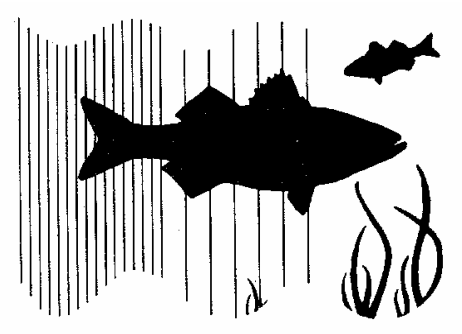

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Comments regarding
Lower Passaic River Restoration Project
Draft Source Control Early Action Focused Feasibility Study, June 2007 (FFS)

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15 August 2007

Overview:

When the Passaic River Coalition (PRC) was founded in 1969 the Passaic River was considered one of the most polluted rivers in the United States. Much has been done to clean up the river since then, and the PRC has been actively involved in these efforts. However, the Lower Passaic River remains badly contaminated. Studies of the contamination in the Lower Passaic River, Newark Bay, and the New York-New Jersey Harbor Estuary have been going on for many years. Representatives of the PRC have been active public participants in the Diamond Alkali Superfund case, Harbor Estuary programs, and other efforts to remediate this contamination since 1993. The Lower Passaic River Restoration Project study was initiated in 2003.[1] During the course of this study, "sediments in the lower eight miles of the river were identified as a major source of contamination to the 17-mile" tidal portion of the river and to Newark Bay.[2] The Focused Feasibility Study (FFS) "was undertaken to evaluate a range of remedial alternatives that might be implemented as an early action to control that major source."[3] This report provides technical comments on the draft Source Control Early Action Focused Feasibility Study (FFS) and recommendations regarding preferences for Early Action remedial alternatives.

We would like to highlight the following recommendations:

- Our preferred alternative for Early Action is "Alternative 1, Dredging" because it would be most effective at reducing risks to human health and the environment, and at helping to revitalize both the ecology and the economy of the Lower Passaic River and the New York-New Jersey Harbor Estuary.

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1 U.S. Army Corps of Engineers, New York District; U.S. Environmental Protection Agency, Region II; New Jersey Department of Transportation, Office of Maritime Resources. April 2003. Project Management Plan, Lower Passaic River, New Jersey, Investigation and Feasibility Study for Remediation and Ecosystem Restoration.

2 FFS, Executive Summary, page i.

3 FFS, Executive Summary, page i.

- The Federal government should be considered a "responsible party" in this Superfund case.
- The navigational channels of the Lower Passaic River should be restored to their authorized depths by the U.S. Army Corps of Engineers.
- A processing facility, which would store dredged sediments temporarily on land, and then treat them so that they could be used beneficially, should be developed in the Newark Bay area. Such a facility has long been needed so that harbors along the East Coast can be dredged and revitalized, and so that Brownfields can be reused to the economic benefit of the region.
- Funding for this project must reflect a practical division of responsibility.

Development of Remedial Action Objectives:[4]

The Remedial Action Objectives for the Source Control Early Action are as follows:[5]

- Reduce cancer risks and non-cancer health hazards for people eating fish and shellfish from the Lower Passaic River by reducing the concentration of contaminants of potential concern (COPCs) in fish and shellfish.
- Reduce the risks to ecological receptors by reducing the concentrations of contaminants of potential ecological concern (COPECs) in fish and shellfish.
- Reduce the inventory (mass) of COPCs and COPECs in sediments that are or may become bioavailable.
- Remediate the most significant mass of contaminated sediments that may be mobile to prevent it from acting as a source of contaminants to the Lower Passaic River or to Newark Bay and the New York-New Jersey Harbor Estuary.

Working towards these objectives is the critical first step towards restoring the Lower Passaic River to healthier conditions.

In the Lower Passaic River the contaminants of greatest concern that are getting into fish and shellfish and making them unhealthy to eat are substances that persist for decades in the river sediments. River sediments, especially in the lower 8 miles, have been extensively analyzed for COPCs and COPECs. Consultants for the Lower Passaic River Restoration Project (LPRRP) have analyzed the sediment and tissue data that were collected between 1990 and 2006.[6] Table 1 lists the COPCs and COPECs for which Preliminary Remediation Goals (PRGs) are recommended because these contaminants pose elevated risks to human and ecologic health.[7] Table 1 also lists the number of sediment samples that were tested for the contaminant of concern between 1990 and 2001.[8]

The Potential Remedial Goals for these sediment contaminants that would be most protective of human and ecologic health are listed in Table 2. However, cleaning up the sediments in the Lower Passaic River to conform to most of these Risk Based Remedial Goals could not be implemented in an Early Action project. Therefore, background contributions of contaminants to the sediments of the Lower Passaic River were considered.

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4 FFS, Sections 2.1 to 2.4, pages 2-1 to 2-18.
5 FFS, page 2-2.
6 FFS, Appendix C, pages 2-1 to 2-3.
7 FFS, pages 2-11 to 2-14.
8 Lower Passaic River Restoration Project: Pathways Analysis Report. July 2005. Prepared by Battelle, under contract to Malcolm Pirnie, Inc., for US Environmental Protection Agency, Region 2 & US Army Corps of Engineers, Kansas City District. Pages 15-17.

Table 1 – Selected Sediment Contaminants of Concern in the Lower Passaic River[9]

Type of Contaminant of Concern	*Sediment Contaminant*	*Number of Samples*	*Detection Frequency (%)*	*Maximum Concentration (ppb)*	*Location in Lower Passaic*
Dioxin	Dioxin (2,3,7,8-TCDD)	223	99%	14	Harrison
Pesticides	Dieldrin	211	41%	270	Point No Point
Pesticides	Total DDx (DDT *et al.*)	195	100%	5,980	Harrison
PAHs	LMW PAHs	211	100%	1,410,000	Newark
PCBs	Total PCBs	185	100%	17,200	Point No Point
PAHs	HMW PAHs	283	100%	1,400,000	Newark
Inorganics	Lead	218	100%	2,200,000	Upstream
Inorganics	Copper	218	100%	2,470,000	Newark
Inorganics	Mercury	276	98%	12,400	Upstream
Pesticides	Chlordane	103	100%	210	Kearny

Table 2 – Risk Based Remedial Goals for Selected Sediment Contaminants of Concern[10]

Sediment Contaminant	*Maximum Concentration (ppb)*	*Risk Based Remedial Goal (ppb)*	*Type of Risk*	*Ratio of Maximum to Risk Based Remedial Goal*
Dioxin (2,3,7,8-TCDD)	14	0.00027	Human, cancer (10^{-6})	51,852
Dieldrin	270	0.02	Benthos	13,500
Total DDx (DDT *et al.*)	5,980	1.58	Benthos	3,785
Low Molecular Weight PAHs	1,410,000	552	Benthos	2,554
Total PCBs	17,200	14	Human, non-cancer	1,229
High Molecular Weight PAHs	1,400,000	1,700	Benthos	824
Lead	2,200,000	10,606	Wildlife	207
Copper	2,470,000	13,318	Wildlife	185
Mercury	12,400	2,814	Human, non-cancer	4
Chlordane	210	72	Human, non-cancer	3

In the Superfund (CERCLA) Cleanup Program cleanup levels are usually not set below background concentrations of the contaminants of concern.[11] The suspended solids that come over the Dundee Dam from the Upper Passaic River to the Lower Passaic River are the most significant source of sediment contaminants of concern, with the exception of 2,3,7,8-TCDD, from outside the Superfund site, which is the Lower Passaic River below Dundee Dam and its drainage area. Background concentrations of the contaminants of concern were measured in the recently deposited sediments from a core collected from the Upper Passaic River immediately above Dundee Dam in 2007.[12] The

[9] *Op. cit.* 8, Table 1.
[10] FFS, Sections 2.4.1 & 2.4.2, pages 2-11 to 2-14, Tables 2-3 and 2-4.
[11] FFS, Section 2.4.3, page 2-16.
[12] FFS, Sections 2.4.3 and 2.4.4, pages 2-15 to 2-18, including Table 2-6.

Background Concentrations found are reported in Table 3. "… the CERCLA program, generally, does not clean up to concentrations below natural or anthropogenic background levels."[13] The anthropogenic background levels of many of the contaminants in the sediments above Dundee Dam pose unacceptable risks. Nevertheless, it is proposed that these background levels be selected as the Preliminary Remedial Goals (PRGs) for the Early Action project. This selection should make the Early Action project to be proposed capable of being implemented within the near future. Furthermore, we concur that "a separate source control action will need to be implemented above Dundee Dam to identify and reduce or eliminate those background sources."[14] The cooperating agencies in the Lower Passaic River Restoration Project, especially the New Jersey Department of Environmental Protection, should consider what course of action to take in the stretch of river above Dundee Dam to the headwaters.

Table 3 – Background Levels of Selected Contaminants in Sediments above Dundee Dam

Sediment Contaminant	*Maximum Concentration in Lower Passaic River (ppb)*	*Background Concentration, Selected Remedial Goal (ppb)*	*Ratio of Maximum to Background*	*Risk Based Remedial Goal (ppb)*	*Ratio of Background to Risk Based Remedial Goal*
Dioxin (2,3,7,8-TCDD)	14	0.002	7,000	0.00027	7
Dieldrin	270	4.3	63	0.02	215
Total DDx (DDT *et al.*)	5,980	91	66	1.58	58
Low Molecular Weight PAHs	1,410,000	8,900	158	552	16
Total PCBs	17,200	660	26	14	47
High Molecular Weight PAHs	1,400,000	65,000	22	1,700	38
Lead	2,200,000	140,000	16	10,606	13
Copper	2,470,000	80,000	31	13,318	6
Mercury	12,400	720	17	2,814	0
Chlordane	210	92	2	72	1

Identification of Potential Target Areas for Remediation:[15]

Tidal currents in the Lower Passaic River continuously cause surface sediments to resuspend, mix and move, and redeposit. Data from eight bathymetric surveys of the lower eight miles of river bed conducted between 1989 and 2004 were used to identify a Primary Erosional Zone between River Mile (RM) 3.7 and RM5.3.[16] A Primary Inventory Zone where the mass per unit area of contaminants is high exists between RM2.6 and RM3.5.[17] High values for mass per unit area of contaminants are also found at RM6.8.[18] Are these values caused by the mixing and redepositing phenomena caused by tidal currents? It is concluded that remediation of the Primary Inventory Zone, the Primary Erosional Zone, or both would not provide adequate risk reduction or meet the remedial action objectives. Therefore,

[13] FFS, Page 2-18.
[14] FFS, Page 2-18.
[15] FFS, Sections 2.5 to 2.7, pages 2-18 to 2-32.
[16] FFS, Section 2.5.1.1, page 2-19.
[17] FFS, Section 2.5.1.2, page 2-20.
[18] FFS, Figure 2-3.

the target area for remediation selected is the Area of Focus.[19] This includes the entire (bank-to-bank) river area from RM0 to RM8.3. The Area of Focus encompasses the Primary Inventory Zone, the Primary Erosional Zone, and the remaining fine-grained sediment, which contain elevated concentrations of the contaminants of concern, and which are at risk of being eroded and transported due to high flow events as well as typical flow and tidal conditions. It does not include the area above River Mile 8.3 to Dundee Dam (RM8.3 to RM17) because only about 11% of the total fine-grained sediment is found in the upstream portion of the Lower Passaic River.[20] Active remediation of the entire Area of Focus to reduce concentrations of contaminants of concern to within background concentrations of sediments coming over the Dundee Dam would reduce human health risks from eating fish from the Lower Passaic River by 95 to 98%.[21]

Remedial Technology and Process Options:[22]

A No Action response must be considered because it is legally required.[23] However, leaving the contaminated sediments in place without treatment or containment should be considered unacceptable when all the other alternatives proposed should reduce the risks.

In situ treatment of sediments involves chemical, physical, or biological techniques to reduce risks while leaving the contaminated sediment in place. None of these techniques would sufficiently reduce the risks from the fine-grained sediments in the Area of Focus, so it is appropriate that none of these techniques will be considered for further evaluation.[24]

The following process options have been retained for further evaluation:[25]

- Institutional control, including, but not limited to, fish consumption advisories and dredging restrictions in shoal areas.
- Monitored natural recovery processes.
- Containment via engineered caps and geotextiles.
- Sediment removal via excavation, mechanical dredging, and/or hydraulic dredging.
- *In situ* immobilization for the purposes of geotechnical improvements and resuspension control.
- *Ex situ* treatment via immobilization, sediment washing, vitrification, or thermal destruction.
- Beneficial uses including sanitary landfill cover, construction fill, brownfields remediation material, and mined lands reclamation.
- Disposal in an off-site landfill, upland Confined Disposal Facility (CDF), or near-shore CDF unit.

Development of Remedial Action Alternatives:[26]

The alternatives outlined in Table 4 have been developed as potential remedial actions for contaminated sediment in the Area of Focus. As required by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Section 121(d), these proposed Superfund remedial actions comply with federal and state applicable requirements (ARARs).[27]

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[19] FFS, Section 2.5.1.3, pages 2-20 to 2-21.
[20] FFS, Section 2.5.1.3, page 2-21.
[21] FFS, Section 2.7, page 2-32.
[22] FFS, Section 3.0.
[23] FFS, Section 3.1.1, page 3-2.
[24] FFS, Section 3.3.5, pages 3-10 to 3-13.
[25] FFS, Section 3.5, page 3-27.
[26] FFS, Section 4, pages 4-1 to 4-35.
[27] FFS, Section 4.3, page 4-9.

Table 4 -- Alternatives Suggested for Early Action

Alternative	*Removal of Contaminated Sediment (million cubic yards)*
No Action	0
Alternative 2: Engineered Capping of Area of Focus	1.2
Alternative 4: Engineered Capping with navigation channel to accommodate current usage	3.2
Alternative 5: Engineered Capping with navigation channel for future use	6.3
Alternative 3: Engineered Capping with federally authorized navigation channel	7.1
Alternative 6: Engineered Capping with navigation channel for future use and removal of fine grained sediment from primary inventory zone and erosional zone	7.2
Alternative 1: Removal of Fine Grained Sediment from Area of Focus	11

Sediment removal would involve mechanical dredging, transporting the sediments to a processing facility for dewatering, transporting the processed dredged material for further treatment and/or placement, and backfilling or capping of the dredged area.[28] Two possible scenarios are suggested for Dredged Material Management (DMM). DMM Scenario A assumes that all dredged material would be permanently disposed of in a near-shore Confined Disposal Facility (CDF).[29] DMM Scenario B "assumes that all dredged material would initially be placed in a CDF, but the volume stored above the original mudline grade (prior to excavation within the CDF footprint), would be dewatered and treated by an onsite thermal treatment facility."[30]

Analysis of Alternatives:[31]

The following alternatives are unacceptable for the reasons cited.

No Action Alternative: As noted in the report, "Active remediation of the Area of Focus followed by monitored natural recovery will achieve any threshold for 2,3,7,8-TCDD, which is responsible for about 65 percent of the risk, 40 years faster than it would be achieved by the No Action alternative."[32] The No Action alternative will not reduce the risks to human health and the environment for too many years, will increase the risks from flooding, and will decrease navigability due to increased sediment build up in the Lower Passaic River.

Alternative 2 and Alternative 4: Engineered capping without significant dredging of the river would cause a considerable increase in flooding along the Lower Passaic River from Dundee Dam down to Newark Bay. The potential impacts on flooding from climate change have not been considered in this report, but it is predicted that the ocean could rise by as much as two feet by the end of the century.[33] Such a rise would have significant impacts on the areas flooded along the Lower Passaic River, Newark Bay, and the New York-New Jersey Harbor Estuary. Navigation would be further impaired by Alternative 2, and not improved by Alternative 4. Engineered capping requires on-going monitoring and maintenance to assure that parts of the cap are not washed out, which would expose

[28] FFS, Section 4.3.1.3, pages 4-10 to 4-12.
[29] FFS, Section 4.3.1.6, pages 4-18 to 4-19.
[30] FFS, Section 4.3.1.6, pages 4-18 to 4-19.
[31] FFS, Section 5 and Section 6, pages 5-1 to 5-27.
[32] FFS, Section 5.2.1, page 5-16.
[33] Union of Concerned Scientists. 2007. Climate Choices, Northeast.

contaminated sediments. These Operations and Maintenance costs would be high. The contaminated sediments would persist in the river untreated. "Capping does not satisfy the CERCLA statutory preference for treatment."[34]

Alternative 3, Alternative 5, and Alternative 6: With these alternatives more of the contaminated sediments would be removed from the river, and flooding would not be worsened by these actions. However, these alternatives require engineered capping, and the problems caused by engineered capping make these alternatives objectionable. The navigational uses, which are very impaired at present because most of the Lower Passaic River has not been dredged since the 1940s, would be somewhat improved.[35] Alternative 3 would restore the navigational channels to their authorized depths. However, Alternative 5 and Alternative 6 would only partially restore the navigational channels, and would require administrative changes to the navigation channel authorization.[36]

Dredged Material Management (DMM) Scenario A: In this scenario it is assumed that the contaminated dredged material would be placed in a near-shore Confined Disposal Facility (CDF) "in water within the Area of Contamination (which is the Lower Passaic River, Newark Bay, and areal extent of contamination)" as a final disposal site.[37] This alternative would move the contaminated sediments to another location but it would not treat them. "This approach would not reduce the toxicity of the dredged material, and would not meet the CERCLA statutory preference for treatment."[38] Like capping, near-shore Confined Disposal Facilities (CDFs) would have high, long-term operations and maintenance costs. Furthermore, they would be likely to increase risks from flooding. DMM Scenario A should be rejected.

Dredged Material Management (DMM) Portions of Scenario B: The concept proposed in this study is that "the dredged material removed during the implementation of Alternative 1 would be placed in a near-shore CDF", and that "after the material is passively dewatered", it may be removed from the CDF for thermal treatment.[39] A near-shore CDF is described as "in water with one or more sides adjacent to land."[40] We object to the option of using near-shore CDFs because they would increase future flooding, increase future costs, and not provide facilities for the remediation and beneficial use of contaminated sediments in the future. We objected to the use of such CDFs in Newark Bay in 1995. In a letter to the U.S. Army Corps of Engineers we wrote the following:[41]

> The Passaic River Coalition has extended its services for more than twenty five years to the public both in and around the Passaic River Basin. Throughout our history, we have analyzed environmental problems and sought implementable solutions to these problems. One of the most difficult problems in the Basin and the estuary into which the Passaic River flows is the problem of contaminated sediments in the harbor. We understand that the dredging and clearing of the harbor channels in the Port of New Jersey and New York are essential, and that significant deleterious impacts may result to the environment, economy, and social fabric of the Greater New York / New Jersey community, if the channels are not cleared. We support the

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[34] FFS, Section 5.1.2.2, page 5-9.
[35] FFS, Executive Summary, pages ii-iii.
[36] FFS, Executive Summary, page x.
[37] FFS, Section 4.2, page 4-9, and Section 4.3.1.6, page 4-19.
[38] FFS, Section 5.1.2.2, page 5-9.
[39] FFS, Section 4.3.2.1, page 4-27.
[40] FFS, Section 3.3.9.2, page 3-21.
[41] Filippone, Ella F. & Anne L. Kruger, Passaic River Coalition. 1995. Letter to Mr. Joseph J. Seebode, Chief, Regulatory Branch, U.S. Army Corps of Engineers. Re: Public Notice Number 95-04370-J1, Scoping for the Preparation of an Environmental Impact Statement for the Construction and Operation of a Confined Disposal Facility in Newark Bay, New Jersey.

> recommendation of Governor Christine Whitman's Dredged Materials Management Team for the use of a Confined Disposal Facility (CDF) as a temporary or interim solution. … CDFs are only short term, temporary fixes. We feel an obligation to future generations of people and other biota living in and around the estuary to restore it to greater vitality than presently exists. Recently we met with people from the New Jersey Department of Environmental Protection, Division of Science and Research, who are educating people about the hazards of consuming fish from the lower Passaic River and the estuary. We asked when the fishing bans might be lifted. The answer was essentially, "Not in a hundred years!" This is unacceptable! We recognize the problems with short term political reality, and fear that this project will be considered the solution that will end the problems in the harbor. We fear that the unresolved problem of excessive amounts of sediments carrying intolerable levels of contaminants entering the estuary will be ignored politically until environmentalists proclaim the next disaster. The U. S. Army Corps of Engineers (Corps) can afford to take a longer view into the future. In the DEIS we ask that you give us an analysis of future alternatives. These should encompass the issues of decontamination and disposal of contaminated sediments located in the estuary, as well as the issues of excessive transport of sediments and contaminants into the estuary. The Corps is in a unique position in the development of this DEIS to provide the people of New Jersey and New York, as well as the rest of the country, with a plan for reaching a permanent solution to the problems associated with dredging the harbor.

The use of CDFs in Newark Bay for the management of dredged materials is as unacceptable today as it was twelve years ago.

Preferred Alternatives:

Alternative 1: Removal of Fine Grained Sediment from Area of Focus: The objective of Alternative 1 is to remove as much of the fine-grained sediment as practicable by mechanical dredging, resulting in the exposure of the underlying sandy material. Two feet of backfill material would be placed on the sandy material to mitigate residual contamination, but this backfill material would not need to be monitored or maintained.[42] Some of the benefits from this alternative, as opposed to the others, are as follows:

☺ Most of the contaminated sediments in the lower eight miles would be permanently removed from the Lower Passaic River so they could no longer move upstream or into Newark Bay and the New York-New Jersey Harbor Estuary.
☺ This alternative would maximize the reductions in risks to human health and in ecological hazards. Over time it might make the Lower Passaic River “fishable”.
☺ Flooding would be reduced.
☺ The potential uses of the Area of Focus for navigation would be vastly improved.
☺ Ongoing Operation and Maintenance Costs would only be needed for sediment, water, and biota monitoring, not for cap monitoring and maintenance, thereby making this alternative much more cost effective.
☺ Recreational uses of the river and river front would become more abundant.
☺ Cleaning up the Lower Passaic River should help to revitalize the economy of the region.

Dredged Material Management (DMM) Portions of Scenario B: Although Scenario B assumes that the dredged material “would initially be placed in a CDF”, which is unacceptable, it also assumes that the dredged material “would be dewatered and treated by an onsite thermal treatment facility.”[43] This

[42] FFS, Section 4.3.2.1, pages 4-26 to 4-27.
[43] FFS, Section 4.3.1.6, page 4-19.

is an appropriate type of treatment for much of the sediment to be dredged from the Lower Passaic River. We concur with the finding that "thermal destruction would irreversibly destroy contaminants in the treated sediment" and that "thermal treatment residuals could be used beneficially as a product."[44] The Cement-Lock® technology has been demonstrated in pilot projects to be effective in treating contaminated sediments dredged from the Area of Focus in the Lower Passaic River.[45] This technology produces a beneficial use product, construction-grade cement.[46] This component of Dredged Material Management should be included in the Early Action project proposed.

Recommendations for Dredged Material Management:

There has long been a need for a facility in the New York, New Jersey region that would move dredged materials from water to land and that would treat them so they can be used beneficially. Such facilities exist along waterways in the Netherlands and Germany. At present nearby facilities for dewatering and storing dredged materials are all temporary, and the closest thermal treatment facility that could treat the sediments from the Lower Passaic River is in Ontario, Canada.[47] A processing facility for dredged sediments and contaminated soils should be developed in New Jersey that would serve New York, New Jersey, and other areas on the East Coast. Because dredging the harbors of the East Coast is critical to maintaining shipping, providing a dredged materials processing facility in New Jersey would provide tremendous economic benefits in the future to the entire country. The study outlines some of what is needed for a dredged materials processing facility.[48] The study has identified eight potential sites greater than 50 acres that are located within ten miles of the area between RM2.4 and RM4.6. However, the study fails to propose a dredged material processing facility that will beneficially manage the sediments dredged in the Early Action project as well as the contaminated materials from many other sites in the region that need to be treated and used beneficially. We strongly recommend that a processing facility that would serve the Port of New York and New Jersey district be designed and sited, preferably on the waterfront of Newark Bay, as soon as feasible.

This facility should include the following capabilities:

Material Preparation: Offloading from barges or other transportation modes, and screening are needed. The BioGenesis[SM] demonstration project found that PAH (polyaromatic hydrocarbon) levels were elevated in the larger particles, which included organic debris such as twigs and leaves, which collected on the screens.[49] BioGenesis believes that this problem can be addressed in making manufactured soil. Other remedies for this problem can also be found.

Dewatering and Storage: Temporary storage of the dredged materials on land will be needed. The space needed will be less if the materials are dewatered before they are stored. Dewatering stabilizes/solidifies the materials, and it is necessary to prepare the materials for thermal treatment. There are accepted methods for dewatering that can be used.

Wastewater Treatment: The water should then be treated at a treatment works such as those of the Passaic Valley Sewerage Commissioners.

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44 FFS, Section 5.2.4.4, page 5-22.
45 FFS, Appendix H, pages H-87 to H-162.
46 FFS, Section 3.3.7.4, page 3-17.
47 FFS, Section 4.3.1.5, page 4-17.
48 FFS, Section 4.3.1.7, pages 4-22 to 4-23.
49 FFS, Appendix H, pages H-18 to H-19.

Treatment of Contaminated Materials to Produce Usable Products: This facility will be more economically viable if it can produce several different types of products to satisfy different demands and thus avoid over saturation of markets by one beneficial use product. For maximum processing efficiency we suggest that the following types of treatment facilities could operate on the same site:

- *A thermal treatment facility, such as the Cement-Lock® process, which produces a beneficial use product, construction-grade cement.*[50] With such a facility gaseous emissions of nitrogen oxides (NO_x) and mercury (Hg) need to be reduced to acceptable levels, and there are effective, mature methods to do so. In the Cement-Lock® demonstration project fixed beds of activated carbon pellets were used effectively to capture mercury.
- *A sediment washing facility, which can be used to "produce high-end topsoil" or other construction grade products.*[51] The BioGenesis[SM] sediment washing demonstration project has shown that it is feasible to produce beneficial use products from dredged materials if used appropriately.[52] Such a facility could also be used to treat the soils from contaminated sites and to restore Brownfields to healthier conditions. The thermal treatment facility kiln can be used to treat contaminated wastes from the sediment washing processes.
- *A facility for the storage and transfer of dredged materials and other materials that can be used beneficially elsewhere or need appropriate disposal.*

This facility should be economically beneficial to the communities involved because it will facilitate dredging to improve navigation and reduce flooding throughout the Port of New York and New Jersey, and reduce the risks to human and ecological health from sediment contamination throughout the New York-New Jersey Harbor Estuary. It should also help in efforts to clean up the waterfront so that people "Face the River, Fix the River!"

Costs:

Total Cost: The costs are high. For the preferred Early Action project, Alternative 1, Scenario B, the estimated cost is $2.3 billion. The capital costs for "pre-construction investigations and design, mobilization/demobilization, site preparation, dredging" and backfilling are estimated at close to $1.1 billion.[53] For Dredged Material Management the estimated capital costs are also close to $1.1 billion.[54] The remaining $0.1 billion would cover operations and maintenance costs for up to 30 years.[55]

Capital Costs: The estimated capital costs for dredging (Alternative 1) are two times higher than for capping (Alternative 2).[56] However, if capping were the chosen alternative, the future costs that would be imposed by increased flooding and reduced navigability have not been included in these estimates. In the Early Action plan to be proposed by EPA a benefit-to-cost analysis for the chosen alternative as compared with the No Action alternative would be informative.

Operation and Maintenance (O&M) Costs: For Alternative 1, Scenario B, some monitoring of conditions in the river after dredging would be needed. However, long-term monitoring of the condition of caps would not be needed. O&M costs for Alternative 2, Capping, are estimated to be

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[50] FFS, Section 3.3.7.4, page 3-17.
[51] FFS, Appendix H, page H-15
[52] FFS, Appendix H, pages H-15 to H-86.
[53] FFS, Section 5.2.7.1, page 5-26 & FFS, Appendix J, page J-2.
[54] FFS, Appendix J, page J-2.
[55] FFS, Appendix J, page J-2.
[56] FFS, Appendix J, page J-2.

only 2% higher than those for Alternative 1, Dredging.[57] In our judgment, the monitoring requirements for Alternative 1 should be reevaluated. The O&M costs most probably will be considerably lower than estimated in this study.[58]

Dredged Material Management (DMM) Costs: The critical component of these cost estimates is the estimate for dredged material management. For Alternative 1, Scenario A, Near-shore Confined Disposal, the Total DMM Cost is estimated at $0.76 billion, whereas that for Scenario B, "Near-shore Confined Disposal, Storage, Thermal Treatment, and Beneficial Use" is 42% higher at $1.09 billion.[59] The estimated costs of Scenario A are so much lower than those of Scenario B because the costs of the risks from in-water CDF disposal of the contaminated sediments have not been added into the costs. Of the DMM cost estimate for Scenario B only 27% ($0.30 billion) is to be used for "on-site thermal treatment" of the dredged sediments.[60] The remainder would be used for the development of a confined disposal facility (CDF). Instead of the development of a near-shore CDF, the development of a dredged materials processing facility, which would store dredged sediments temporarily on land, and then treat them so that they could be used beneficially, would be preferred. The costs of developing such a facility to treat dredged materials from throughout the New York-New Jersey harbor area and beyond might be higher than these estimates. However, a new industry with new jobs would be created in an economically deprived area, which will benefit from the income to be derived from such a facility in the future. This investment is needed at this time in this area. We suggest that the preliminary costs for the development of such a facility should be borne by federal and state governments with the aid of private investors.

Responsibility for the Costs of an Early Action Project:

With No Action, as conditions are at present in the Lower Passaic, the people who are paying the most are residents and businesses in the communities along the river, such as those who get sick from eating fish, who are flooded out, who can not navigate the river, or who can not enjoy the wildlife that should be there. An Early Action project is needed to reduce these costs. However, the municipalities that would benefit most from the project can not afford to spend over $2 billion.

Implementation of an Early Action project would be the responsibility of the U.S. Environmental Protection Agency (USEPA) under the Superfund Program, the U.S. Army Corps of Engineers (USACE) and New Jersey Department of Transportation (NJDOT) under the Water Resources Development Act, and by the U.S. Fish and Wildlife Service (USFWS), National Oceanic and Atmospheric Administration (NOAA), and New Jersey Department of Environmental Protection (NJDEP) as Natural Resource Trustees.[61] Funding should also be available from federal and state governments in order to restore the navigational capacity of the New York-New Jersey Harbor, which includes the Lower Passaic River. The issue of how the costs of an Early Action project might be apportioned needs to be addressed as soon as possible. Some of our observations follow.

Funding under the Superfund Program: The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), commonly known as Superfund, was enacted in 1980.[62] This law created a tax on the chemical and petroleum industries, which went to a trust fund for cleaning up

[57] FFS, Appendix J, page J-2.
[58] FFS, Appendix J, pages J-35 & J-36.
[59] FFS, Appendix J, page J-2
[60] FFS, Appendix J, page J-45.
[61] FFS, Executive Summary, page i.
[62] USEPA. 2007. CERCLA Overview. Website: <http://www.epa.gov/superfund/policy/cercla,htm>

abandoned or uncontrolled hazardous waste sites when no responsible party could be identified. Over five years $1.6 billion was collected, but the tax was discontinued. The Lower Passaic River is part of the Superfund Site which was listed on the National Priorities List in 1984. As of today there are 71 corporations that are listed as "Potentially Responsible Parties" (PRPs) in this Superfund case.[63] These parties have agreed to fund a continuing Remedial Investigation/Feasibility Study (RI/FS) for the entire 17 miles of the Lower Passaic River and its watershed. However, this agreement does not address the responsibility for funding an Early Action project. Funding can be sought from these PRPs, but they are unlikely to fund an Early Action project costing $2.3 billion. Furthermore, there are many unidentified responsible parties, most of whom are no longer in business. The Lower Passaic River watershed was "one of the major centers of the American industrial revolution."[64] For more than two centuries industrial and municipal waste streams have discharged many contaminants, including dioxins, petroleum hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), pesticides, and metals to the Lower Passaic River. Furthermore, industries along the Lower Passaic River were major contributors to war efforts, including the Spanish-American War, World War I, World War II, the Korean War, and the Vietnam conflict, when the US Defense Department used Agent Orange. The role of the Federal government in degrading the environment at this Superfund site is well documented in a paper entitled "Wartime Mobilization and the Newark Bay Home Front Environment: A Case Study Revealing Opportunity for Federal Leadership in Resolving Mega Site Problems."[65] In two judicial cases that have been heard by the United States Court of Appeals the courts have ruled that under CERCLA the Federal government is liable for some portion of response costs based on government's role in operation of facilities during war.[66] The responsible parties in this Superfund case should include the Federal government, which instituted these wars and commanded that war supplies be produced by companies along the Lower Passaic River and others.

Funding under the Water Resources Development Act: The U.S. Army Corps of Engineers (USACE) lists the mission priorities of their civil works program as follows:[67]

- Navigation (Deep draft)
- Ecosystem Restoration
- Flood Damage Reduction (Coastal and Riverine)

An Early Action project that dredges and restores navigational capacity to the lower eight miles of the Lower Passaic River, and that develops a dredged materials processing facility that would treat and use the dredged materials beneficially would meet all these mission priorities. In the Water Resources Development Act of 1999 the Passaic River is listed as one of eight priority sites. Funding up to $50 million per year may be used to "remove and remediate contaminated sediments from the navigable waters of the United States for the purpose of environmental enhancement and water quality improvement if such removal and remediation is requested by a non-Federal sponsor and the sponsor agrees to pay 35 percent of the cost of such removal and remediation."[68] This is a source of funding

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[63] Kluesner, Dave, US EPA, Region 2. 2007. Proposed Amendment to Administrative Settlement for the Lower Passaic River Study Area. Website: www.ourpassaic.org.

[64] FFS, Executive Summary, Description of the River, page ii.

[65] Reis, Michael. 2006. Wartime Mobilization and the Newark Bay Home Front Environment: A Case Study Revealing Opportunity for Federal Leadership in Resolving Mega Site Problems. Environmental Claims Journal, 18(4/Fall):293-320 (2006), pages 293-320.

[66] United States Court of Appeals, Third Circuit. 1994. FMC Corporation vs. United States Department of Commerce. & United States Court of Appeals, Ninth Circuit. 2002. Cadillac Fairview/California, Inc., vs. Dow Chemical Company vs. United States of America.

[67] U.S. Army Corps of Engineers. 2007. Passaic River Basin, New Jersey, Congressional Staff and Stakeholders Briefing, April 5, 2007.

[68] Water Resources Development Act of 1999, Section 224.

that can be used to remove and remediate the fine grained sediments in the Area of Focus that are outside of the navigational channel, an estimated 36% of the sediments to be dredged and treated under Alternative 1. The State of New Jersey should be the non-Federal sponsor, and should request that the USACE bear 65% of the costs of removing the contaminated sediments from outside of the navigational channel.

Funding to Restore Navigational Channels: "The Federal interest in navigation derives from the Commerce Clause of the Constitution."[69] The U.S. Army Corps of Engineers (USACE) is the Federal agency responsible for maintaining the navigational channels of the New York-New Jersey Harbor, including the channels in the Lower Passaic River. Most of the Lower Passaic River has not been dredged since the 1940s.[70] The USACE abandoned its responsibilities without authorization by Congress, and the authorized navigational channels have been filled in with contaminated sediments. Therefore, in our judgment Congress should demand that the USACE fulfill its responsibilities to dredge and restore the navigational channels of the lower eight miles of the Lower Passaic River, and that the Federal government should fully fund this aspect of Alternative 1.

Funding to Develop a Dredged Materials Processing Facility: The development of a dredged materials processing facility, which would treat the dredged materials so that they could be used beneficially, and which would eliminate the need for ocean disposal or in-water confined disposal facilities, would facilitate future dredging to improve the navigational capacities of the harbor, to restore ecosystems, and to reduce flood damage. Such a facility could also be designed to treat contaminated soils from Brownfield sites and other contaminated sites. Such a facility could provide far reaching environmental benefits. It also could provide many economic benefits for the region. Since this facility would be selling usable products, such as clean soil for rehabilitating Brownfield sites, and thermally treated materials that can be used in road repair, the facility would have an income. In the past there has been much discussion and study about how contaminated sediments and soils should be cleaned up, which is not reflected in this study, but no action has been taken. Now is the time to design, build, and use a facility that will turn contaminated sediments and soils into useful products. Agencies involved in implementing this part of the project, which is of paramount importance, should include the USEPA, the USACE, the NJDOT, the Port Authority of New York and New Jersey, the NJDEP, the New Jersey Environmental Infrastructure Trust, and private investment concerns.

Potential Sources of Funding to Implement Preferred Early Action Project: Table 5 lists suggestions for potential sources of funding for the preferred Early Action project. The estimated project costs are derived from the cost estimates for Alternative 1, Dredging, DMM Scenario B.[71] These cost estimates should be reevaluated as the process for selecting an Early Action project proceeds. For Dredged Material Management (DMM) we are recommending that a Dredged Material Processing Facility be developed on land instead of constructing a near-shore Confined Disposal Facility (CDF). Initially this might cost more than is projected for DMM costs for site characterization (1B-1), starter cell construction (1B-2), sub-grade cell construction (1B-3), and CDF construction (1B-4), which total $788 million, but the long-term costs should be less.[72] The suggestions for potential sources of funding and the percentages that each might pay are intended to start stimulating a discussion among involved parties so that we can find mutually acceptable ways to fund and implement this project as

[69] U.S. Army Corps of Engineers. 2000. ER1105-2-100, 22 April 2000. Appendix E, Civil Works Missions and Evaluation Procedures, Section II-Navigation, page E-18.
[70] FFS, Executive Summary, pages ii-iii.
[71] FFS, Appendix J, pages J-4 & J-45.
[72] FFS, Appendix J, page J-45.

soon as practicable. The 71 cooperating parties who are Potentially Responsible Parties (PRPs) in this Superfund case should decide among themselves how to apportion their share of the costs. Federal and State governmental funding will require legislative and executive actions. Such actions can be forthcoming if there is widespread support for the Early Action project proposed.

Table 5 – Potential Sources of Funding for Early Action Project Alternative 1B, Removal of Fine Grained Sediment from Area of Focus with Sediment Treatment

Cost	*Estimated Total Cost (Million $)*	*Source of Funding*	*% of Funding*	*Amount (Million $)*
Capital Costs for Dredging Navigational Channel	$699	USACE, Federal Government	100%	$699
Capital Costs for Dredging beyond Navigational Channel	$393	WRDA, USACE	65%	$256
		Superfund, PRPs	35%	$138
Development of Dredged Material Processing Facility	$788	State of New Jersey, Environmental Infrastructure Trust	60%	$473
		Private investors	40%	$315
On-Site Thermal Treatment of Dredged Material	$297	Superfund, PRPs	100%	$297
Operations & Maintenance Costs	$95	State of New Jersey	100%	$95
Totals	$2,272			$2,272

State and Community Acceptance:[73]

Since 1969 the Passaic River Coalition has been actively trying to have the Lower Passaic River cleaned up so that the millions of people living and working in the area, as well as visitors from around the world, can enjoy the ecologic and economic benefits of a healthy river and harbor. Acceptance by the State of New Jersey and the communities involved of the costs and benefits of the Early Action project proposed will be critical to the implementation of this project. Framing the issues so that there can be productive dialogue among state leaders, community leaders, and interested stakeholders, including the Cooperating Parties, will be a challenge, <u>but must be done now</u>.

Suggested Revisions to the Draft Focused Feasibility Study:

Many studies made in the past sixteen years document the fact that the sediments of the Lower Passaic River are highly contaminated with persistent pollutants. There is no need for further delays in cleaning up the river in the near future. Neither the Federal nor State governments should abdicate their responsibilities, and an Early Action project should be implemented. However, the following issues need to be clarified before an Early Action project is proposed:

- Design and operation of a dredged material processing facility;
- Responsibilities for payment of the costs involved.

[73] FFS, Section 5.1.3, pages 5-15 to 5-16.