

PROJECT MANAGEMENT PLAN

**LOWER PASSAIC RIVER
NEW JERSEY**

**INVESTIGATION AND FEASIBILITY STUDY
FOR
REMEDICATION AND ECOSYSTEM
RESTORATION**

Prepared By:

U.S. Army Corps of Engineers, New York District

U.S. Environmental Protection Agency, Region II

Office of Maritime Resources/ New Jersey Department of Transportation

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ECOSYSTEM RESTORATION
EXECUTIVE SUMMARY**

Overview

In response to a resolution of the U.S. House of Representatives Committee on Transportation and Infrastructure, the U.S. Army Corps of Engineers, New York District (Corps) initiated a reconnaissance study to identify and inventory water resources and sediment quality related problems and needs in the Hudson-Raritan Estuary. The reconnaissance study identified the Lower Passaic River as one of the priority restoration areas within the estuary. Within the identified Lower Passaic River study area is a six-mile river segment that has been designated an Operable Unit of the Diamond Alkali Superfund Site. This area has been the subject of a Remedial Investigation and Feasibility Study (RI/FS) pursuant to the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986 (CERCLA). In recognition of the coincidental study areas and the related roles and responsibilities of the United States Environmental Protection Agency (EPA), and the Corps along with the project sponsor, Office of Maritime Resources/New Jersey Department of Transportation (OMR/NJDOT), the agencies have decided to combine the EPA Superfund RI/FS and the Corps Feasibility Study into one comprehensive, cooperative study. For the purpose of this study a ‘governmental partnership’ will be formed and include members of USACE, USEPA, OMR/NJDOT, NJDEP, National Oceanic Atmospheric Administration (NOAA), United States Fish and Wildlife Service (USFWS), the Agency for Toxic Substances and Disease Registry (ATSDR), and others to assist in recommending a comprehensive solution for the Lower Passaic River Basin.

In general terms, the purpose of the joint study is to develop a comprehensive watershed-based plan for the remediation and restoration of the Lower Passaic River Basin. This will include one or more proposals for remedial actions as defined under CERCLA and the identification of ecosystem restoration opportunities in the study area to support broader estuary-wide restoration efforts. Remedial alternatives and ecosystem restoration measures will be analyzed together to ensure that the overall solution(s) to the complex problems posed by the contamination in the area are compatible and provide for acceptable exposure levels that are protective of human health and the environment and also effectuate the best mix of: long-term effectiveness and permanence; reduction of toxicity, mobility, or volume through treatment; short-term effectiveness; implementability; cost-effectiveness; compliance with applicable or relevant and appropriate regulations and stakeholder/public acceptance. The study will include a cost-benefit analysis of potential remedies, as required pursuant to the Water Resources Development Act (WRDA), an analysis of the risk posed by the existing conditions of contamination, as required

by CERCLA, and consideration of a “no-action” alternative. Remediation may include: sediment removal, placement of caps, sediment decontamination in-situ or ex-situ, and engineering controls on combined sewer outfalls (CSOs) while complimenting restoration goals may include benthic habitat restoration, tidal wetland restoration, vegetative buffer creation, shoreline stabilization, and aquatic habitat improvement.

Background

The Hudson-Raritan Estuary reconnaissance study area encompassed the Port District, which is centered on the New York/New Jersey (NY/NJ) Harbor. The Port District is a sub-set of the Hudson-Raritan Estuary, which extends from the Sandy Hook-Rockaway Transect north up the Hudson River to the Tappan Zee Bridge. It includes the tidally influenced portions of rivers flowing into the estuary, such as the Hackensack, Passaic, Raritan, Shrewsbury, and Navesink Rivers, the Harlem River, and the East River from the Battery through Hells Gate to the Long Island Sound (LIS). The reconnaissance phase study area also includes the western portion of the LIS extending east to Greenwich Cove, Connecticut on the north shore of the LIS and Matinecock Point, Long Island, New York on the south shore. This highly developed urban area encompasses approximately 2,000 square miles with an average density of nearly 6,000 people per square mile.

The reconnaissance study identified the Lower Passaic River as a priority restoration area within the estuary. This area includes the tidal portion of the Lower Passaic River Basin, which extends 17 miles up to the Dundee Dam, and all its influences. The study area may be expanded based on models that will determine if recommended alternatives may be affected by other sources (i.e. upstream of Dundee Dam, Hackensack River, Newark Bay, etc.). The preliminary assessment of water resource problems and needs in Lower Passaic River Basin identified extensive habitat loss and degradation that has greatly reduced the functional and structural integrity of ecosystems within the study area.

Development induced impacts on the environment include: modifications to the natural hydrologic regime resulting from channelization, bridge support structures, dams, the creation of fast land in former aquatic habitats, shoreline hardening and other alterations, and the overall increase in impervious area throughout the watershed. Numerous studies completed to date (e.g., EPA’s Regional Environmental Mapping and Assessment Program) and data collected pursuant to the Diamond Alkali Superfund Site Operable Unit Two, Passaic River Study Area (OU2) indicate that pollutant loading and sediment contamination impose adverse impacts on human health and the environment. The Superfund study completed to date demonstrates the benefit of extending the study area upstream to include the entire 17-mile tidal reach and to recognize the importance of the downstream Newark Bay system. Therefore, this joint study will characterize the nature and extent of human health and ecological risks posed by the contamination in the entire 17-mile stretch, develop plausible actions to reduce/eliminate the risks, and evaluate alternatives for comprehensive remediation and restoration of the area.

The Investigation and Feasibility Study Implementation

This PMP was developed to provide a framework to guide this joint, integrated WRDA/CERCLA remediation and restoration feasibility study. Specific technical studies, activities, and reports required to produce the feasibility study are outlined in the PMP. EPA, the Corps, and OMR/NJDOT worked together to ensure that all tasks required under WRDA and CERCLA have been identified and that there would be no duplication of effort. Detailed technical Scopes of Work will be developed for each task prior to implementation. The Corps, EPA, and OMR/NJDOT and/or their contractors will perform execution of the tasks.

A Memorandum of Agreement (MOA) developed by the Corps, EPA, and OMR/NJDOT will provide the details regarding the interagency team, specifying the roles and responsibilities of the agencies with respect to task execution and the project as a whole.

Study Area and Focus

This PMP focuses on sustainable comprehensive watershed ecosystem remediation/restoration of the tidally influenced section of the Lower Passaic River from the Dundee Dam to the river mouth in Newark Bay. The PMP study area is defined as:

- The 17 mile length of the Passaic River from the Dundee Dam to the confluence with the Hackensack River in Newark Bay and its contributors;
- Contributing areas of the Hackensack River and Newark Bay;
- Tributaries to the Lower Passaic, including Saddle River, Second River and Third River; and
- The Lower Valley component of the Passaic River Watershed, which is 170 square miles of the total 935 square mile Passaic River Watershed.

Feasibility level analyses to be conducted under this PMP include contaminant source and track-down, assessment of extent of contamination in the surface water and sediment, human health and ecological risk assessment, evaluation of remediation actions for contaminant sources and affected media, and habitat restoration related analyses such as, wetland delineation and assessment, and hydrologic modeling. Remediation efforts and ecosystem restoration measures will be analyzed together to ensure that the overall solution(s) to the complex problems posed by the contamination in the area are compatible and provide for acceptable exposure levels that are protective of human health and the environment and also effectuate the best mix of: long-term effectiveness and permanence; reduction of toxicity, mobility, or volume through treatment; short-term effectiveness; implementability; cost-effectiveness; and stakeholder/public acceptance (see Table 1). Ecosystem studies will involve coordination with the Natural Resource Trustees as required pursuant to CERCLA. The Superfund remedy selection process shall be fully integrated with the WRDA restoration selection process to ensure that an effective and compatible holistic approach is taken for the Lower Passaic River.

TABLE 1

Restoration Alternatives Identified in the Reconnaissance Report to be Considered in the Feasibility Study

Potential Project		Project Summary
Location / Name	Opportunity	
Area 1 – Six Mile Reach: Point-No-Point, Harrison, Newark, Kearny, and Arlington reaches	Sediment and water quality improvement, restore benthic habitat and submerged aquatic vegetation	Identify, isolate, and/ or remove contaminated sediments to meet human health and ecological risk based standards. Dredged material shall be tested in accordance with RCRA hazardous waste identification methods and treated in accordance with RCRA standards, and/or in accordance with Harbor Dredged Material Management Plan and/or other placement options.
Area 2 – Kearny Point Reach	Sediment and water quality improvement, restore benthic habitat and submerged aquatic vegetation	Identify, isolate, and/or remove contaminated sediments to meet human health and ecological risk based standards. Dredged material shall be tested in accordance with RCRA hazardous waste identification methods and treated in accordance with RCRA standards, and/or in accordance with Harbor Dredged Material Management Plan and/or other placement options.
Area 3 – Upstream Reach: Belleville, Nutley, Rutherford, and Wallington reaches	Sediment and water quality improvement, restore benthic habitat and submerged aquatic vegetation	Identify, isolate, and/or remove contaminated sediments to meet human health and ecological risk based standards. Dredged material shall be tested in accordance with RCRA hazardous waste identification methods and treated in accordance with RCRA standards, and/or in accordance with Harbor Dredged Material Management Plan and/or other placement options.
Area 4 – Oak Island Yards, Newark	Restore contiguous network of remaining tidal, intertidal, and palustrine wetland areas in the City of Newark	Soften and vegetate shoreline, create upland buffer zone, remove fill and regrade, reintroduce native wetland and upland species
Area 5 – Second River Corridor from the Passaic River to Montclair	Restore natural stream channel substrate and vegetated riverbank, restore palustrine and intertidal wetlands, reduce local flooding	Soften and vegetate shoreline, remove hard substrate, create riparian buffer zone, reintroduce native wetland and upland species, investigate stormwater management and flood storage capabilities
Area 6 – Passaic River left descending bank from Kearny Point to East Rutherford	Restore filled in former salt marshes, provide shoreline stabilization, create riparian vegetative buffer	Vegetate shoreline, remove fill and regrade, reintroduce native wetland and upland species, create riparian buffer zone
Area 7 – Passaic River left descending bank, Wallington and Garfield	Restore filled in former salt marshes, remove derelict structures, under utilized and abandoned shoreline areas	Vegetate shoreline, remove fill and regrade, reintroduce native wetland and upland species, create riparian buffer zone, remove derelict structures

All investigation, planning, and design efforts carried out during the Lower Passaic River feasibility study will be coordinated with ecosystem restoration planning developed for the non-tidally influenced portions of the Passaic River, specifically; upstream of Dundee Dam, currently in the reconnaissance phase. In addition, coordination will occur with the Harbor Estuary Program Contaminant Assessment and Reduction Plan, and the Hudson-Raritan Estuary Comprehensive Restoration Implementation Plan.

The study, remediation, and restoration activities will be conducted pursuant to the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), implementing CERCLA, and WRDA 1990 (Section 312). Section 312, as amended, provides for the removal and remediation of contaminated sediments from the navigable waters of the United States for the purpose of environmental enhancement and water quality improvement. CERCLA and WRDA have compatible goals. By joining the EPA Superfund risk assessment, Natural Resource Damage Assessment, and cost recovery program with the Corps navigational dredging, ecosystem restoration, and cost-benefit program (WRDA), a fully integrated remedy selection, cleanup, restoration, and waterfront/economic redevelopment program can be engineered and funded through a mix of private and public monies.

In recognition of the coincidental study areas and the related roles and responsibilities of EPA and the Corps, the agencies have decided to combine the EPA Superfund RI/FS and the Corps Feasibility Study into one comprehensive, cooperative study. A Proposed Plan for remediation and restoration and a Record of Decision, pursuant to CERCLA, will supplement this joint Investigation and the Corps Feasibility Report. Together, these documents will include one or more proposals for remedial actions as defined under CERCLA and the identification of ecosystem restoration opportunities in the study area to support broader estuary-wide restoration efforts.

Upon completion of the integrated FS, the agencies will recommend the remedial and restoration plan. Final selection of remedial and restoration alternatives is a three step process. First, the preferred alternatives are presented to the stakeholders /public in a proposed plan for review and comment. Second, EPA, the Corps, and the State of New Jersey, review the comments in order to determine if the proposed alternatives remain the most appropriate actions. Third, EPA, the Corps, and the local sponsor jointly make the final determination. The Corps will recommend the final determination(s) for construction to Congress. EPA will concurrently submit a Record of Decision pursuant to CERCLA.

Study, Design and Implementation Cost Sharing

Because a Corps' WRDA study has been authorized by Congress, and a WRDA study is similar in technical scope to a remedial investigation under CERCLA, EPA and the Corps have devised this joint study to address both the WRDA feasibility study needs and EPA's RI/FS requirements. Consequently, all of the data and information already compiled from the six-mile study area work will be incorporated into this study.

A Feasibility Cost Sharing Agreement (FCSA) for the study will be executed between the Corps and OMR/NJDOT. Cost estimates have been developed for the tasks that will be cost shared between the Corps and OMR/NJDOT in order to quantify the level of effort required to complete individual tasks. Cost estimates have also been developed for EPA's tasks;-however, EPA task

cost estimates are not presented in this document. The task cost estimates incorporate the close coordination and information sharing required between the agencies and cost savings in the project due to the joining of efforts. Continued revisions to the PMP during the feasibility study will be made; with an emphasis on the areas where EPA studies are being conducted so as not to duplicate efforts and ensure work products are compatible for all purposes for all agencies involved.

Creative solutions and financial partnerships (e.g., Brownfields, Green Coasts, CERCLA joint and several liability, WRDA public/private cost sharing) involving all levels of government and stakeholders will be sought to finance the design and implementation of the remedial / restoration alternatives.

A process for integrating Natural Resource Damage Assessment (NRDA) claims pursuant to the Clean Water Act, CERCLA], the NCP], and the State of New Jersey’s Technical Requirements for Site Remediation (N.J.A.C. 7:26E) will be developed during the FS. This will assist the Natural Resource Trustees in identifying the loss or injury to natural resources from the release of hazardous substances to the river in order that the Trustees can identify primary and compensatory restorations to make the public and environment whole for lost resource services.

TABLE 2
Feasibility Study Cost Estimate¹ (Corps and OMR/NJDOT)

A four-year feasibility study schedule was developed to accommodate the varying budgetary cycles between the Federal and non-Federal cost-sharing partners. The allocation of Corps and OMR/NJDOT costs by fiscal year, including cash and in-kind contributions by the non-Federal partner, is shown in Table 3.

WBS Code	Task Description	Total Task Cost	Total Sub-Account Cost	Federal Cost	Non-Federal Cost
JA	Engineering Studies		\$2,308,700		
JAA	Surveying and Mapping	\$366,800		\$366,800	\$0
JAB	Hydrology and Hydraulics	\$136,000		\$136,000	\$0
JAC	Geotechnical Studies	\$284,100		\$284,100	\$0
JAE	Engineering & Design Analysis	\$1,337,800		\$168,900	\$1,168,900
JAF	Model Studies	\$92,600		\$46,300	\$46,300
JAG	Value Engineering Studies	\$46,400		\$23,200	\$23,200
JAH	External Technical Review	\$45,000		\$22,500	\$22,500
JB	Socio-Economic Studies/Report		\$457,300	\$0	\$0
JBA	Economic Analysis	\$256,800		\$256,800	\$0
JBB	Social Studies	\$49,200		\$49,200	\$0
JBC	Institutional Studies	\$125,600		\$125,600	\$0
JBD	Ability to Pay Report			\$0	\$0
JBE	Financial Analysis Report	\$6,400		\$6,400	\$0
JBF	External Technical Review	\$19,300		\$19,300	\$0
JC	Real Estate Analysis/Report		\$86,400		
JCA	Real Estate Supplement/Plan	\$14,400		\$14,400	\$0

¹ These are the line item tasks for a standard Corps WRDA study. Many line item tasks are also part of a standard CERCLA RI/FS. EPA will amend this table in a future draft identifying its roles and responsibilities regarding each line item and the Corps and EPA will subdivide the work, and costs, as appropriate and ensure that there is no repetition and that the federal government only expends costs once for a task item.

WBS Code	Task Description	Total Task Cost	Total Sub-Account Cost	Federal Cost	Non-Federal Cost
JCB	Gross Appraisal/Report	\$38,100		\$38,100	\$0
JCD	Physical Takings Analysis	\$7,000		\$7,000	\$0
JCE	Attorney's Opinion on Compensability	\$2,100		\$2,100	\$0
JCF	Rights of Entry	\$18,900		\$18,900	\$0
JCG	External Technical Review	\$5,900		\$5,900	\$0
JD	Environmental Studies/Reports		\$1,753,900		
JDA	Scoping Meetings	\$43,300		\$21,650	\$21,650
JDC	EIS & ROD	\$208,800		\$104,400	\$104,400
JDD	Coordination Documents	\$38,600		\$19,300	\$19,300
JDE	Environmental Resource Inventory	\$416,000		\$0	\$416,000
JDF	Mitigation Analysis Report	\$3,400		\$2,700	\$700
JDG	Endangered Species Report	\$8,400		\$4,200	\$4,200
JDH	Section 404(b)(1) Analysis	\$44,900		\$22,450	\$22,450
JDI	401 State WQ Certification	\$30,100		\$15,050	\$15,050
JDJ	Record of Decision				
JDK	Section 103 Evaluation				
JDL	CZM Consistency Determination	\$28,900		\$14,450	\$14,450
JDL	Other Environmental Studies	\$899,700		\$438,900	\$460,800
JDN	External Technical Review	\$31,800		\$15,900	\$15,900
JE	USFWS Coordination Act Report	\$25,000	\$25,000	\$12,500	\$12,500
JF	HTRW Studies/Report		\$1,542,300		
JFA	Preliminary Assessment Report	\$321,500		\$160,750	\$160,750
JFB	Site Inspection & Brownfield Report	\$1,143,600		\$571,800	\$571,800
JFD	External Technical Review	\$77,200		\$38,600	\$38,600
JG	Cultural Resources Report		\$168,400		
JGA	Site Survey Field Report	\$60,000		\$30,000	\$30,000
JGB	Data Collection & Analysis Report	\$80,000		\$40,000	\$40,000
JGC	Mitigation Plan Report	\$5,200		\$2,600	\$2,600
JGD	Memorandum of Agreement	\$10,000		\$5,000	\$5,000
JGF	External Technical Review	\$3,200		\$1,600	\$1,600
JGG	Other Cultural Resources Reports	\$10,000		\$5,000	\$5,000
JH	Cost Estimates		\$247,900		
JHA	Study Cost Update	\$15,000		\$7,500	\$7,500
JHB	PE&D Cost Estimate	\$26,300		\$13,150	\$13,150
JHC	Project Cost Estimate	\$157,800		\$78,900	\$78,900
JHD	[OMR]R&R Cost Estimate	\$18,800		\$18,800	\$0
JHE	Baseline Fully Funded Cost Estimate	\$15,000		\$7,500	\$7,500
JHF	External Technical Review	\$15,000		\$7,500	\$7,500
JI	Public Involvement Documents		\$170,800		
JIA	Public Meetings	\$66,300		\$33,150	\$33,150
JIB	Meeting Minutes	\$4,100		\$2,050	\$2,050
JIC	Public Comments Report	\$14,400		\$7,200	\$7,200
JID	Newsletters	\$56,700		\$28,350	\$28,350
JIE	Public Involvement Appendix	\$29,300		\$14,650	\$14,650
JJ	Plan Formulation Report		\$640,300		
JJA	District Coordination Meeting	\$10,400		\$5,200	\$5,200
JJB	Establish Without Project Conditions	\$69,600		\$34,800	\$34,800
JJC	Preliminary Formulation and Screening	\$175,700		\$131,100	\$44,600
JJD	Detailed Evaluation	\$261,100		\$130,550	\$130,550
JJE	Plan Formulation Mgmt and Report	\$95,300		\$47,650	\$47,650
JJF	External Technical Review	\$28,200		\$14,100	\$14,100

WBS Code	Task Description	Total Task Cost	Total Sub-Account Cost	Federal Cost	Non-Federal Cost
JQ	Alternative Formulation Briefing		\$81,500		
JQA	AFB Project Documentation	\$67,400		\$33,700	\$33,700
JQB	AFB External Technical Review Documents	\$14,100		\$7,050	\$7,050
JK	Draft Report Documentation		\$264,500		
JKA	Draft Feasibility Report	\$151,100		\$75,550	\$75,550
JKB	Public Review Comments	\$81,200		\$40,600	\$40,600
JKD	All Other Draft Feasibility Reports				
JKE	External Technical Review Documents	\$19,300		\$9,650	\$9,650
JKF	Policy Review Compliance Documents	\$12,900		\$6,450	\$6,450
JL	Final Report Documentation		\$87,200		
JLB	All Other Final Feasibility Reports				
JLC	Final Feasibility Reports	\$74,300		\$37,150	\$37,150
JLD	External Technical Review Documents	\$12,900		\$6,450	\$6,450
JM	Washington Level Report Approval				
JP	Management Documents		\$105,300		
JPB	Coordination Documents	\$28,400		\$14,200	\$14,200
JPC	Study Funds Control Documents	\$36,200		\$18,100	\$18,100
JPD	Trip Reports	\$8,900		\$4,450	\$4,450
JPE	Minutes of TRCs	\$9,200		\$4,600	\$4,600
JPF	All Other Management Documents	\$22,600		\$11,300	\$11,300
KA	Initial Draft DA Package		\$104,000		
KAA	Initial Draft DA	\$40,700		\$20,350	\$20,350
KAB	Allocation of Funds Table	\$12,700		\$6,350	\$6,350
KAC	Deviation Report	\$25,300		\$12,650	\$12,650
KAD	Certification of Legal Review	\$25,300		\$12,650	\$12,650
L	Project Management Plan	\$107,400	\$107,400	\$53,700	\$53,700
Z	Programs & Project Management	\$231,600	\$231,600	\$115,800	\$115,800
TOTAL ALL ACCOUNTS			\$8,382,500	\$4,191,250	\$4,191,250
Contingency (~7%)			\$617,500	\$308,750	\$308,750
TOTAL FEASIBILITY STUDY COST			\$9,000,000	\$4,500,000	\$4,500,000

Table 3

Cost Sharing by Federal Fiscal Year (\$1,000) ¹

Partners	Total Partner Cost	Total Corps Cost	FY 2003			FY 2004			FY 2005			FY 2006			FY 2007			FY 2008		
			Partner		Corps	Partner		Corps	Partner		Corps	Partner		Corps	Partner		Corps	Partner		Corps
			Cash	In-Kind		Cash	In-Kind		Cash	In-Kind		Cash	In-Kind		Cash	In-Kind		Cash	In-Kind	
NJDOT/OMR	4,694.2			1,000		100	1,000		950			850			500			100		
USACE		4,694.2			1,000			1,100			950			850			500			100

¹ The Federal Fiscal Year runs from 1 Oct to 30 Sep (e.g., FY 2003 runs from 1 Oct 02 to 30 Sep 03)

PROJECT MANAGEMENT PLAN LOWER PASSAIC RIVER NEW JERSEY

INVESTIGATION AND FEASIBILITY STUDY FOR REMEDICATION AND ECOSYSTEM RESTORATION

I. Reconnaissance Overview

This document outlines the Project Management Plan (PMP) prepared in accordance with Engineering Regulation (ER) 5-1-11, dated 27 Feb 98, ER 1110-2-1150 dated 31 August 99, and ER 1105-2-100 dated 22 April 2000. The PMP is developed during the reconnaissance phase to identify and schedule feasibility study tasks and estimate the costs of implementing those tasks.

This document is also broader in scope than a typical PMP since it incorporates the remedial investigation and feasibility study tasks required under the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended, (CERCLA also known as Superfund). Therefore, this PMP also complies with Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA (EPA/540/G-89/004) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), (40 CFR Part 300 et seq.). Throughout the feasibility phase meetings will be held with United States Environmental Protection Agency (USEPA), United States Army Corps of Engineers (USACE) and the non-Federal partner, [New Jersey Department of Transportation – Office of Maritime Resources (OMR/NJDOT)] to update the PMP with a view to evaluating tasks and costs to ensure that funds are efficiently spent and there is minimal overlap in tasks. The result of this may not only lower costs of the study but also ensure a complete recommended plan.

The primary objectives of the reconnaissance phase are to:

- a) Determine whether the aquatic ecosystem and related water resources problems of the Hudson-Raritan Estuary warrant Federal participation in a feasibility study;
- b) Define the Federal interest, consistent with Army policies, costs, benefits and environmental impacts;
- c) Establish a framework for integration with the CERCLA process;
- d) Assess the level of interest and support from non-Federal entities in cost sharing for the feasibility phase; and
- e) Assess the level of interest and support from potentially responsible parties (as defined under CERCLA) for remedy implementation (construction) and prepare the

government's enforcement strategy to ensure a non-Federal cost share for implementation of the restoration actions and remedial actions proposed via this study.

- f) Prepare a Project Management Plan (PMP) for the Pre-construction Engineering and Design Phase (PED).

Tasks a) and b) have been completed and the Section 905(b) Preliminary Analysis was approved 28 July 2000. The Memorandum of Agreement between the Corps and EPA outlines the process in which the two statutes will be integrated, fulfilling the goal of task c. Previously, OMR/NJDOT had been in consultation with EPA regarding the Diamond Alkali Superfund Site – Operable Unit Two (Passaic River Study Area). OMR/NJDOT assisted the Agency in framing out a potential integration with a Corps WRDA study. As such, item d) was addressed upfront and was an integral part of the formulation of this joint project. OMR/NJDOT will cost share the feasibility phase with the Corps and EPA.

With regards to item e), EPA has been working on the enforcement strategy for the Superfund project since 1994 and has already provided notice to 16 entities as to their potential liability for contamination in the Passaic River. EPA has sent out scores of information request letters pursuant to Section 104 (e) of CERCLA and has gathered information preparatory to sending out many more to implement an expanded enforcement strategy and to provide notice to other parties that have contributed to the contamination problem in the river. As part of this process, EPA will lead a meeting with all such entities to describe the joint investigation and feasibility study and inform these entities of their future obligations to reimburse EPA and the State for all investigation costs necessary for compliance with CERCLA, and to inform them of their future obligations to perform and/or finance the construction of the any remediation and restoration actions identified through this study. The integration of CERCLA and WRDA provides flexibility for the cost sharing of the construction phase.

In addition to this reconnaissance study, a separate reconnaissance study has been initiated for the non-tidally influenced portions of the river and its watershed. A separate feasibility study (the Hudson-Raritan Estuary Feasibility Study) will address overall ecosystem degradation and water resources problems in the larger Hudson-Raritan Estuary through the development of a Comprehensive Restoration Implementation Plan that will identify restoration opportunities and provide for coordination of restoration efforts in an estuary-wide approach to restoration planning. The results of the Lower Passaic River investigation and feasibility analysis will be coordinated with this Comprehensive Hudson-Raritan Estuary Restoration Implementation Plan. This watershed-based approach will identify comprehensive solutions for environmental restoration and water resources problems in the Estuary. In addition, this coordinated Lower Passaic study will integrate CERCLA remediation into the solution. EPA's Clean Water Action Plan and the Corps' Policy Guidance Letter #61, dated 27 January 1999, provides the guidance for applying a watershed perspective to such projects.

This Corps' and EPA watershed approach in combination with EPA's Superfund remediation program offers benefits to the watershed and coastal zone, including risk reduction, improved water and sediment quality, enhanced recreational opportunities, and a more integrated approach to ecosystem restoration that specifically addresses habitat fragmentation, systematic ecosystem degradation, and enhancement of aquatic and related habitat.

The New York District coordinated with interested Federal, State and local entities, and citizen groups to identify problems and formulate potential solutions for ecosystem restoration and protection. As previously discussed, the New York District also met with EPA's Superfund program to discuss the Diamond Alkali Superfund Site – Operable Unit Two – Passaic River Study Area. Information on water resources problems in the Lower Passaic River was gathered from numerous public agencies, private organizations, and individual citizens during meetings with other Federal and non-Federal resource agencies. Site visits were conducted by the New York District to further identify problems and opportunities, formulate reconnaissance level alternatives, and determine the type and scope of investigations, which would be included in a feasibility study. Throughout the feasibility phase, coordination with all stakeholders and partners will be on-going and the PMP may be revised based on future findings and input

This PMP describes the scope, schedule, and budget for accomplishing remedial investigation, risk assessment, feasibility study, and ecosystem restoration study tasks. This document also includes:

- a critical path method (CPM) network diagram that shows the logic and interrelationships of tasks;
- a detailed project schedule (Gantt chart);
- cost summary tables;
- detailed work task descriptions and a work breakdown structure;
- the division of task responsibilities among the Corps, EPA, and OMR/NJDOT and their contractors.
- a Quality Control/External Technical Review Plan.
- A Public Relations / Media Plan.

The Corps, EPA, and OMR/NJDOT have prepared this PMP. In parallel to preparation of the PMP, the Corps and OMR/NJDOT have been negotiating a Feasibility Cost Sharing Agreement (FCSA). The FCSA is a matter between the Corps and OMR/NJDOT. However, costs identified in the FCSA will be determined based upon the funding and implementation of certain tasks by EPA.

A. Study Authorization

The Lower Passaic River Ecosystem Restoration Study, the WRDA component of this joint study, is being carried out under the Corps' General Investigations (GI) Program. The study was authorized under the Hudson-Raritan study authorization, in a resolution of the Committee on Transportation and Infrastructure of the U.S. House of Representatives, dated 15 April 1999, which reads:

“Resolved by the Committee on Transportation and Infrastructure of the United States House of Representatives, That, the Secretary of the Army is requested to review the reports of the Chief of Engineers on the New York and New Jersey Channels, published as House Document 133, 74th Congress, 1st Session; the New York and New Jersey Harbor Entrance Channels and Anchorage Areas, published as Senate Document 45, 84th Congress, 1st Session; and the New York Harbor, NY Anchorage Channel, published as House Document 18, 71st Congress, 2nd Session, as well as other related reports with a view to determining

the feasibility of environmental restoration and protection relating to water resources and sediment quality within the New York and New Jersey Port District, including but not limited to creation, enhancement, and restoration of aquatic, wetland, and adjacent upland habitats.”

Funds to conduct the Section 905(b) Preliminary Analysis were provided in the FY 2000 Energy and Water Development Appropriations Act (House Report 106-336).

The CERCLA component of this joint study is being undertaken as part of the Diamond Alkali Superfund Site and other CERCLA authorities.

Congress enacted CERCLA, also known as Superfund, on December 11, 1980. This provided broad Federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment. CERCLA established prohibitions and requirements concerning closed and abandoned hazardous waste sites, provided for liability of persons responsible for releases of hazardous waste at these sites, and established a trust fund to provide for cleanup when no responsible party could be identified.

If a site is listed on the National Priorities List (NPL), pursuant to the NCP, a remedial investigation/feasibility study (RI/FS) is performed at the site. The remedial investigation serves as the mechanism for collecting data to: characterize site conditions; determine the nature of the waste; assess risk to human health and the environment; and conduct treatability testing to evaluate the potential performance and cost of the treatment technologies that are being considered.

The FS is the mechanism for the development, screening, and detailed evaluation of alternative remedial actions. The RI and FS are conducted concurrently - data collected in the RI influence the development of remedial alternatives in the FS, which in turn affect the data needs and scope of treatability studies and additional field investigations. This phased approach encourages the continual scoping of the site characterization effort, which minimizes the collection of unnecessary data and maximizes data quality.

The Diamond Alkali Superfund Site (also known as the Diamond Shamrock Site or the 80 and 120 Lister Avenue Site) was proposed to the NPL on September 1, 1983 and was added to the NPL on September 1, 1984. In the ranking package that determined the site's eligibility for inclusion on the NPL, there was recognition that the Passaic River adjacent to the site had likely been affected by the contamination on the property. Consequently, the "upland" property on Lister Avenue was defined as an operable unit and addressed first, through a Record of Decision (ROD) issued by EPA in 1987. The ROD called for an interim containment remedy (capping, subsurface slurry walls, and a groundwater treatment system). Design and construction of that remedial action has been implemented by the responsible party and is now in its operation and maintenance phase. The 1987 ROD also identified the need for another phase of investigation to investigate the contamination in the adjacent River.

In 1994, the responsible party for OU1 and EPA entered into an Administrative Order in which the party would conduct an RI/FS in a six-mile stretch of the Passaic River adjacent to the Site. The six-mile stretch of the River was considered a reasonable first step to evaluating the contamination in the sediments, based on the surficial levels of dioxin in the sediments.

Operable Unit 2 (OU2) Remedial Investigation work completed to date has demonstrated that hazardous substances from the Site have migrated into the river. In addition, other hazardous

substances attributable to other sources have been found in river sediments. Hazardous substances identified include, but are not limited to: cadmium; copper; lead; mercury; nickel; zinc; polyaromatic hydrocarbons (PAHs); bis (2-ethylhexyl) phthalate; polychlorinated biphenyls (PCBs); dichlorodiphenyl-trichloroethate (DDT); diesel (TELPH); 2,3,7,8-tetrachloro-dibenzo-p-dioxin (2,3,7,8-TCDD); 2,4-dichlorophenoxy acetic acid (2,4-D); 2,4,5-Trichlorophenoxy acetic acid (2,4-T); and 2,4,5-trichlorophenol (2,4,5-TCP).

As a legal matter, the site consists of all contaminated areas within the area used to define the site, and any other location to which contamination from that area has come to be located. The precise nature and extent of the site are typically not known at the time of listing.

Such substances are hazardous substances within the meaning of that term as defined in Section 101(14) of CERCLA, 42 U.S.C. § 9601(14), or constitute “any pollutant or contaminant” that may present an imminent or substantial danger to public health or welfare under Section 104(a)(1) of CERCLA, 42 U.S.C. § 9604(a)(1).

B. Study Area Description

The study area is identified as the tidally influenced portion of the Lower Passaic River, including the surrounding watershed (see figure 1). The Passaic River has a total watershed of 935 square miles that empties into Newark Bay in the New York/New Jersey Harbor. The watershed is distinctly divided into three regions: the Highland Area, the Central Basin, and the Lower Valley. The Highland area is the 500 square mile northwesterly portion of the Passaic River watershed, and is located in mountainous and wooded areas of the Appalachian Province. The Central Basin consists of 262 square miles in a low-lying floodplain area that includes meadows, swamps, and bogs. The Passaic River meanders through the low-lying areas of the Central Basin until it passes through a gorge at Little Falls and enters the Lower Valley. The 173 square mile Lower Valley section of the Passaic River watershed narrows to widths of less than a mile in areas south of the Dundee Dam at river mile 17.2. The Dundee Dam is the terminus of tidal influence on the Passaic River. The main tributary to the Lower Passaic River is the Saddle River, which joins the Passaic at river mile 15.5.

The Lower Passaic River watershed (below the Dundee Dam) consists of approximately 100 acres in a highly developed urban area located in portions of Bergen, Essex, Hudson, and Passaic counties in northeastern New Jersey. These four counties have a combined population of 2.8 million people with an average density of 4,700 people per square mile. The City of Newark (pop. 274,000) is located on approximately eight miles of the right descending bank of the Passaic River, from the mouth of the river at Newark Bay upstream to the confluence with the Second River. Land use in the watershed is a mix of residential, commercial, and industrial uses. Intensive commercial and industrial uses occur near Newark Bay due to proximity to a varied transportation infrastructure that includes roadway, railway, and marine transportation services. Numerous industrial properties exist adjacent to the Lower Passaic River.

The banks of the Lower Passaic River are extensively developed and consist of miles of hardened shoreline, especially along the right descending bank. Along the left descending bank there are relatively fewer areas of hardened shoreline and a few parks that have been developed on fill placed in the flood plain. The 1989 New York District Reconnaissance Report on Stabilization of the East Bank (left descending bank) of the Lower Passaic River identified 45 acres of riparian wetland remaining from more than 4,000 acres that existed in 1940. The

reduction in wetland acreage is due to filling in and development of wetland areas. Remaining wetlands are typically situated as narrow discontinuous fringes often measuring only a few feet in width. A more current wetland delineation has not been conducted for this reconnaissance phase, but field visits reveal that 45 acres of riparian wetland may overstate existing conditions. There are also some small areas of non-vegetated tidal flats existing at the base of hardened shoreline areas along the river.

A 12-mile Federal navigation channel extends from the turning basin at the mouth of the river in Newark Bay to the Eighth Street Bridge in the town of Wallington. Authorized project depths range from 30 feet below mean low water at Kearny Point Reach at the mouth of the river in Newark Bay and at the Point-No-Point Reach, 20 feet below mean low water at the Harrison Reach, to 10 feet below mean low water from the Belleville Reach at Second River upstream to the Eighth Bridge in Wallingford. However, much of the Federal channel is not maintained to project depth. Existing channel depths range from 18 feet below mean lower low water (MLW) at Kearny Point Reach to 8 feet below MLW in the Harrison Reach upstream of the Point-No-Point Bridge and down to 2 feet below MLW in the Wallington Reach approaching the Eighth Street Bridge.

The lower Passaic River has a long history of industrialization, dating back two centuries. By the turn of the century, Newark was the largest industrial-based city in the United States with well established industries such as petroleum refining, shipping, tanneries, creosote wood preservers, metal recyclers, and manufacturing of materials such as rubber, rope, textiles, paints and dyes, pharmaceutical, raw chemicals, leather, and paper products. Currently, many of these sites are abandoned or underutilized and may be on-going contaminant sources. In 1983, as part of EPA's National Dioxin Strategy, the properties at 80 and 120 Lister Avenue were sampled for dioxin. The strategy called for EPA to sample all facilities in the United States that produced 2,4,5-Tand/or its pesticide derivatives. 2,3,7,8-TCDD was found predominantly on 80 Lister Avenue as well as in the surrounding community and in Passaic River sediment and river biota.

C. *Statement of Problems and Opportunities*

The major environmental problems in Lower Passaic River include human health and ecological risks, and extensive habitat loss and degradation that have reduced the functional and structural integrity of ecosystems within Lower Passaic River and the surrounding watershed. Contaminant related water quality and sediment quality problems also impact adjacent waters and sediments of Upper and Lower New York Bay. These environmental problems are due to both the direct and indirect impacts of two hundred years of coastal development in New York/New Jersey Harbor and urban industrial development in Newark and surrounding areas. Significant human health and ecological risks appear to be predominantly derived from more recent developments in the manufacture of synthetic chemical compounds for use as herbicides, pesticides, germicides and PCBs.

Development induced impacts on the environment include: modifications to the natural hydrologic regime resulting from channelization, shoreline hardening, and other alterations, the creation of fast land in former aquatic and wetland habitats, the overall increase in impervious area throughout the watershed, and the extensive contamination of river sediments with synthetic organochlorines. It is surmised that the bulk of the organochlorines were generated by facilities, which manufactured pesticides and herbicides, such as from the Diamond Alkali Superfund Site

and an adjacent property, Montrose Chemical. Among other chemicals, these companies manufactured 2,4-D, 2,4,5-T, and 2,4,5-TCP, from which 2,3,7,8-TCDD is a by-product. Sampling of the Passaic River sediment during the course of EPA's remedial investigation showed the presence of 2,3,7,8-TCDD, DDT, 2,4-D, 2,4,5-T, and 2,4,5-TCP. Discharge pipes, ground water, and surface water migration pathways existed on the properties, and consequently, the sediments in the river have been contaminated by these sites (among other sources). Other hazardous substances (as defined under CERCLA) are found within the Passaic River sediments and include, but are not limited to: cadmium, copper, lead, mercury, nickel, zinc, PAHS, DDT, and PCBs. These physical and chemical encroachments on the natural environment have eradicated habitats in some areas and severely degraded many remaining habitats, often on a system-wide level.

As discussed above, based on a limited data-set regarding contaminated sediment in the 1980s, EPA designated a six-mile stretch of river as a second operable unit of the Diamond Alkali Superfund Site. An RI/FS was initiated pursuant to an Administrative Order on Consent with a PRP, Occidental Chemical Corporation in 1994. As of 2002, the RI work in the six mile Study Area is nearly completed. EPA has determined, based on this more extensive sediment and biota data, that contaminant characterization, a risk assessment, and sediment transport modeling outside of the six-mile study area is necessary to adequately quantify human health risks, environmental risks, and devise effective remediation alternatives.

Based on the results of monitoring and research undertaken since the mid-1970s, the State of New Jersey has taken a number of steps, in the form of consumption advisories, closures, and sales bans, to limit the exposure of contaminated fish and crabs to the public. The discovery of widespread dioxin contamination in the Newark Bay Complex led the State of New Jersey to issue a number of Administrative Orders in 1983 and 1984 which prohibited the sale or consumption of all fish, shellfish, and crustaceans from the tidal Passaic River (New Jersey Administrative Code 7:25-14, 18A), based on PCB, dioxin, and/or chlordane contamination. These advisories and prohibitions are still in effect.

Sediment contamination in the Lower Passaic River contributes to sediment contamination in other areas of the estuary through the transport of contaminants by river and ocean currents. Dredged material from navigation channels in Newark Bay, Arthur Kill, Kill van Kull and many portions of the Upper Bay consistently fail toxicity criteria for ocean placement at the Historic Area Remediation Site (HARS). The cost of disposing HARS unsuitable sediments is typically five to ten times greater than the costs of placing the material at the HARS. This huge cost differential affects planning, construction, and maintenance decisions concerning all navigation channels in the harbor. Reduction of contaminant levels in harbor sediments and biota is identified as a primary management option in the Dredged Material Management Plan (DMMP) and is the focus of the Contamination Assessment and Reduction Project (CARP) initiated by the New York/New Jersey Harbor Estuary Program.

Overall, the cumulative impacts of coastal and urban development on aquatic and upland habitats in Lower Passaic River have greatly reduced the quality of coastal habitats and the environmental benefits those habitats provide to the river, to Newark Bay, and to the larger Hudson-Raritan Estuary. Populations of fish, shellfish, and fish eating birds in New York/New Jersey Harbor have been severely reduced through the combined impacts of habitat loss, habitat degradation, and pollution in the Lower Passaic River and surrounding watershed. The New York/New Jersey Harbor Estuary has among the highest levels of polychlorinated dibenzo-p-

dioxins (PCDDs) and PCBs in the United States. Consequently, commercial and recreational uses of environmental resources within Lower Passaic River have been severely reduced and restricted. Sediment contamination in the Lower Passaic has also contributed to increased costs of constructing and maintaining navigation improvements in New York/New Jersey Harbor.

Superfund remediation work coupled with ecosystem restoration of the Lower Passaic River would be consistent with a number of public initiatives, including New Jersey Coastal Resource and Management Policies (NJDEP) and the New Jersey Brownfields Redevelopment Program (New Jersey Office of State Planning, NJOSP). The cleanup and restoration work would support major brownfield related public policy concerns identified by the NJOSP, NJDEP and NJDOT. NJOSP has identified the following public policy concerns: public health impacts on-site and in adjacent areas, the blighting influence on neighborhood development, the fiscal drain on municipalities, the inability to achieve site's highest and best use, a deterrent to new employment and economic activity, and an increased pressure to develop on rural and suburban fringes due to the lack of developable urban sites.

The cleanup and restoration efforts proposed for Lower Passaic River will be used to support the Comprehensive Hudson-Raritan Estuary Restoration Implementation Plan that is being developed in a separate feasibility analysis. Information, data, and alternative cleanup and restoration designs for Lower Passaic River will be used as input for the development of the Comprehensive Restoration Implementation Plan. The Comprehensive Restoration Implementation Plan will give structure to restoration efforts throughout the Hudson-Raritan Estuary, act as a coordinating tool for these activities, and provide the necessary planning guidelines that will enhance the system-wide success of these and other restoration efforts. Priority restoration efforts, such as Lower Passaic River, that may be developed prior to the full development of the Comprehensive Restoration Implementation Plan will be used as a source of valuable urban restoration experience. These near term cleanup and restoration efforts will provide immediate benefits to an especially degraded portion of the estuary system and provide a reference for improvement of future restoration efforts. In the framework of an estuary-wide restoration approach, ecosystem restoration planning in Lower Passaic River will consider the roles of plant and animal species populations and their habitats in the larger regional context of community and ecosystem relationships.

D. *Without Project Conditions*

D.1 Existing Conditions

A general overview of existing conditions in New York/New Jersey Harbor reveals that the Hudson-Raritan Estuary contains a wide range of aquatic and terrestrial habitat types in a relatively small geographic area. Wetland habitat was once a dominant feature in the estuary. According to the U. S. Fish and Wildlife Service's 1997 report: Significant Habitats and Habitat Complexes of the New York Bight Watershed, approximately 300,000 acres of tidal wetlands and underwater lands within the Hudson-Raritan Estuary System have been filled and only about 20% (15,500) acres of the once existing tidal wetlands remain. The Lower Passaic River once supported extensive tidal wetlands and provided significant benthic habitat. Wetlands and underwater lands were filled in during the construction of water dependent industrial facilities and during the construction of transportation infrastructure. Much of the shoreline on the right descending bank was reconfigured to a hardened vertical surface that supports the McCarter

Highway. The left descending bank consists of hardened surfaces in industrialized areas nearer Newark Bay, but also includes significant stretches of vegetated shoreline along parkland in some abandoned or underutilized areas upstream of the confluence with Saddle River. Currently, less than 45 acres of tidal wetlands remain in the Lower Passaic River.

Industrial and residential pollution have degraded water and sediment quality in Lower Passaic River for more than 100 years. The Passaic Valley Sewerage Commissioners was formed as an agency of the State of New Jersey in 1902 to address water quality issues in the Lower Passaic River and watershed. By 1924, an extensive wastewater treatment infrastructure was in place including a treatment plant and piping to outfalls located at Robbins Reef in Upper New York Bay. In recent years, a slow reversal of water quality degradation has begun resulting from stormwater and wastewater treatment system upgrades. Nonetheless, the Lower Passaic River earned the poorest rating on EPA's Index of Watershed Indicators. The "high vulnerability" rating is attributed to "more serious" conditions concerning wetland loss, contaminated sediments, fish and wildlife consumption, and designated use attainment. There are scores of NPDES (National Pollutant Discharge Elimination System) permit discharges into the river and there are also more than one hundred identified potential hazardous waste sources in the watershed.

Water and sediment quality problems in the Lower Passaic River have contributed to ecosystem degradation in the river, as well as to ecosystem degradation in the adjacent waters of Newark Bay and Upper and Lower New York Bay. Point and non-point source pollution, sedimentation, lack of vegetative buffer and cover, loss of wetlands, and sediment contamination cause water quality problems (see Table 1). Water quality problems are exacerbated by wetland destruction and degradation, which could provide natural filtering capacity and storm water retention.

As stated above, sediments in the Lower Passaic river are known to contain 2,3,7,8-TCDD, DDT, 2,4-D, 2,4,5-T, and 2,4,5-TCP and other hazardous substances that include, but are not limited to; cadmium, copper, lead, mercury, nickel, zinc, PAHs, DDT, and PCBs. These contaminants impact ecological and human receptors, limit the potential for waterfront development and future land use in the area, and are a likely contributor to contaminant loading in the estuary.

TABLE 1

Restoration Alternatives Identified in the Reconnaissance Report to be Considered in the Feasibility Study

Potential Project		
Location / Name	Opportunity	Project Summary
Area 1 – Six Mile Reach: Point-No-Point, Harrison, Newark, Kearny, and Arlington reaches	Sediment and water quality improvement, restore benthic habitat and submerged aquatic vegetation	Identify, isolate, and/ or remove contaminated sediments to meet human health and ecological risk based standards. Dredged material shall be tested in accordance with RCRA hazardous waste identification methods and treated in accordance with RCRA standards, and/or in accordance with Harbor Dredged Material Management Plan and/or other placement options.
Area 2 – Kearny Point Reach	Sediment and water quality improvement, restore benthic habitat and submerged aquatic vegetation	Identify, isolate, and/or remove contaminated sediments to meet human health and ecological risk based standards. Dredged material shall be tested in accordance with RCRA hazardous waste identification methods and treated in accordance with RCRA standards, and/or in accordance with Harbor Dredged Material Management Plan and/or other placement options.
Area 3 – Upstream Reach: Belleville, Nutley, Rutherford, and Wallington reaches	Sediment and water quality improvement, restore benthic habitat and submerged aquatic vegetation	Identify, isolate, and/or remove contaminated sediments to meet human health and ecological risk based standards. Dredged material shall be tested in accordance with RCRA hazardous waste identification methods and treated in accordance with RCRA standards, and/or in accordance with Harbor Dredged Material Management Plan and/or other placement options.
Area 4 – Oak Island Yards, Newark	Restore contiguous network of remaining tidal, intertidal, and palustrine wetland areas in the City of Newark	Soften and vegetate shoreline, create upland buffer zone, remove fill and regrade, reintroduce native wetland and upland species
Area 5 – Second River Corridor from the Passaic River to Montclair	Restore natural stream channel substrate and vegetated riverbank, restore palustrine and intertidal wetlands, reduce local flooding	Soften and vegetate shoreline, remove hard substrate, create riparian buffer zone, reintroduce native wetland and upland species, investigate stormwater management and flood storage capabilities
Area 6 – Passaic River left descending bank from Kearny Point to East Rutherford	Restore filled in former salt marshes, provide shoreline stabilization, create riparian vegetative buffer	Vegetate shoreline, remove fill and regrade, reintroduce native wetland and upland species, create riparian buffer zone
Area 7 – Passaic River left descending bank, Wallington and Garfield	Restore filled in former salt marshes, remove derelict structures, under utilized and abandoned shoreline areas	Vegetate shoreline, remove fill and regrade, reintroduce native wetland and upland species, create riparian buffer zone, remove derelict structures

D.2 Future Without Project Conditions (No Action Alternative)

The recent trend of improving water quality in Lower Passaic River will continue as recently planned improvement efforts, such as sewage system and pumping station upgrades, and potential combined sewer overflow (CSO) abatement, and contaminant source reduction plans are implemented. Remedial efforts at the 80 and 120 Lister Avenue property will fully abate that property's contaminant contribution into the Lower Passaic River. There is also a strong grassroots effort to improve water quality and encourage recreational use of the Lower Passaic River, the Hackensack River, and the adjacent Meadowlands. However, improved water quality will have a limited beneficial impact on habitat and ecosystem functions in the Lower Passaic River and Newark Bay because of numerous structural impediments to ecosystem restoration, such as poor sediment quality, sedimentation, extensive filling, lack of vegetative buffer, shoreline hardening, and steep vertical bulkheads.

The Lower Passaic River will continue to support aquatic habitat significantly below its ecological potential. Contaminated sediments will continue to pose human health risks and ecological health risks through food web bioaccumulation and direct contact with contaminated sediment. In addition, there are numerous point and non-point sources with continuous discharge to the River. The river has limited resilience to potential natural and man-made disturbances, such as extreme weather events or chemical spills. The lack of aquatic vegetation, wetlands, and vegetated buffer zone limits the effectiveness of both regulatory and grassroots efforts to foster ecosystem restoration in Lower Passaic River. Contaminated sediments in the river channel and adjacent areas will continue to migrate with river and ocean currents increasing the costs and impacting the economic feasibility of the construction and maintenance of navigation improvements in the New York/New Jersey Harbor.

D.3 Alternatives to be Considered in the Feasibility Study

The Section 905(b) (WRDA 86) Preliminary Analysis Report recommended that the Federal government proceed to the feasibility phase and initiate a cost-shared feasibility study to formulate ecosystem restoration projects and conduct a comprehensive restoration opportunities analysis for Lower Passaic River. The CERCLA program also requires that sites (in this case, the Diamond Alkali Superfund Site, Passaic River Study Area) undergo a prescribed feasibility study utilizing nine criteria specified in the NCP for alternative comparison.

This combined WRDA and CERCLA program is a comprehensive, watershed based approach. This joint study will identify problems and opportunities, quantify human health and ecological risks, and identify cleanup and restoration alternatives. Cleanup alternatives will consider the identified restoration needs and EPA, the Corps, and the State of New Jersey will recommend, based on the prescribed evaluation criteria within the NCP and WRDA guidelines, the actions necessary to address the human health and ecological risks and associated restoration work. As the investigation work proceeds, EPA, the Corps, and OMR/NJDOT may identify additional work that can be incorporated into the study. Opportunities to expedite implementation of cleanup and restoration work, including interim construction authorities, will be explored throughout the process. Also, information, data, and alternative designs resulting from this study will be used to support the Comprehensive Hudson-Raritan Estuary Restoration Implementation Plan.

Work Breakdown Structure (WBS)

The Work Breakdown Structure (WBS) is a Corps' product-oriented hierarchy of the scope of work, and is broken down into component products and sub-products. The WBS presented below follows the definition of major tasks, tasks, and subtasks defined in the Scope of Studies (SOS). The WBS is intended to summarize the entire feasibility work effort and is an outline of the specific tasks that are to be accomplished to produce the feasibility study products. The WBS follows a consistent set of accounting codes. The accounting codes of the WBS are intended to allow products, tasks, cost, and schedule to be tracked with easy reference. This WBS is necessary for the Corps to track its costs. The work tasks that will be performed by EPA alone or in conjunction with the Corps/OMR/NJDOT are designated in this WBS.

The Civil Works Breakdown Structure used here is an accounting system for Corps of Engineers Civil Works projects. The Corps of Engineers Financial Management System (CEFMS) and the Project Management Information System (PROMIS) were designed to directly accept cost data for projects established using the Civil Works Breakdown Structure. With these management systems on line, no funds can be spent without a study budget based on the Civil Works Breakdown Structure. Other new Corps applications are expected to require the use of the Civil Works Breakdown structure as well. Therefore, in anticipation of the requirements of these systems, we have adopted the accounting system of the Civil Works Breakdown Structure for the WBS. Table II-1 lists the accounting codes of the Civil Works Breakdown Structure for this feasibility study. The alphabetic code J corresponds to (and links) all work efforts related to preparing the feasibility report to the Feasibility Report product. The second level (e.g., JA - Engineering Appendix) corresponds to sub-products of the feasibility report. The third level (e.g., JCB - Gross Appraisal Report) corresponds to major tasks/work elements. Tasks (4th level), sub-tasks (5th level), and sub-sub-tasks (6th level) are also used, in some cases, to provide further detailed task descriptions. Only those CWBS accounting codes for which work is anticipated are included in Table II-1.

Table II-1
Civil Works Breakdown Structure
For The Lower Passaic River Feasibility Report

- J-----Feasibility Report
 - JA----Engineering Appendix
 - JAA---Surveying and Mapping
 - JAAA--Topographic Mapping
 - JAAB--Water Surface Profiles and Cross-Sections
 - JAAC --Graphic Information System (GIS)
 - JAAD –Geophysics and Ground Truth Sampling
 - JAB---Hydrology and Hydraulic Studies/Report
 - JABA-- Hydrology and Hydraulic Modeling
 - JAC---Geotechnical Studies/Report
 - JAD---Site Development Analysis/Report
 - JAE---Engineering and Design Analysis Report with Preliminary Drawings
 - JAEA--Preliminary Design
 - JAEB--Detailed Design

- JAEC--Design Appendix
 - JAECA—Treatability Studies
 - JAECAA—Determination of Candidate Technologies & the Need for Testing
 - JAECAB—Conduct Literature Survey & Determine Need for Treatability Testing
 - JAECAC—Evaluation of Treatability Studies
 - JAECAD—Treatability Testing & Deliverables
 - JAECAE—Treatability Testing Work Plan
 - JAECAF—Treatability Study SAP
 - JAECAG—Treatability Study Health & Safety Plan
 - JAECAH—Treatability Study Evaluation Report
 - JAF---Feasibility Modeling Studies
 - JAG---Value Engineering Report
 - JAH---External Technical Review
- JB----Socioeconomic Studies/Report
 - JBA---Economic Analysis/Report
 - JBB---Social Studies/Report
 - JBC---Institutional Studies/Report
 - JBD---Ability to Pay Report
 - JBE---Financial Analysis Report
 - JBF---External Technical Review
- JC----Real Estate Analyses/Documents
 - JCA---Real Estate Supplement/Plan
 - JCB---Gross Appraisal/Report
 - JCC---Preliminary Real Estate Acquisition Maps
 - JCD---Physical Takings Analysis
 - JCE---Preliminary Attorney's Opinion of Compensability
 - JCF---Rights of Entry
 - JCG---Other Real Estate Documents/External Technical Review
- JD----Environmental Studies/Reports
 - JDA---Minutes of Scoping Meetings
 - JDC---Environmental Impact Statement (NEPA Document)
 - JDD---Coordination Documents with Other Agencies
 - JDE---Environmental Resource Inventory Report
 - JDEA—Define Human & Ecological Use of Study Area
 - JDEB—Assess Human & Ecological Risk
 - JDF---Mitigation Analysis Report
 - JDG---Endangered Species Analysis
 - JDH---Section 404(b)(1) Analysis Report
 - JDI---401 State Water Quality Certification
 - JDJ---Record of Decision (ROD)
 - JDK---Section 103 Evaluation
 - JDM---CZM Consistency Determination
 - JDN---Other Environmental Documents
- JE----Fish and Wildlife Coordination Act Report
- JF----HTRW Studies/Report

- JFA---HTRW Preliminary Assessment Report
 - JFAA—Data Compilation/Study Area Background
- JFB---HTRW Site Inspection and Sediment Characterization Report
 - JFBA—Conceptual Site Model Development & Remedial Investigation/Feasibility Study Planning
 - JFBB—Sampling & Analysis Plan
 - JFBC—Identify Sources of Contamination
 - JFBD—Study Area Characterization
 - JFBDA—Field Investigation
 - JFBDB—Implement & Document Field Support Activities
 - JFBDC—Investigate & Define Study Area Physical & Biological Characteristics
 - JFBD—Describe the Nature and Extent of Contamination
 - JFBD—Evaluate Study Area Characteristics
- JFC—HTRW Remedial Investigation Study /Report
 - JFCA—Preliminary Study Area Characterization RI Data Compilation
- Summary
 - JFCB—Human Health & Ecological Risk Assessment Report
 - JFCC—Remedial Investigation (RI) Report
- JFD---External Technical Review
- JG---Cultural Resource Report
 - JGA---Site Survey Field Report
 - JGB---Data Collection and Analysis/Report
 - JGC---Mitigation Plan Report
 - JGE---One Percent Waiver
 - JGD---Memorandum of Agreement
 - JGF---External Technical Review
 - JGG---All Cultural Resources Studies/Reports
- JH---Cost Estimates
 - JHA---Study Cost Estimates Updates
 - JHB---PED Cost Estimate
 - JHC---Project Cost Estimate
 - JHD—[OMR]R&R Cost Estimate
 - JHE---Baseline Fully Funded Cost Estimate
 - JHF---External Technical Review
- JI---Public Involvement Documents
 - JIA---Notices and Public Meeting(s)
 - JIB---Minutes of Public Meeting(s)
 - JIC---Public Comments Report
 - JID---Newsletters
 - JIE---Other Public Involvement Documents
 - JIEA—Stakeholder--Webpage
- JJ---Plan Formulation and Evaluation Report
 - JJA---District Coordination Meeting
 - JJB---Establish Without Project Conditions
 - JJC---Preliminary Formulation and Screening of Alternatives
 - JJCA—Develop Preliminary Remediation Goals (PRGs)

- JJCB—Development & Screening of Remedial Alternatives
 - JJCBA—Development & Screening of Remedial Alternatives
 - JJCBB—Refine & Document Remedial Action Objectives (RAOs)
 - JJCBC—Develop General Response Actions
 - JJCBD—Identify Areas & Volumes of Sediments
 - JJCBE—Identify, Screen, & Document Remedial Technologies
 - JJCBF—Assemble & Document Alternatives
 - JJCBG—Refine Alternatives
 - JJCBH—Conduct & Document Screening Evaluation of Each Alternative
 - JJCBI—Alternatives Development & Screening Deliverables
- JJD---Detailed Evaluation
 - JJDA—Detailed Analysis of Remedial Alternatives
 - JJDAA—Detailed Analysis of Alternatives
 - JJDAB—Apply Nine Criteria & Document Analysis
 - JJDAC—Compare Alternatives Against Each Other & Document the Comparison of Alternatives
- JJE---Plan Formulation Management and Report
- JJF---External Technical Review
- JQ--Alternative Formulation Briefing
 - JQA---AFB Project Documentation
 - JQB---AFB Technical Review Documents
 - JQC---AFB Policy Compliance Review Documents
 - JQD---AFB Guidance Memorandum
- JK----Draft Report Documentation
 - JKA---Draft Feasibility Report and NEPA Document
 - JKB---Public Review Comments
 - JKC---Project Guidance Memorandum (PGM)
 - JKD---All other Draft Feasibility Report Documents
 - JKE---Technical Review Documents
 - JKF---Policy Compliance Review Documents
- JL----Final Report Documentation
 - JLA---Division Commander's Notice
 - JLB---All Other Final Feasibility Report Documents
 - JLC---Final Feasibility Report and NEPA Document
 - JLD---Technical Review Documents
- JM----Washington Level Report Approval
 - JMA---Policy Compliance Review Documents
 - JMB---Chief of Engineers' Report
 - JMC---OMB Letter to ASA(CW)
 - JMD---ASA(CW) Transmittal to Congress
 - JME---State & Agency Review and NEPA Document Filing Letters
- JN----All Other Feasibility Studies
 - JNA—Remedial Investigation/Feasibility Study Scoping
- JO----Damage Assessed A/E Contractors
- JP----Management Documents
 - JPA---A/E Contract Documents

- JPB---Coordination Documents
 - JPBA—Project Team—Shared Server
 - JPBB—Data Management Procedures
 - JPBC—Maintain Sample Management & Tracking
- JPC---Study Funds Control Documents
- JPD---Trip Reports
 - JPDA—Document Field Activities
- JPE---Minutes of Technical Review Conference
- JPF---All Other Management Documents
- K-----Design Agreement (DA)
 - KA----Initial Draft DA Package
 - KAA---Initial Draft DA
 - KAB---Federal/Non-Federal Allocation of Funds Table
 - KAC---DA-Deviation Report
 - KAD---DA-Certification of Legal Review
 - KAE---DA-Checklist
- L-----PED Project Management Plan (PED PMP)
- Z-----Programs and Project Management Documents

II. Scope of Studies

This section of the Project Management Plan (PMP) provides a definition of the products and a description of the tasks to be accomplished during the course of the feasibility study. A complete listing of the tasks, which must be accomplished to meet all applicable Federal laws, statutes and policies, is provided above in table II Work Breakdown Structure. The majority of this section of the PMP is devoted to specific descriptions of each feasibility study task, including: the technical studies and investigations to be accomplished; the reasons for each task; the techniques, models, and procedures to be used; the organizational elements responsible for each task; and the cost of each task. Remediation tasks to be conducted by EPA in coordination with restoration feasibility study tasks are identified in the description of the corresponding feasibility study task. The schedule for each task, including relationships and dependencies, are addressed in Section V, Feasibility Study Schedule.

The organization and description of feasibility study tasks follows the U.S. Army Corps of Engineers Civil Works Breakdown Structure (CWBS) definitions (10 September 1997 Revisions to the 30 November 1993 draft). The CWBS follows a hierarchical organization and provides a breakdown of products, sub-products, major tasks/work elements, and tasks/activities required to produce an RI/FS report in increasing levels of detail and specificity.

A. Review of Feasibility Study Work Products

The major products to be produced are:

1. Draft Final PED Project Management Plan;
2. Work Plans for each project task with schedules;
3. Community & Stakeholder Relations Plan;
4. Stakeholder Participation Memorandum of Agreement;
5. Peer Review Plan;
6. Raw data packages;
7. QA/QC'd data packages;
8. Remedial Investigation Report that includes Human Health and Ecological Risk Assessments;
9. Feasibility Study Report;
10. Proposed Plan(s) for remediation and restoration of the Passaic River;
11. Preliminary Design Agreement and Financing Plan;
12. Record(s) of Decision for remediation and restoration of the Passaic River.

1. Other Supporting Plans

Other supporting plans will be developed as needed as the study progresses to address specific items such as regional habitat issues, public outreach and local cooperation, real estate acquisition, quality control, value engineering, environmental and cultural resources, safety and security, and sediment management. Throughout the feasibility phase, opportunities to expedite

restoration construction through alternative pathways, such as the provisions of Section 206, WRDA 1996, and Section 312, WRDA 1990 will be fully explored. The feasibility analysis will also identify opportunities to coordinate ecosystem restoration planning with the Hudson-Raritan Estuary Comprehensive Restoration Implementation Plan, the joint USEPA-USACE-OMR/NJDOT Sediment Decontamination Program, Brownfields re-development planning, water quality improvement programs, acquisition programs, ecosystem restoration planning for the Upper Passaic River and watershed, and other Federal and non-Federal ecosystem improvement efforts.

B. Description of Tasks Required to Produce Products, Analyze Alternatives, and Determine Feasibility

The purpose of this section of the PMP is to describe the products, sub-products, major tasks/work elements, and tasks/activities required to produce the feasibility study. Tasks are organized according to the U.S. Army Corps of Engineers Civil Works Breakdown Structure (CWBS) definitions (10 September 1997 Revisions to the 30 November 1993 draft). The USEPA will conduct tasks related to the ongoing RI/FS, pursuant to CERCLA, in coordination with tasks conducted by the Corps for this Feasibility Study. Tasks to be conducted by the Corps and related tasks to be conducted by the USEPA are identified below in the context of this Feasibility Study. USEPA task costs have not been determined and are not included in the task descriptions below.

Product J Investigation and Feasibility Report

The Investigation and Feasibility Study is the second phase of the Corps of Engineers planning process and follows a favorable Reconnaissance Report and execution of a Feasibility Cost Sharing Agreement (FCSA) between the Corps of Engineers and the non-Federal partners. In recognition of the coincidental study areas and the related roles and responsibilities of EPA and the Corps [along with the project sponsor, OMR/NJDOT], the agencies have decided to combine the EPA Superfund RI/FS and the Corps Feasibility Study into one comprehensive, cooperative study. The purpose of the joint study is to develop a comprehensive watershed-based plan for the remediation and restoration of the Lower Passaic River Basin. This joint Investigation and Feasibility Report will be supplemented by a Proposed Plan for remediation and Restoration and a Record of Decision (subsequent to a public comment period), pursuant to CERCLA. Together these documents will include one or more proposals for remedial actions as defined under CERCLA and the identification of ecosystem restoration opportunities in the study area to support broader estuary-wide restoration efforts.

EPA will prepare a draft RI/FS report for review. This RI/FS will analyze the extent of contamination in the sediment and surface water, and the sources of contaminants (e.g., the sediment, the CSOs, ground water transport, etc.), alternatives to remediate these contaminant sources, human health and ecological risk, aquatic ecosystem problems and opportunities throughout the entire Lower Passaic River watershed. This RI/FS will identify, screen, and formulate alternative remediation and restoration plans for the project areas identified above and other sites that may be identified. Restoration projects that meet Federal criteria and are consistent with CERCLA recommended remedial actions will be recommended for construction. Opportunities to expedite construction authorization, such as interim authorities, will be explored. Requests for construction authorization at any or all of the proposed restoration sites

may proceed prior to full completion of the Comprehensive Hudson-Raritan Estuary Restoration Implementation Plan being developed under a separate feasibility study. Information, data, and alternative designs resulting from the Lower Passaic River feasibility study will be used to support the Comprehensive Restoration Implementation Plan. This report, as ultimately adopted or amended by EPA, provides a basis for remedy selection by EPA and documents the development and analysis of remedial alternatives. The CERCLA ROD will document the alternative(s) selected for remediation and restoration. Upon approval of the ROD by EPA and approval of the Feasibility Report by the HQUSACE, the Office of the Assistant Secretary of the Army (Civil Works), the recommendations for remediation and restoration will be formally transmitted to Congress, along with a Consent Decree with CERCLA PRPs denoting the percentage of funding to be supplied by the PRPs to implement the remedial action(s) and restoration(s). This will be to support a project authorization decision (the percentage of WRDA money that the Corps and EPA are requesting to fund the project). Once the project is authorized for construction, funding is provided annually in Energy and Water Development Appropriations Acts.

Sub-Product JA Engineering Appendix

An Engineering Appendix will be prepared that supports the recommendations as described in the Feasibility Report. The Engineering Appendix will be prepared at a level of detail necessary to develop a defensible baseline cost estimate that addresses all pertinent cost factors with adequate contingency factors. The Engineering Appendix will document the results of all of the engineering investigations conducted during the feasibility phase, including: surveying and mapping, hydrology and hydraulics studies, geotechnical investigations, site investigations, design analysis, remedial technology investigations, and cost estimating for the alternatives analysis for the restoration sites. The Engineering Appendix will be prepared by the New York District's Engineering Division (or their Contractor) and will be scheduled for completion in time to be incorporated into the draft Feasibility Report. The content and cost of required engineering technical investigations are detailed below. Engineering management accounts for approximately ten percent of the cost required for engineering technical investigations.

The total cost of Sub-Product JA: Engineering Studies is \$1,308,700.00.

Major Task JAA Surveying and Mapping

Coastal floodplain mapping is required to delineate tidal reach and overbank flows for civil, hydrologic, and hydraulic design and is required to develop quantities and cost estimates. Tidal elevations are a critical component of coastal ecosystem restoration. Detailed topography is also required to plan and delineate ecosystem restoration projects and watershed-wide analyses. Prior surveys and plans prepared by the non-Federal partner and others will be used as much as possible. Extensive surveying and mapping has been performed in this area for other Corps projects, including flood control and erosion control projects for the Lower Passaic and Saddle Rivers. That data will be reviewed and updated as required so that it can be used as the main source of survey and mapping data for this feasibility analysis. The United States Geologic Survey (USGS), National Resource Conservation Service (NRCS), State and County planning agencies and universities will be contacted to locate and obtain any existing surveying and mapping data. Prior to conducting new surveying and mapping activities, the New York District (or their contractor) will contact the National Geospatial Data Clearinghouse and the New York State Geographic Information System (GIS) clearinghouse for available GIS data, per the requirements of ER 1110-1-8156. Recent and historical aerial photography will also be obtained from available sources. Surveying and mapping activities described below will be conducted by the New York District (or their Contractor).

The total cost of Major Task JAA: Surveying and Mapping is \$366,800.00.

Task JAAA Topographic Mapping

Topography will be developed to support alternative designs at proposed restoration sites. Site-specific mapping will be developed for sites, which emerge from the initial screening process. Topography will show the top of banks, bottom of banks, edge of water, bridges and culverts, inverts and opening sizes, and any other significant topographic or man-made features. Topographic maps generated from 1990 aerial surveys were developed in electronic format (MicroStation format) with one-foot contours for a previous flood control project. This data will be reviewed and updated as required. Computer Aided Drafting and Design Files (CADD) will be

compliant with the CADD A/E/C Standard Release 1.8. Original aerial surveys using digital orthographic photography will not be conducted for this feasibility analysis.

The cost estimate for topographic mapping was developed based on the assumption that original topographic mapping will not be required due to the availability of recent existing data. Costs for this task only include the review and updating of existing data. Line maps at a target scale of 1 inch = 100 feet will be developed for the delineated project area. The mapping and related digital and hardcopy products shall meet the US Army Corps of Engineer (USACE) accuracy standards. Contours shall be developed at 1-foot increments for all project areas described above. Surveys will be used in conjunction with the newly developed (January 2000) New York City Base Map and other existing topographic products. Topographic mapping of areas adjacent to the study areas will be derived from the New York City Base Map or other existing sources. Topographic mapping will be provided to the project designers and plan formulators. This task will be conducted by the New York District (or its Contractor) at a cost of \$68,300. There are no remediation tasks to be conducted by the USEPA in coordination with the topographical mapping tasks required for the restoration component of the feasibility study.

Task JAAB Stream Bed Profiles and Cross-Sections

Streambed profiles and cross-sections developed for previous studies will be reviewed and updated for use in the hydraulic, hydrodynamic, and hydrologic analyses. Survey data will establish cross sections and streambed profiles along waterways in the study area. Cross-sections will extend to top of high bank. Cross sections have been taken (1994) at 500-foot intervals for the length of the Lower Passaic River and above and below each bridge. Bridge section surveys include abutments, low chord of bridge opening, roadway deck, and any obstructions that might influence flow through the bridge opening. Cross-sections have been developed in electronic format for display (AUTOCAD, MicroStation, and ASCII station and elevation formats) and for direct import into the hydraulic model (HEC-RAS or other approved model) and the hydrodynamic model (RMA2, UNET or other approved model). Existing cross-section data will be reviewed for accuracy and updated as required, however it is assumed that the cross-section data will require minimal new work. Cross-section data will be provided to the project designers and plan formulators. Bathymetry data will be collected as required under Major Task JAF (Modeling Studies). This task will be conducted by the New York District (or its Contractor) at a cost of \$27,800. There are no remediation tasks to be conducted by the USEPA in coordination with the streambed profile and cross section tasks required for the restoration feasibility study.

Task JAAC Geographic Information System (GIS)

A geographic information system (GIS) will be developed for the Lower Passaic River study. The GIS will be used to assist the study team in assessing problems, formulating and evaluating solutions, and presenting study findings. It is anticipated that all aspects of the feasibility study will benefit from and contribute to the GIS. The GIS developed for the Lower Passaic River study will also be used as a component of the broader GIS being developed for the Hudson-Raritan Estuary Comprehensive Restoration Implementation Plan. Information to be included in the GIS includes, but is not limited to: soils, vegetative cover, wetlands, topography, hydrology, tidal reach and elevations, water quality / chemistry, sediment quality, property ownership, land use / cover, zoning, demographic data, regulatory floodplain boundaries, stream cross-sections, HTRW (Hazardous, Toxic and Radioactive Waste) and cultural sites. Other mapping information needs will be developed in the initial screening process.

The GIS will be developed using the base map and structure survey data obtained under JAAA Topographic Surveys and which will integrate existing GIS data. Existing digital geospatial soils and land use data will be obtained from the NRCS and the USGS. Existing bathymetric, benthic, and sediment data will be obtained from the USEPA. Data gathered during the feasibility analysis will be input into the GIS to create a multi-layered analytical tool that will be applied to restoration planning within the study area. The need for centralized data storage for this project will be considered. This tool will be used to identify and analyze system-wide concerns, such as areas of contaminated sediments, blocked hydrology, extensive debris, areas of fill, etc.

Prior to implementing the GIS system, the New York District (or its contractor) will contact the National Geospatial Data Clearinghouse and the New Jersey GIS clearinghouse for available GIS data, per the requirements of ER 1110-1-8156. Any data collected during the study will be documented using CorpMet 95 (FGDC compliant metadata) and will also be posted on the Corps node of the Clearinghouse by the New York District. Data collection should utilize the CADD/GIS Technology Center (formerly the Tri-Services Center) Spatial Data Standards, release 1.95.

The New York District (or its Contractor) will develop the GIS system for all restoration areas, incorporating and supplementing the data already available. This task will be conducted by the New York District (or its Contractor) at a cost of \$270,700.

In coordination with the geographic information system tasks to be conducted by the New York District for the restoration feasibility study, the USEPA will develop a sediment-sampling plan for the study area. A statistically based sediment-sampling plan will contribute to the effectiveness and efficiency of the sediment management plan. Results of sediment and benthic sampling will be integrated into a geospatial database including sediment composition, sediment contamination, and benthic community data.

Task JAAD Geophysics with Ground Truth Sampling

To supplement the existing data described that will be assembled and synthesized in Tasks JAAA and JAAC, a hydrographic survey will be planned and executed, that will include bottom-profiling, sub-bottom profiling in conjunction with differential, hydrostatic GPS. The electronic data collected will be supplied to meet the requirements specified in Task JAAC. Ground truth sampling will be used to characterize sediment type and physical characteristics.

Major Task JAB Hydrology and Hydraulic Studies/Report

Modeling studies will be performed to support the identification and analysis of alternatives to remediate and restore degraded ecosystems in Lower Passaic River. Hydrology modeling using computer program HEC-1 or HEC-HMS or other models as applicable; and hydraulic modeling using computer program HEC-RAS or other models as applicable will be performed as described in Task JABA. Also, existing hydrodynamic models developed for the New York/New Jersey Harbor area and the Lower Passaic River will be modified and calibrated for application to remediation and restoration areas within Lower Passaic River. Contaminant fate and transport modeling using the modeling framework developed for the NY/NJ Harbor Estuary Program Contaminant Assessment and Reduction Program (CARP), will be performed as described in Major Task JAF – Other Feasibility Modeling Studies.

The total cost of Major Task JAB: Hydrology and Hydraulic Studies/Report is \$136,000.00.

Task JABA Hydrology and Hydraulic Modeling

A report will be prepared that details the results of hydraulic and hydrologic (H&H) studies conducted during the feasibility study to characterize the study area and design and evaluate alternative plans. Activities to be documented in the H&H report include: development of input data including verification of existing and future (2020) land use; development, calibration and verification of models; establishment of existing and future condition water surface profiles for various flow conditions; evaluation of existing stormwater management ordinances, characterization of surface drainage patterns; model adjustment for future without project conditions; alternative screening; detailed analyses of several alternatives; risk and uncertainty analysis (as applicable); hydraulic design of alternatives; refinement of with project hydrologic engineering analysis; sediment assessment; activity estimate for PE&D phase; and preparation of the Hydraulics and Hydrology Appendix. This task also requires attendance at study team meetings and coordination with the USEPA. The New York District (or its contractor) will perform the following H&H investigations for ecosystem restoration at the seven proposed sites:

- Prepare a hydraulic engineering management plan for the feasibility phase, including a listing, by site, of data input needs, required studies, and an analysis of prior studies by others; and
- Prepare a technical hydrology and hydraulics report suitable for incorporation as an appendix to the draft feasibility report.

The ECOM hydrodynamic model is a three dimensional model including tidal influences developed for the entire New York Harbor. Within ECOM's network, wetland areas, channels and hydraulic structures will be added as appropriate. Water level boundary conditions would be developed for about a month-long or longer simulation. The boundary conditions would be representative of long-term water level statistics. It is anticipated that this or another applicable model will be calibrated for areas with a higher resolution grid by using topographic information gathered under task JAA.

Hydrologic models HEC-1 or HEC-HMS or other applicable models will be used to simulate the non-tidal freshwater flow in the drainage areas. The hydraulic model HEC-RAS or other applicable models will analyze channelized flows in proposed restoration areas, if any channelized flows are considered significant to the river. Tidal reach and the effects of storm surges will be modeled by linking the hydrodynamic and hydrologic impacts to the hydraulic models. General analytical criteria for sizing and evaluating tidal creeks will be established using information from the wetland research community, as well as local criteria. Reference marshes will be designated near each site whereby its hydrodynamic behavior will be monitored with water level recorders. The reference marsh behavior will be significant factor in establishing the analytical criteria for the proposed restoration sites.

Many of the activities listed below have been conducted for a previous flood control project. Specific hydraulic and hydrologic work activities to be conducted for this feasibility study will incorporate as much of the previous work as reasonable. Specific work activities include:

- Review cross-sectional and topographic survey data for adequacy in developing the hydraulic model;

- Conduct field visits, install/retrieve instrumentation, and collect appropriate high water marks, tidal elevations, and current profiles necessary to update existing data and calibrate the hydrodynamic model;
- Review and update the existing hydrodynamic model for existing and also for future conditions (if different) for the 1-, 2-, and 10-year floods and a low flow condition as necessary for development of ecosystem restoration plans. If possible, peak storm elevations will be based on existing stage frequency data and synthetic tide marigrams will be generated. The District will code, debug, and calibrate the model, as discussed above, to measured morphological stream channel characteristics. Channel cross-sections will be collected in Task JAA at appropriate stream intervals and upstream and downstream of bridges and culverts known to be significant restrictions to channel flow;
- Determine the existing hydrologic conditions for the 1, 2, 10 year and low flow conditions. The flows for those events will be developed for the proposed sites. The hydrology for two improved conditions will also be analyzed if relevant to proposed restoration;
- Lay out and compute existing water surface profiles;
- Determine design (high flow / storm – episodic event) scenarios
- Modify and run the hydrodynamic model for a minimum of 2 improved conditions for each plan alternative. The District will perform analysis to size structural (e.g., culvert openings) and stream channel modifications to ensure adequate flooding durations and/or tidal exchange for ecosystem restoration objectives;
- Examine the sedimentation patterns and sediment transport throughout the Lower Passaic River and Newark Bay and coordinate sediment transport analyses with the CARP. An analytical algorithm will be established to evaluate the stability of the inlets of the tidal creeks when appropriate. Estimates of long-shore sediment transport will be performed and a sedimentation model may be used if the conditions at the site(s) warrant more adequate analyses; and
- Assess potential for floodplain impoundments.
- Evaluate the stability of the existing and proposed shoreline and bank slopes, which include a historical shoreline change analysis, and determining wind and vessel generated wave climates.

The use of other Corps approved hydrodynamic models will be considered if they meet the goals of the project.

Task JABA will be conducted by the New York District (or its Contractor) at a cost of \$136,000.

Major Task JAC Geotechnical Studies/Report

A preliminary analysis of restoration areas and adjacent lands will be conducted based upon existing published soils and geologic data as well as on previous studies conducted by others and on site-specific geotechnical testing. It is anticipated that onsite investigations will be required for 24 locations within the ecosystem restoration areas (18 locations identified in the 1989 East bank Stabilization Reconnaissance Study, 3 locations along Second River, and 3 locations in the Oak Island Yards as identified in the 2000 Restoration Options Report, Section 206 prepared for the City of Newark). Site-specific analyses will be conducted at a general level of detail, based on geologic and soils information to guide field explorations and selected laboratory testing. Analysis of existing geotechnical data, such as Natural Resources Conservation Service Soil

Surveys, will be conducted for the restoration sites. Overall geotechnical engineering studies to be conducted include: site selection, material utilization, dewatering and diversion, and construction sequencing. All activities will be accomplished at the minimum level of detail sufficient to meet the requirements of a baseline cost estimate. Sediment analysis in support of benthic habitat opportunities will be performed under Major Task JFB (HTRW Site Inspection), a sediment management plan, including sediment characterization analysis, will be developed under Major Task JDN (Other Environmental Documents).

Site-specific geotechnical testing will be performed to quantify insitu soil and sediment properties at areas selected for shoreline softening and also for areas selected for wetland restoration. Samples will be obtained using test pits and borings. It is anticipated that 24 borings (half of the sites at two borings per site) and 24 test pits (one per site) will be conducted to an average depth of 6 feet. Field permeability's may be performed as required at potential shoreline softening and wetland restoration sites. Recompacted permeability tests will be performed in the laboratory if required.

The total cost of Major Task JAC: Geotechnical Studies/Report is \$284,100.00.

Major Task JAD Site Development Analysis/Report

This report is generally required only on major structural projects where the site cannot be selected based on an initial field inspection or evaluation of existing data, and will require additional field investigations and possibly more detailed hydraulic analysis. The need for additional site development and analysis is not anticipated at this time.

The total cost of Major Task JAD: Site Development Analysis/Report is \$_____.

Major Task JAE Engineering and Design Analysis Report with Preliminary Drawings

This work will include preparing conceptual designs for remediation measures and designs for all ecosystem restoration measures. The basis of design will include drawings displaying the plan, profile, and typical cross sections. Quantities will be developed based on design sheets. The work will include field investigations and coordination with local interests and USEPA remediation tasks regarding design considerations. This task will include determination of alternative operation and maintenance requirements and alternative real estate requirements. Details of the work will be discussed on a basis of design, which will be included as an appendix to the feasibility report. The level of detail of the design work will be sufficient to estimate the baseline cost, identify the National Economic Development/National Environmental Restoration (NED/NER) plan, and determine the selected plan.

The total cost of Major Task JAE: Engineering and Design Analysis Report is \$337,800.00.

Task JAEA Preliminary Design

Conceptual designs for remediation may include about eight project alternatives, while preliminary designs for ecosystem restoration will be prepared on approximately three project alternatives for each of the seven ecosystem restoration project sites. Preliminary level designs will be prepared at a level of detail sufficient to develop venture level cost estimates and aid in

the screening of alternatives, and preparation of support materials for public meetings and other outreach activities. The USEPA (or their contractor) and the New York District (or their Contractor) will perform this task at a cost of \$142,600.

Task JAEB Detailed Design

Detailed designs and preliminary drawings will be prepared for one-project alternative and 3 plan scales for each of the ecosystem restoration project sites. Designs and drawings will be developed at a feasibility level of detail. The likely ranges of alternatives to be designed are listed in Table 1 above. The New York District (or its Contractor) will perform this task at a cost of \$150,100.

The USEPA's detailed design will not commence until after a Record of Decision is recorded. Hence no budget estimate will be required at this time.

Task JAEC Design Appendix

A design appendix to the feasibility report will be prepared. All designs and drawings will be presented in a level of detail that will insure the integrity of the structure and/or system and meet the requirements of the baseline cost estimate. The New York District (or its Contractor) will perform this task at a cost of \$45,100.

The total cost for Major Task JAE: Engineering and Design Analysis is \$1,337,800.

Task JAECA: Treatability Studies

To the extent necessary, to complete the screening of remediation alternatives, treatability testing will be performed to assist in the detailed analysis of alternatives. In addition, if applicable, testing results and operating conditions will be used in the detailed design of the selected remedial technology to the extent necessary. If treatability studies are needed to complete screening of the remedial alternatives, the following activities will be performed. USEPA and OMR will jointly fund the Treatability Studies. OMR will contribute \$1,000,000 as in-kind services towards the completion of the studies outlined in Task JAECA.

The total cost for Task JAECA: Treatability Studies is \$1,000,000.

Task JAECAA: Determination of Candidate Technologies & the Need for Testing

In coordination with the ongoing USEPA-USACE-OMR Sediment Decontamination projects candidate technologies will be identified, in a technical memorandum based on the preliminary screening. The listing of candidate technologies will cover the range of technologies required for alternatives analysis.

Task JAECAB: Conduct Literature Survey & Determine Need for Treatability Testing

A literature survey will be conducted that focuses on existing environmental dredging technologies and sediment treatment methods to gather information on performance, relative costs, applicability, removal efficiencies, operation and maintenance (O&M) requirements, environmental engineering controls and implementability of candidate technologies. Based on this review and project Data Quality Objectives (DQOs), EPA, will determine whether removal and treatment is a feasible and cost-effective alternative for sediments. If EPA determines that removal and treatment is a feasible and cost-effective alternative based on existing study area characteristics, and if practical candidate technologies have not been sufficiently demonstrated, or cannot be adequately evaluated for this Study area on the basis of available information, treatability testing will be conducted.

Where it is determined by EPA that treatability testing is required, a statement of work will be developed outlining the steps and information and data necessary to evaluate and initiate the treatability-testing program. If it is determined that treatability studies are appropriate, the partnership shall begin the process of obtaining a site at which this work could be conducted. The treatability testing study area will be dependent on the specifics of the process, and those specifics will be presented in a technical memorandum.

Task JAECAC: Evaluation of Treatability Studies

Once a decision has been made to perform treatability studies, EPA will decide on the type of environmental dredging technology and treatability testing to use (e.g., bench versus pilot). Because of the time required to design, fabricate, and install pilot scale equipment as well as perform testing for various operating conditions, the decision to perform pilot testing shall be made as early in the process as possible to minimize potential delays of the FS. A brief scope of work will be prepared by EPA/ACE/OMR that lists the candidate environmental dredging and decontamination technologies, identifies the scale that they will be tested on (pilot vs. bench), and lists available facilities/study areas at which the decontamination can occur. This scope of work will be made available for review prior to preparation of the work plan for the treatability studies. To assure that a treatability-testing program is completed on time, and with accurate results, a separate treatability testing work plan or an amendment to the study area work plan will be developed.

Task JAECAD: Treatability Testing & Deliverables

The deliverables that are required, in addition to the memorandum identifying candidate technologies, where treatability testing will be conducted, include a work plan, a sampling and analysis plan (SAP), and a final treatability evaluation report. EPA will also develop a treatability study health and safety plan, if necessary.

Task JAECAE: Treatability Testing Work Plan

A treatability testing work plan or amendment to the Study area work plan will be written for review and approval describing the Study area background, remedial technologies to be tested, test objectives, experimental procedures, treatability conditions to be tested, measurements of performance, analytical methods, data management and analysis, health and safety, and residual waste management. The DQOs for treatability testing shall be documented as well. If pilot scale treatability testing is to be performed, the pilot scale work plan will describe environmental

dredging technologies and monitoring, pilot plant installation and start-up, pilot plant operation and maintenance procedures, operating conditions to be tested, a sampling plan to determine pilot plant performance, and a detailed health and safety plan. If testing is to be performed off-study area, permitting requirements will be addressed.

Task JAECAF: Treatability Study SAP

If the Quality Assurance Project Plan (QAPP) or Field Sampling Plan (FSP) are not adequate for defining activities to be performed during the treatability tests, a separate treatability study SAP or amendment to the Study area SAP will be prepared by EPA for review.

Task JAECAG: Treatability Study Health & Safety Plan

If the original health and safety plan is not adequate for defining the activities to be performed during the treatment tests, a separate or amended health and safety plan will be developed.

Task JAECAH Treatability Study Evaluation Report

Following completion of treatability testing, EPA and OMR will analyze and interpret the testing results in a technical report. Depending on the sequence of activities, this report may be a part of the RI/FS report or a separate deliverable. The report will evaluate each technology's effectiveness, implementability, cost, and actual results as compared with predicted results. The report will also evaluate full-scale application of the technology, including a sensitivity analysis identifying the key parameters affecting full-scale operation.

Major Task JAF Feasibility Modeling Studies

Water quality information required for the restoration feasibility study will be developed during water quality modeling and analysis conducted by the USEPA and USACE for the remediation feasibility study. The USEPA will prepare a report that details the results of water quality studies (WQ) conducted during the remediation feasibility study to characterize the study area and develop potential remedies to improve water quality, including identification of upland and submerged contaminant sources such as Superfund, RCRA, ISRA sites and contaminated sediments. Activities to be documented in the WQ report include: review of existing data; collection of new data; evaluating existing loads to the system (including point source loads, boundary loads, atmospheric deposition, land-side runoff loads, loads from groundwater recharge etc.); development of input data; development, calibration and verification of the WQ model; establishment of existing and future condition (2020) for in stream water quality; analysis of water quality conditions that would alleviate usage restrictions; alternatives development including alternative combined sewer overflows and storm water outfall placement, alternatives screening; conceptual analyses of several alternatives; risk and uncertainty analysis (as applicable); evaluations of in stream water quality in regard to EPA NPDES (National Pollutant Discharge Elimination System) guidelines and limits for urban drainage; evaluation of existing stormwater regulations in regard to water quality for existing and future conditions. This task requires preparation of the Water Quality Section in the Hydraulics and Hydrology Appendix, attendance at study team meetings, and coordination with the Corps' engineering, environmental, and planning staff.

As a part of a previous flood control feasibility study a three-dimensional water quality model

has been developed for the Lower Passaic River, Newark Bay and tidal portions of the Hackensack River. This model will be reviewed, updated and evaluated for use in this feasibility analysis. Models and modeling protocols developed for the CARP will be utilized as applicable. The USEPA will perform the following water quality investigations for the remediation feasibility study:

- Prepare a water quality design study plan for the feasibility phase, including a listing of data input needs, required studies, and an analysis of prior studies by others;
- Provide listing of the pollutants to be modeled; and
- Prepare a technical water quality report suitable for incorporation as a section in the H&H appendix to the draft feasibility report.

Specific work activities will include:

- Review cross-sectional and topographic survey data for adequacy in developing the water quality model;
- Review existing bathymetry data and collect additional data as required;
- Review existing water quality data and contaminant source information in order to design and implement a water quality sampling program necessary to calibrate the water quality model;
- Coordinate with regulatory agencies (NJDEP, USEPA, NOAA, USFW, NMFS, etc.) to develop a consensus on methodologies to be used and the overall study approach;
- Review and update the existing water quality model for existing and for future conditions. Code, debug, and calibrate the model to known measured levels. Information used to develop the H&H model, including hydrodynamic data, will be used where appropriate to increase model setup efficiency;
- Future water quality conditions will be projected for the engineering screening alternatives selected to be evaluated.

The New York District will support the USEPA's modeling effort by providing technical review, assistance in the assessment of water quality effects of site-specific restoration alternatives, and assistance in the identification of best management practices and management scenarios to increase the overall water quality of the study area.

The total cost of Major Task JAF: Model Studies is \$92,600.00.

Major Task JAG Value Engineering Report

Value engineering (VE) studies are required for Construction General projects with an estimated cost of \$2 million or greater and are also a required component of an Engineering Documentation Report (EDR). An EDR is the implementation document for projects constructed under separate authorization, as may be identified during the feasibility study. The purpose of the VE is to certify that the designs selected for the recommended plans are the most cost effective designs. This approach differs from the Cost Effectiveness/Incremental Cost Analysis (CE/ICA) in that the VE study focuses on the design components of an individual plan whereas the CE/ICA focuses on the comparisons among alternative plans.

This item is included to assure that quality standards have been applied to the selection of the recommended feasibility plan. The Project Manager will establish a multi-disciplinary team for each VE study implemented during the feasibility study. The VE team will be involved at interim steps throughout the plan formulation process to insure that VE team recommendations

can affect plan design and evaluation. The VE team shall streamline the recommended design in terms of design optimization, efficiency and cost. Before VE methodology is applied, a site visit will be convened to investigate the project site. The VE team shall use a standard methodology in the feasibility study, consisting of six phases: Information, Speculation, Analysis, Development, Presentation and Implementation. Cost models shall be prepared to determine areas of relative high cost to ensure that the VE team focused on those parts of the project which offer the most potential for cost savings.

The final product will be a VE team executive summary, detailing this methodology, and showing the VE team's recommendations. A formal presentation of these findings shall be made to the New York District, USEPA, and OMR/NJDOT. Following this presentation and any potential revision to these findings, the VE team's recommended plans shall be included into the draft Feasibility Report.

The total cost of Major Task JAG: Value Engineering Studies is \$46,400.00.

Major Task JAH External Technical Review

Technical review will be conducted on all work products generated under Sub-Product JA-Engineering Appendix. A report will be prepared detailing the results of the technical review including comments, issues and resolutions.

The total cost of Major Task JAH: external technical review is \$45,000.00.

Sub-Product JB Socioeconomic Studies/Report

Socioeconomic studies will be performed in compliance with the requirements of ER 1105-2-100. The purpose of socioeconomic studies is to assist in problem identification, characterize the social and demographic characteristics of the affected populations, and to quantify benefits and costs of proposed solutions. Specifically, economic studies will quantify and describe the costs and impacts of ecosystem restoration plan in order to identify the plans, which achieve their objectives at the least cost. Economic analysis will be used to assess decontamination and beneficial use dredged material placement options in support of the sediment management plan and will be used to assess cost savings and other benefits of environmental dredging in accordance with Implementation Guidance for Section 312 Memorandum dated 25 April 01. In addition, socioeconomic studies will include ability to pay analysis, financial analysis, analysis of local sponsors (including any PRPs) financing capability. The results of socio-economic studies will be presented in a Socio-Economic Appendix to the Feasibility Report. Summary results will also be incorporated into the main body of the Feasibility Report and NEPA document.

The total cost of Sub-Product JB: Socioeconomic Studies/Report is \$457,300.00.

Major Task JBA Economic Analysis/Report

Work conducted as part of the feasibility study effort will include a cost effectiveness and incremental cost analysis (CE/ICA) of ecosystem restoration features to support decision making on implementation of the ecosystem restoration alternatives for the seven priority restoration sites identified in the plan formulation process. The CE/ICA will follow the procedures specified in EC 1105-2-210, Ecosystem Restoration in the Civil Works Program 1 June 1995.

Economic analysis will also include evaluation of alternative sediment decontamination methods and evaluation of alternative dredged material disposal and beneficial use management options. This economic analysis will be used in support of the Lower Passaic River sediment management plan developed under Major Task JDN, Other Environmental Documents. Management of material dredged for ecosystem restoration purposes is not addressed in the District's Dredged Material Management Plan.

The objective of this major task is to provide information to assist in determining the most cost effective level of ecosystem restoration. The level of ecological benefits associated with each restoration alternative will be developed by team ecologists (see Major Task JDE). The cost of each restoration alternative will be developed by team cost estimators (see Major Task JHC). The CE/ICA combines this information to develop and evaluate a range of alternatives and determine the plans, which provide the greatest level of ecological benefit at the lowest cost.

Implementation Guidance for Section 312 Memorandum dated 25 April 01 requires that the costs of removal and remediation of contaminated sediments are justified based on operations and maintenance cost savings and non-monetary environmental benefits. Under this task the monetary benefits of environmental dredging will be assessed for each of the alternative plans. This task also includes identification of the most cost effective plan and the plan that maximizes net operations and maintenance cost savings. In support of the sediment management plan, work conducted under this task includes assessment of the benefits and costs of dredged material management alternatives, including beneficial use alternatives. This task also includes a cost effectiveness assessment of alternative decontamination technologies in support of a treatability analysis of contaminated sediments in the Lower Passaic River.

Work conducted under this major task will be performed by the New York District Planning Division (or its Contractor).

The total cost of Major Task JBA: Economic Analysis is \$256,800.00.

Major Task JBB Social Studies/Report

Under this task, the existing social, economic and demographic conditions of the Lower Passaic River study area and the specific project areas will be documented for the Feasibility Report. The socio-economic profile will be limited to only those variables, which are expected to influence formulation, or be affected by implementation of a project. Social impacts will be evaluated on the regions, communities and groups within the zone of influence of the project. Impacts to be considered will include: income distribution; employment distribution; population distribution and composition; the fiscal condition of the state and local governments; the quality of community life; life, health, and safety factors; displacement; long-term productivity; and energy requirements and energy conservation. Human Health and Ecological risk assessments will be carried out by the USEPA and are identified in Major Task JFB, HTRW Site Assessment. Benefits and impacts to minorities and low-income groups will also be evaluated and incorporated into the environmental justice analysis in the NEPA document.

The total cost of Major Task JBB: Social Studies/Report is \$49,200.00.

Major Task JBC Institutional Studies/Report

An investigation will be conducted to identify the jurisdictions, concerns, and authorities of the non-Federal partner(s) who will cost-share the construction and to determine the level of interest of agencies and organizations that may be involved in the study. The legal and institutional requirements for implementation of project features, including those to be implemented by the non-Federal partner(s), will also be identified. This task includes support and coordination with USEPA efforts to identify parties responsible for sediment contamination.

The total cost of Major Task JBC: Institutional Studies/Report is \$125,600.00.

Major Task JBD Ability to Pay Report

An ability to pay analysis will be prepared in compliance with the requirements of ER 1105-2-100 and the provisions of WRDA 1986. The analysis will determine the non-Federal partner's eligibility to reduce their cost sharing responsibilities based on local economic conditions. This analysis will be based upon and coordinated with work performed under Major Task JBE Financial Analysis Report.

The total cost of Major Task JBD: Ability to Pay Report is \$0.00.

Major Task JBE Financial Analysis Report

A financial analysis report will be prepared, which consists of the non-Federal partner's statement of financial capability, their preliminary financing plan, and the District Commander's assessment of the non-Federal partner's financial capability. The financing plan will include: a current schedule of estimated Federal and non-Federal costs, by fiscal year; a schedule of the sources and uses of non-Federal funds during and after construction, by fiscal year; and the method of finance for all non-Federal outlays, including Operation, Maintenance, Replacement, Repair and Rehabilitation (O&M) associated with the project. The non-Federal sponsor's statement of financial capability will include evidence of their authority and ability to obtain and commit the identified sources and uses of funds.

The non-Federal sponsor will prepare a Financing Plan that clearly and convincingly describes how it intends to meet its financial obligations for the project in accordance with the project funding and O&M schedules. The financing plan will include a current schedule of estimated Federal and non-Federal expenditures by Federal fiscal year which will be provided by the Corps of Engineers and will exactly reflect cost sharing policy and should agree with estimated cost figures in the Feasibility Report. In addition, a schedule of the sources and uses of non-Federal funds during and after construction by Federal fiscal year should be included. The schedule should include project outlays and income as well as outlays and income related to project construction and financing. Also, the schedule of the sources and uses of funds should be consistent with the schedule of estimated Federal and non-Federal expenditures. Finally, the Financing Plan should explain the method of finance for all non-Federal outlays including O&M associated with the project.

The Statement of Financial Capability is a clear and convincing description, submitted by the non-Federal sponsor, of its capability to meet its financial obligations for the project in accordance with the project-funding schedule. This includes providing evidence of the non-Federal sponsor's authority to utilize the identified source or sources of funds; and each Statement of Financial Capability should provide information on the non-Federal sponsor's

capability to obtain remaining funds, if any.

The District Commander's assessment of the non-Federal sponsor's financial capability will determine if it is reasonable to expect that ample funds will be available to satisfy the non-Federal sponsor's financial obligations for the project. Consideration should be given to prior performance of the non-Federal sponsor on similar projects, certainty of revenue sources and method of payment, and the overall financial position of the non-Federal sponsor. The assessment will demonstrate: 1) that the sponsor has adequate funds to meet its financial obligations as delineated by the project funding schedule provided by the Corps; 2) that the reliability of the sources of funds has been demonstrated; 3) that the sponsor has full and legal access to those funds; and 4) that all the parties providing funding essential to meeting the sponsor's financial obligation are legally committed to providing those funds.

The total cost of Major Task JBE: Financial Analysis Report is \$6,400.00.

Major Task JBF External Technical Review

Technical review will be conducted on all work products generated under Sub-Product JB-Socio-Economic Studies/Report. A report will be prepared detailing the results of the technical review including comments, issue and resolutions.

The total cost of Major Task JBF: external technical review is \$19,300.00.

Sub-Product JC Real Estate Analysis/Documents

The real estate Scope of Work (SOW) stated below is in compliance with ER 405 -1-12, Chapter 12, entitled " Real Estate Roles and Responsibilities for Civil Works: Cost Shared and Fully Federal Projects", dated 1 May 1998 and the project management Work Breakdown Structure ("WBS"). It identifies required work for the feasibility/Decision Document phase. It includes Project Review Board milestone as to Complete Real Estate Plan - which is the date the New York District (NAN) completes the Real Estate Report which will be included as an appendix to the decision document.

The total cost of Sub-Product JC: Real Estate Analysis/Documents is \$86,400.00.

Major Task JCA Real Estate Supplement/Plan

A Real Estate Supplement will be prepared as an appendix to the Feasibility Report for the ecosystem restoration project that outlines the minimum real estate requirements for the proposed project, in accordance with ER 405-1-12. The Real Estate Division or its contractor will

(1) Participate with the Planning Technical Manager, Project Manager and other district elements in meetings and discussions during Feasibility phase.

(2) Participate with the Planning Technical Manager, Project Manager and other district elements in the discussion of the Project Cost Sharing Agreement (PCA) with the sponsor

(3) Participate in negotiations regarding real estate work products or services to be contributed in-kind by the sponsor during the feasibility phase, which may include the following:

- a.) tax maps of the areas for project features under consideration for construction; public right-of-way maps;
- b.) a list of owners of the property upon which project features are under consideration;
- c.) provide tax roll information (value, structure, type, etc.) regarding each parcel potentially affected by the placement of project features;
- d.) provide zoning information regarding each parcel potentially affected by the placement of project features;
- e.) provide the last search of records for each parcel potentially affected by the placement of project features;
- f.) provide information on any anticipated mineral extraction in the project area and determine if any such activity is permitted by law;
- g.) identify all structures potentially affected by contemplated project works that are occupied that will be removed due to project implementation;
- h.) identify all known public utilities located within the proposed project area that will be affected or relocated;
- i.) identify the local acquisition costs and local real estate administrative costs associated with implementation of each alternative plan; and
- j.) provide location maps (City or County map) of local area upon which proposed features may be constructed, including material disposal areas or dredged material processing facilities.

(4) Assist and coordinate with all real estate activities with Local Sponsor.

(5) Initiate discussion and coordination with the sponsor regarding acquisition policies and procedures, including compliance with the Uniform Relocation Benefits (URA), as amended, Lands, Easements, Rights-Of-Way, and Relocations (LERR) crediting procedures, and milestones for land acquisition for schedule to be included in the Real Estate Plan (REP) as Exhibit.

(6) Advise the sponsor in writing as to the risks associated with acquiring LERR prior to the execution of the PCA or the Government's notice to proceed with LERR acquisition.

(7) Attend Project management meetings, Alternative Formulation Briefings (AFB), Feasibility Review Conference, or any other meetings or briefings, prepare and provide project status(s), as required.

(8) Prepare request for Real Estate Valuation Report to be used in part to develop cost ratio analysis, as required.

The Real Estate Report/Plan (REP), will be prepared in accordance with Chapter 12, ER 405-1-12, to accompany the Feasibility Report as an Appendix to the decision document. The REP will

a. Identify all Land requirements for the project that will be based on the minimum interest in real estate which will be acquired in order to support construction, operation, and maintenance of the project. Greater interests may be appropriate depending on the purposes of the project and the uses of the land. In addition, fee, easement and temporary easements may

also be altered based on the purposes of the project and the uses of the land. Determinations on the appropriate interests or estates in land will be made by the Chief of Real Estate in consultation with Engineering, the PM, and the non-federal sponsor.

b. Describe the estimated Lands, Easements, and Rights-of Way (LER) value, together with the estimated administrative and incidental costs attributable to providing such LER, and the acquisition process that will be required to support project implementation. It will be prepared to the same level of detail as the Feasibility Report.

c. Discuss the following topics listed below, if required. If conclusions as well as facts are presented, the REP will also include a brief description of the rationale supporting such conclusions:

(1) The purpose of the REP, in relation to the Feasibility Report it supports.

(2) For each project purpose and feature, a description of the lands, easements and rights-of-way required for the construction, operation, and maintenance of the project including those required for relocations, borrow material and dredged or excavated material disposal. This information will include the acreage, estates, number of tracts and ownership estimated value. The total acreage will be broken down as to the various interests and the life of the estates. Information will also be included regarding the extent that project LER is owned by private parties, by the sponsor, and by other public entities.

(3) A description of all LER required for the project that are already owned by the non-Federal sponsor, the acreage and interest owned, whether the existing estates are sufficient and available for the project. The REP will also briefly discuss special value consideration or crediting principles that may be applicable to existing sponsor ownership(s).

(4) A copy of proposed estates to include a discussion and justification of estates.

(5) Whether there is an existing Federal project that lies fully or partially within the LER required for the project. If so, the REP will also briefly describe the existing project; the extent of overlap of the two projects; the identity of the sponsor, if any, of the existing project; whether the LER that supports the existing project was previously provided as an item of local cooperation for such project; the owner of the LER that supports the existing project; the nature of the estate(s) owned; and the sufficiency and availability of the existing estate(s) for the new project.

(6) Whether there is any federally owned land within the LER required for the project. If there is such land, the REP will also describe the purpose for which the land is required for the project; the identity of the managing agency for the land, the acreage and estate owned by the United States, the acreage and estate required for the project; the views of the local representative of the managing Federal agency as to use for the project; and the acquisition plan for acquiring the required real property interests or other possessory rights.

(7) The extent, if any, that the LER required for the project lies below the ordinary high water mark, or the mean high water mark, as the case may be, of a navigable water course together with a brief discussion of whether the navigation servitude will be exercised for project purposes.

The total cost of Major Task JCA: Real Estate Supplement/Plan is \$14,400.00.

Major Task JCB Gross Appraisal/Report

The New York District's Real Estate Division will evaluate the selected ecosystem restoration project areas and conduct a Gross Appraisal. A detailed, supported appraisal of the collective real estate requirements and impact of the project, or selective portion thereof, including review and approval, will be performed as required by ER 405-1-12, (Chapter 4 and Draft Chapter 12) and policy guidance. Integral to this work is the preparation of a Baseline Cost Estimate for Real Estate in M-CACES format and a Real Estate Supplement (RES). These items are required for inclusion in the final report.

The Gross Appraisal on the selected plan for all LERR will be used, in part, to develop the Baseline Cost Estimate for Real Estate, including contingencies for all LERR. The Baseline Cost Estimate will be included as an exhibit to the REP. The Gross Appraisal will include the following:

- a.) A total estimated value for fee and easement estates, including improvements, minerals and severance damages;
- b.) A breakdown of fee and easement estates by acreage and dollar amounts;
- c.) The Duration of temporary easements or other temporary interests;
- d.) Discussion of the restrictions of the easements or use of the residual.
- e.) Additional detail or refinement (from that performed for the Initial Real Estate Cost Estimate during Reconnaissance) of:
 - f.) The location and description of the area;
 - g.) Any special features (i.e. timber, minerals, water rights, etc.);
 - h.) Environmental concerns including potential HTRW, or lack thereof;
 - i.) Existing encumbrances;
 - j.) The highest and best use(s) involved;
 - k.) The assumptions and limiting conditions.
- l.) A discussion of the relationships between the comparable data and the subject area;
- m.) The verified market data utilized to support the valuation;
- n.) A discussion of the relationships (support and analysis) between the market data and the subject area;
- o.) A discussion of any differences between local, state and federal appraisal rules and the effect on the interests to be acquired;
- p.) A breakdown of the land required for facility relocation, if any;
- q.) An identification of and the reasons for any contingency on the lands and damages valuation;
- r.) A copy of the mapping used for the Gross Appraisal;
- s.) General photographs of the project area;
- t.) Photographs and maps of the comparable properties;
- u.) Appropriate certifications; Appraiser qualifications; and Appropriate review and/or approval.

The Gross Appraisal will be of sufficient detail to provide an accurate cost estimate, which will be sufficient for authorization considering the cost growth limits of Section 902 of Public Law 99-662.

The total cost of Major Task JCB: Gross Appraisal/Report is \$38,100.00.

Major Task JCC Preliminary Real Estate Acquisition Maps

The Real Estate Division will prepare an initial set of maps and drawings that delineate the real estate acquisition lines for the ecosystem restoration project based on technical design drawings developed during the feasibility phase. Maps and drawings will reflect the minimum real estate required for project purposes. Map(s) will be prepared to clearly depict the project area, the tracts required for support of the project, utilities and facilities to be relocated, and any known potential HTRW lands, and the required LERRDS. New York District's Real Estate Division, in conjunction with its Engineering and Planning Divisions, will perform this task.

The cost of this task is included in Major Task JCA.

Major Task JCD Physical Takings Analysis

A discussion of whether there will be flooding induced by construction operation and maintenance of the project. If induced flooding is anticipated the REP will also describe the nature and extent thereof and whether additional LER should be acquired as a result. Where significant induced flooding anticipated, or where otherwise required, a written Physical Taking analysis separate from the REP will be prepared with the conclusion of the analysis included in the REP.

The total cost of Major Task JCD: Physical Taking Analysis is \$7,000.00.

Major Task JCE Preliminary Attorney's Opinion of Compensability-

A determination of what facilities must be relocated, including roads, railroads, pipeline, utilities, bridges, and cemeteries and whether or not Section 111 of 72 State. 303, as amended, applies. Real Estate Division will obtain an Attorney's Opinion of Compensability or Compensable Interest from the Office of Counsel. A statement of the cost of relocations will be included. Real Estate will include the value of the land and associated costs for facility relocations in the Baseline Cost Estimate for Real Estate. Engineering Division will provide the costs associated with the performance or construction of the relocation. In addition, the REP will include a statement as to whether the Government, the non-Federal sponsor, if applicable, or the owners will be responsible for the relocation and acquisition of new rights-of-way, and the costs for relocation and land to be acquired allocated to each entity.

The total cost of Major Task JCE: Preliminary Attorney's Opinion of Compensability is \$2,100.00.

Major Task JCF Rights of Entry

Documents which evidence permission from the landowner to temporarily use owner(s) lands for a specific time and purpose will be obtained for the purpose of environmental investigations, cultural assessments, core sampling, surveys, explorations, etc. Government, Contractor or the non-Federal Sponsor may obtain the Rights-of-Entry (ROE). ENG Form 1258-R will be used by the District to obtain Rights-of-Entry.

The total cost of Major Task JCF: Rights of Entry is \$18,900.00.

Major Task JCG Other Real Estate Documents / External Technical Review

In addition to the foregoing, the REP will contain:

a. A discussion of any relocation assistance benefits anticipated being required in accordance with the Uniform Relocation Assistance Act (PL 91-646), including the number of persons, farms and businesses to be displaced and estimated costs. It will describe the availability of replacement housing and the need for last resort housing benefits, if required.

b. A discussion of the present or anticipated mineral activity in the vicinity of the proposed project that may affect construction, operation, maintenance of the project together with a recommendation, including rationale, regarding acquisition of mineral rights or interests. The REP will also discuss other subsurface minerals or timber activity if applicable.

c. A thorough assessment of the non-Federal sponsor's legal and professional capability and experience to acquire and provide the LER for the construction, operation and maintenance of the project, including condemnation authority and quick-take capability. The REP will indicate whether the non-Federal sponsor was advised of the Uniform Relocation Assistance URA requirements and the requirements for documenting expenses for credit purposes. An Assessment of Non-Federal Sponsor's Real Estate Acquisition Capability checklist will be prepared as required by PGM Letter No 12, dated 2 May 1996.

d. A discussion of the type of ordinance proposed, its intended purpose, and whether enactment and enforcement of the ordinance will result in a taking of a real property interest for which compensation must be paid, if enactment of zoning ordinances is proposed in connection with the project.

e. A reasonably detailed schedule of all land acquisition milestones, including LERR certification. Real Estate, the Project Manager, and the sponsor will agree upon the dates reflected in the schedule.

f. A concise discussion of the impacts on the real estate acquisition process (e.g. values, schedules) due to known or suspected presence of contaminants that are located in, on, under, or adjacent to the LER required for the construction, operation or maintenance of the project including LER that is subject to the navigation servitude. The discussion will include the status of the District's and USEPA's investigation for such contaminants, whether such contaminants are regulated under CERCLA, other Federal statutes (e.g. RCRA) or specified state law. The REP will also disclose whether clean up or other response action will be required to implement the project; who will be responsible for performing, and paying the costs of performing such work as between the Government and the sponsor.

g. A discussion of known or anticipated support for, or opposition to, the project by landowners in the project area and any known or anticipated landowner concerns related to issues that could impact the acquisition process (e.g. estate selection, amount of acreage, etc.).

h. A statement that the non-Federal sponsor has been notified in writing about the risks associated with acquiring land before the execution of the PCA.

i. A description of any other real estate issue relevant to planning, designing or implementing the project.

2. In addition to the foregoing, this task also will require

a. External technical review and response to Project Guidance Memorandum, Formal Review Conference, or other comments.

b. Adherence to Corps of Engineers Financial Management System (CEFMS) funding requirements and Real Estate Management Information System (REMIS) management information systems requirements.

The total cost of Major Task JCG: external technical review is \$5,900.00..

Sub-Product JD Environmental Studies/Reports

Environmental studies will be performed in accordance with the National Environmental Policy Act (NEPA), ER 1105-2-100, ER 200-2-2, and other applicable laws, statutes, Executive Orders, and regulations. A NEPA document will be prepared as an integrated component of the Feasibility Report. NEPA documentation will include a full evaluation of the site-specific remediation and restoration plans and a Human Health and Ecological Risk Assessment conducted by the USEPA. NEPA analysis and documentation will be coordinated with state and Federal environmental agencies and the public. Information from studies performed under other tasks, such as sediment analysis, decontamination technology analysis, decontamination method economic evaluation, dredged material placement analysis, and water quality modeling will be coordinated and input into a Lower Passaic River sediment management plan developed as a part of this sub-product. Also an environmental resource inventory will be performed to provide information critical to establishment of without project conditions, with project conditions, and plan formulation of site-specific recommendations.

The total cost for Sub-Product JD: Environmental Studies/Reports is \$1,753,900.00.

Major Task JDA Minutes of Scoping Meetings

A formal record will be made of discussions with the public and resource agencies, including New York – New Jersey Harbor Estuary Program committees and the USEPA, that define the environmental concerns related to the evaluation of project alternatives and the selection of the recommended plan. The cost for this task includes meeting preparation, travel, attendance, and de-briefing.

The total cost for Major Task JDA: Scoping Meetings is \$43,300.00.

Major Task JDC Environmental Impact Statement (NEPA Document)

A document will be prepared for the site-specific ecosystem restoration projects, as required by the National Environmental Policy Act of 1969 (NEPA) that evaluates the impacts of project alternatives on the human environment. This document will include a Human Health and Ecological Risk Assessment conducted by the USEPA. The Human Health and Ecological Risk Assessment will be used to determine the necessity of and define the level of remediation required for the contaminated sediments. All tasks performed by USEPA will be fully coordinated with and incorporated in to the NEPA document when necessary.

The total cost for Major Task JDC: Environmental Impact Statement is \$208,800.00.

Major Task JDD Coordination Documents with Other Agencies

Letters, meeting records, etc. will be prepared that document the correspondence and dialogue between agencies regarding the proposed project. Documentation will include District review and comment of the USFWS's Coordination Report and any Memoranda of Understanding

between the USEPA, the non-Federal sponsor and the New York District. This task also includes records of public meetings, draft and final documents, and records of decision.

The total cost for Major Task JDD: Coordination Documents is \$38,600.00.

Major Task JDE Environmental Resource Inventory Report

An inventory will be prepared describing the biological, ecological and natural resources within the study area. Existing information collected as a part of the ecological sampling program for OU2 will be used, as applicable. The inventory will be accomplished via literature review, field reconnaissance, and sample analysis. In addition, vegetative maps and wetland delineations of the environmental restoration sites will be prepared.

Environmental resources will be inventoried for potential restoration sites to quantify existing site conditions and provide a baseline for measurement of ecosystem benefits. It is assumed that sediment sampling and benthic habitat analysis will be performed throughout the entire Lower Passaic River, including intensive sampling at selected locations. Vegetative cover at potential restoration sites will be mapped from available aerial photography. Field samples will be collected to verify the site cover map and to quantify the species composition of vegetative cover units. Reference wetland areas within the coastal floodplain to be improved would also be mapped and described. The identification and assessment of reference wetlands are a critical component of establishing restoration goals. Preliminary functional assessments will be conducted on the reference wetland areas to provide a baseline wetland benefit to the ecosystem. Efforts will be made to identify reference wetlands and to collect design parameters to guide the restoration and creation of wetlands and coastal floodplains. Stream classification, stream state and EPA rapid bio-assessments will help guide the selection of reaches for restoration as well as the selection of appropriate techniques for restoration and habitat enhancement.

It is anticipated that floral and faunal surveys will be conducted throughout the entire Lower Passaic River study area. Surveys will include terrestrial and aquatic vegetation, herptofauna, avifauna, and mammals. The floral and faunal surveys will identify species inhabiting the proposed restoration sites and adjacent areas and species that typically use these areas during seasonal migrations. The surveys will qualitatively characterize species abundance at the proposed restoration sites and adjacent areas. Fieldwork for the surveys will be conducted during each season and at various times of day and night as required to obtain an accurate biological characterization of the restoration sites and adjacent areas. Fieldwork will be preceded by literature and database reviews and contacts with local flora and fauna experts. Intensive sampling for biological inventories has been completed seasonally for the 6-mile (Operable Unit) and should be used to minimize additional work.

The Environmental Resources Inventory (ERI) report will contain sufficient documentation to support plan formulation, NEPA documentation, and documentation of impacts on essential fish habitat. Congress defined essential fish habitat for federally managed fish species as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." The ERI report will include a comprehensive environmental inventory. This inventory will describe land use, air quality, noise, geology, soils, water quality, water resources, vegetation, wildlife, fisheries, recreation, socio-economic characteristics, Federal and state threatened and endangered species, other species of special concern, and critical habitats; historic properties; toxic or hazardous materials; caves; and wetlands and other appropriate topics/resources known to be in the area which may be affected. Information will be field verified and mapped on an

ArcView or other applicable GIS platform in task JAAC. The NJDOT/OMR (or its Contractor) will perform this task at a cost of \$416,000.

The total cost for Major Task JDE: Environmental Resource Inventory Report is \$416,000.

Task JDEA: Define Human & Ecological Use of Study Area

The study area will be defined so that a specific exposure assessment can be performed. In addition to existing literature, information and data gathering, defining the use of the study area may require observation, surveys (including field surveys of fish and wildlife populations and habitats, and surveys of human fishing practices) and personal interviews. These activities will take into account the range of both the resident and migratory populations.

The RI/FS work plan will be considered as a starting point for collection of this information. Study area use will be determined on a year-round basis. In addition, future use of the study area shall be investigated, in recognition of the ecosystem restoration (NRD and WRDA) components of this study. Specifically, planned or projected shoreline developments, navigational dredging projects, and any other reasonably foreseeable future uses that may affect sediment quality or human or ecological exposure to hazardous substances at or from the in-water portion of the study area will be identified.

Task JDEB: Assess Human & Ecological Risk

The baseline human health and ecological risk assessments will be conducted following the collection of chemical and biological information and data as determined by EPA. EPA will perform the risk assessments in accordance with existing policy and guidance. This guidance may include but not be limited to:

- Risk Assessment Guidance for Superfund: Volume 1 - Human Health Evaluation Manual (Parts A and D);
- Interim Guidance: Developing Risk Based Clean-up Levels at Resource Conservation and Recovery Act Study areas in Region 10, (January, 1998);
- Ecological Risk Assessment for Superfund: Process for Designing and Conducting Ecological Risk Assessments, Interim Final, June 1997; and
- Guidelines for Ecological Risk Assessment, EPA/630/R95/002-F, 1998.

Many of these guidance documents and others can be found at:

www.epa.gov/superfund/programs/risk/humhlth.htm and
www.epa.gov/r10earth/offices/oea/risk/r0riskec.htm

EPA, NJDEP, and NRTs will meet to scope the risk assessments. Following the scoping meeting, the EPA will prepare a risk assessment scoping memorandum for EPA review. The risk assessment scoping memorandum shall describe the scope of the human health and ecological risk assessments, describe the key elements of the human health and ecological risk assessments (e.g., exposure pathway and receptor identification) and provide a list of interim deliverables and a schedule for their submittal. It is anticipated that the conceptual site models, exposure assessments, and problem formulation that were completed during RI/FS scoping will be revised to reflect new information and data. Draft baseline human health and ecological risk assessment reports will be developed for review. The final risk assessment reports shall be

included with the RI report.

Major Task JDF Mitigation Analysis Report

All feasibility report recommendations are expected to produce positive ecological net benefits and the need for a mitigation plan is not foreseen. All efforts will be made to avoid and minimize negative environmental impacts of the proposed actions. Under the unlikely situation that there are any unavoidable detrimental impacts associated with a proposed restoration project, a detailed evaluation will be conducted of possible actions that would offset those impacts.

The total cost for Major Task JDF: Mitigation Analysis Report is \$3,400.00..

Major Task JDG Endangered Species Analysis

Enhancement of critical habitat for listed endangered/threatened species and proposed species is a major objective of the watershed and regional system approach to ecosystem restoration. A report evaluating the potential effects of proposed restoration projects on listed endangered/threatened species and proposed species and designated or critical habitat will be prepared and provided to the U.S. Fish and Wildlife Service and the National Marine fisheries Service for their use in their determining whether formal consultation or a conference is required. It is anticipated that a Biological Assessment pursuant to Section 7 of the Endangered Species Act will not be required.

The total cost for Major Task JDG: Endangered Species Analysis is \$8,400.00.

Major Task JDH Section 404(b)(1) Analysis Report

A report will be prepared as required by the Clean Water Act which presents an analysis of any water quality impacts associated with the placement of fill material in the waters of the United States. Although, it is anticipated that the placement of fill will not occur as a component of the recommended restoration plans, this same section of the Clean Water Act requires analysis of the effects of removing dredged material from the river bottom, including effects due to turbidity, habitat disturbance, etc. This analysis will address issues such as resuspension of contaminated sediments, destruction of benthic fauna, and impacts on fish populations. Dredged material processing and beneficial use will be addressed as a part of the Treatability Studies in task JAECA and the sediment management plan identified in Major task JDN.

The total cost for Major Task JDH: Section 404(b)(1) Analysis Report is \$44,900.00.

Major Task JDI 401 State Water Quality Certification

Certification will be obtained from the State of New Jersey that proposed actions will not result in a violation of state water quality criteria. This task includes pre-application coordination, formal application, related meetings, and documentation.

The total cost for Major Task JDI: 401 State Water Quality Certification is \$30,100.00.

Major Task JDJ Corps of Engineers Record of Decision (ROD)

A draft Corps Record of Decision will be prepared by the District to document the history of actions taken to evaluate project impacts and list and describes all compliance actions to be

taken. The ROD signifies compliance with NEPA. This task will be performed by the New York District's Planning Division (or its Contractor) and the USEPA.

The total cost for Major Task JDJ: Corps of Engineers Record of Decision (ROD) is included in Task JDC.

Major Task JDK Section 103 Evaluation

A Section 103 evaluation will not be required for the project as there is no anticipation of ocean disposal of dredged material.

Major Task JDM CZM Consistency Determination

The purpose of this task is to ensure compliance and cooperation between ecosystem restoration projects, the Comprehensive Restoration Implementation Plan, and the Comprehensive Coastal Management Plans compiled by the New York-New Jersey Harbor Estuary Program. A report will be prepared to document consistency with coastal zone management regulations and policies, including City of Newark waterfront revitalization plans. This task will be performed by the New York District's Planning Division (or its Contractor) at a cost of \$28,900.

Major Task JDN Other Environmental Documents and External Technical Review

Analyses performed under this major task include (1) development of a sediment management plan, (2) ecological functional assessment of alternative restoration plans, (3) coordination with Brownfield initiatives and development of Brownfield opportunities, and (4) external technical review. Development of a sediment management plan incorporates information from sediment analyses performed under Major Task JFB and economic evaluations from Major Task JBA. The sediment management plan will evaluate the feasibility of decontamination methods in coordination with the joint USEPA-USACE-OMR/NJDOT Decontamination Program and recommend decontamination alternatives. The sediment management plan will incorporate an analysis of available technologies to be jointly conducted by the USEPA, OMR/NJDOT and the Corps.

Sediment Management Plan

Sediment management plan tasks to be conducted by the New York District, USEPA and OMR/NJDOT include identification of dredged material disposal and beneficial use management alternatives and recommendation of preferred alternatives. Economic analyses conducted in support of the sediment management plan, such as decontamination and placement cost assessments and cost effectiveness analysis are identified in major task JBA Economic Analysis. The Lower Passaic River sediment management plan will be developed in coordination with other sediment management analyses carried out for the Hudson-Raritan Estuary Comprehensive Restoration Implementation Plan and will be coordinated with the New York District Dredged Material Management Plan. The restoration feasibility study cost of sediment management plan tasks to be conducted by the New York District, USEPA and/or OMR/NJDOT (or its Contractor) under Major Task JDN is \$438,900.

Ecological Functional Assessment

Under Major Task JDE (Environmental Resource Inventory) resources were identified and quantified. Under this major task the level of ecological functioning of environmental resources will be assessed. It is anticipated that multi-metric assessment procedures that include the results

of analyses such as wetland functional analyses and the hydrogeomorphic approach (HGM) may be used to formulate environmental restoration alternatives. Multi-metric assessment procedures evaluate the existing physical conditions and biological and ecological communities. Multi-metric indices allow complex physical and biological ecosystems to be compressed, stratified, and ultimately compared with other similar resources within the same reference domain by extracting a single number to represent a targeted habitat or biological group. This task will include consulting a team of regional experts, including biologists, ecologists, hydrologists, etc., familiar with biological, ecological and physical attributes of local stream/riparian ecosystems. Modifications to the assessment procedures and inventory metrics used may occur based on conditions in the local area. The inherent variation present in natural systems will render ecosystem responses due to restoration treatments difficult or impossible to detect without fine-tuning the assessment metrics to best reflect the local environment.

Wetland assessment measures are anticipated to include the Wetland Evaluation Technique (WET), modified HEP evaluations for estuarine systems, and the hydrogeomorphic approach to wetland functional assessment (HGM). Characteristics of each of these evaluation procedures may be used depending on local conditions and the metrics most likely to be readily affected by restoration measures. For example, restoration may have an immediate effect on the depth and/or duration of flooding in riverine wetlands adjacent to streams, however, physical hydric soil characteristics may not be apparent for 50 years or more.

The habitat assessment technique developed for the study will be used to establish existing ecological conditions in the project area, assist in the formulation of habitat restoration alternatives, determine success criteria following implementation of preferred alternatives, and quantify increases in ecological outputs associated with plans and plan scales. After the initial screening process, project ecologists will quantify the expected ecological gains associated with each restoration alternative (and scale of alternative) for use in conducting the cost effectiveness and incremental cost analysis. Project ecologists will also identify the relationships (i.e. inter-dependencies) between management measures. The NJDOT/OMR (or its Contractor) will perform this task at a cost of \$370,200.

Brownfield Initiatives And Opportunities

This task will also include an assessment of the impacts of Brownfields within the watershed on restoration opportunities in the study area, and on broader estuary-wide restoration opportunities. The Lower Passaic River study area is a densely populated and heavily industrialized coastal area that has suffered severe ecological impacts from more than a century of industrial development. There are many Brownfield areas in the study area that are expected to impact upon the Corps' and the non-Federal partner's ecosystem restoration objectives. Coordination of Brownfield revitalization efforts, such as contaminant assessment, may enhance proposed ecosystem restoration and advance Brownfield redevelopment objectives. Supplementing existing information characterizing Brownfield sites in the study area, and coordinating HTRW (JF) and Water Quality (JAF) analyses, would support ecosystem restoration opportunities by identifying the potential impacts of Brownfield sites on proposed ecosystem restoration efforts. A technical report that documents Brownfield impacts, identifies Brownfield restoration opportunities that support ecosystem restoration in the Lower Passaic River, and that identifies opportunities to coordinate with existing local Brownfield initiatives will be incorporated as an appendix to the Feasibility Study. It will include findings obtained through contacts, file reviews, and site verification. The NJDOT/OMR (or its Contractor) will perform this task at a cost of

\$90,600.

Sub-Product JE: Fish and Wildlife Coordination Act Report

This work product includes a report by the U.S. Fish and Wildlife Service (USFWS) to document the environmental studies in accordance with the Fish and Wildlife Coordination Act. The principal product of this task is a Coordination Act Report. The report will be prepared by the USFWS and will define the impacts and potential value of restoration alternatives on fish and wildlife habitat and recommend types and amounts of mitigation for habitat losses, if required. The District will coordinate with the USFWS and supervise the interagency contract as part of Sub-Product JD. The USFWS will participate in study scoping, identification of fish and wildlife concerns, identification of available information, determination of the significance of fish and wildlife resources, and quantification of anticipated impacts. The Coordination Act Report will be prepared by USFWS to accompany the Feasibility Report and NEPA document. The Coordination Act Report will likely include Planning Aid Letters designed to help screen needs and restoration options, including their affect on endangered species and essential fish habitat. Funding in the amount of \$25,000 will be provided by the Corps of Engineers to the USFWS in accordance with the current Corps/USFWS Transfer Funding Agreement.

The total cost for Sub-Product JE – Fish and Wildlife Coordination Act Report is \$25,000.00.

Sub-Product JF: HTRW Studies /Report

HTRW investigations will be conducted in accordance with guidance provided in ER 1165-2-132 and CERCLA remedial investigation guidance. A report will be prepared which describes any hazardous/toxic/radiological waste (HTRW) occurrences within or nearby the project areas. It will include a determination of the nature and extent of contamination, a qualitative analysis of contamination impacts, and a quantitative analysis of contamination impacts in the absence of response actions. It will also include a preliminary identification of potential source areas, contaminant release mechanisms, exposure routes, potentially exposed populations, as well as a determination of the potential adverse health effects for the identified potential receptors. An evaluation of the environmental consequences of all storage, beneficial use, and disposal of contaminated sediments will also be conducted. HTRW site inspections will be conducted for the ecosystem restoration projects in support of alternative plan development. Human health and ecological risk assessments will be conducted by the USEPA as identified in Major Task JDC, Environmental Impact Statement.

The total cost of Sub-Product JF: HTRW Studies/Report is \$1,542,300.00.

Major Task JFA: Hazardous, Toxic and Radioactive Waste Preliminary Assessment Report

For the entire Lower Passaic River study area, a report will be prepared describing existing and past land uses, based on a review of the historical records and other public documentation. Existing data sources such as CERCLA, RCRA, NPDES, and other permits and documents will be evaluated to determine the potential presence of any HTRW. All HTRW investigations will be coordinated with any ongoing RCRA and ISRA investigations. The evaluation will include the potential impact of known HTRW sites in the vicinity, including human health and

ecological risk assessments. Similar analyses will be conducted for Brownfield areas and landfills within the watershed to evaluate their impacts on aquatic habitat and related water resources. If opportunities for coordination of ecosystem restoration and Brownfields re-development or landfill remediation can be identified, then these sites may be considered as project alternatives or may move forward as separate projects. Existing data concerning contaminated sediments in the study area will be identified and assessed for indications of additional areas of concern. The NY District (or its Contractor) will perform this task at a cost of \$321,500.

The total cost for Major Task JFA: Hazardous, Toxic and Radioactive Waste Preliminary Assessment Report is \$321,500.

Task JFAA: Data Compilation/Study Area Background

USEPA will gather, evaluate, and present the existing study area information and data, and will conduct a study area visit with representatives of each member of the “Governmental Partnership” to assist in planning the scope of the RI/FS.

The following types of information and data as they relate to contamination in the river will be considered, compiled, and evaluated for subsequent use:

- a) NJPDES and USACE permits and related data;
- b) fish and shellfish tissue chemistry;
- c) fish and shellfish: life history data, home range, abundance and distribution; histopathology and biomarker data;
- d) benthic community analyses;
- e) sediment chemistry (both bulk and pore water);
- f) ground water discharges/quality;
- g) surface water quality;
- h) river hydrology and estuarine hydrodynamic data;
- i) sediment toxicity bioassays;
- j) sensitive and special habitat areas;
- k) demographic data including socio-economic and ethnicity information;
- l) study area use information (e.g., public access, commercial, recreational, fish and shellfish consumption, and subsistence fishing activities, etc.);
- m) potential sources of contamination to the in-water portion of the study area, including a summary of sources in surface water, groundwater, storm water, CSO and SWO discharges to the river, and other upland sources;
- n) bathymetric surveys, and any available sediment transport data; and
- o) data on federally listed threatened and endangered species and state-listed species.

A relational database will be designed. At a minimum, the database will support geographic information system (GIS) presentation of information and data. Existing information and data will be utilized to help determine data gaps, verify chemicals of potential concern, develop a preliminary conceptual site model, preliminarily identify risks to human health and the environment, better define potential applicable or relevant and appropriate requirements (ARARs), and develop a range of preliminarily identified remedial alternatives.

Major Task JFB HTRW Site Inspection and Sediment Characterization Report

Once alternative project sites are selected for detailed study, present and past maps, existing aerial photos, and community records for those sites will be reviewed; visual site surveys will be conducted; and land owners and knowledgeable individuals will be interviewed. If it is determined that there is no suspected HTRW problem at any of the restoration locations, the investigation and findings to support this determination will be clearly indicated in the feasibility report. However, it is assumed that HTRW contamination is possible at all of the proposed restoration sites and HTRW contamination is known to exist in the soils and sediments throughout the study area. Remediation and restoration plans will be formulated specifically to address the HTRW contamination issue. If existing Brownfield sites are identified as contributing to aquatic habitat degradation, restoration opportunities for those sites will be identified in a Brownfields Opportunity Report.

Intensive sediment testing will be carried out in all reaches of the Lower Passaic River in support of the Lower Passaic River sediment management plan developed under Major Task JDN, Other Environmental Documents. An optimized sediment-sampling program will be developed using three dimensional geostatistical modeling. The preliminary sampling plan used to generate feasibility study cost estimates is based on the sampling plan used for the six-mile stretch of the Lower Passaic River identified as Operational Area 2. The preliminary sampling plan assumes three cores will be taken along transects spaced at 1,200 foot intervals for eleven miles of the Lower Passaic River and along one mile of the Saddle River, Second River, and Third River. Vibratory coring techniques will be used at a minimum of 200 locations in the Lower Passaic River and tributaries. It is assumed that standing penetration test borings will not be required. Each core will yield 6 samples for a total of 1200 samples.

The USEPA will conduct the analysis for 1,000 samples to be taken from approximately 11 miles of the Passaic River; the remaining six miles of the Passaic River within the study area have been assessed through previous investigations. The New York District will conduct the analysis for 200 of the 1,200 samples that are located along the Saddle River, Second River, and Third River. The preliminary sampling plan is expected to be revised and optimized for effectiveness and efficiency. Data from these investigations will be integrated with data from Operational Area 2 to characterize sediment contamination in the entire study area. Sediment and upland contamination data will be input into a geospatial model (developed under major task JAAC Geographic Information System) used to formulate and evaluate removal and remediation alternatives, decontamination methods, and dredged material placement alternatives. Quality Control and Quality Assurance tasks will be carried out in accordance with ER 1165-2-132.

The total cost for Major Task JFB: HTRW Site Inspection and Sediment Characterization Report is \$1,143,600.00.

Tasks JFBA: Conceptual Site Model Development & Remedial Investigation / Feasibility Study Planning

The information compiled in Tasks 2 will be used to identify, to the extent practicable, supplemental data needed to complete the RI/FS per EPA guidance. The analysis will identify additional information and data that will be required to complete the baseline human health and ecological risk assessments, and to identify and screen remedial action alternatives. The analysis will include the preparation of a preliminary conceptual site model (CSM), and development of preliminary analytical data quality objectives to support the analysis.

The preliminary CSM will portray the relationship among sources, chemicals, transport mechanisms (including boundary loads, sediment transport, surface runoff and groundwater discharges, etc.), receptors, and other parameters. The preliminary CSM for the ecological risk assessment (ERA) will include a variety of species that could be impacted by study area -related in-water contamination based on information generated during the historical review and will show the relationships among species and potential exposure pathways. The CSM for the human health risk assessment (HHRA) will include potential exposure pathways. Given the tidal nature of this system, it is anticipated that the scientific study area will include the Hackensack River - Newark Bay system and will extend to the termination of the Arthur Kill and Kill van Kull (dependent on model outputs). This scientific study area is considered to be a subset of the Hudson-Raritan Estuary study area, which extends to the New York Bight and includes New York Harbor.

Data Quality Objectives (DQOs) will be developed as part of the planning process to assist in selecting appropriate analytical methods, which are consistent with the CSM for both ecological and human health exposure pathways. The analytical goals will include an evaluation of:

- chemical specific ARARs;
- sediment concentrations for protection of benthic invertebrates;
- published tissue concentrations for protection of human health through consumption of fish;
- published tissue concentrations for protection of fish and wildlife;
- method detection limits for standardized analytical methods.

As part of the planning process for the feasibility study (FS), a technical memorandum will be prepared, that outlines the broad range of options that will undergo a preliminary screening (such as natural attenuation, capping, dredging etc.) and the supporting activities that will be required to support implementation of these options (long term monitoring, treatment facility siting, disposal facility siting, etc.) The potential alternatives will include, where appropriate, alternatives in which treatment significantly reduces the toxicity, mobility, or volume of the waste; alternatives that involve containment with little or no treatment; alternatives that include removal of contamination, and a no-action alternative. If remedial actions involving treatment are identified then initial treatability testing activities (such as research and study design) should occur concurrently with implementation of the RI/FS work plan.

EPA will develop criteria for assessing areas, which might benefit from early action (i.e. activities other than RI/FS activities performed before a ROD). The early action areas could include sediment early actions, source control, etc.

Task JFBB: Sampling & Analysis Plan

A sampling & analysis plan (SAP) will be prepared to ensure that sample collection and analytical activities are conducted in accordance with technically acceptable protocols and will include a field sampling plan (FSP) and a quality assurance project plan (QAPP).

The FSP will detail the sampling and data-gathering methods, and will include sampling quality assurance objectives, sample location and frequency, sampling equipment and procedures, and sample handling and laboratory analysis.

The QAPP will describe the project objectives and organization, functional activities, and quality assurance and quality control (QA/QC) protocols, which are consistent with the levels for

Remedial Action Objectives (RAOs) identified in the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR 300.420 (c)(4) and 300.430(b)(8). Also, sampling procedures, sample custody, analytical procedures, and data reduction, validation, reporting, and personnel qualifications will be defined. If a selected laboratory is not in the CLP program, a laboratory QA program will be executed.

A health & safety plan will be prepared in compliance with OSHA regulations and protocols. The health and safety plan will include the eleven (11) elements described in USEPA's RI/FS Guidance, such as a health and safety risk analysis, a description of monitoring and personal protective equipment, medical monitoring, and study area control.

Task JFBC: Identify Sources of Contamination

As part of the RI/FS, the identification and evaluation of upland contaminant sources to the study area, shall be undertaken. Such examples of these sources are Combines Sewer Overflows (CSOs). EPA and NJDEP will utilize this information in making source control adequacy determinations. Because upland study areas represent a potentially significant source of contaminants, coordination with NJDEP's ISRA/RCRA and EPA's RCRA/Superfund investigations and source control efforts will be required.

Task JFBC: Study Area Characterization

The in-water, tidal-wetland and possibly the flood-plain portion of the study area will be identified which may pose a threat to human health or the environment. The study area's physiography, geology, and hydrology will be described and both surface and subsurface pathways of contaminant migration to the river will be evaluated to support contaminant fate and transport analyses. The nature, extent, and volume of sediment that poses unacceptable risk (using the human health and ecological risk assessment processes) will be identified along with on-going sources of contamination, which will be identified by working with NJDEP.

During this phase of the RI/FS, the work plan, SAP, and health & safety plan are implemented. Field information and data are collected and analyzed to provide the information required to meet the goals of the RI. This work plan will be a 'living document', given that possible unknown conditions might exist and modifications to the plan will have to be implemented. Therefore, it is anticipated that activities might be iterative, and to satisfy the objectives of the RI/FS. If supplemental work is required, then those tasks will be added to the 'living document'. Monthly progress reports will be posted on the Public Shared Server and distributed via e-mail; and stakeholder meetings at major decision points, as described in the work plan, will be used to communicate both progress and findings during the RI/FS process.

Task JFBCA: Field Investigation

Field investigation includes gathering of information and data to fill data gaps, and to define study area physical and biological characteristics, sources of contamination, the nature and extent of contamination, and both human and ecological risks associated with the study area.

Task JFBCB: Implement & Document Field Support Activities

Field support activities following finalization of the work plan and SAP. Field support activities may include obtaining access to the portions of the study area, scheduling and procuring

equipment, obtaining field laboratory space, laboratory services, and/or specialty sub-contractors. A 'living schedule' will be available on the shared public server, which will be updated at least one week prior to initiating field activities.

Task JFBCC: Investigate & Define Study Area Physical & Biological Characteristics

Information and data on the physical and biological characteristics of the study area relevant to the presence and migration of hazardous substances, the evaluation of risks to human health and the environment and the development and evaluation of remedial action alternatives. Data gathering will be focused on those characteristics that impact the decision-making process, including the physiography, geology, and hydrology, and specific physical characteristics identified in the work plan.

This information will be collected through various means that may include a combination of physical measurements, observations, and sampling efforts, and will be utilized to help identify potential transport pathways and the human and ecological receptors mentioned in the project objectives. In defining the study area's physical characteristics sufficient data will be collected to support: the development of a contaminant fate and transport modeling framework; development and screening of remedial action alternatives; and the assessment of treatment technologies.

Task JFBD: Describe the Nature and Extent of Contamination

The information necessary to describe the nature and extent of contamination will be gathered as a final step during the field investigation. Where required, sampling will generate information and data on contaminant distributions and biological effects. Any study program identified in the work plan or SAP shall utilize analytical techniques sufficient to detect and quantify the concentration of contaminants and the migration of contaminants through the various media (specifically groundwater and sediment). In addition, the participants will collect the information and data necessary to assess contaminant fate and transport. Subsequent sampling events may be required. This process is continued until sufficient information and data are known to characterize the area and depth of contamination to complete the RI and to evaluate remedial alternatives.

The information will be used to determine the nature and extent, and the fate and transport of contamination in conjunction with the baseline risk assessments to determine the level of risk present. This information will also be used to help determine the appropriate potential remedial action alternatives to be evaluated.

Task JFBE: Evaluate Study Area Characteristics

The USEPA will analyze and evaluate the information and data to describe:

1. Study area physical and biological characteristics;
2. contaminant source characteristics in areas impacted by contaminant sources;
3. nature and extent of contamination in the study area ; and
4. contaminant fate and transport.

Study area physical characteristics, source assessments, and extent of contamination analyses are

utilized in the analysis of contaminant fate and transport. The evaluation of contaminant fate and transport will include the extent of horizontal and vertical spread of contamination as well as information from the literature on contaminant mobility and persistence of contaminants. The modeling approached to be used will be utilized; will be documented in a technical memorandum (which will be posted on the public shared server) prior to their use. If necessary, any information and data needed to fill data gaps identified by EPA will be collected. Also, this evaluation shall include information relevant to study area characteristics that is necessary for evaluation of the need for remedial action in the baseline risk assessment and for the development and evaluation of remedial alternatives.

Major Task JFC: HTRW Remedial Investigation Study/Report

It is expected that a separate remedial investigation study/report will not be required as a part of the feasibility study because the components of a remedial investigation are contained within this feasibility study. Any site-specific remedial investigations required for a recommended plan will be described in detail in the plan description.

Task JFCA: Preliminary Study area Characterization RI/Data Compilation Summary

After completing field sampling and analyses, EPA will produce a concise study area characterization RI data compilation summary. This summary will review the investigative activities that have taken place, and describe and display study area information and data documenting the location and characteristics of surface and subsurface features and contamination at the Study area, including sample locations, chemical concentration distributions and the results of any biological testing. This evaluation will include, to the extent practicable, chemical distributions relative to known sources, the location and varying concentrations of contaminants in areas influenced by sources, and the extent of contaminant migration through the study area. The RI data compilation summary will provide EPA with a preliminary reference for evaluating the risk assessments, the development and screening of remedial alternatives, and the further identification of ARARs.

Task JFCB: Human Health & Ecological Risk Assessment Report

Once all interim deliverables have been completed, EPA shall write the baseline risk assessment reports, in accordance with EPA guidance

Task JFCC: Remedial Investigation (RI) Report

EPA will prepare and submit a draft RI Report for review. This report, will follow RI/FS guidance, and shall summarize results of field activities to characterize the Study area, sources of contamination, nature and extent of contamination, and the fate and transport of contaminants. A final RI Report will be prepared by EPA.

Major Task JFD External Technical Review

Technical review will be conducted on all work products generated under Sub-Product JF-HTRW Studies/Report. The technical review will be performed by the District and USEPA. A

report will be prepared detailing the results of the technical review including comments, issues and resolutions.

The total cost for Major Task JFD: external technical review is \$77,200.00.

Sub-Product JG Cultural Resource Report

Section 106 of the National Historic Preservation Act of 1966, as amended, requires Federal agencies or project sponsors seeking Federal funding and/or permits to take into account the effect of any undertaking on any cultural resource included in, or eligible for inclusion in, the National Register of Historic Places (NRHP). During feasibility cultural resource surveys will be conducted to identify resources and evaluate their eligibility for inclusion on the National Register of Historic Places. Project plans will be modified to avoid or minimize any impacts to eligible resources. An evaluation of the impact of alternative plans on eligible properties will be developed in consultation with the State Historical Preservation Officer (SHPO). If eligible resources cannot be avoided a Memorandum of Agreement (MOA) will be developed in consultation with the appropriate SHPO(s) to mitigate for unavoidable impacts. Any work stipulated in the MOA will be undertaken prior to initiation of project construction unless otherwise agreed with the SHPO(s). If any additional alternatives are considered cultural resource studies will be required at additional costs.

Major Task JGA Site Survey Field Report

Preliminary cultural resource investigations will be conducted for all proposed project locations. The initial surveys will include background research followed by limited fieldwork consisting primarily of pedestrian survey. The site survey field report will provide information on potential cultural resources and will guide the need for, and direction of, further cultural resource investigations.

The total cost for Major Task JGA: Site Survey Field Report is \$60,000.00.

Major Task JGB Data Collection and Analysis/Report

Locations identified as sensitive for cultural resources during Task JGA will be investigated further through additional research and fieldwork. Fieldwork may entail subsurface testing, geomorphological sampling and remote sensing. The fieldwork will be tailored to each alternative proposed, and will be based on site topography, fill depths, anticipated resources, and proposed project actions. If resources are identified their eligibility for listing on the National Register of Historic Places will be evaluated. Recommendations will be made for avoiding significant sites and possible mitigation measures will be suggested, if sites cannot be avoided. Topographic maps with preliminary project designs will be needed before a scope of work for cultural resource work can be developed. Historic resource considerations that may influence the plan recommendations will be summarized and clearly set forth in the Feasibility Report.

The total cost for Major Task JGB: Data Collection and Analysis/Report is \$80,000.00.

Major Task JGC Mitigation Plan Report

The mitigation plan report will document the need for mitigating any adverse effects on historic properties listed or eligible for listing on the National Register of Historic Places, and will include plans and cost estimates for mitigation or other treatment of historic properties affected

by the project.

The total cost for Major Task JGC: Mitigation Plan Report is \$5,200.00.

Major Task JGD Memorandum of Agreement

If eligible resources are encountered, and cannot be avoided by project plans, then a Memorandum of Agreement (MOA), must be developed based on the results of the cultural resource studies conducted for the project and on project plans as they develop. MOA preparation will be conducted by the New York District and will require coordination with the appropriate SHPO(s) and, possibly, the Advisory Council on Historic Preservation. Other interested parties may also be consulted. This task will not be required if no significant resources are encountered. Implementation of the MOA must be completed prior to the initiation of project construction. Should this task be required the anticipated cost is \$5,200 and does not include the costs to implement the MOA, which will occur in the Preconstruction Engineering and Design (PED) phase.

Major Task JGE One Percent Waiver

If archaeological data recovery costs are expected to exceed one percent of the total estimated Federal appropriation required for construction of a project and Congress has not specifically authorized expenditures in excess of this amount, a waiver request in the form of a letter report submitted through channels to HQUSACE should be prepared. The waiver must then be submitted to the Secretary of the Interior, through the Department Consulting Archaeologist, for concurrence and Congressional notification. The One Percent Waiver applies only to archaeological data recovery. It is not expected that a one percent waiver will be required for this project.

Major Task JGF External Technical Review

Technical review will be conducted on all work products generated under Sub-Product JG-Cultural Resource Report. A report will be prepared detailing the results of the technical review including comments, issue and resolutions.

The total cost for Major Task JGF: external technical review is \$3,200.00.

Major Task JGG All Other Cultural Resources Studies/Reports

This task will include, but not be limited to, attendance of Corps, interagency and public meetings and review of Corps and other relevant project documents. This work also includes the preparation of contracting documents including scopes for detailed investigations, review of A/E submissions, preparation of input to the Feasibility Report including preparation of mitigation plans and cost estimates for the PED and PMP.

The total cost for Major Task JGG: All Other Cultural Resources Studies/Report is \$10,000.00.

Sub- Product JH Cost Estimates

This activity includes all deliverables required to prepare life cycle project cost estimates needed to support the Feasibility Report, and to prepare the baseline project cost estimate. Cost

estimates will be developed in accordance with the guidance contained in ER 1110-2-1302, *Civil Works Cost Engineering*, using the M-CACES cost estimating system. Cost estimates will be presented in the Civil Works Breakdown Structure (CWBS) format. Cost estimates will include both Federal and non-Federal costs for construction, real estate, engineering and design, construction management, environmental, cultural resources and HTRW investigations and remediation, operation and maintenance, replacement, repairs and rehabilitation of alternatives and the recommended project. Revisions to the estimates prepared for the draft report and comparative cost estimates used for alternative analysis will also be included. In addition, this product will include an estimate of the cost of the preparation of cost estimate updates during the Preconstruction Engineering and Design (PED) phase.

The total cost for Sub-Product JH: Cost Estimates is \$247,900.00.

Major Task JHA Study Cost Estimate Updates

This activity includes all deliverables related to the preparation of and revisions to the Feasibility Study Cost Estimate. This task will be performed after the initial screening of potential restoration sites and after the optimization of the sediment sampling program to ensure the feasibility budget is allocated appropriately. This task will also include updates of remedial action costs.

The total cost for Major Task JHA: Study Cost Estimate Updates is \$15,000.00.

Major Task JHB Construction PED Cost Estimate

The PED cost estimate will be prepared and revised, as necessary, to accompany the Feasibility Report and PMP. The PED cost estimate will include all Federal costs for preconstruction, engineering and design from the date of the Division Commander's Notice to the award of the first Federal construction contract. This task will be coordinated by the New York District's Engineering Division, with input from each District element responsible for a portion of the PED investigations (costs for preparation of individual elements of the PED estimates are included in the Feasibility Study cost estimates for each technical discipline). PED cost estimates will be completed for the ecosystem restoration projects.

The total cost for Major Task JHB: Construction PED Cost Estimate is \$26,300.00.

Major Task JHC Project Cost Estimate

Project cost estimates will be prepared using a phased approach. Preliminary, reconnaissance level cost estimates will be prepared for approximately three (3) alternatives for the ecosystem restoration projects to support to plan formulation and screening of alternatives. Comparative cost estimating techniques will be used to support alternative screening and preliminary benefit-cost analyses. Separate cost estimates will also be developed for remedial alternatives such as environmental dredging, beneficial uses, and decontamination. Preliminary cost estimates may also be used as input into a cost/risk analysis.

Detailed feasibility level cost estimates will be prepared for the final selected alternatives for the ecosystem restoration projects. Detailed cost estimates will be prepared in M-CACES and will be documented with notes to explain the assumed construction methods, crews, productivities, sources of materials, and other specific information. Labor costs will be based on the prevailing Davis-Bacon wage rates for each trade. Equipment costs will be based on EP 1110-1-8, *Construction Equipment Ownership and Operation Expense Schedule*. Contingencies will be

developed and applied where areas of uncertainty exist. Detailed costs for all of the non-construction cost items (lands and damages, construction management, PED) will be provided by the appropriate District offices and incorporated into the estimate.

The Cost Engineering Appendix will include a written description of the methodology used in the development of the baseline cost estimate. The appendix will also include a description of the scope of the projects included in the estimate and a description of the potential risk associated with the estimate. Estimates will include both Federal and non-Federal costs for construction, real estate, engineering and design, cultural resources, construction management, HTRW investigations and remediation of potential project impacts. The preliminary, comparative costs estimates that were used for alternative screening and benefit-cost analyses will also be included in the Appendix.

The total cost for Major Task JHC: Project Cost Estimate is \$157,800.00.

Major Task JHD OMRR&R Cost Estimate

This activity includes all deliverables related to the preparation of the Operation, Maintenance, Replacement, Repair and Rehabilitation (OMRR&R) cost estimates. The preliminary, comparative cost estimates that were used for alternative screening and benefit-cost analyses will also be included. OMRR&R cost estimates will be completed for initial remediation work and for the ecosystem restoration projects.

The total cost for Major Task JHD: Operation, Maintenance, Replacement, Repair and Rehabilitation (OMRR&R) Cost Estimate is \$18,800.00.

Major Task JHE Baseline Fully Funded Cost Estimate

The fully funded cost estimate will be prepared based on the project cost estimate developed in Task JHC – Project Cost Estimate. The project cost estimate will be updated, revised, and escalated for inflation through completion of the project. The fully funded cost estimate will be used to support the Construction Project Management Plan (Construction PMP) and upward reporting requirements. Fully funded cost estimates will be completed for the ecosystem restoration projects.

The total cost for Major Task JHE: Baseline Fully Funded Cost Estimate is \$15,000.00.

Major Task JHF External Technical Review

Technical review will be conducted on all work products generated under Sub-Product JH- Cost Estimates. A report will be prepared detailing the results of the technical review including comments, issue and resolutions.

The total cost for Major Task JHF: external technical review is \$15,000.00.

Sub-Product JI Public Involvement Documents

Work under this sub-product will be performed by the New York District's Planning Division (or its contractor), the USEPA, and the non-Federal sponsor (OMR/NJDOT). Public involvement activities will include public meetings/workshops and agency meetings held during the feasibility study, plus other miscellaneous meetings with local officials, technical work groups, community groups, and umbrella organizations. Coordination with state and local agencies will

be initiated immediately and will be maintained throughout the study process. Public involvement will also include communication using various media, such as newsletters, video, and the internet. The intention of the public involvement effort is to establish consensus and local commitment to restoration projects.

Public involvement includes interagency coordination between the New York District; USEPA; OMR/NJDOT; Federal and New Jersey resource management agencies; the proposed local sponsors for construction, environmental and community groups; and other interested parties. Project scoping and status meetings will be held with USEPA and OMR/NJDOT. Meetings will be held to discuss data collection needs and study area water resource problems with various organizations. Newsletters, fact sheets and/or individually written letters will be generated to keep interested parties updated on the status of the feasibility study. The District will provide the local sponsor with minutes of meetings and forward appropriate information regarding the project schedule.

The total cost for Sub-Product JI: Public Involvement Documents is \$170,800.00.

Major Task JIA Notices and Public Meeting(s)

Letters, notices, newspaper articles, and radio announcements will be used to inform the public of meetings, workshops and hearings. Meetings will be held at appropriate locations within the project area to inform the public and obtain input to the plan formulation and decision making process. All public involvement will be coordinated with USEPA and OMR/NJDOT. Public involvement requirements for each of the study components are shown below:

- Project introduction / kickoff meeting
- Status update at project mid-point and/or at other times, as appropriate;
- Presentation of alternative solutions; and
- Presentation of the feasibility study results.

The total cost for Major Task JIA: Notices and Public Meeting(s) is \$66,300.00.

Major Task JIB Minutes of Public Meeting(s)

Verbal record and written transcripts of public meeting(s) will be developed and maintained on file at the New York District.

The total cost for Major Task JIB: Minutes of Public Meeting(s) is \$4,100.00.

Major Task JIC Public Comments Report

A brief summary of the comments received during and after public meetings and workshops will be prepared and kept on file at USEPA and at the New York District. Development of the comments summary will be coordinated with USEPA.

The total cost for Major Task JIC: Public Comments Report is \$14,400.00.

Major Task JID Newsletters

A significant component of feasibility study public outreach will be the drafting and distribution of study related newsletters. Newsletter development will be coordinated with USEPA and OMR/NJDOT. Newsletters are expected to be distributed twice a year throughout the study.

The total cost for Major Task JID: Newsletters is \$56,700.00.

Major Task JIE Other Public Involvement Documents

The results of the public involvement program will be documented in a Public and Agency Coordination Appendix to the Feasibility Report. The Appendix will document public involvement activities performed during the feasibility phase. Other public involvement work tasks will include responding to inquiries from the general public, agencies and Congressional interests; coordination with the media; briefings for various committees and private organizations; and preparing materials, including visual aids, for meetings. All public involvement documents will be developed in coordination with USEPA and OMR/NJDOT.

The total cost for Major Task JIE: Other Public Involvement Documents is \$29,300.00.

Task JIEA: Stakeholder - Webpage

A secure shared server will be available for the viewing of:

- draft and final project documents
- meeting schedules, agenda, minutes
- validated information and data;
- project schedules, and
- Superfund file (notices, etc.)

This task will be fully coordinated with all public involvement tasks.

Sub-Product JJ Plan Formulation and Evaluation Report

The feasibility study will follow the six step planning process specified in ER 1105-2-100. Steps in the plan formulation process will be coordinated with the EPA and will include: The specific problems and opportunities that will be addressed in the study will be identified, and the causes of the problems will be discussed and documented. This analysis will include site-specific assessments and an assessment of estuary-wide impacts. Planning goals will be set, objectives will be established, and constraints will be identified.

1. Existing and future without project conditions will be identified, analyzed and forecast. The existing condition of resources, problems and opportunities critical to plan formulation, impact assessment, and evaluation will be characterized and documented.

2. The study team will formulate alternative plans that address planning objectives and resource needs. An initial set of alternatives will be developed for each restoration opportunity and will be evaluated at a preliminary level of detail. One alternative plan will be selected for each opportunity and three levels of restoration for the final set of alternatives will be developed in order to bracket the NER plan.

3. Alternative project plans will be evaluated for effectiveness, efficiency, completeness and acceptability. The impacts of alternative plans will be evaluated using the system of accounts framework (NED, NER, RED, OSE) specified in the Principles and Guidelines and ER 1105-2-100.

4. Alternative plans will be compared. A Cost Effectiveness/Incremental Cost Analysis will be conducted where applicable to prioritize and rank alternatives. The public involvement program will be used to obtain public input to the alternative evaluation process.

5. A plan will be selected for recommendation and a justification for plan selection will be prepared. It is anticipated that the recommended plan will be a compilation of multiple restoration opportunities that include site-specific and system-wide measures.

The six-steps as described above will be followed explicitly in the identification, development, and formulation of restoration plans for the seven restoration sites. In addition, plan formulation will also satisfy CERCLA remediation planning requirements. The following tasks will be completed by the Planning Division Project Planner, USEPA, and OMR/NJDOT. The costs of participation in plan formulation activities by the rest of the study team are included in their technical study estimates under the appropriate Sub-Products.

The total cost of Sub-Product JJ: Plan Formulation Report is \$640,000.00.

Major Task JJA District Coordination Meeting

A meeting will be held with all study team members, including the non-Federal sponsor and the USEPA, shortly after the initiation of the feasibility phase. The purpose of the meeting will be to plan and coordinate activities between the different technical disciplines responsible for performing portions of the feasibility study investigations.

The total cost for Major Task JJA: District Coordination Meeting is \$10,400.00.

Major Task JJB Establish Without Project Conditions

Without project conditions will be developed and refined in the early stages of the Feasibility Study based on environmental, hydrologic, institutional and socioeconomic input. This task will fully document restoration needs based on existing and projected conditions. Analysis performed under this task includes the coordination and interpretation of data and information collected under numerous previous tasks including engineering, environmental, HTRW, and cultural related tasks in coordination with USEPA and OMR/NJDOT.

The total cost for Major Task JJB: Establish Without Project Conditions is \$69,600.00.

Major Task JJC Preliminary Formulation and Screening of Alternatives

The project planner will lead the study team (including USEPA and OMR/NJDOT) in identifying and screening alternative opportunities for remediation and ecosystem restoration. Based on review of existing data and limited field reconnaissance, the study team will identify potential alternatives, develop concept level designs and venture level cost estimates, and conduct a preliminary cost effectiveness/incremental cost analysis (CE/ICA) of alternatives. This information, plus CERCLA evaluation methods and information obtained from the public, will be used to screen alternatives to the final set, which will be subject to detailed evaluation. Alternative plans for environmental dredging will also consider decontamination and dredged material placement requirements.

The total cost for Major Task JJC: Preliminary Formulation and Screening of Alternatives is \$175,700.00.

Task JJCA: Develop Preliminary Remediation Goals (PRGs)

To support RI/FS activities, PRGs will be developed that are consistent with EPA guidance. Development of PRGs for applicable contaminants will include the following:

1. sediment quality objectives for the protection of benthic invertebrates based on national and/or state and/or regionally developed numerical criteria/standards/guidelines;
2. fish/shell fish tissue quality objectives for the protection of human health from consumption of aquatic organisms. Development of acceptable fish tissue calculations will consider the patterns and consumption rates of subsistence fishers and/or other potentially highly exposed individuals;
3. wetland/floodplain soil quality objectives for the protection of human health assuming direct contact with environmental media as a result of beach use, fishing, occupational exposure, transient use, recreational activities, and other activities in which such contact may occur;
4. groundwater quality objectives, for water that enters the River or daylighted in seeps where humans can become exposed to it as surface water for protection of human health from consumption of aquatic organisms and from direct contact activities;
5. fish/shellfish tissue quality objectives for an appropriate piscivorous wildlife receptor; and
6. water quality objectives for the protection of aquatic organisms based on national and/or state and/or regionally developed numerical criteria / standards / guidelines.

Where appropriate pertinent studies in support of establishing these PRGs will be executed (e.g. the establishment of trophic level relationships in fish /shellfish which will be used to support the development of a food chain modeling framework in support of protecting the health of resident and migratory fish [for all contaminants of concern]).

External technical review

External technical review of all tasks performed under sub-product JD will also be included in this task.

This task will be performed by the New York District's Environmental Analysis Branch (or its Contractor) at a cost of \$31,800.

Task JJCB: Development & Screening of Remedial Alternatives

The development and screening of remedial alternatives are performed to develop an appropriate range of alternatives that will be evaluated. This range of alternatives shall include, but is not limited to, no action, natural attenuation/enhanced natural recovery and/or attenuation, in-place confinement (capping), dredging and disposal in confined aquatic disposal study areas (CADs), near shore and/or upland confined disposal facilities, dredging and disposal in existing landfills, dredging and sediment reuse, treatment, as appropriate, to reduce the toxicity, mobility, or volume of hazardous substances, and options combining aspects of these and/or other alternatives. The following activities will be performed as a function of the development and screening of remedial alternatives.

Task JJCBA: Development & Screening of Remedial Alternatives

EPA will begin to develop and evaluate a range of appropriate alternatives (i.e., remedial alternatives as well as disposal alternatives) that ensure protection of human health and the environment following completion of the baseline risk assessment.

Task JJCBB: Refine & Document Remedial Action Objectives (RAOs)

Based on the baseline risk assessment, and the results of the RI, EPA will review and, if necessary, modify the study area -specific RAOs. Revised RAOs will include updated

PRGs that were initially calculated during the RI. The revised PRGs will be documented in a technical memorandum that will be available for review. These modified PRGs will specify the contaminants and media of interest, exposure pathways and receptors, and an acceptable contaminant level or range of levels (at particular locations for each exposure route).

Task JJCBC: Develop General Response Actions

A general response actions for each media of interest will be developed defining containment, treatment, excavation, pumping, natural attenuation, or other actions, singly or in combination, as appropriate to satisfy the RAOs.

Task JJCBD: Identify Areas & Volumes of Sediment

Areas and volumes of contaminated sediments to which general response actions, other than early actions, may apply, taking into account requirements for protectiveness as identified in the RAOs will be identified. The chemical and physical characterization of the Study area will also be taken into account.

Task JJCBE: Identify, Screen, & Document Remedial Technologies

Technologies applicable to each general response action will be identified and evaluated to eliminate those that cannot be implemented and/or are not feasible at the study area. General response actions will be refined to specify remedial technology types. Technology process options for each of the technology types will be identified either concurrent with the identification of technology types, or following the screening of the considered technology types. Process options will be evaluated on the basis of short and long-term effectiveness, implementability, and cost factors to select and retain one or, if necessary, more representative processes for each technology type. The technology types and process options will be summarized for inclusion in a technical memorandum. The reasons for eliminating alternatives must be specified.

Task JJCBF: Assemble & Document Alternatives

The Partnership will assemble selected representative technologies into alternatives for the study area. Together, all of the alternatives will represent a range of treatment and containment combinations that will address the study area. A summary of the assembled alternatives and their related action-specific ARARs will be prepared and will be included in a technical memorandum. The reasons for eliminating alternatives during the preliminary screening process must be specified.

Task JJCBG: Refine Alternatives

The Partnership will refine the remedial alternatives to identify the contaminated sediment volume addressed by each alternative. Sufficient information will be collected for an adequate comparison of alternatives. PRGs for each chemical in each medium will also be modified as necessary to incorporate any new risk assessment information presented in the baseline risk assessment report. Additionally, action-specific ARARs will be reviewed and possibly updated, as the remedial alternatives are refined.

Task JJCBH: Conduct & Document Screening Evaluation of Each Alternative

The Partnership may perform a final screening process based on short-term and long-term aspects of effectiveness, implementability, and relative cost. Generally, this screening process is only necessary when there are many feasible alternatives available for detailed analysis. If necessary, the screening of alternatives will be conducted to assure that only the alternatives with the most favorable study area evaluation of all factors are retained for further analysis. As appropriate, the screening will preserve the range of treatment and containment alternatives that was initially developed. The range of remaining alternatives will include options that use treatment technologies and permanent solutions to the maximum extent practicable. A technical memorandum will be prepared and made available for review, which will summarize the results and reasoning employed in screening, arraying alternatives that remain after screening, and identifying the action-specific ARARs for the alternatives that remain after screening.

Task JJCBI: Alternatives Development & Screening Deliverables

The Partnership will prepare a technical memorandum summarizing the work performed in and the results of each task above, including an alternatives array summary. The memorandum identifies a complete and appropriate range of viable alternatives to be considered in the detailed analysis. This deliverable will document the methods, rationale, and results of the alternatives screening process.

Major Task JJD Detailed Evaluation

The final set of detailed plans will be formulated from a variety of ecosystem restoration measures to display a full array of remediation and restoration opportunities, assess their performance under various flood events, identify the NER plan, and satisfy NEPA requirements. As part of the formulation process, the study will consider technical feasibility, risk reduction, economic feasibility, environmental impact, real estate acquisition, induced flooding, and views of the public. Plans that include environmental dredging components will be consistent with Implementation Guidance for Section 312 Memorandum dated 25 April 01. The alternatives that pass the initial screening process described in Major Task JJC will be analyzed in terms of costs, benefits, effectiveness, and efficiency to support determination of an NER plan. This task also includes identification and analysis of non-structural actions that may be recommended in support of restoration activities, such as land-use restrictions and non-point source pollution control measures that cannot be implemented by the Corps.

The total cost for Major Task JJD: Detailed Evaluation is \$261,100.00.

Task JJDA: Detailed Analysis of Remedial Alternatives

The detailed analysis will be conducted by EPA with the information needed to allow for the selection of Study area remedies. This analysis is the final task to be performed by EPA during the FS.

Task JJDA: Detailed Analysis of Alternatives)

EPA will conduct a detailed analysis of alternatives, which will consist of an analysis of each option against the set of nine CERCLA evaluation criteria and a comparative analysis of all options using the same evaluation criteria.

Task JJDA: Apply Nine Criteria & Document Analysis

EPA will apply the nine CERCLA evaluation criteria to the assembled remedial alternatives to ensure that the selected remedial alternative(s) will be protective of human health and the environment; will be in compliance with, or include a waiver of, ARARs; will be cost-effective; will utilize permanent solutions and alternative treatment technologies, or resource recovery technologies, to the maximum extent practicable; and will address the statutory preference for treatment as a principal element. The evaluation

criteria include:

1. overall protection of human health and the environment;
2. compliance with ARARs;
3. long-term effectiveness and permanence;
4. reduction in toxicity, mobility, or volume;
5. short-term effectiveness;
6. implementability;
7. costs;
8. state (or support agency) acceptance; and
9. community acceptance.

(Note: criteria 8 and 9 are considered after the RI/FS report has been released to the general public.) For each alternative, EPA shall provide: (1) a description of the alternative that outlines the sediment management strategy involved and identifies the key ARARs associated with each alternative; and (2) a discussion of the assessment of each alternative against each of the nine criteria.

Task JJDA: Compare Alternatives Against Each Other & Document the Comparison of Alternatives

The Partnership will perform a comparative analysis between the remedial alternatives to evaluate the relative performance of each alternative in relation to each specific evaluation criterion. That is, each alternative will be compared against the others using the evaluation criteria as a basis of comparison. Identification and selection of the preferred alternative are reserved by EPA. The Partnership will prepare and submit a technical memorandum summarizing the results of the comparative analysis prior to preparation of the FS report.

Major Task JJE Plan Formulation Management and Report

A Project Planer will be assigned from the District's Planning Division to lead the plan formulation effort. OMR/NJDOT will also assign a study coordinator to work with the Corps

Project Planner and coordinate non-Federal in-kind services. The Project Planner and OMR/NJDOT study coordinator will coordinate the plan formulation process. Management of the plan formulation effort will include such activities as planning team meetings, upward reporting, preparation of study management documents, coordination with OMR/NJDOT and other agencies, and integration of all technical investigations.

The Project Planner will summarize the results of the technical studies leading to plan selection in the Plan Formulation Report. The Plan Formulation Report will document the alternative formulation, evaluation and selection process that was used to identify the NER plan and the recommended plan. The costs and environmental impacts of alternatives presented in the report will be developed at the feasibility level of detail, although the detailed, technical appendices will not be prepared by this time.

The annual and periodic activities and responsibilities for operating and maintaining the completed project will be described in the Plan Formulation Report. The magnitude of these activities will be described for the alternative recommended for implementation. All requirements of 33 CFR 208 and other Federal regulations specifying operation and maintenance requirements will be clearly described so that the local sponsor(s) of construction will be aware of its future O&M responsibilities.

Management of the plan formulation process for remediation and/or restoration at the project areas, and preparation of the Plan Formulation Report will be performed by the New York District's Planning Division.

The total cost for Major Task JJE: Plan Formulation Management and Report is \$95,300.00.

Major Task JJF External Technical Review

Technical review will be conducted on all work products generated under Sub-Product JJ- Plan Formulation and Evaluation Report. Technical review will be coordinated with USEPA and OMR/NJDOT. A report will be prepared detailing the results of the technical review including comments, issue and resolutions.

The total cost for Major Task JJF: external technical review is \$28,200.00.

Sub-Product JQ Alternative Formulation Briefing

A checkpoint conference will be scheduled midway through the formulation effort, to insure that the Corps, USEPA, and the non-Federal sponsor focus their resources on alternatives that are in the Federal interest. The checkpoint conference will take the form of an Alternative Formulation Briefing (AFB), in accordance with Planning Guidance Letter (PGL) #24.

The New York District, the non-Federal sponsor, the North Atlantic Division, HQUSACE, USEPA, and resource agencies will attend the Alternative Formulation Briefing. The purpose of the AFB is to review study findings concerning problems and needs; to evaluate the array of alternatives and determine their consistency with the Federal interest; and to review the preliminary analysis of the impacts of alternatives. This meeting will be a key decision point in determining whether alternatives meet Federal and non-Federal policies and budgetary criteria and should be recommended for project implementation. If the non-Federal sponsor has a preferred alternative, which differs from the Federally recommended plan, it will be identified

and reviewed at this time.

The AFB will be scheduled when technical studies such as hydrologic modeling and baseline economic and environmental investigations have progressed to the point where a determination can be made as to whether potential alternatives are in the Federal interest.

The total cost for Sub-Product JQ: Alternative Formulation Briefing is \$81,500.00.

Major Task JQA AFB Project Documentation

Background material in the form of the Alternative Formulation Report will be sent to NAD and Headquarters at least four (4) weeks prior to the conference. The designs and costs presented at the AFB will be at a preliminary level of detail sufficient to screen alternatives and select the plans, which will be subject to a detailed analysis.

The total cost for Major Task JQA: AFB Project Documentation is \$67,400.00.

Major Task JQB AFB Technical Review Documents

Technical review documents will be prepared by the New York District.

The total cost for Major Task JQB: AFB Technical Review Documents is \$14,100.00.

Major Task JQC AFB Policy Compliance Review Documents

Policy compliance review documents will be prepared by HQUSACE. This task will be performed by HQUSACE and will be funded through General Expense appropriations.

Major Task JQD AFB Guidance Memorandum

An AFB Guidance Memorandum will be prepared by HQUSACE documenting directions provided to the New York District for completion of the feasibility study. This task will be performed by HQUSACE and will be funded through GE appropriations.

Sub-Product JK Draft Report Documentation

A draft Feasibility Report will be prepared following the guidance contained in ER 1105-2-100 and following CERCLA feasibility study regulations. With minor revisions, the plan formulation report will be suitable for incorporation into the Feasibility Report as sections of the main report. Detailed appendices will be prepared that document the results of the technical analyses. The costs of preparing report appendices are contained under each of the technical elements described previously. The contents of the Draft Feasibility Report are summarized below:

1. Concise main report (including any interim recommendations or reports, and the plan formulation report) summarizing the study's technical findings, conclusions and recommendations;
2. A draft NEPA document;
3. Technical appendices presenting the detailed backup and results of individual work tasks;
4. An appendix containing the sponsor's (including any PRPs) financial capability statement

and preliminary financing plan; and

5. Other supporting documentation including the Construction Project Management Plan (Construction PMP).

The total cost for Sub-Product JK: Draft Report Documentation is \$264,500.00.

Major Task JKA Draft Feasibility Report and NEPA Document

Preparation of the Draft Feasibility Report includes assembling, writing, editing, typing, drafting, reviewing, reproducing and distributing the Draft Feasibility Report, including the integrated Draft NEPA document and other related documentation required for transmittal to USACE, USEPA, and higher authorities for use as a decision document. The District's Planning Division will prepare the Draft Feasibility Report and the integrated Draft NEPA document in coordination with USEPA. The costs of preparing the Draft NEPA document are included under Sub-Product JD Environmental Studies/Reports.

EPA will prepare a Proposed Remedial Action Plan (PRAP) that details the selected remedial and restoration alternatives based on the final joint Investigation Report, which will have met the criteria for a CERCLA RI/FS.

The total cost for Major Task JKA: Draft Feasibility Report and NEPA Document is \$151,100.00.

Major Task JKB Public Review Comments

This task involves reviewing and preparing responses to letters received from agencies and the public in response to the Draft Feasibility Report and Draft NEPA document. Responses to the comments will be included in the Final Feasibility Report and Final NEPA document. Responses to comments will be coordinated with USEPA.

USEPA will also release the PRAP and solicit comments, both in written form and at a public meeting sponsored to explain the proposed remedial and restoration alternatives. At the end of the public comment period, EPA will prepare a responsiveness summary and, if necessary, modify the remedy as appropriate.

The total cost for Major Task JKB: Public Review Comments is \$81,200.00.

Major Task JKC Project Guidance Memorandum (PGM)

This task includes directive guidance prepared by HQUSACE for the work to be accomplished to obtain approval of the Final Feasibility Report. This task will be performed by HQUSACE and will be funded through GE appropriations.

Major Task JKD All Other Draft Feasibility Report Documents

Other draft feasibility report documents include any stand alone reports that may result from the feasibility analysis, such as a separate report to local agencies that presents structural and non-structural actions that would support the restoration activities recommended in the feasibility report. Other draft feasibility report documents are expected to be short documents that will come directly from the larger report. The New York District's Planning Division (or their Contractor) will perform this task.

The cost of Major Task JKD: All Other Draft Feasibility Report Documents is included in Major Task JKA: Draft Feasibility Report and NEPA Document.

Major Task JKE Technical Review Documents

Technical review documents will be prepared by the New York District.

The total cost of Major Task JKE: Technical Review Documents is \$19,300.00.

Major Task JKF Policy Compliance Review Documents

Policy compliance review documents will be prepared by HQUSACE.

The total of Major Task JKF: Policy Compliance Review Documents is \$12,900.00.

Sub-Product JL Final Report Documentation

The Final Feasibility Report will incorporate comments from agencies, the public and higher authority review. The steps in producing a Final Feasibility Report include the following:

1. Finalize Draft Feasibility Report for internal, USEPA, and sponsor review;
2. Conduct review board meetings;
3. Revise the Draft Feasibility Report in response to NAD, HQUSACE, USEPA, and OMR/NJDOT comments;
4. Modify the Draft Feasibility Report in response to comments received during the agency and public comment period;
5. Coordinate with USEPA, OMR/NJDOT, and internal District elements;
and
6. Reproduce and distribute the Final Feasibility Report.

EPA will also prepare and issue a Record of Decision (ROD) which will be based on the PRAP and any substantive comments received during the public comment period that may change the remedy.

The total cost of Sub-Product JL: Final Report Documentation is \$87,200.00.

Major Task JLA Division Commanders Notice

A public notice will be prepared to announce the completion of the Division Commander's Report, based on his endorsement of the findings and recommendations of the District Commander. The public notice will indicate that the report has been submitted for Washington Level Review. This task will be performed by the North Atlantic Division and will be funded through GE appropriations.

The total cost of Major Task JLA: Division Commanders Notice is included in Major Task JLC: Final Feasibility Reports.

Major Task JLB All Other Final Feasibility Report Documents

Other final feasibility report documents will incorporate comments from agencies, the public and

higher authority review. Other final feasibility report documents are expected to be short documents that will come directly from the larger report. The New York District's Planning Division (or their Contractor) will perform this task.

The total cost of Major Task JLB: All Other Final Feasibility Report Documents is included in Major Task JLC: Final Feasibility Reports.

Major Task JLC Final Feasibility Report and NEPA Document

The New York District's Planning Division will prepare the Final Feasibility Report and final NEPA document in close coordination with the USEPA. The costs of preparing the Final NEPA document and the technical appendices are included under other Sub-Products. The costs of responding to Washington Level review, agency, and public comments are included in this task.

The total cost of Major Task JLC: Final Feasibility Report is \$74,300.00.

Major Task JLD Technical Review Documents

The New York District will prepare technical review documents.

The total cost of Major Task JLD: Technical Review Documents is \$12,900.00.

Sub-Product JM Washington Level Report Approval

This Sub-Product includes all activities necessary for submittal of the Final Feasibility Report to Congress after completion of all levels of review. To ensure that the non-Federal sponsor is afforded an opportunity to participate in any significant effort as a result of Washington level review, funding for the District and the non-Federal sponsor are included as a separate work item in this Sub-Product. These costs, including any necessary travel, will be limited to those reasonable costs associated with the review and processing of the Feasibility Report. This task will be funded through GE appropriations.

The total costs of Sub-Product JM: Washington Level Report Review are included Major Task JLC: Final Feasibility Reports.

Major Task JMA Policy Compliance Review Documents

A written assessment of the final Feasibility Report will be prepared by HQUSACE, Civil Works Directorate, Policy Division, to document the Feasibility Report's compliance with current policy. This task will be funded through GE appropriations.

Major Task JMB Chief of Engineers' Report

A brief summary of the Feasibility Report, signed by the Chief of Engineers, will be prepared to transmit recommendations to the Assistant Secretary of the Army for Civil Works (ASA(CW)). This task will be performed by HQUSACE and will be funded through GE appropriations.

Major Task JMC OMB Letter to ASA(CW)

A letter will be prepared from OMB to ASA(CW) expressing the Administration's position regarding transmitting the report to Congress for authorization. This task will be performed by OMB and will be funded through other appropriations.

Major Task JMD ASA(CW) Transmittal to Congress

A letter will be prepared from ASA(CW) transmitting the Feasibility Report along with ASA(CW)'s recommendation to Congress. This task will be performed by ASA(CW) and will be funded through other appropriations.

Major Task JME State & Agency Review and NEPA Document Filing Letters

Letters from appropriate State and Federal regulatory agencies will be obtained by the New York District and included in the final NEPA document.

Other authorities and programs will fund the total cost of all activities to complete Sub-Product JM - Washington Level Report Approval.

Sub-Product JN All Other Feasibility Studies/Investigations

Major Task JNA– Remedial Investigation / Feasibility Study Scoping

A detailed project scope will be developed to encompass all the requirements of an RI/FS work plan. Because all the work required to perform the RI/FS is not fully known at this time, it is anticipated that the PMP (and hence the RI/FS components of the PMP) will be considered to be a 'living document' and individual tasks will be refined and updated as necessary, based on study findings. Information gathered as part of the RI/FS will be utilized, to the extent possible, in the overall NEPA document identified in Corps' tasks. The overall project scope is based on a watershed perspective and will consider known or suspected sources of contamination, including: boundary, in-place, upland, groundwater recharge, atmospheric deposition, etc. Additionally species listed under the Endangered Species Act (ESA), which are located in and adjacent to the study area will be identified and be factored into the RI/FS development.

Goals to be considered, include the protection of survival, growth, and reproduction of the following human and ecological receptors:

1. human health: protection of human health (cancer and non-cancer impacts) from ingestion of aquatic life and exposure to sediments and surface water and groundwater, as a result of dermal exposure and incidental ingestion through expected beach use, in-water recreation, occupational activities, and subsistence fishing;
2. benthic invertebrates;
3. fish and shellfish;
4. birds and mammals; and,
5. species listed under the ESA.

with respect to releases or threatened releases of any hazardous substances to the in-water portion of the study area .

Sub-Product JO Damages Assessed A/E Contractors

Documents that determine and assess the liability for inadequate A/E efforts will be prepared, if required. It is assumed that these documents will not be required and therefore no costs have been assigned.

Sub-Product JP Management Documents

This Sub-Product includes all of the documents related to the management of the Feasibility Report, including A/E contract administration and in-house control.

The total cost of Sub-Product JP: Management Documents is \$105,300.00.

Major Task JPA A/E Contract Documents

This activity includes preparation of negotiation, award and contract administration documents for the utilization of A/E Contractors to complete, or assist in the completion of, Feasibility Phase products.

The total cost of Major Task JPA: A/E Contract Documents is included in Major Task JPF: All Other Management Documents.

Major Task JPB Coordination Documents

Included under this major task are: copies of letters exchanged with the local sponsor that affect study costs, scopes and/or schedules; official correspondence with higher authority on similar subjects; internal memoranda which bear on significant study elements and, in general, any other correspondence which affects significant aspects of the study. The New York District's Project and Programs Management Division (PPMD) will perform this task.

The total cost of Major Task JPB: Coordination Documents is \$28,400.00.

Task JPBA: Project Team - Shared Server

A secure shared server will be available for the 'governmental partnership' members which will include: NJDEP, OMR/NJDOT, NOAA, USACE, USEPA, USFWS, the Agency for Toxic Substances and Disease Registry (ATSDR), USDOJ, etc. and designed to accomplish the following objectives:

Viewing of:

- Approved Project documents / deliverables
- validated information and data;
- photographs, sketches;
- project schedules,
- memoranda,
- references,
- correspondence regarding schedule and project status; Temporary Repository:
- multiple party documents
- comments and approvals

Sensitive information (e.g. location of endangered species habitats) shall not be placed on the shared server. Further information can be found under III. B.

Task JPBB: Data Management Procedures

EPA will consistently document the quality and validity of field and laboratory data compiled and generated during the RI.

Task JPBC: Maintain Sample Management & Tracking

EPA and/or its contractors will maintain field reports, sample shipment records, analytical results, and QA/QC reports to ensure that only validated analytical data are reported and utilized in the characterization of the nature and extent of sediment contamination and the development and evaluation of remedial alternatives. Analytical results developed under the work plan will not be included in any study area characterization reports unless accompanied by or cross-referenced to a corresponding QA/QC report. In addition, EPA and/or its contractors will establish a data security system to safeguard chain-of-custody forms and other project records to prevent loss, damage, or alteration of project documentation.

Major Task JPC Study Funds Control Documents

This task includes preparation and management of internal funds control documents for the allocation and management of the Feasibility Study. The New York District's Project and Programs Management Division (PPMD) project manager (PM) is responsible for managing the overall study cost, schedule, preparing present and future budget year submissions, and conducting fiscal coordination with OMR/NJDOT. A representative of OMR/NJDOT will assist in project management. The New York District PM, with assistance by OMR/NJDOT's project manager, will: monitor expenditures, keep the PMP current, prepare project management reports, and report study status and issues to the District Engineer and the Executive Committee. The project management structure will continue into the PED phase. Updates of PMP will include monthly finance and accounting reports regarding expenditures and obligations, executive summary reports for the Project Review Board, schedule and cost changes, and changes to work elements.

This task includes preparation of budget documents and financial reports. At the end of the study a final audit will be performed. Work required to prepare a sponsor letter of intent to participate in the Preconstruction Engineering & Design and construction phases will be also be prepared under this task. The New York District's Project and Programs Management Division (PPMD) will perform this task.

The total cost of Major Task JPC: Study Funds Control Documents is \$36,200.00.

Major Task JPD Trip Reports

Written trip reports will be prepared that document study area visits, meetings with the non-Federal sponsor, and other trips that affect the scope, cost or schedule of the Feasibility Report or the project.

The total cost of Major Task JPD: Trip Reports is \$8,900.00.

Task JPDA: Document Field Activities

Information gathered during study area characterization will be consistently documented and adequately recorded by EPA and/or its contractors in well-maintained field logs and laboratory reports. The method(s) of documentation must be specified in the work plan and/or the SAP. Field logs must be utilized to document observations, measurements, and significant events that have occurred during field activities. Laboratory reports must document sample custody, analytical responsibility, analytical results; adherence to prescribed protocols, nonconformity events, corrective measures, and/or data deficiencies.

Major Task JPE Minutes of Feasibility Review Conference (FRC)

Minutes will be prepared on the results of the FRC. Comments received on the technical aspects of the Feasibility Report as reviewed concurrently at a Feasibility Review Conference with the District, MSC, and HQUSACE will be documented and responses prepared. The costs of preparing the FRC minutes are included under Sub-Product JJ – Plan Formulation and Evaluation Report.

The total cost of Major Task JPE: Minutes of Feasibility Review Conference (FRC) is \$9,200.00.

Major Task JPF All Other Management Documents

This task includes all other appropriate management documents determined to be needed on a case by case basis.

The total cost of Major Task JPF: All Other Management Documents is \$22,600.00.

Product K Design Agreement (DA)

The Design Agreement (DA) documents the cost sharing aspects, relative roles and responsibilities for the project, and contains an analysis of the local sponsor's (including any PRPs) ability to meet their responsibilities under the terms of the DA.

Sub-Product KA Initial Draft DA Package

The Initial Draft DA Package will accompany the Feasibility Report and will include: (1) the applicable model DA for an ecosystem restoration project (see ER 1105-1-100 and ER 1165-2-131); (2) a draft DA for the Lower Passaic River Restoration Project (3) Federal and non-Federal allocation of funds table; (4) DA deviation report; (5) certification of legal review; and (6) MSC review comments.

The total cost of Sub-Product KA: Initial Draft DA Package is \$104,000.00.

Major Task KAA Initial Draft DA

A draft Design Agreement (DA) will be included in the Feasibility Report. The DA is a legally binding agreement that sets forth the terms and conditions of the relationship between the Federal government and the non-Federal sponsor (including any PRPs) for construction, operation and maintenance of projects approved through the feasibility process. The New York District's Project and Programs Management Division (PPMD) will perform this task in close coordination with the non-federal sponsor.

The total cost of Major Task KAA: Initial Draft DA is \$40,700.00.

Major Task KAB Federal/Non-Federal Allocation of Funds Table

An allocation of funds table will be prepared that includes the allocation of funds for each feature, programmed by FY, for the non-Federal sponsor (including any PRPs) and Federal government. This table outlines the cash flow for each partner for project purposes (see ER 1165-2-131, ER 11-2-240, and appropriate Project Management guidance letters). The New York District's Project and Programs Management Division (PPMD) will be perform this task in

coordination with USEPA and the non-federal sponsor.

The total cost of Major Task KAB: Federal/Non-Federal Allocation of Funds Table is \$12,700.00.

Major Task KAC DA-Deviation Report

The Deviation Report outlines, point-by-point, the deviations of the DA from the standard model DA. This report is intended to assist higher-level authorities in their review of the DA. The Deviation Report will be an attachment to the letter forwarding the draft PCA package to HQUSACE. The New York District's Project and Programs Management Division (PPMD) will perform this task.

The total cost of Major Task KAC: DA Deviation Report is \$25,300.00.

Major Task KAD DA-Certification of Legal Review

A brief memorandum for record will be prepared that certifies that the District Counsel has reviewed the initial draft DA for legal sufficiency. The New York District's Office of Counsel will perform this task.

The total cost of Major Task KAD: DA Certification of Legal Review is \$25,300.00.

Major Task KAE DA-Checklist

An endorsement will be attached to the Draft DA that contains the NAD review comments on the PCA. This task will be performed by NAD and funded through other appropriations.

Product L Design and Construction Project Management Plan (Construction PMP)

The Design and Construction Project Management Plan (PMP) will be prepared based on the recommended plan. A baseline cost estimate will be developed and the draft PMP will address the schedule and cost of Pre-construction Engineering and Design (PED) and construction activities. These activities will include preparation of plans and specifications for the initial construction contracts and baseline monitoring that may be required for permits and to assess project performance. The draft PMP will address the development of additional products and detailed plans for successful management and completion of the projects. The draft PMP will be completed concurrent with the draft feasibility report. This task will include integration of USEPA's proposed plan and integration with Corps recommended plan.

The total cost of Product L: Design and Construction Project Management Plan (Construction PMP) is \$107,100.00.

Product Z Programs and Project Management Documents

Major Task ZAA Project Coordination

The Project Manager (PM), assisted project planner, serves as the primary New York District point of contact with Corps higher authority, customers, local partners and other interested parties. The PM is responsible for reporting to the District's Project Review Board and higher authority on the project status, as well as monitoring and updating the study plan. In addition, PM responsibilities include the macro level monitoring of project schedules and finances,

processing schedule and cost change requests, review of budget documents, coordination of preliminary Design Agreement, and resolving problems and issues.

The total cost of Major Task ZAA: Project Coordination is \$143,400.00.

Major Task ZAB Study Team Coordination

The study team will include representatives from the Corps of Engineers, USEPA, OMR/NJDOT, NJDEP, The Port Authority of New York and New Jersey and other agencies, as appropriate. This team will ensure appropriate scopes of services for the technical studies, guide their accomplishment, and participate in plan formulation and selection of potential alternatives. The team will be directly involved in establishing mutual roles for the study team members and in focusing feasibility investigations on the critical issues. OMR/NJDOT will also appoint representatives to the study team. The team will recommend to the Executive Committee the tasks to be conducted and the extent of planning and evaluation to be carried out in the feasibility phase. The team will also report to the Executive Committee and PRB on the results of the studies and recommend alternative courses of action for project implementation. Study team meetings will be held regularly throughout the feasibility phase. Meetings will be held at approximately quarterly intervals, but may be more frequent at critical decision points.

The total cost of Major Task ZAB: Study Team Coordination is \$88,200.00.

The total cost of all activities to complete Product Z is \$231,600.

C. Reference to Statutes, Regulations, and Guidance

This section of the PMP lists statutes, regulations, Corps guidance, and other source materials that will be referred to during the feasibility study to guide completion of feasibility study tasks. The table below provides a summary of the acronyms and subject matter of various types of guidance. This table was extracted from the U.S. Army Corps of Engineers, Institute for Water Resources, IWR Report 95-R-15, Draft Planning Manual, December 1995, which is also a useful reference document in providing practical suggestions for conducting water resource planning studies.

AR	Army Regulation
EC	Engineering Circular
EM	Engineering Manual
EP	Engineering Pamphlet
ER	Engineering Regulation
OM	Office Memorandum
PGL	Planning Guidance Letter
TL	Technical Letter
1105	Planning
1110	Engineering

1120	Construction – Operations
1130	Construction – Operations
1140	Construction – Operations
1165	Policy

The principal engineering regulation (ER), which guides the Corps of Engineers planning process is ER 1105-2-100, Guidance for Conducting Civil Works Planning Studies, 22 April 2000, U.S. Army Corps of Engineers. Appendix A of ER 1105-2-100 contains references to the applicable statutes, public laws, executive orders, and engineering regulations, which guide preparation of Corps feasibility studies that had been promulgated as of the time of the ER (April 2000).

USACE Guidance Documents

Additional references that will be utilized during the completion of work tasks include the following:

CEAO-I Memorandum, dated 10 August 1988, subject: HQUSACE Internal Review Guides - Compliance with Feasibility Study Guidance.

CECW-A Policy Memorandum, Implementation of New Technical and Policy Review Procedures, 14 April 95, U.S. Army Corps of Engineers.

CECW-A Policy Memorandum No. 2, Civil Works Decision Document Review - Review Compliance, 6 April 95, U.S. Army Corps of Engineers.

CECW-P/CEWC-O, Memorandum, Implementation Guidance for Section 312 of the Water Resources Development Act of 1990, Environmental Dredging, as amended by Section 224 of the Water resources Development Act of 1999, 25 April 2001

CECW-PM, Planning Guidance Letter 61 , WRDA 96 Implementation, 19 November 1996, U.S. Army Corps of Engineers.

CECW-PM, Planning Guidance Letter 97-1, WRDA 96 Implementation, 19 November 1996, U.S. Army Corps of Engineers.

CECW-PE, Planning Guidance Letter 97-10, Shortening the Planning Process, 26 March 1997, U.S. Army Corps of Engineers.

CECW-PE, Memorandum, Model Agreement for Feasibility Studies, 21 March 1997, U.S. Army Corps of Engineers.

EC 1105-2-208, Preparation and Use of Project Management Plans, 23 December 1994, U.S. Army Corps of Engineers.

EM 1110-1-1005, Topographic Surveying, 31 August 1994, U.S. Army Corps of Engineers.

EM 1110-1-1804, Geotechnical Investigations, U.S. Army Corps of Engineers.

EM 1110-1-1802, Geophysical Exploration for Engineering and Environmental Investigations, 31 August 1995, U.S. Army Corps of Engineers.

EM 1110-2-1415, Hydrologic Frequency Analysis, 05 March 1993, U.S. Army Corps of Engineers.

EM 1110-2-1416, River Hydraulics, 15 October 1993, U.S. Army Corps of Engineers.

EP 11-1-4, Value Engineering: A Profitable Partnership, 15 May 1995, U.S. Army Corps of Engineers.

EP 715-1-4, Architect-Engineer Contracts, 8 June 1994, U.S. Army Corps of Engineers.

EP 1110-2-9, Hydrologic Engineering Study Design, 31 July 1994, U.S. Army Corps of Engineers.

EP 1165-2-502 Ecosystem Restoration – Supporting Policy Information, 30 September 1999, U.S. Army Corps of Engineers.

ER 5-1-11, Program and Project Management, 27 February 1998, U.S. Army Corps of Engineers.

ER 220-2-2, Procedures for Implementing NEPA, (33 CFR 230), 4 March 1988, U.S. Army Corps of Engineers.

ER 405-1-12 (Chapter 12), Real Estate Handbook - Local Cooperation, 01 May 1998, U.S. Army Corps of Engineers.

ER 715-1-16, Selection of Architect-Engineer Firms, 3 March 1995, U.S. Army Corps of Engineers.

ER 1105-2-101, Planning – Risk Based Analysis for Evaluation of Hydrology/Hydraulics, Geotechnical Stability, and Economics in Flood Damage Reduction Studies, 1 March 1996, U.S. Army Corps of Engineers.

ER 1105-2-214, P.

ER 1110-1-12, E&D Quality Management, 1 June 1993, U.S. Army Corps of Engineers.

ER 1110-1-1003, NAVSTAR Global Positioning System Surveying, 31 December 1994, U.S. Army Corps of Engineers.

ER 1110-1-1300, Cost Engineering Policy and General Requirements, 26 August 1999, U.S. Army Corps of Engineers.

ER 1110-2-1150, Engineering and Design for Civil Works Projects, 31 August 1999, U.S. Army Corps of Engineers.

ER 1110-2-1302, Civil Works Cost Engineering, 31 March 1994, U.S. Army Corps of Engineers.

ER 1110-2-1450, Hydrologic Frequency Estimates, 31 August 1994, U.S. Army Corps of Engineers.

ER 1110-2-1460, Hydrologic Engineering Management, 7 July 1989, U.S. Army Corps of Engineers.

ER 1110-2-1464, Hydrologic Analysis of Watershed Runoff, 30 June 1994, U.S. Army Corps of Engineers.

ER 1110-2-8153, Technical Project Sedimentation Investigations, 30 September 1995, U.S. Army Corps of Engineers.

EP 1165-2-1, Digest of Water Resource Policies and Authorities, 15 February, 1996 (updated annually), U.S. Army Corps of Engineers.

ER 1165-2-131, Local Cooperation Agreements for New Start Construction Projects, 15 April 1989, U.S. Army Corps of Engineers.

ER 1165-2-132, Hazardous, Toxic and Radioactive Waste (HTRW) Guidance for Civil Works Projects, 26 June 1992, U.S. Army Corps of Engineers.

ER 1165-2-501, Civil Works Ecosystem Restoration Policy, 30 September 1999, U.S. Army Corps of Engineers.

Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies, 10 March 1983, U.S. Water Resources Council.

EPA Guidance Documents

The following list, although not comprehensive, comprises many of the regulations and guidance documents that apply to the RI/FS process:

USEPA, 1978 “EPA NEIC Policies and Procedures Manual”, May 1978, revised November 1984, EPA-330/9-78-991-R.

USEPA, 1981 “Health and Safety Requirements of Employees Employed in Field Activities”, U.S. EPA, Office of Emergency and Remedial Response, July 12, 1981, EPA Order No. 1440.2.

USEPA, 1982 “Users Guide to the EPA Contract Laboratory Program: U.S. EPA, Sample Management Office, August 1982.

USEPA, 1987a “Data Quality Objectives for Remedial Response Activities”, U.S. EPA, Office of Emergency and Remedial Response and Office of Waste Programs Enforcement, EPA/540/G-87/003, March 1987, OSWER Directive No. 9335.0-7B.

USEPA, 1987b “Interim Guidance on Compliance with Applicable or Relevant and Appropriate Requirements”, U.S. EPA, Office of Emergency and Remedial Response, July 9, 1987, OSWER Directive No. 9234.0-05.

USEPA, 1987c. “A Compendium of Superfund Field Operations Methods”, Two Volumes, U.S. EPA, Office of Emergency and Remedial Response, EPA/540/P-87/001a, August 1987, OSWER Directive No. 9355.0-14.

USEPA, 1988a “Community Relations in Superfund: A Handbook”, U.S. EPA, Office of Emergency and Remedial Response, June 1988, OSWER Directive No. 9320.0-03B.

USEPA, 1988b “CERCLA Compliance with Other Laws Manual”, Two Volumes, U.S. EPA, Office of Emergency and Remedial Response, August 1988 (draft), OSWER Directive No. 9234.1- 01 and -02.

USEPA, 1988c “Guidance on Remedial Actions for Contaminated Groundwater at Superfund Study area s”, U.S. EPA, Office of Emergency and Remedial Response, (draft), OSWER Directive No. 9283.1-2.

USEPA, 1988d “Interim Guidance on Potentially Responsible Party Participation in Remedial Investigation and Feasibility Studies”, U.S. EPA, Office of Waste Programs Enforcement, Appendix A to OSWER Directive No. 9355.3-01.

USEPA, 1988e The (revised) National Oil and Hazardous Substance Pollution Contingency Plan (NCP). “Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA”, U.S. EPA, Office of Emergency and Remedial Response, October 1988, OSWER Directive No. 9355.3-01.

USEPA, 1988f “Community Relations During Enforcement Activities and Development of the Administrative Record”, U.S. EPA, Office of Waste Programs Enforcement, November 1988, OSWER Directive No. 9836.0-1A.

USEPA, 1989a OSHA Regulations in 29 CFR 1910.120 (Federal Register 45654, December 19, 1986). “Interim guidance on Administrative Records for Selection of CERCLA Response Actions”, U.S. EPA, Office of Waste Programs Enforcement, March 1, 1989, OSWER Directive No. 9833.3A.

USEPA, 1989b “Risk Assessment Guidance for Superfund--Volume II Environmental Evaluation Manual”, March 1989, EPA/540/1-89/001.

USEPA, 1989c “Draft Guidance on Preparing Superfund Decision Documents”, U.S. EPA, Office of Emergency and Remedial Response, March 1988, OSWER Directive No. 9355.3-02. “Risk Assessment Guidance for Superfund--Volume I, Human Health Evaluation Manual (Part A)”, December 1989, EPA/540/1-89/002.

USEPA, 1990a “Guidance for Data Usability in Risk Assessment”, October 1990, EPA/540/G-90/008. “Performance of Risk Assessments in Remedial Investigation/ Feasibility Studies (RI/FSS) Conducted by Potentially Responsible Parties (PRPs)”, August 28, 1990, OSWER Directive No. 9835.15.

USEPA, 1990b “Guidance on Oversight of Potentially Responsible Party Remedial Investigations and Feasibility Studies”, U.S. EPA, Office of Waste Programs Enforcement, SWER Directive No. 9835.3.

USEPA, 1991 “Role of the Baseline Risk Assessment in Superfund Remedy Selection Decisions”, April 22, 1991, OSWER Directive No. 9355.0-30.

USEPA, 1993 “Guidance on Conducting Non-Time-Critical Removal Actions Under CERCLA”, U.S. EPA, Office of Emergency and Remedial Response, August 1993, OSWER Directive No. 9360.0-32.

USEPA, 1996a “Guidance for the Data Quality Objectives Process EPA QA/G-4”, U.S. EPA, Office of Environmental Information, EPA/600/R-96/055, August 2000.

USEPA, 1996b “Coordination between RCRA Corrective Action and Closure and CERCLA Study Area Activities”, Office of Enforcement and Compliance Assurance, U.S. EPA, September 24, 1996.

USEPA, 1998 “EPA Guidance on Quality Assurance Project Plans”, U.S. EPA, Office of Emergency and Remedial Response and Office of Waste Programs Enforcement, EPA/600/R-98/018, February 1998.

USEPA, 1999a “EPA Requirements for Quality Assurance Plans”, U.S. EPA, Office of Emergency and Remedial Response and Office of Waste Programs Enforcement, EPA QA/R-5, Interim Final, November 1999.

USEPA, 1999b “EPA Requirements for Quality Management Plans”, U.S. EPA, Office of Emergency and Remedial Response and Office of Waste Programs Enforcement, EPA QA/R-2, Interim Final, November 1999.

USEPA, 2001 “EPA Requirements for Quality Assurance Project Plans”, USEPA. EPA QA/R5, March 2001.

III. Organizational Breakdown Structure (OBS)

The Organizational Breakdown Structure (OBS) identifies which organization has responsibility or input for completing each feasibility study task. In addition to identifying task responsibilities, the OBS section includes mechanisms for ensuring proper coordination between the Federal and non-Federal study team members involved in preparing the feasibility study.

A. Organizational Work Responsibilities

The Organization Breakdown Structure (OBS) describes the responsibility of each organization in providing input to and/or completing tasks identified in the Scope of Studies and Work Breakdown Structure. The following paragraphs identify the management and technical responsibilities for the study. Three levels of management responsibility will be used to guide development of the study: the Executive Committee, the Project Review Boards (PRB), and the study team. This management structure will be formalized in the Feasibility Cost Sharing Agreement (FCSA) and the Interagency Memorandum of Agreement. Responsibilities for performing the technical feasibility study investigations are identified following the description of the management structure.

1. Executive Committee

As indicated in the FCSA, management of the overall study is the responsibility of the Executive Committee, which will be comprised of the New York District Engineer; the Deputy District Engineer for Programs and Project Management; the Chief of Planning Division; USEPA; and the representatives of OMR/NJDOT. Representatives of the NJDEP will also participate in Executive Team Meetings as outlined in the Memorandum of Agreement (MOA) for this study.

The Executive Committee will meet throughout the study to review study progress, finances, and findings as developed and reported by the study team. The representatives of USEPA and the non-Federal partner will be equal partners with the District representatives on the Executive Committee. The District Engineer or the Chief of Planning Division (or designee) and his counterpart from the non-Federal partner will co-chair the committee. The Executive Committee will manage the overall study by: (1) maintaining a working knowledge of the feasibility study, (2) resolving policy or major resource issues, (3) ensuring that evolving study results and policies are consistent and coordinated, (4) directing the study team, and (5) reviewing and approving decisions made by the study team.

The Executive Committee will participate in Issue Resolution Conferences (IRCs). The committee is also responsible for resolving any disputes that may arise during the study. The committee will agree on solutions and study direction, which may include study termination. At least one IRC will be held prior to the public distribution of the draft feasibility report to ensure that all issues are resolved before the final report is submitted to higher authority. Additional IRCS will be held, as required, throughout the study to resolve any problems that may arise.

As detailed in the FCSA, the Executive Committee must approve any significant amendments to the FCSA. Significant changes are defined as any modification to the FCSA, which increases the total study costs by more than 15 percent. They must also approve any reassignment of work items between the local sponsor and the Federal government. The Executive Committee is also responsible for decisions on whether to suspend or terminate studies under conditions of the FCSA.

The committee will also resolve any disputes not resolved by the study team and will appoint representatives from their respective organizations to serve on the study team.

2. Project Review Boards (PRBs)

PRBs have been established at three levels within the Corps of Engineers to evaluate the status and progress on all studies, projects, and programs. The primary PRB will be held by the New York District and chaired by the District Engineer or his designee. It will include the chiefs of the elements whose functions are integral to the role of the District in civil works projects. The District PRB will review the PES report monthly (along with all others for the District) for compliance with the PMP and provide comments to the Division and the project manager. The District PRB will facilitate resolution or elevate to NAD major issues raised during the study, monitor study contingencies and costs of changes against the approved study cost estimate, and take appropriate action on Schedule and Cost Change Requests (SACCRs), in accordance with ER 5-1-11. The District PRB also will approve the PMP and any significant changes identified by the study team and recommended by the project manager in accordance with ER 5-1-11. The non-Federal partner may attend the District PRB meetings at its discretion.

The second PRB will be chaired by the NAD Commander or designee and include the chiefs of the elements whose functions are integral to the role of the Division in civil works projects. The NAD PRB will review monthly the project executive summary (PES) for compliance with the PMP and provide comments to the District. The NAD PRB will facilitate resolution or elevate to the Division Commander or higher authority major issues raised during the study, monitor study contingencies and cost changes against the approved study cost estimate, and take appropriate action on schedule and cost change requests, in accordance with ER 5-1-11.

The third PRB includes HQUSACE. The HQUSACE PRB is chaired by the Director of Civil Works or designee and includes the chiefs of the elements whose functions are integral to the USACE role in civil works project development. The HQUSACE PRB will review the study only if it determines that it needs intensive management at that level or if recommended by the NAD PRB. The HQUSACE PRB will facilitate resolution of major study issues, concerns, or problems through Corps functional channels and make recommendations to the Director of Civil Works, NAD, and the local sponsors as part of intensive management. Upon receipt of a Schedule and Cost Change Request (SCCR), the HQUSACE PRB will approve changes in major milestones and significant cost increases in accordance with Engineering Regulation (ER) 5-1-11. The HQUSACE PRB will meet bimonthly.

3. Study Team

The study team will include representatives from the Corps of Engineers, USEPA, OMR/NJDOT, NJDEP, and other agencies, as appropriate. This team will ensure appropriate scopes of services for the technical studies, guide their accomplishment, and participate in plan formulation and selection of potential alternatives. The team will be directly involved in establishing mutual roles for the study team members and in focusing feasibility investigations on the critical issues. Corps of Engineers representatives will include the Project Planner, the Chief of the Plan Formulation Branch, the Environmental Analysis Branch Team Leader, and technical staff. The non-Federal partner will also appoint representatives to the study team. The team will recommend to the Executive Committee the tasks to be conducted and the extent of planning and evaluation to be carried out in the feasibility phase. The team will also report to the

Executive Committee and PRB on the results of studies and recommend alternative courses of action for project implementation. Study team meetings will be held regularly throughout the feasibility phase. Meetings will be held at approximately 1-month intervals, but may be more frequent at critical decision points.

4. Programs and Project Management Division (PPMD)

The Deputy District Engineer for Programs and Project Management will assign a project manager to the project from the Harbor Program Branch. The Project Manager is responsible for the overall conduct of the project including reporting to the Project Review Board. In addition, the PM will be responsible for monitoring project schedules and finances, processing schedule and cost change requests (SaCCR), reviewing budget documents, coordinating preparation of the Design Agreement (DA), and identifying and resolving problems and issues.

5. Planning Division (PD)

A project planner will be assigned from the Plan Formulation Branch and will be responsible for performing study activities, including: assisting the Project Manager in leading the study team, plan formulation, public involvement, preparing study schedules, monitoring the progress of technical work, and developing and preparing the feasibility report. The Economics team will be responsible for developing economic data and demographic information, evaluating cultural resource impacts, performing the cost effectiveness and incremental cost analysis, and developing the financing plan. The Environmental Analysis Branch will be responsible for assessing environmental impacts and values, coordinating ecosystem restoration studies, recommending and evaluating restoration options, and accomplishing NEPA compliance activities. Planning Division will closely coordinate with USEPA on all tasks, in particular tasks for assessing environmental impacts and NEPA compliance.

6. Engineering Division (EN)

The Engineering Division Project Engineer will be responsible for managing the Engineering Division contribution to the feasibility study. This includes coordinating with the Project Manager and Project Planner regarding the status of engineering work efforts. The Cost Engineering Branch will be responsible for developing cost estimates for initial construction and operation and maintenance of alternative plans, and the selected plan. The Civil Resources Branch will be responsible for conducting hydrologic and hydraulic design studies. The Design Branch will be responsible for developing designs and drawings, structural investigations, and developing scopes of work for surveying and mapping activities.

7. Real Estate Division (RE)

The Real Estate Division will be responsible for performing all required real estate activities for the project. Real Estate activities will include determining land ownership, developing the real estate gross appraisal, and preparing the real estate plan which will include a baseline cost estimate for real estate, development of a detailed schedule of acquisition milestones, and a general description of the area and total acreage to be acquired, with fee and easement breakdown. The Appraisal Branch will prepare gross appraisals. The Acquisition Branch will obtain rights-of-entry, prepare preliminary real estate acquisition maps and prepare the Real Estate Supplement/Plan. The Real Estate Division will also prepare the physical takings analysis and

the request that the District Counsel prepare the preliminary attorney's opinion of compensability.

8. USEPA

The USEPA will be involved in all aspects of the feasibility study to ensure full compliance with CERCLA regulations and procedures. The USEPA will conduct technical investigations, such as human health and ecological risk assessments; will engage in public involvement activities; and will conduct enforcement activities in coordination with USACE and the non-Federal sponsor. USEPA will attend progress meetings, public workshops; provide scientific/technical input to field studies; participate in the plan formulation process; assist in the development of recommended plans; and review reports.

9. Non-Federal Partner

The non-Federal partner will be involved in all aspects of the feasibility study to ensure that they agree with the findings of the study. The non-Federal partner will attend progress meetings, public workshops; provide scientific/technical input to field studies; participate in the plan formulation process; assist in the development of recommended plans; and review reports.

10. Other Study Participants

Numerous agencies/organizations including NOAA, USDOJ, USFWS and other State trustee agencies will be consulted throughout the study for their input. The Trustee Agencies will play an integral role in this project to consider natural resource damage assessment issues throughout the FS.

B. Description of Coordination Mechanisms

The Lower Passaic River feasibility study will require input from many different work elements, the sponsor, and other external organizations, such as consultants, and other government agencies. Proper coordination among these study participants is essential to maintain the project schedule, to avoid duplication of efforts, to detect problems in a timely manner, and to maintain agreement and cooperation on the direction of the study. Therefore, formal coordination mechanisms are described in the PMP.

1. Internal Coordination Mechanisms

Internal coordination mechanisms will be used to ensure that effective internal command, control, and coordination is maintained during the feasibility study. The primary internal coordination mechanisms will be the monthly Project Review Board (PRB) meetings, monthly meetings of the Study Team, and Issue Resolution Conferences scheduled at critical phases of the study. An earned value analysis will also be accomplished on a monthly basis. The purpose of the analysis is to assess actual study progress against scheduled progress in regards to both cost and schedule. This analysis also will indicate cost and schedule variances.

A work plan will also be developed on an annual basis, which reflects anticipated funding levels and work efforts, based on the PMP. The District PRB will review the work plan for compliance with the PMP and provide comments to the Division and the project manager. The plan will include reports on study progress to date, a schedule for the efforts planned for the coming year, specific

work tasks required to complete investigations, estimates of costs from each work group, and other pertinent information. The Executive Committee will approve the annual work plans.

2. External Coordination Mechanisms

Coordination outside the Corps of Engineers and local sponsors will be necessary to ensure the success of the feasibility study. External agency counterparts for the environmental work effort include but are not limited to the: State of New Jersey, and the Port Authority of New York and New Jersey, Advisory Council on Historic Preservation (ACHP), U.S. Fish and Wildlife Service (USFWS), and the State Historic Preservation Officer (SHPO).

2.1 Public Meetings/Workshops and Technical Work Group Meetings

These gatherings will be scheduled throughout the study period to gather input, report on study progress, or to report study findings. The Project Planner, and the Harbor Programs Branch Public Affairs Specialist will arrange for and report on public meetings/workshops and technical work group meetings.

2.2 Study Briefings and Fact Sheets

Study briefings will be provided and fact sheets prepared throughout the study period for congressional representatives, state and local officials, community organizations, and others, as appropriate.

C. Development of Resource Codes

A set of Resource Codes has been developed for accounting and administrative purposes. The resource codes presented in Table IV-1 include abbreviations for the names of the technical elements responsible for conducting portions of the feasibility study. These abbreviations are also used in the Responsibility Assignment Matrix (Table IV-2).

Table IV-1

Resource Codes

Harbor Programs Branch/Project Manager.....	PP-H
Planning Division.....	PL
Plan Formulation Branch.....	PL-F
Flood Control & Navigation Section.....	PL-FF
Environmental Analysis Branch.....	PL-E
Environmental Assessment Section.....	PL-EA
Special Studies Section.....	PL-ES
Engineering Division.....	EN
Civil Resources Branch.....	EN-H
Hydraulics & Hydrology Team.....	EN-HH
Coastal & General Layout Team.....	EN-HC
Engineering Management Branch.....	EN-M
Civil Works Section.....	EN-MC
Design Branch.....	EN-D
Civil Engineering Design Section.....	EN-DC

Structural Team.....	EN-DC-S
Geotechnical Team.....	EN-DC-G
Civil Engineering Team.....	EN-DC-C
Cost Engineering Branch.....	EN-C
Operations Division.....	OP
Operation Support Branch.....	OP-S
Surveys Section.....	OP-SS
Real Estate Division.....	RE
Construction Division.....	CO
Office of Counsel.....	OC
Contracting Division.....	CT

D. Responsibility Assignment Matrix (RAM)

The Responsibility Assignment Matrix (RAM) is a tabular representation of the organizational responsibilities for the performance of the work efforts defined in the Work Breakdown Structure and is a required component of the PMP. It defines the intersection of the Organizational Breakdown Structure and the Work Breakdown Structure (WBS). Table IV-2 presents the RAM for the Lower Passaic River Feasibility Study. WBS codes (1st through 3rd levels) are represented vertically in the first column of the matrix and adopt the accounting system of the Civil Works Breakdown Structure. The second column includes an abbreviated description of the activity. Resource Codes of the OBS are represented horizontally in the first row of the matrix. The individual cells of the matrix (the intersection of the WBS and OBS) identify the responsible organization for each WBS activity. Lead organizations are identified with a check mark. Supporting organizations are identified with an “s”.

IV. Feasibility Study Schedule

This section of the PMP defines the schedule for completion of major milestones and tasks for use in monitoring the progress of the feasibility study. The feasibility study schedule includes all critical study tasks, inter-relationships between tasks, key decision points, in-progress reviews, and issue resolution meetings.

1. Major Milestones

The major milestones for the feasibility study are shown below. Milestone dates assume a April 1, 2003 study start and will be adjusted proportionally if study initiation occurs earlier or later.

PX-5 Milestone	NAD and Local Partner Sign FCSA	May 2003
P-6 Milestone	Initial Feasibility Coordination Meeting	July 2003
P-7 Milestone	Formulation Briefing/Meeting	Dec 2005
P-8 Milestone	Draft Feasibility Report	Sep 2006
P-9 Milestone	Final Feasibility Report	Feb 2007
P-10 Milestone	Division Engineer’s Public Notice	Mar 2007

2. *Task Dependencies and Timeline for Work Activities*

The Gantt chart contained in Figure V-1 below presents the feasibility study schedule for the Lower Passaic River Feasibility project. The Gantt chart shows work activities to the Major Task Level (e.g. JAA – Surveying and Mapping) using the Civil Works Work Breakdown Structure (CWBS) organization. The Gantt chart identifies task dependencies and provides a timeline for work activities. Each Major Task is listed, along with its duration in days. In addition, the Gantt chart provides a visual representation of when the tasks begin, what other tasks are being conducted simultaneously, and milestone dates (shown with a diamond). Following the Gantt chart is a critical path method (CPM) network, shown on Table V-2, which lists task duration, start and finish dates, and dependencies among tasks (i.e., predecessor and successor relationships). Critical tasks are highlighted in italics.

V. *Baseline Feasibility Study Cost Estimate*

This section of the PMP presents the cost estimate for the feasibility study. The feasibility study cost estimate is presented in Table VI-1. Study costs are displayed by Federal Fiscal Year at the CWBS Major Task level. The table displays total cost for each major task, the Federal contribution, and the local sponsor contribution (including cash and in-kind services). Table VI-2 displays Federal and non-Federal partner costs for each major task, by Federal Fiscal Year.