

SOUTH RIVER  
RARITAN RIVER BASIN, NJ  
FEASIBILITY STUDY

PROJECT STUDY PLAN

U.S. Army Corps of Engineers  
New York District  
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SOUTH RIVER, RARITAN RIVER BASIN, NEW JERSEY  
MULTI-PURPOSE FEASIBILITY STUDY  
PROJECT STUDY PLAN

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## PROJECT STUDY PLAN

### SOUTH RIVER, RARITAN RIVER BASIN, NEW JERSEY

#### I. PURPOSE.

This document outlines the Project Study Plan (PSP) in accordance with ER 2-7-1 (FR) and EC 1 105-2-208 for conduct of the feasibility studies for flood control and environmental restoration along the South River, Raritan River Basin, New Jersey. This PSP has been developed by the New York District.

The plan details the scope, schedule, and budget of feasibility study tasks as well as the division of responsibilities for accomplishment by the New York District and the respective consultants and contractors. Included in the PSP is a detailed work description, cost-summary table, and preliminary schedule outlining the initiation and completion of tasks by the New York District.

The PSP was prepared by the Corps of Engineers, New York District (CENAN), will be approved by the North Atlantic Division (CENAD), and certified by Headquarters, US Army Corps of Engineers. The plan will be implemented by the New York District.

The purpose of the Feasibility Study is to accomplish the followings

- a. To address the problems, needs, and opportunities of the area in accordance with the Principles & Guidelines and the Planning Guidance Notebook, ER 1105-9-100.
- b. To identify the National Economic Development (NED) plan and recommend the plan in cooperation with local interests.
- c. To attain authorization for construction.

#### II. SCOPE OF WORK

The South River, Raritan River Basin, New Jersey Multi-Purpose Feasibility Study includes all studies required in preparation of a favorable report to be processed to the Congress. This phase includes the following products:

- a. Work Plan for Feasibility Report
- b. Feasibility Report with Design Appendix
- c. Draft and Final NEPA Documentation
- d. Preliminary Project Cooperation Agreement (PCA) and Financing Plan

- e. Draft Project Management Plan (PMP) for Pre-construction Engineering and Design (PED), including preparation of Plans and Specifications for the initial construction contract .
- f. Other Supporting Plans

### **III. PROJECT DESCRIPTION**

This scope of work is based on the findings of the New York District's reconnaissance report for the South River, Raritan River Basin, NJ, dated May 1995. The reconnaissance study concluded that there is a great opportunity for Federal interest for further study of two entirely separate purposes - flood damage reduction and environmental restoration

The opportunity for flood damage reduction measures is driven by the imminent flood threat in urban Middlesex County New Jersey. Two core alternatives were developed: a system of levees along the river and a tidal barrier with gate near the confluence of the South River, Washington Canal, and the Raritan River. The flood control component of the "reconnaissance plan" was a derivative of the system of levees, and consists of two levees protecting the Boroughs of Sayreville and South River. Levee "3" would protect the Borough of South River, running along the left bank, while levee "4" protects the Borough of Sayreville along the right bank.

The opportunity for environmental restoration is driven by the tidal basin's current conditions of vast areas of environmentally degraded areas overgrown by phragmites which cannot support significant and diverse habitat. Such areas, as determined in the reconnaissance report, can be converted to environmentally significant salt marshes which could support significant and diverse habitat. Further support for this environmental restoration opportunity is based on the Federal government's role in creating the problem through construction and maintenance of the Washington Canal and South River navigation project. Accordingly the reconnaissance plan calls for the restoration of 250 acres of wetlands degraded by previous Federal involvement.

The alternatives to be studied in the feasibility phase will include a full range of measures to reduce flood damages. These include the levee system, a tidal barrier with gate, a combination of early warning system, flood proofing and relocations, and no action. The feasibility study will identify the National Economic Development (NED) plan for flood control based on consideration of all of these measures and optimization of plans. The study will also investigate environmental restoration measures to restore important habitat to urban New Jersey.

## IV. WORK BREAKDOWN STRUCTURE/DESCRIPTION OF PRODUCTS

### WORK BREAKDOWN STRUCTURE (WBS)

The Work Breakdown Structure (WBS) is a product-oriented hierarchy of the scope of work, and is broken down into component products and sub-products. It provides a system for organizing the scope in a logical manner. The WBS is prepared in conjunction with the scope of work and is developed to the level of detail where responsibility for work performance is assigned. The WBS provides a common framework for planning and controlling the work to be performed. A Civil Work Breakdown Structure for this study follows:

#### CIVIL WORK BREAKDOWN STRUCTURE (CWBS)

Level 1: Product.

Level 2: Phase.

Level 3: Product.

Level 4: Sub-Product.

Level 5: Sub-Sub-Product.

Level 1. South River, Raritan River Basin, New Jersey Multi-Purpose Project

2. Reconnaissance Phase (Completed)

2. Feasibility Phase

3. Feasibility Report

4. Study Coordination

5. Coordination with Local Sponsor

5. Internal Coordination

5. External and Higher Authority Coordination

4. Engineering Appendix

5. Surveys and Mapping, except for Real Estate

5. Hydrology and Hydraulic Studies/Report

5. Geotechnical Studies/Report

5. Site Development Analysis/Report

5. Engineering and Design Analysis Report with Detailed Drawings

5. Modeling Studies

4. Socioeconomic Studies

5. Economic Analysis/Report

5. Social Studies/Report

5. Ability to Pay Report

4. Real Estate Analysis

5. Real Estate Supplement/Plan

5. Gross Appraisal Report

5. Preliminary Real Estate Acquisition Maps

- 5. Physical Takings Analysis
- 5. Preliminary Attorney Opinion of Compensability
- 4. Environmental Studies/Report (less USF&WL)
  - 5. Scoping Meeting
  - 5. Environmental Assessment
  - 5. Environmental Impact Statement
  - 5. Coordination of documents with Others
  - 5. environmental Resource Inventory Report
  - 5. Mitigation Analysis Report
  - 5. Endangered Species Report
  - 5. Section 404 (b)(1) Analysis Report
  - 5. Environmental Restoration Report
  - 5. 401 State Water Quality Certification
  - 5. Record of Decision
  - 5. Section 103 Evaluation
  - 5. Statement of Findings
  - 5. Coastal Zone Management Consistency determination
- 4. Fish and Wildlife Coordination Act Report
- 4. HTRW Studies/Report . .
  - 5. Preliminary Assessment Report
  - 5. Site Inspection Report
  - 5. Remedial Investigation Study Report
- 4. Cultural Resources Report
  - 5. Site Survey Field Report
  - 5. Data Collection and Analysis Report
  - 5. Mitigation Plan Report
  - 5. Memorandum of Agreement
- 4. Cost Estimates
  - 5. Study Cost Estimate Updates
  - 5. PED Cost Estimate
  - 5. Project Cost Estimate
  - 5. OMRR&R Cost Estimate
  - 5. Baseline Fully Funded Cost Estimate
- 4. Public Involvement Documents
  - 5. Notice of Public Meetings
  - 5. Minutes of Public Meetings
  - 5. Public Comments Report
  - 5. Correspondence
- 4. Plan Formulation and Evaluation Report
- 4. Draft Report Documentation
  - 5. Review conferences
  - 5. Public Review comments
  - 5. Project Guidance Memorandum (PGM)
- 4. Final Report Documentation
  - 5. Division Commanders Notice
- 4. Washington Level Review
  - 5. Policy Review

- 5. Feasibility Review Conference
- 5. Division Engineer's Notice
- 5. Chiefs Report
- 5. ASA(CW) Report Approval
- 5. Transmittal of Report to Congress
- 3. Project Cooperation Agreement (PCA)
  - 4. Initial Draft PCA Package
  - 4. Final Draft PCA Package
  - 4. Executed PCA
- 3. Project Management Plan
- 2. Preconstruction Engineering & Design Phase
- 2. Construction Phase
- 2. Operations and Maintenance Phase

## DESCRIPTION OF PRODUCTS

The PSP covers the development of four products prior to the initiation of PED including:

### a. Feasibility Report

This product includes all activities leading to the approval of the final Feasibility Report NEPA Document by the Office of the Chief of Engineers. It entails all problem identification and formulation activities required to identify and recommend a plan of improvement. The report will include an engineering appendix in sufficient detail to allow the District to proceed directly into Plans & Specifications. It also includes NEPA Section 106 and other environmental compliance documentation; coordination of the study and results with all interested parties; review by the US Army Corps of Engineers, ASA(CW) approval, OMB concurrence, and ultimately, transmittal to Congress. The feasibility phase of study, culminating in the Notice of the Division Engineer, is scheduled for completion in FY 01.

### b. NEPA document

This product includes all activities leading to the assessment of environmental impacts related to flood control improvements for the South River project. This includes scoping and preparation of the environmental document, public coordination and review, and notification of findings.

### c. Preliminary project Cooperation Agreement (PCA) and Financing Plan

As the details of the recommended plan are finalized, coordination will be undertaken with the local sponsor to review the model language for a Project Cooperation Agreement (PCA) on a flood control project, from ER 1165-2-131. A letter of intent will be developed which acknowledges the requirements of local cooperation and expresses a good faith intent to provide those items for the recommended project. Additionally, a preliminary financing plan will be developed by the sponsor to detail plans for financing costs. An assessment of this plan will then be completed by the District. The scheduled completion for the coordination of the PCA model and the preliminary financing plan is FY 01.

d. Draft Project Management Plan (PMP)

As part of the feasibility efforts, a draft Project Management Plan will be prepared based on the recommended project and a baseline cost estimate will be developed. The draft PMP will address the schedule of PED activities. This includes the preparation of plans and specifications for the initial construction contract. The draft PMP will address the development of additional products and more detailed plans for successful management and completion of the project. This document will form the basis for the Project Management Plan to be finalized for project construction. The draft PMP will be submitted with the feasibility report in FY 01.

e. Other Supporting Plans

Other supporting plans will be developed as needed as the study progresses to address specific items such as local cooperation, real estate and acquisition, quality control, value engineering, environmental and cultural matters, safety and security, and operation and maintenance.

f. Reporting requirements specified in the Project Management ER 5-7-1 (FR) will be observed.

**V. ORGANIZATION BREAKDOWN STRUCTURE (OBS)**

The Organization Breakdown Structure (OBS) identifies the appropriate organization/individual having the authority to perform the work consistent with the assigned responsibility. The "Resource Name" in the figure that follows provides a written identification of the organization, individual, or other agency responsible for execution of all or part of the activities associated with the product elements identified in the WBS and the "Resource Code" provides the associated code. A more detailed narrative regarding the role of the Executive Committee and the Study Team follows the OBS.

**ORGANIZATION BREAKDOWN STRUCTURE  
(OBS)**

<u>RESOURCE NAME</u>	<u>RESOURCE CODE</u>
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
District Engineer .....	DE
Deputy District Engineer For Program & Project Management .....	DP
Chief, Civil Project Branch/Project Manager .....	PP-C
New Jersey Department of Environmental Protection (Local Sponsor) .....	NJDEP
U.S. Fish and Wildlife Service .....	USFWS
State Historic Preservation Office .....	SHPO
Engineering Division .....	EN
Civil Resources Branch .....	EN-H
Hydraulics & Hydrology Section .....	EN-HH
Coastal & General Layout Section .....	EN-HC
Engineering Management Branch .....	EN-M
Metro Section .....	EN-MM
Design Branch .....	EN-D
Structural/F&M Section .....	EN-DS
Civil Engineering Section .....	EN-DE
Cost Estimating 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

Executive Committee

As indicated in the Feasibility Cost Sharing Agreement (FCSA), the overall study management is the responsibility of the Executive Committee, which includes the New York District Engineer, Deputy District Engineer for Programs and Project Management, Chief of Planning Division, and the administrator for Engineering & Construction for the New Jersey Department of Environmental Protection. The Executive Committee will meet periodically throughout the study to review study progress, finances, and findings as developed and reported by the study team. The Chief of Plan Formulation Branch, New York District, will act as alternate for the Chief of Planning Division while also serving as liaison to the study team.

As detailed in Article III of the FCSA, the Executive Committee must approve any significant amendments to the FCSA. Significant changes are defined as follows:

- a. Any modification to the FCSA which increases the total study costs by more than 15 percent, relative to the current study cost estimate.
- b. Any modification in the estimated cost of a study work item or any obligation for a study work item, which changes the total cost of that work item by more than 15 percent of the work.
- c. Any extension of the completion schedule for a study work item of more than thirty (30) days beyond the established late finish date from the CPM network; or
- d. Any reassignment of work item between the sponsor and the Federal government.

The Executive Committee is also responsible for any decisions on whether to suspend or terminate studies under Article XII of the FCSA. The committee will also resolve any disputes which are not resolved by the study team, and will appoint appropriate representatives to serve on the study team.

Study Team

The study team is responsible for accomplishment of the study in accordance with the FCSA, PSP, and appropriate Federal and State guidance and regulations. The study team will regularly meet to coordinate on study progress, interim findings, financial status, and all matters related to conduct and completion of the study.

The study team is composed of representatives from the New York District Planning Division, Construction Division, Operations Division, Engineering Division, and Real Estate Division. In addition, representatives of the New Jersey Department of Environmental Protection, including but not limited to a study manager, are also part of the study team.

The Project Manager (PM) is responsible for upward reporting to the Project Review Board (PRB) and for preparation of required Life Cycle Project Management (LCPM) reports. In addition, PM responsibilities include: the monitoring of project schedules and finances, processing of schedule and cost change requests, management of contingencies, review of budget documents, development of the FCSA and PCA, and identification of problems and issues. The study team has the responsibility of study formulation, technical project management, and development of the feasibility report.

Planning Division is responsible for the development of data regarding benefits and damage types, demographic information, and evaluation of economic impacts. The Environmental Analysis Branch is responsible for developing environmental and cultural data, assessing environmentally related project impacts, preparing mitigation plans, accomplishing environmental compliance and developing environmental restoration alternatives. In addition, the Environmental Analysis Branch is responsible for testing of sample boring for hazardous content. The Plan Formulation Branch and the Environmental Analysis Branch will work together in the formulation of plans for both flood control and environmental restoration.

The Environmental Analysis Branch is responsible for testing of sample boring for hazardous content. Finally, FWS, NMFS, EPA and the NJDEP representatives will be requested to actively participate in HEP analysis, mitigation and restoration efforts.

Review of design studies of foundations, groundwater, and other geotechnical matters including subsurface exploration testing are accomplished by the Design Branch. Engineering Division. Design Branch is also responsible for the development of the recommended plan including land easements requirements. Development of cost estimates for initial construction and maintenance of alternative plans and the selected plan is the responsibility of the Cost Engineering Branch. The Hydrology and Hydraulics Section, is responsible for studies to determine average annual flood conditions for the areas being studied. In addition, Hydrology and Hydraulics Section is also responsible for developing preliminary levee designs and determining maintenance requirements and assembling models to facilitate environmental restoration.

The Operations Division will provide all necessary surveying and mapping.

The development of a timely, quality product within the established task budget is the responsibility of the Technical Manager for each task and, ultimately, the Project Manager. In addition, the individual elements are responsible for scope of work preparation, contract

negotiation, and performance of any work to be completed by consultants or other Federal agencies. Quality Control/Quality Assurance.

As agreed by representatives from all levels of the Corps of Engineers and the local sponsor at the 18 October 1995 Reconnaissance Review Conference, a quality control (QC) plan specific to the South River Feasibility study needs to be formalized by New York District. This plan will be developed with North Atlantic Division and attached to this document at a later date.

This PSP includes time and funds for a technical review by the District. It is envisioned that a "review board" of technical experts not associated with fee study will be established. In addition, Engineering Division has added a separate task to accomplish this and since much of the environmental work will be through a contractor, technical review will be the review of their work.

Quality Assurance will be facilitated by the North Atlantic Division.

## **VI. PRELIMINARY SCHEDULE**

This PSP reflects New York District capability. The following milestone schedule assumes that funding for the study is provided as required to effectively accomplish the study:

<u>MILESTONE</u>	<u>ACTION</u>
April 1996	Execute Feasibility Study Cost-Sharing Agreement (FCSA) with the Sponsor.
May 1996	Initiate Feasibility Study.
June 1996	Study Coordination Meeting (P).
November 1996	Division Receives formulation (P4).
July 1998	Alternative formulation/Project Selection Briefing.
October 2000	Division Receives Draft Feasibility Report and NEPA Document (P6).
August 2000	Feasibility Resolution Conference (FRC).
January 2001	Division Receives Final Feasibility Report and NEPA Document (P8).
March 2001	Division Engineer's Public Notice (P9).

## **VII. WORK TASKS and DETAILED FEASIBILITY STUDY COST ESTIMATE**

For accounting and administrative purposes, all tasks are categorized by cost subaccount. The following is a listing of each subaccount, a detailed description of what each entails, and the cost:

22A Public Involvement. This effort will be coordinated by the Plan Formulation Branch and includes at least two general public meetings/workshops and two local agency workshops held during the feasibility study to discuss the flood control project, plus other miscellaneous meetings with local officials. Coordination with state and local agencies will be initiated immediately and will be maintained throughout the study process.

The proposed mitigation plan will be put out for public review under CWA section 404 guidelines.

Public meetings will be coordinated as required under the NEPA. Meetings to take place include: meetings with local sponsor to discuss restoration opportunities, outputs of the restoration project, and status of the project; coordination with the USFWS and NJDEP to complete any permits which are required, coordination with NMFS regarding fishery goals and with EPA. An active program will be developed to solicit local input in developing restoration goals and features.

Total Cost This Subaccount \$65,000

22B Ability To Pay Report. Work under this subaccount will be performed by the New York District Planning Division. Work to be accomplished includes: local sponsor documentation of financial capability (including funding sources for project construction and credit analyses); New York District (CENAN) evaluation of local sponsor financial capability for project construction and for handling post-construction project costs (such as operation and maintenance, bond debt service, major repairs and long-term replacements to project features, etc); and preparation of a financing plan for project construction including Federal government outlays and sponsor cash and credit contributions.

Total Cost This Subaccount \$10,000

22C Social Studies. Work under this subaccount will be performed in by the Economics Team, Plan Formulation Branch of the New York District Planning Division. Work tasks include studies required to determine and assess the social impact of alternative plans under detailed consideration. to include the environmental restoration component. The existing population, employment, housing, education, and industrial activity for the study area will be defined, and projections of these same items will be prepared. Issues to be addressed for the restoration include the positive impacts of potential recreation and educational activities and negative impacts from an increased in shallow water areas such as mosquito infestation.

This material will be incorporated in the Economics Appendix.

Total Cost This Subaccount \$5,000

22D Cultural Resource Studies. Work under this subaccount will be performed by use of the Environmental Analysis Branch Cultural Indefinite Delivery Order Contract. Delivery order scope of work, contract oversight, technical review, and agency coordination will be performed by an Environmental Assessment Section archaeologist. Work includes tasks required for compliance with Section 106 of the National Historic Preservation Act of 1966 as amended. In order to determine the impact of the proposed project upon cultural resources, investigations shall be conducted for the recommended alternative. Investigations shall include historical research and an updated literature search. Research on the geomorphology of the wetland areas will be undertaken to determine the potential for deeply buried prehistoric archaeological sites. Field work will consist of pedestrian survey followed by subsurface testing in areas determined sensitive through background research. This work will identify potentially significant resources. Further investigations, if necessary will include additional archaeological study to ascertain the eligibility of sites for the National Register of Historic Places. Approximately twenty potentially eligible resources were identified in the reconnaissance study. Recommendations will be made for avoiding significant sites and possible mitigation measures will be suggested, if sites cannot be avoided. Section 106 coordination and documentation shall also be accomplished. Since the work performed will be by a contract, the technical review for this section will be the review of the contractor's submission.

This subaccount also includes a portion of the costs for supervision and clerical support within the Environmental Analysis Branch.

Total Cost This Subaccount \$130,000

22E Environmental Studies (Except U.S. Fish and Wildlife). Work under this sub-account will be performed by the Environmental Analysis Branch (EAB) in concert with the Plan Formulation Branch. EAB will take the lead role in the biological and compliance based analyses while Plan Formulation Branch will assist in insuring consistency with overall planning objectives, constraints, economic efficiency and sponsor acceptability. Since the study will have two distinct purposes - flood control and environmental restoration, the environmental interface with plan formulation requires the following explanation for each:

Flood Damage Reduction. The Principles and Guidelines (P&G) will be followed in the plan formulation process. This requires that flood control plans be formulated to avoid environmental impacts where possible. If avoidance is impossible, environmental impacts will be minimized and mitigated. Environmental mitigation plans will be formulated to replace the habitat units that would be disturbed by the flood control plan, based on a habitat evaluation procedure (HEP).

Environmental Restoration. EC 1105-2-210 will be followed for plan formulation for environmental restoration. Environmental restoration measures will be assessed by using a HEP to determine possible environmental outputs. This analysis will yield outputs expressed in terms of dollars per habitat unit (EMU) restored. The area(s) to be restored will be examined in increments and the \$/HU for each increment will be compared to facilitate the decisions of the extent of Federal (and non-Federal) interest. Other factors to be included in the decision process will include relative significance and importance of the habitat to be restored.

At this point, based on the reconnaissance plan, it was envisioned that the large tract of phragmites overgrowth near the mouth of the South River could be converted to spartina in both the flood control mitigation and environmental restoration components to form one contiguous quality salt marsh. Technical studies will be combined for both purposes, where possible, for efficiency. The actual measures to be implemented will be determined, based on the technical study described below, but also by performing a literature search for environmental opportunities, and coordinate with the sponsor and the environmental community for a practical and desirable restoration plan. The restoration study will be based on the view point that the phragmites is a symptom of a general ecosystem condition that needs to be changed.

Future sedimentation of the mitigation area and the restoration area has been estimated to be minimal. The hydrology of the area is tidally influenced with upstream sediment carried to the area from storm events only. Historic filling of the degraded salt marsh area occurred mostly as a result of maintenance of the Washington Canal and South River Channel Navigation Project.

The feasibility study will follow the guidance provided at the 18 October 1995 MC. Specifically; the study team will work with NJDEP and other districts to identify lessons learned from past efforts on similar restoration efforts.

#### Contract Preparations

Contracts must be prepared for the following work: wetland delineation, habitat evaluation, soil analysis, development of mitigation and restoration plans and designs and hydrologic studies. Tasks include writing scopes of work, negotiations and writing government estimates.

#### Impact Assessment

This task will be performed by the Environmental Analysis Branch with contractor support.

##### Wetland Delineation

Demarcating the wetland area impacted by the flood control project. The area will be surveyed and mapped. The hydrology, vegetation and soils will be assessed to determine wetland boundaries.

##### Habitat Evaluation

The Environmental Branch will evaluate surrounding habitat, direct and indirect effects of hydrological changes from the flood control project on surrounding habitat.

A Habitat Evaluation Procedure will be performed at the flood control project site (without project) and a with project determination will be made.

#### Conduct Wetland Evaluation Technique.

##### Wildlife Assessment

Assessment includes: characterization of anadromous fish, characterization of floral community, evaluation of surrounding habitat.

##### Data Review

Data to be analyzed includes bio-bench marking, soil sampling and or monitoring of adjacent landfill, tidal movements and evaluation of other hydrologic influences.

#### Interagency Scoping and Coordination

Work includes the Environmental Branch coordinating and attending meetings with interagency members of the Habitat Evaluation Procedure (HEP) Team. The team will actively meet to execute HEP analysis. A HEP will be performed on the area being impacted by the flood control project, the mitigation area and the restoration area.

The Environmental Branch will review and comment on Fish and Wildlife Coordination Act report.

#### Environmental compliance

Analysis of project for compliance with Clean Water Act Section 404b. Endangered Species Act Section 7 and the state water quality certification,

A NEPA document will be prepared and distributed for public review. Final review of the Draft Feasibility Report and final NEPA documents.

#### Develop Mitigation Plans

##### Habitat Assessment

A habitat evaluation study will be conducted to assess the mitigation site to replace the natural resource losses from the flood control project. The Habitat Evaluation Procedure (HEP) will be used. HEP is based on habitat value derived from a set of measurable habitat variables that are important to the selected study species.

\*Pre-field activities involve forming a study team, delineate study boundaries, assessment of vegetative cover types, review aerial photos, select species to evaluate

\*Field activities may include estimation of nesting habitat, estimating tree density, measuring water level fluctuations, water temperature or pH.

A habitat evaluation will be performed on the following to arrive at the selected mitigation plan:

- \*Baseline habitat analysis without restoration
- \*Output analysis on HEP values with restoration

#### Habitat Mitigation Analysis

Increases in habitat value will be predicted based on the conceptual alternative plans developed. The results of this analysis will be used in the incremental cost analysis.

#### Develop Mitigation Plans

Based on the results of the existing conditions analysis and habitat evaluation, at least three conceptual alternative wetland restoration plans will be developed. Based on Design drawings will then be created from the plans.

#### Preliminary Costs

Work includes developing cost estimates for each of the alternative plans.

#### Incremental Cost Analysis

Work will include the evaluation of alternative solutions to mitigate for impacted wetlands. An incremental cost analysis will be developed based on values obtained through the habitat analysis in order to determine which mitigation activities will be selected for construction. The Habitat Evaluation Procedure technique will be used to determine “outputs” associated with the mitigation. Tasks include a draft and final incremental cost analysis.

#### Develop Restoration Plans

##### Background Information

Background information about the wetland restoration to be reviewed includes: conducting a literature search, reviewing aerial photography of the wetland areas, obtaining recent unpublished studies conducted in the area, obtaining the soil survey of the area, and obtaining information from the New Jersey mosquito control office. Background information concerning potential contamination of the wetland restoration site from the neighboring landfill will also be investigated.

##### Study of Existing Conditions

This work will be done by the Environmental Analysis Branch and includes general assessment of potential restoration area including existing and potential use by wildlife species, evaluation of surrounding habitat, evaluation of constraints to construction of restoration area, size and location of restoration and potential HTRW contamination sites.

Data to be analyzed includes bio-bench marking, soil sampling and or monitoring of adjacent landfill, tidal movements and evaluation of other hydrologic influences.

#### Habitat Assessment

A habitat evaluation study will be conducted to assess the restoration site. The Habitat Evaluation Procedure (HEP) will be used. HEP is based on habitat value derived from a set of measurable habitat variables that are important to the selected study species.

\*Pre-field activities involve forming a study team, delineate study boundaries, assessment of vegetative cover types, review aerial photos, select species to evaluate.

\*Field activities may include estimation of nesting habitat, estimating tree density, measuring water level fluctuations, water temperature or pH.

A habitat evaluation will be performed on the following to arrive at the selected mitigation plan:

\*Baseline habitat analysis without restoration

\*Output analysis on HEP values with restoration

#### Develop Restoration Plans

Based on the results of the existing conditions analysis and habitat evaluation, at least three conceptual alternative wetland restoration plans will be developed. Based on the conceptual plans engineering design drawings will then be created from the plans.

#### Habitat Restoration Analysis

Increases in habitat value will be predicted based on the conceptual alternative plans developed. The results of this analysis will be used in the incremental cost analysis.

#### Preliminary Costs

Work includes developing cost estimates for each of the alternative plans.

#### Incremental Cost Analysis

Work will include the evaluation of alternative solutions to wetland restoration component of the project. An incremental cost analysis will be developed based on values obtained through the habitat analysis in order to determine which restoration activities will be selected for construction. The Habitat Evaluation Procedure technique will be used to determine “outputs” associated with the restoration project. Tasks include a draft and final incremental cost analysis.

Subtotal This Account    \$766,000

22F U.S. Fish and Wildlife Studies. This subaccount includes the participation of the U.S. Fish and Wildlife Service (USFWS) in technical environmental input. Work to be accomplished includes the following: an update on baseline and “future without” project conditions for all alternatives, evaluation of potential impacts; identification of possible mitigation. Restoration measures; and preparation of a Fish and Wildlife Coordination Act Report.

This subaccount does not include the evaluation of impacts associated with a beneficial use project.

Total Cost This Subaccount \$52,000

22G Economic Studies. This subaccount includes studies pertinent to an economic assessment of plans under consideration, and, where applicable, studies of cost allocations among the purposes involved. Required effort will include an extension of the reconnaissance level economic analysis to include the most recent data available and providing a detailed assessment of National Economic Development (NED) effects on alternatives.

Work identified under this subaccount will be performed by the Plan Formulation Branch of the New York District Planning Division. This subaccount includes studies pertinent to an economic assessment and analysis of the alternative plans under consideration.

As part of the Feasibility Study effort, many work tasks will be accomplished under this subaccount. All of these work tasks will be oriented toward identifying, analyzing, and evaluating alternative solutions to the problem(s) identified during the early phases of the Feasibility Study.

To better define the problem(s) related to flood control along the South River, an analysis of existing conditions within the area will be conducted to identify the maximum benefits. Part of the investigation and identification of problems will be based on analysis of historic flooding data for the most recent 2-3 year period collected through interviews with local governments, commerce, industry and local residents.

Development of an appropriate database management system will facilitate analysis of impacts of various alternatives on and assist in the identification of the National Economic Development (NED) plan.

As part of the analysis of each structural and non-structural alternative, NED costs and benefits will be identified and, through the use of incremental analysis, outputs and optimal plan size will be identified.

All economic investigations conducted during the multi-year feasibility study will be documented, and a detailed economics appendix will be prepared by the Corps for the final feasibility report.

Work will also include the evaluation of alternative solutions to mitigating impacted wetlands for the environmental restoration effort. The Economic Team will prepare an incremental cost analysis based on values obtained through the habitat analysis in order to determine which restoration activities will be selected for construction. Tasks include a draft and final incremental cost analysis.

The economic analysis will consist of the following tasks:

Review document “South River Reconnaissance Report,” dated May 1995, as well as all pertinent files and computations.

determine historical growth patterns and forecast future trends in land use, housing and development patterns. Then locate and number all structures affected on aerial maps and delineate the affected area into economic/hydrologic reaches and conduct a 100% inventory of study area structures. The inventory will consist of a windshield survey and will define the structures as to construction type, condition, age, number of stories, first floor elevations, and square footage. Other important development such as out-buildings, landscaping, etc., will also be noted and inventoried. The current structure depreciated replacement values will be established using “Means” or similar real estate valuation publications. A 1% to 2% sample survey of all residential structures will be in the form of interviews. These interviews will help validate historic flood damages and future flood damage susceptibility. While residential content value will be assumed to be 50% of structure value for residential structures, if supported by the sample survey interviews, the estimate of contents value for commercial and industrial facilities will be determined from on-site interviews of a 5% sample of floodplain commercial and industrial firms. The ten largest businesses, as identified in the Reconnaissance Report will be interviewed as part of the 5% sample. These field survey data will be entered into a computer data base in a spreadsheet format.

It is proposed to use the current FIA depth-percent damage functions for all floodplain structures. However, an analysis will be conducted to determine if any modifications to these standard curves are warranted due to possible local site-specific variables in either structure or content characteristics. Interviews will be conducted with floodplain businesses. Approximately 5% of total commercial/industrial structures will be included in this interview process including the ten largest.

Damages per storm frequency event for existing conditions without project will be determined. These damages will be determined for both residential and non-residential structures and contents, as well as for roads, utilities, and other infrastructure for a range of storm frequencies (5 yr, 10 yr, 25 yr, 50 yr, 100 yr, 900 yr, 500 yr) under existing conditions without project for up to 6 reaches. Using average annual rates of projected long-term growth and future changes in hydrology, project storm damages to structures and contents and infrastructure, roads, and utilities, will be analyzed for the base year and at 10 year increments over the project life of 50 years, by reach. Buildings over 50% damaged will be assumed to be totally lost and considered replaced meeting current FEMA floodplain construction regulations. Land-use development trends and needs will be established, including the determination of existing residential lot sizes, and the determination of existing residential lot sizes, and the determination of the number of acres of underdeveloped land in the affected area, by reach. The number of residential structures to be constructed in the future will be estimated, damage to this future development will be calculated. Residential flood damages as well as project-induced damages,

if any will also be determined. These inundation damages without project will be processed by use of a computer spreadsheet program and expressed as expected annual damages, by 10 year increments, over the life of the project, by reach. The expected annual storm damages without project will be converted to present-worth damages as of the base year and then amortized over the project life using the current discount rate, by reach, as well as by using discount rates (for sensitivity) of 7 percent and 9 percent.

Damages per storm frequency event for existing conditions with project will be determined. These damages will be determined for both residential and non-residential structures and contents, as well as for roads, utilities, and other infrastructure for a range of storm frequencies (5 yr, 10 yr, 25 yr, 50 yr, 100 yr, 200 yr, 500 yr) under existing conditions without project for up to 6 reaches. Using average annual rates of projected long-term growth and future changes in hydrology, project storm damages to structures and contents and infrastructure, roads, and utilities, will be analyzed for the base year and at 10 year increments over the project life of 50 years, by reach. Buildings over 50% damaged will be assumed to be totally lost and considered replaced meeting current FEMA floodplain constructions regulations. Land-use development trends and needs will be established, including the determination of existing residential lot sizes, and the determination of the number of acres of undeveloped land in the affected area, by reach. The number of residential structures to be constructed in the future will be estimated, damage to this future development will be calculated. Residual flood damages as well as project-induced damages, if any will also be determined. These inundation damages without project will be processed by use of a computer spreadsheet program and expressed as expected annual damages, by 10 year increment, over the life of the project. By reach. The expected annual storm damages as of the base year and then amortized over the project life using the current discount rate, by reach, as well as by using discount rates (for sensitivity) of 7 percent and 9 percent.

The following steps will be performed for a Risk & Uncertainty analysis of without and with project damages as they pertain to levee height:

- a. Identify the variables which have significant effect on benefits. For example: flood stages, structure size, low opening height, etc. Flood stage frequency information will be provided by H&H.
- b. Examine the availability of the data required.
- c. Define probability distributions and distribution parameters for each of the available variables.
- d. Modeling of the spreadsheet and assigning probability distributions to the variables.
- e. Run Monte Carlo or Latin Hypercube simulations.

f. Outputs (benefits and BCR) will be represented by probability distributions. The probability distribution will answer questions such as “what is the chance that the BCR will fall under 1?” or “under 95% of chance, what will be the upper and lower boundary for the BCR?”.

Public emergency and clean-up costs will be estimated for a range of storm events. The expected annually emergency and clean-up costs will be computed for both existing and future conditions, expressed as base year values, and amortized over the project life.

FIA costs saved will be determined by assessing the number of policies without project and multiplying the current average administrative cost per policy by the estimated number of policies reduced with the project.

Typical flood proofing measures include raising of the first floor elevations to at least the 100-year level by means of land fill. With project, some of these costs can be eliminated. These flood proofing reduction costs will be determined as the difference in these costs with- vs without project.

The possibility of an increase in recreation associated with a project will be examined and analyzed, with any increase in either usage or value will be calculated using the UDVB methodology. The UDV values with and without project will be determined by reach. Average annual recreation benefits will be determined, by reach.

Any reduction in traffic detours and delays as a result of the project will be analyzed and quantified.

Costs to be expended and benefits, if any, that will accrue during project construction will be analyzed by reach, for all alternatives considered.

Using average annual costs for all structural alternatives the benefit-cost ratios and the net benefits will be determined for an array of alternative plans.

Excess benefits over costs for each alternative plan will be analyzed and the plan which maximizes net benefits selected as the NED plan.

Past storm damages will be researched and the synthetic storm damages verified to the extent possible.

A tabulation of expected storm damages, by storm event and in average annual form, will be summarized upon completion of the storm damage analysis without project.

Technical review of the economic analysis will be conducted in four stages throughout the feasibility study: (1) after the windshield survey/damage interviews have been conducted and the results tabulated; (2) after the without project damages have been computed; (3) after with

project damages have been analyzed; and (4) after all benefits have been computed, preliminary BCR's have been computed, and the draft economic appendix has been completed. The technical review will be conducted by the District's Regional Economist.

Benefits will be adjusted for current interest rates and price levels upon submission of draft and final feasibility reports.

Draft report write-up will include text, tables, graphs, and all relevant damages, benefits, and BCR's.

Total Cost This Subaccount \$165,000

22H Real Estate Studies. This subaccount includes a gross appraisal of the costs of lands required for economic evaluations and construction of alternative plans. Detailed determination of lands, easements, rights-of-way, and relocations is also included. This information will be compiled in a Real Estate Supplement (RES).

Work under this subaccount will be performed by the Real Estate Division, New York Distr ct. with the gross appraisal conducted by the Baltimore District Real Estate Division. Work tasks include: feasibility stage preliminary real estate analysis which includes a gross appraisal of the costs of lands, if any, and damages required for economic evaluations of alternative plans; and a preliminary determination of requirements and costs for lands easements, rights-of-way, and relocations (LERRD) for all proposed project plans to be completed for use in determining the NED plan.

Also included are: costs for real estate acquisition and cost-study, thus establishing the sponsor's administrative costs of acquiring LERRD for project implementation; and a cost estimate for detailed determination of costs and requirements for LERRD for the recommended plan for use during Plans & Specifications.

Detailed real estate costs will be a part of the baseline cost estimate for the recommended project. The appendix will also include ownership data, acreage, gross appraisal, and preliminary right-of-way maps.

Total Cost This Subaccount \$42,000

22J Hydrologic and Hydraulics Investigations . Work under this subaccount including investigations and analysis of alternatives for the NED plan will be performed by the Hydrology and Hydraulics Section of the New York District Engineering Division. Work includes

Hydrology

Develop HEC-1 Models. HEC-1 models for the South River and extend the Raritan River HEC-1 model to mouth. Develop sub-basins, unit graphs and routing reaches. Assemble, code, run, and debug models.

Existing Conditions. Calibrate HEC-1 models to August 1971 flood and December 1992 Northeast. Develop peak discharge frequency curves at gages and calibrate model to curves. Define stage-discharge relations for a range of hypothetical existing flows. Develop range of hypothetical peak and coincidental discharges at various nodes along the South River and the lower Raritan River.

Future without Project Conditions. Determine future urbanization values of unit graphs and percent impervious area and input to model. Develop future without project peak discharges at various nodes.

Improved Conditions. Determine storage-discharge relations for three alternative plans of improvement. Determine improved conditional peak and coincidental discharges for three alternative plans.

Interior Drainage. Develop unit graph and loss functions for 14 interior inflow sub-basins. Run IFH model for interior inflow against exterior hydro graphs. Analyze minimum facility for three alternative plans, analyze minimum facility for range of hypothetical events for chosen plan, and perform final detailed interior analysis of chosen plan for selected event.

Residual Flooding Analysis. Analyze and describe extent of flooding that would still occur with project in place.

Hydrology Appendix. Write-up hydrology appendix. Develop tables, figures, and graphs.

### Hydraulics

Tidal Modeling. This will be done, probably by CERC, to develop stage frequency data in the study area resulting from storm tidal events in the Raritan Bay. stage frequency data, which has been previously modeled in the Raritan Bay, will be extended through the Raritan River up to the study area using a TABS or similar type model. The modeling will be done for the various alternatives considered, tidal gate plan and levee plans to determine the impacts of the improvements. The tidal modeling will produce outputs which will feed into both environmental and economic tasks:

a. Environmental Restoration and Flood Control Mitigation: Stage frequency data will be provided for the environmental analysis for the areas proposed for both restoration and mitigation.

b. Risk and Uncertainty: In order to develop risk and uncertainty input to feed into the economic analysis, additional analysis will be applied to the tidal modeling. At the current time there is no methodology of varying parameters to a TABS model to account for R&U. Therefore, the R&U input required by economics for use in their risk simulation model will be developed by analyzing the output of the TABS model and coming up with an envelope of confidence limits. From those limits, standard deviation will be computed and provided for economic input.

Develop HEC-2 Models. Develop detailed HEC-2 model for South River and refine lower Raritan River HEC-2 model. Code cross sections, bridges, develop n values, reach lengths, and effective flow limits. Assemble, run, debug, and calibrate to historic fluvial events.

Existing Conditions. Develop storage for HEC-1 model, run peak and coincidental flows for South River and lower Raritan River. Run future without project coincidental flows for peak tidal conditions. Develop and plot peak envelope profiles for a range of hypothetical flows. Develop rating curves and joint probability stage-frequency curves.

Improved Conditions. Lay out levees and recode HEC-2 for three alternative plans. Develop storage for HEC-1 model for alternative plans, as well as profiles for three alternative plans. Develop a range of hypothetical flow profiles for the chosen plan. Develop joint probability stage-frequency curves for the chosen plan.

Detailed Development of Chosen Plan for Selected Level of Protection. Perform final detailed analysis of chosen plan for selected level of protection. Perform riprap analysis, sedimentation analysis, and develop inundation mapping.

Interior Drainage. Analyze existing drainage system behind levees. Develop interior ponding areas and size pipes (if necessary) and develop exterior stage hydro graphs for minimum facility for three alternative plans. Size pump station capacity required for tidal gate alternative. analyze minimum facility for a range of hypothetical flows for chosen plan. Perform final detailed interior analyze of chosen plan for selected level of protection.

Hydraulics Appendix. Write-up hydraulics appendix. Develop tables, graphs, figures and plates.

Preliminary Layouts, Quantities, and Costs. Lay out three alternative plans and develop quantities and costs for each alternative. Refine layout for chosen alternative (if necessary). Develop quantities and costs for chosen alternative.

#### Wetland Mitigation and Environmental Restoration Support

Wetland areas impacted by the flood control project in addition to direct fill from the levees will be determined.

Work associated with the wetland mitigation and ecosystem restoration will include determining tidal movements and tide duration to assess the potential hydrology of the restored wetland and achieve desired results. A hydrologic model of the mitigation and restoration area will be done to assess water movement in the area.

Total Cost this Subaccount: \$617,900

22K Geotechnical Investigations. Work under this subaccount will be performed by the Design Branch of the New York District Engineering Division.

The Foundations & Materials Section will conduct the subsurface exploration. The results will be summarized on boring logs and boring location plans will be prepared. Subsurface conditions will be evaluated and a geology report will be written. A foundation and stability analysis of the floodway and railroad closure structure, new bridges, concrete face steel sheet piling, channel alignment side slopes and levees will be conducted as well as a seepage analysis for the levees and flood walls. All foundations and materials computation and results will be detailed in the Foundation & Material Appendix.

The Structural Engineering Section will conduct site inspections and review the seismic foundation and material, and the optimized plan reports. Structural computations would then be detailed in the Structural Appendix.

Soil sampling will be conducted at selected sites within the wetland mitigation area. Assessment of soils is necessary to evaluate affects of earth moving on the wetland. In addition, soil samples will be chemically analyzed for contaminants as a result of leachate from neighboring landfill. It is proposed that composite sampling be conducted in the mitigation and restoration areas (resulting in approximately two (2) samples per acre) and soil analyzed for heavy metals such as chromium, lead, silver, zinc, nickel and cadmium. A more extensive analysis will be done through the HTRW process. (\$60,000)

Total Cost This Subaccount \$360,100

22L Hazardous and Toxic Wastes Investigations. Work under this subaccount includes costs to conduct physical and chemical testing for HTRW contamination. In accordance with ER 1 165-2-132, Water Resource Policies and Authorities. Hazardous, Toxic, and Radioactive Waste Guidance for Civil Works Projects, 26 Jun 92, the HTRW Design District (Baltimore, CENAB-EN-HN) will be the technical lead. CENAB-EN-HN will prepare a site safety and health plan, a sampling design and detailed work plan, cost estimates, conduct sample collection, develop HTRW response alternatives, and prepare the HTRW Appendix. New York District's Environmental Analysis Branch will serve as the overall manager of Baltimore's work and coordinate all products with them.

Based upon the "reconnaissance plan" of two levees, the priority for HTRW investigations is the Sayreville Landfill. Four additional sites also require testing. They are Pacer's Field (former landfill), Alumet Corporation, Michaelson's Foreign Car. and S&W Auto Body Corporation. An expanded records search of State, County, and Local files will be conducted to determine the potential presence of HTRW concerns impacting the proposed project. In addition to these sites, the areas chosen for mitigation and environmental restoration will be tested. All HTRW investigations are expected to involve surface soil, subsurface soil, and groundwater sampling and analyzed to determine the nature and extent of contamination or potential for such at each site.

Technical review will be in accordance with ER 1165-1-132, with the mandatory center of expertise (Missouri River Division) conducting a review of each step of the HTRW activities conducted during the feasibility study.

Total Cost This Subaccount \$515,000

22N Surveying and Mapping. Work under this subaccount will be performed by the New York District Operations Division. This subaccount includes all surveying and mapping that may be required for the project area. The work includes: conducting topographic surveys; digitizing utilities and structures in the immediate improvement vicinity; editing and processing data; and preparing full size and report size drawings. All information will be available on the Computer Aided Design (CAD) system.

A topographic survey of the wetland area to 1 foot intervals will be developed for the mitigation and restoration effort. Topographic mapping of the wetland area is critical in creating a functioning wetland because of the effects on hydrology.

Elevations include:

- \*Wetland delineation flags
- \*Any vegetation bench marking to determine elevations of areas where desired vegetation exists
  
- \*Channels that influence hydrology to assist in evaluating available sources of water to restore the wetland
- \*Washington Canal shoreline to evaluate grade for possible grade changes
- \*Location of any soil sampling
- \*Depth of any open water.

This subaccount also includes a portion of the costs for project management of the surveying activities by Operations Division including scheduling, coordination, budget monitoring, and correspondence, etc.

Total Cost This Subaccount \$235,000

22P Engineering Analysis and Design/Project Cost Estimates. Work under this subaccount will be performed by the Cost Engineering Branch of the New York District Engineering Division. Technical support will also be provided by Civil Resources Branch and Design Branch. This subaccount will include the preparation of an MCACES cost estimate to at least the subfeature level of detail for the preferred plan. The above construction cost estimate, developed with a specific price level and escalation will form the Baseline Cost Estimate, in accordance with ER 5-7-1. Other work to include abbreviated cost estimates for alternative plans, estimates of annual operation, maintenance, and replacement costs and the cost appendix. (\$60,500)

The Civil Engineering Section in the Design branch will prepare the detailed plans, profiles, cross sections, drainage facilities, closure structure, flood wall, planting and real estate sheets for the flood control project, the mitigation plan and the environmental restoration plan. The section will also provide the project quantities. These plans will meet the specifications of the Corps and will be used in developing the cost estimate.

Total Cost This Subaccount \$448,700

22Q Study Management. This subaccount includes all activities related to the management of the study by the Project Manager, including scheduling, coordination, budget preparation, correspondence, etc. A minimum of three meetings of the feasibility study Executive committee as well as monthly progress meetings between the Corps Project Manager and local sponsor counterparts are anticipated.

Work under this subaccount will be performed by the Plan Formulation Branch of the New York District Planning Division. Specific work tasks include all activities related to the management of the study such as scheduling, coordination, budget preparation, and correspondence. Work effort assumes: minimum of three meetings of the feasibility study Executive Committee as well as monthly progress reports by telephone or in meetings between the Corps project manager and his sponsor counterparts.

Work to be accomplished includes the following: tracking funds issued for feasibility study, initiated by the study manager as needed; preparation of Project Management Plan (PMP) incorporating the recommended project baseline cost estimate, schedule for Preconstruction Engineering & Design (PED) (Plans & Specifications), and project construction schedule; Feasibility Review Conference (F.C.); F.C. Memo by CENAD (study manager responsible for disseminating this document to the study team and coordinating responses if necessary); CENAD review of draft feasibility report with project manager being responsible for disseminating to the study team any comments on this document and coordinating responses if necessary; and Division Commanders Notice.

A project management plan (PMP) will be prepared by the Corps as part of this work item and submitted along with the feasibility report.

This subaccount includes funds for technical management by Engineering Division.

Total Cost This Subaccount \$273,100

22R Plan Formulation and Evaluation . This subaccount includes efforts necessary for formulation and evaluation of alternatives by the Corps and local sponsor in accordance with the P&G's criteria for completeness, effectiveness, efficiency, and acceptability . The evaluation will array the costs and benefits associated with each plan as well as trade-offs required to select the recommended plan for implementation. Formulation studies will require testing and evaluation of alternative plans and the identification of the NED Plan. Work under this subaccount will be performed by the Plan Formulation Branch of the New York District Planning Division. As discussed under Section 22E, the Plan Formulation Branch will work closely with the Environmental Analysis Branch in all environmental aspects of Plan Formulation.

Work accomplished includes: establishing feasibility study plan alternatives using the results of the reconnaissance study and input from the public scoping meeting; coordination of the initial engineering design as well as the hydraulics and hydrology (H&H), economic, cultural, and environmental analyses. Study plan alternatives will be evaluated with the data generated from the initial engineering design, economic, environmental, cultural, and H&H analyses for the purpose of formulating the National Economic Development (NED) plan and, if different, the locally preferred plan. Formulation of project alternatives to be studied in additional detail will be verified.

Work will include the development of alternative plans for the wetland mitigation and restoration efforts. "Without" flood control project future conditions will be assessed for each selected site for comparison with the "with" flood control project future conditions. The evaluation of alternatives will compare the costs and benefits associated with each plan for implementation.

Documentation of the project formulation process will be prepared by the Corps and included in the following reports:

a. The P-4 Plan Formulation Document, which will explain the screening process to distinguish measures to be considered for final analysis from measures eliminated from further consideration.

b. The Project Selection Briefing, where the District brief the North Atlantic Division, HQ, USAGE, the NJDEP (as the local sponsor) and other reviewing agencies for their early concurrence of the selected plan prior to initialing detailed design work.

c. Draft Feasibility Report

d. Final Feasibility Report

Total Cost This Subaccount \$49,200

22S Report Preparation. Work under this subaccount will be performed by the New York District Planning Division. Work tasks include the assembling, writing, editing, typing, drafting, reviewing, reproducing, and distributing of study reports, environmental assessments, surveying and design appendices as well as other related documentation required for transmittal by the Corps to higher authorities. The feasibility report will consist of:

(1) a main report summarizing the technical findings and containing the study conclusions and recommendations and an integrated Environmental Assessment (EA) or finding of no significant impact (FONSI);

(2) technical appendices covering work accomplished in the various task subaccount's;

(3) an appendix containing the sponsor's financial capability statement along with a preliminary financing plan for project implementation;

(4) other supporting documentation to be submitted along with the report will include the Project Management Plan (PMP).

Other work to be accomplished includes preparation of the draft feasibility report and draft EA/FONSI that includes the work accomplished during the feasibility study process and also incorporates the results of the Feasibility Review Conference. Other work involves preparation of a final feasibility report incorporating any changes necessary to respond to comments made during the review of the draft report.

Total Cost This Subaccount \$60,000

22T Feasibility Program & Project Management. This subaccount includes costs for macro-level tracking of the study and funds by the New York District Project Manager. Effort is assumed to include one man-day per month during the study and attendance by upper level management at Executive Committee meetings and public meetings. In addition, attendance by upper-level management at Executive Committee Meetings, public meetings, and the Feasibility Review Conference (F.C.). This subaccount also includes funds to the technical review of products and the draft report.

Total Cost This Subaccount \$150,000

22V Initial Draft Project Cooperation Agreement. This subaccount includes costs for coordination by the Project Manager and Plan Formulation Branch with the local sponsor to develop a draft Project Cooperation Agreement (PCA). Also included in this subaccount are costs for obtaining a letter of intent to sign the PCA and costs for obtaining any necessary rights-of-entry

Total Cost This Subaccount \$15,000

22Y HQUSACE Review. By regulation, five percent of study cost (or \$50,000, whichever is less) is set aside to cover expenses incurred by the sponsor and the New York District during higher authority review. If costs for this work item exceed this limit, then a negotiated modification to the Feasibility Cost Sharing Agreement (FCSA) will be required to cost share the additional amount.

Total Cost This Subaccount \$50,000

**VIII. Fiscal Year Cost Breakout**

Account	FY 96	FY97	FY 98	FY 99	FY 00	FY 01	Total
22A Public Involvement	10.0	10.0	15.0	10.0	10.0	10.0	65.0
22B Ability to Pay						10.0	10.0
22C Social Studies			5.0				5.0
22D Cultural Resources			5.3	124.7			130.0
22E Environmental Studies	53.2	56.0	104.0	542.6	20.2		776.0
22F US Fish & Wildlife			52.0				52.0
22G Economic Studies		41.5	123.5				165.0
22H Real Estate				9.0	33.0		42.0
22J Hydrologic & Hydraulic	54.8	217.5	203.2	142.4			617.9
22K Geotechnical Studies			14.1	346.0			360.1
22L HTRW Studies	103.0	122.1	140.0	149.9			515.0
22N Surveying & Mapping	150.0		85.0				235.0
22P Design & Cost -			12.0	340.6	96.1		448.7
22O Study Management	13.0	53.3	53.3	53.3	53.1	53.8	279.8
22R Plan Formulation	10.0	19.6	19.6				49.2
22S Report Preparation						50.0	50.0
22T Project Management		30.0	30.0	30.0	30.0	30.0	150.0
22V Draft PCA						15.0	15.0
22Y HQ USAGE Review						50.0	50.0
Study Fiscal Year Totals	394.0	550.0	862.0	1748.5	242.4	218.8	4015.7
Contingency @ 15%	0.0	0.0	129.3	262.2	36.3	44.5	472.3
Escalation @ 3%	0.0	0.0	25.7	52.3	7.3	7.1	92.4
<b>TOTAL FISCAL YEAR</b>	<b>394.0</b>	<b>550.0</b>	<b>1017.0</b>	<b>2063.0</b>	<b>286.0</b>	<b>270.4</b>	<b>4580.4</b>

All numbers are in \$1,000

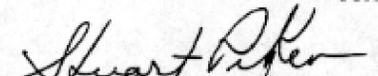
Allocation between Federal Government and New Jersey

Federal Share	197.0	75.0	508.5	1031.5	143.0	35.2	2290.2
State of New Jersey	197.0	275.0	508.5	1031.5	143.0	135.2	2290.2

ENDORSEMENTS

SOUTH RIVER, RARITAN RIVER BASIN, NEW JERSEY  
FEASIBILITY STUDY

PROJECT REVIEW BOARD

  
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Planning Division

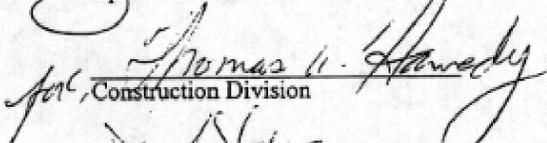
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Engineering Division

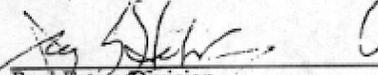
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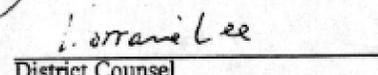
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Contracting Division

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Resource Management Office

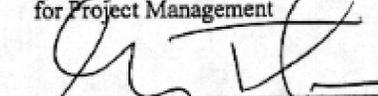
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District Counsel

2/6/96  
Date

  
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Deputy District Engineer  
for Project Management

3/4/96  
Date

  
\_\_\_\_\_  
District Engineer

7 Mar 96  
Date

  
\_\_\_\_\_  
New Jersey Department  
of Environmental Protection

7 Mar 96  
Date

