Econ Dr

US Army Corps of Engineers
New Orleans District

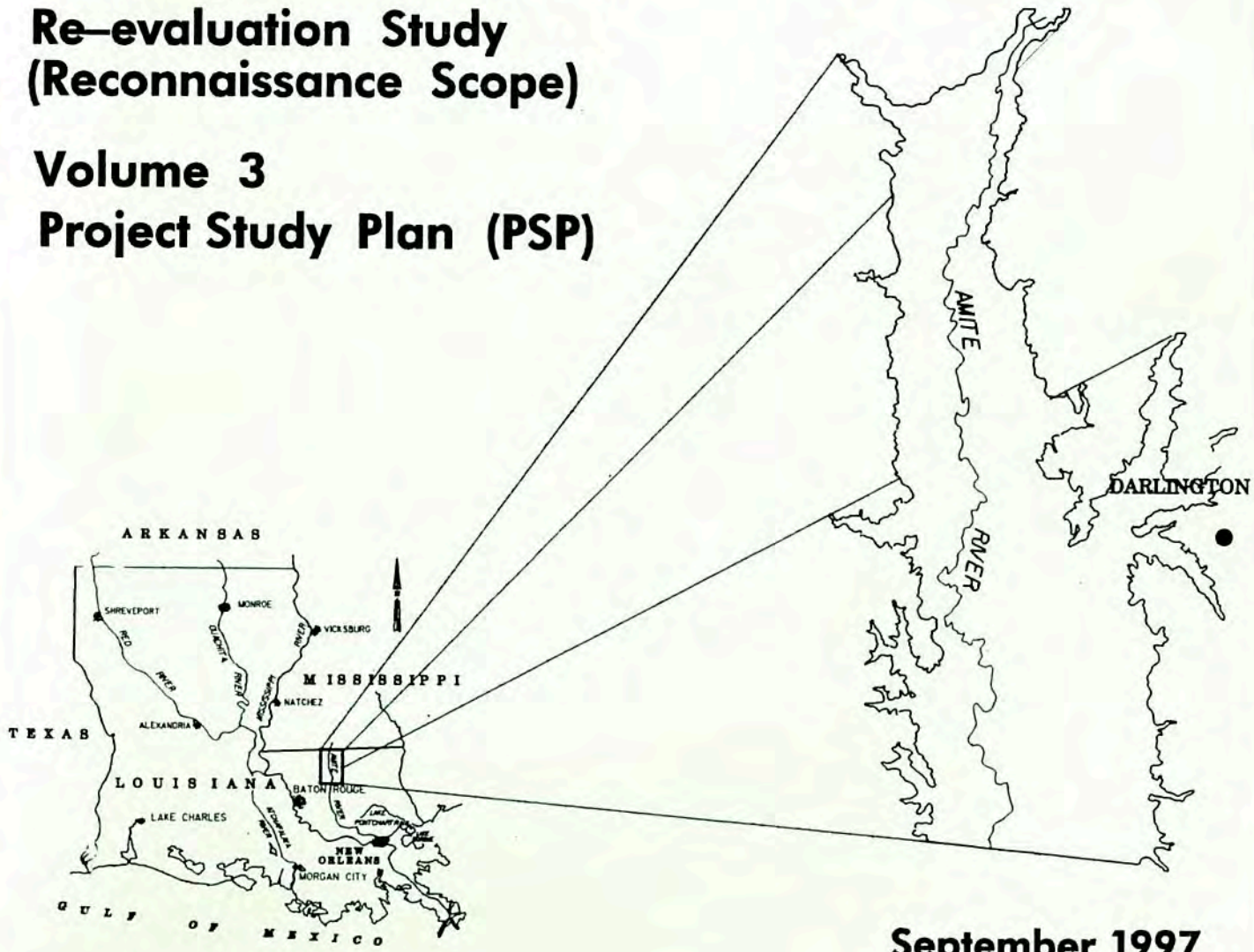
Louisiana Department of Transportation and Development

Amite River and Tributaries, Louisiana

Darlington Reservoir

Re–evaluation Study (Reconnaissance Scope)

Volume 3
Project Study Plan (PSP)



September 1997

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APPENDIX D	PROJECT STUDY PLAN (PSP)

AGREEMENT BETWEEN

THE UNITED STATES OF AMERICA

AND

THE STATE OF LOUISIANA

FOR THE AMITE RIVER AND TRIBUTARIES STUDY

THIS AGREEMENT, entered into this 5th day, of February 1985, by and between the United States of America (hereinafter called the "Government") represented by the Contracting Officer executing this Agreement and the State of Louisiana (Hereinafter called the "Study Sponsor"),

WITNESSETH, that

WHEREAS, the Public Works Committee of the United States Senate adopted a resolution on 14 April 1967 that authorized the Corps of Engineers to conduct a study to determine the feasibility of providing improvements for flood control and other water related land resource needs including water supply, water quality control, hydropower, recreation, and fish and wildlife; and

WHEREAS, the Corps of Engineers has conducted a reconnaissance phase study of flood problems and other water related land resource problems and potential solutions pursuant to this authority, and has determined that further study in the nature of a "Feasibility Phase Study" is required to fulfill the intent of the study authority and to determine the extent of the Federal interest in solution to flood problems and other water related land resources problems; and

WHEREAS, the Study Sponsor considers it in its best interest to have the "Feasibility Phase Study" promptly completed, and is willing to

cost-share up to 50% of the total costs of the "Feasibility Phase Study" as indicated in Article I.

WHEREAS, the Secretary of the Army may determine that it is necessary for cost-sharing by non-Federal interests on the authorized "Feasibility Phase Study."

NOW THEREFORE, the parties agree as follows:

ARTICLE I - CONSIDERATION AND PAYMENT

a. Should the Secretary of the Army determine that cost-sharing is necessary, the Study Sponsor shall pay, as further specified in this agreement, 50% of the total costs of the Feasibility Phase Study for any or all of the following items:

Basinwide Protection

Comite River Diversion

East Baton Rouge Parish

Monte Sano Bayou
Jones Creek
Bayou Fountain
Clay Cut Bayou
Hurricane Creek
Nonstructural measures

Livingston Parish

Grays Creek and Tributaries
Effects of roads and bridges on
Restricting Flood Flows
Nonstructural measures

Ascension Parish

New River, Black Bayou, Bayou Narcisse,
and Bayou Francois
Sorrento
Nonstructural measures

The term "total costs of the feasibility phase study" means:

(1) For any Feasibility Phase Study that is in progress at the time the Secretary of the Army decides to proceed with cost-sharing as provided in this agreement, all actual costs of the Feasibility Phase Study that are incurred by the Government or the Study Sponsor pursuant to the terms of this agreement commencing 60 days after the date the decision to proceed with cost-sharing is made, including supervisory and administrative costs.

(2) For any Feasibility Phase Study that is not in progress at the time the Secretary of the Army decides to proceed with cost-sharing as provided in this agreement, all actual costs of the Feasibility Phase Study incurred by the Government or the Study Sponsor pursuant to the terms of this agreement, including supervisory and administrative costs.

b. A Feasibility Phase Study shall be deemed to be complete for cost-sharing purposes with concurrence of the Study Sponsor when the Division Commander issues his notice of completion of the Feasibility Report.

c. The Government, using funds contributed by the Study Sponsor and appropriated by the Congress, shall expeditiously make and complete the Feasibility Phase Study, applying those procedures usually followed or applied pursuant to Federal laws, regulations and policies. The Government will consult with the Study Sponsor in determining the advisability and scope of work to be performed by contract. All bid proposals will be reviewed by the Study Sponsor at their option and comments will be provided to the Government for use in selection of contractors. Award of any contracts with appropriated funds or Study Sponsor contributed funds shall be exclusively within the control of the Government. Concurrent review of work performed by a contractor by the Government and Study Sponsor will be performed in accordance with the contract provisions.

d. The Study Sponsor makes such contributions with the clear understanding that it does not obligate the Government to either recommend authorization of or undertake the construction of a Federal project upon completion of the Feasibility Phase Study. The Study Sponsor shall not have any recourse for payment or reimbursement of any nature whatsoever from the Government for contributions tendered pursuant to the terms of this agreement (except with respect to excess cash contributions as set forth in Article II.e.).

ARTICLE II - METHOD OF PAYMENT

a. To provide for consistent and effective communication between the Study Sponsor and the Government during the term of study, the Study Sponsor and the Government will appoint representatives to coordinate on scheduling, planning, and other matters relating to the Feasibility Phase Study.

b. The Government will notify the Study Sponsor of the decision to proceed with cost-sharing as provided in this agreement within seven

working days of the date the decision to proceed with cost-sharing is made.

(1) In the event the Feasibility Phase Study is in progress at the time this decision is made, the Government will, in addition to notifying the Study Sponsor of that decision, also provide the Study Sponsor with an estimate of the Study Sponsor share of Feasibility Phase Study Costs for the remainder of the Government Fiscal Year. The Study Sponsor will then satisfy its obligation to provide 50% of the total "Feasibility Phase Study" costs for the remainder of the Government Fiscal Year by providing within 60 working days of notice by the Government cash contributions, and/or in-kind services during the course of the remainder of the Government Fiscal Year, equal in amount to the Study Sponsor share of Feasibility Phase Study costs for the remainder of the Government Fiscal Year.

(2) In the event the Feasibility Phase Study is not in progress at the time the decision to proceed with cost-sharing is made, the Government will, at the time it provides notice of the decision to proceed with cost-sharing, also provide the Study Sponsor with a date on which the Government expects to initiate the Feasibility Phase Study and an estimate of the Study Sponsor share of the Feasibility Phase Study costs for the Government Fiscal Year in which the Feasibility Phase Study is to be initiated. The Government will obtain the Study Sponsor Share of the total costs of the Feasibility Phase Study from the Study Sponsor for the Government Fiscal Year in which the study is to be initiated, prior to initiating the Feasibility Phase Study. The estimated Study Sponsor's share of the Feasibility Phase Study costs for the Government Fiscal Year will be limited to 50 percent of the estimated costs for the Feasibility Phase Study for the Government Fiscal Year.

c. For subsequent Government Fiscal Years; the Government will provide the Study Sponsor with a statement of the Study Sponsor's share of the total costs of the Feasibility Phase Study for that Government Fiscal

Year six months before the start of the Government Fiscal Year. The Study Sponsor will provide its share of the total costs of the Feasibility Phase Study for that Government Fiscal Year by providing at the start of the Government Fiscal Year cash contributions, and/or in-kind services during the course of the Government Fiscal Year, equal to the Study Sponsor share. For each subsequent Government Fiscal Year, the estimate of the Study Sponsor's share for the pending Fiscal Year will be limited to 50 percent of the estimated costs of the Study in the pending Government Fiscal Year.

d. The Study Sponsor shall make any cash contributions required under this agreement available to the Government by either cash payments to the Government or by deposits of cash into an escrow account acceptable to the Government. The Government will draw on such contributions as it deems necessary to cover contractual and in-house obligations as they occur.

e. Upon completion of the Feasibility Phase Study and resolution of any contract claims and appeals, the Government will compute the total costs of the Feasibiltiy Phase Study and tender to the Study Sponsor a final accounting of its share of the study costs. In the event the Study Sponsor has paid less than its share of the total Feasibility Phase Study costs at the time of the accounting, the Study Sponsor agrees to pay the Government within 90 calendar days after receipt of written notice, whatever sum is required to meet the Study Sponsor share of study costs, provided the Study Sponsor received prior written notice that additional funds would be necessary to complete the Study and the Study Sponsor concurred. In the event the Study Sponsor paid more than its share of total Feasibility Phase Study costs at the time of the final accounting, the Government will return to the Study Sponsor within 90 calendar days the excess cash contribution.

f. HOWEVER, where the Study Sponsor is the State itself, this agreement does not obligate future legislative appropriations or other funds for such performance and payment when obligating future

appropriations or other funds would be inconsistent with State constitutional limitations.

ARTICLE III - CREDIT FOR IN-KIND SERVICES

When approved by the Government, the Study Sponsor may receive a credit for in-kind services provided in connection with accomplishment of the Feasibility Phase Study. The credit shall be applied against the requirement established in Article Ia to pay 50% of the cost of the Feasibility Phase Study, but shall not exceed 50% of the total Study Sponsor requirement for Feasibility Phase Study costs. The procedures and methods for computing the value of in-kind services shall be agreed to by the Government and the Study Sponsor prior to the provision of any such services.

ARTICLE IV - TERMINATION

This agreement may be terminated by either party within thirty days by providing written notice to that effect. There shall be a final accounting and settlement upon termination, with all costs including costs incurred as a result of the termination to be cost shared on a 50-50 basis as is otherwise provided under the terms of this agreement.

ARTICLE V - DISPUTES

Any dispute arising under this agreement which is not disposed of by mutual consent shall be decided by the Contracting Officer who shall reduce his decision to writing and mail or otherwise furnish a copy to the

Study Sponsor. The decision of the Contracting Officer shall be final and conclusive unless, within 30 days from the receipt of such copy, the Study Sponsor mails or otherwise furnishes to the Contracting Officer a written appeal addressed to the Corps of Engineers Board of Contract Appeals. The decision of the Board shall be final and conclusive. Pending final decision of a dispute hereunder, the Study Sponsor shall proceed diligently with the performance of the agreement in accordance with the Contracting Officer's decision.

ARTICLE VI - MAINTENANCE OF RECORDS

The Government and the Study Sponsor shall keep books, records, documents and other evidence pertaining to costs and expenses incurred pursuant to this agreement to the extent and in such detail as will properly reflect total Feasibility Phase Costs. The Government and the Study Sponsor shall maintain such books, records, documents and other evidence for inspection and audit by authorized representatives of the parties to this agreement.

ARTICLE VII - RELATIONSHIP OF PARTIES

The parties to this agreement act in an independent capacity in the performance of their respective functions under this agreement, and neither party is to be considered the officer, agent, or employee of the other.

ARTICLE VIII - OFFICIALS NOT TO BENEFIT

No member of or delegate to the Congress, or other elected official, shall be admitted to any share or part of this agreement, or to any benefit that may arise therefrom.

ARTICLE IX - COVENANT AGAINST CONTINGENT FEES

The Study Sponsor warrants that no person or selling agency has been employed or retained to solicit or secure this agreement upon agreement or understanding for a commission, percentage, brokerage, or contingent fee, excepting bona fide employees or bona fide established commercial or selling agencies maintained by the Study Sponsor for the purpose of securing business. For breach or violation of this warranty, the Government shall have the right to annul this agreement without liability or in its discretion to add to the agreement or consideration, or otherwise recover, the full amount of such commission, percentage, brokerage, or contingent fee.

IN WITNESS WHEREOF, the parties hereto have executed this agreement as of the day and year first above written.

THE UNITED STATES OF AMERICA

BY _____

Colonel Corps of Engineers
District Engineer
Contracting Officer

WITNESSES:

_____

_____

STATE OF LOUISIANA

BY _____

Secretary
Department of Transportation
and Development

CERTIFICATE OF AUTHORITY

I, Norman L. Sisson do hereby certify that I am the General Counsel of the Department of Transportation and Development, State of Louisiana, that the State of Louisiana is a legally constituted public body with full authority and legal capability to perform the terms of the agreement between the United States of America and the State of Louisiana in connection with the Amite River and Tributaries Study, and with full authority and legal capability to pay judgments for damages through the Legislature of the State of Louisiana, if necessary, in the event of the failure to perform, and that the persons who have executed the agreement on behalf of the State of Louisiana have acted within their statutory authority.

IN WITNESS WHEREOF, I have made and executed this certificate this 5th day of February, A.D., 19 85.

Norman L. Sisson
General Counsel
DOTD, State of Louisiana

FIRST SUPPLEMENT TO THE
AGREEMENT BETWEEN

THE UNITED STATES OF AMERICA
AND
THE STATE OF LOUISIANA

FOR THE AMITE RIVER AND TRIBUTARIES STUDY

THIS SUPPLEMENTAL AGREEMENT is entered into this_____ day of _____ 1990, by and between the United States of America (hereinafter called the "Government") represented by the Contracting Officer executing this Supplemental Agreement and the State of Louisiana through the Louisiana Department of Transportation and Development (hereinafter called the "Study Sponsor"), represented by its Secretary,

WITNESSETH THAT:

WHEREAS, on 5th day of February 1985, the Government and the Study Sponsor entered into a Cost-Sharing Agreement for the Amite River and Tributaries Study (hereinafter called the "Original Agreement"); and

WHEREAS, the Study Sponsor has requested that the Original Agreement be modified to include the Darlington Reservoir; and

WHEREAS, the Study Sponsor is currently cost-sharing the Amite River and Tributaries Study on a 50-50 basis; and

WHEREAS, the Study Sponsor is willing to cost-share on a 50-50 basis the increased cost of this modification to include the Darlington Reservoir in the Amite River and Tributaries Study.

NOW THEREFORE, the parties agree as follows:

The Original Agreement for the Amite River and Tributaries Study is hereby modified to include the Darlington Reservoir.

The Secretary of the Army has determined that cost-sharing is necessary, therefore the Study Sponsor shall pay, as is specified in this Supplemental Agreement, 50% of the total costs of the Feasibility Phase Study for the Darlington Reservoir Study.

All the Articles of the Original Agreement, not specifically changed or modified herein, shall remain in full force and effect, and apply to this Supplemental Agreement as if they were incorporated herein and made a part hereof.

IN WITNESS WHEREOF, the parties hereto have executed this Supplemental Agreement as of the day and year first above written.

UNITED STATES OF AMERICA

BY _____

Colonel Corps of Engineers
District Engineer
Contracting Officer

WITNESS:

_____

_____

STATE OF LOUISIANA

BY _____

Secretary
Louisiana Department of
Transportation and Development

Darlington Reservoir, Louisiana
PROJECT STUDY PLAN

This plan has been prepared in accordance with the following guidance:

a. ER 5-7-1 (FR), Project Management
b. ER 1105-2-100, Guidance for Conducting Civil Works Planning Studies
c. EC 1105-2-xxx, Preparation and Use of Initial Project Management Plans
d. EC 1105-2-208, Preparation and Use of Project Study Plans

Presented for Approval by:

_____
R. H. Schroeder, Jr.
Chief, Planning Division

Approved by:

PROJECT REVIEW BOARD

Chief, Programs and Project Management Division _____
Robert L. Tisdale

Chief, Engineering Division _____
W. E. Tickner

Chief, Construction Division _____
R. T. Hill, Jr.

Chief, Operations Division _____
Albert J. Guillot

Chief, Program Management Branch _____
R. E. Pittman

Chief, Office of Comptroller _____
Brenda Weber

Chief, Contracting Division _____
A. A. Tilden

Chief, Real Estate Division _____
Clyde H. Sellers

Chief, Office of Counsel _____
Gwenn Nachman

_____
(Date)

DARLINGTON RESERVOIR STUDY
PROJECT STUDY PLAN

PROJECT STUDY PLAN
DARLINGTON RESERVOIR STUDY

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DARLINGTON RESERVOIR STUDY
PROJECT STUDY PLAN

INTRODUCTION

The Project Study Plan (PSP) is a plan of study which is used to define and manage the development and conduct of a feasibility study. This PSP documents the assumptions, work tasks, products and the level of detail that will be necessary during the feasibility study to determine the existing and the future without project conditions; formulate a range of alternatives; assess their effects; and present a clear rationale for the selection of a water resource development plan(s). This PSP includes the baseline study cost, schedule and assignment of responsibilities. The PSP also provides district management a mechanism for cost and schedule control, establishes the basis for changes, promotes internal communications, and precludes review problems for the feasibility study.

This PSP includes all of the requirements to complete a feasibility study for the Darlington Reservoir. The feasibility study will consider three alternatives to provide flood protection to the residents in the Amite River Basin by providing a reservoir along the upper Amite River. Three types of reservoirs will be considered: a dry reservoir, a reduced wet reservoir, and a full sized wet reservoir.

The information provided in the re-evaluation report and the PSP was developed through numerous meetings with the local sponsor, Louisiana Department of Transportation and Development (LADOTD), and the Amite River Basin Drainage and Water Conservation District. LADOTD has been involved in various state and local meetings as well as many interdisciplinary planning team meetings.

DARLINGTON RESERVOIR STUDY
PROJECT STUDY PLAN

SEPTEMBER 1997

1. STUDY AUTHORITY

This study is part of the Amite River and Tributaries (ART) Study being conducted in response to a resolution of the committee on Public Works of the United States Senate. The resolution, sponsored by the late Senator Allen J. Ellender and Senator Russell B. Long of Louisiana, was adopted on April 14, 1967, and reads as follows:

> "RESOLVED BY THE COMMITTEE ON PUBLIC WORKS OF THE UNITED STATES SENATE, That the Board of Engineers for Rivers and Harbors, created under Section 3 of the River and Harbor Act approved June 13, 1902, be, and is hereby requested to review the report of the chief of Engineers on Amite River and Tributaries, Louisiana, published as House Document Numbered 419, Eighty-fourth Congress, and other pertinent reports, with a view to determining whether the existing project should be modified in any way at this time with particular reference to additional improvements for flood control and related purposes on Amite River, Bayou Manchac, and Comite River and their tributaries."

The 1996 Senate Appropriation included the following language concerning Amite River and tributaries, LA

> "The Committee is aware of recent flooding in the Amite River basin which encompasses about 2,000 square miles in southeastern Louisiana and southwestern Mississippi. While the Corps continues to study some possible flood control solutions for this area, the Committee supports the examination of additional measures. Therefore, the Committee has included $200,000 to reevaluate the State of Louisiana's review of the previously suspended feasibility phase studies of Darlington Reservoir."

2. STUDY PURPOSE

The purpose of the Darlington Reservoir study is to investigate the feasibility of providing flood protection for the residents of the lower Amite River Basin. The proposed Darlington Reservoir project would lower stages on the lower Amite River and tributaries, providing flood protection to the residents of Denham Springs, Port Vincent, and the eastern and southeastern portions of East Baton Rouge Parish. The dam site would be located on the Amite River about 25 miles northeast of Baton Rouge and 6 miles southwest of the town of Darlington in St. Helena Parish. The reservoir would control a 682 square mile drainage area. The dam would be an earthen

embankment with a low-level flood control structure outlet and a concrete uncontrolled spillway. Two alternatives were investigated in the re-evaluation: the 25 year dry reservoir and the 25 year reduced wet alternative. The 25 year dry reservoir alternative consists of a 171.0 NGVD flood control pool elevation and a 12,800 acre pool. The top of dam elevation is 201.0 NGVD with a spillway crest of 171.0 NGVD. The 25 year reduced wet alternative consists of a 172.8 NGVD flood control pool elevation and a 13,600 acre pool for flood control. The top of dam elevation is 202.8 NGVD with a spillway crest of 172.8 NGVD. The reduced wet reservoir also consists of a small normal pool maintained at elevation 150.0 NGVD (4,400 acres).

3. STUDY HISTORY

A negative feasibility report on Darlington Reservoir was provided to the local sponsor to document study results in September 1992. The local sponsor, Louisiana Department of Transportation and Development (LDOTD), asked that the study be suspended while they consulted with others on certain Corps' assumptions and design criteria. In 1994, the Amite River Basin Drainage and Water Conservation District contracted with Harza Engineering Company to conduct a comprehensive study of all Corps, state and local flood control studies in the area. Harza's 1995 evaluation report questioned a number of the Corps' assumptions and design criteria and concluded that re-design could sufficiently reduce the cost of the dam to economically justify the project. Congress added money in fiscal year 1996 and 1997 for the New Orleans District to evaluate the Harza report and re-evaluate the earlier Corps work. The re-evaluation was generally of a reconnaissance level, with the exception of the geotechnical design which is closer to a feasibility level. The re-evaluation report addresses Harza's comments on the 1992 feasibility report, and provides a reconnaissance level investigation of the 25 year dry reservoir alternative and the 25 year reduced wet reservoir alternative.

4. GENERAL DESCRIPTION OF STUDY AREA

The study area encompasses about 2,200 square miles in southeastern Louisiana and southwestern Mississippi. The study area is largely forest and agricultural. These land uses make up 72 percent of the land use. Urban and built-up land comprise 12 percent of the land use. Major urban centers in the study area include the Cities of Baton Rouge, Baker, Zachary, Gonzales, Sorrento, and Denham Springs, Louisiana. The City of Baton Rouge is the State Capitol. This basin is one of the three most populated basins in the State of Louisiana. Four major floods have occurred in the basin between 1973 and 1990. Flooding within the basin originates from excessive rainfall resulting in headwater and backwater overflow of the Amite River and tributary streams. The maximum flood of record occurred in 1983 and caused approximately $172.0 million in damages.

5. RE-EVALUATION OF 1992 FEASIBILITY STUDY

The New Orleans District was directed to re-evaluate the work documented in the 1992 feasibility study on Darlington Reservoir as a result of the 1995 Harza Engineering Report. The 1995 Harza Report concluded that the Darlington Reservoir could be economically justified based on Federal criteria. In the re-evaluation, a major portion of the funds were used to re-design the geotechnical portion of the project, resulting in a total re-design of the dam structure. The District reviewed it's design criteria and assumptions for the 1992 feasibility study and documented responses to the Harza Engineering report. In addition, the 25-year dry reservoir and the 25-year reduced wet reservoir were evaluated at a reconnaissance level of detail. The benefits to cost comparison for these two alternatives evaluated yielded a ratio greater than 1.0. Consequently, it was recommended to higher authority that the feasibility study should continue.

6. PROPOSED ACTION

The Darlington Reservoir re-evaluation study identified two economically feasible plans. The three plans that will be evaluated are:

1) 25-year Dry Reservoir. The 25-year dry reservoir will not have a normal pool elevation. The flood control pool will be at 171.0 feet NGVD, with a flood pool encompassing 12,800 acres.

2) 25-year Reduced Wet Reservoir. The 25-year reduced wet reservoir will have a normal pool elevation of 150.0 feet NGVD, with a flood pool elevation of 195.3 feet NGVD. The normal pool, or "lake", will encompass 4,400 acres while the flood pool will encompass 13,600 acres.

3) 25-year Full Wet Reservoir. The 25-year full wet reservoir will have a normal pool elevation of 171.0 feet NGVD, with a flood pool elevation of 205.0 feet NGVD. The normal pool, or "lake", will encompass 12,800 acres while the flood pool will encompass 18,900 acres.

7. SCOPE OF WORK

The feasibility study activities presented in this PSP will be completed to determine the feasibility of the above plans and/or modifications of such plans. During the feasibility phase the national economic development (NED) plan and the locally preferred, if different from the NED plan, will be identified.

The description of tasks and associated costs provided in the following sections reflect the required efforts to complete feasibility scope designs and costs. These estimates are based upon completing a feasibility scope analysis for a combination of three reservoir types (dry, reduced wet and full wet). The estimates are also based upon one level of

protection per alternative. Any additional alternatives will be evaluated at additional time and cost.

This PSP was developed generally in accordance with the following guidelines:

a. Engineering Regulation (ER) 1105-2-100: "Guidance for Conducting Civil Works Planning Studies", dated 28 December 1990,

b. ER 5-7-1: "Project Management", dated 30 September 1992,

c. ER 1110-2-1150: "Engineering and Design for Civil Works Projects",

d. ER 405-1-12: Draft Chapter 12, Real Estate handbook,

e. ER 1105-2-208: "Preparation and Use of Project Study Plans", dated 23 December 1994.

A specific work scope for the activities required to accomplish the Darlington Reservoir Feasibility Study is presented in Annex A. Activities are grouped generally according to the organization responsible for performing the task. A general description of **what, why, how, who, when,** and the **time and funds** required to accomplish each task are presented.

8. WORK BREAKDOWN STRUCTURE (WBS)

A Work Breakdown Structure (WBS) outlining the component products and sub-products for the feasibility study are listed in a hierarchy of levels in Annex B. The codes shown for each activity and product in the WBS can be cross referenced with the Responsibility Assignment Matrix (RAM) in Annex C.

9. RESPONSIBILITY ASSIGNMENT MATRIX (RAM)

A presentation of the organizational responsibility for the products shown in the WBS is shown in Annex C. This report generally defines the organization(s) required to perform the specific activities associated with production of the feasibility report and other associated products of the feasibility study effort. The organizations responsible for each product and activity can be cross-referenced with the organizational breakdown structure in Annex D.

10. ORGANIZATIONAL BREAKDOWN STRUCTURE

Annex D contains a list of the various offices within the New Orleans District Corps of Engineers and other agencies that will be involved in the feasibility study efforts.

11. BUDGET AND COST ESTIMATES

The baseline cost estimate is shown in Annex E. The Open Plan schedule is included in Annex E. The incremental feasibility study cost estimate shown is $4,525,000; and the fully-funded cost estimate is $4,899,000.

Revisions to the PSP will be required if significant changes are made to the specific work scope. At key points throughout the study the necessity of remaining tasks will be evaluated. If an alternative is eliminated from further analysis, costs associated with related tasks will be deducted from the total study cost. The budget and schedule will be revised as needed.

12. SCHEDULE

A Critical Path Method (CPM) network schedule showing the logical progression of all the activities required for the feasibility study are presented in Annex E. This schedule is based on the assumptions presented in Annex A, SPECIFIC WORK SCOPE (INDIVIDUAL TASKS). The current schedule assumes that the New Orleans District will receive approval to initiate the feasibility phase in March 1998.

The schedule of major study milestones is presented below:

MILESTONE	ACTION
2 Mar 1998	Initiate Study
9 Feb 1999	Initiate H&H Alternative Analysis
3 May 1999	Document Environmental Impacts
10 May 1999	Complete Economic Analysis of Existing Conditions
28 Jun 1999	Complete Economic Benefit Analysis
20 Aug 1999	Initiate Geotechnical Design
12 May 2000	Complete Preliminary Cost Estimate
18 Aug 2000	Select NED Plan
16 Feb 2001	Finalize Engineering Designs
22 May 2001	Alternative Formulation Briefing (AFB) Meeting
18 Sep 2001	Complete Draft Feasibility Report
08 Feb 2002	Submit Final Report and Environmental Impact Statement

13. CURRENT BENEFITS PLAN

Project benefits for the selected plan will be developed and will reflect an effective date corresponding to submission of the draft feasibility report. The feasibility report and the Project Management Plan will present a plan for updating project benefits for the selected plan every 2 years.

14. LOCAL COOPERATION PLAN

The cash requirements of the local sponsor, presented in Annex E, Baseline Cost Estimate, will be made available as follows: for each fiscal year of the study, the Government shall, no later than 60 days prior to the beginning of the fiscal year, notify the local sponsor of the sponsor's cash requirement for the upcoming fiscal year. No later than 15 calendar days after the beginning of the fiscal year, the local sponsor shall verify to the satisfaction of the Government that it has deposited the requisite amount in an escrow account acceptable to the Government, with interest accruing to the local sponsor. As the study progresses, the Government will adjust the cash amounts required to be provided by the local sponsor such sums as the Government deems necessary to cover contractual and in-house fiscal obligations attributable to the study as they are incurred.

A copy of the escrow agreement to be executed between the Government, the local sponsor, and the financial institution is provided as Annex G.

15. ACQUISITION PLAN

The Federal Acquisition Regulations (FAR) and the Engineer FAR (EFAR) require the preparation of an acquisition plan. The acquisition plan will provide a comprehensive and concise picture of what is being procured, how the proposed acquisition will take place, and to document why the type or manner of procurement was most appropriate for the acquisition planned. The acquisition plan will be a coordinated product of the appropriate functional elements, contracting, and the Small and Disadvantaged Business Utilization Office (SADBU). The acquisition plan will be developed during the feature design memorandum phase of project development for construction contracts.

16. REAL ESTATE PLAN

Real Estate Division, New Orleans District, will prepare a Real Estate Plan (REP), which will include a Baseline Cost Estimate (Chart of Accounts) for the selected plan(s), as well as milestones and other pertinent real estate information. Cost estimates for lands and damages associated with the various alternatives will be prepared and included in the alternative cost estimates used to screen and select the recommended plan. The baseline cost estimate for real estate required for the selected plan will include a gross appraisal, which will be reviewed and approved according to current

delegated authority.

The Sponsor will acquire all necessary rights-of-entry for the accomplishment of field investigations such as: surveys; soil borings; cultural resource investigations; environmental assessments; hazardous, toxic and radioactive waste surveys; and other exploratory activities, including the right of ingress and egress to perform these activities, as deemed necessary for completion of the study.

17. QUALITY CONTROL PLAN

The quality control plan (QCP) for the Darlington Reservoir feasibility study provides a technical review mechanism insuring that quality products are developed during the course of the study by the New Orleans District (NOD). Technical review will consist of a single level study review and will be performed at NOD throughout the course of the study. The Mississippi Valley Division (MVD) will be responsible for verifying that NOD's products meet the needs and expectations of the customer, and that competent technical resources are utilized throughout the design and review process. One level of policy review for the Darlington Reservoir study will be performed at the Headquarters of the United States Army Corps of Engineers (HQUSACE), and will insure that all applicable statutes have been applied with respect to cost sharing, project purpose and budget criteria. All processes, quality control, quality assurance, and policy review, should compliment each other producing a seamless review process which identifies and resolves technical and policy issues during the course of the study and not during the final study stages.

The QCP for the Darlington Reservoir feasibility study has been formulated to provide for a sound technical review process at the NOD level which focuses on several objectives. Primarily, quality technical products will be produced through an effective and comprehensive single level technical review process throughout product development while verifying that functional, legal, safety, health and environmental requirements are satisfied. This review process will insure that cost effective solutions, while maintaining product requirements, are developed. Technical review will also act as a mechanism to avoid startovers and re-design efforts, and will assure accountability for the technical quality of the product. Each technical review objective in the QCP will be satisfied through a seamless review process performed by NOD (technical review), MVD (quality assurance of technical products) and HQUSACE (policy review). The scope of the Darlington Reservoir feasibility studies quality control plan is based upon applicable guidance from higher authority including the Report of the Task Force on Technical Review, dated December 1994, and CELMV-ET memorandum of 23 September 1995, subject: Lower Mississippi Valley Division, Directorate of Engineering and Technical Services, Quality Control and Quality Assurance Guidance.

17.1. TECHNICAL REVIEW

Based upon cost, technical expertise, and current and projected work load, the technical review for the Darlington Reservoir feasibility study will be conducted by in-house resources. The local sponsor, and the U. S. Fish and Wildlife Service will also be involved in the review process by participating in Interdisciplinary Planning Team (IPT) meetings. These agencies will also be invited to have a representative on the Technical Review Team. In-house technical review is expected to result in a lower project and review cost when compared to out-of-house services, thereby adding value to the project and yielding the most cost effective method for technical review. In terms of technical expertise, NOD has a vast amount of experience and capability in order to produce a quality product for the Darlington Reservoir study given the moderate size and complexity of the project. Based upon the current and projected work load of NOD, the current project study plan indicates that the study will be completed in approximately four years. This duration is well within the acceptable timeframe for a flood control feasibility study. Also, NOD has completed numerous planning studies with the local sponsor, Louisiana Department of Transportation and Development, and appreciates and understands their needs, requirements, and desires in flood control studies.

17.2. TECHNICAL REVIEW TEAM (TRT)

The TRT for both Planning and Engineering Divisions will be responsible for performing an independent technical review of the Darlington Reservoir feasibility study. The TRT will be established at the initial stages of the study and will be maintained to the maximum extent possible during the life of the study. At the initial study stages, the TRT will consist of one or more reviewers from each functional area within each division, and will consist of existing senior staff who perform other technical work but are not involved in the technical products under review. The TRT will be comprised of the same disciplines on the IPT, and will have experience in the type of analyses in which they are responsible for reviewing. Each TRT member will be senior or equal in experience to the analyst or production person. The TRT will be responsible for verifying; 1) assumptions, 2) methods, procedures, and material used in analyses based on the level of analyses, 3) alternatives evaluated are reasonable, 4) appropriateness of data used, and level of data obtained, 5) reasonableness of results, and 6) products meet customer needs and are consistent with law and existing policy. The makeup of the TRT may be modified as the study progresses to match the review requirements as the complexity of the alternatives better defined. The changes to the TRT may result in out-of-house resources.

17.2.1. Planning Division Technical Review Members

Technical Review Members will be from the functional areas within Planning Division which include Plan Formulation Branch, Economics Branch, and Environmental Branch. Each functional area will be represented by one or more reviewers on the TRT from the various disciplines. Thus, a minimum of three members from Planning

Division will reside on the TRT for the Darlington Reservoir feasibility study.

17.2.2. Engineering Division Technical Review Members

The Technical Review Members were selected from the design offices based upon the moderate complexity of the Darlington Reservoir feasibility study. The members may change as the project progresses and specific project features are better defined. The TRT will consist of a TRM at the GS-12 Civil Engineer level from Projects Engineering Section of the Design Services Branch, and representatives from the various design offices. The design offices include Civil Branch, Cost Engineering Branch, General Engineering Branch, Geotechnical Branch, Hydraulics & Hydrologic Branch, Structures Branch, and Design Services Branch. Each branch will be represented by one or more reviewers on the TRT from the various disciplines. Thus, a minimum of seven Engineering Division members will reside on the TRT for the Darlington Reservoir feasibility study.

The Darlington Reservoir feasibility study Technical Review Team comprised of Planning, Engineering, Operations, Real Estate, and Programs and Project Management Divisions will consist, as a minimum, of the following disciplines:

Darlington Reservoir Feasibility Study Technical Review Team Members

DISCIPLINE	DIVISION	BRANCH	SECTION
Economist	Planning	Economic and Social Analysis	General Water Resources Section
Environmentalist	Planning	Environmental Analysis	Environmental Studies
Cultural Resource Specialist	Planning	Environmental Analysis	Natural/Cultural Resource Analysis
Recreational Resource Specialist	Planning	Environmental Analysis	Natural/Cultural Resource Analysis
Review Manager	Planning	Plan Formulation	Basin Special Planning
Hydraulic Engineer	Engineering	Hydraulics & Hydrologic	Hydraulic Design
Environmental Engineer	Engineering	Hydraulics & Hydrologic	Hydraulic Modeling
Cost Estimator	Engineering	Cost Engineering	Cost Engineering
Civil Engineer	Engineering	Geotechnical	Dams, Levees, & Channel Slopes
Civil Engineer	Engineering	Civil	Waterways
Civil Engineer	Engineering	Structures	Flood Control Structure
Civil Engineer	Engineering	Civil	Levees
Civil Engineer	Engineering	Design Services	Relocations

Civil Engineer	Engineering	Design Services	Projects Engineering
Reality Specialist	Real Estate	Acquisition	Acquisition
Appraiser	Real Estate	Appraisal	Appraisal
Attorney	Real Estate	Legal Support	Legal Support
Civil Engineer	Operations	Tech Support	Flood Control

17.3. TECHNICAL REVIEW MEETINGS AND CRITICAL CHECKPOINTS

The quality control process recognizes that the appropriate place to perform one-on-one verification for both Planning Division and Engineering Division products will vary among the functional areas. However, the verifications will occur prior to the release of data and/or final products to another office/division, but may include reviewers and IPT members from other functional areas. The one-on-one verifications for both divisions will occur numerous times throughout the current four year schedule. In fact, the number of one-on-one verifications are too numerous, for practical purposes, to be shown on the Open Plan diagram. Therefore, the one-on-one verifications for both divisions are shown as a hammock on the Open Plan diagram. Each one-on-one verification meeting will be documented and become part of the quality control records used in the quality assurance process by MVD.

In addition to the one-on-one verification process, Engineering Division has several critical checkpoints during the development of engineering design products. Based upon the moderate complexity of the Darlington Reservoir feasibility study, the milestone review schedule for engineering design products will be completed at 25%, 40%, 60%, 80%, and 95% completions. The percentages will reflect funds expended. However, during the course of the study the completions may be changed to reflect time elapsed and/or significant break points in the study. The draft copy of the Darlington Reservoir feasibility report will be reviewed and provided to the entire TRT for their review and comments at the 95% completion milestone.

In addition to the one-on-one verification process, there are also points within the study process where it is appropriate for the TRT and IPT to perform the verification process as a team. This feature of the quality control process allows the flexibility to optimize the one-on-one verification process within the functional area while maintaining the team concept during the Technical Review Meetings. Each meeting will be documented and become part of the quality control records used in the quality assurance process by MVD. For the Darlington Reservoir feasibility study, four Team Technical

Review Meetings and two critical checkpoints have been scheduled.

17.4. QUALITY CONTROL RECORDS

Quality control records for both Planning and Engineering Division products will be maintained in a technical review package prepared by the IPT leader and included in the Darlington Reservoir feasibility report. The package will consist of review comments, and a certification checklist. The review comments will summarize the major issues/comments from the independent technical review along with the response or resolution to each comment. The Planning Division technical review checklist will also be included within the report as a means of documenting the independent technical review. Both the Planning and Engineering Division checklists will assure that the major elements of the quality control plan have been followed. Planning Division reviewers will sign the checklist, certifying that, for their particular subject area, the document conforms to pertinent regulations, guidance, and sound professional practices. Prior to the submittal of the draft report to HQUSACE the checklist will be completed by the Planning Division functional chief, reviewed by the Chief of Planning Division, and signed by the District Commander as part of the required report documentation. Engineering Division's quality control records, comments and resolutions, will accompany the design document, and the design checklists will serve as a tool for the TRT and will become part of the district's files.

18. VALUE-ENGINEERING PLAN

During the feasibility study, a Value-Engineering Plan will be developed for the selected plan and detailed in the Project Management Plan. This plan will discuss the need for a cost effectiveness review.

19. SAFETY PLAN

Field investigations will be conducted following current safety regulations. The local sponsor will assist the study team in identifying hospitals and emergency facilities throughout the project area.

20. SECURITY PLAN

This element has been evaluated and is not applicable to the study.

21. CULTURAL AND RECREATIONAL RESOURCE PLAN

This work activity requires an in-house evaluation of project alternatives. Effort will focus on designing and implementing cultural resources investigations, monitoring project developments, and coordinating efforts with the State Historic Preservation Officer (SHPO) and the Advisory Council on Historic Preservation (ACHP).

Contractor assistance will be required to conduct an intensive survey of approximately 25 percent of any areas previously not impacted by construction. The contractor will be responsible for conducting investigations using appropriate professional methods and techniques to identify cultural resources within the sample area, and assessing them for National Register (NR) of Historic Places eligibility according to established criteria. The contractor will complete any NR forms, if appropriate, and prepare a written report of findings. The report will provide recommendations for the protection and preservation of significant cultural resources and include a discussion on the potential for sites in the unsurveyed portions of the project area.

22. RECREATION PLAN

The New Orleans District will conduct a recreation investigation for presentation in the report and EIS and for review by higher authority and subsequent coordination with the public and other agencies as required by the Federal Water Project Recreation Act of 1965 (PL 89-72) to study recreation as an equal and incremental project feature. The investigation will be completed through field investigations and coordination with the National Park Service and Louisiana Office of Cultural Recreation and Tourism, Louisiana Office of State Parks and through contractual agreement with A/E firm.

23. ENVIRONMENTAL PLAN

The New Orleans District will conduct the feasibility study such that there are no unmitigated adverse impacts on significant resources, including endangered species. This will be done using the following:

a. Environmental design/landscape planning. Alternatives will be designed to avoid environmental impacts and minimize unavoidable impacts in the immediate area of construction. Environmental design will include recommendations of the U.S. Fish and Wildlife Service and various State and local natural resource agencies. Cultural and esthetic resources will be assessed and impacts considered in plan formulation, design, and mitigation planning.

b. Environmental Impact Statement. An Environmental Impact Statement will be prepared for Urban Flood Control and will be coordinated with appropriate Federal, State, and local agencies as required for NEPA compliance. Compliance documents for Coastal Zone consistency and 404 (b) 1 guidelines will be prepared as required.

c. Mitigation plan. If required, a mitigation plan will be prepared after minimization of losses to compensate for any unavoidable environmental or cultural resource losses caused by construction or operation and maintenance activities, as well as losses due to induced development.

24. OPERATION AND MAINTENANCE

Operations Division, New Orleans District, will review all alternatives to determine the operation and maintenance requirements, recommend typical standard operating procedures, and estimate the operation, maintenance, replacement, and rehabilitation costs. This information will be coordinated with and approved by the non-Federal sponsor.

25. MANAGEMENT CONTROL PLAN

Management of this study will be in accordance with ER 5-7-1 and ER 1105-2-100. Cost, schedule, and technical performance will be monitored by the project manager and the planning functional manager utilizing standard procedures outlined in the regulations referenced above.

The FCSA shall formalize an Executive Committee and its responsibilities. The committee will be comprised of the district engineer, his chief planner, a person of commensurate decision making authority for the non-Federal sponsor and his primary technical advisor. The district engineer and his counterpart will co-chair the committee. During the feasibility phase, the committee will participate in the Issue Resolution Conference and participate in decisions and recommendations made by the Study Management Team. The Executive Committee will also be responsible for resolving any disputes that may arise during the feasibility phase and determining appropriate solutions and study direction, including termination or suspension.

In accordance with EC 1105-2-208, changes that significantly alter the scale and scope of the study as originally agreed to in the PSP, the Major MSC will notify HQUSACE so that all levels can reach a new agreement on the conduct of the study.

26. REPORTING REQUIREMENTS

Reporting of study progress and expenditures will be made utilizing the guidelines given in ER 1105-2-100 and ER 5-7-1.

27. CHANGE CONTROL PLAN

If a change in activity cost or schedule is identified during preparation of Management Control Reports or other study activities, the identifying team member will submit a Schedule and Cost Change Report (SACCR).

The project manager, in consultation with the study manager, sponsor, and appropriate technical managers, will determine whether a second Technical Review Conference or a reduced variation thereof is necessary to redetermine project scope. After the revised scope is agreed upon, the affected team members will submit SACCR's.

Submission and approval of SACCR's are not a correction for poor planning, poor execution, or efforts/expenditures outside the scope of the PSP. Necessary efforts/expenditures outside the scope of the PSP will be reviewed and approved by the project manager, study manager, and sponsor prior to being undertaken.

28. SCREENING AND SCOPE REVISIONS

Throughout the study process, various levels of screening will be completed for each alternative to determine the potentiality of Federal participation in the next phase, Preconstruction Engineering and Design (PED). Federal participation is primarily based upon the benefit to cost ratio and environmental acceptability. Currently, the benefit to cost ratio must exceed 1.0 for Federal participation. During the study process, each alternative that does not qualify for Federal participation, will be eliminated from further analysis. If an alternative is screened out, work task(s) associated with that alternative , as described in this annex, will not be required and thus eliminated. The associated cost(s) of each task(s) will be deducted from the total study cost.

29. RISK-BASED ANALYSIS FOR HYDROLOGY/ HYDRAULICS AND ECONOMICS

Risk and uncertainty are intrinsic in water resources planning and design. They arise from measurement errors and from the inherent variability of complex physical, social, and economic situations. All measured or estimated values in project planning and design are to various degrees inaccurate. Invariably the "true" values are different from the single, point values presently used in project formulation, evaluation, and design.

In order to account for such uncertainties, risk-based analysis will be completed for both the H&H analysis and economic analysis for the Darlington Reservoir feasibility study. Risk-based analysis is defined as an approach to evaluation and decision making that explicitly, and to the extent practical, analytically incorporates considerations of risk and uncertainty. It is recognized that the "true" values of key planning and design variables and parameters are frequently not known with certainty and can take on a range of values. One can describe, however, the likelihood of a parameter taking on a particular value by a probability distribution. The probability distribution may be described by its own parameters, such as, mean and variance for a normal distribution, or minimum and maximum, and most likely for a triangular distribution. The approach combines the underlying risk and uncertainty information so that the engineering and economic performance and associated reliability of a project can be expressed in terms of probability distributions.

The tools that will be used to complete the risk-based analysis for the Darlington Reservoir feasibility study will include @RISK, a general purpose Monte Carlo based risk analysis package, Hydrologic Engineering Center and Institute of Water Resources most current applications for risk-based analysis, and the traditional interactive flood damage analysis computer programs (SID-EAD) when updated to include risk-based analysis. Key

economic variables will include depth-damage curves, structure values, content values, structure first-floor elevations, and structure types. Key hydrologic and hydraulic parameters will consist of stage and discharge.

30. UNCERTAINTIES IN SCOPE OF WORK

The scope of work in this PSP defines the tasks required to complete the Darlington Reservoir feasibility study as currently scoped. The required tasks are based upon an assumption of three alternatives in feasibility phase. These required tasks and related costs, are subject to change during the course of the study if plan modifications, additional plans, or other study modifications are warranted. Amendments to the scope of work will be developed through consultations between the Federal and non-Federal cost sharing partners. All scope of work amendments must be agreed upon by both cost sharing partners prior to initiating any new task(s). If changes in the scope of work are required, the total study cost will be adjusted to reflect such changes. The cost sharing for any such changes shall equate to 50 percent Federal, and 50 percent non-Federal.

ANNEX A
SPECIFIC WORK SCOPE

PLANNING DIVISION (PD)

PLAN FORMULATION BRANCH

Plan Formulation Branch (PD-F)
Organization Code: B2K0200

What: Supervision of Plan Formulation Branch, Basin Special Planning Section, providing input to the subject project, as well as review of all input.

Why: To ensure that Branch goals and objectives are satisfied.

Who: One GS-15 and one GS-14 civil engineers and one GS-04 secretary.

When: Throughout the feasibility study.

How: Through meetings and oral, written, and electronic communications.

Time and Cost: 120 man-days/$84,000

Plan Formulation Branch, Basin Special Planning Section (PD-FB)
Organization Code: B2K0215

What: Public Involvement. Develop and implement a public involvement plan.

Why: To assure that agencies, groups, and individuals interested in the study are identified and contacted, and that their views and concerns relative to the study process and plan formulation are identified and addressed in the study.

Who: One GS-13 section chief, one GS-12 civil engineer, one GS-11 civil engineer, one GS-9 civil engineer technician, one GS-4 secretary and one GS-4 student.

When: Throughout the feasibility study.

How: A public involvement plan will be developed and implemented through a notice of study initiation, public meetings, workshops, and other public involvement. A notice of study initiation will be prepared and distributed according to an updated mailing list developed during the reconnaissance phase. News releases will be prepared in coordination with the public affairs office and distributed to the appropriate media. Responses to the notice of study initiation and media releases will be reviewed to identify study issues and concerns and responses will be

prepared. Issues and concerns will be presented to the Interdisciplinary Planning Team (IT) for consideration. Public meetings and workshops will be conducted as required to provide and receive information to and from the public, formulate a consensus, and develop a method for future interaction. One public meeting will be scheduled subsequent to the public release of the draft report and environmental assessment to present the study conclusions. Public meetings or workshops will be held during other stages of the study, if needed, to exchange information with the public. Recordings of the public meetings will be analyzed to ensure that the study is responsive to the needs and concerns of the public. Additional public coordination will include preparing correspondence to address individual issues and concerns, preparing and making presentations to business and civic groups interested in the study, and conducting meetings with local interests to determine their views and gather input to the study.

Time and Cost: 80 man-days/$46,000

What: Plan Formulation. The plans developed during the re-evaluation study will be refined, and additional plans developed if necessary.

Why: To assure that the National Economic Development (NED) Plan and the locally preferred plan are identified and that the best plan, from an overall standpoint, is recommended.

Who: One GS-13 section chief, one GS-12 civil engineer, one GS-11 civil engineer, one GS-9 civil engineer technician, one GS-4 secretary, and one GS-4 co-up student.

When: Throughout the feasibility study, prior to plan selection.

How: Plans will be investigated by the IT to assure that a range of viable alternative plans bracketing the National Economic Development plan is developed. Plan features will be refined, to the extent practical, to minimize costs and maximize benefits. Separable project features will be identified and incrementally analyzed. Input from other District elements will be analyzed to assure that all plan features are developed to the appropriate scope; that plan features and analyses are consistent with each other; that all adverse effects of the plan that may require modifications to the project are identified; and that appropriate modifications are included in the plan. Other plans will be developed to assure that the locally preferred plan is identified, developed, and evaluated. All plans considered will be responsive to all significant public concerns. The recommended plan will be developed through coordination with the IT, the Project Review Board (PRB), the local Sponsor, and other interests. This includes the development, presentation, and coordination of tentative study recommendations.

Time and Cost: 200 man-days/$100,000

What: Study Management.

Why: To implement the study in accordance with the PSP.

Who: One GS-13 section chief, one GS-12 civil engineer, one GS-11 civil engineer, one GS-9 civil engineer technician, one GS-4 secretary, and one GS-4 student.

When: Throughout the feasibility study.

How: Conduct the study in accordance with the PSP to develop alternative plans, modifications to those plans, and a comprehensive report through the management of the IT; the IT is composed of engineers, economists, real estate specialists, and environmentalists. Coordinate and synthesize the efforts of the IT members, District technical specialists, support personnel, consultants, contractors, and state, Federal, and local agencies participating in the study. Determine the work to be accomplished, work assignments, schedules, and guidance; and assist in resolving unusual or controversial problems. Monitor the progress of the study and report to higher echelons. Meet and deal with representatives of various governmental agencies and private organizations to discuss study related matters and problems. Negotiate differences on criteria and procedures for the processing of data and findings to be utilized to meet the established mutual goals and objectives of the study. Review the completed study material to assure that conclusions and decisions reached are consistent with sound engineering and planning practices and conform to Corps and other governmental policies and requirements. Perform research, review, and analysis of available engineering material to assist in the development of information pertaining to the study area, which may be required by IT members or higher echelon.

The Local Sponsor will appoint a Study Manager who will coordinate Sponsor activities with the Corps of Engineers. This individual will have the experience and background in similar studies and will be knowledgeable in local flood control. The Sponsor study manager will coordinate efforts to meet the obligations and schedules described herein when the Sponsor has a lead roll in an activity. When the roll of the Sponsor is to support an activity, the Corps manager will coordinate efforts to accomplish the assigned tasks in a timely manner.

Time and Cost: 500 man-days/$250,000

What: Report Preparation. Report preparation includes the preparation of the preliminary draft, draft, and final reports.

Why: The preliminary draft provides a presentation of study results for technical review by the in-house reviewers and higher authority prior to release for coordination with other agencies and the public. The draft report includes revisions in response to the planning guidance memorandum. The draft report is also released for coordination with other agencies and the public. The final report includes revisions in response to coordination with other agencies and the public.

Who: One GS-13 section chief, one GS-12 civil engineer, one GS-11 civil engineer, one GS-9 civil engineer technician, one GS-4 secretary, and one GS-4 student.

When: The various reports will be reviewed and submitted after receipt of input from all offices. Submittal dates are presented in Appendix G.

How: Report preparation includes writing and editing the main report (tables, plates, report covers, etc.) and assembling the report and its appendices. Coordination of printing of draft reports and the final report will be completed by the Corps study manager. Coordination of the draft report review and comment revisions with District, Division, the Sponsor, other agencies, and the public will be conducted through this office.

Time and Cost: 131 man-days/$66,000 Duration = 20 workdays

What: Budget Preparation.

Why: To support the Programs and Project Management Division with periodic updates of budget documents and study status reports.

Who: One GS-13 section chief, one GS-12 civil engineer, one GS-11 civil engineer and one GS-4 secretary.

When: Throughout the feasibility study for budget submissions.

How: Prepare PB-6's, justification sheets, supplemental information sheets, fact sheets, issue papers, etc., required for Initial, Office of Management and Budget (OMB), and Congressional budget submissions. Assist the project manager with the Division Engineer's annual budget presentation for Congressional hearings and follow-up responses to questions developed by Division, HQUSACE, and Congressional interests regarding the annual budget testimony.

Time and Cost: 15 man-days/$7,000

What: Project Management Support.

Why: To provide input to monthly reports for the District Project Review Board (PRB), Division PRB, HQUSACE PRB, and ASA (CW).

Who: One GS-13 section chief, one GS-12 civil engineer, and one GS-11 civil engineer.

When: Throughout the feasibility study.

How: The Corps study manager will assist in data gathering and monthly updating of information for the monthly PRB meeting.

Time and Cost: 15 man-days/$7,000

ECONOMIC AND SOCIAL ANALYSIS BRANCH

Economic and Social Analysis Branch (PD-E)
Organization Code: B2K0300

What: Supervision by Chief, Economic and Social Analysis Branch. Project supervision includes program coordination and review of economic analyses. As a functional chief, the branch chief also makes final decisions on technical review issues and exercises overall responsibility for the quality control plan.

Why: Supervision by the branch chief is necessary to ensure that program goals are achieved within an effective organizational setting and that all products comply with ER-1105-2-100 and other relevant guidance.

Who: One GS-14 supervisory economist.

When: This task occurs throughout the feasibility study.

How: Project supervision is accomplished through staff meetings, one-on-one meetings, official correspondence and other written communication.

Time and Cost:

GS-14 10 days of labor at $700 per day: $ 7,000

Duration: Throughout the study.

Economic and Social Analysis Branch, General Water Resources Section (PD-EW)
Organization Code: B2K0320

What: Document Historical Flood Damages. Historical data on major floods in the study area will be collected. Data sources include Federal Emergency Management Administration flood claim records, Red Cross surveys, conversations with local officials, post-flood reports compiled by the corps, and newspaper articles.

Why: Data collected on historical flooding will assist the Hydraulics and Hydrology Branch in developing overflow boundaries. These data can also be used to evaluate the accuracy of the software programs used to compute flood damages.

Who: One GS-12 senior economist and one GS-11 journeyman economist.

When: This task can begin upon receipt of study funds.

How: Reports will be solicited from agencies that gather flood-related data and research will be conducted using newspaper articles and post-flood reports. These materials will then be organized and evaluated. The results will then be delivered to the Hydraulics and Hydrology Branch.

Time and Cost:

GS-11 2 days of labor at $450 per day: $ 900
GS-12 1 day of labor at $540 per day: $ 540

Total Cost: $ 1,440

Duration: 3 days

What: Prepare Overflow Maps and Delineate Reach Boundaries. Aerial photographs showing 2-foot contours that were used for the 1992 feasibility study will be used for field surveys. Changes in the 500-year overflows, as developed by Hydraulics Branch, will be noted on the aerial photographs.

Why: Overflow maps are an essential tool in identifying those economic asses at risk in the study area which would be afforded protection by a Federal flood control project and as a guide during field surveys. Study reaches are established in order to properly model the variance in flood stages over the study area for a given project storm.

Who: One GS-12 senior economist and one GS-11 journeyman economist.

When: This task can begin upon receipt of final adjustments to the 500-year overflows from the Hydraulics and Hydrology Branch.

How: Any new overflow boundaries and/or reach designations will be drawn onto contour maps in close coordination with staff of the Hydraulics and Hydrology Branch.

Time and Cost:

GS-11 10 days of labor at $450 per day: $ 4,500
GS-12 3 days of labor at $540 per day: $ 1,620

Total Cost: $ 6,120

Duration: 20 days

What: Collect Residential Structure Inventory. An inventory of all residential structures within the overflow boundaries will be collected. This inventory consists of a single record for each structure. Each record contains information with respect to the particular structural characteristics which includes residential structure type, quality of construction, square feet of living area, effective age, condition, number of stories, type of heating and cooling equipment, composition of exterior wall, composition of roof, number of fireplaces, type of garage, and square feet of garage space. For each structure, the local address, associated study reach, ground elevation, and elevation of the first floor are also indicated.

The structure inventory used in the 1992 feasibility study was compiled in April 1985 by Gulf South Research Corporation (GSRC). Structure values were estimated through a record of real estate transfers that reflected current prices instead of depreciated replacement costs. Due to the age and potential inaccuracy of the collected data and the likely significant growth in housing stock in the 12 years since 1985, a new structure inventory will be required. If the hydrologic reaches change, there will need to be an extensive effort to reaggregate the structures within those reaches.

Why: An inventory is required in order to establish the number of residential structures that would benefit from a given flood damage reduction project. Recordation of structure characteristics is essential in order to compute the depreciated replacement cost of each structure.

Who: One GS-12 senior economist and one GS-11 journeyman economist.

When: This task can begin once overflow areas and study reaches have been established.

How: Structure characteristics will be obtained through field investigations.

Time and Cost:

GS-11 7 days of labor at $450 per day: $ 3,150
GS-12 5 days of labor at $540 per day: $ 2,700

Total Cost: $ 5,850

Duration: 15 days

What: Collect Commercial Inventory. Commercial structures added to the floodplain since 1985 will be inventoried in the same manner as residential structures. This inventory consists of a single record for each structure. Each record contains information with respect to the particular structural characteristics which includes commercial structure class, quality of construction, square feet of interior area, occupancy classification, shape, effective age, condition, number of stories, story height, type of heating and cooling equipment, availability of elevators, and existence of sprinkler systems. For each structure, the local address, associated study reach, ground elevation, and elevation of the first floor are also indicated. For industrial structures, a field count will be conducted, followed by a direct mail survey in order to acquire detailed structural characteristics that cannot be ascertain by field inspection.

Why: An inventory is required in order to establish the number of commercial and industrial structures that would benefit from a given flood damage reduction project. Documentation of structure characteristics is essential in order to compute the depreciated replacement cost of each structure.

Who: One GS-12 senior economist and one GS-11 journeyman economist.

When: This task can begin once overflow areas and study reaches have been established.

How: Structure characteristics will be obtained through field investigations.

Time and Cost:

GS-11 7 days of labor at $450 per day: $ 3,150
GS-12 3 days of labor at $540 per day: $ 1,620

Total Cost: $ 4,770

Duration: 10 days

What: Compile Inventory for Future Development. An update to the 1988 land use study prepared by the Louisiana State Planning Office will be used to project the future land usage in the area under both without and with-project conditions for residential, commercial, and industrial structures that are expected to be constructed during the period of analysis. These structures will be assigned to selected study reaches and placed at the appropriate ground and first floor elevations according to the prevailing floodplain development regulations.

Why: Flood damage reduction benefits may accrue to structures that are expected to be added to the floodplain during the period of analysis.

Who: One GS-12 senior economist and one GS-11 journeyman economist.

When: This task can begin once overflow areas and study reaches have been established.

How: Evolving patterns of land use will be investigated. Historical land use patterns; current trends; and natural and regulatory constraints on development will be used to project future land use. Consistent with the results of the land use survey, projections will be made of population and housing in the study area. Housing growth trends will be developed using U.S. Department of Commerce, Bureau of the Census data and other appropriate sources. Results will be compared to available projections made by university research departments and local planning agencies.

Time and Cost:

GS-11 5 days of labor at $450 per day: $ 2,250
GS-12 7 days of labor at $540 per day: $ 3,780

Contract Cost: $ 5,000

Total Cost: $11,030

Duration: 30 days

What: Determine Structure Values. The depreciated replacement cost of all structures within the overflow boundaries will be estimated.

Why: The monetary value of flood damage for structures and their contents is directly related to the value of the structures.

Who: One GS-12 senior economist and one GS-11 journeyman economist.

When: This task can begin upon the completion of field surveys.

How: Characteristics for each structure in the inventory are entered into the Marshall and Swift Valuation Service software program. Operated on an interactive basis, this software uses construction cost data, gathered by region and updated quarterly, to provide a detailed estimate of the depreciated replacement cost of each structure.

Time and Cost:

GS-11 20 days of labor at $450 per day: $ 9,000
GS-12 7 days of labor at $540 per day: $ 3,780

Total Cost: $12,780

Duration: 25 days

What: Develop Depth-Damage Relationships. Depth-damage functions describe the relationship between the level of water in a structure and the amount of damage that is sustained. These functions are used to compute flood damages and are expressed in terms of "percent damage to structure" and "percent damage to contents." The structure is defined as the building and its components, including built-in appliances, shelves, and carpeting. Contents include all items within a structure that are not permanently attached. Percent damage to structure is defined as the percentage of the depreciated replacement cost of the structure that is damaged at a given level of inundation; percent damage to contents is defined as the percentage of the depreciated replacement cost of the contents within the structure that are damaged at a given level of inundation. Within each function, percent damage varies in direct relation to water depth. Unique depth-damage functions will be used according to residential or commercial structure types, the type of flooding (freshwater or saltwater), and the duration of flooding.

Why: Depth-damage functions provide an efficient and reliable method of computing the value of flood damages for a range of flood events.

Who: One GS-12 senior economist and one GS-11 journeyman economist.

When: This task can begin once overflow areas and study reaches have been established.

How: Depth-damage functions will be obtained through a private industry contract. A panel of local experts will be assembled to develop depth-damage relationships for prototypical structures and contents in the study area. Based on field surveys and professional experience, panel members will define a prototypical structure and a set of prototypical contents for each residential and commercial structure type. The panel will then estimate a replacement cost for each structure based on its value as new construction. Next, the panel will develop depth-damage functions by assessing the damage to each component of the structure at increasing flood depths. The component damage is defined as the cost to repair or replace the item. If the cost to repair the item is less than the cost to replace it, then repair cost is used. For components that can not be repaired, the replacement cost is used. After each component in the structure is analyzed, the total damages at each increment of flooding are summed and shown as a percentage of the total replacement cost of the structure. A similar procedure is used for constructing depth-damage functions for contents.

Time and Cost:

GS-12 10 days of labor at $540 per day: $ 5,400

Contract Cost: $91,000

Total Cost: $96,400

Duration: 45 days

What: Develop Contents-to-Structure Value Ratios. The contents-to-structure value ratio (CSVR) represents the value for the depreciated replacement cost of the contents within a structure as a proportion to the depreciated replacement cost of the structure itself. Unique CSVRs exist for each type of residential and commercial structure.

Why: CSVRs are used to compute flood damages to structure contents as a function of the total value of the structure.

Who: Costs included in Depth-Damage task above.

When: Task included above.

How: CSVRs will be obtained through the same a private industry contract used to acquire depth-damage functions. A panel of local experts will valuate the contents of a prototypical by type and relate that estimate to the replacement cost of the structure.

Time and Cost:

Included in Depth-Damage task: $0

What: Prepare Estimates of Measurement Error. Measurement error associated with estimates of structure values, first-floor elevations, depth-damage functions, and content-to-structure value ratios will be evaluated and expressed in the form of probability distributions. These distributions, along with those that reflect measurement error for the stage-frequency curves, will be used to prepare a cumulative probability distribution for project benefits associated with each construction alternative. This "risk-based analysis" will comply with the requirements specified in the Guidance for Conducting Civil Works Planning Studies (ER 1105-2-100), Rev. May 1997, and in Risk-Based Analysis for Evaluation of Hydrology/Hydraulics, Geotechnical Stability, and Economics in Flood Damage Reduction Studies (ER 1105-2-101), 1 March 1996.

Why: Cumulative probability distributions describe the likelihood that project benefits will exceed certain values. These data can serve as valuable information for project sponsors who are interested in comparing the performance of alternative construction plans. As a result of this investigation, it is possible that risk-based analysis may provide project sponsors with a rationale to select a plan that shows a relatively high probability that benefits exceed a certain level,

although the most likely level of benefits is less than those of alternative plans.

Who: One GS-12 senior economist.

When: This task can be pursued concurrently with tasks related to the compilation of structure value, elevation, depth-damage function, and content-to-structure value ratio data.

How: Measurement error for structure values will be obtained by consulting realty specialists who use alternative software programs in estimating the depreciated replacement costs. A sufficient number alternative estimates for each structure type will be gathered in order to define the corresponding probability distributions. Measurement error for first-floor elevations will be based on the degree of accuracy specified for the surveys used to establish study area contours. Measurement error for the depth-damage functions and the contents-to-structure value ratios will be quantified by the panel of local experts, reflecting the diversity of the estimates prepared by individual panel members prior to the compilation of consensus estimates.

Time and Cost:

GS-12 5 days of labor at $540 per day: $ 2,700

Total Cost: $ 2,700

Duration: 10 days

What: Prepare Flood Damage Model Input Files. Technical data collected on 23 basins encompassing 90 study reaches, each with unique stage-frequency curves, will be compiled and examined. Economic and hydrologic data will be integrated as necessary and input in an automated urban flood damage program for computer execution.

Why: All data relevant to the computation of flood damages must be organized into the format that is usable by the flood damage analysis model.

Who: One GS-12 senior economist and one GS-11 journeyman economist.

When: This task can begin once the structure inventory, structure values, depth-damage functions, content-to-structure value ratios, and stage-damage curves for each project condition are acquired.

How: Information related to study reach, structure type, structure value, occupancy code (for commercial structures), ground elevation, and first floor elevation data, along with program codes specified by the model, are manually written into individual records and stored in a computer data file. A separate data file is assembled that contains depth-damage functions and

content-to-structure value ratios which correspond to all structure types found in the study area, and which reflect the type (freshwater or saltwater) and duration of flooding. For each study reach, stage-frequency data for existing conditions and each project alternative are manually input into a third data file. Stage-frequency data for 23 basins encompassing 90 study reaches will be entered.

Time and Cost:

GS-11 14 days of labor at $450 per day: $ 6,300
GS-12 3 days of labor at $540 per day: $ 1,620

Total Cost: $ 7,920

Duration: 20 days

What: Calculate Average Annual Flood Damages under Future Without-Project Conditions. The SID flood damage analysis model will be used to estimate average annual damages under future without-project conditions. If, during the period of analysis, no changes are expected in the structure inventory and study area hydrology, then damage estimates under conditions prevailing in the base year (existing conditions) are identical to those under future without-project conditions. In this case, a minimum number of model runs will be required to calculate average annual damages for each study reach. If changes in structure inventory or study area hydrology are anticipated, additional model runs will be conducted in order to estimate future damages by year; once these additional runs are completed, the separate estimates of future damages will be annualized.

Why: The estimate of flood damages under without-project conditions is used to measure the effectiveness of alternative construction plans in reducing flood damage.

Who: One GS-12 senior economist and one GS-11 journeyman economist.

When: This task can begin once the flood damage input files have been prepared.

How: Configuration files within flood damage analysis program are established in order to model the characteristics of the flood plain at the level of individual study reaches and to call the appropriate input files during program execution. Once model execution is completed, output files, which summarize damage estimates by study reach and flood zone, are then carefully inspected. Should unusual or unreasonable results be found as a result of this inspection, a reevaluation of model inputs will be conducted, data adjustments will be made, and additional model runs will be performed until the highest level of accuracy in computing damage estimates is achieved.

Time and Cost:

GS-11 2 days of labor at $450 per day: $ 900
GS-12 1 day of labor at $540 per day: $ 540

Total Cost: $ 1,440

Duration: 4 days

What: Calculate Average Annual Flood Damages under Future With-Project Conditions. The SID flood damage analysis model will be used to estimate average annual damages under future with-project conditions. Separate model runs will be conducted for each construction plan and, within each plan, for designs which provide alternative degrees of flood protection. If, during the period of analysis, no changes are expected in the structure inventory and study area hydrology, then damage estimates under conditions prevailing in the base year are identical to those under future with-project conditions. In this case, a minimum number of model runs will be required to calculate average annual damages for each study reach. If changes in structure inventory or study area hydrology are anticipated, additional model runs will be conducted in order to estimate future damages by year; once these additional runs are completed, the separate estimates of future damages will be annualized.

Why: The estimate of flood damages under with-project conditions is used to measure the effectiveness of alternative construction plans in reducing flood damage.

Who: One GS-11 journeyman economist.

When: This task can begin once the flood damage input files have been prepared.

How: Configuration files within flood damage analysis program are established in order to model the characteristics of the flood plain at the level of individual study reaches and to call the appropriate input files during program execution. Once model execution is completed, output files, which summarize damage estimates by study reach and flood zone, are then carefully inspected. Should unusual or unreasonable results be found as a result of this inspection, a reevaluation of model inputs will be conducted, data adjustments will be made, and additional model runs will be performed until the highest level of accuracy in computing damage estimates is achieved.

Time and Cost:

GS-11 2 days of labor at $450 per day: $ 900

Total Cost: $ 900

Duration: 2 days

What: Calculate Flood Damage Reduction Benefits for Structures and their Contents. An estimate of benefits representing reduced flood damage to structures and their contents located within the study area will be prepared for each construction plan and, within each plan, for designs which provide alternative degrees of flood protection.

Why: Estimates of project benefits are used to establish the economic justification of alternative plans as part of benefit-cost and optimization analyses.

Who: One GS-12 senior economist.

When: This task can begin once calculation of benefits under without-project and with-project conditions have been completed.

How: For each plan and construction design, damage estimates are subtracted from without-project condition damage estimates.

Time and Cost:

GS-12 1 day of labor at $540 per day: $ 540

Total Cost: $ 540

Duration: 1 day

What: Calculate Flood Damage Reduction Benefits for Vehicles. An estimate of benefits representing reduced flood damages to vehicles will be prepared.

Why: Flood damage reduction for vehicles represents a project output that can be used to establish the economic justification for alternative construction plans.

Who: One GS-12 senior economist and one GS-11 journeyman economist.

When: This task can begin once the configuration of the flood damage analysis model is completed.

How: The approach for calculating flood damage benefits for vehicles is similar to that for structures and contents. First, an inventory of vehicles is compiled, depreciated replacement costs for vehicles are estimated, and depth-damage functions are established. Then, input files are assembled for use in the flood damage analysis programs. Vehicle damages under without-

project and with-project conditions are computed and compared to yield an estimate of vehicle benefits associated with each construction plan.

Time and Cost:
GS-11 2 days of labor at $450 per day: $ 900
GS-12 2 days of labor at $540 per day: $1,080

Total Cost: $1,980

Duration: 5 days

What: Calculate Project Benefits for Other Categories. An estimate of benefits for categories other than flood damage reduction will be prepared. These additional categories of benefits include the reduction of emergency costs, reoccupation costs, and Federal Insurance Administration (FIA) operating costs. Emergency costs are comprised of food, clothing, and personal items for victims; cleanup operations; placement of barricades and sandbags; overtime pay for law enforcement officials, emergency management officials, emergency operations personnel, public works employees and mosquito and rodent control specialists; and flood damage surveys conducted by the American Red Cross and Corps of Engineers. Reoccupation costs represent the time that homeowners and business owners spend to contract, supervise, and inspect repairs; to clean and disinfect their homes; and to process claims for casualty losses and flood damage assistance. FIA costs are the costs, measured on a per policy basis, to administer the national flood insurance program and can be lowered since fewer policies will be maintained as structures are removed from the 100-year flood plain by flood control projects.

Why: Flood damage reduction for other categories represents a project output that can be used to establish the economic justification for alternative construction plans.

Who: One GS-12 senior economist and one GS-11 journeyman economist.

When: This task can begin once the configuration of the flood damage analysis model is completed.

How: Since emergency costs and reoccupation costs are incurred only during flooding events, the benefit estimation methodology is similar to that used for structures and vehicles. An emergency and reoccupation cost per flood event and per structure will be estimated by consulting with local officials and researching published data. FIA costs per policy are published annually by CECW-PD in Economic Guidance Memoranda and are used directly with model outputs showing the number of structures removed from the 100-year flood plain.

Time and Cost:

GS-11 5 days of labor at $450 per day: $ 2,250
GS-12 3 days of labor at $540 per day: $ 1,620

Total Cost: $ 3,870

Duration: 10 days

What: Conduct Benefit Analysis for Alternative Plans. Flood damage reduction benefits for structures, vehicles, and other benefit categories will be combined in order to estimate total benefits attributable to each construction alternative.

Why: All creditable benefit categories for a construction alternative should be summed in order to accurately assess project performance as measured by National Economic Development outputs.

Who: One GS-12 senior economist and one GS-11 journeyman economist.

When: This task can begin once benefit estimates in all categories have been prepared.

How: The present value of benefits in each category will be identified separately and annualized using the Federal discount rate prevailing in the fiscal year in which the analysis is conducted. Average annual benefits in each category will be summed in order to derive total average annual benefits for each construction plan considered.

For alternative plans that have different base years, average annual net benefit estimates will be compounded or discounted, as appropriate, to a common year in order to equitably compare plans.

Time and Cost:

GS-11 8 days of labor at $450 per day: $ 3,600
GS-12 5 days of labor at $540 per day: $ 2,700

Total Cost: $ 6,300

Duration: 15 days

What: Conduct Cost Analysis for Alternative Plans. Estimates of the average annual cost required to implement each construction alternative will be prepared.

Why: The economic feasibility of each construction alternative can only be established by

measuring the extent to which average annual project benefits exceeds average annual project costs. Average annual project costs are also required for optimization analysis.

Who: One GS-12 senior economist.

When: This task can begin once cost estimates for each construction alternative are received.

How: Expenditures for project construction, estimated on an annual basis by Engineering Division, will be compounded to the base year at the applicable Federal discount rate to determine total implementation costs. These costs will then be annualized over the period of the project life at the Federal discount rate to yield an average annual estimate of project first costs. Future operations and maintenance (O&M) expenditures, estimated by Engineering Division for each year of the project, will be discounted at the Federal discount rate to the base year in order to determine the present value of these costs. The present value of O&M costs will then be annualized over the period of the project life at the Federal discount rate to yield an average annual equivalent of these costs. Average annual first costs are then added to average annual O&M costs to produce an estimate of total average annual project costs. This procedure is repeated for each construction alternative.

Time and Cost:

GS-12 3 days of labor at $540 per day: $ 1,620

Total Cost: $ 1,620

Duration: 5 days

What: Conduct Net Benefit and Optimization Analyses. Estimates of net benefits for each construction alternative will be prepared. The alternative that shows the highest level of net project benefits will be identified.

Why: The alternative that exhibits the greatest difference between estimated benefits and costs contributes the most to national income, constitutes the preferred plan from a public investment standpoint, and is identified as the National Economic Development Plan.

Who: One GS-12 senior economist.

When: This task can begin once project benefit and cost estimates have been completed.

How: In net benefit analysis, estimates of average annual project costs are subtracted from average annual project benefits for each construction plan to yield estimates of average annual net project benefits. In optimization analysis, each alternative is evaluated according to the

magnitude of average annual net project benefits. The plan that shows the highest level of net project benefits is designated as the National Economic Development Plan. In addition, the ratio of project benefits to project costs is calculated for all alternatives. Those alternatives that show benefit-to-cost ratios of 1.0 or greater are economically justified.

Time and Cost:

GS-12 3 days of labor at $540 per day: $ 1,620

Total Cost: $ 1,620

Duration: 3 days

What: Evaluate Net Project Benefits Under the Risk-Based Analysis Approach. Incorporating estimates of measurement error obtained in prior tasks, an estimate of net benefits and the corresponding benefit-to-cost ratio will be reported both as a single expected value and on a probabilistic basis (value of the net benefit and its associated probability) for each construction alternative. The confidence, in probabilistic terms, that net benefits are positive and that the benefit-to-cost ratio is at or above 1.0 will be presented for each alternative.

Why: The total effect of risk and uncertainty on project design and economic feasibility can be expressed through explicit tradeoffs between risks and costs. Project sponsors have the opportunity to examine these tradeoffs and make more a more informed decision in selecting among project alternatives that reflect unique risk preferences.

Who: One GS-12 senior economist.

When: This task can begin upon completion of the net benefit analysis.

How: A series of Lotus 1-2-3 spreadsheet programs developed by the Hydrologic Engineering Center and Institute for Water Resources will be used to calculate net project benefits within the risk-based analysis framework. Within these spreadsheet programs, which are designed to operate in conjunction with the *@Risk* add-on to Lotus 1-2-3, a probability distribution will be defined for each critical economic and hydrologic variable for each construction alternative. The probability distributions will be assembled using data previously obtained in the task associated with estimating measurement error. Through a step-wise process involving numerous iterations within an established sampling methodology, spreadsheet macros will be executed in order to derive 1) stage-damage, stage-frequency, and damage-frequency curves with associated confidence intervals and 2) cumulative probability distributions. From these cumulative probability distributions, each construction alternative is compared in terms of the probability that net project benefits exceed specific values. The results will be summarized in tables and graphs.

Time and Cost:

GS-12 20 days of labor at $540 per day: $ 10,800

Total Cost: $ 10,800

Duration: 30 days

What: Conduct Net Benefit Analysis for Non-Structural Alternatives. Net benefits will be estimated for non-structural flood control alternatives which may include structure raising, flood proofing, structure relocation, and ring levees.

Why: Non-structural measures may constitute the most effective and efficient means of addressing local flooding problems under circumstances where structural alternatives generate comparatively fewer NED benefits or where selected areas of the floodplain do not achieve significant damage reductions under the NED plan.

Who: One GS-12 senior economist and one GS-11 journeyman economist.

When: This task can begin once the structure inventory has been compiled and the costs for implementing the selected non-structural alternatives are received from Engineering Division.

How: Existing flood damage analysis programs have the ability to calculate the average annual benefit associated with a particular non-structural alternative for each structure in the flood plain inventory. The computation of damage reduction benefits for non-structural plans occurs simultaneously with that for structural plans as the flood damage analysis programs are executed. Non-structural measures are incrementally justified by comparing the economic benefit accruing to a given structure for a given non-structural plan with its associated cost. Costs to implement a non-structural alternative for a given structure is computed by multiplying the implementation cost per square foot, (obtained from Engineering Division) by the number of square feet in the structure.

Time and Cost:

GS-11 5 days of labor at $450 per day: $ 2,250
GS-12 3 days of labor at $540 per day: $ 1,620

Vehicle cost for 5 days @ $30/day: $ 150
Per Diem - 1 person @ 5 days @ $100/day: $ 500

Total Cost: $ 4,520

Duration: 10 days

What: Conduct Social Impact Analysis for Input into the Environmental Assessment. A comparison of the social impacts associated with each project alternative to a no-action alternative will be presented.

Why: The evaluation of socioeconomic impacts is an integral part of the environmental impact assessment process that is required by the National Environmental Policy Act of 1969.

Who: One GS-11 journeyman economist.

When: This task can begin once the final array of construction alternatives has been determined.

How: A description of the social and economic conditions in the study area under existing conditions for each of a number of resource areas identified in Section 122 will be prepared using secondary sources. From this description professional judgement will be used to assess future conditions in each resource area under the no-action alternative and each construction alternative.

Time and Cost:

GS-11 7 days of labor at $450 per day: $ 3,150

Total Cost: $ 3,150

Duration: 10 days

What: Conduct Financial Analysis. The local sponsor's financing plan will be reviewed and a preliminary commander's assessment of the local sponsor's ability to cost share will be prepared.

Why: This analysis is necessary in order to determine whether the local sponsor has the capability to meet the financial obligations for the selected plan in accordance with the project funding schedule. A preliminary commander's assessment is a required part of the project cost sharing agreement.

Who: One GS-12 senior economist.

When: This can begin once the selected plan is determined, a fully-funded project cost estimate is prepared, and the local sponsor submits a copy of their financing plan.

How: The local sponsor submits a copy of their financing plan which features a sources and uses of funds statement and an explanation of the method that will be used to acquire funds to meet its

obligations under the project cost sharing agreement. The financing plan will be assessed using information supplied by the local sponsor, such as financial statements and documents related to the statutory tax and bonding authorities, and private organizations, such as Moody's and Standard and Poor's. Section personnel will work closely with representatives of the local sponsor in order to ensure that the financing plan is accurate and meets all regulatory requirements. The conclusions of the review of the financing plan will be presented in the commander's assessment.

Time and Cost:

GS-12 22 days of labor at $540 per day: $ 11,880

Total Cost: $ 11,880

Duration: 25 days

What: Study Coordination and Preparation of Report. Study coordination includes: the planning and monitoring of study budgets and schedules; participation in staff meetings, interdisciplinary planning team meetings, in-progress review conferences, and *ad hoc* meetings; staff supervision; the processing of official correspondence; and the preparation of inputs to meetings, conferences, and reviews to brief the New Orleans District, Mississippi Valley Division, and Headquarters USACE on study issues and status. Report preparation consists of writing and editing a manuscript which describes the methodology used in the economic analysis and the conclusions of the investigation. The report narrative, tables, graphs and related documentation will be presented in a logical manner to illustrate study results. Included in this task are section and branch review of the economics report and district review of the feasibility report.

Why: Study coordination is essential to ensure that the economic analysis is prepared within established schedules and budgets and that all resources are available to accomplish this goal. Report preparation is the principal means by which the results of the economic analysis is documented and communicated to other corps elements, the local sponsor, and the public.

Who: One GS-13 supervisory economist, one GS-12 senior economist, and one GS-11 journeyman economist.

When: Study coordination occurs throughout the feasibility study. Report preparation begins once risk-based analysis is completed.

How: Study coordination is accomplished through staff meetings, one-on-one meetings, official correspondence and other written communication. Report input is a product of expository writing which presents in a detailed, clear, and logical manner an explanation of each step that was performed in the economic analysis and the that were results achieved. Report input is

supplemented with numerous graphs and tables which not only provide all relevant data used in reaching conclusions but which systematically illustrate the study methodology employed.

Time and Cost:

GS-11 5 days of labor at $450 per day: $ 2,250
GS-12 30 days of labor at $540 per day: $16,200
GS-13 30 days of labor at $510 per day: $15,300

Total Cost: $33,750

Duration: 60 days

ENVIRONMENTAL ANALYSIS BRANCH

Environmental Analysis Branch, Environmental Studies Section (PD-RS)
Source Code: B2K0410

What: Notice of Intent. Prepare Notice of Intent to produce as EIS and publish in Federal Register. Prepare Scoping Input Request and mail to interested parties. Depending on response from Scoping Input Request, one or more public scoping meetings may be held.

Why: By regulation, the Notice of Intent must be published.

Who: GS-12 biologist (environmental impact statement coordinator).

When: The notice would be published in the Federal Register and then scoping would begin.

How: Information necessary for this task would be readily available from information generated for Phase 1 of the study.

Time and Costs: 6 man-days @ $500/day = $3,000

What: Scoping. Review past scoping results and obtain additional information from the public to identify any new concerns and issues to be addressed in the EIS.

Why: Regulations require scoping.

When: This task would be performed in the early Phase of the feasibility study.

How: Information could be obtained through mail, meetings with concerned individuals or groups, and public.

Time and Costs: 30 man-days @ $500/day = $15,000

What: Document Significant Resources and Environmental Setting. Conduct interagency field trip. Determine significant resources to be discussed in the EIS and prepare environmental setting (existing condition).

Why: Required by regulations.

Who: GS-12 biologist (environmental impact statement coordinator). The EIS coordinator would also assemble and format information from other district elements. such as PD-EN and ED.

When: This task would be performed during the early phase of the feasibility study.

How: Information would be obtained through field trips, published reports, aerial photography, information collected for the reconnaissance study, unpublished information available from other agencies, and local interviews.

Time and Costs: 25 man-days @ $500/day = $12,500

What: Determine most probable future without project which can be incorporated into the project alternatives.

Why: The future under No Action must be documented in order to compare impacts of alternatives.

Who: GS-12 biologist (environmental coordinator).

When: Planning for environmental features would occur during preliminary design of project alternatives.

How: An interagency team of biologists would project trends into the future to estimate possible future conditions.

Time and Costs: 15 man-days @ $500/day = $7,500

What: Conduct preliminary and field habitat evaluation which document existing conditions.

Why: Minimizing and avoiding environmental impacts are the first two steps in mitigation planning.

When: Planning for environmental features would occur during preliminary design of project alternatives.

How: Environmental features would be developed through brainstorming sessions of the Interdisciplinary Planning Team and consultation with natural resource agencies.

Time and Costs: 20 man-days @ $500/day = $10,000

What: Determine Environmental Features - develop and determine appropriate environmental features which can be incorporated into the study alternatives. Coordinate environmental features with the study manager and the design engineers.

Why: To minimize or avoid environmental impacts through design.

Who: GS-12 biologist

When: After existing conditions are documented and general information about the plans is known.

How: Interagency and IT meetings.

Time and Costs: 20 man-days @ $500/day = $10,000

What: Determine and assess direct and indirect biological impacts of project alternatives.

Why: Documentation of impacts of alternatives required in the EIS by the NEPA and CEQ Guidelines.

Who: GS-12 biologist (environmental coordinator)

When: This effort would occur early during Phase II of the study.

How: Published and unpublished written information and consultation with knowledgeable persons along with personal knowledge would be the primary sources of information.

Time and Costs: 80 man-days @ $500/day = $40,000

What: Instream Flow Modeling or Comparable analysis - for fisheries impacts of areas potentially impacted by alternatives under consideration.

Why: Required to determine the need for fish and wildlife mitigation. Mitigation of the loss of fish and wildlife habitats is required by WRDA 86, Section 906.

Who: Contract or MIPR.

When: During impacts analysis, in order to incorporate in the PEIS.

How: Collect field data to produce model and then run the model for all alternatives.

Time and Costs: 120 man-days @ $500/day = $60,000

What: Complete Habitat Evaluation of areas potentially impacted by alternatives under consideration.

Why: Required to determine the need for fish and wildlife mitigation. Mitigation of loss of fish and wildlife habitats is required by WRDA 86, Section 906.

Who: GS-12 biologist (environmental coordinator)

When: During Phase II of the study, in order to incorporate in the PEIS.

How: HEP suitability index models for key species or HES manual would be utilized or other appropriate method. Previously noted field trips would provide the information to determine existing habitat suitability.

Time and Costs: 30 man-days @ $500/day = $15,000

What: Develop Fish and Wildlife Mitigation Plans for Remaining Impacts & Incremental Analysis. Determine and develop mitigation plans for all alternatives for impacts to fish and wildlife habitats. Plans may include avoiding and minimizing impacts through project design changes and compensation for unavoidable impacts.

Why: Mitigation planning is required by WRDA 86, Section 906.

Who: GS-12 biologist (environmental coordinator).

When: After all impact analyses complete in order to incorporate into the PEIS.

How: The EIS coordinator will be the primary entity. The USFWS and other District elements will provide ideas, technical information, and cost estimates in order to develop the plans. The EIS coordinator and the USFWS will cooperatively determine fish and wildlife habitat benefits associated with each of the mitigation plans evaluated.

Time and Cost: 100 man-days @ $500/day = $50,000

What: Preparation of Fish and Wildlife Coordination Act Report. USFWS provides assistance in impact identification and analysis, HEP analysis, mitigation planning, and for the preparation of the USFWS Coordination Act Report (CAR).

Why: A CAR is required by the Fish and Wildlife Coordination Act.

Who: U.S. Fish and Wildlife Services, Lafayette Field Office. (The EIS must contain responses to the recommendations contained in the CAR.)

When: Mitigation planning would occur throughout. The CAR would be required in time to incorporate recommendations in the PDEIS.

How: The USFWS will provide professional assistance in developing and evaluating mitigation plans for the various alternatives. The Coordination Act Report contains a detailed description of the biological resources found in the study area, an evaluation of the effects of the tentatively selected plan, and recommended mitigation features that may include avoidance, minimization, and compensation for impacts to fish and wildlife resources or habitats. The USFWS will use their collective personal knowledge, published literature, the comments of the Louisiana Department of Wildlife and Fisheries (and possibly the National Marine Fisheries Services), and their appropriate regulations to prepare the report.

Time and Cost: MIPR for $35,000

What: Water Quality Certification.

Why: To satisfy requirements of the Clean Water Act.

Who: GS-12 biologist (environmental coordinator).

When: After impacts analysis is complete.

How: Apply to DEQ for water quality certification, advertise in Baton Rouge paper.

Time and Cost: 25 man-days @ $500/day = $12,500

What: 404 (b)(1) Evaluation. Prepare evaluation document for the preferred plan and prepare and send out public notice.

Why: Compliance with Clean Water Act.

Who: GS-12 biologist.

How: Using published literature, maps, models, and professional knowledge.

Time and Cost: 40 man-days @ $500/day = $20,000

What: Mussel Survey of upper reach of Amite River for Alabama heelspliter mussel and bird survey of pinelands for red-cockaded woodpecker Field efforts to document any changes in habitat range from survey conducted in the 1980's.

Why: Compliance with Endangered Species Act.

Who: Contract.

When: After details of alternatives are known.

How: Divers and biologist for mussels, biologist for woodpeckers.

Time and Cost: 30 man-days @ $500/day = $15,000

What: Prepare Endangered Species Assessment. Prepare evaluation document for the preferred plan and prepare and send out public notice.

Why: Compliance with Endangered Species Act.

Who: GS-12 biologist.

When: After details of alternatives are known and finish when 3-D model runs are complete.

How: Using published literature, maps, models, and professional knowledge+ new mussel surveys and results of three dimensional modeling of the river.

Time and Cost: 50 man-days @ $500/day = $25,000

What: Air quality assessment. Documentation of the amount of ozone and possibly other pollutants from construction and operations must be documented and held below the threshold for the area.

Why: To satisfy requirements of the Clean Air Act.

Who: GS-12 biologist (environmental coordinator) or contract.

When: After details of alternatives are known so that numbers and types of construction equipment are known.

How: From the numbers and types of construction equipment, tables of emissions are used to calculate the hourly and daily amounts.

Time and Cost: 30 man-days @ $500/day = $15,000

What: Preparation of environmental appendix for the EIS. Specific items include documentation of Prime and Unique Farmland Coordination, Threatened and Endangered Species Consultation, Section 404 (b)(1) Evaluation, State Water Quality Certification, and Coastal Zone Management Act Consistency Determination.

Why: To satisfy requirements of various laws and regulations including the Farmland Protection Policy Act, Endangered Species Act, Clean Water Act, and the Coastal Zone Management Act.

Who: GS-12 biologist (environmental coordinator).

When: After details of alternatives are known and impact analysis is complete.

How: Published literature will be used to prepare biological assessments for threatened and endangered species if assessments are warranted. 7 CFR 658 would be used to analyze impacts to prime and unique farmlands. The section 404 (b)(1) evaluation will follow either the "short form" format utilized by the district or the "long form" format found in Appendix N to ER 1105-2-100. The format designed by the Louisiana Department of Natural Resources will be used for the Coastal Zone Consistency Determination (if a determination is deemed necessary).

Time and Cost: 40 man-days @ $500/day = $20,000

What: Feasibility Report. Provide PD-F with environmental input to draft feasibility report.

Why: To provide cost data, so that data and findings in the EIS and the Feasibility Report agree.

Who: GS-12 biologist (environmental coordinator).

How: Summarize important data and findings for the feasibility report.

Time and Cost: 15 man-days @ $500/day = $7,500

What: Prepare DEIS. Based on the results of the Alternative Formulation Briefing (AFB) prepare narrative for various sections of the DEIS. Specifically, the cover sheet, summary, table of contents, purpose and need for action, alternatives, affected environment/ environmental consequences, list of preparers, mailing list, and index must be prepared and formatted into an appropriate written presentation. Prepare hard copy of the DEIS and environmental appendix for integration into the feasibility report.

Why: To fulfill requirements of the NEPA.

Who: GS-12 biologist (environmental coordinator). The EIS coordinator, will assemble all the l sections of the EIS.

When: This is the major, time-consuming effort required to assemble the EIS following the AFB. A District technical review and subsequent revision may be necessary prior to release of the report to the public and higher authority. This effort would occur during the middle to latter part of Phase II.

How: The information to be contained in the DEIS will be generated during the course of Phase II investigations by the interdisciplinary team.

Time and Cost: 40 man-days @ $500/day = $20,000

What: District Technical Review of DEIS. The DEIS must be reviewed by pertinent district elements to ensure that assumptions and facts presented in each section are as correct as possible.

Why: To fulfill requirements of the NEPA.

Who: District reviewers.

When: During initial planning and after DEIS is complete.

How: The environmental coordinator will send the DEIS to all concerned district elements for review.

Time and Cost: 25 man-days @ $500/day = $12,500.

What : Mapping, GIS, Photos, Graphics. Produce maps, graphics, GIS maps, etc. used in analyses or presentation in the EIS.

Why: To fulfill requirements of the NEPA.

Who: CADD/GIS/Photography specialists or contract.

When: Phase I and II

How: The environmental coordinator will request the specialist to prepare any needed materials.

Time and Cost: 20 man-days @ $400/day = $10,000

What: Travel. Site visits, field habitat work, out of town meetings.

Why: To fulfill requirements of the NEPA.

Who: GS-12 biologist.

When: Throughout the study.

How: Use of government vehicles, TDY near the site.

Time and Cost: $1,000

What : EIS and Feasibility Report Coordination. There will be many informational meetings, phone calls, requests for information, etc. that must be met. Includes participation in the AFB and FRC.

Why: To fulfill requirements of the NEPA.

Who: GS-12 biologist.

When: Throughout the study.

How: The environmental coordinator will attend meetings and handle phone calls and requests for information from the public.

Time and Cost: 35 man-days @ $500/day = $17,500

What: Revise DEIS. Make revisions to DEIS as required after District Technical Reviews.

Why: To fulfill requirements of the NEPA.

Who: GS-12 biologist.

When: After district review.

How: Change DEIS as needed.

Time and Cost: 20 man-days @ $500/day = $10,000

What : Branch Supervision and Secretary.

Why: Quality control.

Who: GS-13/14 biologists and GS-5 secretary.

When: Throughout the process.

How: Coordinate and Review documents.

Time and Cost: $30,000.

What : Prepare Filing Package, Transmittal letters and mail DEIS.

Why: NEPA compliance.

Who: GS-12 biologist (environmental coordinator).

When: During and after Report/DEIS is printed.

How: Work with secretary to get all letters typed and documents packaged and mailed

Time and Cost: 8 man-days @ $500/day = $4,000

What : Public review of DEIS and Public Meeting.

Why: NEPA compliance.

Who: GS-12 biologist (environmental coordinator).

When: After Report/DEIS is sent out for 45-day public review.

How: Coordinate and attend public meeting and respond to public inquiries.

Time and Cost: 10 man-days @ $500/day = $5,000

What : Supervision and Secretary.

Why: Quality Assurance.

Who: GS-13/14 biologists and GS-5 secretary.

When: During DEIS preparation and review.

How: Coordinate and attend public meeting and respond to public inquiries.

Time and Cost: $10,000

What : Respond to PGM and Public Comments on DEIS. - prepare Public Involvement Appendix which includes the public and agency comments on the DEIS and responses to these comments.

Why: NEPA compliance.

Who: GS-12 biologist (environmental coordinator) and other personnel as needed. The EIS coordinator will prepare responses to comments on environmentally related issues. Depending on the level of comments, some or all of the District elements that provided input to the EIS may have to provide input to the responses. Modify EIS and necessary.

When: Immediately after 45 day public review period concludes.

How: Read all comments and gather additional information if necessary.

Time and Cost: 85 man-days @ $500/day = $42,500

What : Prepare FEIS. - Prepare Final EIS for filing and public review.

Why: NEPA compliance.

Who: GS-12 biologist (environmental coordinator) and other personnel as needed. The EIS coordinator will prepare responses to comments on environmentally related issues. Depending on the level of comments, some or all of the District elements that provided input to the EIS may have to provide input to the responses. Modify EIS as needed.

When: Immediately after 45 day public review period concludes and the above task is complete.

How: Read all comments and gather additional information if necessary.

Time and Cost: 60 man-days @ $500/day = $30,000

What: Preparation of Final Fish and Wildlife Coordination Act Report. USFWS provides assistance in impact identification and analysis, HEP analyses, mitigation planning, and for the preparation of the USFWS Coordination Act Report (CAR).

Why: A CAR is required by the Fish and Wildlife Coordination Act.

Who: U.S. Fish and Wildlife Service, Lafayette Field Office. (The EIS must contain responses to the recommendations contained in the CAR.)

When: During preparation of FEIS.

How: The USFWS will provide professional assistance in developing and evaluating mitigation plans for the various alternatives. The Coordination Act Report contains a detailed description of the biological resources found in the study area, an evaluation of the effects of the tentatively selected plan, and recommended mitigation features that may include avoidance, minimization, and compensation for impacts to fish and wildlife resources or habitats. The USFWS will use their collective personal knowledge, published literature, the comments of the Louisiana Department of Wildlife and Fisheries (and possibly the National Marine Fisheries Service), and their appropriate regulations to prepare the report.

Time and Cost: MIPR for $15,000

What : Prepare transmittal letters for filing with EPA and public review.

Why: NEPA compliance.

Who: GS-12 biologist (environmental coordinator)

When: During and after printing of the Report/FEIS.

How: Coordinate with secretary.

Time and Cost: 8 man-days @ $500/day = $4,000

What : Record of Decision. Prepare decision document for District Commander's signature after public review of the FEIS.

Why: Final NEPA compliance.

Who: GS-12 biologist (environmental coordinator)

When: After review of any comments on the Report/FEIS.

How: Coordinate with secretary.

Time and Cost: 8 man-days @ $500/day = $4,000

What : Supervision and Secretary.

Why: Quality Assurance.

Who: GS-13/14 biologists and GS-5 secretary.

When: During FEIS preparation and review.

How: Review documents.

Time and Cost: $5,000

Environmental Analysis Branch, Natural and Cultural Resource Analysis Section (PD-RN)

Organization Code: B2K0425

What: Cultural Resources Investigation. The full wet reservoir project alternative will be evaluated to determine its potential impact to cultural resources. The other two project alternatives are contained within the large full wet reservoir; thus, there is no need to design three separate cultural resource plans.

Why: Geologic data will be examined to determine the potential each project alternative has for presence of cultural resource sites.

Who: Staff archeologist from Planning Division will review cultural resource records and reports to determine if previously recorded cultural resource sites are located in the project area.

How: In-House labor will be utilized to prepare a scope of work for the completion of cultural resource sample survey and site testing for the full wet reservoir project alternative. Following completion of the field investigation, the contractor will prepare a technical report summarizing his/her finding and recommendation for future investigation. The report will discuss those sites found within each project alternative and the potential for additional resources in the unsurveyed portions of the project area. Preliminary evaluations and recommendations will also be made regarding National Register of Historic Places eligibility and the need for additional investigations. In-House labor will be utilized to manage and monitor the contractor's work and coordinate the review process with the SHPO. Completion of this work will also provide sufficient data for completion of cultural resource input into the Environmental Impact Statement.

Time and Cost:

TASK	DAYS	COST
In-house research, contract preparation and management	40	$24000
Field investigations and report (contractor furnished)		$80000
Forward contractor furnished report and COE recommendation to SHPO for review and comment	4	$2400
Prepare input for EIS and feasibility report	6	$3600

What: Recreation Investigation. Recreation planning coordination and input into PD report. Technical COR for site specific study.

Why: For presentation in the report and EIS for review by higher authority and subsequent coordination with the public and other agencies as required by the Federal Water Project Recreation Act of 1965 (PL 89-72)to study recreation as an equal and incremental project feature.

Who: One GS-12 Outdoor Recreation Planner. Contract with an A/E Firm to conduct site specific study.

When: Upon notice to commence and availability of funds.

How: Through field investigations and coordination with the National Park Service and Louisiana Office of Culture Recreation and Tourism, Louisiana Office of State Parks and through contractual agreement with A/E firm.

Time and Cost: hired labor - 1 man - year @/$100,000
contract labor 1 study (18 months) @/ $250,000

What: Preparation of a comprehensive commercial/industrial land-use history and environmental agency records review for an HTRW Initial Site Assessment (ISA) to be completed for the project area as part of the feasibility study.

Why: To satisfy HTRW requirements.

Who: Planning Division staff (in-house labor) will prepare and manage contract.

How: The actual ISA will be prepared and compiled inhouse. The ISA will incorporate the data compiled from previously noted contract work, and will include all appropriate inquiry into the previous ownership and uses of the area property consistent with good commercial or customary practice. The full wet reservoir project alternative will be evaluated. The other two project alternatives are contained within the large full wet reservoir; thus, there is no need to design three separate HTRW plans.

Time and Cost: The completion of the ISA will enable COE Planning Division staff to reduce the risk of HTRW health and safety problems from project construction and operation, and identify potential costly HTRW conflicts.

TASK	DAYS	COST
HTRW Land-use History		

and Agency Review:

In-house research, contract preparation and management	20	$12,000
Field investigations and report (contractor furnished)		$28,000
Prepare input for feasibility report	6	$3,600

Environmental Projects Section (PD-RP)
Organization Code: B2K0420

What: Completion of an on-the-ground reconnaissance and field report including interviews and any additional research in support of the HTRW Initial Site Assessment (ISA) to be completed for the project area as part of the feasibility study.

Why: To satisfy HTRW requirements.

Who: Planning Division staff (in-house labor) will prepare and manage contract.

How: The actual ISA will be prepared and compiled inhouse. The ISA will incorporate the data compiled from previously noted contract work, and will include all appropriate inquiry into the previous ownership and uses of the area property consistent with good commercial or customary practice. The full wet reservoir project alternative will be evaluated. The other two project alternatives are contained within the large full wet reservoir; thus, there is no need to design three separate HTRW plans.

Time and Cost: The completion of the ISA will enable COE Planning Division staff to reduce the risk of HTRW health and safety problems from project construction and operation, and identify potential costly HTRW conflicts.

TASK	DAYS	COST
HTRW Environmental Data:		
Contract preparation and management	5	$2500
Field investigations and report		

(contractor furnished)		$41000
Prepare feasibility report and research	20	$8800

Engineering Division

CIVIL BRANCH

Civil Branch (ED-L)
Organization Code: B2L0400

What: Engineering Coordination. Supervise all sections in Civil Branch.

Why: To assure that branch goals and objectives are met for each alternative.

Who: One GM-14 Civil Engineer, and one GS-5 Secretary.

When: During all phases of the project requiring input from Civil Branch.

How: Through meetings and oral, written, and electronic communications.

Time and Cost: 4 man-days @ $550/day= $2,200

Civil Branch, Waterways Section (ED-LW)
Organization Code: B2L0430

What: Waterways design channel alignment for report input including channel feature lengths, widths, and project depths. Develop and/or refine design including quantity estimates and disposal requirements.

Why: For input to the development of channel design and cost estimates for three alternative plans; for input to the land, easement and rights-of-way requirements for the real estate cost estimate; and to input to the direct construction impacts for the environmental assessment.

Who: One GM-13 Civil Engineer, one GS-12 Civil Engineer, one GS-11 Civil Engineer, one GS-9 Civil Engineering Technician, and one GS-7 Civil Engineering Technician.

When: The channel design task will start following the completion of certain channel cross sections data collection along the project reaches. Hydraulic Design Section will then develop a hydraulic model, calculate discharges and determine appropriate channel sizes.

How: The survey data and H&H channel sizes will be used to develop layout of the channels,

compute quantities to be excavated, and determine disposal requirements. Also, will develop cost estimates and prepare report plates.

Time and Cost: 60 man-days @ $500/day = $30,000
Duration 6 months after receipt of survey data and H&H design

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COST ENGINEERING BRANCH

Cost Engineering Branch (ED-C)
Organization Code: B2L0600

What: Prepare preliminary construction cost estimates for each alternative based upon an evaluation of each line item from cost engineering's historical data (including previous MCACES projects) or abbreviated (non-detailed) estimating procedures.

Why: Prepare a detailed MCACES cost estimate for one selected plan. In addition to the detailed cost estimate for each line item, the MCACES includes contingency costs based upon a risk analysis via a range estimating computer program which addresses the uncertainty in both engineering data and costs for each feature of work.

Who: GS-12 senior cost engineer will perform the work with supervision by GS-12 team leader and a GM-14 Branch Chief.

When: Ongoing with design data.

How: Engineering knowledge with emphasis on construction cost estimating.

Time and Cost: Alternatives 15 days - $10,000
1 MCACES 30 days - $22,000

What: Cost Engineering Specialist from engineering division will prepare detailed cost estimates for structural mitigation.

Why: Mitigation cost estimates will be needed for calculation of Project costs.

Who: GS-12 cost estimator from ED.

When: After mitigation details are known.

How: Using published literature, maps, models, and professional knowledge.

Time and Cost: 5 man-days @ $500/day = $2,500

DESIGN SERVICES BRANCH

Design Services Branch (ED-S)
Organization Code: B2L0500

What: Supervision and Review of Feasibility Level Design. Supervision of all sections in Design Services Branch providing input to the subject project. Review of input and output.

Why: To assure that Branch goals and objectives are met.

Who: GS-14 Civil Engineer and GS-05 Secretary

When: During all phases of the project requiring input from Design Services Branch.

How: Through meetings and oral, written, and electronic communications.

Time & Cost: $10,000

Design Services Branch, Drafting Section (ED-SD)
Organization Code: B2K0530

What: Provide drafting support for preparation of displays and input to the feasibility report.

Why: To provide engineering figures and plates.

Who: GS-09 Civil Engr Technician

When: The duration of the study.

How: Using CADD.

Time and Cost: $6,000

Design Services Branch, Project Engineering Section (ED-SP)
Organization Code: B2K0520

What: Coordinate and prepare total project and yearly cost estimates and schedules for

Engineering Division work during the feasibility phase. Track expenditures and schedules. Assemble right-of-entry requirements and send request to Real Estate, coordinate and track progress. Assemble and initiate survey and aerial photography requests, coordinate, and track progress. Distribute and oversee directives for Engineering Division work. Coordinate Engineering Division work to ensure work is being accomplished in accordance with project objectives and on schedule; hold meetings with Engineering Division personnel as necessary. Coordinate preparation and presentations with Planning Division for Technical Review Conference(s) and the Feasibility Review Conference. Coordinate with higher authority to advise them of project status and to resolve design problems. Develop and update steering committee sheets; attend steering committee meetings. Attend IT meetings and public meetings. Assist in preparation of LCA and review LCA. Coordinate input to Engineering Appendix. Develop cost estimates and schedules for remaining reports (FDMS, P&S, etc.) and cost estimates for E&D during construction. Assemble Code of Accounts cost estimate. Develop expenditure by FY schedule. Assemble input, put in proper format, rewrite as required and prepare additional input to the Engineering Appendix. Coordinate review of draft report and review draft report; assemble comments. Coordinate, prepare and assemble responses to comments. Revise Engineering Appendix as necessary. Coordinate Engineering Division input to PMP. Coordinate Engineering Division review of the PMP and review PMP. Assemble comments and transmit to Project Management Office.

Why: To document the engineering designs and cost estimates of alternatives studied and the recommended plan.

Who: GS-13 Supervisor
GS-12 Engineer
GS-09 Civil Engr Technician
GS-04 Secretary

When: The duration of the study.

How: Through meetings and oral, written, and electronic communications using current work processing programs.

Time and Cost: Labor Time:
Cost: $150,000
Duration: 4 years

Design Services Branch, Relocations Section (ED-SR)
Organization Code: B2L0510

What: Relocations studies for facilities identification, plan development, coordination, cost estimates, and report preparation.

Why: To determine impacts of all interfering facilities.

Who: GS-13 Supervisors
GS-12 Engineer
GS-11 Civil Engineering Technician
GS-04 Secretary

When: Upon determination of the locations and dimensions of the project features by design elements.

How: Research existing files for pertinent information; prepare new files using information still current; visit sites to verify/identify facilities; conduct investigations to identify the owners and possible affected facilities; request from owners detailed designs, specific project requirements, and applying the District's relocations criterion to the existing facilities- identify the affected utilities and determine the extent of the relocation. Request from Real Estate Division a preliminary investigation report on compensable interest. Generate a relocations cost estimate. Participate in numerous coordination efforts through correspondence and meetings with District personnel. Prepare a relocations write-up for input into the feasibility report. Include in this write-up procedures for accomplishing the relocations and identify the parties responsible for the relocations cost.

Time and Cost: Labor Time - 54 man-days
Costs - $25,000.00
Duration - 7 Months

ENGINEERING CONTROL BRANCH

Engineering Control Branch (ED-E)
Organization Code: B2L0700

What: Fund Management in CEFMS.

Why: To manage the funds allotted to Engineering Division for their portion of the work.

Who: One GS-11 Program Analyst and others.

When: During all phases of the project requiring input from Engineering Division.

How: Through meetings and oral, written, and electronic communications in conjunction with CEFMS.

Time and Cost: 20 man-days @ $400/day= $8,000

What: Technical Review Coordination for Engineering Division

Why: To coordinate technical review for all branches in Engineering Division.

Who: One GS-12 Engineer

When: During all phases of the project requiring input from Engineering Division.

How: Through meetings and oral, written, and electronic communications.

Time and Cost: $4,000

GENERAL ENGINEERING BRANCH

General Engineering Branch (ED-G)
Organization Code: B2L0800

What: Supervision and Review of Feasibility Level Design. Supervision of all sections in General Engineering Branch providing input to the subject project. Review of input and output.

Why: To assure that Branch goals and objectives are met.

Who: GS-14 Civil Engineer and GS-05 Secretary

When: During all phases of the project requiring input from General Engineering Branch.

How: Through meetings and oral, written, and electronic communications.

Time & Cost: $2,000

What: Prepare detailed feasibility scope electrical and mechanical designs and cost estimates for all features of the alternative selected from the pre-screening process to be included in the detailed design.

Why: To furnish electrical and mechanical design input for Feasibility Report

Who: GS-12 or GS-13 engineer

When: Upon completion of preliminary studies and pre-screening process that determines final feature types, sizes and locations. All detailed design parameters are required to perform this work.

How: Gather required physical data, develop design criteria and parameters and perform design calculations for electrical and mechanical features. Provide input to cost estimate.

Time & Cost: Labor Days: 20
Cost: $14,000
Duration: 2 months

GEOTECHNICAL BRANCH

Geotechnical Branch (ED-F)
Organization Code: B2L0300

What: Supervision and Review of Feasibility Level Design. Supervision of all sections in Geotechnical Branch providing input to the subject project. Review of input and output.

Why: To assure that Branch goals and objectives are met.

Who: GS-14 Civil Engineer
GS-05 Secretary

When: During all phases of the project requiring input from Geotechnical Branch.

How: Through meetings and oral, written, and electronic communications.

Time & Cost: Time to Accomplish Tasks : 8 Labor Days(LD)
Cost @ $513 / LD : $4,100
Duration : 8 Months

What: One on One Independent Technical Review (ITR) for geotechnical design

Why: To ensure technical review of geotechnical design

Who: GS-12 engineers

When: As required throughout the dam design process

How: Through one on one meetings with the geotechnical designer and technical reviewer.

Time & Cost: $2,750

Geotechnical Branch, Subsurface Exploration Unit (ED-FG-S)
Organization Code: B2L0351

What: Feasibility Level Design for the Darlington Reservoir. - Drill four 100 ft undisturbed borings, two in the west abutment terrace area and two in the east abutment terrace. Clear and survey the area to determine the ground and water table elevations. Transport soil samples to NOD lab.

Why: To determine the types of soil in the foundation.
To obtain soil samples for laboratory tests.

Who: Major portion WG-5
WG-7
WG-10
Supervision and review WL-10, WS-10, GS-13

When: After Real Estate Division provides Right-of-Entry.

How: By using a drill rig and following standard drilling procedures.

Time & Cost: Time to Accomplish Tasks : Labor Days (LD)
Cost @ $ / LD : $18,000
Duration : 1 Month

Geotechnical Branch, Soil and Material Processing Unit (ED-FG-P)
Organizational Code: B2L0352

What: Feasibility Level Design for Darlington Reservoir. Visual classification of four 100 ft undisturbed borings. Process and store samples for in-house and A/E laboratory use. Perform liquid and plastic limits, water content, sieve and other miscellaneous indices.

Why: To determine the types of soils at the site. Obtain soil properties for geotechnical design. Provide soil classification for soil logs to develop geologic profiles, and prepare specimens to be used A/E laboratory.

Who: Major portion GS-5
GS-6
GS-8

Supervision and review GS-11

When: After samples are received from the field.

How: By performing the various test procedures in EM 1110-2-1906, dated 30 Nov 70.

Time & Cost: Time to Accomplish Tasks : 28 Labor Days (LD)
Cost @ $ 287/ LD : $8,000
Duration : 3 weeks

Geotechnical Branch, Geology Section (ED-FG)
Organization Code: B2L0350

What: Feasibility Level Design for the Darlington Reservoir. Determine the surface and subsurface geologic environments. Incorporate the borings that were taken for the reevaluation and those for this study into the geologic profile. Provide a written description of the geologic conditions. Point out any geologic anomalies discovered during the investigation that may impact the design.

Why: To determine the types of soils at the site. Provide a continuous interpretation of the soil types along the project alignment. To help the design engineer separate the soil types into design reaches for the various analyses.

Who: Major portion GS-11
GS-12
Supervision and review GS-12
GS-13

When: After borings are classified and the data is input into the computer.

How: By analyzing the types of soils in the borings that will be taken for this project, and data from previous studies. By conducting a literature search of geologic maps of the area. The geologist will combine all of the data into a map that represents the geologic conditions for the site.

Time & Cost: Time to Accomplish Tasks : 25 Labor Days (LD)
Cost @ $ 455/ LD : $11,500
Duration : 1 Month

Geotechnical Branch, A/E Geotechnical Laboratory

What: Feasibility Level Design for Darlington Reservoir. Perform Q-tests, R tests, S tests,

consolidation, permeability, sieve, liquid and plastic limits, water content, specific gravity. Plot mohr circles, e log p curves, and furnish test sheets for each sample.

Why: To obtain test data for geotechnical designs. Q, R, and S tests will be used to compute stability analyses. Seepage analyses will require permeability and sieve data. Consolidation tests will be used to compute settlement

Who: Major portion (unknown)
Supervision and review (unknown)

When: Within 2 weeks after receiving samples from NOD laboratory.

How: By using triaxial, consolidation, and other
state-of-the-art laboratory test equipment.

Time & Cost: Time to Accomplish Tasks : Labor Days (LD)
Cost @ $ / LD : $10,600
Duration : 2 weeks

What: Geology and Soils Specialist from Engineering Division will participate in EIS meetings and prepare sections to EIS on conditions and impacts.

Why: To include multidisciplinary information in the EIS as required by NEPA.

Who: GS-12 geologist from ED.

When: After alternatives descriptions are complete.

How: Using published literature, maps, and professional knowledge.

Time and Cost: 6 man-days @ $500/day = $3,000

What: Dam Safety Specialist from Engineering Division will participate in EIS meetings and prepare sections to EIS on conditions and impacts.

Why: To include multidisciplinary information in the EIS as required by NEPA.

Who: GS-12 dam safety specialist from ED.

When: After description of alternatives is complete.

How: Using published literature, maps, models, and professional knowledge.

Time and Cost: 14 man-days @ $500/day = $7,000

What: A/E Geotechnical Consultant for Seepage Investigation. Geotechnical consultant with experience in the field of seepage problems of high earthen dams. The person must be nationally recognized and approved by Division and Washington personnel. Look over all of the geotechnical data that is available. Discuss the proposed methods of seepage control. Advise about the types of tests that should be performed. Recommend the best type of seepage control. Discuss possible problems associated with other methods that are under consideration. Attend meetings with Corps and personnel from other Agencies, if required to discuss seepage matters.

Why: To provide an independent review and insure that designers look at various methods. Discuss experiences with seepage problems at other dams and recommend solutions that do not result in the same mistakes.

Who: Geotechnical Consultant (unknown)
Branch Chief GS-14
Section Chief GS-13
Design Engineer GS-12

When: During the geotechnical investigation.

How: By reviewing soil boring data, test results, design methods, and experience with mishaps at other dam sites.

Assumptions:
-Consultant will be retained for 14 days.
-Consultant will take two trips to NOD.
-Consultant will spend 8 days in New Orleans.
-Government personnel will spend 18 days gathering data, attending meetings, and performing analyses associated with the consulting services.

Time & Cost:
Time to Accomplish Tasks : Labor Days (18 LD)
Government Cost @ $502 / LD : $ 9,000
Consultant Cost(*) $18,500

Total Cost = $27,500

(*) includes travel and per diem

Organization Code: B2L0340

What: Feasibility Level Design for Darlington Reservoir. Data collection and evaluation, field trips, meetings, supervision, and coordination with support personnel and labs. Coordinate with Real Estate about right-of-entry for borings. Plot boring logs. Compute Stability and seepage analyses for portions of the foundation that have not been investigated. Investigate filtration and segregation requirements for zoned embankment. Analyze the adequacy of the slurry trench. Investigate if upstream impervious blankest are required, especially near the abutments. Perform seepage analyses of the spillway area in more detail than is currently available. Evaluate the overall stability and seepage requirements based on all of the data that is available. Determine the type and extent of subsurface investigation, testing program, and geotechnical analyses for the Design Memorandum study. Perform an independent technical review. Prepare geotechnical report with data, designs, conclusions, and recommendations.

Why: To determine the foundation conditions in areas that do not have adequate borings to reveal the geologic environments. Perform more in-depth geotechnical analyses relative to stability and seepage requirements, especially seepage. Seepage has to be investigated in more detail to provide realistic cost estimates. Zoning requirements will be investigated to provide preliminary quantities for the various soils that will be required during construction.

Who: Major portion GS-11
GS-12
Supervision and review GS-12, GS-13

When: We will start these tasks at the Project Manager's request.
How: Soil samples from the site will be tested and analyzed to yield design data. Computer programs and hand calculations will be used to determine required slopes to meet safety requirements. Established geotechnical procedures will be used to evaluate seepage conditions

Time and Cost: Time to Accomplish Tasks: 261 Labor Days (LD)
Cost @ $502 / LD : $131,000
Duration : 6 Months

HYDRAULICS AND HYDROLOGIC BRANCH

Hydraulics and Hydrologic Branch (ED-H)
Organization Code: B2L0200

What: Engineering Coordination. Supervision of all sections in Hydraulics and Hydrologic Branch providing input to the subject project.

Why: To assure Branch goals and objectives are met.

Who: One GS-14 Branch Chief and one GS-5 Secretary.

When: During all phases of the project requiring input from Hydraulics and Hydrologic Branch.

How: Review of input for all alternatives through meetings and oral, written, and electronic communications.

Time and Cost: 4 man-days / $3,600

What: One on One Independent Technical Review (ITR) for H&H design

Why: To ensure technical review of hydraulic design

Who: GS-12 engineers

When: As required throughout the hydraulic design process

How: Through one on one meetings with the hydraulic designer and technical reviewer.

Time & Cost: $4,500

Hydraulics and Hydrologic Branch, Hydraulic Design Section (ED-HD)
Organization Code: B2L0250

What: Hydrologic and Hydraulic Design of Three Reservoir Alternatives. HEC-1 and HEC-2 modeling will be performed in order to design to feasibility level.

Why: To obtain the hydraulic design parameters for each of the reservoir alternatives.

Who: One GS-13 Hydraulic Engineer, one GS-11 Hydraulic Engineer, and one GS-11 Hydrologic Technician.

When: At the beginning of the study.

How: HEC-1 routings will be performed for each of the reservoir alternatives in order to develop; Conservation, Flood Control and Surcharge Pool Elevations; dam heights; and design flows through the low level outlet and emergency spillway. HEC-2 backwater runs will be made to establish stages at damage locations. Detailed hydraulic design will be done for appurtenant drainage structures.

Time and Cost: 120 man-days / $69,700
Duration = 180 workdays

Hydraulics and Hydrologic Branch, Hydrologic Engineering Section (ED-HH)
Organization Code: B2L0240

What: Climatology. Develop input for Engineering Appendix.

Why: To provide climatological and hydrological data that describes the study area, including description of major floods.

Who: One GS-13 Hydraulic Engineer, one GS-11 Hydraulic Engineer, and one GS-09 Hydrologic Technician.

When: Prior to completion of the Engineering Appendix for the re-evaluation study.

How: A detailed write-up explaining necessary climatological and hydrologic parameters will be submitted along with the tables and plates showing location of gages.

Time and Cost: 7-man days / $2,600
Duration = 14 workdays

Hydraulics and Hydrology Branch, Hydrologic Engineering Section (ED-HH)
Organization Code: B2L0240

What: Sedimentation Analysis. Develop input for Engineering Appendix and Environmental Impact Statement

Why: To identify changes in channel characteristics area upstream and downstream for three selected project alternatives. To identify changes to the heelsplitter habitat as a result of construction and operation of the Darlington Reservoir.

To provide a description of historical, existing, and projected future without-project scour and deposition patterns, estimated bank migration, and point bar movement.

To provide a description of projected existing and future with-project scour and deposition patterns, estimated bank migration, and point bar movement for three selected project alternatives.

Who: One GS-13 Hydraulic Engineer, one GS-12 Hydraulic Engineer, one GS-11 Hydraulic

Engineer, and one GS-09 Hydrologic Technician.

When: Work will begin at the initiation of the study and conclude prior to completion of Engineering Appendix and EIS. Many portions of the work cannot be initiated until the hydraulics and hydrologic analyses of the alternatives are complete.

How: A two stage approach will be used as documented in ER 1110-2-4000, Sedimentation Investigations of Rivers and Reservoirs. The first stage will identify the potential effects of the reservoir alternatives on river system morphology and provide information for the final design phase. The second stage will be initiated if it is found, at the end of the first stage, that the reservoir alternatives have a substantial impact on stream system morphology and significantly affecting the heelsplitter habitat.

First stage

Review work performed to date, particularly the work performed by Espy Huston. Determine additional data requirements. From field reconnaissance, aerial photographs, historical information, and other studies, identify the suspended sediment, bed material, and planform characteristics of the Amite River within the project affected area. Working with Environmental Section personnel, identify heelsplitter mussel habitat and the characteristics of the habitat.

Set up and implement data collection program in project affected area if necessary.

Review previous sediment yield studies and update develop new sediment yield information as necessary.

Using qualitative or empirical methods, estimate the effects of three alternative reservoir plans on stream system morphology, including the effects on the flow system from changing water yield, sediment yield, water discharge duration, depth, velocity, slope or width of flow, size of sediment particles. Estimate bank and pointbar migration rates.

Develop existing and future without-project sedimentation model; develop period of record routing.

Sedimentation analysis upstream of three reservoir plans using the sedimentation model to include trap efficiency, volume depletion of reservoir, effect of deposits on future stages, verify elevations for real estate requirements.

Sedimentation analysis downstream of reservoir for three plans using the sedimentation model to include degradation of channel due to clear water release, channel response over time, future tributary degradation.

Second Stage

If the above investigation shows that the changes to the river system morphology significantly affect the heel splitter habitat, a more detailed assessment will be made to spatially identify sediment impacts, quantify the impacts, recommend corrective measures, and assess the effectiveness of these measures. This analysis will be a site specific analysis using more complex modeling techniques. Boundary conditions will be developed from work performed during the first step.

Time and Cost:

First stage, including writeup
310 labor days/$117,600 duration = 1 year
lab and other nonlabor costs = $20,000

Second stage, including writeup:
185 labor days/$70,000 duration = 6 months
nonlabor costs = $10,000

Hydraulics and Hydrologic Branch, Hydraulic Modeling Section (ED-HM)
Organization Code: B2L0260

What: Projection of Reservoir Water Quality for Three Reservoir Alternatives. CE-QUAL-W2 modeling will be performed to project the water quality for each alternative considered. The potential for thermal stratification will also be examined.

Why: To determine what the potential water quality of the proposed reservoir would be.

Who: One GS-13 Hydraulic Engineer, one GS-12 Environmental Engineer, and one GS-11 Hydraulic Engineer.

When: At the beginning of the study, once alternative pool elevations are determined.

How: By using the two dimensional, vertical-longitudinal hydrodynamic and water quality model, CE-QUAL-W2, the concentration of nutrients (such as nitrates, phosphorus, TKN, etc.) and other water quality parameters will be projected for both the short and long term. The potential for thermal stratification will also be examined. Boundary condition parameters will be developed by calibrating the model to a reservoir of similar latitude and underlying soil conditions such as Okatibbee Lake north of Meridian, Mississippi. Loading parameters will be determined from existing data obtained as part of previous studies of Darlington Reservoir, and from new water testing to be done as part of the Water Quality Assessment

Time and Cost:

Time to accomplish tasks:	90 Labor Days (LD)
Cost @ $555/day:	$55,000
Cost of AGPM Software For use with CE-QUAL-W2	$1,000
Total Cost:	$56,000
Duration: 12 months	

What: Projection of Water Quality Downstream of Reservoir. CE-QUAL-TWQM will be used to estimate the effects of the reservoir on water quality downstream of the reservoir.

Why: To develop design parameters for the outlet works and spillway so that the effects of the reservoir on downstream water quality can be minimized.

Who: One GS-13 Hydraulic Engineer, one GS-12 Environmental Engineer, and one GS-11 Hydraulic Engineer.

When: As soon as different outlet works and spillway configuration alternatives are developed.

How: Different configurations of outlet works, spillways, hydropower, etc. will be evaluated using the CE-QUAL-TWQM model. This model is a steady state longitudinal model developed to compute the water quality distribution downstream of a reservoir. The results of this model will be used to develop a configuration which will reasonably minimize negative effects of the reservoir on downstream water quality.

Time and Cost:

Time to accomplish tasks:	65 Labor Days (LD)
Cost @ $555/day:	$36,000
Duration: 9 months	

What: Water Quality Report Preparation. Preparation of the water quality assessment which is required as part of the feasibility report.

Why: To document the existing water quality and the expected without project water quality within the study area. The future with project condition will also be projected in this report.

Who: One GS-13 Hydraulic Engineer, one GS-12 Environmental Engineer, and one GS-11 Hydraulic Engineer.

When: Once all alternatives to be studied are identified.

How: Existing water quality will be analyzed based upon existing long term monitoring data obtained from the EPA database STORET, and from the results of water testing done as a part of this effort. A series of 5 water samples will be collected from mid-depth o provide a good picture of existing water quality of the Amite River. The results of this data will be compared to the State of Louisiana's water quality criteria, and will be used to quantify the expected impacts of the proposed project.

Time and Cost:

Time to accomplish tasks: 20 Labor Days (LD)	
Cost @ $555/day:	$11,000
Cost of Collection and Analysis of Water Samples (5 Phases @ $2,000 per phase):	$10,000
Total Cost:	$21,000
Duration: 4 months	

What: Water Quality Input to 404 (b) (1) Long Form Evaluation.

Why: To obtain the proper environmental clearances to proceed with construction of the proposed project.

Who: One GS-13 Hydraulic Engineer, one GS-12 Environmental Engineer, and one GS-11 Hydraulic Engineer.

When: Once the selected alternative is identified.

How: Existing information will be used to quantify the effects of this project. Sources of information include long term monitoring data from the EPA database STORET, reports prepared by other state and Federal agencies, and the Water Quality Assessment and Environmental Impact Statement Input prepared as part of this study.

Time and Cost:

Time to accomplish tasks: 15 Labor Days (LD)	
Cost @ $555/day:	$8,500
Duration: 2 months	

What: Input to the Environmental Impact Statement.

Why: To disclose the existing water quality in the study area, and the expected impact of the project on water quality.

Who: One GS-13 Hydraulic Engineer, one GS-12 Environmental Engineer, and one GS-11 Hydraulic Engineer.

When: Once the selected alternative is identified.

How: This will be prepared using all available information including long term monitoring from the EPA database, STORET, the Water Quality Assessment, and results of the water quality monitoring for this project.

Time and Cost:
Time to accomplish tasks: 15 Labor Days (LD)
Cost @ $555/day: $8,500
Duration: 3 months

What: Projection of Runoff Quality. The EPA's HSPF model will be used to estimate the water quality of the runoff from the Amite River Basin upstream of the proposed reservoir alternatives.

Why: This is required as input to the CE-QUAL-ICM/TOXI model to estimate the fate of toxic contaminants contained in the runoff to be impounded by the proposed reservoir alternatives.

Who: One GS-13 Hydraulic Engineer, one GS-12 Environmental Engineer, and one GS-11 Hydraulic Engineer.

When: As soon as study funds are received.

How: By modeling the watershed and land uses, we can estimate the amount of contaminants contained in the runoff from the Amite Basin above the proposed reservoir site. The results of this model will then be calibrated to results of water testing done at various points during the year, particularly after moderate to heavy rainfall events.

Time and Cost:

Time to accomplish tasks: 66 Labor Days (LD)
Cost @ $500/day: $33,000
Cost of Additional Testing required for Model Calibration $10,000

Total Cost: $43,000
Duration: 12 Months

What: Projection of Fate of Toxic Contaminants. The CE-QUAL-ICM/TOXI model will be used to estimate the fate of toxic contaminants including metals, pesticides, and herbicides contained in runoff in the proposed reservoir.

Why: To insure that water quality in the reservoir will be of acceptable quality to achieve project benefits.

Who: One GS-13 Hydraulic Engineer, one GS-12 Environmental Engineer, and one GS-11 Hydraulic Engineer.

When: After the CE-QUAL-W2 and HSPF modeling have been completed.

How: By using the CE-QUAL-W2 hydrodynamic output and the results of the HSPF modeling and the results of the water quality testing, the fate of toxic contaminants in the proposed reservoir alternatives can be estimated.

Time and Cost:

Time to accomplish tasks: 55 Labor Days (LD)
Cost @ $500/day: $27,500
Total Cost: $27,500
Duration: 5 Months

STRUCTURES BRANCH

Structures Branch (ED-T)
Organization Code: B2L0900

What: Supervision of all sections in Structures Branch providing input to the subject project. Review of input.

Why: To assure that Branch goals and objectives are met.

Who: GS-14 Structural Engineer
GS-05 Secretary

When: During all phases of the project requiring input from Structures Branch.

How: Through meetings and oral, written, and electronic communications.

Time and Cost: 50 hours = $40,000 for the entire study

Structures Branch, Major Structures Section (ED-TM)
Organization Code: B2L0910

What: Alternative Studies - Prepare preliminary feasibility scope designs and cost estimates for all preliminary structural features sufficient to screen out alternatives which are not to be carried through to detail design. Three alternatives designs will be evaluated.

Why: To enable the project study team to evaluate the three alternatives so that the most favorable can be chosen prior to initiating detail design.

Who: GS-11 or 12 Structural Engineer(s) will perform work with supervision by a GS-13 Section Chief

When: This can be done after the hydraulic and geotechnical parameters for the alternatives have been established to a degree of accuracy to allow for a meaningful investigation. Other required pertinent data includes, survey data, structural feature types, sizes, and locations.

How: Develop structural design criteria and parameters, perform preliminary design calculations and quantity take offs and coordinate development of cost estimates for structural features.

Time and Cost: Man-days : 28
Duration: 1.5 Months
Total Cost: $15,000

What: Prepare detailed feasibility scope structural designs for all features of the alternative selected from the pre-screening process to move on to detailed design.

Why: To furnish structural design input for Feasibility Report.

Who: GS-11 or GS-12 Structural Engineer(s) will perform work with supervision by a GS-13 Section Chief

When: Upon completion of preliminary studies and pre-screening process that determines final feature types, sizes and locations. All detailed design parameters are required to perform this task.

How: Gather required physical data, develop structural design criteria and parameters and perform design calculations for structural features.

Time and Cost: Man-Days: 120

Duration: 6 Month
Total Cost: $65,000

What: Prepare detailed feasibility scope structural design input for cost estimates of selected features.

Why: To furnish structural design cost input for Feasibility Study.

Who: GS-11 or 12 Structural Engineer(s) will perform work with supervision by a GS-13 Section Chief

When: Upon completion of detailed design of selected features.

How: Coordinate with Cost Engineering Branch for required level of detailed breakdown, calculate quantity takeoffs and develop spreadsheets for estimates of each structural feature.

Time and Cost: Man-days: 15
Duration: 1 month
Total Costs: $8,000

What: Prepare design and construction schedules for all structural features.

Why: To furnish structural design input for Feasibility Report.

Who: GS-11 or 12 Structural Engineer(s) will perform work with supervision by GS-13 Section Chief

When: Upon completion of detail design and cost estimates of selected features.

How: Prepare E&D estimates for all required engineering documents (DM's, P&S, etc.), coordinate with Cost Engineering Branch for construction durations of proposed contracts and develop breakdown of costs based on anticipation sequence of contract completion.

Time and Cost: Man-days: 5
Duration: 0.5 months
Total Cost: $3,000

What: Prepare structural design input for engineering appendix which documents assumptions, methods and criteria used for all feature designs.

Why: To furnish structural design input for Feasibility Study engineering appendix..

Who: GS-11 or 12 Structural Engineer and a GS-9 Civil Engineer Technician will perform work with Supervision by GS-13 Section Chief

When: Upon completion of detail design of selected features.

How: Prepare a narrative write up of feature descriptions, design methods, assumptions, and criteria used to design all features along with plates graphically depicting physical features and design methods.

Time and Cost: Man-days: 35
Duration: 2 months
Total Cost: $20,000

What: Overall support and coordination required during execution of study.

Why: To furnish structural design input for Feasibility Study and provide support and information as needed.

Who: GS-11 or 12 Structural Engineer will perform work with supervision by GS-13 Section Chief

When: Throughout entire time study is ongoing on an as-needed basis.

How: Attend meetings, answer comments, review documents, coordinate transfer of information, site visits and other miscellaneous items.

Time & Cost: Man-Days: N/A
Duration: Entire Study
Total Cost: $3,000

What: Technical Review. Quality control review of engineering designs, cost estimates, alternative analysis, recommended plan of action and reports. **(UNFUNDED TASK)**

Why: Review the results of Projects Engineering Section task's to insure that the level of quality desired is achieved. Attend and provide comments for two technical review meetings.

Who: GS-13 Civil Engineer
GS-12 Civil Engineer
GS-11 Civil Engineer

When: The first review will be held when the selected alternatives are identified. The second review will be conducted towards the end of the study after the Draft Report is completed.

How: Through meetings and oral, written, and electronic communications using current word processing programs.

Time & Cost: Time to Accomplish Tasks : 15 Labor Days
$8,000
Duration: Study Duration

REAL ESTATE DIVISION

ACQUISITION BRANCH (RE-AP) AND LEGAL SUPPORT (RE-L)
Organization Code: B2N0100 AND B2N0010

What: Real Estate Obtain Right of Entry (Alternatives 25 Yr Wet, 25 Yr Dry, and 25 Yr Reduced Wet.) Secure rights of entry to perform surveys, soil borings, hazardous, toxic, and radiological waste studies, environmental assessments, and cultural resources investigations.

Why: To provide legal access to sites for collecting data relative to each activity.

Who: One GS-12 realty specialist in Acquisition Branch, with review by one GS-12 and one GS-13 realty specialist, and one GS-12 attorney in Legal Support.

When: Rights of entry will be secured as requested by Engineering Division upon determination of activities to be conducted and the areas in which these activities are to be conducted.

How: Acquisition Branch coordinates with the district element requesting rights of entry to determine requirement and with Legal Support which determines ownership(s) through courthouse research. Engineering Division's request will describe the activities to be conducted, the manner of conducting these activities, and describe the area(s) in which these activities are to be conducted which should be depicted on a corresponding right-of-way map furnished by Engineering Division. Acquisition Branch will take the actions necessary to obtain the right of entry for the United States of America to perform the specified activities. Once obtained, Legal Support reviews right of entry documentation for legal sufficiency and Acquisition Branch notifies requesting district element that entry is available.

Time and Cost:
B2N0100 GS-12; 128 man-days @$480/manday = $61,440

SUB-TOTAL: $61,440
Duration: 730 calendar days

B2N0010 GS-12; 40 man-days @$480/manday = $19,200
SUB-TOTAL: $19,200
Duration: 730 calendar days - concurrent with B2N0100

Planning and Control Branch (RE-P); Appraisal Branch (RE-E); Management and Disposal Branch (RE-M); Acquisition Branch (RE-AP); and Legal Support (RE-L)
Organization Codes: B2N0400, B2N0200, and B2N0010

What: Real Estate Cost Estimates for Study Plans (Alternatives 25 YR WET,25 YR REDUCED WET, AND 25 YR DRY.) Prepare real estate cost estimates (Chart of Accounts format) for alternative plan(s) introduced during feasibility, to include value of LERRD's, acquisition, real estate plan, gross appraisal, attorneys opinion of compensability, P.L. 91-646 relocation, and all hired labor charges. The scope and format of the estimate is directed by draft Chapter 12, ER 405-1-12, as amended.

Why: These costs are needed for input to the total project cost.

Who: A GS-11 realty specialist in Planning and Control Branch; a GS-12 Appraiser in Appraisal Branch, with review and approval by a GS-13 review appraiser; and a GS-12 attorney in Legal Support.

When: These estimates will be developed as requested by Planning and/or Engineering Division and on receipt of the preliminary design drawings, to include any known HTRW sites, disposal areas, relocations, utilities, type of easements, acreage, and realty interest(s) required.

How: Planning and Control Branch will research and compile information on the number of ownerships, local sponsor, realty interest(s) required, utilities, relocations, and will furnish this information to other Real Estate Division elements to obtain their input to the Chart of Accounts estimate. Planning and Control Branch will develop the formal Chart of Accounts estimate(s) for the Real Estate Division. Appraisal Branch will perform market research, verify comparable sales, and estimate value to prepare the LERRD's estimates and prepare other input to the chart of accounts based on past experience and historical information. Acquisition Branch will develop the acquisition costs based on the information furnished by

Planning and Control Branch and on past experience. For input to the chart of accounts, Management and Disposal Branch will, based on past experience and historical information, perform research to identify U.S.A. existing interest, research to see if there are encroachments on that existing interest that must be cleared before the project can be constructed, and will also provide disposal costs for those areas scheduled for disposal after the project is constructed. Legal Support will conduct research determining ownerships and will review rights-of-way documentation and real estate payments for legal sufficiency and determine the local sponsor authorities and ability to pay from a review of state statutes and prior projects. For input to the Chart of Accounts, Legal Support will estimate the cost for review of deeds, review and negotiations of the project cooperation agreement, review of rights-of-way acquisitions, condemnations, and review of real estate payments.

Time and Costs:

B2N0400 GS-11; 2 man-days @ $480/manday = $ 2,880
SUB-TOTAL: $ 2,880
Duration: 30 calendar days

B2N0200 GS-12; 15 man-days @ $480/manday = $ 21,600
GS-13; 01 man-days @ $560/manday = $ 1,680
SUB-TOTAL: $ 23,280
Duration: 60 calendar days

B2N0010 GS-12; 02 man-days @ $480/manday = $ 2,880
SUB-TOTAL: $ 2,880
Duration: 30 calendar days

Planning and Control Branch (RE-P); Appraisal Branch (RE-E); Acquisition Branch (RE-AP); Management and Disposal Branch (RE-M); and Legal Support (RE-L)
Organization Codes: B2N0400, B2N0200, and B2N0010

What Task: Real Estate Cost Estimate for Mitigation (Three Alternatives.) Prepare real estate cost estimates (Chart of Accounts format) for mitigation alternative plan(s) introduced during feasibility, to include value of LERRD's, acquisition, real estate plan, gross appraisal, attorneys opinion of compensability, P.L. 91-646 relocation, and all hired labor charges. The scope and format of the estimate is directed by draft Chapter 12, ER 405-1-12, as amended.

Why: These costs are needed for input to the total project cost.

Who: A GS-11 realty specialist in Planning and Control Branch; a GS-12 Appraiser in Appraisal Branch, with review and approval by a GS-13 review appraiser; and a GS-12

attorney in Legal Support.

When: These estimates will be developed as requested by Planning and/or Engineering Division and on receipt of the preliminary design drawings, to include any known HTRW sites, disposal areas, relocations, utilities, type of easements, acreage, and realty interest(s) required.

How: Planning and Control Branch will research and compile information on the number of ownerships, local sponsor, realty interest(s) required, utilities, relocations, and will furnish this information to other Real Estate Division elements to obtain their input to the Chart of Accounts estimate. Planning and Control Branch will develop the formal Chart of Accounts estimate(s) for the Real Estate Division. Appraisal Branch will perform market research, verify comparable sales, and estimate value to prepare the LERRD's estimates and prepare other input to the chart of accounts based on past experience and historical information. Acquisition Branch will develop the acquisition costs based on the information furnished by Planning and Control Branch and on past experience. For input to the chart of accounts, Management and Disposal Branch will, based on past experience and historical information, perform research to identify U.S.A. existing interest, research to see if there are encroachments on that existing interest that must be cleared before the project can be constructed, and will also provide disposal costs for those areas scheduled for disposal after the project is constructed. Legal Support will conduct research determining ownerships and will review rights-of-way documentation and real estate payments for legal sufficiency and determine the local sponsor authorities and ability to pay from a review of state statutes and prior projects. For input to the Chart of Accounts, Legal Support will estimate the cost for review of deeds, review and negotiations of the project cooperation agreement, review of rights-of-way acquisitions, condemnations, and review of real estate payments.

Time and Costs:

B2N0400 GS-11; 01 manday @ $480/manday = $ 1,440
B2N0400 SUB-TOTAL: $ 1,440
Duration: 30 calendar days

B2N0200 GS-12; 10 man-days @ $480/manday = $ 14,400
GS-13; 01 man-days @ $560/manday = $ 1,680
B2N0200 SUB-TOTAL: $ 16,080
Duration: 30 calendar days

B2N0010 GS-12; 02 man-days @ $480/manday = $ 2,880
B2N0010 SUB-TOTAL: $ 2,880
Duration: 15 calendar days

Planning and Control Branch (RE-P); Appraisal Branch (RE-E); Acquisition Branch (RE-AP); and Legal Support (RE-L)
Organization Codes: B2N0400, B2N0200, and B2N0010

What: Real Estate Provide Input to Feasibility Report/PSP.
Prepare the real estate plan for the feasibility study. The real estate plan will be prepared for the tentatively selected plan and mitigation area once it has been developed.

Why: A real estate plan is required as directed by draft Chapter 12, ER 405-1-12, as amended. The real estate plan presents information on project name; location; authorization; description of area; total acreage; estates; discussion of navigational servitude; requirements on cost-shared projects; number and cost of PL 91-646 relocations; Baseline Cost Estimate (COAs) for Real Estate; mineral activity; detailed schedule of real estate acquisition activities; Attorneys Opinion of Compensability, if required; HTRW; and the Gross Appraisal on the property. Pursuant to ER 405-1-12, as amended, Real Estate Division is required to prepare ownership/right-of-way maps(s) showing the project area delineating the lands over which specified estates are to be acquired, property lines, utilities and facilities to be relocated, and any known potential HTRW lands. The maps are used as Exhibits in the real estate plan.

Who: A GS-11 realty specialist and a GS-08 cartographic technician in Planning and Control Branch; a GS-12 appraiser in Appraisal Branch with review and approval by a GS-13 review appraiser; and a GS-12 attorney in Legal Support.

When: The real estate plan is prepared in the Feasibility Phase. The real estate plan is prepared once the tentative selected plan and mitigation area has been determined and once the preliminary drawings and identification of environmental mitigation areas are received from Planning and/or Engineering Divisions. The real estate plan is prepared alongside the Gross Appraisal. The preparation of the acquisition right-of-way map(s) will coincide with the preparation of the real estate plan. The preparation of the Attorneys Report of Compensable Interest is prepared alongside the real estate plan once with final list of affected utilities and relocations is received from Engineering Division.

How: Planning and Control Branch will coordinate with other District elements and conduct research to obtain information for other Real Estate Division elements, will prepare maps for the real estate plan, will compile information from other Real Estate elements, and will write the real estate plan. Planning and Control Branch will update their input to the chart of accounts. To prepare the gross appraisal, Appraisal Branch will perform market research, inspect the project area, verify comparable sales, and write a gross appraisal report. Appraisal Branch will update their input to the chart of accounts based on past experience and historical information. Acquisition Branch will prepare a synopsis describing the local sponsor acquisition experience, plans of acquisition, and any other information which is deemed pertinent to acquisition of the required rights-of-way and the performance of any PL

91-646 relocations. Acquisition Branch will update their input to the chart of accounts. Legal Support will write the needed estates, assist in preparing project cooperation agreement, review the rights needed in land owned by the United States, review the use of the "navigational servitude", assist in the determination of the local sponsor's land acquisition authority and experience, review mineral activity within project boundaries, review any HTRW problems, prepare a "preliminary" compensable interest report, if necessary, and update their input to the chart of accounts.

Time and Costs:

B2N0400	GS-11; 08 man-days @ $480/manday = $ 3,840
	GS-08; 02 man-days @ $240/manday = $ 480
B2N0400	SUB-TOTAL: $ 4,320

Duration: The realty specialist needs 90 calendar days to develop the real estate plan. The Cartographic Technician needs 10 concurrent working days to complete mapping requirements.

B2N0200	GS-12; 35 man-days @ $480/manday = $16,800
	GS-13; 02 man-days @ $560/manday = $ 1,120
B2N0200	SUB-TOTAL: $17,920

Duration: 60 calendar days

B2N0010	GS-12; 40 man-days @ $480/manday = $19,200
B2N0010	SUB-TOTAL: $19,200

Duration: 30 calendar days

Planning and Control Branch (RE-P); Appraisal Branch (RE-E); Acquisition Branch (RE-AP); Management and Disposal Branch (RE-M); and Legal Support (RE-L)
Resource Code: B2N0400, B2N0200, and B2N0010

What: Miscellaneous. Consists of meeting attendance, including the Feasibility Review Conference, participating in field investigations, and other activities not directly related to one of the other Real Estate Division tasks.

Why: To keep abreast of the status and progress of the study and activities being undertaken by other elements of the District which may have an impact on Real Estate's work performance and schedules and to view the study area to get a first-hand knowledge of the area and factors which may influence acquisition of the required rights-of-way.

Who: A GS-11 realty specialist in Planning and Control Branch; a GS-12 appraiser in Appraisal Branch; and a GS-12 attorney in Legal Support.

When: Throughout the feasibility study, as required.

How: Self explanatory.

Time and Cost:

B2N0400	GS-11; 02 man-days @ $480/manday = $ 960
B2N0400	SUB-TOTAL: $ 960
B2N0200	GS-12; 05 man-days @ $480/manday = $ 2,400
B2N0200	SUB-TOTAL: $ 2,400
B2N0010	GS-12; 40 man-days @ $480/manday = $19,200
B2N0010	SUB-TOTAL: $19,200

Duration: As necessary throughout the study.

Planning and Control Branch (RE-P); Appraisal Branch (RE-E); Acquisition Branch (RE-AP); Management and Disposal Branch; and Legal Support
Organization Codes: B2N0400, B2N0200, and B2N0010

What: Report Reviews and Comment Response. Attend meetings, respond comments, and/or revise real estate input to draft and final Feasibility Report and PMP, as necessary.

Who: Varies, as required.

When: These tasks will be accomplished when necessary after completion of the draft and final Feasibility Report and PMP.

How: Respond to comments on the preliminary draft and final reports in the planning guidance memorandum. Prepare responses to comments on the draft report that result from their formal coordination with other agencies, the public, and from the public meeting. The nature of the comments are unknown and effort may vary significantly for each level of review. Review real estate and related pertinent sections of the draft and final reports prior to their release and/or submission. The basis of the effort required is for an average time for each review.

Time and Cost:

B2N0400	GS-11; 05 man-days @ $480/manday = $ 2,400
B2N0400	SUB-TOTAL: $ 2,400
B2N0200	GS-12; 05 man-days @ $480/manday = $ 2,400
B2N0200	SUB-TOTAL: $ 2,400
B2N0010	GS-12; 40 man-days @ $480/manday =$ 19,200
B2N0010	SUB-TOTAL: $ 19,200

Duration: As needed after completion of the draft and final Feasibility Report and PMP.

OPERATIONS DIVISION (OD)

TECHNICAL SUPPORT BRANCH

Technical Support Branch, Flood Control Function (OD-T)
Organization Code: B2R0310

What: Provide O&M Cost Estimates. Prepare operation and maintenance estimates (O&M) for each alternative and selected plan.

Why: To provide input to the cost estimates for the comparison of each alternative plan.

Who: One GS-13 civil engineer and one GS-12 civil engineer

When: Prior to annualization of all alternative project costs.

How: Participate in study team meetings as design activities progress. Develop estimates of the operating costs and routine maintenance costs for each plan based on its design and experience in similar projects. Review estimate for the selected plan and revise if necessary.

Time and Cost: 30 man-days/$15,000
Duration: 10 workdays

PROGRAMS AND PROJECT MANAGEMENT DIVISION

PROJECT MANAGEMENT BRANCH

Project Management Branch (PM-M)
Organization Code: B2H0050

What : Project Management. Provide project management during the feasibility phase.

Why: For project management, including budgeting and programming, during the feasibility phase in accordance with ER 5-7-1.

Who: One GM-13 project manager, one GS-12 project manager, and one GS-11 program analyst.

When: Throughout the feasibility study, phases I through III.

How: This includes participation in the IT meetings; monitoring the progress of the study; advising the study manager and study team on matters related to project execution; participation in plan formulation; updating the monthly Project Executive Summary (PES) report submitted for review up to the District and Division Project Review Board (PRB); attending monthly District PRB meetings; reporting to higher echelons on the project; coordinating the overall project; monitoring project expenditures; managing contingencies; preparing/managing the program and budget; meeting with representatives of various governmental agencies and private organizations to discuss project related matters; participating in technical review conferences, the feasibility review conference (FRC), public meetings; and meetings with the local sponsor; reviewing the feasibility report to insure that conclusions and decisions reached are consistent with sound engineering and conform to Corps and other governmental policies and requirements; preparing and negotiating the Project Cost Sharing Agreement (PCA); and developing the financing plan for the project.

Time and Cost: 249 man-days / $ 131,000

What: Preparation of PMP. Prepare project management plan (PMP) for the tentatively selected plan.

Why: The project management plan (PMP) establishes the scope, schedule, budgets, interface with the customer, and technical performance requirements for the management and control of the proposed project as required by ER 5-7-1.

Who: One GM-13 project manager, one GS-12 project manager, and one GS-11 program analyst.

When: Subsequent to the development of the tentatively selected plan (TSP).

How: This includes the preparation of project execution plans; work breakdown structure charts; critical path networks which incorporate estimates of the durations and costs of all activities (DM's, P&S's, construction contracts, relocations agreements, etc.) required to complete the project, as provided by all required District elements; resource costs, milestones, and other reports, program requirements; and fully-funded estimates.

Time and Cost: 81 man-days / $ 42,600

What: Revise PMP. Revise the project management plan (PMP) in response to comments and other changes resulting from planning guidance memorandum (PGM), public and agency review, Washington-level review, and other pertinent changes.

Why: To prepare the final PMP for submission and approval with the final feasibility report/EIS.

Who: One GM-13 project manager, one GS-12 project manager, and one GS-11 program analyst.

When: Subsequent to preparation of the PMP and throughout the review process..

How: Contingent on comments and changes.

Time and Cost: 22 man-days / $ 11,600

PROGRAMS MANAGEMENT BRANCH

Programs Management Branch (PM-P)
Organization Code: B2H0100

What Task: Program Management.

Why: This is required to assure continued and optimal funding for the feasibility phase; planning, engineering, and design phase; and construction phase.

Who: One GS-12 program analyst.

When: Throughout the feasibility study.

How: Review, coordinate, and submit all budget documents and budget maps. Type and

distribute all documents to numerous district elements. Determine reprogramming authority and preparation of reprogramming memoranda. Attend budget briefings and hearings. Review 2101's and cost estimates. Review and approve work orders.

Time and Cost: 50 man-days / $ 26,300

ANNEX B
WORK BREAKDOWN STRUCTURE

DARLINGTON RESERVOIR STUDY
ANNEX B
Work Breakdown Structure

Level 1. The Project

Level 2. Major Elements of the Project

Reconnaissance Report
Feasibility Report
Plans and Specifications Package
Construction Contracts

Level 3. Elements Subordinate to Level 2 Major Elements

Level 2. Feasibility Report

Level 3. Environmental Assessment
Engineering Appendix
Environmental Appendix
Economic Appendix
Public Coordination Appendix
Real Estate Supplement
Recreation Appendix

Level 4. Elements Subordinate to Level 3

Level 3. Engineering Appendix

Level 4. H&H Analysis
Geotechnical Analysis/Report
Water Quality Assessment/Report
Structures Design Report
Relocations Report
Cost Estimate (MCACES)

Level 3. Environmental Assessment

Level 4. Environmental Inventory
Environmental Design Features
Report HEP Analysis Mitigation
Analysis Section 404 (b)(1)

Level 3. Economic Appendix

Level 4. Economic Base Benefit-Cost Analysis
Sensitivity and Risk Analysis

Level 3. Public Coordination Apendix

Level 4. Summary Report of Public Meetings
Draft Report Review
Comments and Responses

Level 3. Real Estate Supplement

Level 4. Real Estate Chart of Accounts
Preliminary Attorney's Report of Compensability
Gross Appraisal

Level 3. Recreation Appendix

Level 4. Recreation Demand Analysis
Mitigation Analysis
Design Analysis

ANNEX C
RESPONSIBILITY MATRIX
MATRIX (RAM)