PROPOSED REMEDIAL ACTION PLAN

Moreau Dredge Spoil Disposal Site
State Superfund Project
Moreau, Saratoga County
Site No. 546042
February 2012

Prepared by
Division of Environmental Remediation
New York State Department of Environmental Conservation

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SECTION 1: SUMMARY AND PURPOSE OF THE PROPOSED PLAN

The New York State Department of Environmental Conservation (the Department), in consultation with the New York State Department of Health (NYSDOH), is proposing a remedy for the above referenced site. The disposal of hazardous wastes at the site has resulted in threats to public health and the environment that would be addressed by the remedy proposed by this Proposed Remedial Action Plan (PRAP). The disposal of hazardous wastes at this site, as more fully described in Section 6 of this document, has contaminated various environmental media. The proposed remedy is intended to attain the remedial action objectives identified for this site for the protection of public health and the environment. This PRAP identifies the preferred remedy, summarizes the other alternatives considered, and discusses the reasons for the preferred remedy.

The New York State Inactive Hazardous Waste Disposal Site Remedial Program (also known as the State Superfund Program) is an enforcement program, the mission of which is to identify and characterize suspected inactive hazardous waste disposal sites and to investigate and remediate those sites found to pose a significant threat to public health and environment.

The Department has issued this document in accordance with the requirements of New York State Environmental Conservation Law and Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York; (6 NYCRR) Part 375. This document is a summary of the information that can be found in the site-related reports and documents in the document repositories identified below.

SECTION 2: CITIZEN PARTICIPATION

The Department seeks input from the community on all PRAPs. This is an opportunity for public participation in the remedy selection process. The public is encouraged to review the reports and documents, which are available at the following repositories:

NYSDEC - Central Office
Attn: William Shaw
625 Broadway
Albany, NY 12233
Phone: (518) 402-9676

USEPA - Hudson River PCB Project Field Office
421 Lower Main Street
Hudson Falls, NY 12839
Phone: (518) 747-4389

Town of Moreau Office Building
61 Hudson Street
South Glens Falls, NY 12803
Phone: (518) 792-1030

A public comment period has been set from:

2/24/2012 to 3/26/2012

A public meeting is scheduled for the following date:

3/6/2012 at 7:00 PM

Public meeting location:

Town of Moreau Office Building / 61 Hudson Street / South Glens Falls, NY

At the meeting, the findings of the remedial investigation (RI) and the feasibility study (FS) will be presented along with a summary of the proposed remedy. After the presentation, a question-and-answer period will be held, during which verbal or written comments may be submitted on the PRAP.

Written comments may also be sent through 3/26/2012 to:

William Shaw
NYS Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway
Albany, NY 12233
wxshaw@gw.dec.state.ny.us

The Department may modify the proposed remedy or select another of the alternatives presented in this PRAP based on new information or public comments. Therefore, the public is encouraged to review and comment on the proposed remedy identified herein. Comments will be summarized and addressed in the responsiveness summary section of the Record of Decision (ROD). The ROD is the Department's final selection of the remedy for this site.

Receive Site Citizen Participation Information By Email

Please note that the Department's Division of Environmental Remediation (DER) is "going paperless" relative to citizen participation information. The ultimate goal is to distribute citizen

participation information about contaminated sites electronically by way of county email listservs. Information will be distributed for all sites that are being investigated and cleaned up in a particular county under the State Superfund Program, Environmental Restoration Program, Brownfield Cleanup Program, Voluntary Cleanup Program, and Resource Conservation and Recovery Act Program. We encourage the public to sign up for one or more county listservs at http://www.dec.ny.gov/chemical/61092.html

SECTION 3: SITE DESCRIPTION AND HISTORY

Location:

The Moreau Dredge Spoil Disposal Site is located in the Town of Moreau, Saratoga County. The site is immediately west of the Hudson River, east of West River Road, a short distance south of rail line which crosses the Hudson River at Rogers Island. NY State Route 197 is approximately 1/4 mile north of the site.

Site Features:

The Moreau Dredge Spoil Disposal Site consists of a closed and covered containment cell built by the New York State Department of Transportation (NYSDOT) between 1977 and 1979 to hold dewatered sediment removed from portions of the upper Hudson River following the demolition of the Fort Edward Dam in 1973. The grass covered containment cell is lined with clay and has a clay cap. The southern and eastern margins of the containment cell slope away sharply and the entire cell is surrounded with an asphalt-lined drainage system that drains rain water and directs groundwater away from the cell along the southern property margin to the Hudson River. Portions of the area east of the containment cell are a mixture of open grassy areas and woodlands, while the area furthest to the east and closest to the Hudson River is currently being used as a Work Support Marina Facility for the Hudson River PCBs Site remedial dredging project. A large portion of the parcel being used for the Work Support Marina Facility is covered with clean fill and pavement.

Current Zoning/Use:

The closed and covered containment cell at the site is the location of a Toxic Substances Control Act approved dredge spoil containment structure and is currently zoned Hudson River Regulatory. The eastern portion of the property occupied by the containment cell is also zoned as Hudson River Regulatory and is now the location of an active Work Support Marina Facility for the Hudson River PCBs Site remedial dredging project.

Historic Use:

The single lined containment cell at this site was constructed in the western portion of the current property parcel by the NYSDOT in 1977 and was used to hold dewatered dredge spoil material removed from the Hudson River around Rogers Island in conjunction with routine and emergency maintenance dredging operations and some PCB-contaminated river bottom materials or remnant deposits that were stranded along the eastern shore of the Hudson River upstream of

the former Fort Edward Dam following its removal in 1973. Available NYSDOT records report that the Moreau Dredge Spoil Disposal Site was used between 1977 and 1979 for the disposal of up to 200,000 cubic yards of dredge spoil material. The containment cell was then closed and covered with a TSCA-approved clay cap installed by the NYSDOT. The site is inspected and maintained the site under the TSCA program. The latest TSCA program inspection occurred on May 20, 2010.

Site Geology and Hydrogeology:

The natural site overburden is consistent with the regional model of alluvial and stratified unconsolidated glacio-fluvial and glacio-lacustrine deposits, except it is on a smaller scale with greater variability. Native material underlying and surrounding the dredge spoil materials at the site primarily consists of brown to gray silty clays inter-fingered with layers of gray to brown silty sands.

Groundwater flow in the area outside of the closed and covered containment cell typically moves away from the slight topographic rise on the west and toward the Hudson River in a general east-southeast direction.

A site location map is attached as Figure 1.

SECTION 4: LAND USE AND PHYSICAL SETTING

The Department may consider the current, intended, and reasonably anticipated future land use of the site and its surroundings when evaluating a remedy for soil remediation. For this site, alternatives (or an alternative) that restrict(s) the use of the site to commercial use (which allows for industrial use) as described in Part 375-1.8(g) are/is being evaluated in addition to an alternative which would allow for unrestricted use of the site.

A comparison of the results of the investigation to the appropriate standards, criteria and guidance values (SCGs) for the identified land use and the unrestricted use SCGs for the site contaminants is included in the Tables for the media being evaluated in Exhibit A.

SECTION 5: ENFORCEMENT STATUS

Potentially Responsible Parties (PRPs) are those who may be legally liable for contamination at a site. This may include past or present owners and operators, waste generators, and haulers.

The PRPs for the site, documented to date, include:

General Electric Company

NYS Department of Transportation

The PRPs for the site declined to implement a remedial program when requested by the Department. After the remedy is selected, the PRPs will again be contacted to assume responsibility for the remedial program. If an agreement cannot be reached with the PRPs, the Department will evaluate the site for further action. The PRPs are subject to legal actions by the state for recovery of all response costs NYSDEC has incurred.

SECTION 6: SITE CONTAMINATION

6.1: Summary of the Remedial Investigation

A Remedial Investigation (RI) has been conducted. The purpose of the RI was to define the nature and extent of any contamination resulting from previous activities at the site. The field activities and findings of the investigation are described in the RI Report.

The following general activities are conducted during an RI:

- Research of historical information,
- Geophysical survey to determine the lateral extent of wastes,
- Test pits, soil borings, and monitoring well installations,
- Sampling of waste, surface and subsurface soils, groundwater, and soil vapor,
- Sampling of surface water and sediment,
- Ecological and Human Health Exposure Assessments.

6.1.1: Standards, Criteria, and Guidance (SCGs)

The remedy must conform to promulgated standards and criteria that are directly applicable or that are relevant and appropriate. The selection of a remedy must also take into consideration guidance, as appropriate. Standards, Criteria and Guidance are hereafter called SCGs.

To determine whether the contaminants identified in various media are present at levels of concern, the data from the RI were compared to media-specific SCGs. The Department has developed SCGs for groundwater, surface water, sediments, and soil. The NYSDOH has developed SCGs for drinking water and soil vapor intrusion. The tables found in Exhibit A list the applicable SCGs in the footnotes. For a full listing of all SCGs see: http://www.dec.ny.gov/regulations/61794.html

6.1.2: RI Information

The analytical data collected on this site includes data for:

- groundwater
- surface water
- soil

The data have identified contaminants of concern. A "contaminant of concern" is a hazardous waste that is sufficiently present in frequency and concentration in the environment to require evaluation for remedial action. Not all contaminants identified on the property are contaminants of concern. The nature and extent of contamination and environmental media requiring action are summarized in Exhibit A. Additionally, the RI Report contains a full discussion of the data. The contaminant(s) of concern identified at this site is/are:

POLYCHLORINATED BIPHENYLS (PCB)

As illustrated in Exhibit A, the contaminant(s) of concern exceed the applicable SCGs for:

- soil

6.2: Interim Remedial Measures

An interim remedial measure (IRM) is conducted at a site when a source of contamination or exposure pathway can be effectively addressed before issuance of the Record of Decision.

There were no IRMs performed at this site during the RI.

6.3: Summary of Human Exposure Pathways

This human exposure assessment identifies ways in which people may be exposed to site-related contaminants. Chemicals can enter the body through three major pathways (breathing, touching or swallowing). This is referred to as *exposure.*

Access to the site is unrestricted. However, direct contact with contaminated soil is unlikely since it is below a clay cap. People could come in contact with contaminants in sediment and surface water within drainage areas on the site.

6.4: Summary of Environmental Assessment

This section summarizes the assessment of existing and potential future environmental impacts presented by the site. Environmental impacts may include existing and potential future exposure pathways to fish and wildlife receptors, wetlands, groundwater resources, and surface water.

The Fish and Wildlife Resources Impact Analysis (FWRIA) for OU 01, which is included in the RI report, presents a detailed discussion of the existing and potential impacts from the site to fish and wildlife receptors.

The disposal of approximately 200,000 cubic yards of PCB-contaminated dredge spoil materials at this site has been confirmed. The containment cell at the Moreau Dredge Spoil Disposal Site is clay lined and has a clay cap. Based upon investigations conducted to date, the primary contaminants of concern for the Moreau Dredge Spoil Disposal Site are PCBs in soils. Groundwater monitoring data from the area outside of the closed and covered containment cell demonstrates that groundwater is not being impacted by this site. Some of the soils that have accumulated within the asphalt-lined drainage system that drains rain water and directs groundwater away from the cell are contaminated with PCBs and could potentially impact the water within the drainage system, the groundwater, or the Hudson River.

6.5: Summary of the Remediation Objectives

The objectives for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375. The goal for the remedial program is to restore the site to pre-disposal conditions to the extent feasible. At a minimum, the remedy shall eliminate or mitigate all significant threats to public health and the environment presented by the contamination identified at the site through the proper application of scientific and engineering principles.

The remedial action objectives for this site are:

Soil

RAOs for Public Health Protection

- Prevent ingestion/direct contact with contaminated soil.

RAOs for Environmental Protection

- Prevent migration of contaminants that would result in groundwater or surface water contamination.
- Prevent impacts to biota from ingestion/direct contact with soil causing toxicity or impacts from bioaccumulation through the terrestrial food chain.

SECTION 7: SUMMARY OF THE PROPOSED REMEDY

To be selected, the remedy must be protective of human health and the environment, be cost-effective, comply with other statutory requirements, and utilize permanent solutions, alternative technologies or resource recovery technologies to the maximum extent practicable. The remedy must also attain the remedial action objectives identified for the site, which are presented in Section 6.5. Potential remedial alternatives for the Site were identified, screened and evaluated in the FS report.

A summary of the remedial alternatives that were considered for this site is presented in Exhibit B. Cost information is presented in the form of present worth, which represents the amount of money invested in the current year that would be sufficient to cover all present and future costs

associated with the alternative. This enables the costs of remedial alternatives to be compared on a common basis. As a convention, a time frame of 30 years is used to evaluate present worth costs for alternatives with an indefinite duration. This does not imply that operation, maintenance, or monitoring would cease after 30 years if remediation goals are not achieved. A summary of the Remedial Alternatives Costs is included as Exhibit C.

The basis for the Department's proposed remedy is set forth at Exhibit D.

The estimated present worth cost to implement the remedy is $762,000. The cost to construct the remedy is estimated to be $534,000 and the estimated average annual cost is $123,000.

The elements of the proposed remedy are as follows:

1. Remedial Design
A remedial design program will be implemented to provide the details necessary for the construction, operation, maintenance, and monitoring of the remedial program. Green remediation principles and techniques will be implemented to the extent feasible in the design, implementation, and site management of the remedy as per DER-31. The major green remediation components are as follows;

- Considering the environmental impacts of treatment technologies and remedy stewardship over the long term;
- Reducing direct and indirect greenhouse gas and other emissions;
- Increasing energy efficiency and minimizing use of non-renewable energy;
- Conserving and efficiently managing resources and materials;
- Reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste;
- Maximizing habitat value and creating habitat when possible;
- Fostering green and healthy communities and working landscapes which balance ecological, economic and social goals; and
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development.

2. Maintain the existing isolation cap/cover, which has been constructed, over the former dredge spoil disposal structure to satisfy Toxic Substances Control Act requirements.

3. Installation of a cover system where surficial PCB concentrations exceed 1 part per million beyond the margins of the closed and covered portions of the Moreau Dredge Spoil Disposal Site. This will involve the installation, maintenance, and monitoring of a soil cover system. Included are the areas along the margins of the drainage system surrounding the containment cell and that lead away from the containment cell toward the Hudson River where PCB levels exceed 1 ppm.

A site cover will be required to allow for commercial use of the site. The cover will consist of a soil cover in areas where the upper one foot of exposed surface soil will exceed the applicable soil cleanup objectives (SCOs). Where the soil cover is required it will be a minimum of one

foot of soil, meeting the SCOs for cover material as set forth in 6 NYCRR Part 375-6.7(d) for commercial use. The soil cover will be placed over a demarcation layer, with the upper six inches of the soil of sufficient quality to maintain a vegetation layer. Any fill material brought to the site will meet the requirements for the identified site use as set forth in 6 NYCRR Part 375-6.7(d).

4. For those accumulations of soil within the existing, asphalt-lined drainage system around the Moreau Dredge Spoil Disposal Site, removal and consolidation under the cover to be applied over the soil along the margins of the drainage system surrounding the closed and covered containment cell. Approximately 395 cubic yards of soil will be removed.

5. Imposition of an institutional control in the form of an environmental easement or an environmental notice for the controlled property that:

(a) requires the remedial party or site owner to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3);
(b) allows the use and development of the controlled property for restricted residential (parcels zoned residential) or commercial (parcels not zoned residential) as defined by Part 375-1.8(g), although land use is subject to local zoning laws;
(c) restricts the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or County DOH;
(d) prohibits agriculture or vegetable gardens on the portions of the controlled property which were subject to remediation; and
(e) requires compliance with the Department approved Site Management Plan.

6. A Site Management Plan is required, which includes the following:

(a) an Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for the site and details the steps and media-specific requirements necessary to ensure the following institutional and/or engineering controls remain in place and effective:

Institutional Controls: The Environmental Easements and Environmental Notices discussed in Paragraph 5 above.

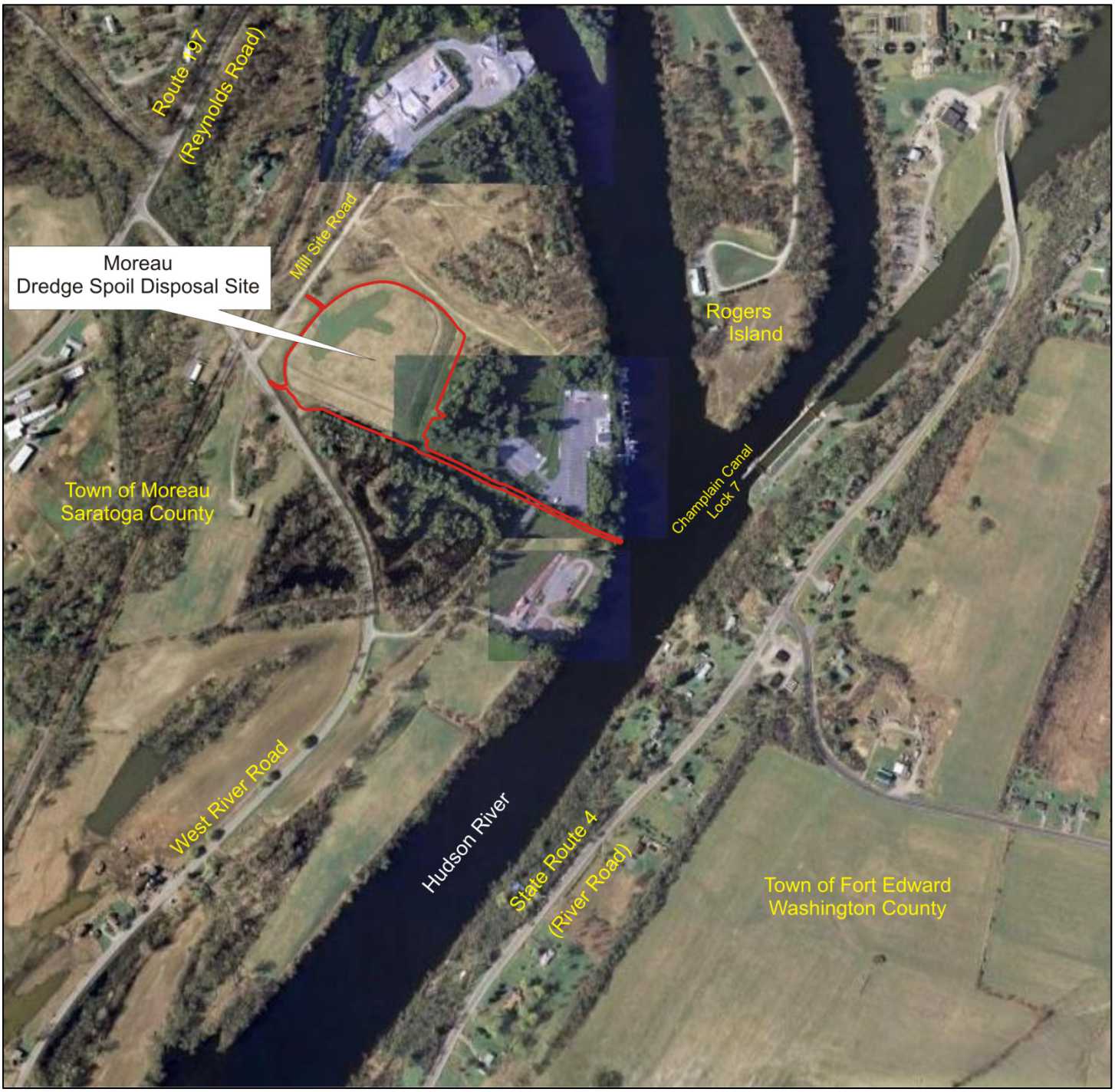
Engineering Controls: The existing isolation cap/cover discussed in Paragraph 2 above and the soil covers discussed in Paragraph 3 above.

This plan includes, but may not be limited to: (i) Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination; (ii) descriptions of the provisions of the environmental easement including any land use and/or groundwater use restrictions; (iii) provisions for the management and inspection of the identified engineering controls; (iv) maintaining site access controls and Department notification; and (v) the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls; and

(b) a Monitoring Plan to include, but not be limited to: (i) monitoring of groundwater to assess the performance and effectiveness of the remedy; and (ii) a schedule of monitoring and frequency of submittals to the Department.

Figure 1 - Location Map

Moreau Dredge Spoil Disposal Site
Proposed Remedial Action Plan
February 2012



0 100 200 300 400 500 1000 1500 2000

Scale in Feet

N
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Aerial Imagery extracted from Google Earth and Microsoft's Bing Maps.

Figure 2
Remedial Findings and Proposed Remedy

Moreau Dredge Spoil Disposal Site
Proposed Remedial Action Plan
February 2012

Excerpt from the February 2012
"Remedial Investigation Report for the Moreau Dredge Spoil Disposal Site"

Exhibit A

Nature and Extent of Contamination

This section describes the findings of the Remedial Investigation for all environmental media that were evaluated. As described in Section 6.1, samples were collected from various environmental media to characterize the nature and extent of contamination.

For each medium, a table summarizes the findings of the investigation. The tables present the range of contamination found at the site in the media and compares the data with the applicable SCGs for the site. The contaminants are arranged into one category; pesticides/ polychlorinated biphenyls (PCBs). For comparison purposes, the SCGs are provided for each medium that allows for unrestricted use. For soil, if applicable, the Restricted Use SCGs identified in Section 6.1.1 are also presented.

Waste/Source Areas

As described in the RI report, waste/source materials were identified at the site which could potentially impact groundwater, surface water, and/or sediment.

Wastes are defined in 6 NYCRR Part 375-1.2 (aw) and include solid, industrial and/or hazardous wastes. Source Areas are defined in 6 NYCRR Part 375 (au). Source areas are areas of concern at a site were substantial quantities of contaminants are found which can migrate and release significant levels of contaminants to another environmental medium. Wastes and Source areas were identified at the site include the following:

As approved by the EPA in 1978 (EPA 1978), a 6-acre clay-lined capped disposal cell was constructed on the western half of the site and was used by the NYSDOT to hold polychlorinated biphenyl (PCB)-contaminated sediment /dredge spoils removed from the Hudson River around Rogers Island in conjunction with routine and emergency maintenance dredging operations and some PCB-contaminated river bottom materials or remnant deposits that were stranded along the eastern shore of the Hudson River upstream of the former Fort Edward Dam following its removal in 1973. The disposal cell is covered with grass with moderate to steep grade. An asphalt-lined drainage system surrounds the disposal cell and drains rain water and directs groundwater away from the cell along the southern property margin to the Hudson River.

The waste/source area identified will be addressed in the remedy selection process.

Groundwater

Based on groundwater samples collected in December of 2005; March, June and September of 2006; and June and September of 2008 during the RI, PCBs were not detected in groundwater samples collected from monitoring wells located outside of the disposal cell.

Table 1 - Groundwater

Detected Constituents	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)	Frequency Exceeding SCG
Pesticides/PCBs			
Total PCBs	ND	0.09	(No exceedances)

a - ppb: parts per billion, which is equivalent to micrograms per liter, ug/L, in water.
b- SCG: Standard Criteria or Guidance - Ambient Water Quality Standards and Guidance Values (TOGs 1.1.1), 6 NYCRR Part 703, Surface water and Groundwater Quality Standards, and Part 5 of the New York State Sanitary Code (10 NYCRR Part 5).

No site-related groundwater contamination of concern was identified during the RI. Therefore, no remedial alternatives need to be evaluated for groundwater. The evaluation of remedial actions for the waste area (the capped and lined cell) will take into account the need to protect groundwater from releases from the cell.

Soil

Surface Soil

Prior to the RI, NYSDEC collected 90 on-site surface soil samples from the Moreau Site and the Old Moreau Dredge Spoil Site to the north to evaluate the potential for levels of PCBs above unrestricted SCOs. The majority of samples contained detectable PCB concentrations less than 1 ppm and approximately 15% of the samples exhibited PCB concentrations ranging from 1 ppm to 5.5 ppm. Samples exhibiting the highest PCBs concentrations were collected by NYSDEC from the drainage area along the northern border of the Moreau site, adjacent to the southern perimeter of the Old Moreau site and to the east of the Moreau site containment cell.

During the RI, surface soil samples (less than 2 inches below grade) were collected from 40 locations, including six locations along the disposal cell perimeter. The majority of surficial soil samples collected on the site contained PCB concentrations that ranged from not detected to less than 1 ppm. Surface soil samples containing PCBs at greater than 1 ppm were collected outside the northwest corner of the disposal cell near the access road and east of the containment cell near the center of the site.

Subsurface Soil

Ten test pits were excavated on-site in the area surrounding the containment cell during the RI. PCB concentrations up to 23 ppm were detected within samples from these test pits. The greatest concentrations of PCBs were detected in dredge spoils collected from test pits between the cemetery and Jones/Rogers estate and from depths generally less than 6 feet BGS. Subsurface soil samples collected from 19 borings in the vicinity of the cell exhibited PCB concentrations ranging from 1.5 ppm to 24 ppm; soil samples collected during installation of monitoring wells exhibited PCB concentrations in the same range. The majority of native soil samples collected beneath the dredge spoils did not contain detectable concentrations of PCBs and the few native soil samples that did contain PCBs were at concentrations less than 0.5 ppm.

Fifty-six subsurface soil samples collected from 36 soil borings located either within or immediately adjacent to the disposal cell. Thirty-two of these samples contained PCB concentrations greater than 1 ppm, with the highest detection at 20 ppm.

During RI activities, seven samples were collected from the on-site drainage system bordering the eastern and southern edges of the dredge spoils disposal cell, while two were collected from the drainage path along the

southern perimeter of the site. During the additional site investigation, a sample was collected from the lower drainage path on the southwest side of the disposal cell. The PCB concentrations in these samples ranged from 0.18 to 1.4 ppm, with the highest concentrations in the drainage path east of the cell. As these samples were taken from areas where there is only occasional water associated with runoff events within a paved drainage system, these areas will be managed as soils when evaluating and implementing the remedial alternatives for the site.

The predominant PCB detected in surface and subsurface soil samples was Aroclor 1248; however, Aroclors 1242 and 1254 was also detected.

Detected metals in surface and subsurface soils did not exceed SCOs. Some soil samples collected from the drainage system surrounding the disposal cell exhibited elevated levels of barium, calcium, cobalt, iron, manganese, and sodium. However, because these naturally occurring metals were detected much less frequently than PCBs, PCBs are the primary contaminant of concern in soils.

Table 2 - Soil

Detected Constituents	Concentration Range Detected (ppm)[a]	Unrestricted SCG[b] (ppm)	Frequency Exceeding Unrestricted SCG	Restricted Use SCG[c] (ppm)	Frequency Exceeding Restricted SCG
Pesticides/PCBs					
Total PCBs	ND to 24 ppm	0.1	*7/35*	1	*43/121*

a - ppm: parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;
b - SCG: Part 375-6.8(a), Unrestricted Soil Cleanup Objectives.
c - SCG: Part 375-6.8(b), Restricted Use Soil Cleanup Objectives for the Protection of Public Health for Restricted Residential or Commercial Use, unless otherwise noted.

The primary soil contaminants are polychlorinated biphenyls (PCBs) associated with the deposition of dredge spoils at the site. The contaminated soils are primarily within the constructed cell, but are also found at or near the surface within and adjacent to the drainage system that surrounds the constructed cell and that leads away from the cell toward the Hudson River.

Based on the findings of the Remedial Investigation, the presence of PCB associated with the disposal of dredge spoils has resulted in the contamination of soil. The site contaminants identified in soil which are considered to be the primary contaminants of concern, to be addressed by the remedy selection process are PCBs.

Surface Water

During the RI sampling, four surface water samples were collected from the asphalt-lined drainage system that drains rain water and directs groundwater away from the disposal cell. In addition, two possible groundwater seeps were sampled in 2008 beyond the drainage path along the southern extent of the disposal cell. PCBs were detected in three of the four surface water sample locations within the drainage system, at concentrations ranging from 0.72 parts per billion (ppb) to 1.8 ppm. The highest concentrations were detected near where the groundwater capture pipes join with the drainage system at the north east and southwest corners of the disposal cell. The two samples collected in 2008 form the possible groundwater seeps south of the disposal cell did not contain any PCBs.

Table 3 - Surface Water

Detected Constituents	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)	Frequency Exceeding SCG
Pesticides/PCBs			
Total PCBs	ND to 1800	0.09	3/4

a - ppb: parts per billion, which is equivalent to micrograms per liter, ug/L, in water.
b-SCG: Ambient Water Quality Standards and Guidance Values (TOGs 1.1.1) and 6 NYCRR Part 703: Surface Water and Groundwater Quality Standards.

The primary surface water contaminant is PCBs associated with the drainage system around the dredge spoil disposal site.

Based on the findings of the Remedial Investigation, the presence of PCBs has resulted in the contamination of surface water. The site contaminants that are considered to be the primary contaminants of concern which will drive the remediation of surface water to be addressed by the remedy selection process are PCBs.

Exhibit B

Description of Remedial Alternatives

The following alternatives were considered based on the remedial action objectives (see Section 6.5) to address the contaminated media identified at the site as described in Exhibit A. Two sets of alternatives are evaluated; one set to address the cell containing the dredge spoils, and a second set to address the soil contamination associated with the drainage swale surrounding and leading away from the cell.

Cell Alternative 1: No Action

The No Action Alternative is evaluated as a procedural requirement and as a basis for comparison. This alternative leaves the site in its present condition and does not provide any additional protection to public health and the environment.

Cell Alternative 2: Cell Hydraulic Management with Offsite Water Treatment and Site Management

Alternative 2 includes the periodic removal of impounded water as needed from the closed and covered containment cell using existing structures, with treatment of the extracted water at a permitted offsite facility. Alternative 2 also includes operation, maintenance and monitoring, as well as development of a Site Management Plan. Engineering controls include signs and possible access limitations. Institutional Controls include an Environmental Notice.

Present Worth: *$658,000*
Capital Cost: ..... *$ 430,000*
Annual/Periodic Costs: ..... *$ 123,000*

Cell Alternative 3: Cell Hydraulic Management with On Site Water Treatment and Site Management

Alternative 3 is identical to Alternative 2, except that extracted water treatment would be done at a wastewater treatment plant constructed on site. The water would be discharged to either a drainage way to the river, or to the Hudson River directly.

Present Worth: ..... *$ 1,904,000*
Capital Cost: ..... *$ 543,000*
Annual/Periodic Costs: ..... *$ 1,260,000*

Cell Alternative 4: Excavation and On Site Treatment

This alternative achieves all of the SCGs discussed in Section 6.1.1 and Exhibit A and soil meets the unrestricted soil clean objectives listed in Part 375-6.8 (a). This alternative would include excavation and on-site treatment of all waste and soil contamination above the unrestricted soil cleanup objectives. Treated residuals would be used as backfill on site. The remedy will not rely on institutional or engineering controls to prevent future exposure. There is no Site Management, no restrictions, and no periodic review. This remedy

will have no annual cost, only the capital cost. The treatment technology used, determined during design, is assumed to be high temperature thermal desorption for the purposes of analysis. All applicable substantive permit requirements relating to the operation of the treatment process apply to the work.

Capital Cost:.....$ 45,207,000

Cell Alternative 5: Excavation and Off Site Disposal

This alternative achieves all of the SCGs discussed in Section 6.1.1 and Exhibit A and soil meets the unrestricted soil clean objectives listed in Part 375-6.8 (a). This alternative would include excavation and off-site disposal of all waste and soil contamination above the unrestricted soil cleanup objectives. The remedy will not rely on institutional or engineering controls to prevent future exposure. There is no Site Management, no restrictions, and no periodic review. This remedy will have no annual cost, only the capital cost.

Capital Cost:.....$ 43,810,000

Drainage Swale Alternative 1: No Action

The No Action Alternative is evaluated as a procedural requirement and as a basis for comparison. This alternative leaves the site in its present condition and does not provide any additional protection to public health and the environment.

Drainage Swale Alternative 2: Excavation and Off Site Disposal

This alternative includes the excavation and off-site disposal of all soils within and immediately adjacent to the drainage swale which surrounds the disposal cell and conveys water to the area east of the cell toward the river. The surface soil SCG of 1 part per million total PCB applies to this alternative. There would be no site management, restrictions, or periodic review.

Capital Cost:.....$ 445,000

Drainage Swale Alternative 3: Soil Cover

This alternative includes the installation of a soil cover over the areas in and adjacent to the drainage swale which exceed the surface soil SCO of 1 part per million total PCBs. In the wetted portion of the swale, the soil would be removed and consolidated under the cover to be applied over the soil along the margins of the drainage system. This alternative also includes operation, maintenance and monitoring, as well as development of a Site Management Plan. Engineering controls include signs and possible access limitations.

Present Worth:.....$ 104,000
Capital Cost:.....$ 104,000
Annual Costs:.....$ 0

Exhibit C

Remedial Alternative Costs

Remedial Alternative	Capital Cost ($)	Annual / Periodic Costs ($)	Total Present Worth ($)
Cell Alternative 1 - No Action	0	0	0
Cell Alternative 2 – Site Management with Off Site Water Treatment	430,000	228,000	658,000
Cell Alternative 3 – Site Management with On Site Water Treatment	543,000	1,361,000	1,904,000
Cell Alternative 4 – Excavation and Onsite Treatment	45,176,000	31,000	45,207,000
Cell Alternative 5 – Excavation and Off Site Disposal	43,779,000	31,000	43,810,000
Swale Alternative 1 – No Action	0	0	0
Swale Alternative 2 – Excavation and Off Site Disposal of Source Areas and Swale Contents	455,000	0	455,000
Swale Alternative 3 – Soil Cover	104,000	0	104,000

Exhibit D

SUMMARY OF THE PROPOSED REMEDY

The Department is proposing Cell Alternative 2: Cell Hydraulic Management with Off Site Water Treatment and Site Management**,** along with Swale Alternative 3: Soil Cover, as the remedy for this site. Cell Alternative 2 and Swale Alternative 3 would achieve the remediation goals for the site by managing the water within the disposal site to prevent any future releases from the cell, and by eliminating the potential route of exposure to the surface soils in the drainage swales. The elements of this remedy are described in Section 7. The proposed remedy is depicted in Figure 2.

Basis for Selection

The proposed remedy is based on the results of the RI and the evaluation of alternatives. The criteria to which potential remedial alternatives are compared are defined in 6 NYCRR Part 375. A detailed discussion of the evaluation criteria and comparative analysis is included in the FS report.

The first two evaluation criteria are termed "threshold criteria" and must be satisfied in order for an alternative to be considered for selection.

1. Protection of Human Health and the Environment. This criterion is an overall evaluation of each alternative's ability to protect public health and the environment.

Cell Alternative 1 and Swale Alternative 1 are not protective, as no work would be undertaken to abate the current exposures posed by the site. The proposed Cell Alternative 2 and Swale Alternative 3 would satisfy this criterion by preventing future exposures to the dredge spoils within the cell, and to the PCB contaminated soils within and adjacent to the swales. Under this remedy, the dredge spoils within the cell continue to be inaccessible for direct contact or erosion, and the hydraulic management prevents releases via groundwater. Routes of exposure associated with surface exposure of the PCB contaminated soils within and adjacent to the drainage swales would be eliminated by the removal of the contaminated soils within the swale and their consolidation under the cover to be applied over those areas of contaminated soil along the margins of the drainage system.

Cell alternatives 4 and 5, excavation with either offsite disposal or onsite treatment, would both also meet this criterion, as would Cell alternative 3. Swale alternative 2 would also meet this criterion by eliminating the routes of exposure related the contaminated material within and adjacent to the drainage swale.

2. Compliance with New York State Standards, Criteria, and Guidance (SCGs). Compliance with SCGs addresses whether a remedy will meet environmental laws, regulations, and other standards and criteria. In addition, this criterion includes the consideration of guidance which the Department has determined to be applicable on a case-specific basis.

Cell alternatives 2, 3, 4 and 5, as well as Swale alternatives 2 and 3, all meet SCGs. The alternatives involving on site treatment of soil (cell alternative 4) and water (cell alternative 3) would require meeting the substantive requirements of the permits which would otherwise be issued for the work.

The next six "primary balancing criteria" are used to compare the positive and negative aspects of each of the remedial strategies.

3. Long-term Effectiveness and Permanence. This criterion evaluates the long-term effectiveness of the remedial alternatives after implementation. If wastes or treated residuals remain on-site after the selected remedy has been implemented, the following items are evaluated: 1) the magnitude of the remaining risks, 2) the adequacy of the engineering and/or institutional controls intended to limit the risk, and 3) the reliability of these controls.

The Cell alternatives with the highest degree of long term effectiveness and permanence are Cell alternatives 4 and 5. Cell alternatives 2 and 3 also have high long term effectiveness and permanence, as the maintenance and monitoring of the already constructed cell sufficiently reduces the risk of exposure to the dredge spoils over the long term. Swale alternative 2 (removal with off-site disposal) has higher permanence than Swale alternative 3 (soil cover in place for source areas and excavation of soils within swale).

4. Reduction of Toxicity, Mobility or Volume. Preference is given to alternatives that permanently and significantly reduce the toxicity, mobility or volume of the wastes at the site.

Cell alternative 4 has the highest degree of reduction in toxicity, mobility or volume, as all of the dredge spoils within the cell would be treated. Cell alternatives 2, 3 and 5 would result in the same reduction in mobility, as the material would be contained within a lined and capped cell with water management and long term operation and maintenance. For the swale alternative, the offsite disposal alternative, 2, has slightly higher reduction in mobility as all of the contaminated material would be in a lined off site landfill rather than a portion remaining beneath a soil cover.

5. Short-term Impacts and Effectiveness. The potential short-term adverse impacts of the remedial action upon the community, the workers, and the environment during the construction and/or implementation are evaluated. The length of time needed to achieve the remedial objectives is also estimated and compared against the other alternatives.

Cell alternative 4 would have the highest degree of short term impacts, as the entire cell would be excavated and treated on site. Cell alternative 5 would have somewhat lesser impacts, as the material would be shipped offsite rather than treated on site. Cell Alternatives 4 and 5 reflect a lesser degree of green remediation as they include significant expenditure of energy and resources. Cell alternatives 2 and 3 both have significantly less short term impacts, with cell alternative 2 having the least short term impacts since shipment of leachate for offsite treatment is done without need for constructing and operating an on -site water treatment plant. Swale alternatives 2 and 3 have similar short term impacts and effectiveness.

6. Implementability. The technical and administrative feasibility of implementing each alternative are evaluated. Technical feasibility includes the difficulties associated with the construction of the remedy and the ability to monitor its effectiveness. For administrative feasibility, the availability of the necessary personnel and materials is evaluated along with potential difficulties in obtaining specific operating approvals, access for construction, institutional controls, and so forth.

The most implementable cell alternative is 2, as the only active measures would be shipping leachate for off-site treatment along with maintenance and monitoring of the cell. Commercial treatment capacity is readily available, as are contractors to transport the water. Cell alternative 3 requires design, construction, operation and monitoring of a water treatment plant; the personnel and materials are available, and meeting the substantive requirements of a water discharge permit is achievable. Cell alternatives 4 and 5 take much more substantial effort to excavate the cell, but personnel and equipment are available. For alternative 4 the design, construction and operation of a soil treatment system, including meeting the substantive requirements of

applicable permits, result in the lowest implementability among the alternatives. For the swale alternatives, the implementability of each alternative is very similar.

7. Cost-Effectiveness. Capital costs and annual operation, maintenance, and monitoring costs are estimated for each alternative and compared on a present worth basis. Although cost-effectiveness is the last balancing criterion evaluated, where two or more alternatives have met the requirements of the other criteria, it can be used as the basis for the final decision.

The costs of the alternatives vary widely. The most costly cell alternatives, 4 and 5, address all of the dredge spoils from the site, but at an order of magnitude higher cost. Cell alternatives 2 and 3 also meet SCOs and the RAOs, but at a much lower cost. Swale alternative 3 is more cost effective than swale alternative 2 due to the similar overall effectiveness and the higher cost of alternative 2.

8. Land Use. When cleanup to pre-disposal conditions is determined to be infeasible, the Department may consider the current, intended, and reasonable anticipated future land use of the site and its surroundings in the selection of the soil remedy.

The current land use is as a containment cell for dredge spoils. Achieving predisposal conditions would require an order of magnitude increase in cost, rendering these cell alternatives (4 and 5) infeasible. The surrounding land uses are expected to be commercial or recreational, as there are no adjacent residential parcels. Cell alternatives 2 and 3 are compatible with the current land use (continuing to use the cell for containment of dredge spoils) as are both swale alternatives 2 and 3.

The final criterion, Community Acceptance, is considered a "modifying criterion" and is taken into account after evaluating those above. It is evaluated after public comments on the Proposed Remedial Action Plan have been received.

9. Community Acceptance. Concerns of the community regarding the investigation, the evaluation of alternatives, and the PRAP are evaluated. A responsiveness summary will be prepared that describes public comments received and the manner in which the Department will address the concerns raised. If the selected remedy differs significantly from the proposed remedy, notices to the public will be issued describing the differences and reasons for the changes.

Cell Alternative 2 and Swale Alternative 3 are being proposed because, as described above, it satisfies the threshold criteria and provides the best balance of the balancing criterion.