If necessary, in order to meet the requirements of the disposal facilities, contaminated material would be treated prior to land disposal.

Long-term maintenance would be required and would include periodic inspections and repairs (as appropriate) of the cap.

S3A: former Flintkote Plant

Capital Cost:	$1,303,000
Annual O&M Costs:	$163,000
Present-Worth Cost:	$1,466,000
Construction Time:	3 Months

S3B: White Transportation

Capital Cost:	$821,000
Annual O&M Costs:	$177,000
Present-Worth Cost:	$998,000
Construction Time:	3 Months

S3C: former United Paperboard Company

Capital Cost:	$990,000
Annual O&M Costs:	$192,000
Present-Worth Cost:	$1,182,000
Construction Time:	3 Months

S3D: Upson Park

Capital Cost:	$1,340,000
Annual O&M Costs:	$224,000
Present-Worth Cost:	$1,564,000
Construction Time:	3 Months

Alternative S4: Excavation

This alternative includes the excavation of contaminated soil/fill exceeding the PRGs identified in Table 5 and off-Site disposal at a Resource Conservation and Recovery Act (RCRA) or Toxic Substances Control Act (TSCA) regulated landfill, as appropriate, based on the concentrations of contaminants in the excavated soil/fill. If necessary, in order to meet the requirements of the disposal facilities, contaminated material would be treated prior to land disposal. During the remedial design further evaluations would be conducted to determine whether lead contaminated soil/fill could be treated and stabilized on-site, prior to off-site disposal.

Under this alternative, access roads (gravel and/or paved) would be constructed to facilitate implementation of proposed remedial activities of the Creek. The access roads would remain in place following remediation, except at Upson Park, and form part of the bank stabilization cover system.

Verification samples would be collected following excavation to confirm that all contaminated soil/fill in excess of the PRGs has been removed. At the Flintkote Plant property, temporary shoring along the Millrace would be required to facilitate the removal of contaminated soil adjacent to the Creek Channel and the turbine discovered during the demolition of the building conducted during the implementation of the remedy for OU1. Once excavation activities have been completed, the temporary shoring would be removed, and clean soil would be used as backfill, with the top six inches consisting of topsoil that would be planted with native grasses, shrubs, and/or trees. Following excavation and backfill to grade, pre-existing roadways, parking lots, and access roads would be asphalt paved. The approximate areas requiring excavation are shown on Figure 3.

S4A: former Flintkote Plant

Capital Cost:	$11,307,000
Annual O&M Costs:	$24,000
Present-Worth Cost:	$11,331,000
Construction Time:	9 Months

S4B: White Transportation

Capital Cost:	$317,000
Annual O&M Costs:	$24,000
Present-Worth Cost:	$341,000
Construction Time:	1 Month

S4C: former United Paperboard Company

Capital Cost:	$2,443,000
Annual O&M Costs:	$24,000
Present-Worth Cost:	$2,467,000
Construction Time:	2 Months

S4D: Upson Park

Capital Cost:	$3,235,000
Annual O&M Costs:	$24,000
Present-Worth Cost:	$3,259,000
Construction Time:	2 Months

Alternative S5: Combination Excavation and Capping

This alternative consists of the excavation of contaminated soil/fill containing PCBs and lead at contaminants greater than 50 ppm and 1,000 ppm, respectively, the backfill to grade of excavated areas, and transportation off Site for proper disposal at a RCRA or TSCA regulated landfill, as appropriate, based on the concentrations of contaminants in the excavated soil/fill. If necessary, in order to meet the requirements of the disposal facilities, contaminated material would be treated prior to land disposal. During the remedial design, further evaluations would be conducted to determine whether lead contaminated soil/fill could be treated and stabilized on-site, prior to off-site disposal.

Contaminated soil/fill with PCB concentrations below 50 ppm, but greater than the PRGs identified in Table 5 of this Proposed Plan, would also then be covered with a two-foot soil cover. The approximate areas that would be excavated and capped are shown on Figure 4. In some instances, contaminated soil could be re-used on-site. For example, soil with contaminant concentrations below the specified action levels that had been excavated to remove more contaminated soil located at depth might be reused as fill under the clean soil cover.

Under this alternative, access roads (gravel and/or paved) would be constructed to facilitate implementation of proposed remedial activities at the Creek. The access roads would remain in place following remediation, except at Upson Park, and form part of the bank stabilization cover system. Existing roadways, parking lots, and access roads would be asphalt paved following excavation and construction of the soil cover.

S5A: former Flintkote Plant

Capital Cost:	$6,339,000
Annual O&M Costs:	$179,000
Present-Worth Cost:	$6,518,000
Construction Time:	4 Months

S5B: White Transportation

Capital Cost:	$331,000
Annual O&M Costs:	$142,000
Present-Worth Cost:	$473,000
Construction Time:	1 Month

S5C: former United Paperboard Company

Capital Cost:	$2,341,000
Annual O&M Costs:	$146,000
Present-Worth Cost:	$2,487,000
Construction Time:	2 Months

S5D: Upson Park

Capital Cost:	$2,291,000
Annual O&M Costs:	$233,000
Present-Worth Cost:	$3,154,000
Construction Time:	2 Months

Creek Channel (CC) Alternatives

Alternative CC1: No Action

As mentioned above, the NCP requires that a "No Action" alternative be developed as a baseline for comparing other remedial alternatives. Under this alternative, there would be no physical remedial measures to address contamination in the Creek Channel. This alternative does not include any monitoring or institutional controls.

Capital Cost:	$0
Annual O&M Costs:	$0
Present-Worth Cost:	$0
Construction Time:	Not Applicable

Alternative CC2: Sediment Excavation

This alternative consists of the bank-to-bank removal of all contaminated sediment, estimated at 14,500 cubic yards, covering approximately a distance of 4,000 feet in the Creek Channel followed by backfilling to pre-dredging grade. Under this alternative, PCBs would be used as an indicator compound with a Sediment Action Level of 1 ppm to ensure that RAOs are achieved. For the purposes of this Proposed Plan, bank full width is defined as width at which water begins to leave the Creek Channel and discharge to the floodplain. The areas that would be excavated are shown on Figure 3, and would include the

Creek Channel from the Canal to approximately Harwood Street, including the East Branch, West Branch, and the Millrace. To facilitate the removal of contaminated sediment, the dilapidated and unpermitted Clinton and William Street dams would be removed. During the remedial design, methods to manage and/or divert flows in the Creek from the Canal during sediment removal would be further evaluated. In addition, measures would be evaluated during the remedial design to mitigate the potential impact from the Canal to the Creek during maintenance activities at the Canal.

The contaminated sediment would be removed and dewatered at a facility constructed at the Site before being transported off-site for proper disposal at a RCRA or TSCA regulated landfill, as appropriate, based on the concentrations of contaminants in the material. If necessary, in order to meet the requirements of the disposal facilities, contaminated material would be treated prior to land disposal.

Gravel access roads, up to 20 feet in width, would be constructed along the Creek Corridor to be utilized in the remediation of the Creek sediment. The access roads would remain in place and be re-graded following sediment remediation and form part of a bank stabilization cover system and allow for appropriate bank restoration.

Backfill material would be comprised of clean material. The Creek bank would be restored through the placement of stone, topsoil, biodegradeable erosion control fabric, and live plantings. During the remedial design, the composition and thickness of the individual capping materials would be evaluated to promote reliability and efficacy of the cover system. In addition, a floodplain and hydraulic study would also be conducted during the remedial design to determine the types and locations of rock riffle grade control structures that would be constructed in the Creek to control flow, reduce the potential for erosion and scour of the banks, and reduce the potential for downstream flooding.

Long-term monitoring would be conducted to demonstrate the effectiveness in meeting the remedial action objectives. Institutional controls in the form of informational devices, such as fish consumption advisories, would be implemented to limit exposure to contamination. Fish consumption advisories are implemented and managed by the NYSDOH.

Capital Cost:	$10,519,000
Annual O&M Costs:	$147,000
Present-Worth Cost:	$10,666,000
Construction Time:	2 Years

Alternative CC3: Sediment Excavation and Capping
This alternative includes the remedial measures included in Alternative CC2, but includes the capping of sediment between Clinton Street and the Clinton Street Dam rather than the excavation and off-site disposal of contaminated sediments in this approximately 40,000 ft^2 area (refer to Figure 3). The cap would be 36 inches thick and would include the following layers: chemical isolation layer; bioturbation layer; and an erosion protection layer. This alternative would also include the restoration of the Clinton Street Dam and maintenance of the cap.

Because this alternative would also result in contaminants remaining above levels that allow for unrestricted use and unlimited exposure in the Creek Chanel, CERCLA requires that the Site be reviewed at least once every five years. If justified by the review, additional response actions may be implemented.

Capital Cost:	$7,934,000
Annual O&M Costs:	$174,000
Present-Worth Cost:	$8,108,000
Construction Time:	2 Years

EVALUATION OF ALTERNATIVES

A detailed description of how EPA evaluates remedial alternatives can be found in the box, "Evaluation Criteria for Superfund Remedial Alternatives".

Overall Protection of Human Health and the Environment

A threshold requirement of CERCLA is that the selected remedial action be protective of human health and the environment. An alternative is protective if it reduces current and potential risk associated with each exposure pathway at a site to acceptable levels.

<u>Soil</u>
Alternative S1 (No Action) is not protective of human health and the environment because it does not eliminate, reduce, or control risk of exposure to contaminated soil/fill. Alternative S2 (Limited Action) would provide protection of human health, in as far as the engineering controls could be maintained. Alternative S3 (Capping) would provide greater protection of human health and the environment from future exposure to contaminated soil/fill than Alternative S2 through the placement of cover material, and through institutional controls. Alternative S4 (Excavation) would remove soil/fill with concentrations of contaminants above the PRGs and, therefore, would provide the highest level of protection to human and ecological receptors from contact with contaminants. Alternative S5 (Excavation and Capping) would be protective of human health since contaminated soil/fill would either be removed from the

properties or contained in place, and through institutional controls. However, contaminated soil/fill would remain in place above the PRGs. Under Alternatives S3, S4, and S5, the two-foot bank stabilization cover system would reduce the risk of erosion and exposure to contaminated soil along the banks of the Creek Corridor. The two-foot thick bank stabilization cover system would significantly reduce exposure of ecological receptors to site-related contaminants and address any potential for site-related contaminants to enter the Creek Corridor. In addition, upland soil at the properties provides limited ecological function. There would be no local human health or environmental impacts associated with off-site disposal in Alternatives S4 or S5 because the contaminants would be removed from the Site to a secure disposal facility.

Creek Channel

Alternative CC1 (No Action) is not protective of human health and the environment because it does not eliminate, reduce, or control risk of exposure to contaminated sediment. Alternative CC2 (Excavation) involves the bank-to-bank excavation of all sediments in the Creek Channel and, therefore would provide the highest level of protection to human and ecological receptors from contact with contaminants. Alternative CC3 (Combined Excavation and Capping) would also provide protection of human health and the environment, however, monitoring and maintenance of the cap would be required for protection.

There would be no local human health or environmental impacts associated with off-site disposal in Alternatives CC2 or CC3 because the contaminants would be removed from the Site to a secure disposal facility.

Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

Compliance with ARARs is the other threshold requirement for remedy selection under CERCLA regulations.

Soil

New York State's 6 NYCRR Part 375 is an ARAR, a TBC, or an 'other guidance' to consider in addressing contaminated soil at OU2. Alternative S1 would not achieve cleanup levels for soil since no measures would be implemented and contaminants in the soil/fill, which exceed the cleanup levels, would remain in place. Alternatives S3 through S5 would either cap or remove, or a combination thereof, the soil/fill exceeding the PRGs at each of the properties.

RCRA and TSCA are federal laws that mandate procedures for managing, treating, transporting, storing, and disposing of hazardous wastes and PCBs, respectively. All portions of RCRA that are applicable or relevant and appropriate to the proposed remedy for the Site would be met by Alternatives S2 through S5 and all portions of TSCA would be met by Alternatives S2 through S5.

EVALUATION CRITERIA FOR SUPERFUND REMEDIAL ALTERNATIVES

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

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.

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

Reduction of Toxicity, Mobility, or Volume (TMV) 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 contamination present.

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.

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

Cost includes estimated capital and annual operations 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.

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

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.

Creek Channel
There are currently no federal or state promulgated standards for contaminant levels in sediments. There are, however, other federal or state advisories, criteria, or guidance (which are used as TBC criteria). Specifically, NYSDEC's "Screening and Assessment of Contaminated Sediment Guidance" (2014) sediment screening values are a TBC criteria. Because the contaminated sediments would not be addressed under Alternative CC1, the PCB sediment action level would not be achieved. Alternative CC2 would achieve the sediment action level through the bank-to-bank removal of sediment. Alternative CC3 would achieve the sediment action level through a combination of isolation and removal of sediment.

Because there is no active remediation associated with the sediment for Alternative CC1, action-specific and location-specific ARARs do not apply. Alternatives CC2 and CC3 are expected to comply with action-specific and location-specific ARARs for water quality monitoring during excavation of sediments and wastewater discharge resulting from sediment dewatering.

Pursuant to Section 106 of the National Historic Preservation Act (NHPA), a Stage 1B Cultural Resource Investigation would be performed during the design phase to evaluate the existence of cultural and archaeological resources within the Creek Corridor that could be impacted by the implementation of this alternative.

RCRA and TSCA are federal laws that mandate procedures for managing, treating, transporting, storing, and disposing of hazardous wastes and PCBs, respectively. All portions of RCRA that are applicable or relevant and appropriate to the proposed remedy for the Site would be met by Alternatives CC1 through CC3 and all portions of TSCA would be met by Alternatives CC1 and CC3.

Long-Term Effectiveness and Permanence

Soil
Alternatives S1 provides no reduction in risk. Alternative S2 relies on fencing and institutional controls to limit access, but it would not reduce risk should exposure occur. Alternative S3 would not be as permanent or effective over the long-term as Alternatives S4 or S5 because the cap would require periodic maintenance. Alternative S5 would be more effective and permanent than Alternative S3 because soil/fill containing the highest concentrations of contaminants would be removed, and the remaining material would be capped. The material removed would be taken to an approved off-site disposal facility and treated, if required. Off-site treatment/disposal of the contaminated soil at a secure, permitted hazardous waste facility is reliable because the design of such facilities includes safeguards intended to ensure the reliability of the technology and the security of the waste material. Under Alternative S4, long-term risks would be eliminated because the contaminated soil/fill exceeding the PRGs would be permanently removed and taken to an approved off-site disposal facility, where it would be treated, if required. Bank stabilization would help to promote long-term permanence through the restoration of riparian habitat. Alternatives S2, S3, S4, and S5 also rely on institutional controls and long-term monitoring of the bank stabilization measures to reduce future health risks associated with exposure to contaminated soil.

Creek Channel
Alternatives CC1 provides no reduction in risk. Under Alternative CC2, long-term risks would be eliminated because all of the sediment would be permanently removed and taken to an approved off-site disposal facility. Alternative CC3 would reduce risk by a combination of excavation and capping. Alternative CC3 would not be as permanent or effective over the long-term as Alternative CC2 because some contaminated sediment would remain in place. Proper design, placement, and maintenance of the cap are required for its effectiveness, continued performance, and reliability. Cap monitoring and maintenance programs would provide for reasonable reliability. Though PCBs isolated under the cap would migrate into the cap very slowly through molecular diffusion, they would not be expected to compromise the integrity of the cap.

Alternatives CC2 and CC3 also rely on institutional controls and long-term monitoring to reduce future health risks. The fish consumption advisory would continue to provide some measure of protection of human health until concentrations in fish are reduced to the point where the fish consumption advisory can be relaxed or lifted by NYSDOH.

The NYSDEC RI report concluded that Canal is not a significant contributor of contamination to the Creek sediments within the Corridor. However, the investigation also concluded that one-time events, such as pulling the Canal plug (allows water to drain from the Canal to the Creek) could have the potential to cause contaminated sediments to be released to the Creek. The FS assumed that a sediment release from pulling the Canal plug could be avoided through operational changes (i.e. use of pumps) to prevent such a potential slug release to the Creek. Under Alternatives CC2 and CC3, measures would be evaluated during the remedial design to mitigate the potential impact from the Canal to the Creek.

Reduction of Toxicity, Mobility, or Volume through Treatment

Soil
Alternative S1 and S2 would not achieve any reduction in toxicity, mobility, or volume because contaminated soil/fill would remain in place. Alternative S3 would provide a reduction in mobility and the exposure to contaminants through capping, but it would not reduce the volume or toxicity of the contaminants at the Site. Under Alternative S4, the mobility, volume, and exposure to contaminants would be reduced through the removal and disposal of the soil/fill at an approved off-site facility. Furthermore, off-site treatment, if required, would reduce the toxicity and volume of the contaminated soil/fill prior to land disposal. Alternative S5 would use a combination of capping and removal to achieve a reduction in mobility, volume, and exposure to contaminants at the Site. Under Alternative S5, the exposure to contaminants would be reduced through capping and the mobility and volume of soil/fill containing the highest concentrations of contaminants would be reduced through removal and off-site disposal. If off-site treatment is required, it would reduce the toxicity and volume of the contaminated soil/fill prior to land disposal. Under Alternatives S4 and S5, the on-site stabilization of lead contaminated soil/fill prior to off-site disposal would be evaluated further during the remedial design. On-site treatment would reduce the toxicity of the treated material, however, the addition of a stabilization agent would result in an increase in volume.

Creek Channel
Alternative CC1 would not achieve any reduction in toxicity, mobility, or volume because contaminated sediment would remain in place. Alternative CC2 would reduce the mobility, volume, and exposure to contaminants through the removal and disposal of the sediments at an approved off-site facility. Alternative CC3 employs a combination of excavation and capping. As a result, mobility and exposure to sediments in the Creek Channel at Mill Pond is achieved through isolation of contaminants beneath the cap and through the removal and disposal of the remaining sediments in the Creek Channel at an approved off-Site facility.

Short-Term Effectiveness

Soil
Alternative S1 (No Action) would not create new adverse short-term impacts. Minimal impacts would be expected for Alternative S2 resulting from the installation of fencing. Alternative S3 would present less of an impact than S4 and S5 to the surrounding community since contaminated soils would not be significantly disturbed during the cap construction. However, Alternative S3 would cause some increase in truck traffic and noise in the surrounding community due to the installation of the cap.

Alternatives S4 and S5 would cause an increase in truck traffic, noise, and potentially dust in the surrounding community due to excavation of contaminated soil. These impacts would be greater for Alternative S4 due to the increased volume of soil/fill that would be excavated and transported off-site. Alternatives S4 and S5 would also cause additional exposure to contaminated soil being excavated and handled by workers during the performance of construction activities. Under Alternatives S2, S3, S4, and S5, the construction of the bank stabilization cover system would result in additional short-term risks resulting from the construction activities and exposure to additional contaminated soil being handled to facilitate the construction of the access roads and bank stabilization cover system.

However, proven procedures including engineering controls, personal protective equipment, and safe work practices would be used to address potential impacts to workers and the community. For example, the work would be scheduled to coincide with normal working hours on week days, and no work would occur on weekends or holidays. In addition, trucking routes with the least disruption to the surrounding community will be utilized. Appropriate transportation safety measures would be required during the shipping of the contaminated material to the off-site disposal facility.

The risk of release during implementation of Alternatives S2 through S5 is principally limited to wind-blown soil transport or surface water runoff. Any potential environmental impacts associated with dust and runoff would be minimized with proper installation and implementation of dust and erosion control measures and by performing the excavation and off-site disposal with appropriate health and safety measures to limit the amount of material that may migrate to a potential receptor.

No time is required for construction of Alternative S1 (No Action). Time required for implementation of Alternative S2 (Limited Action) is estimated to take 10 months. Alternative S3 (Capping), Alternative S4 (Excavation), and Alternative S5 (Combination Excavation and Capping) are estimated to take 9 months, 14 months, and 9 months, respectively.

Creek Channel
Alternative CC1 (No Action) would not create new adverse short-term impacts. Under Alternatives CC2 and CC3, several short-term impacts on the community and workers would be expected. These include dust, noise, and potential exposure during handling and transportation of contaminants. To minimize short-term impacts, site access

would be restricted during construction and remediation activities. Proven procedures including engineering controls, personal protective equipment, and safe work practices would be in place to protect the workers and surrounding community. In addition, trucking routes with the least disruption to the surrounding community would be utilized. Appropriate transportation safety measures would be required during the shipping of the contaminated material to the off-site disposal facility.

The risk of release of contaminants into the water column during implementation of Alternatives CC2 and CC3 would be minimized by damming and diverting the Creek Channel to allow excavation and capping of sediment under near dry conditions.

No time is required for construction of Alternative CC1. Time required for implementation of Alternative CC2 is estimated to take two years. Alternative CC3 is also estimated to take two years.

Implementability

Soil

Alternative S1 would be the easiest alternative to implement, as there are no construction activities to implement. Alternatives S2, S3, S4, and S5 would use technologies known to be reliable and that can be readily implemented. These approaches have been used at other sites and have been shown to be reliable in addressing contaminated soil. Alternative S2 would be easier to implement than Alternative S3 because it only involves the installation of fencing along the upland soils rather than the placement of a cap. Alternatives S4 and S5 would be the most difficult to implement because they require the use of heavy equipment to remove large volumes of contaminated soil/fill along steep slopes in some areas. Where necessary, shoring would be used to manage steep slopes. At the former Flintkote Plant property, the steep slope along Mill Street and excavation around the turbine adjacent to the Creek potentially pose the need for additional engineering measures to effectively perform excavation activities. Alternative S5 involves a combination of capping and removal, and it would be slightly easier to implement than Alternative S4 because less material would be removed using heavy equipment.

The personnel required to operate the heavy equipment would require appropriate Occupational Safety and Health Administration (OSHA) certifications (e.g., hazardous waste worker), in addition to being certified in the operation of heavy equipment. Such individuals are readily available. Off-site hazardous and nonhazardous treatment/disposal facilities for the disposal of the contaminated soils are available, so disposal would be feasible.

Creek Channel

Alternative CC1 would be the easiest alternative to implement, as there are no construction activities to implement. Under Alternatives CC2 and CC3, the design and construction methods of both capping and dredging are relatively standard. However, implementation of the dredging component is complicated by limited site access and steep slopes. Under Alternative CC3, the area amenable to capping in the Creek Corridor is limited due to the shallow water depth in significant portions the Creek Corridor. With a deeper water depth, the placement of a cap in the area upstream of the Clinton Street Dam is technically feasible. Since the area targeted for capping is limited, this alternative would not involve large quantities of capping material and the necessary materials are expected to be available. Conditions in the area upstream of Clinton Street Dam targeted for capping are not expected to impact the ability to properly place the cap material nor significantly impact the depth of open water.

Although the management of Creek flows poses implementation challenges, methods could be readily implemented using standard construction equipment and materials. For cost-estimating and planning purposes, EPA's Supplemental FS assumed in-channel Creek flow diversion using fabric dam bags during sediment removal. During the remedial design, alternative measures could be evaluated. Off-site disposal facilities for the disposal of the excavated sediments are available, so disposal would be feasible.

Cost

The estimated capital cost, operation and maintenance (O&M), and present worth cost are discussed in detail in EPA's Supplemental FS. The cost estimates are based on the best available information. Alternative S1 and CC1 have no cost because no activities are implemented. The present worth cost for Alternatives S1 through S5 and Alternatives CC1 through CC3 are provided in Table 6 below. The present-worth costs for each of the alternatives at each property are as follows:

Table 6. Present-Worth Cost of Alternatives

Alternative	Soil				Sediment
	Flintkote Property	White Transportation	United Paperboard	Upson Park	Creek Channel
Soil					
S1 - No Action	$0	$0	$0	$0	
S2 - Limited Action	$189,000	$159,000	$231,000	$212,000	
S3 - Capping	$1,466,000	$998,000	$1,182,000	$1,564,000	
S4 - Excavation	$11,331,000	**$341,000**	**$2,467,000**	**$3,259,000**	
S5 - Combination Excavation and Capping	**$6,518,000**	$473,000	$2,487,000	$3,154,000	
Sediment					
CC1 - No Action					$0
CC2 - Excavation					**$10,666,000**
CC3 - Excavation and Capping					$8,108,000

Note: The preferred alternative for each property is shown in bold.

State/Support Agency Acceptance

NYSDEC concurs with the preferred alternative.

Community Acceptance

Community acceptance of the preferred alternative will be evaluated after the public comment period ends and will be described in the Responsiveness Summary section of the Record of Decision for this OU. The Record of Decision is the document that formalizes the selected of the remedy for an OU.

PREFERRED REMEDY AND BASIS FOR PREFERENCE

Basis for the Remedy Preference

For the OU2 soil alternatives, EPA is proposing the combination of Alternative S4 (Excavation) for the former United Paperboard Company, the White Transportation, and Upson Park properties; Alternative S5 (Combination Excavation and Capping) for the former Flintkote Plant property, and Alternative CC2 (Sediment Excavation) as the preferred alternative for the Creek Channel at OU2 of the Site because these alternatives would effectively achieve the remedial action objectives. The combination of excavation, capping, monitoring and maintenance, and institutional controls ensures protectiveness. The estimated present worth of the preferred alternative remedy is $23.3 million.

The environmental benefits of the preferred alternative may be enhanced by consideration, during the design, of technologies and practices that are sustainable in accordance with the both the EPA Region 2's Clean and Green Energy Policy and NYSDEC's Green Remediation Policy[1]. This would include consideration of green remediation technologies and practices.

At the former United Paperboard Company, the White Transportation, and Upson Park properties, Alternative S4 is preferred because it is expected to achieve substantial and long-term risk reduction through excavation and off-site disposal, and allow the properties to be used for the reasonably anticipated future land use. Alternative S4 reduces the risk within a reasonable time frame, at comparable cost to the other alternatives, and provides for long-term reliability of the remedy. At the former Flintkote Plant property, Alternative S5 is preferred due to the challenges posed by the steep slope along Mill Street and the significantly larger volume of soil that would require excavation at depth adjacent to the Creek Channel under Alternative S4. After removing contaminated soil, proper placement of the cap would ensure effective remediation at the former Flintkote Plant property by preventing direct contact with or migration of contaminants in deeper soil that would be left in place. Under this alternative, no contaminated soil or fill with PCBs above 10 ppm would be left on the Flintkote property. Alternative S5 is not expected to impact the reasonably-anticipated future land use at the former Flintkote Plant property.

[1] See http://www.epa.gov/greenercleanups/epa-region-2-clean-and-green-policy and http://www.dec.ny.gov/docs/remediation_hudson_pdf/der31.pdf

Alternative CC2 is preferred for the Creek Channel because the bank-to-bank excavation of sediment would be more protective over the long term and not require monitoring and maintaining of the cap at Mill Pond in perpetuity.

Based upon the 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) is protective of human health and the environment; 2) complies with ARARs; 3) is cost effective; 4) utilizes permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. The preferred alternative may satisfy the preference for treatment, since, if necessary, in order to meet the requirements of the disposal facilities, contaminated material would be treated prior to land disposal. In addition, during the remedial design further evaluations would be conducted to determine whether lead contaminated soil/fill could be treated and stabilized on-site, prior to off-site disposal. Long-term monitoring and five-year reviews would be performed to assure the protectiveness of the remedy. With respect to the two modifying criteria of the comparative analysis, state acceptance and community acceptance: NYSDEC concurs with the preferred alternative; community acceptance will be evaluated upon the close of the public comment period.

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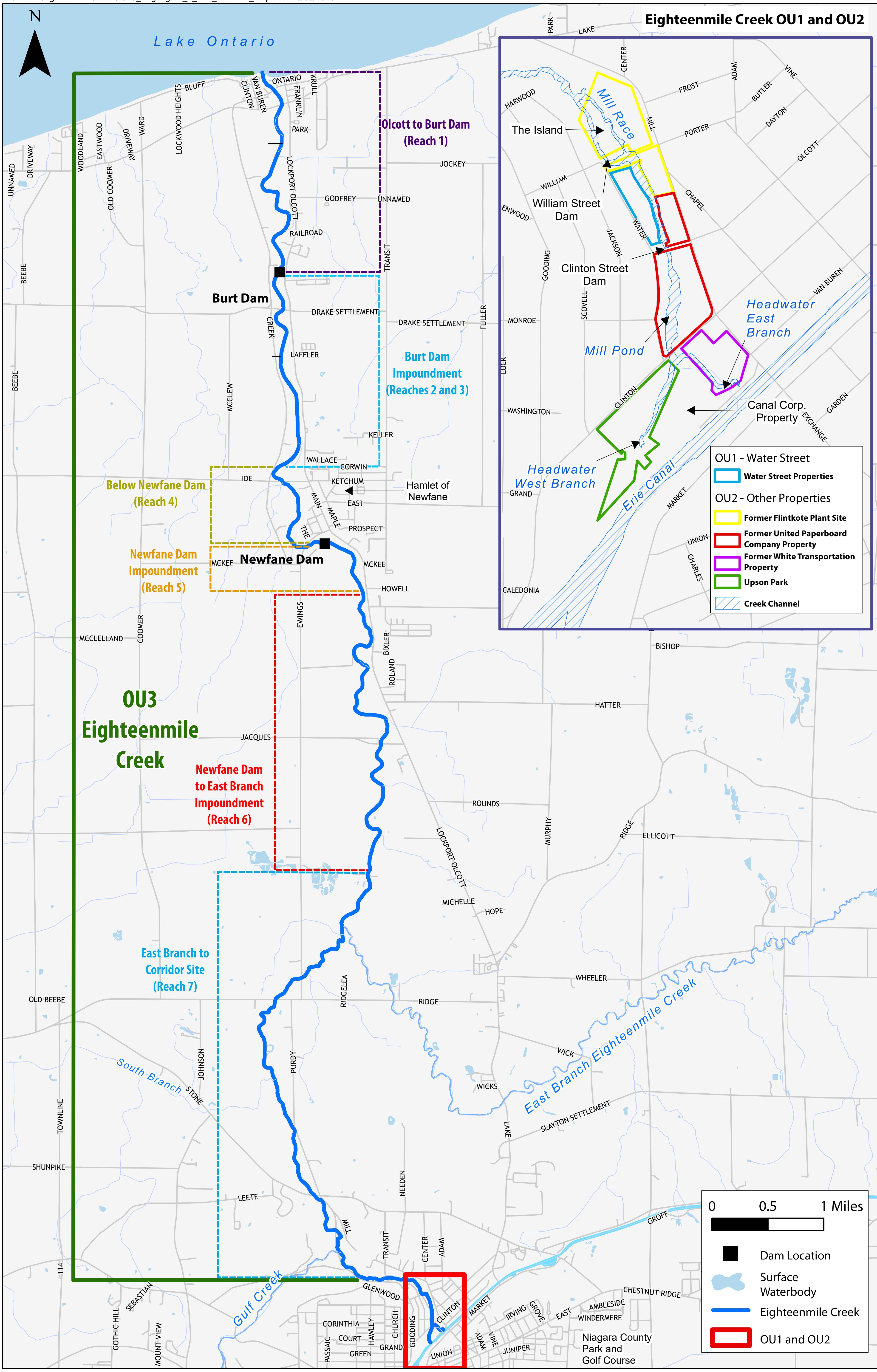

Figure 1 Site Location Map, Eighteenmile Creek Superfund Site
Lockport, NY

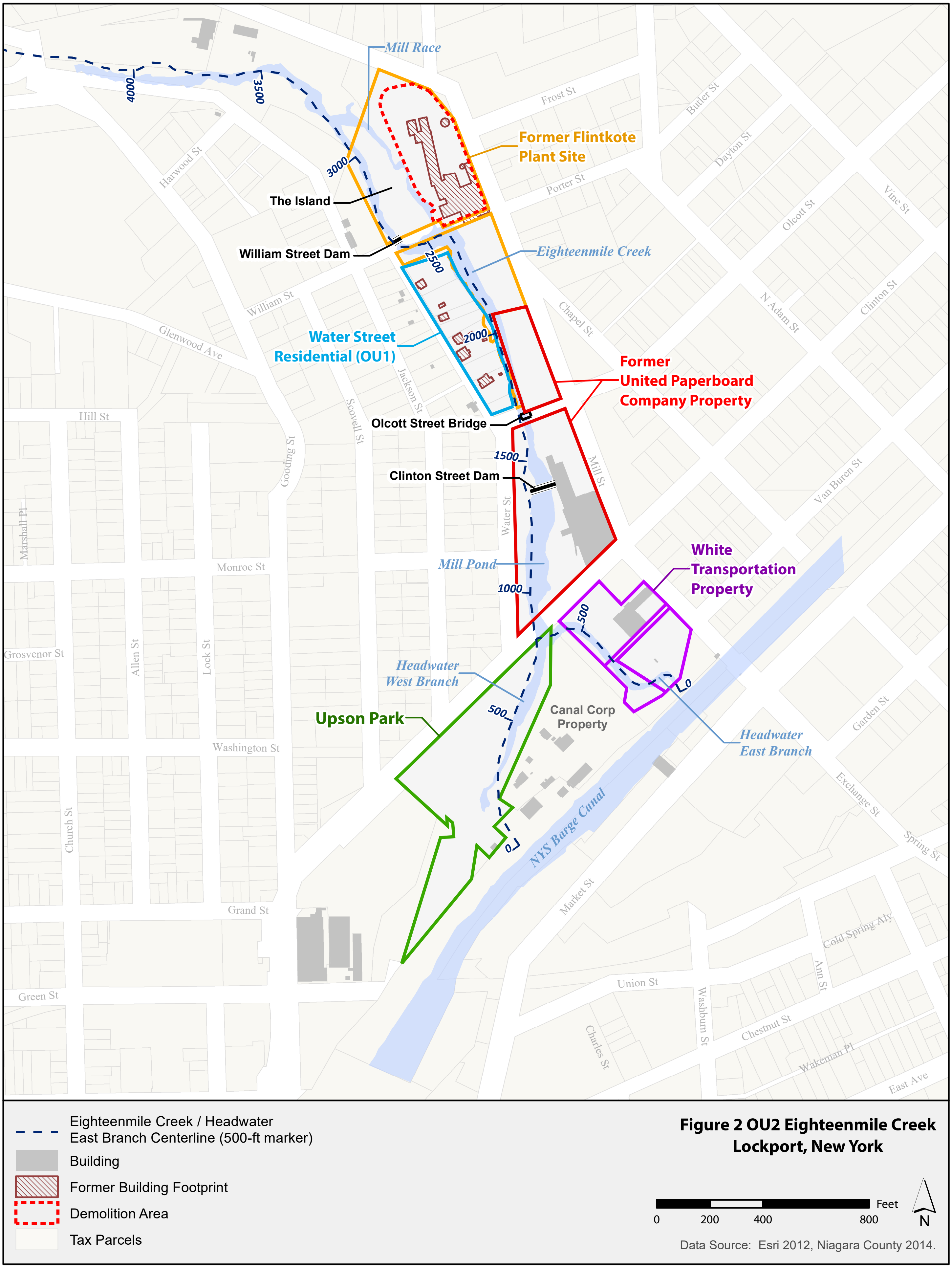

**Figure 2 OU2 Eighteenmile Creek
Lockport, New York**

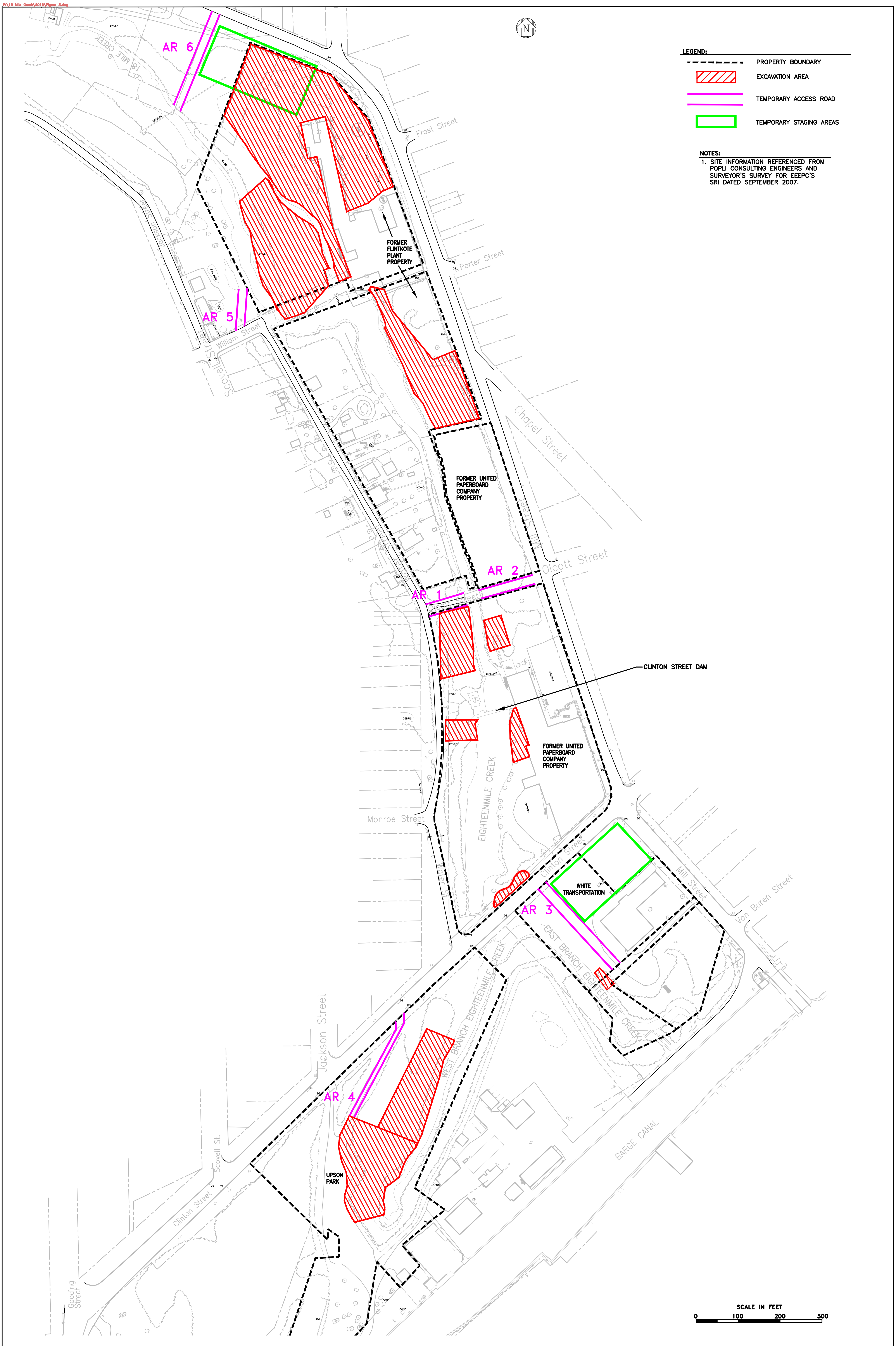

Figure 3 Alternative S4: Excavation, OU2 Eighteenmile Creek Corridor Site Lockport, New York

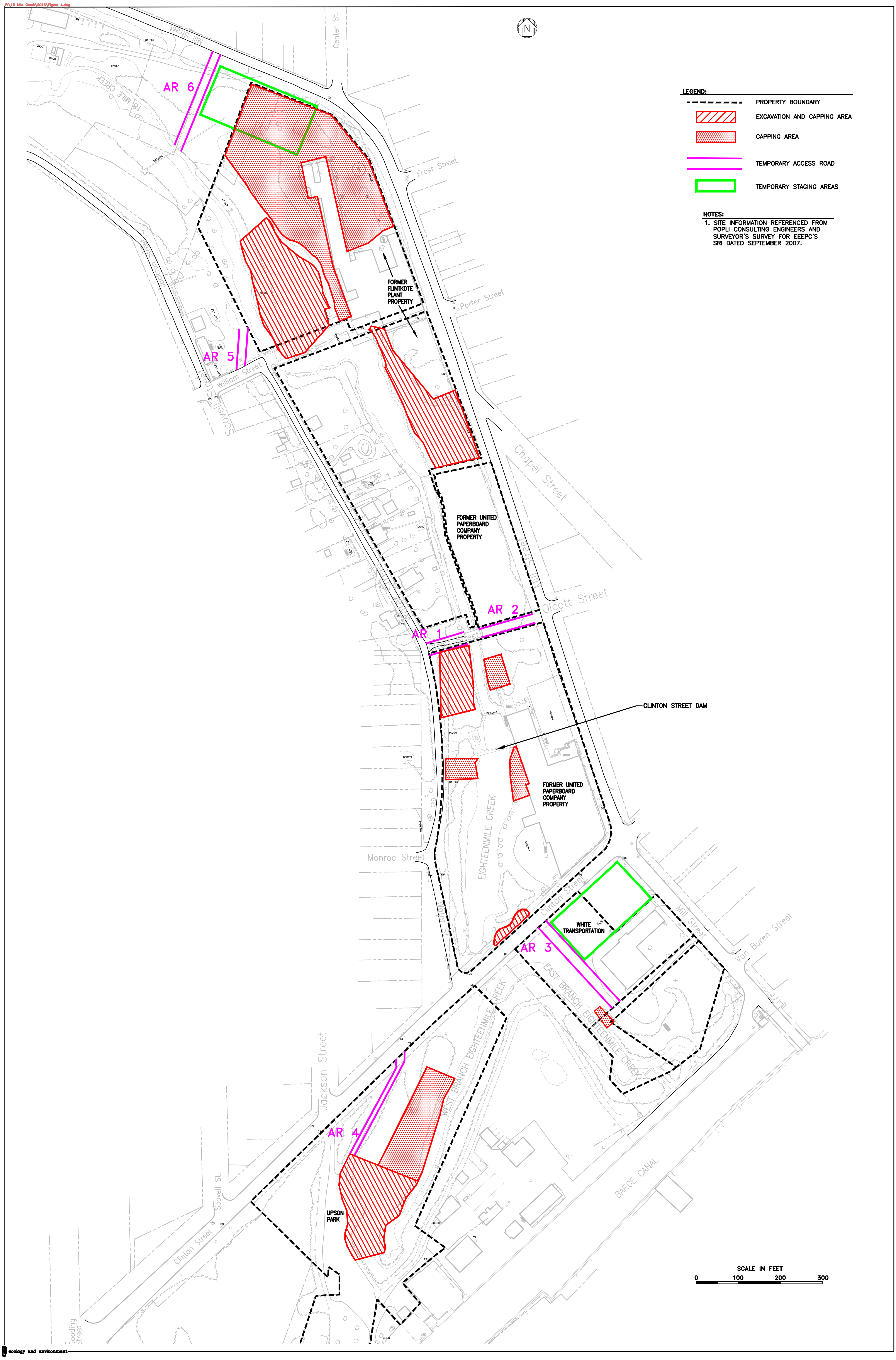

Figure 4 **Alternative S5: Combined Excavation and Capping, OU2 Eighteenmile Creek Corridor Site Lockport, New York**