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| | Planning<br><br>PLANNING GUIDANCE NOTEBOOK | |
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DEPARTMENT OF THE ARMY
U. S. Army Corps of Engineers
Washington, D.C. 20314-1000

ER 1105-2-100

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Regulation
No. 1105-2-100

22 April 2000

Planning
PLANNING GUIDANCE NOTEBOOK

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# CHAPTER 1

## Introduction

1-1. Background. The U.S. Army Corps of Engineers is authorized to carry out Civil Works water resources projects for navigation, flood damage reduction and ecosystem restoration, as well as for storm damage prevention, hydroelectric power, recreation, and water supply. Planning for Federal water resources projects constructed by the Corps of Engineers, along with those of the Bureau of Reclamation, Natural Resource Conservation Service, and the Tennessee Valley Authority, is based on the Principles and Guidelines (P&G) adopted by the Water Resources Council. The P&G are comprised of two parts: The Economic and Environmental *Principles* for Water and Related Land Resources Implementation Studies and The Economic and Environmental *Guidelines* for Water and Related Land Resources Implementation Studies. The first part, commonly referred to as the principles, is reproduced in Figure 1-1. The second part, commonly referred to as the guidelines, expands on the concepts introduced in the principles and provides additional information and requirements to conduct water resources planning studies. Together both parts provide the framework for Corps of Engineers water resources planning studies. Within this framework, the Corps seeks to balance economic development and environmental needs as it addresses water resources problems. The planning process shall address the Nation's water resources needs in a systems context and explore a full range of alternatives in developing solutions. Innovative solutions and the application of the full range of the Corps programs and authorities are integral to the planning process.

1-2. Purpose. This regulation provides the overall direction by which Corps of Engineers Civil Works projects are formulated, evaluated and selected for implementation. It contains a description of the Corps of Engineers planning process, Corps of Engineers missions and programs, specific policies applicable to each mission and program, and analytical requirements. Its fundamental purpose is to describe the planning process in a straightforward, plain-language manner. While that is not always possible in a technical policy document, every effort will be made to make this process understandable not only to planners but to the entire project delivery team, project partners, and the general public. Just as the planning process must reflect reason and common sense; this regulation also shall reflect that same approach.

1-3. Applicability. This engineer regulation applies to all HQUSACE elements, and all USACE commands having Civil Works responsibilities.

1-4. Distribution Statement. Approved for public release, distribution is unlimited.

# Economic and Environmental Principles for Water and Related Land Resources Implementation Studies

These Principles are established pursuant to the Water Resources Planning Act of 1965 (Pub. L. 89-80), as amended (42 U.S.C. 1962a-2 and d-1). These Principles supersede the Principles established in connection with promulgation of principles, standards, and procedures at 18 CFR, Parts 711, 713, 714, and 716.

**1. Purpose and Scope**

These principles are intended to ensure proper and consistent planning by Federal agencies in the formulation and evaluation of water and related land resources implementation studies.

Implementation studies of the following agency activities are covered by these principles:

(a) Corps of Engineers (Civil Works) water resources project plans;

(b) Bureau of Reclamation water resources project plans;

(c) Tennessee Valley Authority water resources project plans;

(d) Soil Conservation Service water resources project plans.

Implementation studies are pre- or postauthorization project formulation or evaluation studies under taken by Federal agencies.

**2. Federal Objective**

The Federal objective of water and related land resources project planning is to contribute to national economic development consistent with protecting the Nation's environment, pursuant to national environmental statutes, applicable executive orders, and other Federal planning requirements.

(a) Water and related land resources project plans shall be formulated to alleviate problems and take advantage of opportunities in ways that contribute to this objective.

(b) Contributions to national economic development (NED) are increases in the net value of the national output of goods and services, expressed in monetary units. Contributions to NED are the direct net benefits that accrue in the planning area and the rest of the Nation. Contributions to NED include increases in the net value of those goods and services that are marketed, and also of those that may not be marketed.

**3. State and Local Concerns**

Federal water resources planning is to be responsive to State and local concerns. Accordingly, State and local participation is to be encouraged in all aspects of water resources planning. Federal agencies are to contact Governors or designated State agencies for each affected State before initiating Studies, and to provide appropriate opportunities for State participation. It is recognized, however, that water projects which are local, regional, statewide, or even interstate in scope do not necessarily require a major role for the Federal Government; non-Federal, voluntary arrangements between affected jurisdictions may often be adequate. States and localities are free to initiate planning and implementation of water projects.

**4. International Concerns**

Federal water resources planning is to take into account international implications, including treaty obligations. Timely consultations with the relevant foreign government should be undertaken when a Federal water project is likely to have a significant impact on any land or water resources within its territorial boundaries.

**5. Alternative Plans**

Various alternative plans are to be formulated in a systematic manner to ensure that all reasonable alternatives are evaluated.

(a) A plan that reasonably maximizes net national economic development benefits, consistent with the Federal objective, is to be formulated. This plan is to be identified as the NED plan.

(b) Other plans which reduce net NED benefits in order to further address other Federal, State, local, and international concerns not fully addressed by the NED plan should also be formulated.

(c) Plans may be formulated which require changes in existing statutes, administrative regulations, and established common law; such required changes are to be identified.

(d) Each alternative plan is to be formulated in consideration of four criteria: completeness, effectiveness, efficiency, and acceptability. Appropriate mitigation of adverse effects is to be an integral part of each alternative plan.

**Figure 1-1**

(e) Existing water and related land resources plans, such as State water resources plans, are to be considered as alternative plans if within the scope of the planning effort.

**6. Plan Selection**

A plan recommending Federal action is to be the alternative plan with the greatest net economic benefit consistent with protecting the Nation's environment (the NED plan), unless the Secretary of the department or head of an independent agency grants an exception to this rule. Exceptions may be made when there are overriding reasons for recommending another plan, based on other Federal, State, local and international concerns.

**7. Accounts**

Four accounts are established to facilitate evaluation and display of effects of alternative plans. The national economic development account is required. Other information that is required by law or that will have a material bearing on the decision-making process should be included in the other accounts, or in some other appropriate format used to organize information on effects.

(a) The national economic development (NED) account displays changes in the economic value of the national output of goods and services.

(b) The environmental quality (EQ) account displays non-monetary effects on significant natural and cultural resources.

(c) The regional economic development (RED) account registers changes in the distribution of regional economic activity that result from each alternative plan. Evaluations of regional effects are to be carried out using nationally consistent projections of income, employment, output and population.

(d) The other social effects (OSE) account registers plan effects from perspectives that are relevant to the planning process, but are not reflected in the other three accounts.

**8. Discount Rate**

Discounting is to be used to convert future monetary values to present values.

**9. Period of Analysis**

The period of analysis to be the same for each alternative plan.

**10. Risk and Uncertainty**

Planners shall identify areas of risk and uncertainty in their analysis and describe them clearly, so that decisions can be made with knowledge of the degree of reliability of the estimated benefits and costs and of the effectiveness of alternative plans.

**11. Cost Allocation**

For allocating total project financial costs among the purposes served by a plan, separable costs will be assigned to their respective purposes, and all joint costs will be allocated to purposes for which the plan was formulated. (Cost sharing policies for water projects will be addressed separately.)

**12. Planning Guidance**

In order to ensure consistency of Federal agency planning necessary for purposes of budget and policy decisions and to aid States and the public in evaluation of project alternatives, the Water Resources Council (WRC), in cooperation with the Cabinet Council on Natural Resources and Environment, shall issue standards and procedures, in the form of guidelines, implementing these Principles. The head of each Federal agency subject to this order will be responsible for consistent application of the guidelines. An agency may propose agency guidelines which differ from the guidelines issued by WRC. Such agency guidelines and suggestions for improvements in the WRC guidelines are to be submitted to WRC for review and approval. The WRC will forward all agency proposed guidelines which represent changes in established policy in the Cabinet Council on Natural Resources and Environment for its consideration.

**13. Effective Date**

These Principles shall apply to implementation studies completed more than 120 days after issuance of the standards and procedures referenced in Section 12, and concomitant repeal of 18 CFR, Parts 711, 713, 714, and 716.

These economic and environmental Principles are hereby approved.

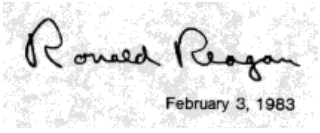


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**Figure 1-1 (continued)**

1-5. References. Relevant published references indicated in the text of each chapter of this engineer regulation are listed in Appendix A.

1-6. Use of this Engineer Regulation. This engineer regulation provides the requirements for conducting planning studies within the U. S. Army Corps of Engineers Civil Works program. This engineer regulation will also be useful in orienting and familiarizing newly assigned personnel, military and civilian, study /project cost-sharing partners and other interested publics with essential requirements regarding the conduct of Corps of Engineers Civil Works activities.

1-7. Availability. This regulation is available at the following web site: http://www.usace.army.mil/inet/usace-docs/er/er1105-2-100/toc.htm. When this regulation is viewed on this site, active hyperlinks are provided to other sections and appendices within this document and to other related regulations and documents. If this document is printed, the hyperlinked references will have to be printed separately. The version of this regulation on the web site is the official and current version. Every effort will be made to notify users when this regulation is updated.

1-8. Organization. This regulation consists of a main regulation and eight appendices. Appendix B provides the requirements for public involvement, collaboration and coordination in Civil Works planning studies. Appendix C addresses the integration of environmental evaluation and compliance requirements into the planning of Civil Works projects. Appendix D covers economic and social considerations, other than procedures for estimating NED benefits, in water resources planning studies. Appendix E provides policy and planning guidance for each Civil Works mission of the Corps of Engineers. Appendix F provides general program principles, policies and planning guidance for the nine legislative authorities under the Continuing Authorities Program (CAP). Appendix G provides guidance and procedures for the management and conduct of planning studies, activities and programs. Appendix H provides review and approval procedures for decision documents.

# CHAPTER 2

## Planning Principles

2-1. Introduction. The Corps of Engineers planning process is grounded in the economic and environmental Principles and Guidelines (P&G) promulgated in 1983 and set forth in different parts of this document. It is also grounded in the laws which apply to the Civil Works Program and to the Corps of Engineers missions. The P&G were set forth to provide for the formulation of reasonable plans responsive to National, State and local concerns. Likewise, the plans recommended for implementation, in general, are to reasonably maximize net national benefits. The Corps of Engineers planning process shall place specific emphasis on sound judgment; planners and other team members shall be guided by common sense in applying the policies and procedures contained herein. It also shall reflect a systematic and comprehensive treatment of watershed resources, including urban watershed resources. With regard to site-specific project studies, every effort should be made to assure that both economic and environmental value is added to watershed resources.

2-2. The Federal Objective

a. The Federal Objective. Principles and Guidelines state that the Federal objective of water and related land resources planning is to contribute to national economic development (NED) consistent with protecting the Nation's environment, in accordance with national environmental statutes, applicable executive orders, and other Federal planning requirements. The P&G use of the term objective should be distinguished from study planning objectives, which are more specific in terms of expected or desired outputs. The P&G's objective (Federal objective) may be considered more of a National goal. Water and related land resources project plans shall be formulated to alleviate problems and take advantage of opportunities in ways that contribute to study planning objectives and, consequently, to the Federal objective. Contributions to national economic development (NED outputs) are increases in the net value of the national output of goods and services, expressed in monetary units, and are the direct net benefits that accrue in the planning area and the rest of the Nation. Contributions to NED include increases in the net value of those goods and services that are marketed and also of those that may not be marketed. Protection of the Nation's environment is achieved when damage to the environment is eliminated or avoided and important cultural and natural aspects of our nation's heritage are preserved. Various environmental statutes and executive orders assist in ensuring that water resources planning is consistent with protection. The objectives and requirements of applicable laws and executive orders are considered throughout the planning process in order to meet the Federal objective.

b. Ecosystem Restoration. Ecosystem restoration is one of the primary missions of the Corps of Engineers Civil Works program. The Corps objective in ecosystem restoration planning is to contribute to national ecosystem restoration (NER). Contributions to national ecosystem restoration (NER outputs) are increases in the net quantity and/or quality of desired ecosystem resources. Measurement of NER is based on changes in ecological resource quality

as a function of improvement in habitat quality and/or quantity and expressed quantitatively in physical units or indexes (but not monetary units). These net changes are measured in the planning area and in the rest of the Nation. Single purpose ecosystem restoration plans shall be formulated and evaluated in terms of their net contributions to increases in ecosystem value (NER outputs), expressed in non-monetary units. Multipurpose plans that include ecosystem restoration shall contribute to both NED outputs and NER outputs. In this latter case, a plan that trades off NED and NER benefits to maximize the sum of net contributions to NED and NER is usually recommended.

2-3. The Planning Process. The Corps planning process follows the six-step process defined in the P&G. This process is a structured approach to problem solving which provides a rational framework for sound decision making. The six-step process shall be used for all planning studies conducted by the Corps of Engineers. The process is also applicable for many other types of studies and its wide use is encouraged. The six steps are:

Step 1 - Identifying problems and opportunities
Step 2 - Inventorying and forecasting conditions
Step 3 - Formulating alternative plans
Step 4 - Evaluating alternative plans
Step 5 - Comparing alternative plans
Step 6 - Selecting a plan

A detailed description of each step is presented in subsequent paragraphs. Corps decision making is generally based on the accomplishment and documentation of all of these steps. It is important to stress the iterative nature of this process. As more information is acquired and developed, it may be necessary to reiterate some of the previous steps. The six steps, though presented and discussed in a sequential manner for ease of understanding, usually occur iteratively and sometimes concurrently. Iterations of steps are conducted as necessary to formulate efficient, effective, complete and acceptable plans.

a. Step 1 - Identifying Problems and Opportunities.

(1) Problems and opportunities statements will be framed in terms of the Federal objective and the specific study planning objectives. Problems and opportunities should be defined in a manner that does not preclude the consideration of all potential alternatives to solve the problems and achieve the opportunities. Problems and opportunities statements will encompass current as well as future conditions and are dynamic in nature. Thus, they can be, and usually are, re-evaluated and modified in subsequent steps and iterations of the planning process.

(2) Properly defined, statements of problems and opportunities will reflect the priorities and preferences of the Federal Government, the non-Federal sponsors and other groups participating in the study process; thus active participation of all stakeholders in this process is strongly recommended. Proper identification of problems and opportunities is the foundation for

scoping the planning process. This problem identification step, and/or “scoping”, should begin as soon as practicable after the decision to initiate a planning study.

(3) The National Environmental Policy Act regulations (40 CFR Parts 1500-1508) require all Federal agencies involved in water resources planning to conduct a process termed "scoping". (See ER 200-2-2 for implementation guidance.) The NEPA scoping process determines the scope of issues to be addressed and identifies the significant issues related to a proposed action. Although NEPA scoping has traditionally been associated solely with identifying the concerns associated with proposed actions, it is possible to combine the NEPA scoping process with step 1 of the planning process. The information on problems and opportunities gathered in step 1 will help to identify primary issues that need to be addressed in subsequent steps of the planning process. Opportunities for combining step 1 of the planning process and the scoping process will vary from study to study, but the opportunity should be explored to minimize duplication of efforts at various stages of the planning process.

(4) Once the problems and opportunities are properly defined, the next task is to define the study planning objectives and the constraints that will guide efforts to solve these problems and achieve these opportunities. Planning objectives are statements that describe the desired results of the planning process by solving the problems and taking advantage of the opportunities identified. The planning objectives must be directly related to the problems and opportunities identified for the study and will be used for the formulation and evaluation of plans. Objectives must be clearly defined and provide information on the effect desired (quantified, if possible), the subject of the objective (what will be changed by accomplishing the objective), the location where the expected result will occur, the timing of the effect (when would the effect occur) and the duration of the effect.

(5) Constraints are restrictions that limit the planning process. Constraints, like objectives, are unique to each planning study. Some general types of constraints that need to be considered are resource constraints and legal and policy constraints. Resource constraints are those associated with limits on knowledge, expertise, experience, ability, data, information, money and time. Legal and policy constraints are those defined by law, Corps policy and guidance. These constraints are discussed in subsequent chapters of this regulation and its appendices. Plans should be formulated to meet the study objectives and to avoid violating the constraints. Thus, a clear definition of objectives and constraints is essential to the success of the planning process.

b. Step 2 – Inventory and Forecast. The second step of the planning process is to develop an inventory and forecast of critical resources (physical, demographic, economic, social, etc.) relevant to the problems and opportunities under consideration in the planning area. This information is used to further define and characterize the problems and opportunities. A quantitative and qualitative description of these resources is made, for both current and future conditions, and is used to define existing and future without-project conditions. Existing conditions are those at the time the study is conducted. The forecast of the future without-project condition reflects the conditions expected during the period of analysis (See paragraph 2-4j for definition of period of analysis). The future without-project condition provides the basis from which alternative plans are formulated and impacts are assessed. Since impact assessment is the

basis for plan evaluation, comparison and selection, clear definition and full documentation of the without-project condition are essential. Gathering information about historic and existing conditions requires an inventory. Gathering information about potential future conditions requires forecasts, which should be made for selected years over the period of analysis to indicate how changes in economic and other conditions are likely to have an impact on problems and opportunities. Information gathering and forecasts will most likely continue throughout the planning process.

c. Step 3 - Formulation of Alternative Plans.

(1) Alternative plans shall be formulated to identify specific ways to achieve planning objectives within constraints, so as to solve the problems and realize the opportunities that were identified in step 1. An alternative plan consists of a system of structural and/or nonstructural measures, strategies, or programs formulated to meet, fully or partially, the identified study planning objectives subject to the planning constraints. A management measure is a feature or an activity that can be implemented at a specific geographic site to address one or more planning objectives. Management measures are the building blocks of alternative plans and are categorized as structural and nonstructural. Equal consideration must be given to these two categories of measures during the planning process. An alternative plan is a set of one or more management measures functioning together to address one or more objectives. A range of alternative plans shall be identified at the beginning of the planning process and screened and refined in subsequent iterations throughout the planning process. However, additional alternative plans may be identified at any time during the process. Plans should be in compliance with existing statutes, administrative regulations, and common law or include proposals for changes as appropriate. Alternative plans shall not be limited to those the Corps of Engineers could implement directly under current authorities. Plans that could be implemented under the authorities of other Federal agencies, State and local entities and non-government interest should also be considered.

(2) The first phase in the plan formulation process is the identification of management measures that could be implemented, giving equal consideration to structural and non-structural measures. The second phase is the formulation of alternative plans by combining the management measures as appropriate. Alternative plans should be significantly differentiated from each other. As a general rule projects must be formulated to reasonably maximize benefits to the national economy, to the environment or to the sum of both. Each alternative plan shall be formulated in consideration of four criteria described in the P&G: completeness, efficiency, effectiveness, and acceptability. Completeness is the extent to which the alternative plans provide and account for all necessary investments or other actions to ensure the realization of the planning objectives, including actions by other Federal and non-Federal entities. Effectiveness is the extent to which the alternative plans contribute to achieve the planning objectives. Efficiency is the extent to which an alternative plan is the most cost effective means of achieving the objectives. Acceptability is the extent to which the alternative plans are acceptable in terms of applicable laws, regulations and public policies. Appropriate mitigation of adverse effects shall be an integral component of each alternative plan.

(3) In formulating alternative plans, it is essential that planners understand and fully visualize the problems of the planning area and how their plans will address these problems. Planners must maintain focus on the larger, complete plan(s) even while carrying out specific, individual tasks. While these individual tasks are necessary, their value is subordinate to successfully creating plans that work and function as visualized by those participating in the planning process. In that regard, vision rather than accountancy shall provide the foundation for sound planning and plan formulation.

(4) Section 904 of the Water Resources Development Act of 1986 (WRDA of 1986) requires the Corps to address the following matters in the formulation and evaluation of alternative plans:

- Enhancing national economic development (including benefits to particular regions that are not transfers from other regions).

- Protecting and restoring the quality of the total environment.

- The well-being of the people of the United States.

- The prevention of loss of life.

- The preservation of cultural and historical values.

(5) Non-structural measures shall be considered as means for addressing problems and opportunities. Non-structural measures may be combined with structural measures to produce a plan or considered as an alternative to structural measures. Non-structural measures shall receive equal consideration in the planning process to structural measures. Management of demand should be considered as a non-structural alternative. Examples are inland waterway congestion fees and changes in water pricing or drought contingency plans. Such measures can delay optimal project on-line dates of structural measures and increase total project net benefits over plans not including the non-structural measures.

(6) Protection of the Nation's environment from adverse effects of each alternative plan, in missions other than ecosystem restoration, is to be provided by mitigation (as defined in 40 CFR 1508.20) of those effects. Each alternative plan shall include mitigation as determined appropriate. Mitigation to address effects on fish and wildlife and their habitat should be determined in consultation with the Federal and State fish and wildlife agencies in accordance with the Fish and Wildlife Coordination Act of 1958. Mitigation to address other adverse effects should be determined in accordance with applicable laws, regulations and Executive Orders. (See Appendix C). Mitigation measures determined to be appropriate should be planned for concurrent implementation with other major project features, where practical. Cost of mitigation measures are part of total project costs and are included in the benefit-cost analysis of alternative plans.

d. Step 4 – Evaluating Alternative Plans.

(1) The evaluation of effects is a comparison of the with-project and without-project conditions for each alternative. The evaluation will be conducted by assessing or measuring the differences between each with- and without-project condition and by appraising or weighting those differences.

(2) Evaluation consists of four general tasks. The first task is to forecast the most likely with-project condition expected under each alternative plan. Each with-project condition will describe the same critical variables included in the without-project condition developed in step 2. Criteria to evaluate the alternative plans include all significant resources, outputs and plan effects. They also include contributions to the Federal objective, the study planning objectives, compliance with environmental protection requirements, the P&G's four evaluation criteria (completeness, effectiveness, efficiency and acceptability) and other criteria deemed significant by participating stakeholders. The second task is to compare each with-project condition to the without-project condition and document the differences between the two. The third task is to characterize the beneficial and adverse effects by magnitude, location, timing and duration. The fourth task is to identify the plans that will be further considered in the planning process, based on a comparison of the adverse and beneficial effects and the evaluation criteria.

(3) Four accounts are established in the P&G to facilitate the evaluation and display of effects of alternative plans.

(a) The national economic development account displays changes in the economic value of the national output of goods and services.

(b) The environmental quality account displays non-monetary effects on ecological, cultural, and aesthetic resources including the positive and adverse effects of ecosystem restoration plans.

(c) The regional economic development account displays changes in the distribution of regional economic activity (e.g., income and employment).

(d) The other social effects account displays plan effects on social aspects such as community impacts, health and safety, displacement, energy conservation and others.

(4) Display of the national economic development and environmental quality accounts is required. Display of the regional economic development and other social effects accounts is discretionary. Evaluation of the beneficial and adverse effects of the alternatives will provide a basis to determine which plans should be considered further, dropped or reformulated. Procedures to evaluate national economic development benefits for each project purpose (i.e., navigation, flood damage reduction, recreation, etc.) are provided in Chapter 3. Additional procedures and requirements are provided in Appendix E.

(6) Steps in the procedures may be abbreviated by reducing the extent of the analysis and amount of data collected where greater accuracy or detail is clearly not justified by the cost of

the plan components being analyzed. The steps abbreviated and the reason for abbreviation shall be documented in the planning reports. Planners can pursue the use of alternative procedures when these would provide a more accurate estimate of benefits. The use of alternative procedures and the consideration of new benefit categories, including the procedures to be used to estimate them, require advance approval from HQUSACE (CECW-P).

e. Step 5 - Comparing Alternative Plans. In this step, plans (including the no action plan) are compared against each other, with emphasis on the outputs and effects that will have the most influence in the decision making process. A comparison of the outputs of the various plans must be made. Beneficial and adverse effects of each plan must be compared. These include monetary and non-monetary benefits and costs. Identification and documentation of tradeoffs will be required to support the final recommendation. The effects include those identified during the evaluation phase and any other significant effects identified in step 5. The comparison step can be defined as a reiteration of the evaluation step, with the exception that in this step each plan (including the no action plan) is compared against each other and not against the without-project condition. The output of the comparison step shall be a ranking of plans.

f. Step 6 - Selecting a Plan. A single alternative plan will be selected for recommendation from among all those that have been considered. The recommended plan must be shown to be preferable to taking no action (if no action is not recommended) or implementing any of the other alternatives considered during the planning process. The culmination of the planning process is the selection of the recommended plan or the decision to take no action. The criteria for selecting the recommended plan differ, depending on the type of plan and whether project outputs are NED, NER, or a combination of both.

(1) The National Economic Development (NED) Plan. For all project purposes except ecosystem restoration, the alternative plan that reasonably maximizes net economic benefits consistent with protecting the Nation's environment, the NED plan, shall be selected. The Assistant Secretary of the Army for Civil Works (ASA (CW)) may grant an exception when there are overriding reasons for selecting another plan based upon other Federal, State, local and international concerns. (See paragraph 2-3g(4))

(2) The National Ecosystem Restoration (NER) Plan. For ecosystem restoration projects, a plan that reasonably maximizes ecosystem restoration benefits compared to costs, consistent with the Federal objective, shall be selected. The selected plan must be shown to be cost-effective and justified to achieve the desired level of output. This plan shall be identified as the National Ecosystem Restoration (NER) Plan.

(3) The Combined NED/NER Plan. Projects which produce both National Economic Development (NED) benefits and National Ecosystem Restoration (NER) benefits will result in a “best” recommended plan so that no alternative plan or scale has a higher excess of NED benefits plus NER benefits over total project costs. This plan shall attempt to maximize the sum of net NED and NER benefits, and to offer the best balance between two Federal objectives. Recommendations for multipurpose projects will be based on a combination of NED benefit-cost analysis, and NER benefits analysis, including cost effectiveness and incremental cost analysis.

(4) The Locally Preferred Plan. Projects may deviate from the National Economic Development Plan and/or the National Ecosystem Restoration Plan if requested by the non-Federal sponsor and approved by ASA(CW). In some instances, a non-Federal sponsor may not be able to afford or otherwise support the NED, NER or Combined NED/NER Plan. Plans requested by the non-Federal sponsor that deviate from these plans shall be identified as the Locally Preferred Plan (LPP). When the LPP is clearly of less scope and cost and meets the Administration's policies for high-priority outputs, an exception for deviation is usually granted by ASA(CW). In making a decision to recommend a LPP smaller in scope and costs than the NED, NER or Combined NED/NER plans, the district should assist the sponsor in identifying and assessing the financial capability of other potential non-Federal interests who may be willing and able to participate in plan development and implementation. In all cases, the LPP must have greater net benefits than smaller scale plans, and enough alternatives must be analyzed during the formulation and evaluation process to insure that net benefits do not maximize at a smaller scale than the sponsor's preferred plan. Paragraphs 4-3b(2)(a) and (b) describe the documentation required to support recommendation of a LPP. Categorical exemptions specifically applicable to flood control and navigation are discussed in paragraphs 3-3b(11) and 3-2b(10). If the sponsor prefers a plan more costly than the NED plan, the NER Plan or the combined NED/NER Plan, and the increased scope of the plan is not sufficient to warrant full Federal participation, ASA(CW) may grant an exception as long as the sponsor pays the difference in cost between those plans and the locally preferred plan. The LPP, in this case, must have outputs similar in-kind, and equal to or greater than the outputs of the Federal plan. It may also have other outputs. The incremental benefits and costs of the locally preferred plan, beyond the Federal plan, must be analyzed and documented in feasibility reports (see paragraph 4-3b(2)(b)).

(5) Agency Decision Making. Decision making for the selection of a recommended plan begins at the district level and continues at the Headquarters level through subsequent reviews and approval. In the case of continuing authorities projects, the review and approval occurs at the Division level. For congressionally authorized projects, the final agency decision maker is the Secretary of the Army through the Assistant Secretary of the Army for Civil Works.

2-4. Principles of Analysis. The principles of analyses that follow are fundamental to the planning process and are to be followed in conducting planning studies.

a. System Analysis. All Corps study initiatives shall consider broad system aspects of problems and solutions. In some instances these system considerations will be addressed throughout the planning process, such as in watershed or navigation systems studies. In other instances, such as with more limited project-oriented studies, systems considerations should be included in a reasonable and cost-effective manner as part of the initial phase of the planning process.

b. With and Without-Project Analysis.

(1) The without-project condition is the most likely condition expected to exist in the future in the absence of a proposed water resources project. Proper definition and forecast of the future without-project condition are critical to the success of the planning process. The future without-project condition constitutes the benchmark against which plans are evaluated. Forecasts of future without-project conditions shall consider all other actions, plans and

programs that would be implemented in the future to address the problems and opportunities in the study area in the absence of a Corps project. Forecasts should extend from the base year (the year when the proposed project is expected to be operational) to the end of the period of analysis.

(2) The with-project condition is the most likely condition expected to exist in the future with the implementation of a particular water resources development project. Comparison of conditions with the project to conditions without the project will be performed to identify the beneficial and adverse effects of the proposed plans. These with and without-project comparisons provide the framework for the evaluation of alternative plans.

(3) Forecasts of with- and without-project conditions should be based on consideration of national and regional forecasts of socio-economic parameters (i.e., income, employment, populations, etc) and other aggregate projections such as exports, land use trends and demand for goods and services. National projections used in planning shall be based on a full employment economy. Other plans that have been adopted for the planning area and other current planning efforts with high potential for implementation or adoption shall be considered as part of the forecasted without-project condition.

(4) Expected environmental conditions, especially trends in ecosystem change, shall be considered in forecasting with- and without-project conditions. Forecasted environmental conditions can be based on a variety of different sources of information available from Federal, State and other natural resource management agencies and private conservation entities. National and State environmental and health standards and regulations shall be recognized and appropriately considered. Standards and regulations concerning water quality, air quality, public health, wetlands protection, and floodplain management should be given specific consideration in forecasting the with- and without-project conditions.

c. Benefit-Cost Analysis and Cost Effectiveness Analysis.

(1) Benefit-Cost analysis is a conceptual framework useful in evaluating government (and private) investments. In principle it is uncomplicated: all pertinent costs and effects (beneficial and detrimental) of an action are systematically tallied. The results can then be tested against investment criteria, such as benefits greater than costs and maximum net benefits which is the criterion used for identification of the NED Plan in accordance with the Federal objective.

(2) All of a project’s monetized benefits, which occur through time, are accumulated, and using a process called discounting are expressed as a single total benefit figure. Costs also occur through time, and the same accumulating and discounting process is conducted, so the costs are also expressed as a single figure. Benefit and cost time streams are directly comparable only as converted to single figures. If the benefits exceed the costs the project may be said to be worthwhile.

(3) Planners may consider plans with different sizes, locations, outputs and costs of implementation in the same study. In effect, different plans are different projects, but the benefits and costs of each may be summarized; and all projects may be compared in a relatively straightforward way by consistent application of benefit-cost principles.

(4) There are similarities between benefit-cost analysis and financial appraisals, but the two are not the same. Caution is required against too easily transferring financial appraisal practices to benefit-cost analysis. For example, all benefits and costs must be accounted: thus (1) donated land (with no financial cost) has a cost in benefit to cost analysis, (2) benefits are counted wherever they accrue (even outside the study area; third party gains would not count in a financial appraisal).

(5) When there is no monetary measure of benefits but project outcomes can be described and quantified in some dimension, cost effectiveness analysis can be used to assist on the decision making process. Cost effectiveness analysis seeks to answer the question: given an adequately described objective, what is the least-costly way of attaining the objective? The ability to identify the least costly among several alternatives having the same outcome is very useful. However, cost effectiveness analysis cannot establish that any project is worthwhile. Cost effectiveness can also aid choice among projects that differ in their outcomes, but in the absence of monetized benefit estimates cannot remove all ambiguity.

d. Net Benefits (optimization). The best project may be defined as the plan that returns the greatest excess of benefits over costs, i.e., it is not possible to improve upon a plan producing maximum net benefits (total benefits less total costs). Benefits can be monetary or nonmonetary, as in the case of ecosystem restoration projects. The process of optimizing net benefits should be reasonable and practical in seeking to maximize net benefits.

e. Incremental Analysis. Incremental analysis is a process used in plan formulation to help identify plans that deserve further consideration in an efficient manner. The analysis consists of examining increments of plans or project features to determine their incremental costs and incremental benefits. Increments of plans continue to be added and evaluated as long as the incremental benefits exceed the incremental costs. When the incremental costs exceed the incremental benefits no further increments are added. For example, fifteen levees, each of a different height, could be designed to find the one with greatest net benefits. This is trial and error. An alternate approach is to start with a levee of low height, then add height in steps or increments (say one foot). For each increment of height the added (incremental) costs and added (incremental) benefits are estimated. As long as the incremental benefits exceed the incremental costs it makes sense to add the foot of height, because the extra foot adds more to benefits than to costs. When incremental costs exceed incremental benefits, no further increments of height are added. This process is more efficient than trial and error, and is thus used in formulating and evaluating most Corps projects.

f. Trade-off Analysis. In planning for multipurpose or multiobjective projects, the Corps needs to strike a balance between financial resources and the commodities that can be produced ("purchased") by the project. Trade-off analysis is the procedure used by the Corps to identify the potential gains and losses associated with producing a larger or lesser amount of a given output or outputs. The results of trade-off analysis are used in the formulation, evaluation, comparison and selection of the recommended plan. For example, consider a trade-off common in Corps planning: river flows are set by nature and cannot be augmented. In a reservoir, therefore, each cubic foot of water sent through generators for hydropower means less retained

behind a dam for recreation. Having more recreation water and more electricity generation is not possible (for a fixed amount of water). It is possible to express the relationship between electricity gains and recreation losses over a range (maybe a wide range) of gains and losses. Assessing these types of trade-offs is common in Corps project planning. Appendix E provides additional information on trade-off analysis.

g. Risk and Uncertainty. The P&G state that planners shall characterize, to the extent possible, the different degrees of risk and uncertainty inherent in water resources planning and to describe them clearly so decisions can be based on the best available information. 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. Risk-based analysis shall be used to compare plans in terms of the likelihood and variability of their physical performance, economic success and residual risks. A risk-based approach to water resources planning captures and quantifies the extent of risk and uncertainty in the various planning and design components of an investment project. The total effect of risk and uncertainty on the project's design and viability can be examined and conscious decisions made reflecting an explicit trade-off between risk and costs. Specific applications of the risk-based approach are discussed in Chapter 3 for each Civil Works mission.

h. Planning Area. The planning area is a geographic space with an identified boundary that includes the area identified in the study authorizing document and the locations of alternative plans which are often called project areas. The locations of resources that would be directly, indirectly, or cumulatively affected by alternative plans are often called the affected area.

i. Prices. The general level of prices for inputs and outputs prevailing during or immediately preceding the period of planning shall be used for the entire period of analysis. Project benefits and costs must be compared at a common point in time and both must be updated periodically. Discounting shall be used to convert future monetary values to present values. Present values, at the base year of analysis, shall be calculated using the discount rate established annually for the formulation and economic evaluation of plans for water and related land resources (published by HQUSACE as an Economic Guidance Memorandum).

j. Period of Analysis. The period of analysis shall be the same for each alternative plan. The period of analysis shall be the time required for implementation plus the lesser of: (1) the period of time over which any alternative plan would have significant beneficial or adverse effects, (2) a period not to exceed 50-years except for major multiple purpose reservoir projects, or, (3) a period not to exceed 100 years for major multiple purpose reservoir projects. Appropriate consideration should be given to environmental factors that may extend beyond the period of analysis.

k. NED costs.

(1) Project measures, whether structural or nonstructural, require the use of various resources. NED costs are used for the economic analysis of alternative projects and reflect the opportunity costs of direct or indirect resources consumed by project implementation. From an economic perspective, the real measure of cost is opportunity cost, i.e., the value of that which is foregone

when a choice of a particular plan or measure is made. In order to capture the opportunity costs of proposed plans, NED costs include three types of costs: implementation costs, other direct costs and associated costs.

(2) Implementation costs are explicit costs of implementing a project. They include the post authorization planning and design costs, construction costs, construction contingency costs, and operations, maintenance, repair, rehabilitation and replacement costs (OMRR&R). These also include costs for all fish and wildlife habitat mitigation, historic and archaeological mitigation and data recovery, lands, easements, relocations, rights-of-way, disposal/borrow areas and water and mineral rights, which are necessary to implement the project.

(3) Other direct costs are the costs of resources directly required for a project or a plan but for which no implementation outlays are made. Examples of these costs are interest during construction, value of donated land, uncompensated NED losses and other negative externalities.

(4) Associated costs are those costs necessary for production of project outputs for which no project expenditure is made. An example would be the cost of transmission lines provided by the private sector necessary for using energy provided by a hydropower improvement.

(5) Typically, opportunity costs are equal to the market prices of goods and services in competitive markets. However, market prices can be often distorted by monopoly power, price controls, taxes or subsidies. In cases where market prices do not reflect the opportunity cost of resource use, other means are used to develop NED costs. Surrogate values are often used which reflect the opportunity costs from a similar situation. For example, water rates in a community that provides subsidized pricing for disadvantaged may not represent the true value of the water. The true value may be better estimated using the price of water in a neighboring community where competitive markets exist.

l. Environmental and Social Impact Assessment. A number of Federal laws, such as the National Environmental Policy Act of 1969, the Clean Water Act of 1977, as amended and Section 122 of the 1970 River and Harbor and Flood Control Act require consideration of a wide range of effects in planning and decision making. In practice, this has been accomplished through a process commonly called impact assessment. While impact assessment covers the full range of effects, it has traditionally focused on non-monetary effects often called environmental and social impacts. These effects may be either adverse or beneficial, intended or unintended. The impact assessment process is synonymous with step 4 of the planning process (Evaluate Effects of Alternative Plans) previously described.

m. Significant Resources and Significant Effects.

(1) The consideration of significant resources and significant effects is central to plan formulation and evaluation for any type of water resources development project. In step 2 of the planning process, significant resources are identified as important to be considered during the study. In step 4, significant effects are identified for consideration in alternative comparison and selection. Significance of resources and effects will be derived from institutional, public or technical recognition. Institutional recognition of a resource or effect means its importance is

recognized and acknowledged in the laws, plans and policies of government and private groups. Technical recognition of a resource or an effect is based upon scientific or other technical criteria that establishes its significance. Public recognition means some segment of the general public considers the resource or effect to be important. Public recognition may be manifest in controversy, support or opposition expressed in any number of formal or informal ways.

(2) In ecosystem restoration planning, the concept of significance of outputs plays an especially important role because of the challenge of dealing with non-monetary outputs. The three sources of significance described in paragraph 2-4m(1) and documentation on the relative scarcity of the resources helps determine the significance of the resources to be restored. This information is used to help establish a Federal interest in the project. The significance of expected restoration outputs is used in conjunction with information from cost effectiveness and incremental cost analyses to help determine whether an alternative should be recommended. Information on effectiveness, acceptability, efficiency and completeness of ecosystem restoration plans also contributes to this determination.

n. Regulatory considerations. In the course of planning studies, consideration of Department of the Army regulatory programs (especially Section 10 of the River and Harbor Act of 1899, Section 404 of the Clean Water Act of 1972 and Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972) will be incorporated into the planning process. This is performed to facilitate the permitting of activities essential to a successful project. (See Appendix C for more details on regulatory considerations.)

o. Project Implementation Timing. Alternative plans can differ in their implementation timing, that is, not all plans or features have to be in place at the beginning of the period of analysis. As project on-line dates are varied, annual benefits and costs will often vary. In general, the more the benefits vary through time and the longer the time to implementation from the base year (first year of period of analysis), the stronger this effect will be. The best schedule for implementing project features shall be considered as an element in the formulation and evaluation of alternative plans.

p. Hazardous, Toxic and Radioactive Wastes (HTRW). Consistent with the guidance in ER 1165-2-132, the Corps will not participate in clean up of materials regulated by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) or by the Resource Conservation and Recovery Act (RCRA). Assessments during the feasibility phase to determine the nature and extent of such materials within the project area shall be cost shared. The cost of clean up of materials not covered by CERCLA and RCRA will be considered when determining if the proposed project is justified. While measures to improve water quality parameters may be included in projects with an ecosystem restoration component, the ecosystem restoration portion of these projects should not principally result in treating or otherwise abating pollution or other compliance responsibility.

q. Brownfields. Brownfields are abandoned or under-utilized properties that are perceived to be or, at worst, are lightly contaminated. Brownfields may be included in the preliminary planning phase of projects where they are integral to solving water resources problems related to Corps mission areas and authorities. If the assessment determines that there

are non-CERCLA types of materials or small, easily and cost effectively managed amounts of CERCLA controlled materials, then these sites may be included in project formulation and any remediation costs would be shared as project costs. If the assessment determines a CERCLA level clean-up is required, then the site will be removed from plan formulation for processing under CERCLA procedures. It is important that no unnecessary Federal liability be incurred when working within a Brownfield site.

r. Congressional Adds. The planning principles described in this chapter apply to Congressionally added studies unless specific instructions otherwise are provided through the budget process.

2-5. Partnerships and Teamwork. The success of the planning process depends to a great extent on establishing a successful partnership with the project sponsors and other stakeholders. A project sponsor for a Corps study may be a State, a political subpart of a State or group of states, a Native American (Indian) Nation, quasi-public organizations chartered under State laws (e.g., a port authority, flood control district, water management district or conservation district), an interstate agency and, for a limited number of authorities, a non-profit organization. Except for non-profit organizations, non-Federal entities must meet the requirements of Section 221 of the Flood Control Act of 1970 as amended, in order to be a sponsor for a Corps study. Project sponsors must be afforded the opportunity to help define the water resource problems and opportunities. They should help define the scope of the study and specific study tasks, cost estimates and schedules. Partnerships facilitate making decisions about the type and mix of study objectives as well as formulation, evaluation and selection of alternative plans. They contribute to project design, including environmental and aesthetic features and ensure that, to the extent possible, other factors that affect sponsoring communities are addressed during the planning process.

a. Cooperation with Other Agencies.

(1) Corps efforts should complement and be complemented by the various authorities of other Federal and State agencies, Native American (Indian) Nations and private groups. The Corps may also be requested, or request other agencies, to participate as a cooperating agency during the NEPA process (see 40 CFR 1501.6). While the Corps is the lead agency for studies specifically assigned to it, the Corps may also be a cooperating agency in water resources studies led by other Federal agencies. As a cooperating agency, the Corps can provide its special expertise in navigation, flood damage reduction, ecosystem restoration and other mission areas as part of integrated interagency and multipurpose planning to the U.S. Environmental Protection Agency, the Bureau of Reclamation, the Natural Resources Conservation Service, and other Federal Agencies. Under approved circumstances, participation as a cooperating agency may be funded through existing Corps studies and projects in the study area, or pursued as a separate item in the General Investigations program.

(2) Corps planners and planning team members should develop partnerships with Federal and State agencies, Native American (Indian) Nations and non-government organizations in the accomplishment of Corps studies and financing. Cooperative efforts may include, for example, information and data base sharing, cooperative planning efforts, as well as collaborative and shared construction, operation and maintenance, and monitoring activities. Cooperative efforts,

which effectively combine Federal investments, can achieve greater economic, social, and environmental benefits than individual agencies acting alone.

b. Public Involvement, Collaboration and Coordination.

1) The goal of public involvement, collaboration and coordination is to open and maintain channels of communication with the public in order to give full consideration of public views and information in the planning process. The objective of public involvement is to ensure that Corps projects and programs are responsive to the needs and concerns of the public. Elements critical to a good public involvement and coordination process are disseminating information about proposed activities, understanding the public's desires, needs and concerns, providing for consultation with the public before decisions are reached, and taking into account the public's views. All this must occur, however, with the awareness that the Corps can not relinquish its legislated decision making responsibility.

(2) All Corps planning studies are required to incorporate public involvement, collaboration and coordination with their Federal and non-Federal partners and the public. This should be initiated during step 1 of the planning process, Identifying Problems and Opportunities, and continue throughout the planning process. Involvement at the initial stage of the planning process not only helps to identify the problems and opportunities, but also extends an invitation to the public for continued involvement and a voice in the planning and decision making process.

(3) The team will determine, in the early phases of the planning process, the extent of public involvement required and will establish an appropriate strategy for integrating public involvement into the planning process. It is important to develop a strategy that creates relevant, quality public involvement opportunities for those who have, or may have, an interest in the study. The components of a good public involvement strategy are discussed in Appendix B. The strategy shall reflect the scope and complexity of each particular study.

(4) Major public involvement activities conducted during the planning process are announcing the initiation of the study, identifying the public, and, the scoping process. These activities are described in detail in Appendix B.

c. International Consultations. When a Federal water project is likely to have a significant impact on any land or resources situated in a foreign country or to affect treaty obligations, the Corps, through the Department of State, must enter into consultations with the government of the affected country.

d. Interdisciplinary Planning.

(1) Because planning problems are complex, using an interdisciplinary team is generally the best approach to the wide range of technical issues encountered in most studies. Planning results are usually better when they have been developed from a variety of perspectives, including the knowledge, skills and insights of professionals from many of the natural, social, engineering and environmental sciences.

(2) The disciplines should be integrated so that each member of the team communicates their various viewpoints and works together to fashion plans that truly reflect a diversity of perspectives on the problems and opportunities that confront the planning area. An effective plan formulation process requires that the interdisciplinary team be involved in the planning process from the very beginning. While the mix of disciplines required for a planning team varies from study to study, Corps teams may include the following types of experts: archaeologists, attorneys, biologists, chemists, civil engineers, ecologists, economists, geographers, geologists, hydraulic engineers, hydrologists, landscape architects, planners, real estate specialists and sociologists. This list is not intended to exclude any discipline but rather express the diversity that might be included.

2-6. A Watershed Perspective. Civil works planning should incorporate a watershed perspective, whether that planning involves a project feasibility study or a more comprehensive watershed study. Such planning should be accomplished within the context of an understanding and appreciation of the impacts of considered actions on other natural and human resources in the watershed. In carrying out planning activities, we should encourage the active participation of all interested groups and use of the full spectrum of technical disciplines in activities and decision-making. We also should take into account: the interconnectedness of water and land resources (a systems approach); the dynamic nature of the economy and the environment; and the variability of social interests over time. Specifically, civil works planning should consider the sustainability of future watershed resources, specifically taking into account environmental quality, economic development and social well-being.

2-7. Environmental Compliance. Civil Works studies and projects should be in compliance with all applicable Federal environmental statutes and regulations and with applicable State laws and regulations where the Federal government has clearly waived sovereign immunity. The National Environmental Policy Act (NEPA) requires Federal agencies, including the Corps, to comply with a process that includes the inventory and assessment of the environmental resources within the study area. NEPA also requires the evaluation and comparison of alternatives to determine the impacts to those ecological, cultural, and aesthetic resources identified and investigated. Involvement by resource agencies and the general public during the study process is also required. Corps NEPA guidance can be found in ER 200-2-2. The NEPA process will be integrated with the Corps six step planning process. This should also include all measures required for compliance with other applicable environmental statutes, such as the Endangered Species Act, the Clean Air Act, the Clean Water Act, the Fish and Wildlife Coordination Act, and the Historic Preservation Act, among others. (See Appendix C for compliance requirements.) This integration is intended to reduce process overlap and duplication. The integrated process will help assure that well-defined study conditions and well-researched, thorough assessments of the environmental, social, and economic resources affected by the proposed activity are incorporated into planning decisions.

2-8. Cost Sharing.

a. General. The costs of water resources studies and projects developed by the Corps are shared between Federal and non-Federal entities as defined in laws and administrative provisions. The WRDA of 1986, established new cost sharing rules for all studies and projects

conducted by the Corps. The cost sharing provisions of the WRDA of 1986 place greater financial responsibilities on non-Federal sponsors of Corps projects. The amount of the non-Federal share varies depending upon the project purpose and the general and specific laws that apply to each project.

b. Local Sponsor Financing. The non-Federal share of a Corps study or project usually consists of some combination of the following components: in kind services, a cash contribution and real estate interests. Sponsors are also responsible for operation, maintenance, repair, replacement and rehabilitation costs as defined for each civil works mission. Sponsors may provide their cash share of project or study costs to the Corps by one of the following means: a check, a deposit in an escrow or similar account with interest accruing to the sponsor, an irrevocable letter of credit or an Electronic Funds Transfer. See ER 1165-2-131 for further information.

c. Study Cost Sharing. Corps of Engineers specifically authorized planning studies are conducted in two phases: Reconnaissance Phase and Feasibility Phase. (See Appendix F for process applicable to the Continuing Authorities Program (CAP).) Cost sharing policies for each of these phases are as follows:

(1) The entire reconnaissance phase, as described in paragraph 4-3a and Appendix G, is conducted at full Federal expense, exclusive of any costs incurred by non-Federal entities in volunteered work or services during this phase. Costs incurred by non-Federal entities during the reconnaissance phase are not creditable toward the non-Federal sponsor's share of the feasibility phase.

(2) The cost of the feasibility phase, as described in paragraph 4-3b and Appendix G, will be shared equally during the study between the Federal government and the non-Federal sponsors. At least 50 percent of a non-Federal sponsor's share (25 percent of the total feasibility phase cost) shall be in cash. The remainder of the non-Federal sponsor share, up to 25 percent of the total feasibility phase cost, may be in-kind products and services. If a cost shared feasibility study is terminated prior to completion, the non-Federal share may be less than 50 percent in cash if the value of the in-kind services is more than one-half of the non-Federal sponsors investment at the time of termination. No credit may be given to the non-Federal sponsor for work prior to the start of the feasibility phase or after its completion (Sec 105 of WRDA of 1986). Guidance on cost sharing for studies conducted under Section 729 of WRDA of 1986 will be provided separately.

(3) Cost sharing is not applicable to single purpose inland navigation studies on the nations inland waterways system. For studies where inland navigation is the primary purpose and there are other purposes being considered, request additional guidance from CECW-P for feasibility phase cost sharing procedures.

(4) Cost sharing exceptions. Exceptions to cost sharing rules include projects specified in Section 103(e)(2) of the WRDA of 1986, waivers for territories as stated in Section 1156 of the WRDA of 1986, and, ability to pay provisions stated in Section 103(m) of the WRDA of 1986, as amended. (See Appendix E for additional details on these exceptions.)

(5) Section 203 of the WRDA of 1996 allows a non-Federal sponsor to defer its cost contribution for excess study costs that are not attributable to changes in Federal law or changes in scope requested by the sponsor, until the execution of a Project Cooperation Agreement. If the project is not authorized, payment of excess costs is due within 5 years after the date of the Chief of Engineer's report. If the study is terminated, payment is due within 2 years of its termination.

d. Preconstruction, engineering and design (PED). Preparation of design documentation reports and plans and specifications during the preconstruction, engineering and design phase will be cost shared in accordance with the cost sharing required for project construction. Under Corps policy, the non-Federal sponsor should provide 25 percent of the cost of PED during this phase. Adjustments, if necessary, shall be made after initiation of the construction phase. (See ER 1110-2-1150).

e. Project Cost Sharing. Appendix E provides project cost sharing requirements by project purpose.

# CHAPTER 3

## Corps Civil Works Missions

3-1. Purpose and Authorities. Federal interest in water resources development is established by law. Within the larger Federal interest in water resource development, the Corps of Engineers is authorized to carry out projects in seven mission areas: navigation, flood damage reduction, ecosystem restoration, hurricane and storm damage reduction, water supply, hydroelectric power generation and recreation. Navigation projects include both inland and deepwater projects. Ecosystem restoration projects improve ecosystem structure and function. Wherever possible and subject to budgetary policy, projects shall combine these purposes to formulate multiple purpose projects. For example, flood damage reduction projects could include ecosystem restoration and recreation; navigation projects could include hydroelectric power generation and ecosystem restoration. In carrying out studies to address problems and take advantage of opportunities within these mission areas, every effort should be made to formulate alternative plans that reasonably maximize the economic and environmental value of watershed resources, including urban watershed resources. In addition, every effort shall be made to be responsive to National**,** State and local concerns by considering the full range of programs available to provide solutions in a timely and cost-effective manner. Such programs may include Congressionally authorized projects, continuing authorities projects, planning assistance to states, flood plain management services and emergency authorities. [For a brief history of Corps involvement in water resources planning refer to “The US Army Corps of Engineers, A Brief History”, by Martin Reuss and Charles Hendricks to be published on the Corps web site.]

3-2. Navigation. The role of the U. S. Army Corps of Engineers with respect to navigation is to provide safe, reliable, and efficient waterborne transportation systems (channels, harbors, and waterways) for movement of commerce, national security needs, and recreation. The Corps accomplishes this mission through a combination of capital improvements and the operation and maintenance of existing projects. Capital improvement activities include the planning, design, and construction of new navigation projects. These activities are performed for the navigation of shallow draft (equal to or less than 14-foot draft) and deep draft (greater than 14-foot draft) vessels on both inland waterways and harbors, and coastal and lake ports, harbors and channels. With the exception of projects implemented pursuant to a continuing authority, Congress specifically authorizes harbor and waterway projects. Financial responsibility for project components is specified in the WRDA of 1986, as amended.

a. Types of Improvements. General navigation features of harbor or waterway projects are channels, jetties or breakwaters, locks and dams, basins or water areas for vessel maneuvering, turning, passing, mooring or anchoring incidental to transit of the channels and locks. Also included are dredged material disposal areas (except those for the inland navigation system, the Atlantic Intracoastal Waterway and the Gulf Intracoastal Waterway) and sediment basins. Special Navigation Programs include removal of wrecks and obstructions, snagging and clearing for navigation, drift and debris removal, bridge replacement or modification, and

mitigation of project-induced damage. These programs are described in more detail in paragraph 3-2a(2).

(1) Harbor and Waterway Projects. Harbors and waterways are treated differently for cost-sharing purposes. Harbors are places that offer vessels shelter from weather. A harbor is also a port if it provides facilities for the loading or unloading of cargo or passengers. Waterways are routes used by vessels. Their primary function is to facilitate the movement of vessels and they may simply connect bodies of deep or shallow water or they may be parts of riverine or coastal waterway systems. (See Table E-60, Appendix E for cost sharing requirements.)

(2) Special Navigation Programs. These navigation improvements are for specific purposes, and may be projects, elements of projects, or simply Corps activities. They are initiated and implemented on congressional authority (specific or continuing). They are usually subject to program or project expenditure limits, with cost sharing as specified in the original authority or as amended.

(a) Removal of Wrecks and Obstructions (Section 19, River and Harbor Act of 3 March 1899). The Corps may remove sunken vessels and similar objects if they are determined to be obstructions to navigation.

(b) Snagging and Clearing for Navigation (Section 3, River and Harbor Act of 1945). The Corps may remove trees, brush and other debris that may be determined to be obstructions to navigation or that may promote flooding.

(c) Drift and Debris Removal (Section 202, Water Resources Development Act Of 1976). The Corps has continuing authority to study and undertake projects to remove and dispose of derelict objects such as sunken vessels, waterfront debris and derelict structures, and other sources of drift that may damage vessels or threaten public health, recreation, or the environment at publicly maintained commercial boat harbors. The harbor need not be, but usually is a Corps project. Congressional authorization is required for projects with Federal costs of $400,000 or more.

(3) Aids to Navigation. These are buoys, lights, ranges, markers, and other devices and systems required for safe navigation or to achieve the project benefits. Aids to navigation are usually provided by the Coast Guard.

b. Specific Policies.

(1) Shoreline Changes. Pursuant to Section 5 of the River and Harbor Act of 1935, each investigation on navigation improvements potentially affecting adjacent shoreline will include analysis of the probable effects on shoreline configurations. A distance of not less than ten miles along the shore on either side of the improvement should be analyzed.

(2) Charter Fishing Craft, Head Boats, and Similar Recreation-Oriented Commercial Activities. Evaluation of benefits to charter fishing and other similar type craft is based on a

change in net income to the owners or operators of all vessels that would be using harbor facilities in the future without-project condition. Benefits to vessel operations that will be induced by the construction of a navigation project are also evaluated as the change in net income that would occur between the with- and without-project condition. Consideration should be given to those vessels that transfer from other areas, so that the proper change in National net income is estimated. Section 230 of the Water Resource Development Act of 1996 states that benefits to cruise ships will also be estimated as commercial benefits for the purpose of evaluating navigation projects.

(3) Subsistence Fishing. This is the activity of individuals who fish primarily for personal or family consumption and whose incomes are normally at or below the minimum subsistence level established by the Department of Commerce. For cost allocation purposes, subsistence fishing is considered commercial fishing.

(4) Coast Guard Coordination. The U.S. Coast Guard is responsible for Federal aids to navigation and enforcement of navigation regulations. Corps districts should confer directly with the Coast Guard concerning establishment or alteration of aids to navigation, and the regulation of lighterage areas (docking and loading areas used to off-load heavy cargo from larger ships to smaller vessels and vice versa), anchorage and channels.

(5) Permit Coordination. During the formulation of navigation projects, a determination must be made whether associated or ancillary sponsor activities (or project user activities) are required to achieve project benefits, and whether Department of the Army (DA) permits are necessary. Examples are provision of mooring and berthing areas and land based infrastructure. Once activities are identified, a preliminary determination of whether they require DA permits, and of what types (i.e., an individual permit, a letter of permission, an existing general permit or a nationwide permit), will be made by the district regulatory office.

(6) Placement of Dredged Materials on Beaches. Construction and maintenance dredging of Federal navigation projects shall be accomplished in the least costly manner possible. When placement of dredged material (beach quality sand) on a beach is the least costly acceptable means for disposal, then such placement is considered integral to the project and cost shared accordingly. When placement of dredged material on a beach costs more than the least costly alternative, the Corps may participate in the additional placement costs under the authority of Section 145 of the WRDA of 1976, as amended. The additional cost of placement may be shared on a 65 percent Federal and 35 percent non-Federal basis if: (1) requested by the State, (2) the Secretary of the Army considers it in the public interest, (3) the added cost of disposal is justified by hurricane and storm damage reduction benefits and (4) the shoreline on which the material is placed is open to public use.

(7) Use of Dredged Material for Ecosystem Restoration. When determining an acceptable method of disposal of dredged material, districts are encouraged to consider options that provide opportunities for aquatic ecosystem restoration. Where environmentally beneficial use of dredged material is the least cost, environmentally acceptable method of disposal, it is cost shared as a navigation cost. Section 204 of the WRDA of 1992, as amended, provides programmatic authority for selection of a disposal method for authorized projects, that provides

aquatic restoration or environmental shoreline erosion benefits when that is not the least costly method of disposal. The incremental cost of the disposal for ecosystem restoration purposes over the least cost method of disposal is cost shared, with a non-Federal sponsor responsible for 25 percent of the costs. Smaller projects typically will be pursued within the programmatic limits of Section 204, as amended. Section 207 of the WRDA of 1996 amended this authority. Section 207 will primarily be used with new navigation projects or in conjunction with maintenance dredging when the incremental cost is large. Projects pursued under Section 207 authority are separately budgeted and will not count towards the Section 204 programmatic limit. (See Appendix E for more information related to Section 207 and Appendix F for additional information regarding Section 204).

(8). Dredged Material Management Plans. Dredged material management planning for all Federal harbor projects is conducted by the Corps to ensure that maintenance dredging activities are performed in an environmentally acceptable manner, use sound engineering techniques, are economically warranted, and that sufficient confined disposal facilities are available for at least the next 20 years. These plans address dredging needs, disposal capabilities, capacities of disposal areas, environmental compliance requirements, potential for beneficial usage of dredged material and indicators of continued economic justification. The Dredged Material Management Plans shall be updated periodically to identify any potentially changed conditions.

(9) Local Service Facilities are the responsibility of non-Federal entities and shall be required as part of the cooperation agreements if they are necessary for project benefits to accrue.

(10) Categorical Exemption to NED Plan. For harbor and channel deepening studies where the non-Federal sponsor has identified constraints on channel depths it is not required to analyze project plans greater (deeper) than the plan desired by the sponsor. For example, if a sponsor only desires to deepen a channel to -40 feet and it is determined that the -40 foot channel is economically justified and has higher net benefits than a -39 foot or -38 foot channel, etc., then the -40 foot channel can be recommended without having to analyze deeper channel plans to identify the NED Plan. The recommended plan must have greater net benefits than smaller scale plans, and a sufficient number of alternatives must be analyzed to insure that net benefits do not maximize at a scale smaller than the recommended plan. If the plan proposed to be recommended contains uneconomical increments an exception from the ASA(CW) must be obtained. An essential element of the analysis of the recommended plan is the identification of trade-offs and opportunities foregone as a result of implementation of the smaller scope plan. The analysis of alternatives must be comprehensive enough to meet the requirements of NEPA.

(11) Other guidance related to navigation projects include ER 1165-2-27, ER 1165-2-123 and ER 1165-2-124.

c. Evaluation Framework. The measurement standard and conceptual basis for benefits is willingness to pay for each increment of output from a plan. In some planning situations it is infeasible to directly measure willingness to pay; therefore, alternative techniques are used to estimate the total value of a plan's output. The evaluation of navigation projects shall be conducted following the process described in paragraph 2-3e of this regulation. The procedures described in the following paragraphs apply to the estimation of benefits used in the economic

evaluation of navigation projects and are only a summary of requirements and procedures. Appendix E provides additional guidance on these procedures and requirements.

(1) National Economic Development Benefits. The base economic benefit of a navigation project is the reduction in the value of resources required to transport commodities. Navigation benefits can be categorized as follows:

(a) Cost reduction benefits for commodities for the same origin and destination and the same mode of transit thus increasing the efficiency of current users. This reduction represents a NED gain because resources will be released for productive use elsewhere in the economy. Examples for inland navigation are reductions in costs incurred from trip delays (e.g. reduction in lock congestions), reduction in costs associated with the use of larger or longer tows, and reduction in costs due to more efficient use of barges. Examples for deep draft navigation are reductions in costs associated with the use of larger vessels, with more efficient use of existing vessels, with more efficient use of larger vessels, with reductions in transit time, with lower cargo handling and tug assistance costs, and with reduced interest and storage costs.

(b) Shift of mode benefits for commodities for the same origin and destination providing efficiency in waterway or harbor traversed. In this case, benefits are the difference in costs of mode transport between the without-project condition (when rails, trucks or different waterways or ports are used) and the with-project condition (improved locks, waterways or channels). The economic benefit to the national economy is the savings in resources from not having to use a more costly mode or point of transport.

(c) Shift in origin and destinations that would provide benefits by either reducing the cost of transport, if a new origin is used or by increasing net revenue of the producer, if a change in destination is realized. This benefit cannot exceed the reduction in transportation costs achieved by the project.

(d) New movement benefits are claimed when there are additional movements in a commodity or there are new commodities transported due to decreased transportation costs. The new movement benefit is defined as the increase in producer and consumer surplus, thus the estimate is limited to increases in production and consumption due to lower transportation costs. Increases in shipments resulting from a shift in origin or destination are not included in the new movement benefits. This benefit cannot exceed the reduction in transportation costs achieved by the project.

(e) Induced movement benefits are the value of a delivered commodity less production and transportation costs when a commodity or additional quantities of a commodity are produced and consumed due to lower transportation costs. The benefit, in this case, is measured as the difference between the cost of transportation with the project and the maximum cost the shipper would be willing to pay.

(2) Without-Project Condition. The following specific assumptions are part of the projected without-project condition.

(a) All reasonably expected nonstructural practices within the discretion of the operating agency, port agencies, other public agencies and the transportation industry are implemented at the appropriate time.

(b) For deep draft navigation studies, alternative harbor and channel improvements available over the planning period (in place and under construction) and authorized projects are assumed to be in place. For inland navigation, only waterway investments currently in place or under construction are assumed to be in place over the period of analysis.

(c) Normal operation and maintenance practices are assumed to be performed over the period of analysis.

(d) In projecting commodity movements involving intermodal movements and in projecting traffic movements on other modes, sufficient capacity of the hinterland transportation and related facilities and the alternative modes is normally assumed.

(e) For inland navigation, user charges and/or taxes required by law are part of the without-project condition.

(f) Advances in technology affecting the transportation industry over the period of analysis should be considered, within reason.

(3) With-Project Condition. The with-project condition is the most likely condition expected to exist in the future if a project is undertaken. The same assumptions as for the without- project condition underlie the with-project condition.

(4) Evaluation Procedure for Inland Navigation. The following ten steps are used to estimate benefits associated with improvements of the inland navigation system. The level of effort on each step depends on the nature of the proposed improvement, the state of the art for accurately estimating the benefits and the sensitivity of project formulation and justification to further refinement. Appendix E provides additional guidance for each of these steps.

(a) Step 1 - Identify the Commodity Types. The types of commodities susceptible to movement on the waterway segment under consideration are identified for new waterways and existing waterways, as applicable. For new waterways, commodity types are identified by interviews of shippers and by resources studies. For existing waterways, commodity types are identified by analysis of data on existing use of the waterway segment.

(b) Step 2 - Identify the Study Area. The study area is the area within which significant project impacts occur. The origins and destinations of products likely to use the waterway are normally included in the study area.

(c) Step 3 - Determine Current Commodity Flow. This step identifies the total tonnage that could benefit from using the waterway. This information is primarily obtained by interviews of shippers. Potential commodities that might use the waterway in response to reduced transportation costs are also identified.

(d) Step 4 - Determine Current Cost of Waterway Use. Current cost of waterway use is determined for all commodities that could potentially benefit from the waterway improvement. This cost includes the full origin-to-destination costs, including handling, transfer, demurrage and prior and subsequent hauls for the tonnages identified in the prior step. Costs are estimated for the without-project and with-project conditions. The difference between the with and without-project costs represents the reduction in current delays and gains in efficiencies with the project in place.

(e) Step 5 - Determine Current Cost of Alternative Movement. The current cost of alternative movement is estimated for all commodities under consideration. This cost includes full origin-to-destination costs, including costs of handling, transfer, demurrage and prior and subsequent hauls. The product of this step, combined with the products from the two previous steps, generates a first approximation of the demand schedule for waterway transportation. In the case of rail movements, the prevailing rate actually charged for moving the traffic shall be used to estimate the alternative movement cost. A "competitive" rate may be used if there is no prevailing rate. Appendix E provides a definition and guidance on how to compute "competitive" rates.

(f) Step 6 - Forecast Potential Waterway Traffic by Commodity. Projections of potential traffic are developed for selected years from the time of the study until the end of the period of analysis, for time intervals not to exceed 10 years. Normally, independent studies are undertaken to develop these projections. Available secondary data supplemented by interviews of relevant shippers, carriers and port officials, opinions of commodity consultants and experts and historical flow patterns are used to develop these projections.

(g) Step 7 – Determine Future Cost of Alternative Mode. The future cost of alternative mode per unit of each commodity will normally be the same as the current cost.

(h) Step 8 – Determine Future Cost of Waterway Use. The potential changes in cost of the waterway mode for future years for individual origin-destination commodity combinations are estimated in this step. Also, an analysis of the relationship between waterway traffic volume and system delays is conducted. This analysis generates data on the relationships between total traffic volume and the cost of transportation on the waterway.

(i) Step 9 – Determine Waterway Use, With and Without-Project. The data developed in previous steps is used to determine waterway use over time with and without the project. This determination is made based upon a comparison of costs for movements by the waterway and by the alternative mode and of any changes in the cost functions and demand schedules. The "phasing in" and "phasing out" of shifts from one mode to another are also considered in this analysis.

(j) Step 10 – Compute NED Benefits. The information produced in previous steps is used to compute total NED benefits for each category described in Paragraph 3-2c(1), as applicable. Total NED benefits are annualized and discounted using the applicable discount rate (published annually by HQUSACE).

(5) Evaluation Procedures for Deep Draft Navigation. The following nine steps are used to estimate deep draft navigation benefits. As in the case of inland navigation benefits, the effort expended on each step will depend on the scope and nature of the proposed improvement, the state of the art to accurately develop the estimates and the sensitivity of project formulation and evaluation to further refinement. Appendix E provides additional guidance for each step.

(a) Step 1 – Determine the Economic Study Area. In this step, the economic study area is delineated. This step includes an assessment of the transportation network that is functionally related to the harbor considered for improvement. Foreign origins and destinations are also included in this assessment. The economic study area is likely to vary for different commodities. In the final delineation of the economic study area, the trade area relative to adjacent ports and any commonality that might exist with the area under study must be considered.

(b) Step 2 – Identify Types and Volumes of Commodity Flow. An analysis of commerce that flows into and out of the economic study area is performed to estimate the types and volumes of commodities that now move on the existing project or that may be attracted as a result of the proposed improvement. This analysis provides an estimate of gross potential cargo tonnage which is used to estimate the prospective commerce that may use the harbor during the period of analysis. Current volumes of prospective commerce are developed using available statistics on waterborne commerce. After determining the types and volumes of commodities currently moving or expected to move in the economic study area, data on origins, destinations and vessel itineraries are used to identify the commodity types and volumes that could benefit from the project. Commodities that are now moving without the project but would shift origins or destinations with the project, as well as induced movements, are segregated for additional analysis.

(c) Step 3 – Project Waterborne Commerce. Projections of the potential use of the harbor or waterway under study are developed for selected years from the time of the study until the end of the period of analysis. The commodities included in the projections should be identified, if possible, according to waterborne modes (e.g., containerized, liquid bulk, dry bulk, etc.) and by imports, exports, domestic shipments, domestic receipts and internal trade. Usually, independent studies are undertaken to develop these projections considering secondary data, data from interviews to shippers, carriers and port officials, opinions of consultants and experts and historical flow patterns. A sensitivity analysis of the projections is performed to account for uncertainties in the estimates.

(d) Step 4 – Determine Vessel Fleet Composition and Cost. The vessel fleet composition is determined by analyzing past trends in vessel size and fleet composition and trends in the domestic and world fleet. The vessel fleet composition is determined for both with- and without-project conditions. Changes in fleet composition may vary by trade route, type of commodity and volume of traffic. Canal restrictions, foreign port depths and lengths of haul also affect the vessel fleet composition. Vessel operating costs, by category of waterborne mode and size, are provided annually by HQUSACE. These costs may be modified to meet the needs of specific studies.

(e) Step 5 – Determine Current Cost of Commodity Movements. Transportation costs prevailing at the time of the study are determined in this step for all tonnage identified in step 2 that could benefit from the project. These costs include full origin-to-destination costs plus handling, transfer, and storage costs, and other accessory charges. Transportation costs are developed for both the with- and without-project conditions. For with-project conditions, these costs reflect efficiencies that can be reasonably expected, such as use of larger vessels, increased loads and reduction in transit time and delays (tides).

(f) Step 6 – Determine Current Cost of Alternative Movement. Alternative movement is the movement of commodities through other competitive harbors, and through other operational means such as lightering, lightening and topping-off operations, off-shore port facilities, transshipment terminals, traffic management, pilotage regulations and other modes of transportation. Transportation costs for these alternative modes of movement, as applicable, are estimated for the with- and without-project condition. These costs are used in the analysis of potential diversion of traffic. Factors to be considered in this analysis, in addition to transportation costs, are handling and transfer charges, available service and schedules, carrier connections, institutional arrangements, and other related factors.

(g) Step 7 – Determine Future Cost of Commodity Movements. Relevant shipping costs are estimated for with- and without-project conditions considering changes in the fleet composition, port delays and port capacity. Future transportation costs are based on the vessel operating costs prevailing at the time of the study.

(h) Step 8 – Determine Use of Harbor and Channel With- and Without-Project. To estimate the proposed harbor use over time, for with- and without-project conditions, the costs for movements via each proposed plan and via each alternative mode are compared. Changes in the cost functions and demand schedules in the current and future without-project condition and the current and future with-project condition are analyzed. The impact of uncertainty in the use of the harbor, the level of service provided and existing and future inventories of vessels are also considered.

(i) Step 9 – Compute NED Benefits. The tonnage moving with and without a project and the cost of movement via the harbor and via each alternative are used to compute total NED benefits for each category of benefits described in paragraph 3-2c(1).

d. Cost Sharing Requirements. Paragraph 2-8 discusses general cost sharing considerations applicable to all project purposes including navigation. Specific cost sharing requirements for this purpose are discussed in Appendix E of this regulation.

(1) Special Cases. Special cases that require a determination of Federal responsibility or cost sharing include, but are not limited to access channels not directly adjacent to primary channels, barge fleeting areas, and an initial single user with potential for future multiple users.

(2) Land Creation or Enhancement at Inland Harbors. Federal participation in inland waterway harbor improvements under the Civil Works program is not warranted when: (1) resale or lease of lands used for disposal of excavated material can recover the cost of the

improvements, or (2) the acquisition of land outside the navigation servitude is necessary for construction of the improvements and would permit local entities to control access to the project. The latter case is assumed to exist where the proposed improvement consists of a new channel cut into land.

(3) Land Creation at Harbors (other than inland harbors). The NED Plan for harbor projects that include land creation benefits shall be formulated using navigation benefits exclusively; thus, land creation benefits shall not be considered in the identification of the NED Plan. Special cost sharing will be required for land creation benefits associated with the NED Plan in proportion to the magnitude of these benefits to the total benefits. The procedure to estimate the cost sharing in this case is described in Appendix E. Non-Federal requests for exceptions to the NED Plan, to include land creation benefits, may be allowed provided all additional implementation costs are non-Federal and the incremental navigation benefits equal or exceed the incremental operation and maintenance costs for the general navigation features. No additional cost sharing will be required for the land creation benefits associated with the project modifications beyond the NED Plan which are requested and paid for by the non-Federal sponsor.

e. Other Authorities. Other authorities that may be applicable to this project purpose are discussed in paragraph 3-10.

3-3. Flood Damage Reduction. Section 1 of the Flood Control Act of 1936 declared flood control to be a proper Federal activity since improvements for flood control purposes are in the interest of the general welfare of the public. The Act also stipulated that for Federal involvement to be justified, " . . . the benefits to whomsoever they may accrue (must be) in excess of the estimated costs, and . . . the lives and social security of people (must be) otherwise adversely affected."

a. Types of Improvements.

(1) Structural Measures: Structural measures are physical modifications designed to reduce the frequency of damaging levels of flood inundation. Structural measures include: dams with reservoirs, dry dams, channelization measures, levees, walls, diversion channels, pumps, ice-control structures, and bridge modifications.

(2) Nonstructural Measures. Section 73 of the Water Resources Development Act of 1974 requires consideration of nonstructural alternatives in flood damage reduction studies. They can be considered independently or in combination with structural measures. Nonstructural measures reduce flood damages without significantly altering the nature or extent of flooding. Damage reduction from nonstructural measures is accomplished by changing the use made of the floodplains, or by accommodating existing uses to the flood hazard. Examples are flood proofing, relocation of structures, flood warning and preparedness systems (including associated emergency measures), and regulation of floodplain uses.

(3) Major Drainage. Drainage projects are usually undertaken in rural areas to increase agricultural outputs. Some portions of drainage improvements may be considered flood damage reduction measures in accordance with Section 2 of the Flood Control Act of 1944. The typical

drainage system consists of drainage ditches, dikes, and related work. An outlet structure is provided at the downstream end where the system empties into a larger channel. The Federal interest in these projects is normally limited to the outlet works. Drainage in urban areas can also qualify under the 1944 Act if the major outlet works do not substitute for works that are a local responsibility, such as municipal storm sewer improvements.

(4) Groundwater. Section 403 of the WRDA of 1986 expands the definition of flood control to include flood prevention improvements for protection from groundwater induced damages.

b. Specific Policies.

(1) Flood Plain Management, Executive Order 11988. Executive Order 11988 (E.O. 11988) was issued in 1977 with the intent to avoid floodplain development, reduce hazards and risk associated with floods, and restore and preserve natural floodplain values (See ER 1165-2-26 for Corps policy on this directive). In the event there is no alternative to construction in the floodplain, the Corps is required to minimize the adverse impacts induced by construction of the project. In considering adverse impacts, planners should address induced new development in the floodplain or induced improvements to existing development in the floodplain that would increase potential flood damages; and, the detrimental effect of induced activities on natural floodplain values.

(2) Project Performance and Risk Framework.

(a) Flood damage reduction studies are conducted using a risk-based analytical framework. The risk framework captures and quantifies the extent of the risk and uncertainty and enables quantified tradeoffs between risk and cost. Decision making considers explicitly what is gained and what is lost. (See ER 1105-2-101 and EM 1110-2-1619 for details.)

(b) Projects are analyzed and described in terms of their expected performance, not in terms of levels of protection. Contingencies are acknowledged and residual risk is not routinely reduced by overbuilding or by inclusions of freeboard. The regulation identifies key variables that must be explicitly incorporated into the risk-based analysis. At a minimum, the stage-damage function for economic studies (with special emphasis on first floor elevation, and content and structure values for urban studies), discharge associated with exceedence frequency for hydrologic studies, and conveyance roughness and cross-section geometry for hydraulic studies must be incorporated in the risk-based analysis. ER 1105-2-101 further requires a probabilistic display of benefits and eliminates freeboard to account for hydraulic uncertainty.

(c) There is no minimum level of performance or protection or size required for Corps projects. The smaller in size or the lower the level of performance however, the higher the residual risk. Residual risk must therefore be carefully analyzed, documented and communicated. Departures from the NED plan may be considered options to manage this risk. In addition, explicit risk management alternatives may be formulated.

(3) Existing Levees/Dams. Proposals to modify existing levees must be evaluated using a risk based approach as described in ER 1105-2-101. Downstream consequences of dams on flood risk are also analyzed in a risk-based framework. Evaluation of dam reliability and safety is based on engineering design criteria found in ER 1110-2-1155.

(4) Residual Damages. The analysis of any proposed flood damage reduction project shall include an estimate of the residual expected annual damages that would occur with the project in place.

(5) Induced Flooding. When a project results in induced damages, mitigation should be investigated and recommended if appropriate. Mitigation is appropriate when economically justified or there are overriding reasons of safety, economic or social concerns, or a determination of a real estate taking (flowage easement, etc.) has been made. Remaining induced damages are to be accounted for in the economic analysis and the impacts should be displayed and discussed in the report.

(6) Minimum Flows, Minimum Drainage Area and Urban Drainage. In urban and urbanizing areas provision of a basic drainage system to collect and convey local runoff is a non-Federal responsibility. Water damage problems may be addressed, under flood damage reduction authorities, downstream from the point where the flood discharge is greater than 800 cubic feet per second for the 10 percent flood (one chance in ten of being equaled or exceeded in any given year) under conditions expected to prevail during the period of analysis. Drainage areas which lie entirely within the urban area and which are less than 1.5 square miles in area, are assumed to lack sufficient discharge to meet the above hydrologic criterion. Urban streams and waterways that receive runoff from land outside the urban area shall not be evaluated using this 1.5 square mile drainage area criterion. Exceptions may be granted in areas of hydrologic disparity, that is areas producing limited discharge for the ten percent event but in excess of 1800 cubic feet per second for the one percent event (See ER 1165-2-21).

(7) Single Properties. The Corps will not participate in structural flood damage reduction for a single private property. Nor will it participate in nonstructural flood damage reduction measures, unless single property protection is part of a larger plan for structural or nonstructural measures benefiting multiple owners collectively. The Corps may consider participation in structural and nonstructural flood damage reduction measures protecting a single, non-Federal, public property. Work to provide protection to a single Federal property is accomplished only on a reimbursable basis, upon request from the Federal agency. In the event such properties are within the study area, Civil Works funds may be used for their protection.

(8) Recreation at Non-Lake Flood Damage Reduction Projects. The Corps participates in recreation facilities at non-lake flood damage reduction projects if the recreation activities have a strong, direct relationship to the proposed flood damage reduction measures, such as trails along the channel or levee right-of-way. Corps participation in these projects is limited by policy as discussed in Appendix E.

(9) Agricultural Flood Protection. The Corps flood damage reduction programs apply to agricultural as well as urban flood damages. Usually the NED plan for agricultural areas provides only a low degree of flood prevention.

(10) Land Development and Floodplain Management. The following general policy principles apply to land development benefits at structural flood damage reduction projects.

(a) Communities participating in a flood damage reduction project with the Corps of Engineers are required to participate in FEMA's National Flood Insurance Program (NFIP) and to comply with the land use requirements of that program.

(b) Communities participating in a flood damage reduction project with the Corps must also prepare a flood plain management plan designed to reduce the impact of future flood events in the project area. This plan must be adopted within one year after signing a project cooperation agreement and the plan must be implemented not more than one year after the construction of a project. Although costs for the preparation of the flood plain management plan are sponsor costs, data collected during the planning process may be used in development of the plan.

(c) Projects or separable increments producing primarily land development opportunities do not reduce actual flood damages and therefore have low budget priority. Federal participation in these projects will not be recommended.

(d) Flood damage reduction projects can greatly impact what is required of a local community for participation in the NFIP. In addressing these impacts, the following should be considered:

- In coordination with the non-Federal sponsor and FEMA, consideration should be given to developing flood maps and flood profiles depicting post-project conditions. The information should be in a form useful to FEMA in revising flood insurance rate maps.

- The appropriate FEMA Regional office will be notified of proposed flood protection works or of changes to established flood protection works.

(11) Categorical Exemption to NED Plan. For flood damage reduction studies, where the non-Federal sponsor has identified a desired maximum level of protection, where the with-project residual risk is not unreasonably high, and where the plan desired by the sponsor has greater net benefits than smaller scale plans, it is not required to analyze project plans providing higher levels of protection than the plan desired by the sponsor. For example, if a sponsor desires a levee of sufficient height to meet FEMA's flood insurance requirements and it is determined that the levee to accomplish this has higher net benefits than smaller levees, then the levee desired by the sponsor can be recommended without having to analyze larger levees to identify the NED Plan. The recommended plan must have greater net benefits than smaller scale plans, and a sufficient number of alternatives must be analyzed to insure that net benefits do not maximize at a scale smaller than the recommended plan. If the plan proposed to be recommended contains uneconomical increments an exception from the ASA(CW) must be

obtained. An essential element of the analysis of the recommended plan is the identification of residual risk for the sponsor and the flood plain occupants, including residual damages and potential for loss of life, due to exceedence of design capacity. The analysis of alternatives must be comprehensive enough to meet the requirements of NEPA.

(12) Exception to NED Plan for Urban Areas. When the NED Plan has less than 90 percent reliability of protecting against the 1 percent chance annual flood event, an exception to the NED Plan may be recommended. The conditions and requirements stated in Appendix E must be met in order to grant this exception.

(13) Use Of Lands Cleared Under The FEMA Hazard Mitigation Grant Program. (Guidance is under development)

c. Evaluation Framework. The measurement standard and conceptual basis for benefits associated with flood damage reduction projects is willingness to pay for each increment of output from a plan. In some planning situations it is infeasible to directly measure willingness to pay; therefore, alternative techniques are used to estimate the total value of a plan's output. The evaluation of flood damage reduction projects shall be conducted following the process described in paragraph 2-3e of this regulation. The procedures described in the following paragraphs apply to the estimation of benefits used in the economic evaluation of flood damage reduction projects, and summarize requirements and procedures. Appendix E provides additional guidance on these requirements and procedures.

(1) National Economic Development Benefits. Benefits from plans for reducing flood hazards accrue primarily through the reduction in actual or potential damages to affected land uses. There are three primary benefit categories, reflecting three different responses to a flood hazard reduction plan. Inundation reduction benefits are the increases in net income generated by the affected land uses when the same land use pattern and intensity of use is assumed for with- and without-project conditions. Intensification benefits are increases in net income generated by intensified floodplain activities when the floodplain use is the same with and without the project but an activity (or activities) is more intense with the project. The third category of benefits is location benefits. If an activity is added to the floodplain because of a plan, the location benefit is the difference between aggregate net incomes (including economic rent) in the economically affected area with and without the project. The magnitude of location benefits that can be claimed is limited by policy. In general, the NED Plan will be formulated to protect existing development and vacant property that is interspersed with existing development. Location benefits can be claimed for vacant property that is not interspersed with existing development only if it is demonstrated that the vacant property would be developed without the project and the benefits are based on savings in future flood proofing costs.

(2) Types of Flood Damage. Flood damages are classified as physical damages and nonphysical damages. Each activity affected by a flood can experience loss in one or both of these classes.

(a) Physical damages. Physical damages occur to residential, commercial, industrial, institutional, and public property. Damages occur to buildings, contents, automobiles, and outside property and landscaping. Physical damages include the costs to repair roads, bridges,

sewers, power lines, and other infrastructure components. Physical damages also include the direct costs and the value of uncompensated hours for cleanup after the flood.

(b) Nonphysical flood losses. Nonphysical flood losses include income losses and emergency costs. Income losses are the loss of wages or net profits to business over and above physical flood damages that usually result from a disruption of normal activities. Estimates of these losses must be derived from specific independent economic data for the interests and properties affected. Prevention of income losses result in a contribution to national economic development only to the extent that the losses cannot be compensated for by postponement of an activity or transfer of the activity to other establishments. Emergency costs include those expenses resulting from a flood that would not otherwise be incurred. For example, the costs of evacuation and reoccupation, flood fighting, and administrative costs of disaster relief; increased costs of normal operations during the flood; and increased costs of police, fire, or military patrol. Emergency costs should be determined by specific survey or research and should not be estimated by applying arbitrary percentages to the physical damage estimates.

(3) Without-Project Condition. The without-project condition is the land use and related conditions expected to occur during the period of analysis in the absence of the proposed project. The following assumptions are part of the projected without-project condition:

(a) Existing flood hazard reduction plans are considered to be in place, considering the actual remaining economic life of existing structures. If there is a high likelihood of construction of a flood hazard reduction plan authorized for implementation but not yet constructed, the authorized plan is assumed to be in place.

(b) The adoption and enforcement of land use regulations pursuant to the Flood Disaster Protection Act of 1973 is assumed.

(c) For planning purposes, the Corps shall assume that communities in the floodplain belong to the National Flood Insurance Program (NFIP) administered by the Federal Emergency Management Agency (FEMA).

(d) Compliance with E.O. 11988 (described in paragraph 3-3b(1)), Floodplain Management and E.O. 11990, Protection of Wetlands, is assumed.

(4) With-project Condition. The same assumptions that underlie the without-project condition apply to the with-project condition.

(5) Evaluation Procedure. The steps required to evaluate benefits for flood damage reduction projects are described in the following paragraphs. These steps are designed to determine land uses and relate these uses to the flood hazard from an NED perspective. The level of effort expended on each step will depend on the scope and nature of the proposed improvement, the state of the art to accurately develop the estimates and the sensitivity of project formulation and evaluation to further refinement. Appendix E provides additional guidance for each step. The first five steps result in a determination of future land use with emphasis on

evaluating the overall reasonableness of local land use plans with respect to State, County or other projections of a larger area encompassing the study area.

(a) Step 1- Delineate the Affected Area. The area affected by a proposed plan consists of the floodplain plus all other nearby areas likely to serve as alternative sites for any major type of activity that might use the floodplain if it were protected. All areas impacted by the proposed plan shall be included in the affected area.

(b) Step 2 – Determine Floodplain Characteristics. An inventory of the floodplain is undertaken to determine those characteristics that make it attractive or unattractive for particular uses as identified in the land use demand analysis. The floodplain is characterized in terms of flooding, including the designation of high hazard areas, natural storage capabilities and constraints, natural and beneficial values and potential for water-oriented transportation. Other attributes, such as physical characteristics, available services and existing activities are also included in the floodplain characterization.

(c) Step 3 – Project Activities in Affected Area. Economic and demographic projections are developed, as needed, on the basis of current unbiased economic growth indices. Whenever possible, the growth indices should be independent estimates.

(d) Step 4 – Estimate Potential Land Use. Demographic projections are converted to land use needs using conversion factors from published secondary sources, from other studies or from empirical data.

(e) Step 5 – Project land Use – Land use demand is allocated to floodplain and non-floodplain lands for the without-project condition and for each alternative floodplain management plan.

(f) Step 6 – Determine Existing Flood Damages. Existing flood damages are the potential average annual dollar damages to activities affected by flooding at the time of the study. Existing damages are those expressed for a given magnitude of flooding or computed in the damage frequency process. The basis for the determination of existing damages is losses actually sustained in historical floods supplemented by appraisals, application of depth-damage curves and an inventory of capital investment within the floodplain. (Further guidance on the use of generic depth-damage curves is provided in Appendix E.) Average annual damages are computed using standard damage-frequency integration techniques and computer programs that relate hydrologic and hydraulic flood variables such as discharge and stage to damages and to the probability of occurrence of such variables. These estimates are developed using a risk-based analytical framework as described in paragraph 3-3b(2) of this regulation.

(g) Step 7 – Project Future Flood Damages. Future flood damages are those damages to activities identified in Step 3 that might use the floodplain in the future with- and without-project conditions. Hydrologic and economic changes are considered in developing these estimates. Procedures described in step 6 are used to estimate future flood damages. Participation in the NFIP requires communities to preclude new development in the regulatory floodway, as defined by the community. It also requires that new development in the NFIP

regulatory floodplain outside of the floodway be constructed at or above the median probability 100-year discharge regardless of whether or not that discharge is expected to increase in the future during the period of analysis. Estimates of future flood damages are constrained by these requirements.

(h) Step 8 – Determine Other Costs of Using the Floodplain. The impact of flooding on existing and potential future occupants of the floodplain, in addition to flood losses, include increased flood proofing costs, increased costs of administration of the NFIP and less efficient use of existing structures. The increased cost of administration of the NFIP can be claimed as a benefit of flood damage reduction projects. HQUSACE annually publishes data on administration cost per policy to use in estimating this benefit. Increased flood proofing costs are used as a measurement of potential location benefits.

(i) Step 9 – Collect Land Market Value and Related Data. If land use is different with and without the project, the difference in income for the land is computed using flood proofing costs as a proxy of the market value of land. If land use is the same with and without the project but the use is more intense, the increased income is determined on the basis of direct computation of costs and revenues. Projects or separable increments of projects that achieve only land development benefits (protection of vacant lands) are not recommended for implementation.

(j) Step 10 – Compute NED Benefits. To the extent that step 5 indicates that the land use is the same with and without the project, inundation reduction benefits are computed as the difference in flood damages with and without the project. In the evaluation of relocation and evacuation projects considerable attention is paid to the with-project use of the land to be evacuated, as the benefit associated with such use may be crucial for project feasibility. NED benefits also include estimates of savings in administration costs of the NFIP, intensification benefits, location benefits and benefits associated with the use of unemployed or underemployed resources. Detailed procedures for computing NED benefits are provided in Appendix E.

(k) Section 219 of the WRDA of 1999 directs the Secretary of the Army to calculate benefits for nonstructural flood damage reduction projects using methods similar to those used in calculating the benefits of structural projects and further directs the Secretary to avoid double-counting of benefits in these projects. Guidance for the implementation of this Section will be included in Appendix E when finalized.

d. Cost Sharing Requirements. Paragraph 2-8 discusses general cost sharing considerations applicable to all project purposes including flood damage reduction. Specific cost sharing requirements for flood damage reduction are discussed in Appendix E.

e. Other Authorities. Other authorities that may be applicable to this project purpose are discussed in paragraph 3-10.

f. Other Related Programs. Flood Plain Management Services (FPMS)

(1) The FPMS Program was established to carry out Section 206 of the Flood Control Act of 1960 as amended. Its objective is to encourage prudent use of the Nation's flood plains for the benefit of the national economy and general welfare by supporting comprehensive flood plain management planning at all appropriate governmental levels. The Corps may provide flood plain information and planning assistance to State, county and city governments, Native American (Indian) Nations, as well as to other Federal agencies. Flood and flood plain information is also provided to private citizens, corporations, and groups.

(2) Assistance can be provided in the form of technical services, planning guidance and assistance on floods and flood plain issues. The Corps also provides support to the National Flood Insurance Program (NFIP) by conducting flood insurance studies and related technical work. Funding for the FPMS Program is obtained through appropriations for non-reimbursable FPMS items and through cost recovery for reimbursable services. Reimbursements for support to the NFIP are obtained from FEMA. Upon request, program services are provided to State, regional, and local governments, Native American (Indian) Nations, and other non-Federal public agencies without charge. Program services also are offered to other Federal agencies and to the private sector on a 100 percent cost recovery basis.

(3) Coordination. Program activities shall be coordinated with State and local agencies and field offices of Federal agencies concerned with flood problems to ensure that they are informed of the Corps FPMS Program, that the Corps is apprised of related activities of other agencies, and that there is no overlap of effort.

3-4. Hurricane and Storm Damage Reduction. Congress has authorized Federal participation in the cost of restoring and protecting the shores of the United States, its territories and possessions. Under current policy, shore protection projects are designed to reduce damages caused by wind-generated and tide-generated waves and currents along the Nation’s ocean coasts, Gulf of Mexico, Great Lakes, and estuary shores. Hurricane protection was added to the erosion control mission in 1956 when Congress authorized cost-shared Federal participation in shore protection and restoration of publicly owned shore areas. Protection of private property is permitted only if such protection is incidental to the protection of public areas, or if the protection of private property would result in public benefits. Federal assistance for periodic nourishment was also authorized on the same basis as new construction, for a period to be specified for each project, when it is determined that it is the most suitable and economical remedial measure.

a. Types of Improvements. The improvements are usually structural measures including such features as beachfill, groins, seawalls, revetment, breakwaters, and bulkheads. Nonstructural measures, such as property acquisition, shall also be considered.

b. Specific Policies.

(1) Geographic Applicability. The shore protection authority is applicable to the shores of the Atlantic and Pacific Oceans, the Gulf of Mexico, the Great Lakes, estuaries, and bays

directly connected therewith of each of the states, the Commonwealth of Puerto Rico, the US Virgin Islands, Guam, American Samoa, and the Commonwealth of the Northern Mariana Islands. The authority extends only that distance up streams where the dominant causes of damage are coastal storms or ocean tidal action (or Great Lakes water motion) and wind-generated waves. The program does not address damages caused by stream flows or vessels.

(2) Erosion Control Measures. In the past, particularly prior to passage of the WRDA of 1986, beach fill or beach restoration was frequently considered an erosion control measure, and erosion control was treated as a project output or project purpose. As a result of enactment of the law, however, erosion control has no separate status as a project purpose or as a project output. Thus, erosion control measures (e.g., beach fill) shall be treated as means to the ends of hurricane and storm damage reduction, ecosystem restoration, or recreation; similar to breakwaters or revetments.

(3) Historic Shoreline. Existing authority provides for restoration and protection of beaches. It provides for extending a beach beyond its historic shoreline only when the extension is desirable for engineering reasons, is environmentally acceptable, and is an economically justified means to prevent or reduce storm damage behind the historic shoreline. In the case of multi-purpose projects that include ecosystem restoration as a project purpose, extending a beach beyond its historic shoreline is acceptable if it is environmentally justified.

(4) Formulation and Establishing Corps Participation. Single purpose shore protection projects are formulated to provide hurricane and storm damage reduction. Highest priority is for reducing damages to existing development. Reducing flooding on, or erosion to, undeveloped lands is not a high priority; and Federal participation in protection of privately owned, undeveloped shores, will not be pursued. Recreation is an incidental output.

(a) The Corps participates in single purpose projects formulated exclusively for hurricane and storm damage reduction, with economic benefits equal to or exceeding the costs, based solely on damage reduction benefits, or a combination of damage reduction benefits and recreation benefits. Under current policy, recreation must be incidental in the formulation process and may not be more than fifty percent of the total benefits required for justification. If the criterion for participation is met, then all recreation benefits are included in the benefit to cost analysis. Costs incurred for other than the damage reduction purpose, i.e. to satisfy recreation demand, are a 100 percent non-Federal responsibility.

(b) The Corps also participates in multiple purpose projects formulated for hurricane and storm damage reduction. For multi-purpose projects that include ecosystem restoration as a project purpose, the combined NED/NER Plan will be formulated in accordance with the guidance in paragraph 2-3g(3) and Appendix E of this regulation.

(5) Public Use and its Relation to Federal Participation. Federal involvement in shore protection has developed historically in relation to beaches, generally with efforts to stabilize, create or restore beaches. It is intended that beaches receiving public aid should not provide exclusively private benefits; and therefore, whenever a hurricane and storm damage reduction

project involves beach improvements, public ownership and use of the beach is required. Items related to public use are discussed below.

(a) User Fees. Reasonable beach recreation use fees are allowable when used to offset the non-Federal sponsor share of project costs.

(b) Parking. Lack of parking may constitute a restriction on public access and use. Therefore, eligibility for Federal participation is precluded in areas where there is a lack of sufficient parking facilities provided for the general public (including nonresident users) reasonably near and accessible to the project beaches. In some instances non-Federal plans may encourage or direct substitution of public transportation access for private automobile access.

(c) Access. Corps participation is conditioned on provision of reasonable public access rights-of-way, consistent with attendance used in benefit evaluation and in accordance with local recreational use objectives.

(d) Beach Use by Private Organizations. Federal aid to private shores owned by beach clubs and hotels which limit beach use to members or guests, is contrary to the intent of Public Law 826 of 1956.

(e) Public Shores with Limitations. Publicly owned beaches which limit use to residents of the community or a group of communities are not considered to be open to the general public and are treated as private beaches.

(6) Shore Lines Owned by Federal Agencies.

(a) Work to provide shore protection to lands under the jurisdiction of another Federal agency shall be accomplished on a reimbursable basis, upon request from the agency. In the event protection has not been requested and such lands are within the study area, Civil Works funds may be used if including them in a project is more cost effective than excluding them.

(b) Protection of (non-Civil Works) Department of the Army lands shall be accomplished with military funds, not civil works funds. If the lands are a minor part within the study area, Civil Works funds may be used if including them in a project is more cost effective than excluding them.

(7) Periodic Nourishment. In accordance with Public Law 826 of 1956 (Beach Nourishment), when the Chief of Engineers determines that the most suitable and economical remedial measures would be provided by a periodic nourishment project, the Chief may consider the periodic nourishment as continuing construction for the length of time that the Chief specifies. Classifying the periodic nourishment as continuing construction establishes the Federal interest in cost sharing renourishments, usually for the economic life of the project. If the NED plan for a shore protection project includes a combination of structures and periodic nourishment, the renourishments may be considered continuing construction while future costs needed to operate, maintain, repair, rehabilitate or replace the structural components are considered operation and maintenance which is a non-Federal responsibility.

(a) New Projects. Federal participation in periodic nourishment may be recommended to continue for the lesser of: (1) project economic life, (2) physical life of structural features required for the project, (3) fifty years.

(b) Existing Projects. Per authority in Section 934 of the WRDA of 1986, when the authorized period of Federal participation in periodic nourishment at existing projects expires, it may be extended without further Congressional action for a period not to exceed 50 years after the date of initial construction. Reevaluation using current evaluation guidelines and policies is necessary. Prior to the expiration of the existing periodic nourishment period the sponsor must request the extension and express a willingness to cost share in accordance with the provisions of WRDA of 1986. This Section 934 authority does not apply to projects using sand bypassing plants.

(8) Outer Continental Shelf Mineral Resources. If mineral resources from the outer continental shelf are proposed for use in Civil Works projects, the Corps and Minerals Management Service (MMS) (U.S. Department of Interior) must enter into a memorandum of agreement. The sponsor must also negotiate a noncompetitive lease with the MMS. Section 215(b) of the WRDA of 1999 amended Section 8(k)(2)(B) of the Outer Continental Shelf Lands Act to exempt state and local government agencies, in addition to Federal agencies, from the assessment of fees for the use of Outer Continental Shelf sand, gravel, and shell resources in a shore protection, beach restoration, or coastal wetlands project or program, or in any other construction project funded or authorized by the Federal Government.

(9) Specific policies for hurricane and storm damage reduction are presented in more detail in ER 1165-2-130.

c. Evaluation Framework. The measurement standard and conceptual basis for benefits is willingness to pay for each increment of output from a plan. In some planning situations it is infeasible to directly measure willingness to pay; therefore, alternative techniques are used to estimate the total value of a plan's output. The evaluation of hurricane and storm damage reduction projects shall be conducted following the process described in paragraph 2-3e of this regulation. The procedures described in the following paragraphs apply to the estimation of benefits used in the economic evaluation of hurricane and storm damage reduction projects and summarize requirements and procedures. Appendix E provides additional guidance on these requirements and procedures.

(1) National Economic Development Benefits. For hurricane and storm damage reduction projects estimated benefits are principally reductions in actual or potential damages to affected land uses. Damages are most frequently due directly to storms or to the resultant shoreline erosion. Storm damage reduction benefits are categorized as wave damage reduction benefits, inundation reduction benefits and other benefits. Erosion protection benefits include loss of land, structural damage prevention, reduced emergency costs, reduced maintenance of existing structures and incidental benefits. The primary benefit to be claimed in hurricane and storm damage reduction projects is reduction of damages to existing structures. Recreation

benefits are incidental and are measured in accordance with the guidance provided in paragraph 3-7 of this regulation and in Appendix E.

(2) With- and Without-Project Conditions. The assumptions described in paragraph 3-3c(3) are also applicable to hurricane and storm damage reduction studies. In addition, whenever a hurricane and storm damage reduction project involves beach improvements, public ownership and use of the beach is required, as described in paragraph 3-4b(5) of this regulation.

(3) Evaluation Procedure. The steps to evaluate benefits for hurricane and storm damage prevention projects are described in the following paragraphs. The level of effort expended on each step will depend on the scope and nature of the proposed improvement, the state of the art to accurately develop the estimates and the sensitivity of project formulation and evaluation to further refinement.

(a) Step 1 – Delineate the Study Area. The study area is that area affected by storms and erosion problems and by proposed alternatives. It includes areas indirectly affected by the problems and projects such as downdrift areas and navigation and other projects outside the immediate project site.

(b) Step 2 – Define the Problem. In this step, existing storm damage and erosion problems are identified and described. The description of existing conditions should include a history of the economic and social effects of storm damage and erosion problems in the area, a history of storms and erosion trends and historical floods and wave attack problems. A determination of the degree of protection afforded by existing structures is also made as part of this step. This includes an assessment of the level of protection actually provided by the structure, its structural integrity, the remaining useful life and operation and maintenance requirements.

(c) Step 3 – Select Planning Shoreline Reaches. Reaches are the primary economic sub-unit of analysis. Geomorphic conditions, land uses and type or level of existing protection are criteria used in the designation of reaches.

(d) Step 4 – Establish Frequency Relationships. Two types of frequency relationship are developed for the analysis. These are elevation-frequency relationship and erosion-frequency relationship. The first one shows the relationship between wave and water level and frequency of occurrence and is used to derive expected annual inundation damages. The second one shows the relationship between periodic erosion (or accretion) and frequency of occurrence and is used to estimate erosion-induced damages.

(e) Step 5 – Inventory Existing Conditions. An inventory of affected properties, including land, is performed to estimate potential damages. The inventory is done by land use activities (i.e., residential, commercial, industrial, etc.) and includes variables such as value, use, ground elevation, distance from the water, construction materials, area, and number of stories. Areas likely to be developed in the future or where land use changes could occur are also identified.

(f) Step 6 – Develop Damage Relationships. Damage relationships describe the expected value of structural or contents damages caused by various factors, such as depth of flooding, duration of flooding, sediment load, wave heights, amount of shoreline recession and warning time. Generalized or site-specific damage relationships can be used depending on the scope of the study and the availability of applicable generalized relationships. Generalized damage relationships are those developed for other geographic areas with similar characteristics to the study area. Site-specific damage relationships are usually required to estimate wave attack and erosion damages. These damage relationships are developed using actual damage data from past storm events. Estimates of losses for buildings, roads, protective works, and other features are developed at current price levels for existing development. Damage relationships are developed for each land use category. Anticipated damages from land loss due to erosion are computed as the market value of the average annual area expected to be lost. Nearshore land values are used to estimate the value of land lost. A risk-based analytical framework should be used to develop the damage relationships.

(g) Step 7 – Develop Damage-Frequency Relationships. The damage-frequency relationships represent how the damage associated with a given event (i.e., storm, wave, erosion) is related to the frequency of that event (probability of occurrence). The damage relationships developed in step 7 are combined with the frequency curves (developed by the hydraulic and hydrologic engineers) to estimate the damage-frequency relationships. Damage-frequency relationships (curves) are developed for each of the applicable damage mechanisms, i.e., long-term erosion, recession, inundation and wave attack and for each land use category. These relationships should be developed using a risk-based analytical framework.

(h) Step 8 – Calculate Expected Annual Damages and Benefits. The expected annual damage is the expected value of erosion losses and storm damages in any given year. Expected annual damages are calculated by computing the area under the damage-frequency curve using a life-cycle approach. Expected annual damages are calculated for the with- and without-project conditions. The difference between the with- and without-project expected annual damages represents the benefit associated with the project.

d. Cost Sharing Requirements. Paragraph 2-8 discusses general cost sharing considerations applicable to all project purposes including hurricane and storm damage prevention. Specific cost sharing requirements for this purpose are discussed in Appendix E.

e. Other Authorities. Other authorities that may be applicable to this project purpose are discussed in paragraph 3-10.

3-5. Ecosystem Restoration. The Corps of Engineers incorporated ecosystem restoration as a project purpose within the Civil Works program in response to the increasing National emphasis on environmental restoration and preservation. Historically, Corps involvement in environmental issues focused on compliance with NEPA requirements related to flood protection, navigation, and other project purposes. The ecosystem restoration purpose shall be carried out in addition to activities related to NEPA compliance as discussed in Appendix C. Ecosystem restoration features shall be considered as single purpose projects or as a part of multiple purpose projects along with navigation, flood protection and other purposes, wherever those restoration features

improve the value and function of the ecosystem. Ecosystem restoration projects should be formulated in a systems context to improve the potential for long-term survival of aquatic, wetland, and terrestrial complexes as self-regulating, functioning systems. Similar to other project purposes, the value of ecosystem restoration outputs shall equal or exceed their cost.

a. Types of Improvements. A wide range of improvements to ecosystem functions is possible including, but not limited to, use of dredged material to restore wetlands, restoring floodplain function by reconnection of oxbows to the main channel, providing for more natural channel conditions including restoration of riparian vegetation, pools and riffles and adding structure, modification of obstructions to fish passage including dam removal, modifications to dams to improve dissolved oxygen levels or temperature downstream, removal of drainage structures and or levees to restore wetland hydrology, and restoring conditions conducive to native aquatic and riparian vegetation.

b. Specific Policies.

(1) The objective of ecosystem restoration is to restore degraded ecosystem structure, function, and dynamic processes to a less degraded, more natural condition. Restored ecosystems should mimic, as closely as possible, conditions which would occur in the area in the absence of human changes to the landscape and hydrology. Indicators of success would include the presence of a large variety of native plants and animals, the ability of the area to sustain larger numbers of certain indicator species or more biologically desirable species, and the ability of the restored area to continue to function and produce the desired outputs with a minimum of continuing human intervention. Those restoration opportunities that are associated with wetlands, riparian and other floodplain and aquatic systems are most appropriate for Corps involvement. A more detailed discussion of Corps ecosystem restoration policy is found in ER 1165-2-501 and Appendix E of this regulation.

(2) Purposes. Projects implemented under this guidance should address the restoration of ecosystems and not restoration of cultural or historic resources, aesthetic resources, or clean up of hazardous and toxic wastes.

(3) Mitigation. Ecosystem restoration projects should be designed to avoid the need for fish and wildlife mitigation. Projects implemented using restoration authorities may not be used as wetland banks or mitigation credit for the non-Federal sponsor.

(4) Public interest. For projects where the land on which the majority of the physical ecosystem restoration will occur is in the ownership of a single firm, individual, club, or association with restrictive membership requirements, it must be demonstrated clearly that the restoration benefits are in the overall public interest and that the benefits do not accrue primarily to the property owner.

(5) Land acquisition. Land acquisition in ecosystem restoration plans must be kept to a minimum. Project proposals that consist primarily of land acquisition are not appropriate. As a target, land value should not exceed 25 percent of total project costs. Projects with land costs exceeding this target level are not likely to be given a high priority for budgetary purposes.

(6) Recreational features. Limited recreational features compatible with the ecosystem outputs for which the project is designed are permissible. Recreational features must be justified and appropriately cost-shared, and should not increase the Federal cost of the ecosystem restoration project by more than 10 percent without prior approval of the ASA(CW). (See Appendix E for additional information.)

(7) Water Quality. Water quality is an important component of ecosystem structure and water quality improvement can be considered as an output of an ecosystem restoration project. However, projects or features that would result in treating or otherwise abating pollution problems caused by other parties where those parties have, or are likely to have a legal responsibility for remediation or other compliance responsibility shall not be recommended for implementation.

(8) Monitoring and adaptive management. Monitoring may be necessary to determine if the predicted outputs are being achieved and to provide feed back for future projects. Cost shared post-implementation monitoring will rarely be required. If cost shared post-implementation monitoring is being considered, it must be clearly defined, justified and the period of cost shared monitoring shall not exceed five years following completion of construction. The cost of monitoring included in the total project cost and cost shared with the non-Federal sponsor shall not exceed one percent of the total first cost of ecosystem restoration features. For complex specifically authorized projects that have high levels of risk and uncertainty of obtaining the proposed outputs, adaptive management may be recommended. The cost of the adaptive management action, if needed, will be limited to 3 percent of the total project cost excluding monitoring costs. Appendix F contains guidance for the CAP.

(9) Real Estate. Requirements specified in paragraph 4-3c(4) apply to ecosystem restoration studies. Generally, fee title is required for ecosystem restoration projects.

c. Evaluation Framework. While the planning process for single purpose ecosystem restoration projects is the same as for any other purpose, the evaluation process is different in that it focuses on quantitative and qualitative restoration outputs and monetary benefits are usually incidental. (See Appendix E for more information on the evaluation process.)

(1) Ecosystem restoration outputs must be clearly identified and quantified in appropriate units. Although it is possible to evaluate various physical, chemical, and/or biological parameters that can be modified by management measures which would result in an increase in ecosystem quantity and quality in the project area, the use of units that measure an increase in "ecosystem" value and productivity are preferred. Some examples of possible metrics which may be used include habitat units, acres of increased spawning habitat for anadromous fish, stream miles restored to provide fish habitat, increases in number of breeding birds, increases in target species and diversity indices. Alternate measures of ecosystem value and productivity may be used upon approval by CECW-P. Monetary gains (e.g., incidental recreation or flood damage reduction) and losses (e.g., flood damage reduction or hydropower) associated with the project shall also be identified.

(2) Cost Effectiveness-Incremental Cost Analyses – As used in this regulation, a plan is considered cost effective if it provides a given level of output for the least cost. Cost effectiveness analysis shall be used to identify the least cost solution for each level of environmental output being considered. Incremental cost analysis compares the additional costs to the additional outputs of an alternative. It is a tool that can assist in the plan formulation and evaluation process, rather than a dictum that drives that process. Incremental analysis helps to identify and display variations in costs among different increments of restoration measures and alternative plans. Thus, it helps decision makers determine the most desirable level of output relative to costs and other decision criteria. These analyses must be performed at an appropriate level of detail for each study to identify the most cost effective plan within the identified constraints.

(3) The significance of the outputs is a critical factor in determining if the monetary and /or non-monetary benefits of the proposed project justify monetary and/or non-monetary costs. The scarcity of the outputs is also a factor in this determination. The concepts of significance and scarcity are discussed in more detail in Appendix E. The risks and uncertainties associated with achieving the projected outputs must also be considered. (See Appendix E for additional information.) Contingent value procedures (survey techniques) for estimating existence, "option", bequest, or other such non-use values will not be approved, and shall not be used, due to several factors including the conjectural nature of estimated values and the high difficulty in controlling bias.

d. Cost Sharing Requirements. Paragraph 2-8 discusses general cost sharing considerations applicable to all project purposes including ecosystem restoration. Specific cost sharing requirements for this purpose are discussed in Appendix E. Appendix F provides details on cost sharing rules applicable to CAP authorities.

e. Other Authorities. Other authorities that may be applicable to this project purpose are discussed in paragraph 3-10.

3-6. Hydroelectric Power Generation. Congress, through various statutes, has directed the Corps to consider the development of hydroelectric power in conjunction with other water resources development plans. Current policy calls for the Corps to formulate comprehensive plans including the development of hydropower by a non-Federal sponsor. The Corps will pursue Federal development only where such non-Federal activity would be impractical. Even in those cases, all costs associated with development of hydroelectric power at the site of a Corps project are borne by non-Federal sponsors.

a. Types of Improvements.

(1) New Federal Projects. Hydroelectric power development may be considered during planning for multipurpose projects involving dams and lakes and may be recommended if non-Federal development would be impractical. The Corps does not construct single purpose hydroelectric power projects.

(2) Addition of Hydropower to Existing Projects. Corps projects without hydroelectric power facilities may add facilities through Federal Energy Regulatory Commission (FERC)

licensed non-Federal development. In rare cases, Congress may authorize Federal development. Cost of development must be borne by non-Federal sponsors.

(3) Pumped Storage. Pumped storage may be considered in the formulation of water resource projects. Non-Federal sponsors are encouraged to develop pumped storage facilities determined to be feasible.

b. Specific Policies.

(1) Practicability. A hydropower project is impractical for non-Federal development if there are compelling physical, operational, legal, competing use, institutional, environmental or economic reasons preventing development or operation, or if non-Federal development would be significantly less productive than Federal development (i.e., produce significantly fewer net NED benefits considering all project outputs).

(2) Economic Justification Requirements. Corps development of single purpose hydropower is precluded. In addition, before hydropower can be included in a multiple purpose project, the project must be economically justified based on other outputs (e.g., flood damage reduction or navigation).

(3) Marketing of Federal Hydropower. Although the Corps constructs and operates power facilities, the power itself is either sold by a Federal power-marketing agency or conveyed to a sponsor. Thus, plan formulation, financing and other implementation requirements should be coordinated with the power-marketing agency and sponsors.

(4) Studies. New studies may be conducted in cases where non-Federal development is impractical. This must be substantiated in order to justify a funding request. No single purpose hydropower studies may be initiated for new sites unless specifically directed and funded by the Congress. Non-Federal sponsors must agree to share the costs of the feasibility study with the explicit understanding that any resultant Federal project will be financed by non-Federal funds.

(5) Technical Services. Upon request, districts may provide reimbursable technical services to states or State subdivisions on hydropower development at sites where hydropower is not an authorized purpose (Intergovernmental Cooperation Act of 1968). Assistance is limited to technical services. Separate authority to construct or operate and maintain hydropower facilities is required. The Corps Center of Expertise for hydropower projects is the Hydroelectric Design Center (HDC) located in Northwestern Division (NWD). Some technical services must be done by the HDC. Any technical service agreements must be coordinated with HDC.

(6) Minimum Facilities for Future Power Installations. To support future hydropower development, penstocks and some other features (“minimum facilities”) may be included in initial project construction, while installation of full facilities is postponed.

(7) Transmission Facilities. The placement of transmission lines and substations must be considered with other project effects.

(8) Hydroelectric Development at Non-Corps Sites. The Corps has no general authority to participate in hydroelectric development at non-Corps sites.

c. Evaluation Framework. The measurement standard and conceptual basis for hydropower benefits is willingness to pay for each increment of output from a plan. In some planning situations it is infeasible to directly measure willingness to pay; therefore, alternative techniques are used to estimate the total value of a plan's output. In the absence of direct measures of marginal willingness to pay, the benefit can be estimated using the resource cost of the most likely alternative to be implemented in the absence of the alternatives under consideration. Since the Corps current participation on the development of hydropower generation projects is very limited, the evaluation procedures are not summarized in this regulation. (See Appendix E for a detailed description, if needed). Current Corps involvement in hydropower generation projects involves the evaluation of major rehabilitation of existing projects. The procedures to evaluate major rehabilitation projects are also described in Appendix E.

d. Cost Sharing Requirements. Paragraph 2-8 discusses general cost sharing considerations applicable to all project purposes including hydropower. Specific cost sharing requirements for this purpose are discussed in Appendix E.

3-7. Recreation. The U.S. Army Corps of Engineers is one of the Nation's largest providers of outdoor recreation opportunities. Although known primarily for the opportunities managed at its lake projects, the Corps also participates in the planning, design and construction of recreation facilities at a wide variety of other types of water resource projects. Such facilities might include hiking and biking trails associated with a stream channel or levee primarily designed for flood damage reduction. There is no general authority for Corps participation in a single purpose recreation project.

a. Types of Improvements. A list of recreational facilities which may be provided in recreation development at Corps projects is provided in Appendix E. As a general rule, the Corps does not participate in the development of improvements that provide outputs or services generally considered vendible. If there is no non-Federal recreation sponsor, facilities or project modifications may not be recommended unless justified by other project purposes, in which case recreation benefits are considered incidental. Minimum facilities needed to maintain public health or safety are permissible. These are limited to road end turnarounds, guardrails, barricades, warning signs, public safety fencing and vault toilets unless upgrades are required by Federal or State regulations. Boat ramps and trailer parking justified by project operations requirements may be provided.

b. Specific Policies.

(1) Lakes (man-made).

(a) Lakes, or reservoirs, are impoundments created behind dams, or behind navigation locks and dams if lands not subject to navigation servitude are needed for water storage. Recreation policies applicable to lakes are not applicable to dry dams, that is, those dams not providing permanently impounded water. The Federal government may participate in basic

recreation facilities on project lands or separable recreation lands if a non-Federal sponsor will participate and cost share. Economically justified recreation facilities are cost shared 50 percent Federal and 50 percent non-Federal. The same conditions apply to separable lands acquired for future recreation development. Cost of recreation development at lakes may not exceed one-half of total project costs. If recreation is a project purpose, several scales of development must be formulated and evaluated.

(b) Reallocation of Storage. Storage reallocation for recreation which significantly affects other authorized purposes, or involves major structural or operational changes, requires Congressional approval. Costs reallocated to recreation and subject to cost sharing will be set to the highest of benefits foregone, revenues foregone, replacement costs, or updated cost of storage. Appendix E provides detailed information on how to compute these benefits, revenues and costs. Cost sharing of facilities is 50 percent Federal and 50 percent non-Federal.

(2) Non-lake Flood Damage Reduction and Navigation Projects. General policies described in the previous paragraphs also apply to non-lake projects, with the following exceptions:

(a) Basic recreation facilities that take advantage of project created opportunities may be provided, but only on lands acquired for non-recreation purposes.

(b) Separable lands acquired for access, parking and facilities, which are required for health and safety are eligible for recreation cost sharing.

(c) Generally, if there is no non-Federally sponsored recreation development, there is no Federal participation in minimum facilities.

(d) The Federal cost of a project including recreation may not exceed the Federal cost of the project excluding recreation by more than ten percent without prior approval by the Secretary of the Army.

(3) Shore Protection Projects. Policy precludes the addition of sand to a beach solely to increase its potential for recreation. Other associated recreation developments are entirely non-Federal responsibility except on Federally-owned shores.

(4) Nonstructural Flood Damage Reduction Projects. Nonstructural flood damage reduction projects are justified mainly by creating new uses for floodplains, and one of the most important new uses is recreation. The limitation of increased Federal cost for recreation development, described in paragraph 3-7b(2), does not apply to projects formulated for nonstructural flood damage reduction that include recreation development. Cost of recreation development may not exceed one-half of the total project costs.

(5) Recreation at ecosystem restoration projects. Recreation at ecosystem restoration projects should be compatible with these types of projects and enhance the visitation experience by taking advantage of natural values. The social, cultural, scientific, and educational values should be considered within the framework of the ecosystem restoration project purpose.

Recreation development at an ecosystem restoration project shall be totally ancillary to the primary purpose, appropriate in scope and scale, and shall not diminish the ecosystem restoration outputs used to justify the project. Recreation facilities may be added to take advantage of the education and recreation potential of the ecosystem restoration project but the project shall not be formulated for recreation. The recreation potential may be satisfied only to the extent that recreation does not adversely impact the ecosystem restoration purpose, and the recreation facilities are justified. The recreational experience shall build upon the ecosystem restoration objective and take advantage of the restored resources rather than detract from them. Ecosystem restoration projects should not encourage public use if there is no non-Federal sponsor to cost share recreation. (Refer to Appendix E for a more detailed discussion on this matter.) Federal participation in recreation development at ecosystem restoration projects will be limited to the facilities shown on the list in Appendix E. Specific policies stated in paragraph 3-7b(2) of this regulation also apply to recreation development at single purpose ecosystem restoration projects. For multi-purpose projects that include non-structural flood damage reduction, ecosystem restoration and recreation, the cost of recreation associated with the non-structural flood damage reduction features may not exceed one-half of the total cost for flood damage reduction plus recreation; and, for recreation associated with ecosystem restoration, the Federal cost of ecosystem restoration plus the Federal cost of recreation may not exceed by more than 10 percent the Federal cost of the ecosystem restoration project without prior approval of the ASA(CW). (See Appendix E for additional information on the implementation of this policy.)

(6) Continuing Authorities. Flood damage reduction, navigation and shore protection continuing authorities are subject to the same recreation policies and conditions of participation as specifically authorized projects. Additionally, all costs in excess of the statutory limitation of Federal expenditures for these projects are entirely a local responsibility.

(7) Limitations on Corps of Engineers Participation in Recreation Projects. Budget Policy generally precludes using Civil Works resources to implement recreation oriented projects in the Civil Works program. An exception is where a project is formulated for other primary purposes and average annual recreation benefits are less than 50 percent of the average annual benefits required for justification (i.e., the recreation benefits that are required for justification are less than an amount equal to 50 percent of project costs).

c. Evaluation Framework. The measurement standard and conceptual basis for recreation benefits is willingness to pay for each increment of output from a plan. In some planning situations it is infeasible to directly measure willingness to pay; therefore, alternative techniques are used to estimate the total value of a plan's output. The evaluation of recreation projects shall be conducted following the process described in paragraph 2-3e of this regulation. The procedures described in the following paragraphs apply to the estimation of benefits used in the economic evaluation of recreation projects and summarize requirements and procedures. Appendix E provides additional guidance on these requirements and procedures.

(1) National Economic Development Benefits. NED benefits from recreation opportunities created by a project are measured in terms of willingness to pay. Benefits for projects that increase the supply of recreational facilities are measured as the willingness to pay for the increment of supply. Benefits for projects that alter willingness to pay for recreational facilities are measured as the with- and without-project willingness to pay.

(2) Evaluation Procedure. It is frequently not possible to estimate demand directly from observed price-consumption data for publicly provided recreation. Thus, three alternate methods can be used to estimate use and willingness to pay. They are the travel cost method (TCM), contingent valuation method (CVM) and the unit day value method (UDV). Criteria to select the method to use include availability of regional demand model, type of recreation activities affected (general or specialized), estimated annual visits and cost of proposed facilities. Appendix E provides details on how to apply these criteria and on how to estimate benefits using each one these evaluation methods.

(a) Travel cost method. The basic premise of the travel cost method is that per capita use of a recreation site will decrease as out-of-pocket and time costs of traveling to the site increases, other variables being constant. TCM consists of deriving a demand curve by using the variable cost of travel and the value of time as proxies for price. This method may be applied to a site-specific study or a regional model.

(b) Contingent Valuation Method. The contingent valuation method estimates NED benefits by directly asking individual households their willingness to pay for changes in recreation opportunities at a given site. Individual values collected may be aggregated by summing willingness to pay for all users in the study area. This method may be applied to a site-specific study or a regional model. Contingent value techniques shall not be used to estimate existence, “option”, bequest or other such non-use values, due to several factors including the conjectural nature of estimated values and the high difficulty in controlling bias.

(c) Unit Day Value. The unit day value method relies on expert or informed opinion and judgment to estimate the average willingness to pay of recreational users. By applying a carefully thought-out and adjusted unit day value to estimated use, an approximation is obtained that may be used as an estimate of project recreation benefits. This method may be applied to site-specific studies only.

d. Cost Sharing Requirements. Paragraph 2-8 discusses general cost sharing considerations applicable to all project purposes including recreation. Specific cost sharing requirements for this purpose are discussed in Appendix E.

e. Other Authorities. Other authorities that may be applicable to this project purpose are discussed in paragraph 3-10.

3-8. Water Supply. National policy regarding water supply states that the primary responsibility for water supply rests with states and local entities. The Corps may participate and cooperate in developing water supplies in connection with construction, operation and modification of Federal navigation, flood damage reduction, or multipurpose projects. Certain conditions of non-Federal participation are required.

a. Types of Improvements. The Corps is authorized to provide storage in multipurpose reservoirs for municipal and industrial water supply and for agricultural irrigation. Some facilities for releasing or withdrawing the stored water can be included in the project structure.

The cost of storage and associated facilities must be repaid by the non-Federal sponsor. The Secretary of the Army is authorized to make agreements with states, municipalities and non-Federal entities for right to storage in Corps reservoirs. Storage for agricultural irrigation may be provided at the request of the Secretary of the Interior in 17 Western states as defined in Appendix E. Storage for this purpose can be provided in non-Western states provided cost sharing requirements described in Appendix E are met. Existing Corps projects may be modified to add storage for municipal and industrial water supply. Storage may also be reallocated from other purposes to municipal and industrial uses. Specific policies and procedures applicable to reallocations of storage are discussed in Paragraph 3-8b(5). Permanent reallocations for irrigation water supply may also be considered in existing projects through the submittal of a Section 216 report (Review of Completed Projects) to Congress. Paragraph 3-10b and Appendix G provide more information on Section 216 reports. The Secretary of the Army can also enter into agreements with states, municipalities, private entities or individuals for the use of surplus water as defined in, and under the conditions described in, Paragraph 3-8b(4). Surplus water can also be used to respond to droughts and other emergencies affecting municipal and industrial water supplies.

b. Specific Policies.

(1) Water Rights. Potential encroachment on the water rights of lawful downstream water users by the operation of water supply storage must be carefully considered and coordinated with responsible State and local interests. The Corps will not acquire water rights necessary for use of stored water. This is a responsibility of the water users. Nor should the Corps become involved in resolving conflicts among water users concerning rights to use stored water, but will look to responsible State agencies to resolve such conflicts.

(2) Permanent Rights to Storage. Under the authority of Public Law 88-140 of 1963 (Extension of Right to Water Supply Storage), the non-Federal sponsor acquires a permanent right to the use of storage as long as the space is physically available.

(3) New Projects. Corps provided water supply service normally means reservoir space for storing water and, where necessary, facilities in the project structure for releasing or withdrawing the stored water for water supply purposes. The non-Federal sponsor must pay all costs allocated to M&I water supply storage space. Conduits for release or withdrawal of stored M&I water may be designed as an integral part of the dam structure. Costs are identified as specific M&I water supply costs with 100 percent payment of investment and annual costs by users.

(a) Multi-purpose Project. Limits are placed on the percent of municipal and industrial (M&I) water that may be included in a multi-purpose project. To be considered multi-purpose, a project must fall in one of the following categories:

- The project has justified, separable storage for flood damage reduction or navigation or agricultural water supply. In this case the sum of benefits for these purposes must be at least ten percent of total NED benefits. If M&I water supply exceeds 90 percent of total benefits the project is considered single purpose M&I water supply and thus not eligible for Federal participation.

- The project has no separable storage for flood damage reduction, navigation or agricultural water supply. In this case the sum of benefits for these purposes must be at least twenty percent of total NED benefits. If M&I water supply exceeds 80 percent of total benefits the project is considered single purpose M&I water supply and thus not eligible for Federal participation.

(b) Single-Purpose Water Supply. The Corps does not conduct single purpose water supply studies, except for analysis of existing data under Section 22 of the WRDA of 1974 as amended. This constraint does not apply to single purpose water supply modifications to previously constructed projects having flood damage reduction or navigation purposes. Also, the Corps may conduct reimbursable single purpose water supply studies for non-Federal interests under provisions of the Intergovernmental Cooperation Act of 1968.

(c) Limits on Future Use Storage. The Water Supply Act of 1958, as amended, states that not more than 30 percent of total construction costs can be allotted to water supply for future use. In addition, Corps policy is to obtain full payment of allocated capital costs from non-Federal entities desiring water supply storage prior to or during construction. Failing this, non-Federal sponsors shall negotiate a repayment agreement, with payments to begin immediately after construction completion under the provisions of Section 932 of the WRDA of 1986.

(4) Surplus Water. Under Section 6 of the Flood Control Act of 1944, the Secretary of the Army is authorized to make agreements with states, municipalities, private concerns, or individuals for surplus water that may be available at any reservoir under the control of the Department. These agreements may be for domestic, municipal, and industrial uses, but not for crop irrigation. When the user desires long-term use, a permanent storage reallocation should be performed under the authority of the Water Supply Act of 1958, as amended. Surplus water is either water stored in a Department of the Army reservoir that is not required because the authorized use for the water never developed or the need was reduced by changes that occurred since authorization or construction, or water that would be more beneficially used as municipal and industrial water than for the authorized purposes over some specific time period. Use of the Section 6 authority is allowed only where non-Federal sponsors do not want to purchase storage because: use of the water is needed for a short term only or use would be temporary pending development of the authorized use and reallocation of storage is not appropriate. Terms of the agreements are normally for five (5) years, with an option for a five (5) year extension, subject to the space being needed for the authorized purposes, or the authorized purpose is deauthorized.

(5) Reallocation of storage. Reallocation or addition of storage that would seriously affect other authorized purposes or that would involve major structural or operational changes requires Congressional approval. Provided these criteria are not violated, 15 percent of the total storage capacity allocated to all authorized project purposes or 50,000 acre feet, whichever is less, may be allocated from storage authorized for other purposes. Or, this amount may be added to the project to serve as storage for municipal and industrial water supply at the discretion of the Commander, USACE. When reallocating storage from the flood control pool to municipal and industrial water supply, the need to compensate existing water supply contract holders shall be evaluated. Dependable yield mitigation storage (DYMS) shall be analyzed and implemented to

compensate these users. Compensation to existing hydropower users through minor operational changes, where appropriate, may also be considered. Procedures and requirements to analyze and implement DYMS and operational changes are described in Appendix E.

(a) Costs of Reallocated Storage. The cost allocated to the non-Federal entity (i.e., the price to be charged for the capital investment for the reallocated storage) will normally be established as the highest of the benefits or revenues foregone, the replacement cost, or the updated cost of storage in the Federal project. The methodologies to be used to compute these benefits, revenues and costs are discussed in Appendix E. The non-Federal entity shall also be responsible for an appropriate share of the annual costs that include specific and joint-use operation, maintenance, repair, replacement and rehabilitation (OMRR&R) costs. In those cases where the cost of water supply is based on hydropower replacement costs, the OMRR&R increment of such cost is to be deleted from the total charge and then billed separately based on a pro rata share of the actual experienced project costs.

(b) Financial Feasibility. A test of financial feasibility must be performed to demonstrate that reallocation of storage is the most efficient water supply alternative. Appendix E provides additional information on how to conduct this analysis.

(c) Addition of Storage. When water supply storage is added to an existing project and storage is not reallocated, a willingness to pay concept is used to assign costs to the new water supply purpose. Under this concept, the non-Federal sponsor is responsible for 100 percent of the new construction costs allocated to M&I water supply. This is to be paid during the construction period. In addition, payments equal to 50 percent of the sponsor's savings are required.

(6) Seasonal Operations for Water Supply. Congress has not provided general authority for including storage space in Corps projects for seasonal M&I use, either as withdrawals or to improve groundwater supplies. However, project specific authorizations are not precluded. In addition, project operations may be modified to enhance ground water replenishment, to increase downstream flows, or to otherwise enhance usage of projects for M&I purposes. Modifications must be consistent with authorized project purposes and law. Cost sharing requirements for seasonal operations for water supply are provided in Appendix E.

(7) Water Withdrawals Contracts. The Corps will not use Section 501 of the Independent Offices Appropriations Act of 1952 to obtain reimbursement for water supply withdrawals. Existing contracts under this authority should be allowed to expire under the terms of the contract. These contracts are not to be extended.

c. Evaluation Framework. The measurement standard and conceptual basis for benefits is willingness to pay for each increment of output from a plan. In some planning situations it is infeasible to directly measure willingness to pay; therefore, alternative techniques are used to estimate the total value of a plan’s output. The evaluation of water supply projects shall be conducted following the process described in paragraph 2-3e of this regulation. The procedures described in the following paragraphs apply to the estimation of benefits used in the economic

evaluation of water supply projects and summarize requirements and procedures. Appendix E provides additional guidance on these requirements and procedures.

(1) National Economic Development Benefits. Where the price of water reflects its marginal cost, that price is used to calculate willingness to pay for additional water supply. If such direct measures of marginal willingness to pay are not available, the benefits are measured by the resource cost of the alternative most likely to be implemented in the absence of the proposed plan. The benefits from nonstructural measures are also computed using the cost of the most likely alternative.

(2) With- and Without-Project Condition. Specific elements included in the definition of the without-project condition are existing water supplies, existing and expected future water systems, water management contracts and operating criteria, water supplies that are under construction or authorized and likely to be constructed during the period of analysis, the probability of delivery for each source of water supply, water quality, and conservation measures. These six elements are also considered under the with-project condition.

(3) Evaluation Procedure. The steps required to evaluate benefits for water supply projects are described in the following paragraphs. The level of effort expended on each step will depend on the scope and nature of the proposed improvement, the state of the art to accurately develop the estimates and the sensitivity of project formulation and evaluation to further refinement. Appendix E provides additional guidance for each step.

(a) Step 1 - Identify the study area. The study area is the area within which significant project impacts will accrue from the use of M&I water supplies, including areas that will receive direct benefits and/or incur costs from the provision of M&I water supply.

(b) Step 2 - Estimate future M&I water supplies. All sources of supply expected to be available to the M&I user are analyzed. The analysis is performed by time period and includes existing water supplies, institutional arrangements, additional water supplies, probability of water supply and water quality.

(c) Step 3 - Project future M&I water supply. Future water use is projected by sector considering seasonal variations in use. The projections are based on an analysis of the factors that may determine variations in levels of water use.

(d) Step 4 – Identify the deficit between future water supplies and use. Projected water use is compared to future water supplies to determine whether any deficits exist in the study area. An analysis of the intensity, frequency and duration of the expected deficits is performed.

(e) Step 5 – Identify alternatives without the Federal plan. Alternative plans that are likely to be implemented by communities and/or industries in the absence of a Federal plan are identified in this step. These plans should be identified through analysis of the total water resources of the region, allowing for present and expected competing uses.

(f) Step 6 – Rank and display the alternative plans based on least cost analysis. All the alternatives are ranked in order from the highest cost alternative to the lowest. Annualized costs for each alternative are calculated on the basis of the service (depreciable) life of the facility or the period of analysis, whichever is less.

(g) Step 7 – Identify the most likely alternative. The least cost alternative is identified as the most likely alternative.

(h) Step 8 – Compute M&I water supply annualized benefits. The annualized benefits of the Federal supply plan are equal to the annualized cost of the most likely alternative.

(i) Risk-analysis techniques, required for all water resources studies, have not been specifically developed for municipal and industrial water supply projects. Where water supply constitutes a substantial portion of total benefits, districts are required to perform, at a minimum, sensitivity analysis of key variables such as cost of least cost alternative, future demand for water and future availability of water supplies.

d. Cost Sharing Requirements. Paragraph 2-8 discusses general cost sharing considerations applicable to all project purposes including water supply. Specific cost sharing requirements for this purpose are discussed in Appendix E.

e. Other Authorities. Other authorities that may be applicable to this project purpose are discussed in paragraph 3-10.

## 3-9. Multiple Purpose Studies.

a. Definition. Multiple purpose studies can examine more than one type of water resources problem or opportunity and recommend projects with more than one purpose. Corps mission areas can be combined to address multiple objectives within the localized study area. For example, many existing flood control dams also supply water for M&I or agricultural uses, or provide hydropower. Additionally, there may be opportunities to address some combination of purposes which also could include ecosystem restoration and/or recreation. Oftentimes there will be competing water resources uses; therefore environmental, social, and economic considerations need to be evaluated. The evaluation process for these projects will demonstrate the trade-offs for providing various combinations and levels of economic, social, and environmental outputs. Multiple purpose studies will typically result in the recommendation of a single project or set of projects that satisfy the range of water resources purposes identified.

b. Comprehensive studies. A comprehensive study characterizes, measures, and evaluates a particular water resources problem or opportunity across a broad area or region. Typically, the focus of comprehensive studies is water resources problems related to the Corps main mission areas (flood damage reduction, ecosystem restoration or navigation). Non-Federal entities with interests common to the Corps mission area(s) identified should be encouraged to participate in the study investigations; the general public should not only be informed about the study but also be canvassed for information related to needs, opportunities and constraints. Based

on evaluation that considers existing and without-project conditions, the study will determine the need for further Corps studies and projects.

c. Watershed Studies. Watershed studies are planning initiatives that have a multi-purpose and multi-objective scope and that accommodate flexibility and collaboration in the formulation and evaluation process. Possible areas of investigation for a watershed study include water supply, natural resource preservation, ecosystem restoration, environmental infrastructure, recreation, navigation, flood management activities, and regional economic development. This multi-purpose approach is recommended since numerous entities within the boundaries of any watershed must agree with and support watershed improvement and management initiatives in order to successfully implement effective system-wide solutions. The outcome of a watershed study will generally be a watershed resources management plan which identifies the combination of recommended actions to be undertaken by various partners and stakeholders in order to achieve the needs and opportunities identified in the study. The watershed resources management plan may or may not identify further Corps studies or implementation projects.

d. Cost Sharing Requirements. Multiple-purpose studies and projects are cost shared in accordance with the cost sharing policies applicable to each project purpose required. Before determining the required cost sharing for projects, an allocation of total project costs to each purpose must be accomplished. The following paragraphs summarize the requirements and procedures used by the Corps for allocating costs of multiple purpose projects. Detailed cost allocation procedures are discussed in Appendix E.

(1) Cost Allocation. The need for cost allocation stems from pricing and cost-sharing policies that vary among purposes. Cost allocation is the process of apportioning total project financial costs among purposes served by a project. Financial costs are implementation outlays, transfer payments such as replacement housing assistance, and the market value of in-kind contributions. Financial costs are to be allocated to those purposes for which the project is formulated.

(2) Cost Allocation Standard. Cost sharing policies may differ for construction costs and other costs such as operation, maintenance, repair, replacement and rehabilitation costs. Allocations for each one of these types of costs shall be made, as applicable, to the particular project. The Separable Costs/Remaining Benefits (SCRB) method shall be used for the allocation of costs among project purposes. Costs allocated to each purpose are the sum of the separable cost for the purpose and a share of joint cost. Joint costs may be allocated among purposes in proportion to remaining benefits. They may also be allocated in proportion to the use of facilities, provided that the sum of allocated joint cost and separable cost for any purpose does not exceed the lesser of the benefit or the alternative cost for that purpose. The SCRB method is also applicable for multi-purpose projects that include ecosystem restoration as a project purpose. Guidance on this application is under development. If the need for a cost allocation analysis for this type of project is foreseen, contact CECW-PD for additional guidance, preferably during the early phases of the study.

## 3-10. Other Authorities.

a. Continuing Authorities Program (CAP). The planning principles, guidelines and process described in previous chapters also apply to studies conducted under the Continuing Authorities Program. Specific guidance and planning requirements for studies conducted under each section included in the Program is provided in Appendix F. The following sections are included under the Continuing Authorities Program:

- Section 14, Flood Control Act of 1946, as amended, for emergency streambank and shoreline protection for public facilities and services
- Section 103, River and Harbor Act of 1962, as amended, for protecting the shores of publicly owned property from hurricane and storm damage
- Section 107, River and Harbor Act of 1960, as amended, for navigation
- Section 111, River and Harbor Act of 1968, as amended, for mitigation of shoreline damage caused by Federal navigation projects
- Section 204 of Water Resources Development Act of 1992, as amended, for beneficial uses of dredged material
- Section 205, Flood Control Act of 1948, as amended, for flood damage reduction
- Section 206 of Water Resources Development Act of 1996, as amended, for aquatic ecosystem restoration
- Section 208, Flood Control Act of 1954, as amended, for snagging and clearing for flood damage reduction
- Section 1135 of Water Resources Development Act of 1986, as amended, for project modifications for improvement of the environment

b. Review of Completed Projects. Section 216 of the River and Harbor and Flood Control Act of 1970 authorizes investigations for modification of completed projects or their operation when found advisable due to significantly changed physical or economic conditions and for improving the quality of the environment in the overall public interest. Initial appraisal reports are prepared under Section 216 using operations and maintenance (O&M) funds. The cost of preparing the initial appraisal report is limited to $20,000. Results from this report can be used to support initiation of a reconnaissance study through normal budgetary process. Following the initial appraisal, the 216 study process is of the same as a normal General Investigations study. A feasibility study under Section 216 authority would be appropriate for large scale ecosystem restoration projects linked to existing Civil Works projects, but whose costs would be too large for Section 1135, Section 206, or Section 204 authorities. Additional guidance can be found in ER 1165-2-119.

c. Planning Assistance to States (PAS). The PAS Program is carried out in accordance with the provisions of Section 22 of the WRDA of 1974 as amended. This law authorizes the Chief of Engineers to cooperate with states, the District of Columbia, the Commonwealth of Puerto Rico, the US Virgin Islands, Guam, American Samoa, the Commonwealth of the Northern Mariana Islands, and Federally recognized Native American (Indian) Nations in preparing plans for the development, utilization, and conservation of water and related land resources of drainage basins, watersheds or ecosystems located within the boundaries of the State or Indian lands. Assistance is provided on the basis of specific requests rather than through Congressional study authorization. (See Appendix G for details on the implementation of this program).

d. Flood Mitigation and Riverine Restoration. Section 212 of the WRDA of 1999 provides programmatic authority for the Secretary of the Army to implement projects that reduce flood hazards and restore the natural function and values of rivers within certain specified limits. The program emphasizes the use of nonstructural approaches to flood damage reduction and coordination with FEMA and other Federal, State, and local agencies, and Native American Nations. Projects must significantly reduce potential flood damages, improve the quality of the environment and be justified considering all costs and beneficial outputs. Funds are authorized to be appropriated in fiscal years 2001 through 2005. Additional guidance for this program is under development.

# CHAPTER 4

## Types of Studies, Reports and Procedures

4-1. Types of Studies and Reports. The process by which projects are formulated and evaluated is one step in the larger project delivery process. In addition to formulation and evaluation, the project delivery process includes the preparation of the decision document, and the technical and policy reviews of that document and its supporting material. It is intended that the production and reviews of planning decision documents also reflect the same common sense approach as described in the Introduction to Chapter 2. Planning decision documents should be prepared in a timely and cost-effective manner, consistent with the size and complexity of the project. Likewise, the time and effort spent in technical and policy review and in responses to review comments should reflect the size and complexity of the project. Wherever possible, technical and policy review should be incorporated positively and proactively into early phases of the planning and documentation processes and throughout these processes, rather than at the end. Planning studies and reports planning are:

a. Pre-authorization Studies and Reports. Studies for project authorization are undertaken in response to either a study-specific authority or a general authority. Study-specific authorization may be a resolution from the House Committee on Public Works and Transportation, a resolution from the Senate Committee on the Environment and Public Works, or included in a public law. General authorities are contained in Section 216 of the Flood Control Act of 1970 and Section 2 of the Fish and Wildlife Coordination Act of 1958. Section 216 authorizes investigations for modification of completed projects or their operation. Section 2 allows investigation of modifications to projects that were not substantially completed prior to August 1958 in the interest of conservation of fish and wildlife. These studies and reports are funded with General Investigations (GI) funds. Studies under these authorities are conducted in two phases in accordance with the WRDA of 1986.

(1) Reconnaissance Phase. The objectives of the Reconnaissance Phase are to: (1) determine if the water resource(s) problems warrant Federal participation in feasibility studies, (2) define the Federal interest, (3) complete a 905(b) Analysis (refers to Section 905(b) of the WRDA of 1986) or a Reconnaissance Report, (4) prepare a Project Management Plan (PMP), (5) assess the level of interest and support from non-Federal entities, and (6) negotiate and execute a Feasibility Cost Sharing Agreement (FSCA). This determines whether or not planning to develop a project should proceed to the more detailed feasibility stage. The reconnaissance phase is Federally funded and the target for completion is 6-12 months from initial obligation of reconnaissance funds to a signed Feasibility Cost Sharing Agreement.

(2) Feasibility Phase. The objective of feasibility studies is to investigate and recommend solutions to water resources problems. Cost of feasibility studies, except single purpose inland navigation studies, are 50 percent Federal and 50 percent non-Federal as defined in Section 105 of the WRDA of 1986. Typical studies should be completed in 18-36 months. The results of these studies are documented in a feasibility report that includes documentation of environmental compliance. (See Appendix G for additional information on the content of the feasibility report.)

b. Post Authorization Studies and Reports. These planning studies and reports are generally funded as a part of engineering and design studies under the General Investigation appropriation. These studies are undertaken pursuant to project specific construction authorities. Construction authorities imply the authority to undertake reevaluation studies. Studies may be necessary if a significant period of time has elapsed or conditions have changed significantly since the feasibility study was completed. The reports described below shall be used to support post authorization changes provided they include the specific information outlined in Appendix G, paragraph G-16.

(1) General Reevaluation. This is reanalysis of a previously completed study, using current planning criteria and policies, which is required due to changed conditions and/or assumptions. The results may affirm the previous plan; reformulate and modify it, as appropriate; or find that no plan is currently justified. The results of the study are documented in a General Reevaluation Report (GRR).

(2) Limited Reevaluation. This study provides an evaluation of a specific portion of a plan under current policies, criteria and guidelines, and may be limited to economics, environmental effects or, in rare cases, project formulation. A Limited Reevaluation Report (LRR) documents the results of the analysis undertaken.

(3) Design Documentation Reports (DDR) and Engineering Documentation Reports (EDR). During the Preconstruction, Engineering and Design (PED) phase, districts will prepare a Design Documentation Report (DDR) which is a record of final design after the feasibility phase. The DDR provides the technical basis for the plans and specifications and serves as a summary of the final design. An Engineering Documentation Report (EDR) may also be prepared to support the PCA when there are minor changes in design and costs from the authorizing reports. The EDR may also be used in lieu of a GRR to document other information not included in a decision document when project reformulation is not required and the changes are only technical changes. Requirements for preparation and processing of these reports are stated in ER 1110-2-1150. If reformulation of plans is required during PED, then districts shall prepare a GRR or LRR, as described in paragraphs 4-1b(1) and 4-1b(2). Per guidance contained in ER 1110-2-1150, GDM's and DM's will no longer be prepared.

(4) National Environmental Policy Act (NEPA) Documentation. The scope and nature of the changes in the environmental effects of the project identified as a result of acquisition of new information, of changed conditions, or changes in the project will determine the appropriate type of NEPA documentation. Options include an Environmental Assessment which may result in a Finding of No Significant Impact or a Supplemental Environmental Impact Statement. Guidance regarding NEPA documentation is contained in ER 200-2-2

c. Other Types of Studies and Reports.

(1) Studies of Water Resources Needs of River Basins and Regions. Section 729 of WRDA of 1986 authorizes the Corps of Engineers to study the water needs of river basins and regions of the United States, in consultation with State, interstate and local governmental entities. Section 729 studies may result in recommendations for more detailed feasibility studies, but this

is not required. Section 729 studies should not result in recommendation of projects for Congressional authorization.

(2) Flood Insurance Studies. See guidance in paragraph 3-3f of this regulation and in Appendix G.

(3) Planning Assistance to States Studies. Guidance on Planning Assistance to States (Section 22) studies is in paragraph 3-10c of this regulation and in Appendix G.

(4) Continuing Authorities Program (CAP) Studies. The planning Principles and Guidelines described in previous chapters apply to studies conducted under the Continuing Authorities Program. However, due to specific legislative requirements, the guidance for each authority must be referenced. This guidance is contained in Appendix F of this regulation.

(5) Section 216 - Review of Completed Projects. See guidance in paragraph 3-10b of this regulation and in ER 1165-2-119.

(6) Congressional Adds. The requirements and processes described in this chapter apply to Congressionally added studies unless specific instructions otherwise are provided through the budget process.

d. Deauthorization. The review of studies and projects to determine eligibility for de-authorization is covered in Paragraph 4-7.

4-2. Corps of Engineers Final Approval Authorities. The table below summarizes the approval responsibilities for the different planning products.

Table 4-1, Corps of Engineers Final Approval Authorities

| PLANNING PROGRAM<br>Study Phase/Product | APPROVAL RESPONSIBILITIES | | |
|---|---|---|---|
| | District | Division | Headquarters (HQUSACE) |
| GENERAL INVESTIGATIONS: | | | |
| Section 905(b) Analysis | | | X |
| Reconnaissance Report | | | X |
| Project Management Plan | X | | |
| Feasibility Cost Sharing Agreement[2] | X | | |
| Feasibility Report | | | X[1] |
| Section 729 Report | | | X |
| | | | |
| CONTINUING AUTHORITIES ( Sections 14, 103, 107, 111, 204, 205, 206, 208, 1135) | | | |
| Preliminary Restoration Plans | | X | |
| Feasibility Cost Sharing Agreement[2] | | X | |
| Planning Design Analysis Documentation | | X | |
| Detailed Project Report | | X | |
| | | | |
| PLANNING ASSISTANCE TO STATES | X | | |
| | | | |
| FLOODPLAIN MANAGEMENT SERVICES | X | | |
| | | | |
| POST-AUTHORIZATION REPORTS: | | | |
| General Reevaluation Report[1] | | | X |
| Limited Reevaluation Report | | X | |
| Major Rehabilitation Reports | | | X |
| | | | |
| REPORTS FOR PROJECTS AUTHORIZED SUBJECT TO A SECRETARIAL FINDING[3] | | | |
| | | | |

[1] Coordinated with ASA(CW).
[2] If deviation from model agreement, HQUSACE approval required.

[3] ASA(CW) approval required.

## 4-3. Procedures for Studies and Reports.

This section provides guidance for studies for projects requiring specific authorization. Additional guidance is found in Appendix G.

a. Reconnaissance Phase. The reconnaissance phase commences with the obligation of appropriated reconnaissance funds, and terminates with the execution of a Feasibility Cost Sharing Agreement (FCSA) or the division commanders' public notice for a report recommending no Federal action. The products are a 905(b) Analysis report, a Project Management Plan, a letter of intent from the non-Federal sponsor, and a feasibility cost sharing agreement (FCSA).

(1) Reconnaissance Study Period. The reconnaissance study and the Section 905(b) Analysis, part of the reconnaissance phase, begins with the obligation of appropriated reconnaissance funds. The target for completing the reconnaissance phase or the signing of the FCSA for the 905(b) Analysis is 6-12 months. The cost of reconnaissance studies generally is limited to $100,000.

(2) 905(b) Analysis Report. This report documents the results of the analyses conducted during the reconnaissance phase. The report shall include a preliminary analysis of Federal interest, costs, benefits, environmental impacts, and an estimate of the costs of preparing a feasibility report. The analyses conducted shall be based on existing, readily available data and professional and technical judgement. The 905(b) Analysis Report is prepared by the district and approved by HQUSACE. Additional details on the content and procedures for the 905(b) Analysis Report are provided in Appendix G.

(3) Project Management Plan (PMP). The Project Management Plan (PMP), prepared and negotiated during the reconnaissance phase, documents the Federal and non-Federal efforts required to conduct the feasibility phase. The PMP will ensure that the work required for the feasibility phase has been carefully developed and considered. The PMP forms the basis for estimating the total study cost and non-Federal sponsor share. It also is the basis for assigning tasks between the Corps and the sponsor and for establishing the value of in-kind services. While developing the PMP, the District Commander must discuss with the prospective non-Federal sponsor(s) the objectives of the feasibility study, necessary level of detail, cost of studies, and scheduling of activities for the feasibility study. During negotiations the prospective non-Federal sponsor must be informed that the level of accuracy of alternative plan evaluation and cost estimates to be developed in the feasibility study will depend on the extent of uncertainties and the depth of investigations made during the feasibility study. The Division will ensure that the PMP receives appropriate review.

(4) Feasibility Cost Sharing Agreement (FCSA). The Feasibility Cost Sharing Agreement documents the commitments of the Department of the Army and a non-Federal sponsor to share the cost of the feasibility phase. The FCSA is intended to promote a partnership for the conduct of the feasibility study. The Department of Army remains responsible for representing the Federal interest by following Federal policies and budgetary priorities. Both parties will conduct planning within the framework established by the P&G with guidance

provided in this regulation. The FCSA will be accompanied by a signed Certification Regarding Lobbying and, if applicable a completed Disclosure of Lobbying Activities.

b. Feasibility Phase. The feasibility phase starts with the issuance of initial Federal feasibility funds, following execution of the FCSA, and terminates on the date the feasibility report is submitted to the Office of Management and Budget by the Assistant Secretary of the Army for Civil Works (ASA (CW)) for review of consistency with the policies and programs of the President. The feasibility phase may also be terminated if it is determined that there is no clear Federal interest in a project or if no project would meet the current policies or budget priorities. (See paragraph 4-3c(6)) The products of the phase are a Feasibility Report, including NEPA documentation, and a Chief of Engineers Report.

(1) Feasibility Phase Cost. The total cost of the feasibility phase will be established through negotiation of the PMP. The cost estimate in appropriate Code of Accounts format will identify major costs by task and by type, and be fully supported and documented.

(2) Feasibility Report. A suggested outline for the feasibility report is provided in Appendix G. The feasibility report should document the planning process and all assumptions and rationale for decision making. The report will present the recommended plan and, if applicable, the degree of, and rationale for, departure from the NED plan, the NER Plan or the Combined NED/NER Plan. The non-Federal sponsor cost sharing requirements, including their responsibilities for implementation and operation of the project must be clearly documented. Two project cost estimates shall be displayed in the feasibility report; one based on constant dollars and one based on projected inflation rates. If there is no acceptable plan, the study should be terminated and guidance obtained from CECW-P. For deviations from the NED, NER or Combined NED/NER, the following additional documentation is required.

(a) If the recommended plan is smaller in scope and costs than the NED, NER or Combined NED/NER, the feasibility report will document the rationale for lack of sponsor support for these plans, as applicable, available facts regarding how and why the LPP is less costly and still provides high-priority outputs, information to show that alternative non-Federal funding sources are not available and the analysis performed. (This information shall be provided to HQUSACE thru the MSC for approval prior to submittal of the feasibility report. It will be included in the feasibility report to document and support the decision recommend the LPP.) In all cases, the recommended LPP must have greater net benefits than smaller scale plans. The feasibility report shall include documentation to demonstrate that sufficient alternatives were formulated and evaluated to insure that net benefits do not maximize at a scale lower than the LPP and to meet the requirements of NEPA. A detailed analysis and description of the NED, NER or Combined NED/NER plans, including a detailed final cost estimate for these plans, are not required and do not need to be documented in the feasibility report. The consequences of lost opportunities associated with implementing a LPP including residual risks and potential solutions to other water resource needs and opportunities that may be foregone will also be documented in the feasibility report. Additional documentation requirements for categorical exemptions applicable to flood damage reduction and navigation projects are discussed in paragraphs 3-3b(11) and 3-2b(10).

(b) If the LPP is larger in scale and costs than the NED, NER or Combined NED/NER plans, then a detailed analysis and description must be developed and presented for both the selected plan and the NED plan. The incremental benefits and costs of the LPP, beyond the NED, NER or Combined NED/NER plans, must be analyzed and documented in the feasibility report. The rationale for selection of the LPP must be clearly documented in the feasibility report.

(3) Environmental Compliance Documentation. Documentation of compliance with applicable environmental laws and regulations must be prepared. This may include items such as biological assessments required by the Endangered Species Act and the Fish and Wildlife Coordination Act Reports, in addition to NEPA documents. In accordance with ER 200-2-2, the NEPA document, either an EA or EIS, may either be a self-supporting document combined with and bound within the feasibility report or integrated into the text of the feasibility report. The EA/EIS should generally be integrated into the text of the report unless complex environmental impacts preclude this alternative. Additional information on environmental compliance documentation is in Appendix C.

c. General Requirements for Reconnaissance and Feasibility Phases.

(1) Study Expansion. Expansion of a study's geographic extent or purposes beyond those specified in the congressional authorization is not allowed without additional congressional authority. Where existing congressional authority is not a constraint, guidance on expansion of cost or scheduling should be requested from the Division.

(2) Interagency Coordination. In the interest of improving interagency coordination on planning studies, and of avoiding issues arising late in the planning process, the following procedures apply:

(a) Appropriate Federal and non-Federal agencies shall be invited to participate in the Reconnaissance Review Conference (RRC), Issue Resolution Conferences (IRC), Feasibility Scoping Meeting (FSM), and the Alternative Formulation Briefing (AFB), as deemed appropriate. These conferences are discussed in Appendix G.

(b) Appropriate Federal and non-Federal agencies shall have opportunity for participation in developing the PMP.

(c) Federal agencies shall be invited to be cooperating agencies as defined by NEPA. Cooperating agencies are agencies with jurisdiction by law or with special expertise that qualify them to participate in a study (see 40 CFR 1508.5, Regulations Implementing the Procedural Provisions of the National Environmental Policy Act of 1969, as amended).

(d) All issues involving other agencies (concerns or non-agreement) should be raised and discussed in a separate section of the Memorandum for the Record (MFR) of the meetings held during the planning process. Issues that can not be resolved at the local or regional level will be sent forward for resolution at the Washington level.

(3) Engineering Level of Detail in Reconnaissance and Feasibility Reports. The scope and complexity of engineering analyses shall be commensurate with the size and complexity of the project being evaluated. The level of detail of the engineering efforts during the feasibility phase and the required content of the Engineering Appendix are discussed in ER 1110-2-1150.

(4) Real Estate. The Real Estate Division shall be included as part of the team early in the planning process. The analysis of the nature and extent of real estate requirements must be conducted in accordance with Chapter 12 of ER 405-1-12, including consideration and identification of the specific interests, estates, and acreage required for the project.

(5) Cost Estimating. All cost estimates required to support Civil Works projects will be prepared in accordance with ER 1110-2-1302, Engineering and Design, Civil Works Cost Engineering.

(6) No Implementable Plan.

(a) The District Commander shall ensure that the sponsor is fully aware that the feasibility study may be terminated if there is no clear Federal interest in a project or if no project would meet the current policies or budget priorities. If the non-Federal sponsor wishes to continue the feasibility study under the terms of the FCSA, continuation will be considered on a case-by-case basis. In reaching this decision, consideration should be given to the value of the feasibility study in identifying project alternatives that reflect the sound planning principles set forth in the Principles and Guidelines . The sponsor shall also be made aware that, the feasibility study may be terminated by either party under the provisions of Article X “Termination of Suspension” of the FCSA.

(b) For those reconnaissance or feasibility studies where there is no potential for a Federally implementable plan, the District Commander will stop all work and notify the Division Commander to facilitate revocation of existing funds, adjustments in budget requests and possible study reclassification except as set forth below. Criteria for making the necessary determination are: (1) the plan is not in the Federal interest, based on current Army policies; (2) the plan does not meet technical requirements for selection as set forth in the P&G and elsewhere in this ER, or; (3) non-Federal interests either do not support the plan or do not intend to provide the necessary local cooperation. If based on these criteria, no Federal action is recommended, a final report to the Congress (usually a letter report) will be prepared, regardless of whether the study is terminated in the reconnaissance or feasibility phase.

(c) Watershed studies may or may not result in identifying further Corps studies or implementation projects. Thus, the procedures specified in paragraphs 4-3c(6)(a) and (b) are not applicable to watershed studies.

(7) Responsibility for Reports. District commanders are responsible for reports, including their content; and for the presentation of reports and findings to higher authority.

d. Washington Level Processing. Procedures for processing reports and decision documents are discussed in Appendix H.

## 4-4. Quality Control/Quality Assurance and Policy Review of Feasibility Reports.

a. General Requirements. Feasibility reports will be reviewed for technical quality and policy compliance. Independent technical and legal reviews are the responsibility of the districts, and District Commanders are responsible for the quality and accuracy of the study processes. HQUSACE is responsible for policy review and approval for decision documents requiring Congressional authorization or ASA(CW) approval. This review will focus on the underlying assumptions, conclusions, recommendations and analyses in the context of established policy and guidance. For all other decision documents covered in this regulation, districts will be responsible for policy quality control and MSCs will be responsible for policy quality assurance. The QC/QA process will be fully documented. Documentation and certification of technical/legal review will accompany the reports that are submitted for HQUSACE policy compliance review.

b. Quality Control. Districts shall prepare a quality control (QC) plan for each product/project which will describe the procedures that will be used to ensure compliance with all technical and policy requirements. The QC plan is a component of the PMP. The District Commander shall approve QC plans. Technical review is the process that confirms the proper selection and application of established criteria, regulations, laws, codes, principles, and professional procedures to ensure a quality product. Technical review also confirms the constructability and effectiveness of the product and the utilization of clearly justified and valid assumptions and methodologies.

c. Quality Assurance. MSCs are responsible for evaluating and recommending changes to the district's QC process. The MSCs' QA process will assure that the QC plan for the project is appropriate. The overall goal of the QA process is to assure that the districts are able to plan, design, and deliver quality projects on schedule, within budget and acceptable to the customer and the Federal Government. Division Commanders shall approve QA plans.

d. Policy Compliance Review. The process for accomplishing policy compliance shall begin with study initiation, and proceed in partnership among the district, MSC and Headquarters until project authorization. Districts are responsible for policy compliance. MSCs are responsible for assuring policy compliance. This process is intended to assure that policy issues are raised and resolved as early as possible in the study, and that final policy compliance reviews of decision documents reflect the success of that process. If policy problems or conflicts are not raised and resolved until the final policy compliance review rather than during the study, the policy partnership between the district, MSC and Headquarters shall be considered a failure.

(1) Compliance Support. Policy compliance support will be available to districts and MSCs on all studies leading to decision documents from initiation to completion. For feasibility studies leading to pre-authorization decision documents, support shall include a preliminary policy compliance review as part of a formal Alternative Formulation Briefing (AFB). The AFB will be scheduled prior to the selection of the recommended plan during the study. It will result in an AFB Project Guidance Memorandum (PGM) describing all policy issues and their

resolution. Subsequent discussions and resolutions of these issues and any additional issues shall be handled through a modification to this AFB PGM.

(2) Compliance Review, Approval and Certification. Headquarters shall be responsible for the policy review, approval and certification of all decision documents requiring Congressional authorization or ASA(CW) approval. Policy review involves the analysis of decision factors and assumptions used to determine the extent and nature of Federal interest, project cost sharing and cooperation requirements, and related issues. Policy compliance review shall ensure that established policy and procedures are applied uniformly nationwide and identifies policy issues that must be resolved in the absence of established criteria, guidance, regulations, laws, codes, principles and procedures or where judgment plays a substantial role in decision making. Policy compliance review also shall ensure that the proposed action is consistent with the overall goals and objectives of the Civil Works program. The final approval and certification of decision documents for policy compliance shall incorporate the AFB PGM and its approved modifications, with sufficient review to assure that documents remain consistent with policy; this shall not constitute a new or independent policy review. Appendix H discusses in detail the policy compliance review process.

4-5. Post-authorization Changes. This section provides guidance for making changes to uncompleted authorized projects. An authorized project is defined as a one specifically authorized by Congress for construction, generally through language in an authorization or appropriation act, or a project authorized pursuant to Section 201 of the Flood Control Act of 1965. Depending on the nature and scope of the changes, a General Reevaluation Report or Limited Reevaluation Report will be required as discussed in paragraphs 4-1b(1) and 4-1b(2) and Appendix G.

a. Addition of Project Purposes. General authorities allow for the addition of project purposes, under certain circumstances, without specific congressional authorization. These purposes include water supply, recreation, fish and wildlife enhancement (except for land acquisition), and low flow augmentation for purposes other than water quality. Additionally, there is authority for adding minimum provisions for future hydroelectric power, and conservation of threatened and endangered species. (See Appendix G for additional information.)

b. Authorized Maximum Cost of Projects. Section 902 of the WRDA of 1986, as amended, legislates a maximum total project cost. Projects to which this limitation applies and for which increases in costs exceed the limitations established by Section 902, as amended, will require further authorization by Congress raising the maximum cost established for the project. No funds may be obligated or expended nor any credit afforded that would result in the maximum cost being exceeded, unless the House and Senate committees on Appropriations have been notified that Section 106 of the Energy and Water Development Appropriations Act of 1997 will be utilized. The maximum project cost allowed by Section 902 includes the authorized cost (adjusted for inflation), the current cost of any studies, modifications, and actions authorized by the WRDA of 1986 or any later law, and 20 percent of the authorized cost (without adjustment for inflation). See Appendix G for detailed procedures to calculate these costs.

4-6. Planning Assistance to States (PAS). Within personnel and funding capabilities, commanders shall cooperate with entities requesting assistance under the PAS program by

providing planning assistance in an effective and timely manner and in accordance with the guidelines in this regulation (see Appendix G). The Corps may provide technical assistance to support State preparation of comprehensive water and related land resources development plans, including watershed and ecosystem planning and help in conducting individual studies supporting the State water plan. A process of review and evaluation of State work requests and the State water plan determines eligibility for participation in the program. Because of the limited funds available under the PAS Program and because the cost sharing requirements are incompatible between the PAS Program and the General Investigations Program, it is not appropriate to use the PAS Program to prepare reports to Congress.

4-7. Study and Project Deauthorization.

a. Study Deauthorization. Section 710 of the WRDA of 1986 requires an annual submission to Congress of a list of authorized but incomplete water resources studies which have not had funds appropriated during the preceding five full fiscal years. The list is a list of studies meeting the elegibility requirement. Congress has 90 days, after the submission, to appropriate funds for the studies on the list. Studies that are not funded during the 90-day period are no longer authorized. Appendix G contains information on annual report requirements.

b. Project Deauthorization. Section 1001 of the WRDA of 1986 as amended, provides for the deauthorization of water resources projects on which Federal funds for planning, design or construction have not been obligated for 7 fiscal years. Every two years, the Secretary of the Army is required to submit to Congress a list of projects that meet this eligibility criteria. Affected congressional delegations must be notified of the projects in their districts or states. The projects remain on the list for 30 months, after which they are automatically deauthorized if Federal funds are not obligated during the 30-month period. Section 1001(c) requires publication of the lists of deauthorized projects in the Federal Register. The project deauthorization process is managed at HQUSACE by CECW-B and that office should be contacted for further information.

FOR THE COMMANDER:

RUSSELL L. FUHRMAN
Major General, USA
Chief of Staff

8 Appendices
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# APPENDIX A

## References

Public Law 14, River and Harbor Act of 1945

Public Law 212, Outer Continental Shelf Lands Act

Public Law 409, River and Harbor Act

Public Law 526, Flood Control Act of 1946

Public Law 534, Flood Control Act of 1944

Public Law 738, Flood Control Act

Public Law 780, Flood Control act of 1954

Public Law 826, Beach Nourishment.

Public Law 858, Flood Control Act of 1948

Public Law 85-500, River and harbor and Flood Control Act of 1958

Public Law 85-624, Fish and Wildlife Coordination Act

Public Law 86-645, River and Harbor and Flood Control Act of 1960

Public Law 87-874, River and Harbor and Flood Control Act of 1962

Public Law 88-140, Extension of Right to Water Supply Storage.

Public Law 89-80, Water Resources Planning Act

Public Law 89-298, River and Harbor and Flood Control Act

Public Law 90-483, River and Harbor and Flood Control Act of 1968

Public Law 90-577, Intergovernmental Cooperation Act of 1968

Public Law 91-190, National Environmental Policy Act of 1969

Public Law 91-611, River and Harbor and Flood Control Act of 1970

Public Law 92-500, The Federal Water Pollution Control Act Amendments of 1972

Public Law 92-532, Marine Protection, Research and Sanctuaries Act of 1972

Public Law 93-205, Endangered Species Act of 1973

Public Law 93-234, Flood Disaster Protection Act of 1973

Public Law 93-251, Water Resources Development Act of 1974

Public Law 93-291, Historical and Archeological Data - Preservation

Public Law 94-580, Resource Conservation and Recovery Act of 1976

Public Law 94-587, Water Resources Development Act of 1976

Public Law 95-217, Clean Water Act of 1977

Public Law 96-510, Comprehensive Environmental Response, Compensation and Liability Act of 1980

Public Law 99-662, Water Resources Development Act of 1986

Public Law 104-206, Energy and Water Development Appropriations Act of 1997

Public Law 104-303, Water Resources Development Act of 1996

Public Law 106-53, Water Resources Development Act of 1999

River and Harbor Act of 1899

Executive Order 11988, Flood Plain Management

Executive Order 11990, Protection of Wetlands

ER 200-2-2, Procedures for Implementing NEPA

ER 405-1-12, Real Estate Handbook

ER 1105-2-101, Risk-based Analysis for Evaluation of Hydrology/Hydraulics and Economics in Flood Damage Reduction Studies

ER 1110-2-1150, Engineering and Design for Civil Works Program

ER 1110-2-1155, Dam Safety Assurance Program

ER 1110-2-1302, Civil Works Cost Engineering

ER 1165-2-21, Flood Damage Reduction Measures in Urban Areas

ER 1165-2-26, Implementation of Executive Order 11988 on Flood Plain Management

ER 1165-2-27, Establishment of Wetlands Areas in Connection with Dredging

ER 1165-2-119, Modifications to Completed Projects

ER 1165-2-123, Single-owner situations

ER 1165-2-124, Construction of Harbor and Inland Harbor Projects by Non-Federal Interests

ER 1165-2-130, Federal Participation in Shore Protection

ER 1165-2-131, Local Cooperation Agreements for New Start Construction Projects

ER 1165-2-132, Hazardous, Toxic and Radioactive Waste (HTRW) Guidance for Civil Works Projects

ER 1165-2-501, Civil Works Ecosystem Restoration Policy

# APPENDIX B

## Public Involvement, Collaboration and Coordination

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# APPENDIX B

## Public Involvement, Collaboration and Coordination

B-1. Purpose. This appendix provides the requirements for public involvement, collaboration, and coordination in Civil Works planning studies. (Note: Every effort has been made to eliminate all inconsistencies between the main body of the ER and the appendices. If any inconsistencies are found, the information in the main body of the ER will prevail over the one in the appendices. Please, notify CECW-PD immediately of any inconsistencies for correction.)

B-2. Definitions.

a. Public. The public includes any individuals, organizations, or unit of government that might be affected by or interested in the results of the Corps planning process. The public includes Federal, regional, State and local government entities and officials, public and private organizations, Native American (Indian) tribes, individuals, and study sponsor representatives.

b. Coordination. Coordination is the formal exchange of information and views, by letter, report, meeting or other prescribed means, between the Corps and another agency. Coordination activities are required by and in accordance with purposes and procedures established by Federal policy (Public Law, executive order, agency regulation, memorandum of agreement, etc).

c. Collaboration. Collaboration occurs when the Corps works jointly with other agencies or entities throughout the planning process. Collaboration is distinguished from coordination through the active involvement of the parties in conducting studies and or implementing recommended projects. Collaborative efforts can range from participation on interagency study teams through joint funding of construction, operation or maintenance of water resource projects.

B-3. Goal and Objectives. The goal of public involvement and coordination is to open and maintain channels of communication with the public in order to give full consideration to public views and information in the planning process. The objectives of public involvement are 1) to provide information about proposed Corps activities to the public; 2) to make the public's desires, needs, and concerns known to decision-makers; 3) to provide for consultation with the public before decisions are reached; and, 4) to consider the public's views in reaching decisions. All this must occur, however, with the awareness that the Corps cannot relinquish its legislated decision-making responsibility. The outcome of any planning is subject to institutional constraints.

B-4. Requirements. District offices shall conduct planning studies in an open atmosphere to attain public understanding, trust, and mutual cooperation and shall provide the public with opportunities to participate throughout the planning process. In addition, each district office shall:

- Develop and implement an effective public involvement strategy as an integral part of the planning process for each study.

- With the cooperation of the non-Federal sponsor, develop and implement an effective management structure to insure that effective collaboration is an integral part of the feasibility study process.

- Discuss in the report how information gained from public and sponsor involvement has been used in and influenced the planning process.

- Solicit comments on the draft report and environmental document to appropriate Federal and State agencies, cooperating agencies and other members of the public (ER 200-2-2).

B-5. Public Involvement Strategy.

a. Maximize Public Input. Each project should have a detailed public involvement strategy that is keyed to maximize public input at each stage of the planning process.

b. Administrative Procedures. The Administrative Procedures Act, (including Section 3, the Freedom of Information Act) and the National Environmental Policy Act (PL 91-190), are among the principal legislative acts requiring public involvement. Federal planning policies, Corps practice, and regulations have consistently required and encouraged open and effective public involvement. Generally, it is impossible to plan effectively for water resources development in accordance with Federal regulations and laws without open and effective public involvement. Public involvement is integral to all phases and activities of the planning process.

c. Developing a Strategy. During the development of the Project Management Plan, the study team determines the extent of public involvement required and establishes an appropriate strategy for integrating public involvement into the planning process. Since there is no single best approach to public involvement, the study team should determine the best mix of public involvement methods. The important point to keep in mind is to provide an overall strategy that creates relevant, quality public involvement opportunities for those who have; or may have, an interest in the study. The purpose of initiating public involvement early in planning is to obtain a clear definition of public needs and concerns. Early involvement also provides a "sensing" stage during which an appraisal is made of the intensity of public interest, the segments of the public most likely to participate, and the kinds of issues which are most likely to generate additional public interest.

(1) Components of a Strategy. A public involvement strategy should include:

(a) An analysis of the major issues likely to be addressed in the planning process.

(b) An identification of agencies, groups, and individuals most likely to be interested in the action under consideration.

(c) An assessment of the level of public interest likely to be generated by the actions under consideration.

(d) A description of the preliminary consultation activities that led to development of the public involvement approach, including the agencies, groups, and individuals consulted.

(e) An identification of the public involvement expertise and effort that may be needed from various organizational units.

(f) Determination of appropriate review points at which to evaluate the structure and function of the public involvement program.

(g) A plan of sequential public involvement activities integrated with the planning and decision-making process, and development of planning reports.

(2) Major Public Involvement Activities

(a) Announce the Initiation of the Study. The public should be informed when a study is initiated. Announcements can be done through any of the communications media, but it is suggested that, at a minimum, a mailing of an announcement be made to potentially interested parties. The mailing method insures that at least those on the list have been made aware of the study initiation. If other media methods (such as TV, radio, newspapers, etc.) would be productive, they should also be pursued through coordination with the public affairs officer.

(b) Identify the Public. The Corps should be sensitive to public concerns and identify interested and affected parties including those who might be unaware of an action that could be of concern to them. Identifying publics is crucial both initially and throughout the planning effort. A starting point is to identify those people and groups who believe themselves to be affected by possible study outcomes. Three ways are typically used to identify publics: self-identification, third party identification, and staff identification. Self-identification means that individuals or groups step forward and indicate an interest in participating in the study. Third party identification is a technique in which existing committees, interest groups, or representatives of known interests are asked to identify other individuals or interests who should be involved. Staff identification comprises a wide range of techniques including intuitive/experiential information, existing lists of groups and individuals, and geographic, demographic, and historical analysis. The nature of the planning study will determine who should be contacted. As a starting point, the following organizations, among others, should be considered: Environmental/Conservation groups; civic and neighborhood associations and community leaders; other Federal, State and local public agencies and entities; user groups; consumer and public interest groups; religious and ethnic groups; business

groups, including small businesses and merchants; civil rights organizations; labor organizations; and, organizations representing the handicapped, the elderly, low income segments of the population, the minorities, and the disadvantaged.

(c) The Scoping Process. Council on Environmental Quality (CEQ) regulations (40 CFR 1051.7) require that a scoping process be utilized to identify the likely significant issues and the range of those issues. The CEQ regulations are very specific as to what is to be determined, but the techniques are left up to the agency. Since much of the information on significant issues rests only with the public, public involvement is the heart of the scoping process. Therefore, the public involvement should be an integral part of the scoping process. A scoping meeting (or meetings, if desired), should be held early in the study. Scoping meetings may be held informally with other Federal, State, local or private groups; however, at least one of the scoping meetings should be broadly announced, held at a convenient location and time and open to all. Scoping should be used to focus in one specific issue areas. Therefore, while a broad scoping meeting may be desirable, it will not suffice for meetings that may be needed to target a specific audience, such as those with fish and wildlife interest.

(d) Input to Feasibility Reports. The Feasibility Reports shall include a description and evaluation of the efforts made to acquire public input and the information and opinions expressed prior to arriving at a decision. The public involvement section of the report shall show how public input was used in the planning and decision-making process.

(e) Public Involvement Techniques.

(1) Dealing with the Media. Media relationships should be conducted by or through the Public Affairs Office (PAO). PAO is skilled in techniques for the presentation of information to the public and in techniques for dealing with various types and levels of the media.

(2) Basic Communication Techniques. Technical experts often experience difficulty in communicating with non-technically oriented publics. Corps planners should know how to recognize values and develop skills to deal with different values. "Values" information is among the most important in the planning process. Values contain the information about what various publics think the plan "ought" to do. To be successful, the planning process must provide forums for dialogue among those holding different values, and facilitate discussion of meaningful tradeoffs.

(3) Meetings and Workshops. The guiding principle of designing meetings and workshops is that "format follows functions," meaning that the design of the meeting should reflect the purpose of the meeting. Meetings can serve five basic functions: information giving; information receiving; interaction; consensus forming/negotiation; and, summarizing. After determining a meeting purpose, the second most important issue facing the planner is room arrangements. Room arrangements reflect the relationships among the participants and are a visual demonstration to participants to

what the Corps expects from the meeting. The third major issue the planner faces is the choice of leadership style and meeting process. Numerous processes, most of which revolve around variations of nominal group techniques, are available to the planner. Within the various meeting processes, the planner should be aware of basic leadership style difference in "facilitating" versus "controlling" meetings. In designing a workshop, the planners should: identify the desired product; identify the resource information which the public will need; select a series of activities which will result in the desired product; and, design a simple mechanism for evaluating the workshop product. As the desired function moves closer to conflict resolution, the state of the arts in meeting design becomes more speculative.

(4) Public Meetings. The need for public meetings in a particular study will depend on the study type and complexity. The Commander has the responsibility to determine if the public or the Corps or both would benefit by the exchange of views or information provided by public meetings. Public meetings should be designed to be fair and impartial two-way communications and should be conducted informally and as simply as possible. The person facilitating the meeting should be: thoroughly familiar with the study; a rank or grade consistent with the audience expected; and skilled in group facilitation techniques. The Corps presentation should contain a brief summarization of the reason for the meeting and the progress of the study, and should provide ample opportunity for interested parties to share their viewpoints. The process used to achieve this exchange of views and information will be determined by the responsible Corps official. Meetings should be held at a time and locality convenient to the expected audience, normally in the area of the study. In cases where interest is very widespread, it may be appropriate to hold meetings away from the study area. The meeting announcement should be sent sufficiently in advance of the meeting to allow attendees to plan for the meeting and should contain sufficient information to allow the prospective attendee to decide if attendance would be beneficial. The meeting should be held at times convenient for working people to attend without requiring them to take leave time from their jobs. The language used in the announcement should be non-technical and the tone should reflect a sincere intent to produce a fair exchange and sharing of views and information. Distribution of the announcement should be as wide-spread as is consistent with the study and should include the members of Congress and the Governors of the States involved. The record of the meeting should be consistent with the type of meeting being held. A meeting involving great controversy may require a verbatim transcript, while a meeting of less intense controversy may require simply a short summarization.

(5) Questionnaires. Public surveys can be a valuable tool for obtaining specific information needs and public preferences. Questions should always be organized around very specific objectives, a data or content analysis plan, and a plan for using the survey results in the planning. As required by the Paperwork Reduction Act of 1995, Public Law 104-13, the Office of Management and Budget (OMB) must approve any questionnaire to be responded to by 10 or more U.S. citizens or US firms, organizations, or agencies outside the Federal Executive Branch. Prior to the use of questionnaires for planning studies, field offices shall submit an SF 83 to HQUSACE (CECW-P). AR

335-15 Chapter 4, describes required information. OMB has pre-approved a group of questionnaires for collection of planning data. The questionnaires are found under OMB-approval number 0710-0001, Questionnaires for U.S. Army Corps of Engineers Civil Works studies. The questionnaires cover the range of data that would generally be collected by surveys in water resources studies. The Paperwork Reduction Act requires OMB approval every three years. The approved questionnaires are transmitted by memorandum every three years following OMB approval. OMB also now requires that each individual survey effort be individually approved. The survey forms must be submitted through a Division office point of contact to the Office of the Secretary of Defense and OMB.

d. Analyzing Public Comment. Typically, the Corps receives large amounts of solicited and unsolicited public comments on planning alternatives. This information comes in the form of public comments, (written and spoken) and letters. Additionally, written and spoken media, as well as past studies, are often available and normally contain a wealth of public comment information. The planner should systematically describe, analyze and evaluate the layers of information usually contained in such public comments.

B-6. Study Management Coordination.

a. Conduct of Reconnaissance Studies. Although the Corps is responsible for the reconnaissance phase, efficient execution of the feasibility phase requires a cooperative reconnaissance effort as well. Therefore, the time to begin assembling the study management structure should be as early in the reconnaissance phase as possible. The management structure will be formalized in the study Feasibility Cost Sharing Agreement (FCSA).

b. Conduct of Feasibility Studies. The management structure developed during the reconnaissance phase will remain in force during the feasibility phase. Some adaptations may have to be made in the Study Management Team and in the Executive Committee to reflect the sharing of study tasks as provided in the executed FCSA and PMP.

B-7. Coordination with State and Local Governments Under E.O. 12372. Division and District commanders shall coordinate civil works planning programs with State and local governments in accordance with Executive Order 12372 (Intergovernmental Review of Federal Programs) and 33 CFR 384 (Intergovernmental Review of the Department of Army Corps of Engineers Programs and Activities).

a. Notification Requirements. Division and District commanders shall continue to directly notify all affected and interested State, area wide and local governmental interests and shall not rely on a state "single point of contact" (SPOC) to distribute notifications. Notices to interested parties shall reference E.O. 12372; shall indicate whether or not the program for which notice is being made has been selected by the affected State, or states, for coordination under the Executive Order procedures; shall

state that comments and responses to the notice should be sent directly to a designated Corps official in addition to the State SPOC in those cases where the program has been selected, and shall not state that the public will be notified, if the report recommendations are materially modified prior to project approval.

b. Effective Coordination. Division commanders shall adopt such procedures as may be necessary to assure coordination is effected with states in a manner consistent with 33 CFR 384 and the processes established by the individual states. Problems should be referred to HQUSACE (CECW-P) if they cannot be resolved to the division commander's satisfaction in the field. Substantive comments received from a SPOC should be acknowledged in writing, even if SPOC comments are fully accommodated.

B-8. Consultation and Coordination with Indian Tribal Governments. Division and District commanders shall coordinate civil works planning programs with American Indian and Alaska Native governments (hereinafter referred to as "tribes") in accordance with Executive Order 13084 "Consultation and Coordination with Indian Tribal Governments" and Department of Defense policy. District and Division commanders will fully integrate the principle and practice of meaningful consultation and communication with tribes by:

- recognizing that there exists a unique and distinctive political relationship between the United States and the tribes that mandates that, whenever (DOD) Corps actions may have the potential to significantly affect protected tribal resources, tribal rights, or Indian lands, (DoD) the Corps must provide affected tribes an opportunity to participate in the decision-making process that will ensure these tribal interest are given due consideration in a manner consistent with tribal sovereign authority;

- consulting, consistent with government-to-government relations and in accordance with protocols mutually agreed to by the particular tribe and DoD, including necessary dispute resolution processes;

- providing timely notice to, and consulting with, tribal governments prior to taking any actions that may have the potential to significantly affect protected tribal resources, tribal rights, or Indian lands;

- consulting in good faith throughout the decision-making process; and

- developing and maintaining effective communication, coordination, and cooperation with tribes, especially at the tribal leadership-to-Division and District Commander levels.

B-9. Public Notices. Public notices issued by field commanders will not contain language to the effect that the public will be notified, prior to final action, should report recommendations be materially modified prior to project approval.

B-10. Advisory Committees. Public Law 92-463 establishes approval and other requirements for advisory committees, boards, councils, conferences, panels, task forces, commissions or other similar groups formed in the interest of obtaining advice or recommendations. Advisory committees wholly comprised to full time officers or employees of the Federal Government, local civic groups whose primary function is rendering a public service with respect to a Federal program, or groups providing advice to State and local governments are exempt from those requirements. If an advisory committee not exempt from the Act is desired as a part of a study, approval shall be requested through HQUSACE (CERM). No advisory committee shall be established prior to approval. AR 15-1 describes information required to establish an advisory committee under the Act.

B-11. Exclusions. The Commander shall have the discretion to modify public involvement requirements for emergency planning studies under Section 14 of Public Law 79-526, as amended (Continuing Authorities)

# APPENDIX C

Environmental Evaluation and Compliance

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# APPENDIX C

## Environmental Evaluation and Compliance

### C-1. Introduction and Overview

a. Purpose. This appendix addresses the integration of environmental evaluation and compliance requirements, pursuant to national environmental statutes, applicable executive orders and other Federal planning requirements, into the planning of Civil Works water and related land resources comprehensive plans and implementation projects. (Note: Every effort has been made to eliminate all inconsistencies between the main body of the ER and the appendices. If any inconsistencies are found, the information in the main body of the ER will prevail over the one in the appendices. Please, notify CECW-PD immediately of any inconsistencies for correction.)

b. Overview. The nation is attuned to the many ways healthy ecosystems support the economy and provide for the public good. The Water Resources Planning Act, as amended (WRPA) (42 U.S.C. 1962a-2) and the National Environmental Policy Act of 1969 (NEPA) (42 U.S.C. 4321-4347 guide the Civil Works planning process, serving to focus the critical evaluation of the cost of today's activities in terms of tomorrow's resources. In 1962, Congress recognized the need for coordinated planning related to the conservation, development, and utilization of water resources and, through the WRPA, required the establishment and use of principles, standards and procedures for the formulation and evaluation of water and related land resources projects. In 1969, by way of the NEPA, Congress recognized the profound impact of human activity on the interrelations of all components of the natural environment as well as the critical importance, to humans, of restoring and maintaining environmental quality. The Federal Government was charged with using all practicable means and measures in a manner calculated to foster and promote the general welfare, create and maintain conditions under which humans and nature can exist in productive harmony, and fulfill the social, economic and other requirements of present and future generations of Americans. Numerous other laws, regulations and Administration initiatives, have echoed this National environmental policy. Integrated, the implementing regulations for the WRPA and the NEPA provide an effective framework for the formulation and evaluation of water resources comprehensive plans and implementation projects, which is responsive to the challenge of sustainable development in our Nation and the world.

c. Federal Objectives. The Federal objective for water and related land resources planning was established in the Water Resource Council's *Economic and Environmental Principles for Water and Related Land Resources Implementation Studies* (Principles), and is further discussed in the *Economic and Environmental Guidelines for Water and Related Land Resources Implementation Studies* (Guidelines).

(1) The Principles and Guidelines (P&G) provide that planning, which is to contribute to national economic development, is to be consistent with protecting the Nation's environment, pursuant to national environmental statutes, applicable executive orders, and other Federal planning requirements. With respect to "protecting the Nation's environment", the Corps has adopted the standard that it "is achieved when damage to the environment is eliminated or avoided and important cultural and natural aspects of our nation's heritage are preserved".

(2) Since implementation of the P&G, Ecosystem Restoration has become a primary mission of the Corps. The Federal objective for this mission is to increase the net quantity and/or quality of desired ecosystem resources. The planning of these projects must also be pursuant to national environmental statutes, applicable executive orders, and other Federal planning requirements.

d. Evaluation Procedures. Evaluation procedures are discussed in Section C-2. Sections C-3 through C-5 provide additional details for addressing the ecological, cultural and aesthetic resources included in the evaluation procedures. Section C-6 addresses additional evaluation procedures related to water quality.

e. Compliance Requirements. Requirements for complying with environmental statutes are also referenced throughout the P&G. Specific procedures for major related environmental compliance requirements are presented in Sections C-3 through 6.

## C-2. Procedures for Environmental Evaluation

a. Purpose. Environmental evaluation is a process that integrates considerations of environmental considerations, impacts and opportunities throughout the planning process. This section provides guidance on applying the environmental evaluation procedures to planning water resources implementation projects while at the same time fulfilling the requirements of the NEPA and other statutory requirements. The P&G, 40 CFR Parts 1500-1508 and ER 200-2-2, discussed below, provide detailed guidance and are incorporated into this appendix.

b. Environmental Planning. Implementing regulations for the WRPA are the P&G, found at: http://www.wrsc.usace.army.mil/iwr/pdf/p&g.pdf. Provisions for environmental considerations are integrated throughout the P&G and are specifically addressed in discussions of the Environmental Quality (EQ) Account (Section 7 of the Principles and Chapter II, Section 1.7.3, of the Guidelines) and the EQ Procedures (Chapter III of the Guidelines). The EQ procedures should be applied early in the planning process so that the significant natural and cultural resources of the study area can be identified and inventoried, used in developing planning objectives, and accommodated in a reasonable set of alternative plans, which achieve the

planning objectives. In later stages of planning, the procedures will be used to evaluate the alternative plans and aid in plan selection. The final use of the procedures is in the decision process that leads to plan selection.

c. NEPA Process. The NEPA requires that decision making should proceed with full awareness of the environmental consequences that follow from a major Federal action, which significantly affects the environment. Provisions for complying with the NEPA are found in the Council of Environmental Quality Regulations (40 CFR Parts 1500-1508) and are supplemented by ER 200-2-2.

(1) The NEPA compliance process, following ER 200-2-2, will begin with an assessment of potential environmental impacts as judged by comparing the with and without project conditions. These potential impacts help define the study area, and should be addressed over the whole of that area. Also, the physical impacts (air and water quality, soils and slope) should be explicitly addressed early in the assessment process, because of their potential influence on any, or all, of the resource analyses. Potential significant impacts on any of these physical attributes should be evaluated and made explicit in the decision process, in the same manner as are the ecological, cultural and aesthetic attributes under the EQ procedures.

(2) The impact assessment process may lead to a determination that an environmental impact statement (EIS) is required. The preparation and coordination of these is also detailed in ER 200-2-2.

(3) Measures to avoid, lessen, mitigate or compensate for environmental impacts should be described in the decision document. The major and significant measures should be summarized in one table that is part of the environmental appendix. This table should describe each measure to be taken, the objective that it is intended to fulfill, and the impact to which it applies. If any of these are a requirement for specific compliance with a statute, legal decision, or formal commitment, that should also be indicated in the table.

d. Additional Requirements. The integrated EQ procedures and NEPA process provide a framework for compliance with other environmental elements with specific statutory compliance requirements. The majority of these are listed as sources of institutional recognition in Table 3.4.3, Chapter III, of the P&G. For additional information concerning environmental statutes and Executive Orders refer to the Civil Works Environmental Desk Reference (IWR Report 96-PS-3, updated July 1997).

C-3. Ecological Resources.

a. Purpose. This section supplements the guidance for evaluation of the ecological attributes under the EQ evaluation procedures. This section has emphasis on ecological resources and ecosystem restoration, with particular consideration of fish and wildlife resources, in Civil Works planning studies.

b. Explanation of Terms.

(1) Ecological Resources. A natural form, process, system or other phenomenon that is related to land, water, atmosphere, plants or animals that has attributes or properties which sustain and enrich human life. These properties are components of the environment and the interactions among all its living (including people) and nonliving components that directly or indirectly sustain dynamic, diverse, viable ecosystems. In this category are functional and structural aspects that require special consideration because of their unusual characteristics. Ecological Resources include fish and wildlife resources, which are provided special consideration under various environmental statutes.

(2) Ecosystem Restoration Planning Objectives. Ecosystem restoration objectives are clearly written statements that prescribe specific actions to be taken to improve the ecosystem, or fish and wildlife resources, and describe units of measurement (e.g. habitat units), to be used to evaluate contributions proposed actions make toward the stated objective.

(3) Enhancement. Enhancement is the net improvement an alternative plan, or project, makes to ecological resources (singularly or collectively) compared with the "without" plan or project condition. Policy under current budgetary constraints does not provide for implementation of separable features for enhancement of fish and wildlife resources unless such enhancement falls within the definition of fish and wildlife habitat restoration.

(4) Essential Fish Habitat: Related to marine resources, it is those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity (Magnuson-Stevens Act, 16 U.S.C. 1801 et seq).

(5) Fish and Wildlife Resources Stewardship. Fish and wildlife resources stewardship is the level of preservation, conservation and protection afforded fish and wildlife resources on project lands, consistent with the Conservation of Forest Lands Act, Public Law 86-717. Stewardship of project lands is a Federal responsibility and should be considered when describing the "with" and "without" project condition.

(6) Ecosystem Restoration. Ecosystem restoration consists of separable features undertaken to return a degraded condition to a less degraded condition. The goal of ecosystem restoration is to reverse the adverse impacts of human activity and restore ecological resources, including fish and wildlife habitats, to previous levels of productivity but not a higher level than would have existed under natural conditions in the absence of human activity or disturbance.

(7) Incremental Analysis. Incremental analysis is the investigation and documentation of the relationship between costs (dollars) incurred to realize each unit of output (improvement) associated with the implementation of each plan increment.

(8) Incremental Cost. Incremental (or marginal) cost means extra cost. Incremental cost is the increase in cost incurred when output is increased by one unit. For example, if it costs $100 to produce 10 units ($10/unit) and $115 to produce 11 units, then $15 is the incremental cost of the 11th unit.

(9) Justification. The determination that the combined monetary and non-monetary value of the last increment of benefits realized from an ecosystem or a fish and wildlife management action or feature (hereafter actions are included under management features) exceeds the combined monetary and non-monetary costs of the last added increment so as to reasonably maximize overall project benefits. For mitigation, "benefits" shall be interpreted as being the same as "losses prevented or replaced".

(10) Management Features. Management features are established ecosystem, including fish and wildlife resources, management procedures, activities or techniques that contribute to mitigation and ecosystem restoration planning objectives. Examples are fencing to prevent habitat damage by livestock or human activities; land cover manipulation designed to increase habitat quality; fish ladders; lands acquired which provide preservation credit and/or opportunities for achieving other mitigation or ecosystem restoration objectives, and the development and enforcement of fish and wildlife conservation-related regulations.

(11) Management Plan Increment. A management plan increment consists of one or more management features. Plan increments may interrelate and complement one another, but they can not be functionally dependent upon another increment. For example, if the fencing out of livestock is required before a constructed food plot can be effective, then the fence and the food plot would be considered as being functionally dependent and, therefore, combined into a single plan increment.

(12) Mitigation. Mitigation includes:

(a) Avoiding the impact altogether by not taking a certain action or part of an action;

(b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation;

(c) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;

(d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action;

(e) Compensating for the impact by replacing or providing substitute resources or environments. “Replacing" means the replacement of fish and wildlife resources in-kind. "Substitute" means the replacement of fish and wildlife resources out-of-kind. Substitute resources, on balance, shall be at least equal in value and significance as the resources lost.

(13) Mitigation Planning Objectives. Mitigation planning objectives are clearly written statements that prescribe specific actions to be taken to avoid and minimize adverse impacts, and identifies specific amounts (units of measurement, e.g., habitat units) of compensation required to replace or substitute for remaining, significant unavoidable losses.

(14) Project Lands. For preauthorization studies, "project lands" are lands determined to be required to realize benefits attributed to alternative plans. For authorized projects, project lands are lands required for authorized project purposes. For projects under construction, or those that have been completed, project lands are lands that have been acquired for project purposes.

(15) Public Lands. Public lands are owned or otherwise legally entrusted to a local, State or Federal agency.

(16) Resource Categorization. Resource categorization consists of describing and assigning values and significance to resources. Ecological resource categorization is used to determine if ecosystem restoration opportunities exist, if losses warrant mitigation considerations, and for making decisions to either mitigate losses in-kind, or to allow for substitute resource trade-offs.

(17) Separable Features. Separable features are single purpose components of a plan designed to address ecological resources management objectives. Separable features include lands acquired specifically for fish and wildlife resources management purposes, engineering features, and management actions performed.

(18) Significant Resources and Effects. The criteria for determining the significance of resources and effects are provided in Chapter I, Section 1.7.3 and Chapter III, Sections 3.4.12 and 3.4.14 of the P&G, 40 CFR Part 1508.27 and section d(4) below.

(a) Significant National Economic Development (NED) Resources. Ecological resources having substantial commercial and/or recreational value.

(b) Significant Environmental Quality (EQ) Resources. Ecological resources, including fish and wildlife resources and associated habitats, that are technically, institutionally, or publicly recognized as having substantial non-monetary value from either an ecological, cultural or aesthetic standpoint.

(c) Significant Effects. Effects an alternative plan has on ecosystems or ecological resources, including fish and wildlife, that are determined to have a material bearing on the decision-making process.

c. Coordination, Consultation and Public Involvement. District commanders shall initiate general public participation procedures, for ecosystem restoration or ecological resources conservation purposes, consistent with guidance set forth in Appendix B of this regulation. Such coordination and public involvement shall include, but not be limited to, government entities at the Federal, regional, State, and local levels, and national and local public and private organizations, including Indian tribes. Special coordination and consultation requirements are discussed below.

(1) Fish and Wildlife Coordination Act (FWCA): Coordination and Funding. The District Commander shall coordinate with the U.S. Fish and Wildlife Service (FWS), the National Marine Fisheries Service (NMFS), and the appropriate head of the State agency exercising administration over the fish and wildlife resources beginning with the initiation of the reconnaissance report phase, and continuing through the feasibility, and planning/engineering/ design phases of project development.

(a) The District Commander shall invite the above agencies to participate in study scoping, to identify fish and wildlife concerns, to identify available information, to obtain their views concerning the significance of fish and wildlife resources and anticipated impacts, and to determine those resources which shall be evaluated in the study. The District Commander shall provide the appropriate offices of the above agencies with relevant information developed in investigations included in reconnaissance, feasibility, and planning/engineering/design studies, and shall provide these agencies an opportunity to comment on the formulation and evaluation of alternative plans. Full consideration shall be given to Federal and State agency comments and recommendations resulting from this coordination.

(b) Funding arrangements between the Corps and FWS for FWCA activities associated with Civil Works feasibility and planning/engineering/design studies shall be implemented consistent with procedures set forth in the current Corps/FWS Transfer Funding Agreement. The Corps/FWS Transfer Funding Agreement is applicable to the reconnaissance report phase, and should be used to scope out FWCA compliance requirements for FWS involvement during the cost-shared feasibility study, consistent with Article III of the Agreement.

(2) Endangered Species Act (ESA): Section 7 Coordination/Consultation. Section 7 provides for specific coordination and consultation with the FWS and NMFS. The District Commander shall initiate specific coordination and consultation, as needed, for endangered and threatened species and designated critical habitat. Coordination, consultation and implementation of Section 7 of the ESA does not require the transfer of funds from the Corps to the FWS or NMFS.

(a) The District Commander shall formally request from the FWS/NMFS information on any listed or proposed species or designated or proposed critical habitat that may be in the project area.

(1) If the FWS/NMFS identifies listed or proposed species or designated or proposed critical habitat, then the District Commander shall conduct a biological assessment to determine if the proposed project may affect any such species and or critical habitat. The biological assessment should be completed within 180 days unless an extension of time is mutually acceptable to the District and FWS/NMFS.

(2) Upon completion, the District Commander shall send the biological assessment and conclusions to the FWS/NMFS, advising them whether plans being considered may affect or will not affect the listed or proposed species or designated or proposed critical habitat.

(b) During the conduct of the biological assessment the District Commander, in coordination with the FWS/NMFS and the appropriate State resource agency(s), shall identify the location in the study area of listed and proposed endangered and threatened species and designated or proposed critical habitat.

(1) If listed and proposed species or designated or proposed critical habitat are identified in the study area, these data shall be used to identify areas that should be avoided or critically considered and to determine what opportunities exist for conserving these resources during the formulation of alternative plans.

(2) If the biological assessment indicates that an alternative plan(s) may affect a listed endangered or threatened species or critical habitat, the District Commander shall request formal consultation with the FWS/NMFS. If the biological assessment determines the alternative plan(s) is not likely to adversely affect endangered or threatened species or critical habitat, then the District Commander may request informal consultation with FWS/NMFS to receive their written concurrence with the determination of no adverse affect. If the FWS/NMFS does not concur with the District Commander's no adverse determination, the FWS/NMFS may request the District Commander to initiate formal consultation with the FWS/NMFS. This request must be documented in a letter either from FWS/NMFS to the District Commander or from the District Commander to FWS/NMFS which acknowledges an oral request from FWS/NMFS made during a meeting or telephone conversation.

(c) If the biological assessment indicates that the action is likely to jeopardize the continued existence of a proposed species or result in the destruction or adverse modification of proposed critical habitat, the District Commander shall initiate a conference with the FWS/NMFS. The FWS/NMFS will review the information and make advisory recommendations, if any, on ways to avoid or minimize the adverse impact. If the species is subsequently listed or critical habitat designated prior to completion of the action, the District Commander must review the action to determine if formal consultation is required.

(d) The District Commander can formally request a formal conference on the proposed species or proposed critical habitat with the FWS/NMFS. The conference may be conducted in accordance with the procedures for formal consultation. An opinion issued at the conclusion of the conference may be adopted as the biological opinion when the species is listed or critical habitat is designated, but only if no significant new information is developed and no significant changes to the proposed action are made that would alter the content of the opinion. An incidental take statement provided with a conference opinion does not become effective unless the FWS/NMFS adopts the opinion once the listing is final.

(e) The incidental take provision, resulting from the Endangered Species Amendments of l982, is provided in all biological opinions, where an anticipated take may occur, whether there is a "no jeopardy" or a "likely jeopardy". This provision permits the District Commander to "take" a specified number of the protected species, or impact a specified acreage of habitat in the project area, without being subject to the prohibitions (penalties) established in Section 4(d) and 9(a)(1-2) of the Act. The incidental take statement will also specify "reasonable and prudent" measures necessary to minimize impacts; set forth the terms and conditions, including, but not limited to, reporting requirements that must be complied with by the District Commander in order to implement reasonable and prudent measures; and, specify the procedures to be used to handle or dispose of any individuals of a species taken.

(f) If the FWS/NMFS biological opinion indicates that an alternative plan would have the positive effect of conserving listed species or critical habitat, the District Commander shall consider this important feature during subsequent formulation and selection of the recommended plan.

(g) If the FWS/NMFS provides conservation recommendations for an alternative plan to create enhancement opportunities for listed species or critical habitat, the District Commander shall have the discretion either to accept or reject the recommended modification. However, a decision to reject such FWS/NMFS recommendations shall be clearly documented and the rationale provided.

(h) In compliance with Section 7(d) of the Act, the District Commander shall not make any irreversible or irretrievable commitment of resources during consultation which, in effect, would preclude formulation or implementation of reasonable alternatives concerning listed endangered and threatened species. The spending of dollars for planning studies does not constitute an irreversible or irretrievable commitment of resources.

(i) If the FWS/NMFS biological opinion indicates that an alternative plan is likely to jeopardize listed species or to destroy or otherwise have an adverse impact on critical habitat, the District Commander shall either respond with additional information in support of the proposed plan, drop the alternative plan from further consideration, accept the FWS/NMFS recommended reasonable and prudent alternative and modify the alternative plan accordingly, or seek an exemption. See 50 CFR, Parts 450-453, for specific guidance for seeking an exemption.

(j) For emergency actions District commanders shall meet the consultation requirements related to the ESA to the fullest extent practicable, unless they determine that the resulting delays will lead to unacceptable risks to health, life, property, or unacceptable economic losses.

(1) When emergency circumstances mandates the need to consult in an expedited manner, consultation may be conducted informally by contacting the FWS/NMFS by telephone and requesting advice. This provision applies to situations involving acts of God, disasters, casualties, national defense or security emergencies, etc. Carrying out the directive of this paragraph is crucial, since compliance with the ESA cannot be waived by the Corps of Engineers.

(2) Formal consultation shall be initiated as soon as practicable after the emergency is under control.

(3) The District Commander shall submit information on the nature of the emergency action(s), the justification for the expedited consultation, and the impacts to endangered or

threatened species and their habitats. The FWS/NMFS will evaluate the information and issue a biological opinion including the information and recommendations given during the emergency consultation.

(3) Food Security Act of 1985: Wetlands Protection and Conversion Determination Under the Swampbuster Provisions of the Act. The Food Security Act of 1985 (Public Law 99-198) contains provisions designed to discourage the conversion of wetlands into non-wetland areas. These, collectively, are commonly referred to as "Swampbuster" provisions, and are implemented under Department of Agriculture (USDA) final rule, effective 17 September 1987 (7 CFR 12). The final rule sets forth the terms and conditions under which a farmer, who has produced an agricultural commodity on converted wetlands, shall be declared ineligible for certain benefits provided by USDA.

(a) Farmers who plant commodity crops, after 23 December 1985, on lands that were converted from a wetland to a non-wetland condition by a Corps project will trigger "Swampbuster" considerations, which may lead to the cited USDA program ineligibility.

(b) District commanders shall coordinate with the Department of Agriculture, Natural Resources Conservation Service, to determine the applicability of Swampbuster to Corps flood control projects that provide protection to agricultural lands, either through design or incidental to other project purposes.

(c) Correspondence developed in association with this coordination shall be included in project reports, and all pertinent information discussed in appropriate environmental documents.

(4) National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668)(Public Law 89-669). Part 668dd, paragraph (d), authorizes the Secretary of the Interior (Secretary) to issue use permits for activities performed on National Wildlife Refuge whenever he determines that such uses are compatible with the major purposes for which such areas were established.

(a) District commanders shall initiate coordination with the Regional Director, U.S. Fish and Wildlife Service, immediately upon determining that a Corps project feature or activity would likely involve the use of refuge lands. This coordination shall be designed to obtain a formal written response from the Regional Director on whether or not the Corps activity will require a compatibility determination; and, if so, the procedures that must be followed to obtain the necessary compatibility determination.

(b) Correspondence associated with seeking a compatibility determination shall be included in project reports, and all pertinent information shall be discussed fully in appropriate environmental documents.

(5) Magnuson Fishery Conservation and Management Act of 1976, as amended: Section 110 Coordination/Consultation: Public Law 99-659, Section 104, and Public Law 104-297, Section 110, amends the 1976 Act to provide for specific coordination and consultation with a Regional Fishery Management Council (Council) and the National Marine Fisheries Service (NMFS), respectively. Consultation/coordination is relative to impacts a Federal activity may have on the habitat of fishery resources. The District Commander shall coordinate and consult with the Council relative to impacts a Federal activity may have on habitat under the Council's jurisdiction and with the NMFS with respect to any action federally authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken, that may adversely affect any essential habitat identified under the Act, as amended.

(a) Coordination and consultation with the Council shall be in accordance with the formal coordination procedures established between District Commanders and appropriate Councils in his or her area. Such procedures shall be modified as appropriate to ensure inclusion of review and comment procedures for feasibility reports involving coastal area development and to respond within 30 days to comments and recommendations made by a Council.

(b) Coordination and consultation with the NMFS shall be initiated specifically, as needed, or concurrent with activities under the FWCA and/or the ESA. Coordination, consultation and implementation of Sections 104 or 110 does not require the transfer of funds from the Corps to the Council or the NMFS.

(c) Correspondence shall be included in project reports, and all pertinent information shall be discussed fully in appropriate environmental documents.

d. Plan Formulation and Evaluation.

(1) General.

(a) It is national policy that ecosystem restoration, particularly that which results in the conservation of fish and wildlife resources, be given equal consideration with other study purposes in the formulation and evaluation of alternative plans. Current planning guidance specifies that the Federal objective of water and related land resources planning is to contribute to national economic development consistent with protecting the Nation's environment, pursuant to national environmental statutes, and applicable executive orders. Protecting the Nation's environment is achieved when damage to the environment is eliminated or avoided; i.e., mitigated, and unavoidable adverse effects are compensated. Mitigation requirements shall be pursued consistent with guidance set forth below.

(b) Ecological resources shall be described and evaluated consistent with current policy and planning guidance. Evaluation of ecological resources shall be based upon the significance of the resources involved; the significance of impacts (positive and negative) alternative plans have on these resources; and the contribution project features make toward fulfillment of established ecological resource-oriented management objectives. Evaluation of management features shall be based upon the features' completeness, effectiveness, efficiency and acceptability in fulfilling established management (mitigation or enhancement) objectives.

(2) Reconnaissance Study Phase. Ecological resources considerations during the reconnaissance stage of planning shall be of sufficient scope and detail to:

(a) Identify the presence and general location of known resources within the study area that should be approached with care;

(b) Make a preliminary appraisal of measures for restoration including an assessment of consistency with Army policies, costs, monetary and non-monetary benefits, impacts and potential for local sponsorship.

(c) Make preliminary determinations of likely impacts potential alternative plans would have on these resources;

(d) Briefly describe potential mitigation features that would address these impacts; and,

(e) Scope out resources surveys, studies and analyses to be conducted during the feasibility study stage.

(3) Feasibility Study Phase. Ecological resources consideration during this stage of planning will be of sufficient scope and detail to effectively quantify impacts the NED, NER and recommended plan (if not one of the same) will have on the resources, and to justify mitigation and restoration features being recommended. In compliance with this guidance, District commanders shall:

(a) Conduct appropriate coordination, studies and analyses throughout the planning process to determine the significance of ecological resources likely to be affected by alternative plans, and the significance of these effects;

(b) Comply with the Fish and Wildlife Coordination Act by giving full consideration to reports and recommendations furnished by the Secretary of the Interior (U. S. Fish and Wildlife Service), the Secretary of Commerce (National Marine Fisheries Service), and the appropriate head of the State agency exercising administration over the fish and wildlife resources;

(c) Give special consideration, as described in section c(2)(i) above, to the reports and recommendations of the Secretary of the Interior (U.S. Fish and Wildlife Service) and the Secretary of Commerce (National Marine Fisheries Service) on the conservation of Federally listed and proposed listed endangered and threatened species, and their designated critical habitat, furnished in compliance with the Endangered Species Act;

(d) Consider comments furnished by local public officials and the general public and use the information, as appropriate, to supplement information and recommendations provided by the above Federal and State fish and wildlife resources agencies;

(e) Determine the need for mitigation by assessing ecological resources gains and losses attributed to alternative plans;

(f) Assess the extent to which beneficial ecosystem management features of alternative plans offset adverse impacts (losses) before consideration is given to separable mitigation features;

(g) Formulate justifiable ecological resource management features based upon thorough professional evaluations;

(h) Consider including separable ecological resources management features only when adverse effects exceed beneficial effects, or when the adverse effects include such significant ecological values the specific features are justified;

(i) Formulate specific ecological resources mitigation and restoration plans using generally known and established techniques to address specific, clearly defined management objectives;

(j) Give full consideration to the establishment of wetland habitat in alternative involving the disposal of dredge material;

(k) For alternatives involving existing projects, give full consideration to modifications in the structures and operations of such projects for purposes of ecosystem restoration;

(l) Demonstrate that damages to significant ecological resources have been avoided or minimized to the extent practicable; that unavoidable damages to these resources have been compensated to the extent justified; and, that restoration opportunities for significant ecological resources have been given appropriate consideration;

(m) Demonstrate that damage to wetland resources has been avoided or minimized to the extent practicable; that unavoidable adverse impacts to wetlands have been compensated; and, that wetland restoration opportunities associated with the study have been properly addressed.

(4) Significance Determination.

(a) Resources. The significance of ecological resources shall be based upon both their monetary (NED) and non-monetary (EQ) values. Both monetary and non-monetary values shall be identified and clearly described. Monetary value shall be based upon the contribution the resources makes to the Nation's economy. Non-monetary value shall be based upon technical, institutional, and public recognition of the ecological, cultural and aesthetic attributes of resources within the study area. Criteria for determining significance shall include, but not be limited to, the scarcity or uniqueness of the resource from a national, regional, State and local perspective. Non-monetary values associated with ecological resources are subjective, and depend on the value society places on them. Different publics may express differing values and concerns for the non-monetary and monetary values associated with similar fish and wildlife resources. Such differences shall be documented, including the rationale used to select values chosen to determine resource significance.

(b) Impacts. The significance of impacts of alternative plans shall be evaluated based upon the extent, intensity and duration of the impact on significant ecological resources, compared to the "future without plan" condition. Refer to Section C-3, c, (3) if farmed or converted (Swampbuster) wetlands are involved.

(5) Methodology. Monetary, as well as a number of non-monetary, values associated with ecological resources arise primarily from the quantity and quality of fish and wildlife habitat within the study area. Therefore, habitat-based evaluation methodologies, supplemented with production, user-day, population census, and/or other appropriate information, shall be used to the extent possible to describe and evaluate ecological resources and impacts associated with alternative plans. Specific guidance for analyses required to evaluate and describe recommended mitigation and restoration features are described below.

e. Mitigation Planning and Recommendations.

(1) General. District commanders shall ensure that project-caused adverse impacts to ecological resources have been avoided or minimized to the extent practicable, and that remaining, unavoidable impacts have been compensated to the extent justified. The recommended plan and the NED plan, if not one in the same, shall contain sufficient mitigation to ensure that either plan selected will not have more than negligible adverse impacts on

ecological resources (Section 906(d), WRDA`86). Any such mitigation measures will be fully justified.

(2) Justification. Justification of mitigation features recommended for inclusion in projects shall be based upon analyses that demonstrate the combined monetary and non-monetary values of the last increment of losses prevented, reduced, or replaced is at least equal to the combined monetary and non-monetary costs of the last added increment so as to reasonably maximize overall project benefits. In addition, an incremental cost analysis, to the level of detail appropriate, will be used to demonstrate that the most cost effective mitigation measure(s) has been selected.

(3) Separable Features. Full credit shall be given to the beneficial aspects of an alternative plan, or project, before consideration is given to adding separable mitigation features. The significance of the ecological resources affected by an alternative plan/project, and the significance of adverse impacts to these resources shall be evaluated to determine the need for separable mitigation features. Evaluation of a separable mitigation feature is appropriate when it is determined that the net adverse impacts of an alternative plan/project exceed its net beneficial effects, and/or when the resulting losses include values (monetary and non-monetary) of such significance that specific consideration is justified.

(4) Range of Alternatives. To properly evaluate and compare mitigation features, and to determine remaining unmitigated losses if any, mitigation planning shall address a range of alternatives up to the full compensation of significant ecological resource losses. Appropriate units of measure shall be specified in mitigation planning objectives to aid in this evaluation. Examples of units of measure include habitat units, or other habitat quality indicators, numbers of animals, pounds of fish, user-days, etc.

(5) Land Requirements. The District Commander shall consider utilization of both public and private lands, and select the lands that represent the best balance of costs, effectiveness, and acceptability consistent with incremental cost analysis guidance described below.

(6) Special Requirements for Bottomland Hardwoods. Mitigation plans shall ensure that adverse impacts to bottomland hardwood forests are mitigated in-kind, to the extent possible. The intent is that the bottomland hardwood forest as an ecological system be mitigated rather than mitigating for faunal species in an upland hardwood forest habitat type. In this instance "to the extent possible" shall take into consideration the availability of manageable units of existing or restorable bottomland hardwood forests and the practicability and feasibility of implementing management measures to accomplish in-kind mitigation. In-kind does not necessarily mean acre-for-acre, but may be restoration or the increased management of bottomland hardwood

forests to compensate for the loss of biological productivity (habitat quality). Consultation with appropriate Federal and non-Federal agencies is required in complying with this requirement.

(7) Wetlands. District commanders shall ensure that adverse impacts to wetland resources are fully mitigated. Mitigation shall be accomplished through appropriate actions taken to avoid, minimize, and compensate for unavoidable losses as required to clearly demonstrate efforts made to meet the administration's goal of no net loss of wetlands.

(8) Incremental Cost Analysis. An incremental cost analysis shall be performed for all recommended mitigation plans. The purpose of incremental cost analysis is to discover and display variation in costs, and to identify and describe the least cost plan. Mitigation analysis shall be presented in an analytical framework commensurate with other project benefits and costs so that rational decisions regarding mitigation can be made. The least cost mitigation plan that provides full mitigation of losses specified in mitigation planning objectives, and which is unconstrained except for required legal and technical constraints, shall always be identified and displayed. The recommended plan, if different, will be compared to it. Planning methods and data shall be used which yield cost estimate accuracy and reliability commensurate with that of other cost analysis components of the overall study. District commanders shall clearly describe sources of data and information used in performing incremental cost analysis.

(a) Procedures. These or similar steps are required to conduct and document incremental cost analysis. All reports recommending mitigation shall demonstrate such steps have been performed and documented under appropriate paragraph headings.

(1) Inventory and Categorize Ecological Resources. Conduct or update, as appropriate, ecological resources inventories. Group resources into categories based on their relative significance considering National, regional, State or local perspectives. Categorize into groups that distinguish resources that must be mitigated in-kind from those that need not be. Clearly describe criteria used in the categorization of resources.

(2) Determine Significant Net Losses. Give full credit to the beneficial effects of the water resources project. Specify in quantitative terms the amount (units) of significant net losses, by resource category.

(3) Define Mitigation Planning Objectives. Develop mitigation planning objectives that reflect the specific losses to be addressed. Use a single unit of measurement to describe losses being addressed by each mitigation planning objective. For example, if the mitigation planning objective is to replace lost habitat quality, the unit of measurement must be in habitat units, or something equivalent. These objectives shall be clearly stated and used to guide plan formulation, to determine appropriate mitigation management features, and to establish

benchmarks for evaluating the performance of each increment of management included in alternative plans. Distinguish between those objectives that address losses that must be mitigated in-kind from those that need not be. Mitigation credit shall be given only to plan increments that contribute towards meeting stated mitigation planning objectives.

(4) Determine Unit of Measurement. The output of mitigation plan increments shall be described in the same units of measurement used to calculate specific ecological resource losses, and to define mitigation planning objectives. More than one unit of measurement (i.e., habitat units, production units, acres of like habitat, user days, etc.) may be appropriate for inclusion in an overall mitigation plan. However, the same unit of measurement must be used for describing increments addressing a single objective, as discussed in (c) above.

(5) Identify and Assess Potential Mitigation Strategies. Identify suitable management features responsive to mitigation objectives. Identify potential project lands, other public lands, and separable private lands determined suitable for applying each candidate management feature. The identification of potential mitigation sites should not be constrained for analysis purposes. This analysis should focus on determining the management potential of each candidate site relative to its ability to meet mitigation objectives. For the purpose of analysis preference shall not be given to the management of project and other public lands over the use of suitable private lands.

(6) Define and Estimate Costs of Mitigation Plan Increments. Properly defining cost associated with each plan increment is critical to incremental analysis. The goal is to discover and reveal variations in their costs. This requires establishing estimates of the cost of implementation of the management features on selected candidate sites. The cost of implementation includes development, operation and maintenance, and acquisition cost, if any. Express incremental cost as the annual equivalent of the present worth of costs, in dollars per unit of output, for example $/HU. Define plan increments so that cost differences are evident when comparing plan increments with one another. Certain features should always be considered either a separate plan increment, or the first added feature of a separate plan increment, e.g., land acquisition, fish hatcheries or ladders, etc. If a given mitigation feature has differing unit costs depending on where or when it is implemented, these cost differences imply separate plan increments for cost analysis purposes. For example, two plan increments would generally result if on project lands a given management feature, e.g., a food plot, has a cost of $.50/HU at site A and $1.00/HU at site B. The same management measure applied to different properties (project vs public vs private lands) shall be treated as separate increments regardless of similarity in their relative costs. This is necessary to allow decision makers an opportunity to choose among these properties when factors other than cost effectiveness must be considered.

(7) Display Incremental Costs. Once costs have been estimated for mitigation plan increments, array them from lowest to highest cost per unit of output. Incremental costs shall be graphically displayed so that readers can easily see and compare the unit cost of each plan increment. For example, incremental cost can be displayed as a bar graph from lowest to highest cost per unit. The reader must be able to tell, either from the display itself or through accompanying text, pertinent facts about each increment's output and cost.

(b) Documentation. All reports recommending mitigation features shall document the above or similar steps used to perform incremental analysis, and discuss findings under the same or comparable paragraph headings.

(9) Timing of Implementation. For all water resources development projects, on which construction has not commenced as of 17 November 1986, authorized ecological resource mitigation features, including the acquisition of lands or interest in lands to mitigate losses to ecological resources, shall be undertaken or acquired either:

(a) Before any construction of the project (other than such mitigation land acquisition) commences; or

(b) Concurrently with the acquisition of lands and interests in lands for project purposes (other than mitigation of fish and wildlife losses); whichever the Secretary, determines is appropriate except that any physical construction required for the purpose of mitigation may be undertaken concurrently with the physical construction of such project. Any project authorized before 17 November 1986, on which more than 50 percent of the land needed for the project, exclusive of mitigation lands, has been acquired shall be deemed to have commenced construction.

(c) Mitigation measures will generally be scheduled for accomplishment concurrently with other project features in the most efficient way. Circumstances warranting the accomplishment of mitigation as the first or last elements of project construction will require prior approval by HQUSACE.

(10) Monitoring. Monitoring is appropriate for all mitigation actions to insure that those actions have achieved the objective. The level of monitoring should be consistent with the magnitude of the project and the degree of risk and uncertainty with the probable success of the mitigation. Forecast methods and techniques have been identified that are applicable to Corps projects that include state-of-the-art techniques and are generally acceptable to the resource agencies. The District Commander shall include the cost of a monitoring program in the estimate of O&M cost for mitigation measures, if such a program has been adopted in accordance with 40 CFR part 1505.2(c) and 1505.3.

(11) Allocation and Apportionment of Mitigation Costs. Ecological resources mitigation costs incurred after 17 November 1986 shall be allocated among the authorized purposes which caused the requirement for mitigation, and shall be cost shared to the same extent as project costs allocated to these purposes.

(a) Allocation. The impact analysis shall identify the project purposes which cause losses to be mitigated. If practicable, the analysis shall identify the extent of losses separable or specific to each purpose. Mitigation costs not associated with specific purposes will be included with other joint project costs.

(b) Apportionment. Once the proportionate amounts of losses and corresponding amounts of mitigation and costs are assigned to the appropriate purposes, joint costs of mitigation should be allocated among the causative purposes on the same basis as other joint costs.

(12) Mitigation Cost Sharing.

(a) LERRD. Non-Federal interests shall be required to provide lands, easements, rights-of-way, relocations and disposal areas (LERRD) where this is a requirement of the purpose that necessitates the mitigation except where otherwise agreed for the Corps to accomplish with non-Federal funds. As Title I of Public Law 99-662 contains a generic requirement that non-Federal interests provide LERRD, all future mitigation features will require non-Federal interests to provide LERRD, if required, unless the project authorization after 17 November 1986 provides differently for mitigation.

(b) Construction. Construction costs for mitigation will be treated the same as other project construction costs for cost sharing purposes.

(c) OMRR&R. Non-Federal interests will be responsible for all costs of operation, maintenance, repair, rehabilitation, and replacement of mitigation features except for:

(1) Inland navigation projects and harbor projects with depths up to 45 feet, which have no requirement for non-Federal sharing of these costs; and,

(2) Harbors with depths over 45 feet which require a 50 percent non-Federal share for those costs assigned to increments in excess of a 45-foot project.

(d) Exception. No cost sharing will be imposed without the consent of the non-Federal interests where contracts have previously been signed for repayment of costs or until such contracts are complied with or renegotiated.

(13) Preconstruction Environmental Protection and Mitigation Fund. This fund was established by Section 908 of WRDA '86. Implementation of the fund has not been sought since timing of implementation of mitigation features will assure that mitigation features will be available to mitigate for unavoidable adverse project impacts as they occur.

(14) Operation, Maintenance, Repair, Rehabilitation and Replacement (OMRR&R) of Mitigation Features.

(a) Federal Responsibility. Execution and performance of OMRR&R for ecological mitigation features of a project shall be a Corps responsibility whenever the project authorization, or recommendation for authorization, provides for the Corps to operate, maintain, repair, rehabilitate or replace other project features. The manner in which the District Commander exercises this authority and responsibility will vary widely, depending on the location of the fish and wildlife mitigation features and the type of ecological management and administration required. Plans recommended for authorization in this category shall identify the Corps OMRR&R responsibility. OMRR&R of ecological resources features included in an alternative plan to mitigate losses associated with an existing Federal program (e.g., National Migratory Bird Management Program) shall be the responsibility of the Federal agency that administers that program.

(b) Non-Federal Responsibility. OMRR&R of fish and wildlife mitigation features shall be a non-Federal responsibility whenever the project authorization or recommendation for authorization provides for non-Federal interests to operate and maintain other project features, and in some cases where there is a Federal OMRR&R responsibility but no Federal (Corps) presence, e.g., no Corps project management office located on site. Assignment of such responsibility shall be a part of the items of local cooperation for the project, to be fulfilled by either a local sponsor or another agency which will provide the necessary assurances to the Corps.

(15) Postauthorization Mitigation. Section 906(b) of the Water Resources Development Act of 1986 authorizes the Secretary of the Army to mitigate damages to fish and wildlife without further specific Congressional authorization within certain limits. Current budgetary constraints do not provide for the implementation of Section 906(b).

f. Applicability of FWCA and ESA to Postauthorization Activities.

(1) FWCA Applicability. The FWCA applies to postauthorization activities if the activity meets the threshold test outlined in Section 2(a) of the FWCA, i.e., the authorized plan is modified or supplemented, and these changes relate to Federal construction which would divert, modify, impound, or otherwise control a waterway.

(2) Section 2(b) Report and Section 2(e) Funding. Sections 2(b) and (e) of the FWCA normally apply during post-authorization activities for Federal projects where the Section 2(a) threshold test has been met.

(a) Mandatory Compliance. Section 2(b) of the FWCA is mandatory when changes to the authorized plan meets the Section 2(a) threshold test and the proposed changes to the authorized plan or project require a report to Congress, or the approval of the Chief of Engineers, or above.

(b) Discretionary Compliance. In all other instances where Section 2(a) applies, compliance with Section 2(b) requirements would be discretionary. However, it is Corps policy to fund the FWS for it's FWCA Section 2(b) activities associated with Corps studies and projects, consistent with procedures set forth in the 1980 Transfer Funding Agreement, as amended effective 21 September 1982.

(3) Discretionary Compliance Determination Criteria. The following criteria are considered appropriate for District commanders to use for determining when Section 2(b) and (e) of the FWCA applies to postauthorization project activities. First, the proposed activity must meet the Section 2(a) threshold test. Second, a project document must be under preparation that requires approval by at least the Division Commander, or above, and any of the following factors exist:

(a) The acknowledgment by the Corps in the feasibility report, or accompanying NEPA document, that sufficient uncertainty exists concerning impacts the recommended plan could have on fish or wildlife resources to warrant further investigations and analysis during postauthorization planning, engineering and design activities;

(b) Modification or supplementation of the authorized plans require the development of a supplement to the FEIS;

(c) New information or factors are identified during postauthorization project activities that appreciably change the extent to which the authorized project would or could impact upon fish and wildlife resources beyond what was documented in the feasibility report;

(d) The authorized project contains major fish and wildlife mitigation or enhancement features, and the further planning, siting, designing and construction of such features would benefit from involving the FWS, NMFS or State resources agencies in these activities; or,

(e) District and Division professional staff determine that continued involvement of the FWS, NMFS or State resources agencies during postauthorization project activities would better assure public and agency acceptance of the water resources development project, including authorized fish and wildlife features included in the project.

(f) The new or supplemented Section 2(b) report, planning aid letter, etc., shall accompany the project document throughout the decision-making process.

(4) ESA Applicability. Section 7 of the ESA is applicable for any project, or unit thereof, regardless of when the project was authorized or completed.

g. Reporting.

(1) General. Feasibility reports shall describe specific considerations given to fish and wildlife resources conservation during the study. All factors which the reporting officer considered as contributing to the justification of the expenditures recommended for mitigation and restoration features shall be explicitly described. Specifically, the report shall:

(a) Describe fish and wildlife resource features included in the recommended plan, including the basis for justification, consistent with guidance set forth in this section;

(b) Include appropriate letters and reports furnished by the FWS/NMFS and State agencies;

(c) Describe recommendations furnished by the FWS/NMFS and affected States in compliance with the FWCA and Section 7 of the ESA, discuss specifically how each recommendation was addressed in appropriate alternative plans, and provide reasons for adoption or non-adoption of each recommendation;

(d) Include, as appropriate, provisions for monitoring mitigation features included in the recommended plan;

(e) Describe consideration given to the protection and restoration of wetland resources, including the establishment of wetlands in connection with recommended plans that include the disposal of dredged material;

(f) Include the necessary letters of intent from agencies and non-Federal sponsors participating in fish and wildlife mitigation and restoration features; and,

(g) Describe how such features will be operated, managed and funded over the life of the project.

(2) Mitigation. Reports seeking authorization or approval of any water resources development project shall contain either:

(a) A determination that such project will have negligible adverse impacts on fish and wildlife; or,

(b) A recommendation with a specific plan to mitigate fish and wildlife losses created by such project.

(3) Wetlands. Feasibility reports and accompanying environmental documents shall, as applicable, describe specific consideration given to protect, reserve, conserve, mitigate adverse impacts, and restore wetland resources associated with the recommended plan. This information shall be in sufficient detail to quantify (acres and appropriate quality indicator) to what extent the recommended plan will contribute to the National goal of no net loss of wetland resources.

(4) Water Rights. If required by State water laws, rights for the use or release of stored water, to maintain reservoir pools or regulate stream flows for fish and wildlife mitigation or restoration, shall be provided by non-Federal sponsors. Reasonable costs of rights for water to accomplish initial filling of the reservoir, including water for mitigation requirements, are eligible for credit in cost sharing determinations. The computation is dependent on the manner of repayment. Non-Federal sponsors are also required to furnish assurance that appropriate action will be taken to prevent downstream withdrawals of water that would negate fishery benefits credited to such releases.

## C-4. Cultural Resources.

a. Introduction. This section provides guidance for consideration of cultural resources in Civil Works planning studies, along with compliance requirements relevant to the identification, evaluation and treatment of these resources. This guidance is applicable to Corps of Engineers' Reconnaissance studies, Feasibility studies and Preconstruction Engineering and Design studies. It also applies to projects pursued under the Continuing Authority Program. This section does not apply to operating projects or Regulatory programs administered by the Corps of Engineers.

b. Definitions.

(1) Historic Property. An historic property is any prehistoric or historic district, site, building, structure or object included in or eligible for inclusion on the National Register of Historic Places (National Register). Such properties may be significant for their historic, architectural, engineering, archeological, scientific or other cultural values, and may be of national, regional, state, or local significance. The term includes artifacts, records, and other material remains related to such a property or resource. It may also include sites, locations, or areas valued by Native Americans, Native Hawaiians and Alaska Natives because of their association with traditional religious or ceremonial beliefs or activities.

(2) Cultural Resources Study. A cultural resources study is a scientific investigation conducted for the purposes of: discovering cultural resources; confirming their location, extent, and character; evaluating their significance; determining their research potential; determining potential project effects; and developing alternative preservation and/or mitigation plans. Such studies are performed at varying levels of intensity and specificity, and include archival, above-ground field examination, sub-surface testing, laboratory studies, and other scientific and analytic investigations. These studies should utilize professionally accepted and "state-of-the-art" methods and techniques as well as employing or testing innovative strategies when possible. The major study types for Civil Works planning studies are described in the following sub-paragraphs. Although timing of execution and level of detail will vary according to the nature of a particular project, general guidelines are provided by phase of planning study.

(a) Literature and Records Review. A search undertaken to determine what resources are known (or considered likely by informed sources), to be located within the planning area and to appraise the type, extent, and validity of any cultural resources investigations already accomplished.

(b) Sample Survey. Field examination of a representative portion of the planning area (which may be coupled with aerial, subsurface or waterborne remote sensing applications as appropriate), adequate to assess and predict, in general terms, the numbers, locations, affiliations, component(s), spatial distribution, data potential and other salient characteristics of historic properties or historic resources. The degree of coverage will be based on scientific and systematic sampling principles. Sampling strategies “should be predicated on knowledge of where pertinent resources are likely to be found, as well as on the degree to which they may be impacted by . . . land use activities.” (CERL Technical Note 98/88). They may include strategies for identifying below-ground resources and additional requirements for evaluation and testing.

(c) Evaluation and Testing. Limited or restricted subsurface excavations to determine National Register eligibility of above-ground and below-ground resources by assessing and

appraising their extent and depth, their data potential, potential project effects, and other relevant characteristics that cannot be ascertained by pedestrian or surface examination alone. To evaluate significance, mapping, archival research, detailed laboratory analysis, and controlled surface collection of artifacts may precede, accompany or supplement such tests and evaluations. Evaluation and testing may also extend to the preparation of measured drawings, photographs, written data, and historical documentation to determine the National Register eligibility of structures and/or buildings.

(d) Intensive Survey/Inventory. A comprehensive, systematic, and detailed physical examination of an area as may be needed to identify and evaluate all historic properties which must be taken into account. This may include pedestrian survey, subsurface testing, archival research, and architectural studies. The inventory may be accompanied and/or followed by analytical studies such as artifact typing, radiocarbon dating, geomorphological mapping, archeobotanical analysis, and zooarcheology. It will also provide data required to develop preservation and/or mitigation plans.

(3) Mitigation. Mitigation is the minimization of losses of significant scientific, prehistoric, historic, architectural or archeological resources which will be accomplished through preplanned actions to avoid, preserve, protect, minimize, or compensate for impacts upon such resources, or to recover a representative sample of the data they contain by implementation of scientific study and other professional techniques and procedures.

(4) Historic Preservation. Historic preservation is the act of identification, evaluation, recordation, documentation, curation, acquisition, protection, management, rehabilitation, restoration, stabilization, maintenance, research, interpretation, conservation and education and training for cultural, built and/or engineered environments.

(5) Advisory Council on Historic Preservation (ACHP). The ACHP is a body of the Executive branch of the Federal government that issues regulations to implement Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended. The Council also consults with Federal agencies and comments on undertakings and programs that affect historic properties.

(6) State Historic Preservation Officer (SHPO). The SHPO reflects the interests of a State and its citizens in the preservation of their cultural heritage. In accordance with NHPA provisions, the SHPO advises and assists Federal agencies in carrying out their NHPA responsibilities.

(7) Tribal Historic Preservation Officer (THPO). The THPO is appointed or designated in accordance with the NHPA and is the official representative of an Indian tribe for the purposes

of Section 106 of the NHPA. If an Indian tribe has assumed the responsibilities of the SHPO for section 106 on tribal lands, Federal agencies shall consult with the THPO in lieu of the SHPO regarding undertakings occurring on, or affecting historic properties on, tribal lands.

(8) Indian tribe. An Indian tribe is a tribe, band, nation, or other organized group or community, including a Native village, Regional Corporation or Village Corporation, as those terms are defined in Section 3 of the Alaska Native Claims Settlement Act (43 U.S.C. 1602), which is recognized as eligible for the special programs and services provided by the United States to Indians because of their status as Indians.

(9) Native Hawaiian organization. A Native Hawaiian organization is any organization which serves and represents the interests of Native Hawaiians; has a primary and stated purpose of the provision of services to Native Hawaiians; and, has demonstrated expertise in aspects of historic preservation that are significant to Native Hawaiians. “Native Hawaiian” means any individual who is a descendant of the aboriginal people who, prior to 1778, occupied and exercised sovereignty in the area that now constitutes the State of Hawaii.

(10) One Percent of the Total Amount Authorized to be Appropriated for Such Project. This is the statutory level set by the Archeological and Historic Preservation Act of 1974 (Public Law 93-291) on Corps of Engineers' general authority to make expenditures for data recovery. The Department of the Interior defines “data” as “evidence about historic and prehistoric periods which are buried in the ground” and recovery as “the scientific excavation or removal and preservation of that evidence . . . when construction projects pose threats that would result in their irreparable loss or destruction.” Activities to survey, test and evaluate archeological resources are considered to be project planning activities, not data recovery activities. Further, mitigation, including but not limited to, protection of historic structures and engineering elements, built environment documentation, real estate support, and engineering support may all be appropriate activities, but, they are not data recovery activities subject to the one percent accounting established by Public Law 93-291. Section 208 of the National Historic Preservation Act Amendments of 1980 authorizes data recovery in excess of the one percent level when the Assistant Secretary of the Army (Civil Works) seeks the concurrence of the Secretary of the Interior (through the Departmental Consulting Archeologist) and notification of Congress.

(11) Significance. Significance is a term attributable to properties listed in or determined to be eligible for listing in the National Register. Significance criteria for the purpose of this regulation shall be those provided in 36 CFR Part 60.4. According to these criteria for evaluation, "(t)he quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and

(a) that are associated with events that have made a significant contribution to the broad patterns of our history; or

(b) that are associated with the lives of persons significant in our past; or

(c) that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

(d) that have yielded, or may be likely to yield, information important in prehistory or history."

(12) Undertaking. An undertaking, for purposes of compliance with Section 106 of the NHPA, means a project, activity or program funded in whole or in part under the direct or indirect jurisdiction of a Federal agency, including: those carried out by or on behalf of the agency; those carried out with Federal financial assistance; those requiring a Federal permit, license or approval; and, those subject to State or local regulation administered pursuant to a delegation or approval by a Federal agency.

(13) Collection. A collection is the composite of all material remains that are recovered from a cultural resources study as well as the associated records that are prepared or assembled in connection with that study.

(14) Collections management and curation. Collections management and curation are those services such as processing, cataloging and accessioning, as well as the application of specialized techniques necessary for conserving and maintaining collections.

(15) Collections Management Center. A collections management center is a facility where material remains and associated records are curated and maintained.

c. Overview. The National Historic Preservation Act (NHPA) of 1966, as amended, states that it is the policy of the Federal government to “provide leadership in the preservation of the prehistoric and historic resources of the United States . . .”. These are finite, non-renewable resources which must be considered in formulating recommendations for project authorization and implementation. Significant cultural resources, also known as historic properties, are those listed in, or eligible for listing on the National Register of Historic Places. As early in the planning process as is possible, historic properties should be identified, characterized and taken into account in accordance with Section 106 of the NHPA and its implementing regulations at 36

CFR Part 800. Consistent with this process, and as appropriate to comply with other cultural resources laws and regulations, Corps undertakings shall be fully coordinated with State Historic Preservation Officers (SHPO), Tribal Historic Preservation Officers (THPO), the Advisory Council on Historic Preservation (ACHP), and all other appropriate interested parties and/or individuals.

d. Cultural Resources Studies.

(1) Principal investigators and key consultants conducting cultural resource studies shall meet the minimum qualifications cited in the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation. Principal investigators shall be responsible for the validity of material presented in their reports.

(2) Draft reports on the results of cultural resources studies shall be distributed for review and comment to appropriate agencies, institutions and individuals, including, but not limited to, the State and/or Tribal Historic Preservation Offices, the Advisory Council, and the Department of the Interior.

(3) Copies of final reports shall be furnished to any appropriate individuals, agencies, and organizations. Final reports should be organized to include appendices or stand-alone volumes containing maps, site forms, references to specific site locations or other sensitive resource data. Appendices or stand-alone volumes may warrant protection from public disclosure under Exemption 3 of the Freedom of Information Act (FOIA), 5 U.S.C.A '552(b)(3) and Section 304 of the National Historic Preservation Act, as amended, 16 U.S.C.A '470w-3(a).

(4) Reconnaissance Phase Studies. Cultural resources investigations conducted during the Reconnaissance Phase of planing shall usually be limited to observations and general predictions regarding the types, variety and frequency of cultural resources that may be affected by potential solutions to water resources problems. These observations and predictions should be supported by a review of in-house information, records and available data. Cultural resources input during this phase of planning should also include projections of costs to accomplish the necessary studies, investigations, consultations and coordination that could occur during the subsequent planning phase.

(5) Feasibility Phase Studies.

(a) Cultural resources investigations during the Feasibility Phase of planning shall usually begin with a literature and records review. This literature and records review shall include manual and/or electronic searches of the National Register of Historic Places, the State archives, State site files, other files of the SHPO/THPO and other available public records of

prior cultural resource investigations within the planning area. It may also include interviews with persons knowledgeable about related topics; contacts with appropriate Native Americans, Native Hawaiians and Alaska Natives; field checks of site locations, and examinations of old photographs, maps and other documents.

(b) In consultation with the SHPO and/or the THPO, Corps Commands shall also design and implement such studies as are necessary to evaluate alternative plans in terms of their relative impact on historic properties. These studies should, when conducted on a sampling basis, provide for the efficient planning of any further cultural resource investigations that may be needed prior to initiation of construction.

(c) The Feasibility Phase studies shall normally be accomplished on a sampling basis formulated within a research strategy tailored to insure adequate coverage of the environmental zones within the alternative plan impact areas. However, when considered necessary or appropriate, a sample survey may be waived in favor of an intensive survey/inventory during the Feasibility Phase.

(d) Sample surveys will be designed to obtain such information as is necessary to identify and predict the presence of historic properties; to evaluate effects to such properties; and to evaluate impacts of alternative plans and assist in plan selection.

(1) The sampling strategy shall consider costs of survey with respect to the number of viable alternatives and the extent of the known area of potential effects.

(2) If this approach delays timely identification of historic properties and project impacts for consideration in a NEPA document or Feasibility Report, a Programmatic Agreement can be developed between the Corps Command, the SHPO and/or THPO, the ACHP and other consulting parties. This Agreement should specify the process by which required surveys, testing, evaluation, effect determination, mitigation planning, and coordination shall be achieved.

(e) The Feasibility Report and NEPA document shall briefly describe identified and predicted historic properties which would be impacted by the alternative plans. Where the extent, scope or significance of potentially impacted resources influence the commander's recommendation, these considerations should be clearly set forth in the feasibility report. If properties listed in, or eligible for listing on the National Register will be affected by the recommended plan, comments of the SHPO and/or THPO, the ACHP, and other interested parties shall be sought pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended, and 36 CFR 800. Comments shall also be sought in the event that for the recommended plan, there will be "no effect" on historic properties.

(F) Cultural resources studies completed during this phase of planning, may indicate that the cost of data recovery could exceed one percent of the total Federal amount authorized for appropriation. In those cases, the Feasibility Phase Report shall include a narrative on the potential need to exceed the one percent level. This narrative shall include, but may not be limited to, the factual basis for concern and the need or likelihood of seeking a waiver under Section 208 of the National Historic Preservation Act Amendments of 1980.

(6) Preconstruction Engineering and Design Phase Studies.

(a) During the period between completion of the Feasibility Report and initiation of construction, intensive surveys/inventories, if required or not previously conducted, shall be accomplished in the area of potential environmental impact of the recommended plan or authorized project. The results of such inventories serve as the basis for formulation of plans for management of historic properties prior to or during the construction and operational stages of projects.

(b) Such inventories shall be accomplished within the context of an explicit research design, formulated in recognition of prior work by the Corps of Engineers and others, and shall include such testing and other comparisons and evaluations as may be required to formulate a program which provides a defensible basis to:

(1) Seek determinations of eligibility of resources for the National Register of Historic Places.

(2) Determine when a project will have "no effect" on historic properties.

(3) Determine the need to mitigate adverse project effects on National Register and eligible properties in light of their historic or architectural significance or their potential to further archeological knowledge.

(4) Develop plans and cost estimates for such mitigation or other treatment of historic properties affected by the project.

(5) Serve as the basis for negotiation of a Memorandum of Agreement (if no Memorandum has been previously prepared) with the SHPO/THPO, and, if appropriate, the ACHP specifying actions which will be taken by the Corps of Engineers prior to or during the project construction period to mitigate adverse effects on National Register and eligible properties.

(c) Should the cost of data recovery exceed one percent of the total estimated Federal appropriation required for construction of a project, a waiver request shall be submitted in accordance with Section 208 of the National Historic Preservation Act Amendments of 1980.

(1) The waiver shall be submitted, through channels, to the Corps Federal Preservation Officer (FPO), who shall serve as the headquarters technical specialist and liaison. The FPO will review the waiver request, coordinate with all appropriate headquarters elements, informally coordinate with the Department of the Interior, and develop any additional documentation for approval by the Assistant Secretary of the Army (Civil Works). The waiver shall then be submitted to the Secretary of the Interior, through the National Park Service Departmental Consulting Archeologist, for concurrence and Congressional notification.

(2) The waiver request should be in the form of a letter report with supporting documentation as deemed necessary. The letter report should include detailed descriptions of the historic properties that will be adversely affected; descriptions of previous studies in the study area; proposed data recovery efforts for each effected property; estimated data recovery costs per property; and a detailed justification for the need to exceed the one percent level.

(3) While early planning and preparation of a waiver request is desirable, it is not always possible. It is important to note that Corps Commands may expend data recovery funds up to the one percent level prior to the completion of the waiver process.

e. Native American Considerations.

(1) When cultural resources studies examine lands held in fee title (or controlled to the same extent as fee title lands) by the Corps, provisions of Section 3 of the Native American Graves Protection and Repatriation Act (NAGPRA), Public Law 101-601, and its implementing regulations found at 40 CFR Part 10, will apply.

(2) NAGPRA does not apply to lands in which the Corps has merely been provided access, or a right of entry, by a landowner and/or local sponsor, for water resources development studies or projects. A full discussion of NAGPRA applicability can be found in a 7 Dec 1995, CECW-AO/CECW-PD/CECC Memorandum and Legal Opinion, subject: Application of the Native American Graves Protection and Repatriation Act to Water Resources Development Activities.

(3) A Presidential Memorandum on Government-to-Government Relations, dated 29 April 1994, reaffirmed the United States “unique legal relationship with Native American tribal governments.” In recognition of the special considerations due to tribal interests, the President directed Federal agencies to operate within a government-to-government relationship with

federally recognized Indian tribes; consult, to the greatest extent practicable and permitted by law, with Indian tribal governments; assess the impact of agency activities on tribal trust resources and assure that tribal interests are considered before the activities are undertaken; and remove procedural impediments to working directly with tribal governments on activities that affect trust property or governmental rights of the tribes. In the Planning process for water resources development, there may be many points of connection between the Corps and Indian tribes. The following Tribal Policy Principles, developed with the Office of the Assistant Secretary of the Army (Civil Works), shall guide Corps-Indian tribe interaction during project planning.

(a) Tribal Sovereignty. The U.S. Army Corps of Engineers recognizes that Tribal governments are sovereign entities, with rights to set their own priorities, develop and manage Tribal and trust resources, and be involved in Federal decisions or activities which have the potential to affect these rights. Tribes retain inherent powers of self-government.

(b) Trust Responsibility. The U.S. Army Corps of Engineers will work to meet trust obligations, protect trust resources, and obtain Tribal views of trust and treaty responsibilities or actions related to the Corps, in accordance with provisions of treaties, laws and Executive Orders as well as principles lodged in the Constitution of the United States.

(c) Government-to-Government Relations. The U.S. Army Corps of Engineers will ensure that Tribal Chairs/Leaders meet with Corps Commanders/Leaders and recognize that, as governments, Tribes have the right to be treated with appropriate respect and dignity, in accordance with principles of self-determination.

(d) Pre-Decisional and Honest Consultation. The U.S. Army Corps of Engineers will reach out, through designated points of contact, to involve Tribes in collaborative processes designed to ensure information exchange, consideration of disparate viewpoints before and during decision making, and utilize fair and impartial dispute resolution mechanisms.

(e) Self Reliance, Capacity Building, and Growth. The U.S. Army Corps of Engineers will search for ways to involve Tribes in programs, projects and other activities that build economic capacity and foster abilities to manage Tribal resources while preserving cultural identities.

(f) Natural and Cultural Resources. The U.S. Army Corps of Engineers will act to fulfill obligations to preserve and protect trust resources, comply with the NAGPRA, and ensure reasonable access to sacred sites in accordance with published and easily accessible guidance.

(4) When Civil Works cultural resource studies include the examination of "Federal lands," as defined by Executive Order 13007, "Indian Sacred Sites", the provisions of that Executive Order apply. For the purposes of Executive Order 13007, Federal lands are any land or interest in land owned by the United States, including leasehold interests held by the United States, except Indian trust lands.

(a) Executive Order (EO) 13007 directs Federal agencies to accommodate access to, and ceremonial use of, Indian sacred sites by Indian religious practitioners. It directs agencies to avoid adversely affecting the physical integrity of such sacred sites and to maintain confidentiality of information pertaining to such locations.

(b) Corps policy on EO 13007 is contained in Policy Guidance Letter Number 58, dated 28 June 1998. That policy is incorporated herein, by reference. In brief, though, it is Corps policy to utilize all reasonable means to accommodate Indian tribes by providing meaningful access to sacred sites on Federal lands. Corps Commands will ensure that Indian tribes have reasonable opportunities to review plans for activities and projects on Federal lands that could potentially adversely affect sacred sites. In the event that the Federal lands examined are owned or leased by another Federal agency, Corps Commands shall ensure that representatives from these other agencies will have a reasonable opportunity to participate in EO 13007 consultations.

(c) Corps cultural resources studies, conducted for planning purposes, on lands subject to the provisions of EO 13007, shall include narratives on the results of tribal consultations regarding access, and potential affects to, Indian sacred sites. These narratives shall include, but may not be limited to: nature and extent of sacred sites within the study area (subject to tribal approval and confidentiality concerns), access accommodations required under "with/without" project conditions, potential affects of the project, and feasible measures to ensure the avoidance of potentially adverse affects.

f. Curation. Collections recovered from lands in which the Corps merely has a right of entry (i.e. no real property interest) are the property of the landowner, unless otherwise specified. Corps Commands conducting cultural resources studies associated with these lands should ensure that collections are properly curated in appropriate collections management centers as long as there is a Corps interest in the collections. When the Corps interest in collections ends, landowners should be encouraged to arrange for permanent curation with collections management centers in a manner consistent with Federal curation requirements.

g. Continuing Authority Projects. Identification, evaluation, and mitigation of effects on historic properties within the impact area of projects planned and implemented under Continuing Authorities for flood control, navigation, streambank erosion control and shore protection shall be accomplished as follows.

(1) Section 103, 107, 111, 205. The implementation of projects under these authorities includes two planning phases (reconnaissance and feasibility), preparation of plans and specifications, and construction.

(a) Cultural resources investigations during the reconnaissance phase of planning should be consistent with the overall objectives of the study as well as time and cost limitations. Investigations during this phase of planning shall usually be limited to observations and general predictions regarding the types, variety and frequency of cultural resources that may be affected by a proposed undertaking. These observations and predictions should be supported by a review of in-house information, records and available data. The review of available information may assist in the design of more intensive investigations of the planning area and the development of cost figures for later implementation phases. In some cases, the results of reconnaissance phase investigations may indicate that the cost of data recovery could exceed the one percent level specified in Section 7a of the Archeological and Historic Preservation Act of 1974 (Public Law 93-291). In those cases, the reconnaissance report shall include a narrative on the potential need to exceed the one percent level. This narrative shall include, but may not be limited to, the factual basis for concern and the need or likelihood of seeking a waiver under Section 208 of the National Historic Preservation Act Amendments of 1980.

(b) The feasibility phase should complete the plan formulation process and result in the preparation of a Detailed Project Report (DPR). If the limited observations and predictions documented in the reconnaissance planning phase reveal the presence, or likely presence, of historic properties within the areas of potential project effect, the Corps Command shall conduct an intensive survey/inventory. The results of the intensive survey/inventory shall be presented in the DPR along with the proposed plan for mitigation if adverse effects on historic properties will occur.

(1) If historic properties will be effected by the recommended plan, comments of the SHPO and/or THPO and the Advisory Council on Historic Preservation shall be sought pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended, and 36 CFR Part 800. Comments shall also be sought in the event that for the recommended plan, there will be "no effect" on historic properties.

(2) Should the cost of data recovery exceed one percent of the total Federal appropriation required for construction of a project for which Congress has not specifically authorized expenditures in excess of this amount, a waiver request shall be submitted in accordance with Section 208 of the National Historic Preservation Act Amendments of 1980. For Continuing Authorities Projects, Corps Commands shall use the same waiver process described in paragraph d(6)(c) above.

(2) Section 14 and 208. Projects considered pursuant to these Continuing Authorities are subject to a single planning phase prior to the preparation of plans and specifications. Section 14 and 208 projects are not exempt from compliance with the National Historic Preservation Act of 1966 and 36 CFR Part 800.3 through 800.6. When Corps projects are in response to a disaster or emergency declared by the President, a tribal government, or the governor of a State or another immediate threat to life or property; and, when the undertaking will be implemented within 30 days after the disaster or emergency has been formally declared by the appropriate authority, Corps Commands can follow accelerated procedures established in 36 CFR Part 800.12 “Emergency situations.”

h. Costs, Apportionment, and Accountability.

(1) Funds expended for cultural resource investigations during the Reconnaissance Phase of Planning shall be a full Federal expense.

(2) Funds expended during the Feasibility Phase for sample surveys, intensive surveys, or other necessary cultural resource investigations are cost-shareable. These may be treated as planning costs and thus, are not accountable under the statutory one percent data recovery expenditures.

(3) Data recovery of significant archeological properties is a full Federal cost up to the one percent level specified in Section 7a of Public Law 93-291. In the event that data recovery costs exceed the one percent level, those costs that exceed the one percent level will be shared by the Federal government and the local sponsor.

(a) For projects that will exceed the one percent level and a Project Cooperation Agreement (PCA) has not been executed, the PCA shall include a specific provision for data recovery cost sharing. In order to determine the cost share formula, the Corps Command shall identify the project purpose which caused the need for the data recovery and cost share the amount over the one percent as if it were a separate project for that purpose.

(b) For projects that will exceed the one percent level and a PCA is in place, but does not specifically address data recovery, the Local Sponsor share of the amount over one percent shall be dictated by the Sponsor's overall financial responsibilities as enumerated in the PCA.

(4) Cultural resources mitigation, other than data recovery, shall not be included in the one percent accounting specified in Section 7a of Public Law 93-291. Cultural resources mitigation, other than data recovery, shall be cost shared between the Corps and the Local Sponsor using the same cost sharing formula established for the project purpose.

(a) For projects that require cultural resources mitigation, other than data recovery, and a PCA has not been executed, the PCA shall include a specific provision for mitigation cost sharing.

(b) For projects that require cultural resources mitigation, other than data recovery, and a PCA is in place, the Local Sponsors share of the mitigation costs shall be dictated by the Sponsor's overall financial responsibilities as enumerated in the PCA.

(5) For Continuing Authorities projects, when cultural resources mitigation costs increase the Federal cost to a level in excess of the Federal Funding Limits, all mitigation costs in excess of the specified Limits shall be the responsibility of the local sponsor. For those Continuing Authorities efforts that are below specified Limits, funding formulas established in paragraph h(3) and (4), above, apply.

## C-5. Aesthetic Resources

a. Purpose. This section provides guidance for consideration of aesthetic resources in Civil Works planning studies.

b. Definitions.

(1) Aesthetic Resources. Those natural resources, landform, vegetation and man-made structures in the environment which generate one or more sensory reactions and evaluations by the observer, particularly in regard to pleasurable response. These sensory reactions are traditionally categorized as visual, auditory and olfactory responses; more simply-sight, sound and smell. The visual sense is so predominant in the observers reaction and evaluation that aesthetic resources, for the purpose of this section, will be referred to as visual resources. The other sensory stimulants, sound and smell, should be dealt with to the extent their presence is perceivable.

(2) Aesthetic Quality. The significance given to aesthetic resources based on the intrinsic physical attributes of those specific features and recognized by public, technical and institutional sources.

(3) Landscape Unit. A distinct and visually connected portion of land which may include compatible vegetation, water, wildlife, land use and man-made structures and forms a distinct and describable visual component.

(4) Procedures. The methods or process used to evaluate aesthetics for Corps of Engineers planning studies. A procedure should be capable of being used to: (1) Identify and assess the existing visual resources conditions affected by a Corps study; and, (2) Assess (describe magnitude, location, duration) and appraise (determine if beneficial or adverse) the visual impacts caused by alternatives; and, (3) Provide a replicable basis of support for any recommended mitigation.

(5) Mitigation. For the purpose of this section, the definition of mitigation includes:

(a) Avoiding the impact altogether by not taking a certain action or part of an action.

(b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation.

(c) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.

(d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.

(e) Compensating for the impact by replacing or providing substitute resources or environments.

c. Guidance.

(1) General. It is National policy that aesthetic resources be protected along with other natural resources. Current planning guidance specifies that the Federal objective of water and related resources planning is to contribute to National Economic Development consistent with protecting the Nation's environment. The Corps established a number of environmental goals, including: (1) Preservation of unique and important aesthetic values; and, (2) Restoration and maintenance of the natural and man-made environment in terms of variety, beauty, and other measures of quality (ER 200-2-2). However, in meeting these goals, a standard of reasonableness must be applied in defining the appropriate level of expenditures for aesthetic quality at Civil Works projects. Current budgetary constraints and the intense competition for Federal funds dictate that a greater level of discipline be applied in meeting the Corps responsibilities to harmoniously blend projects with the surrounding environment while avoiding excessive expenditures. The guidance and procedures presented herein implement these planning and environmental policies and goals and complement the procedures developed for planning, economic evaluation and other environmental resource evaluation.

(2) Aesthetic Resources in Planning. Consideration of Aesthetic resources shall be consistent with current planning guidance. Review of a study (e.g. study area, alternatives) by a landscape architect or trained environmental resources personnel early in the planning process can provide valuable input to the study by identifying significant visual resources as well as other planning issues related to aesthetics that impact on plan formulation, design and engineering. Procedures for consideration of aesthetic resources shall occur throughout the planning process and be documented to reflect the continued effort throughout all phases of the project. This procedure departs from the traditional practice which introduced beautification only during the design stage.

(3) Mitigation. Appropriate mitigation shall be undertaken for adverse effects to significant aesthetic resources. Aesthetic mitigation measures, features, and actions shall be evaluated according to their ability to either avoid, minimize or compensate for adverse, effects on significant aesthetic resources, or to mitigate damage to these resources shall be considered a part of the project and allocated to the project and allocated to the project in the same manner as other project costs.

(4) Project Relationship. Any aesthetic project features must be related to harmoniously blending the project into the project setting and not aimed at "beautifying" the surrounding area. This is not an issue with measures that are integral to project design but is an important consideration for measures that are not integral. For example, plant materials can be used to reduce visual contrast or screen projects. Landscape plantings must be limited to the land required for the project and plantings will not extend to adjacent property even if the adjacent property is a public park or recreation area.

(5) Project Setting. The acceptability and compatibility of aesthetic features of project design are affected by the project setting and the expectation of the users and viewers of the project. The land use in the area surrounding the project is an important consideration in determining the appropriate measures for aesthetics. For example, a concrete channel without aesthetic treatment may not be visually objectionable in a heavy industrial area but a concrete channel in a residential area may require texturing and screening with trees and shrubs to be visually compatible with the residential land use. Linear projects such as levees and channels may incorporate different aesthetic features in different reaches of the same project depending on the visual qualities and land uses of the adjacent property in that reach with an appropriately designed transition between different treatment reaches.

(6) Partnership. Project aesthetic features will be closely coordinated with the non-Federal project sponsor. The objectives, goals, desires and values of the local sponsor will be carefully considered in formulating the aesthetic features of the project within the limits of a uniform application of standard Corps practices for aesthetic quality. A summary of standard

Corps practice is contained in Appendix R. This does not preclude the incorporation of measures into a project that would exceed the normal Corps practice if the non-Federal sponsor is willing to bear all of the incremental costs of such measures as elements of a locally preferred plan. Equity is also an important consideration in working in partnership with local sponsors. The preservation and enhancement of aesthetic quality must be an important goal in all projects regardless of the socio-economic conditions in the project area.

(7) Compatibility. All aesthetic measures must be designed so that they are fully compatible with the project purpose and in no way compromise the safety, integrity or function of the project. For example, it may be appropriate to screen a floodwall with vegetative plantings but it would be inappropriate to plant trees directly on a levee that might endanger it's structural integrity or diminish its hydraulic characteristics.

(8) Cost Allocation. Costs for aesthetic measures that are in accordance with standard Corps practices are shared as project costs. Cost allocation would be an issue in multi-purpose projects where aesthetic costs would be shared in accordance with the purpose to which the costs are allocated. An example would be a hiking trail on a flood control levee. The addition of recreation as a project purpose may introduce the need for an increased consideration of aesthetics since it results in increased public visibility and use of the project. In these cases, any incremental aesthetic costs associated with the recreation purpose should be allocated to the recreation purpose and cost-shared with the non-Federal sponsor on a 50 percent basis.

d. Procedures.

(1) General. A procedure such as the Visual Resources Assessment Procedure (VRAP), WES Instructional Report EL-88-1, or comparable method, to assess aesthetic resources shall be included as a regular part of planning studies. The purpose of using a procedure is to have a systematic approach to consider aesthetic resources. Advantages of a systematic and quantifiable approach include the ability to assign a visual resource value to all of the landscape units within a study area, identify significant aesthetic resources, and to determine causes of adverse impact. Such a procedure provides a clear, tractable basis for including aesthetics in plan formulation, design, reformulation, and mitigation planning.

(2) Level of Detail. The level of effort or detail used in a Procedure will vary dependent on project size, geographical scale, costs, phase of a study, and on the availability of data, identified alternatives, and forecasts of future conditions. The level of detail will increase with the phase of planning and engineering, as the Planning data required, e.g., impact measurements, increases in detail. The procedure used may vary from development of narrative descriptions of the visual resources of a study area to implementation of a visual impact assessment study.

(3) Reporting Requirements. Project measures to preserve and restore aesthetic quality should be fully defined (i.e. described and displayed) in the feasibility report and reflected in the project cost estimate. The feasibility report should include a description of the project setting and the relationship of aesthetic features of the project to the setting. To the extent practical, all the incremental costs of the project aesthetic features should be identified recognizing that some aesthetic considerations are completely integral to the project design and are not separable. This complete description and display of costs will allow any issues on the reasonableness of the aesthetic measures to be addressed prior to project authorization and be reflected in the authorizing document. Increases in levels of project costs for aesthetics during pre-construction engineering and design, beyond inflation, will not be approved.

## C-6. Water Quality and Related Requirements

a. Purpose. This section provides guidance for the consideration of water quality and related programs in Civil Works planning studies. It incorporates water quality policies embodied in Sections 102, 401 and 404 of the Federal Water Pollution Control Act, Section 319 of the Water Quality Act of 1987, and Sections 102 and 103 of the Marine Protection, Research and Sanctuaries Act, which are applicable to Corps of Engineers feasibility studies and preconstruction planning and engineering.

b. Discharge of Dredged or Fill Material into Waters of the United States. Corps of Engineers proposed projects involving the discharge of dredged or fill material into waters of the United States shall be developed in accordance with guidelines promulgated by the Administrator of the Environmental Protection Agency (EPA) in conjunction with the Secretary of the Army under the authority of Section 404(b)(1) of the Clean Water Act, as amended, unless these activities are exempted by Section 404(f).

c. Conducting the Section 404(b)(1) Evaluation in the Planning Process. During feasibility planning, District commanders shall conduct and, to the fullest extent practicable, complete the investigations and analyses required by the Section 404(b)(1) Guidelines. Water quality and related information used in the evaluation will provide documentation to demonstrate that the recommended plan is in compliance with the Clean Water Act. A suggested format for the Section 404(b)(1) evaluation is included as Exhibit C-1.

d. Clean Water Act: Section 404. Feasibility reports recommending projects involving the discharge of dredged or fill material into waters of the United States, including wetlands, shall be developed consistent with Section 404(b)(1) Guidelines. For navigation projects, if compliance with 404(b)(1) Guidelines alone prohibit the designation of a proposed dredged material disposal site, then the economic impact on navigation and anchorage shall be evaluated

and the District Commander may recommend using the proposed site, even if it cannot be officially designated under 404(h)(1) Guidelines (Section 404(b)(2)).

e. Section 404(b)(1) Evaluation Documentation. District commanders shall include in their feasibility planning reports analyses and documentation necessary to demonstrate that the recommended plan is in compliance with 404(b)(1) Guidelines. The 404(b)(1) analysis and compliance determination shall be updated as required during post authorization planning and included in appropriate project documents. Full compliance with the Clean Water Act (CWA), Section 404(b)(1) Guidelines, must be completed prior to the initiation of project construction. A suggested format for the required 404(b)(1) evaluation and compliance determinations is included in Exhibit C-1.

f. State Water Quality Certification. Section 401 of the CWA sets forth requirements and procedures for obtaining State water quality certification for activities which result in any discharge into navigable waters. Section 404(t) provides further guidance relative to navigation projects. State water quality certification requires the District Commander to accomplish the following three tasks:

(1) Complete an evaluation of the effects of the proposed discharge consistent with the Section 404(b)(1) Guidelines;

(2) Issue a public notice, with opportunity for public hearings for the proposed discharge, including or referencing the preliminary Section 404(b)(1) evaluation; and,

(3) Obtain certification, including any required conditions, from the State or interstate water pollution control agency that the proposed action is in compliance with established effluent limitations and water quality standards. If the State in question has assumed responsibilities for the 404 regulatory program, a State 404 permit shall be obtained, if applicable, which will serve as the certification of compliance. District commanders shall provide the State with necessary detailed information it may need to issue the water quality certification.

g. Section 404(r) Exemption. Section 404(r) of the Clean Water Act, waives the requirement to obtain either the State water quality certificate or the 404 permit if:

(1) Information on the effects of the discharge of dredged or fill material into waters of the United States, including the application of the Section 404(b)(1) Guidelines, are included in an environmental impact statement (EIS) on the proposed project; and,

(2) The EIS is submitted to Congress before the actual discharge takes place and prior to either authorization of the proposed project or appropriation of funds for its construction.

(3) District commanders shall clearly document in the feasibility report when the 404(r) exemption criteria have been met, regardless of whether or not the District plans to obtain State water quality certification.

h. Section 404/NEPA Documentation. Evaluation of the effects of the discharge of dredged or fill material, including consideration of the Section 404(b)(1) Guidelines, shall be included in an EA, EIS or EIS Supplement prepared for all Corps actions in planning, design and construction where the recommended plan or approved project involves the discharge of dredged or fill material into waters of the United States.

(1) For feasibility reports going to Congress for authorization, the Section 404(b)(1) evaluation will be discussed in the, body of the EA, EIS or EIS Supplement and included, in full, in an Appendix to the Main Report. The degree to which the proposed project is in compliance with the Act will be noted in the EA (FONSI), or in the Record of Decision (ROD) when an EIS is involved.

(a) If full compliance is noted in the ROD, this will satisfy the Section 404(r) exemption criteria.

(b) If full compliance is not reached during feasibility planning, i.e., the Section 404(b)(1) evaluation is not completed or Section 404(r) requirements are not satisfied, then complete compliance will not be noted until the Section 404(b)(1) evaluations are completed and included in an EIS Supplement filed with EPA prior to project construction.

(2) To aid states and agencies in their review draft feasibility reports that include a draft EIS shall indicate whether of not the District Commander plans to seek exemption under 404(r) once Section 404(b)(1) compliance is met.

(3) Feasibility reports going to Congress, that includes an EA (FONSI) rather than an EIS, must include a State water quality certificate to be in compliance with the Clean Water Act; i.e., Section 404(r) of the, Act does not apply unless an EIS is involved.

(4) For continuing authority projects involving the disposal of dredged or fill material into the waters of the United States, Section 404(b)(1) compliance will be included in the EA, EIS or EIS Supplement consistent with guidance set forth above. Since Section 404(r) does not apply to continuing authority projects (since these reports do not go to Congress) an appropriate State water quality certification or State permit must be obtained before a decision is made on the project.

(5) There may be instances when the District Commander determines that it would be prudent to seek State water quality certification even when an exemption for obtaining such certification is possible under 404(r). In such instances, the District commanders shall accomplish all actions necessary to obtain State water quality certification, and to meet Section 404 (r) exemption requirements. A State water quality certificate shall be obtained prior to requesting project construction funding unless the State is legally unable, or is unwilling to Certify the project even after receiving the necessary Section 404(b)(1) evaluation information from the Corps. In these cases, the District Commander shall officially inform the State of his/her intention to initiate Section 404(r) exemption procedures, and acknowledge this in the appropriate NEPA document.

(6) States requiring final Congressional or Corps action prior to issuing a water quality certification must be advised early in the planning process of the reporting requirements discussed above. In those instances the State must furnish a conditional water quality certification before Sections 401 and 404 requirements are considered met. This issue must be resolved and appropriate documentation included before the Division Commander approves the report and sends it forward to HQUSACE for Washington level review, approval and processing.

i. General Permits. Nationwide and regional permits fall under the category of general permits. A general permit is issued subject to the Section 404(b)(1) Guidelines and to any conditional standards pursuant to Section 404(e) of the Clean Water Act. The conditions of a general permit shall be used in lieu of this regulation for those Federal activities which the District Commander determines to be applicable. However, the use of a general permit shall not substitute for or eliminate the need for the preparation of an appropriate NEPA document, i.e., EIS or EA FONSI.

j. Protection of Wetlands. Executive Order 11990 has declared wetlands to be an important national resource warranting specific preservation measures. Policy and guidance for considering wetland resources in the planning process is found in Section C-3 of this appendix.

k. Aquatic Disposal of Dredged Material.

(1) For projects where discharge of dredged material into the territorial sea is for the primary purposes of fill (e.g., beach nourishment, or replenishment, underwater berm or island construction), the discharge will be evaluated under Section 404 of the Clean Water Act.

(2) For projects involving transportation of dredged material through the territorial sea for the purpose of ocean disposal, or involving dredged material discharge within the territorial sea for the primary purpose of disposal, the discharge will be evaluated under Section 103 of the Marine Protection, Research and Sanctuaries Act (MPRSA). Required consideration for

establishing the need for ocean disposal includes compliance with applicable environmental criteria of 40 CFR Part 227 relating to the effects of disposal, navigation, economic and industrial development, foreign and domestic commerce and availability of practicable alternatives to ocean disposal.

(3) In considering feasible ocean sites for the disposal of dredged material, the District Commander will utilize ocean sites designated by EPA to the maximum extent practical. Where no EPA designated site is available or where such sites are determined not to be feasible for use based on the NED Plan, the District Commander may select a suitable ocean disposal site or sites under authority of Section 103 of the MPRSA using procedures and outlined criteria in 40 CFR 228.4(e), 228.5 and 228.6. Appropriate NEPA documentation should be used to support site selections; preferably incorporating these considerations into the project NEPA document.

(4) Where ocean disposal is determined to be necessary, the District Commander will, to the fullest extent practicable, specify potential disposal sites in the feasibility report. The feasibility report must fully demonstrate that there are acceptable potential disposal sites which incorporate both economic and environmental considerations, within the zone of siting feasibility for the project. District commanders shall conduct and, to the fullest extent practicable, complete the Section 103 evaluation during feasibility planning when ocean dumping alternatives are being considered. Data developed in this manner will facilitate the comparison of alternative ocean disposal plans. If the Section 102 evaluation has not been completed for projects currently in preconstruction planning and engineering, it shall be completed as an integral part of the decisionmaking process for initiating or implementing the project.

(5) Dredged material will be evaluated to ensure that it is suitable for aquatic disposal. Evaluation, and any subsequent sediment testing that may be required, will be performed in accordance with USEPA/USACE “Evaluation of Dredged Material Proposed for Ocean Disposal (Testing Manual)” or USEPA/USACE “Evaluation of Dredged Material Proposed for Discharge in Inland and Near-Coastal Waters - Testing Manual”.

l. Water Quality Standards.

(1) Standards. The District Commander shall consider applicable Federal, State and local effluent limitations, water quality standards and management practices, as part of the formulation of alternative plans in feasibility and preconstruction planning and engineering studies. (See E.0. 12088, 13 October 1978.)

(2) Streamflow Regulation. There are two categories of reservoir capacity for the regulation of streamflow, pursuant to Section 102(b)(1) of the Clean Water Act: (a) That which is associated with identifiable project outputs such as navigation, recreation, fish and wildlife or the

prevention of salt water intrusion, and (b) That which is associated with water quality control. The need for and value of storage for the regulation of streamflow for water quality control may be taken into account in a project only if so determined by the Administrator of EPA. Costs allocated to streamflow regulation for water quality control are nonreimbursable if the benefits of such regulation are widespread. (See Chapter 2, Section III regarding deletion or modification of reservoir storage for water quality purposes in accordance with Section 65, Public Law 93-251.)

m. Water Quality Enhancement Costs. Costs for water quality enhancement must be assigned to the appropriate project purposes and shared in the same percentages as the purposes to which the costs are assigned (See Section 103(d) of Public Law 99-662.)

n. Exclusions for Emergencies. District commanders shall meet the evaluation and coordination requirements related to the Sections 404 and 102 guidelines to the fullest extent practicable, unless they determine that the resulting delays will lead to unacceptable risks to health, life, or property or severe and unacceptable economic losses. To further reduce administrative burdens and to expedite meeting these requirements, the District Commander should establish procedures in cooperation with the appropriate Federal and State agencies as recommended in ER 500-1-1. Carrying out the directives of this paragraph is crucial, since compliance with Section 401(a) of the Clean Water Act cannot be waived by the Corps of Engineers. Currently, Section 14 emergency stream bank erosion is the only element of the Civil Works planning program subject to emergency procedures.

o. Non-Point Source Pollution Program. The Water Quality Act of 1987 (Section 319) requires that Federal assistance programs and development projects be consistent with State non point source (NPS) management programs, for those States which have such Environmental Protection Agency (EPA) approved programs. Federal agencies are required to assure that their programs and projects are consistent with those programs. To assist in this process, EPA has developed a "Nonpoint Source Guidance" document dated December 1987 (52 FR 47971).

p. Coastal Zone Management. Sections 307c(1) and (2) of the Coastal Zone Management Act require that each Federal agency conducting, supporting, or undertaking development activities that are in, or directly affect, the coastal zone of a state shall insure that the project is, to the maximum extent practicable, consistent with approved state management plans. Civil Works activities of the Corps of Engineers in the coastal zone fall within this classification.

q. National Estuary Program. In 1987, Congress amended the Clean Water Act formally establishing the National Estuary Program. The purpose of the Program is to identify nationally significant estuaries, protect and improve their water quality, and enhance their living resources. Section 320 of the Act allows a state's governor to nominate an estuary and convene a management conference to develop a Comprehensive Conservation and Management Plan

(CCMP) for the estuary. Under the law, a management conference must result in the assurance that Federal assistance and development programs are consistent with the goals of the CCMP.

C-7 Air Quality and Related Requirements.

a. Purpose. This section provides guidance for the consideration of air quality in Civil Works planning studies.

b. Clean Air Act. Section 176(c) of the Clean Air Act (CAA) requires that Federal agencies assure that their activities are in conformance with Federally-approved CAA state implementation plans for geographical areas designated as “non-attainment” and “maintenance” areas under the CAA. The EPA General Conformity Rule to implement Section 176(c) is sound at 40 CFR Part 93. The rule addresses how Federal agencies are to demonstrate that activities in which they engage conform to Federally approved CAA state implementation plans. The EPA rule contains a number of “exempted” or “presumed to conform” activities which include a number of Corps activities. As applicable and required, CAA conformity determinations will be completed during feasibility studies and included in feasibility reports.

Exhibit C-1. Recommended Outline for Section 404(b)(l) Evaluation Using 24 December 1980 Guidelines (40 CFR 230) 1/

I. Project Description

a. Location

b. General Description

c. Authority and Purpose

d. General Description of Dredged or Fill Material

(1) General Characteristics of Material (grain size, soil type)

(2) Quantity of Material (cu. yds.)

(3) Source of Material

e. Description of the Proposed Discharge Site(s)

(1) Location (map)

(2) Size (acres)

(3) Type of Site (confined, unconfined, open water)

(4) Type(s) of Habitat

(5) Timing and Duration of Discharge

f. Description of Disposal Method (hydraulic, drag line, etc.)

II. Factual Determinations (Section 230.11) 2/

a. Physical Substrate Determinations (consider items in sections 230.11(a# and 230.20 Substrate)

(1) Substrate Elevation and Slope

Exhibit C-1 (Continued)

(2) Sediment Type.

(3) Dredged/Fill Material Movement

(4) Physical Effects on Benthos (burial, changes in sediment type, etc.)

(5) Other Effects

(6) Actions Taken to Minimize Impacts (Subpart H)

b. Water Circulation. Fluctuation and Salinity Determinations

(1) Water (refer to sections 230.11(b), 230.22 Water, and 230.25 Salinity Gradients; test specified in Subpart G may be required). Consider effects on:

(a) Salinity

(b) Water Chemistry (PH. etc.)

(c) Clarity

(d) Color

(e) Odor

(f) Taste

(g) Dissolved Gas Levels

(h) Nutrients

(i) Eutrophication

(j) Others as Appropriate

(2) Current Patterns and Circulation (consider items in sections 230.11(b), and 230.23), Current Flow and Water Circulation.

Exhibit C-1 (Continued)

(a) Current Patterns and Flow

(b) Velocity

(c) Stratification

(d) Hydrologic Regime

(3) Normal Water Level Fluctuations (tides, river stage, etc.) (consider items in sections 230.11(b) and 230.24)

(4) Salinity Gradients (consider items in sections 230.11(b) and 230.25)

(5) Actions That Will Be Taken to Minimize Impacts (refer to Subpart H)

e. Suspended Particulate/Turbidity Determinations

(1) Expected Changes in Suspended Particulates and Turbidity Levels in Vicinity of Disposal Site (consider items in sections 230.11(c) and 230.21)

(2) Effects (degree and duration) on Chemical and Physical Properties of the Water Column (consider environmental values in section 230.21, as appropriate)

(a) Light Penetration

(b) Dissolved Oxygen

(c) Toxic Metals and Organics

(d) Pathogens

(e) Aesthetics

(f) Others as Appropriate

(3) Effects on Biota (consider environmental values in sections 230.21, as appropriate)

(a) Primary Production, Photosynthesis

Exhibit C-1 (Continued)

(b) Suspension/Filter Feeders

(c) Sight Feeders

(4) Actions taken to Minimize Impacts (Subpart H)

d. Contaminant Determinations (consider requirements in section 230.11(d))

e. Aquatic Ecosystem and Organism Determinations (use evaluation and testing Procedures in Subpart G, as appropriate)

(1) Effects on Plankton

(2) Effects on Benthos

(3) Effects on Nekton

(4) Effects on Aquatic Food Web (refer to section 230.31)

(5) Effects on Special Aquatic Sites (discuss only those found in project area or disposal site)

(a) Sanctuaries and Refuges (refer to section 230.40)

(b) Wetlands (refer to section 230.41)

(c) Mud Flats (refer to section 230.42)

(d) Vegetated Shallows (refer to section 230.43)

(e) Coral Reefs (refer to Section 230.44)

(f) Riffle and Pool Complexes (refer to section 230.45)

(6) Threatened and Endangered Species (refer to section 230.30)

(7) Other Wildlife (refer to section 230.32)

Exhibit C-1 (Continued)

(8) Actions to Minimize Impacts (refer to Subpart H)

f. Proposed Disposal Site Determinations

(1) Mixing Zone Determination (consider factors in section 230.11(f)(2))

(2) Determination of Compliance with Applicable Water Quality Standards (present the standards and rationale for compliance or non-compliance with each standard)

(3) Potential Effects on Human Use Characteristic

(a) Municipal and Private Water Supply (refer to section 230.50)

(b) Recreational and Commercial Fisheries (refer to section 230.51)

(c) Water Related Recreation (refer to section 230.52)

(d) Aesthetics (refer to section 230.53)

(e) Parks, National and Historical Monuments, National Seashores, Wilderness Areas, Research Sites, and Similar Preserves (refer to section 230.54)

g. Determination of Cumulative Effects on the Aquatic Ecosystem (consider requirements in section 230.11 (g))

h. Determination of Secondary Effects on the Aquatic Ecosystem (consider requirements in section 230.11(h))

III. Findings of Compliance or Non-Compliance With the Restrictions on Discharge 3/

a. Adaptation of the Section 404(b)(l) Guidelines to this Evaluation

b. Evaluation of Availability of Practicable Alternatives to the Proposed Discharge Site Which Would Have Less Adverse Impact on the Aquatic Ecosystem (Briefly discuss alternatives considered and that are available and practical and state why the one selected would result in the least amount of significant impacts. Reference should be made to other appropriate sections on alternatives in EIS or Main Reports when the 404 Evaluation is contained in these documents.)

Exhibit C-1 (Continued)

c. Compliance with Applicable State Water Quality Standards

d. Compliance with Applicable Toxic Effluent Standard or Prohibition Under Section 307 Of the Clean Water Act

e. Compliance with Endangered Species Act of 1973

f. Compliance with Specified Protection Measures for Marine Sanctuaries Designated by the Marine Protection. Research, and Sanctuaries Act of 1972

g. Evaluation of Extent of Degradation of the Waters of the United States

(1) Significant Adverse Effects on Human Health and Welfare

(a) Municipal and Private Water Supplies

(b) Recreation and Commercial Fisheries

(c) Plankton

(d) Fish

(e) Shellfish

(f) Wildlife

(g) Special Aquatic Sites

(2) Significant Adverse Effects on Life Stages of Aquatic Life and Other Wildlife Dependent on Aquatic Ecosystems

(3) Significant Adverse Effects on Aquatic Ecosystem Diversity, Productivity and Stability

(4) Significant Adverse Effects on Recreational, Aesthetic, and Economic Values

h. Appropriate and Practicable Steps Taken to Minimize Potential Adverse Impacts of the Discharge on the Aquatic Ecosystem

Exhibit C-1 (Continued)

i. On the Basis of the Guidelines. the Proposed Disposal Site(s) for the Discharge of Dredged or Fill Material (specify which) is (select one)

(1) Specified as complying with the requirements of these guidelines; or,

(2) Specified as complying with the requirements of these guidelines, with the inclusion of appropriate and practical conditions to minimize pollution or adverse effects on the aquatic ecosystem; or,

(3) Specified as failing to comply with the requirements of these guidelines.

Notes:

1/ This outline is furnished for guidance in preparing 404(b)(l) evaluations under the December 1980 Guidelines. The outline should be considered flexible. Each evaluation should be tailored to fit project specific characteristics.

2/ The primary subheadings in this section (II) should be contained in every section 404(b)(l) evaluation since these items are specified to be included by the guidelines. If a particular item is not applicable to a project (such as salinity considerations at a freshwater site), so state.

3/ The Findings and Compliance or Non-Compliance with Restriction on the Discharge should be a narrative and cover the items listed in Section III of the outline. The data presented in the Factual Determination should be compared to the restrictions on #he discharge in paragraph 230.10, and a determination should be made as to whether the discharge will or will not be in compliance. Do not repeat data given in the Factual Determination in the Finding of Compliance. See attached example of a Finding of Compliance.

(EXAMPLE)
FINDING OF COMPLIANCE
FOR
NO NAME PROJECT

1. No significant adaptations of the guidelines were made relative to this evaluation.

2. Three alternative open water disposal sites were available for this project. Use of alternative sites one and three (Figure 1) would have resulted in significant alteration of water circulation patterns and consequently, salinity patterns. These changes would have adversely affected oyster beds and other benthic and fishery populations in the bay. Also, use of site one would cause siltation of shellfish beds due to expected tidal transport of dredged material into these areas. Site two, the selected disposal area, would be the least costly site to use for disposal because it is nearer to the channel dredging area.

3. The planned disposal of dredged material at site two would not violate any applicable State water quality standards with the exception of turbidity. Turbidity standards would be violated outside the allowable mixing zone under extreme tidal conditions, i.e., spring tides. Dredging will be suspended during these periods. The disposal operation will not violate the Toxic Effluent Standards of Section 307 of the Clean Water Act.

4. Use of the selected disposal site will not harm any endangered species or their critical habitat or violate protective measures for the Long Bay Marine Sanctuary.

5. The Proposed disposal of dredged material will not result in significant adverse effects on human health and welfare, including municipal and private water supplies, recreation and commercial fishing, plankton, fish, shellfish, wildlife, and special aquatic sites. The life stages of aquatic life and other wildlife will not be adversely affected. Significant adverse effects on aquatic ecosystem diversity, productivity and stability, and recreational, aesthetic and economic values will not occur.

6. Appropriate steps to minimize potential adverse impacts of the discharge on aquatic systems include cessation of disposal activities during extreme tidal velocities associated with spring tides.

7. On the basis of the guidelines the proposed disposal site for the discharge of dredged material is specified as complying with the inclusion of appropriate and practical conditions to minimize pollution or adverse effects to the aquatic ecosystem.

# APPENDIX D

## Economic And Social Considerations

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# APPENDIX D

## Economic and Social Considerations

### D-1. Background.

a. Introduction. This appendix covers economic and social considerations not addressed elsewhere. Guidance for estimating NED benefits is provided in Appendix E, Civil Works Missions and Evaluation Procedures, where the evaluation procedure for each project type is presented in its mission context. Some aspects of economic evaluation, and of planning generally, are constant across missions; those aspects are in this appendix.

b. Economic Considerations. Economic considerations which cut across missions and projects include such aspects as the proper use of interest rates, how to allocate costs among project purposes, how to test for financial solvency of a non-Federal sponsor, how to best estimate current project benefits, how to evaluate other direct benefits, and other economic evaluation procedures.

c. Social Considerations. The social considerations which cut across various missions and projects include such aspects as the evaluation of unemployed and underemployed labor, evaluation of urban and community impacts such as life, health and safety factors, estimations of displacement, evaluations in changes to long-term productivity or real income, evaluations in changes in energy requirements and conservation, evaluations of changes in educational, cultural or recreational opportunities, evaluations of changes in emergency preparedness.

### D-2. Other Direct Benefits.

a. Purpose. This section provides a definition of other direct benefits and procedural guidance for the evaluation of other direct benefits attributable to water resources plans and projects. Other direct benefits are the incidental direct benefits of a project. The other direct benefits to be included in the NED benefit evaluation are the incidental effects of a project that increase economic efficiency by increasing the output of intermediate or final consumer goods over and above the direct outputs for which the plan is being formulated.

b. Conceptual Basis. Other direct benefits are incidental to the primary purposes of water resource projects. Primary purposes of projects are those purposes for which the alternative plans are formulated. Other direct benefits derive from incidental increases in outputs of goods and services or incidental reductions in production costs.

c. Planning Setting. Standard planning procedures involve comparison of the with project condition to the without project condition. In considering other direct benefits, define the boundary

of direct influence of the plan. Economic efficiency gains to firms in production and satisfaction gains to consumers other than those identified as the direct beneficiaries of primary project purposes should be valued and measured as other direct benefits.

(1) Without Project Condition. Forecast future conditions expected to exist without implementation of the plan. The without project condition is the projection of output and production levels and costs of production likely to be achieved in the absence of a plan.

(2) With Project Condition. Future conditions expected to exist when the plan is fully implemented. The with project condition is the projection of output and production levels and the costs of production likely to be achieved with the plan.

d. Evaluation Procedure: General.

(1) When applicable, compute other direct benefits using the procedures of Appendix E and the remainder of this appendix. Some benefits, such as reduced water supply treatment costs, can be computed on the basis of reduced costs to consumers.

(2) Improvement in production possibilities of the private market sector as well as the non-market sector (some recreation, for example) are other direct benefits. Examples of other direct benefits are included in the following illustration. A large water storage project is to be located upstream on a main tributary of a river system that enters the ocean by a delta through an estuary. The direct output of the project is flood control for communities residing on floodplains along upper valleys of the tributary. One effect of regulating flow by reducing winter high and summer low flows is to increase the recreational potential of land and water in the lower reaches of the river system. A cooling of water temperatures and increased flow during summer increases fish and wildlife productivity; riparian habitats along lower water courses expand and increase in density; and salt water marshland receives less saline water in summer. As a result, there is an increase in dove and pheasant hunting as these wildlife populations increase. Opportunities for sport angling also increase as game fish productivity rises. Also, shrimp production benefits from the change to less saline water in the marshland, and commercial shrimp harvest increases, resulting in greater output at lower unit total cost to shrimp fishermen. Another incidental effect is the improvement in water quality to downstream users as turbidity is reduced in winter and water hardness is reduced in summer. Therefore, treatment costs are lower for firms and households. If the impoundment causes the recharge of groundwater basins in the vicinity of the dam site or along the stream course, these incidental effects are other direct benefits. Pumping costs could be reduced as well.

e. Evaluation Procedure: Problems in Application. The major problems encountered in the estimation of other direct NED benefits are the identification of the firms, industries, and consumers

who will be subject to these incidental effects caused by projects and plans. It must be emphasized that it is not practical or economic to trace out all direct effects.

(1) Determining the context or system within which the major incidental impacts might be experienced is a useful first step in identifying likely direct benefits worth measuring. The immediate watershed or the subsystem of a river system would constitute a relevant context. The delineation of geographical and economic market regions in which impacts are likely to be felt cannot usually encompass the whole regional economy in a highly industrialized area. Nevertheless, it is important to avoid delineating too small an area in which to search for possible effects.

(2) Another procedure for identifying likely impacts is tracing the hydrologic changes that will occur as a result of the project. For example, flows downstream and in other parts of a river system can be changed in quantities and qualities; the water's chemical and physical characteristics, oxygenation, turbidity, temperature, etc. can undergo change that may impact on fish and wildlife resources and on the production functions of firms and the satisfaction of consumers.

f. Evaluation Procedure: Data Sources. An assessment of the current situation and the economic efficiency of potentially affected firms and individuals usually entails the collection from primary sources of data on cost, production function, and firm capacity. Studies of industrial structure and the interdependence of firms in the supply of various inputs and the use of outputs can provide valuable supplemental information.

g. Evaluation Procedure: Risk and Uncertainty. Other direct benefits are unique to each project design and its location, so the historical record of data is of limited usefulness. The risk and uncertainty attached to the hypothesized outcomes can be reduced by clearly revealing areas of uncertainty. A physical description of other direct benefits, together with assessment of their relative (major or minor) significance, is an integral part of such a procedure. Nevertheless, these estimates may involve high degrees of risk and relative uncertainty, based as they are on the total mix of project outputs and the effect these mixes would have on stimulating increased productivity.

h. Report and Display Procedures. Other direct benefits should be identified by component and added onto the benefits of the benefit-cost analysis. The method used to value the benefits should be presented in the report. Provide a tabular breakdown of all other direct benefits claimed for the project.

D-3. NED Cost Evaluation Procedures.

a. Purpose. This section defines the components of NED costs, as defined in the Principles and Guidelines, and provides procedures for the evaluation of NED costs (costs used for economic analysis) of structural and non-structural elements of water resources

plans and projects. NED costs and financial costs may differ. Guidance regarding determination of financial costs is contained in Appendix E of this regulation. Appendix E also provides guidance on classification of costs by project purpose, cost sharing requirements and potential credits to non-Federal sponsors.

b. Conceptual Basis.

(1) Project measures, whether structural or nonstructural, require the use of various resources. NED costs are the opportunity costs of resource use. In evaluating NED costs, resource use must be broadly defined to fully recognize scarcity as a component of value. This requires consideration of the private and public uses that producers and consumers are currently making of available resources or are expected to make of them in the future.

(2) The opportunity costs of resource use are usually reflected in the marketplace. When market prices adequately reflect total resource values, they are used to determine NED costs. When market prices do not reflect total resource values, surrogate values are used appropriately to adjust or replace market prices.

(3) Total NED cost is the market value of a resource plus other values not reflected in the market price of the resource; it therefore accounts for all private sector and public sector uses. Market price is used to reflect the private sector use of resources required for or displaced by a project, and surrogate value is used to reflect the public sector use.

(a) The market price approach relies on the interaction of supply and demand. Price is determined through transactions on the margin between knowledgeable and willing buyers and sellers, neither of whom are able to influence price by their individual decisions. Distortions in market price occur if one or more of the conditions of perfect competition is violated.

(b) The surrogate value approach involves the approximation of opportunity costs based on an equivalent use or condition. Surrogate values are frequently used in restricted markets and in non-market situations.

(4) Proper NED analysis requires that project NED costs and benefits be compared at a common point in time. Costs are calculated in annualized terms (see paragraph D-6).

c. Planning Setting. The basis for the evaluation rests in a thorough analysis of expected conditions in the future with a project and without a project. This requires identification of those resources that will be affected by a project; the current value of such uses is measured as the economic worth to the Nation of the services associated with those uses.

d. Evaluation Procedure: General.

(1) Resources required or displaced to achieve project purposes by project installation and/or operation, maintenance, repair, replacement and rehabilitation activities represent a NED cost and should be evaluated as such. Resources required or displaced to minimize adverse impacts and/or mitigate fish and wildlife habitat losses are also NED costs. Costs for features not required for project purposes, avoiding adverse effects caused by such features, and/or mitigating fish and wildlife habitat losses caused by such features are not project-related NED costs and should not be evaluated. Costs for features not required for project purposes will generally not be part of the Corps project.

(2) All NED costs shall be based on current costs adjusted by the project discount rate to the beginning of the period of analysis as defined in paragraph D-6. Compute all costs at a constant price level and at the same price level as used for the computation of benefits. Current costs shall be based on the price level at the time of the analysis. These costs will be updated in the year(s) the project is submitted for authorization and/or appropriations. Deferred costs will be discounted to the end of the installation period, using the applicable project discount rate. Costs incurred before the beginning of the period of analysis will be increased (i.e., to estimate future value) by adding compound interest at the applicable project discount rate from the date the costs are incurred to the beginning of the period of analysis. All NED costs will be converted to an annual equivalent value over the period of analysis.

(3) Project NED costs may be adjusted by an allowance for the salvage value of land improvements, equipment, and facilities that would have value for non-project uses at the end of the period of analysis. Significant salvage values of replaceable items (e.g., generators) will normally become adjustments to allowances for replacement costs.

e. Evaluation Procedure: Implementation Outlays. The NED costs of implementation outlays include the costs incurred by the responsible Federal entity and, where appropriate, contributed by other Federal or non-Federal entities to construct, operate and maintain a project in accordance with sound engineering and environmental principles and place it in operation. These costs are the remaining post-authorization planning and design costs; construction costs; construction contingency costs; administrative services costs; fish and wildlife habitat mitigation costs; relocation costs; historical and archaeological salvage costs; land, water, and mineral rights costs; and operation, maintenance, repair, rehabilitation, and replacement costs.

(1) Postauthorization (Preconstruction, Engineering and Design) Costs. These costs are the direct cost for investigations, field surveys, planning, design, and preparation of specifications and construction drawings for structural and nonstructural project measures. In the evaluation procedure, these costs will be based on the actual current costs incurred by the responsible Federal entity for carrying out these activities for similar projects and project measures. They may be

computed as a percentage of construction costs when there is a documented basis for the rate used. Make adjustments when appropriate to reflect circumstances special to the project under consideration.

(2) Construction Costs. These costs are the direct cost of installing project measures. They should be based on the market value of goods and services required to install project measures, including those measures required for avoiding adverse environmental effects and public health and safety risks. They include the cost of purchased materials (including associated transportation costs); equipment rental or purchase; construction wages or salaries (including social security and fringe benefit costs); and contractors' management, supervision, overhead, and profit. These costs will be based on current contract bid items in the project area or on the current market value of purchased materials and services, etc.

(3) Construction Contingency Costs. These are project costs normally added to reflect the effects of unforeseen conditions on estimates of construction costs. They are not an allowance for inflation or for omissions of work items that are known to be required. They are included to cover unforeseen construction problems. These costs will vary with the intensity of the surveys and investigations performed, the variability of site conditions, and the type of project measures being installed. They may be computed as an appropriate percentage of estimated construction costs. If contingency costs are included in real estate costs, planners shall ascertain the basis for these contingent costs. To the extent that contingencies are meant to account for inflation, this effect shall be excluded from real estate costs for evaluation purposes. Only that portion of real estate contingency cost for which there is reasonable basis for anticipating uncertainty (condemnation costs may be an example) shall be included.

(4) Administrative Services Costs. These are the costs associated with the installation of project measures, including the cost of contract administration; permits needed to install the project measures; relocation assistance advisory services; administrative functions connected with relocation payments; review of engineering plans prepared by others; government representatives; and necessary inspection service during construction to ensure that project measures are installed in accordance with the plans and specifications. Base these costs on the actual current costs incurred by the responsible Federal entity for carrying out these activities for similar projects and project measures. These costs may be computed as a percentage of construction costs if there is a documented basis for the rate used. Make adjustments when appropriate to reflect unusual circumstances special to the project under consideration.

(5) Fish and Wildlife Habitat Mitigation Costs. These are the costs of mitigating losses of fish and wildlife habitat caused by project construction, operation, maintenance, repair, rehabilitation and replacement. The mitigation measures to be included in the project will be determined by the responsible Federal entity in coordination with Federal and State Fish and Wildlife Agencies as

required by the Fish and Wildlife Coordination Act (Public Law 85-625). Installation of these mitigation measures should be concurrent with the installation of other project measures, where practical. These costs include all project outlays associated with the installation of mitigation measures, including preconstruction, engineering and design costs; construction costs; construction contingency costs; administrative services costs; relocation costs; land, water, and mineral rights costs; and operation, maintenance, repair, rehabilitation, and replacement costs. These costs will be based on current market values and the actual current costs incurred by the Federal entity for carrying out these activities for similar mitigation measures.

(6) Relocation Costs. These are project costs associated with relocation of public highways and other publicly owned facilities, railroads, and utility lines. The relocation cost of publicly owned facilities (except highways), railroads and utility lines will be based on the costs of replacement in kind. In the case of highways, the relocation cost will be based on replacement that reflects the current traffic count and current standards of the owner, which may result in a justified improvement over the configuration of the existing roadway. The additional relocation cost of highways that are upgraded to increase their carrying capacity for project purposes such as recreation is also a project cost. The relocation cost of highways, railroads, and utility lines shall include all project outlays associated with their relocation, including planning and design costs; construction costs; construction contingency costs; administrative services costs; fish and wildlife habitat mitigation costs; land, water, and mineral rights costs; and historical and archaeological salvage costs. These costs will be based on current market values and the actual current costs incurred by the Federal entity for carrying out similar relocations.

(7) The requirements of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 91-646), as amended, including real property acquisition relocation payments as applicable to a displaced person, business, or farm operation. Such payments include moving and related expenses for a displaced person, business, or farm operation; financial assistance for replacement housing for a displaced person who qualifies and whose dwelling is acquired because of the project; and termination payments for dislocated businesses whose owners choose to close out. Base the NED cost of replacement housing on replacement in kind. (Costs over and above replacement in kind are treated as financial costs for non-project purposes.) Base these costs on current market values.

(8) Historical and Archaeological Salvage Operation Costs. These are project costs associated with salvaging artifacts that have historical or archaeological values as prescribed by the Preservation of Historic and Archaeological Data Act (Public Law 93-291). These costs will be based on the current market price of salvage operations carried on during construction.

(9) Land, Water, and Mineral Rights Costs.

(a) These NED costs include all costs of acquiring the land, water, and mineral rights required for installing, operating, maintaining, repairing, rehabilitating, and replacing project measures. They include all expenditures incurred in acquiring land, easements, rights-of-way leases, and water and mineral rights. Such costs include the cost of the land (or interest therein), water, and mineral rights minus salvage value; transactional costs including the cost of surveys incident to a sale, legal fees and transfer costs; and severance damage payments. These costs will be based on current market values and the actual current costs incurred by the Federal entity for carrying out similar land, water, and mineral rights acquisitions. The market value of easements will be based on the difference in market value of land without the easement and with the easement.

(b) Some land, water, and mineral rights are owned by Federal, State, and local governments and have been committed to specific uses. The NED cost of using such resources for project purposes consistent with their committed uses will be based on the surrogate value of the public services provided by the resources. For example, if State-owned land committed to recreation use is to be used for project recreation development, its NED cost is not the market value of the land, but the value of the recreation services that would be provided by the land without the project. Public domain lands not committed to specific uses should be valued at the market value of comparable private land or a surrogate use value, or a combination if there are complementary uses.

(10) Operation, Maintenance, Repair, Rehabilitation, and Replacement (OMRR&R) Costs. These costs represent the current value of materials, equipment, services, and facilities needed to operate the project and make repairs, rehabilitate, and make replacements necessary to maintain project measures in sound operating condition during the period of analysis. They include salaries of operating personnel; the cost of repairs, replacements, or additions; and an appropriate charge for inspection, engineering, supervision, custodial services, and general overhead. When operation, maintenance, repair, rehabilitation, or replacement will be performed by contract, the cost should include an allowance for contingencies and the costs of survey, planning design, and administrative services. These costs will be based on actual current costs incurred for carrying out these activities for similar projects and project measures. When the project is an addition to or extension of an existing project for which the costs and benefits are not included or otherwise involved in the project analysis, include only the additional cost of operation, maintenance, repair, rehabilitation, or replacement necessitated by the addition or extension to the existing project. Adjustments can be made when appropriate to reflect circumstances special to the project under consideration.

(11) Interest During Construction. This represents the opportunity cost of capital incurred during the construction period. The cost of a project to be amortized is the investment incurred up to the beginning of the period of analysis. The investment cost at that time is the sum of construction and other initial cost plus interest during construction. Cost incurred during the construction period should be increased by adding compound interest at the applicable project discount rate from the

date the expenditures are incurred to the beginning of the period of analysis. This is comparable to the treatment of benefits that accrue during the construction period (see paragraph D-4c) and is performed to insure costs and benefits are evaluated on an equivalent time basis.

(a) All PED costs are included in project NED costs and are charged interest during construction. This includes any studies performed using PED funds (i.e., physical modeling, plans and specs, etc.) When performing economic updates, expended PED costs will be considered sunk and not included in the benefit-cost ratio.

(b) Lands acquired are charged interest during construction from the date they are put to use for project purposes, or the date their non project use ceases, whichever is earlier. Through lease back or other arrangements these dates may differ from date of acquisition.

f. Evaluation Procedure: Associated Costs. Associated costs are the costs of measures needed over and above project measures to achieve the benefits claimed during the period of analysis. For example, associated costs include the cost of irrigation water supply laterals, if they are not accounted for in the benefit estimate. Base associated costs on the current market prices of goods and services required for the installation of measures needed over and above project measures.

(1) Associated costs have often been handled through the self-liquidating cost concept. A self-liquidating cost is the cost of a particular type of asset that can be operated in such a way that it repays the money spent to acquire it (e.g. mooring or dock space). The use of self-liquidating costs is limited to those cases in which appropriate associated costs are netted out of benefit measures.

(2) It is preferred that associated costs be explicitly treated as NED project related costs, and appear as costs in benefit-cost ratios. Where the concept of self-liquidating costs has been used to account for associated costs this procedure may continue to be used as long as:

(a) The appropriate associated costs are subtracted from the estimated benefits, and

(b) The associated costs are identified and the netting process documented in project reports.

g. Evaluation Procedure: Other Direct Costs.

(1) These are the costs of resources directly required for a project or plan, but for which no implementation outlays are made. Consequently, they are included in the economic costs of a plan but not in the financial costs. These costs may be important for both structural and nonstructural plans. For example, a zoning plan to preserve floodplain values by restricting development would have as a cost the value of with project development opportunities foregone. A plan that responds to demand growth by reallocating existing outputs from low value uses to high value uses through pricing mechanisms (i.e., raising the price of existing outputs) would have as its major cost the value of the outputs to the users who forego its use as a result of its higher price. On the other hand, a structural project may displace recreation use at the project site and the value of foregone recreational opportunities is a direct cost. Whenever possible, compute these costs using the procedures set forth for computing benefits in Appendix E. If these costs are not quantified, they should be otherwise identified.

(2) Other direct costs also include uncompensated NED losses caused by the installation, operation, maintenance, repair, rehabilitation, or replacement of project or plan measures. All uncompensated net losses in economic outputs (not transfers) that can be quantified shall be considered project NED costs. The evaluation of such costs requires an analysis of project effects both within and outside the project area.

(3) Examples of other direct costs include increased downstream flood damages caused by channel modifications, dikes, or the drainage of wetlands; increased water supply treatment costs caused by irrigation return flows; erosion of land along streambanks caused by dams that prevent the replenishment of bedload material; loss of land and water recreation values through channel modifications, reduced instream flow due to consumptive use of water by irrigated agriculture, or inundation by reservoirs; increased transportation costs caused by rerouting traffic around a reservoir; new or increased vector control costs caused by the creation of wetlands; and decreased output or increased cost per unit of output of private firms caused by project-induced decreases in raw materials. When applicable, compute such costs using the procedures for computing benefits contained in Appendix E and this Appendix. Some costs, such as increased water supply treatment costs, may be computed on the basis of increased costs to resource users.

h. Evaluation Procedure: Problems in Application.

(1) Application of the procedures in this section requires care to ensure that all costs are included. The identification and determination of all associated costs and external diseconomies require full perception of the measures required to achieve the benefits being claimed and the impacts produced by the actions taken. It must be emphasized that it is not practical or economic to trace out all other direct effects.

(2) Application of the procedures in this section requires care to avoid double counting. A full understanding of the values reflected by market and surrogate values is necessary to prevent double counting. For example, the market value of land that includes a private recreation development reflects the recreation value. In this case, double counting would result if a surrogate recreation value (loss) were added as a cost. On the other hand, the market value of land that provides free public recreation does not reflect the recreation value, so the surrogate recreation value (loss) must be added as a cost.

(3) Market prices are relatively easy to obtain. However, some prices are subject to large fluctuations in short periods of time, so care must be taken to determine reasonable current costs of such items for project evaluation purposes.

i. Evaluation Procedure: Data Sources. Market price information is available from data on comparable sales, Government publications (e.g., bulletins of the U.S. Departments of Commerce, Agriculture, and Labor), and business reports. Data sources for those NED benefit evaluation procedures having application to cost analysis are covered in their respective sections of Appendix E.

j. Report and Display Procedures. Display NED costs identified through the procedures described above as line item entries in the adverse effects section of the NED account. The following display tables are suggested:

D-4. Planning Special Topics and Cautions. This section comprises certain topics elaborating, amplifying, and extending ideas contained in, or implied by, the planning and evaluation procedures presented in the main body of this regulation and Appendix E. In a few cases the guidance is mainly for or only for particular project purpose(s) or type(s) of authorization.

a. Non-Standard Procedures. Procedures to calculate the benefit-cost ratio of a project not approved by the Water Resources Council are considered non-standard procedures.

(1) Specific approved procedures are described in Appendix E, this Appendix, and in the Principles and Guidelines (P&G).

(2) An alternative procedure which is not specifically contained in the NED Procedures may be employed if the following requirements are met and the procedure is fully documented:

(a) The procedure is in accord with current policy and estimates of the magnitudes of project effects, that is quantities, are empirically estimated.

(b) The procedure would give a more accurate benefit estimate; or, it can be demonstrated that the procedure reduces study time and cost and does not alter the formulation of the project.

Table D- 1: Project Investment

| | Alternative 1 | | | Alternative 2 | | | Alternative X | | |
|---|---|---|---|---|---|---|---|---|---|
| | Unit | | Amt. | Unit | | Amt. | Unit | | Amt. |
| | Quantity | Price | | Quantity | Price | | Quantity | Price | |
| 1.Construction cost | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| 2.Construction contingency costs | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| 3. Post-authorization planning and design costs | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| 4. Administrative services costs | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| 5. Fish and wildlife habitat mitigation costs | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| 6. Historical and archeological salvage operation costs | | | | | | | | | |
| 7. Land, water, and mineral rights costs | | | | | | | | | |
| 8. Relocation costs | | | | | | | | | |
| 9. P.L. 91-646 Costs | | | | | | | | | |
| 10. Interest during installation period at a rate of ___% | | | | | | | | | |
| Total investments | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Price level: _____.... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Installation period: _____..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Period of analysis: | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| _____ | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |

Table D- 2: Annualized Adverse Effects

| | Alternatives | | |
|---|---|---|---|
| | 1 | 2 | X |
| Interest on investment<br>Amortization on investment<br>Annual OMRR&R<br><br>Associated costs[a]<br>Other direct costs[a] | | | |
| Total annualized costs .....<br>Other adverse effects not evaluated in monetary terms[a] | | | |

(d) Prior approval for each application of such alternative procedures is obtained from HQUSACE (CECW-PD). Approval is less likely for procedures proposing use of the cost of an alternative or administratively established values as an estimate of benefits.

b. Current Estimates of Project Benefits. It is Corps policy to report and maintain current estimates of project benefits, costs, and economic justification of all active funded projects and separable elements beginning with the Report of the Chief of Engineers. The purpose of the policy is to provide reasonable estimates of economic justification to non-Federal sponsors, Congress and Federal decision makers throughout the project development process. An analysis is considered current if it was approved within 3 fiscal years of the pertinent decision date. As an example, in June 1996 budget submissions, the approval date of the document containing the most recent economic analysis could be no earlier than October 1992, since FY 1993 is three fiscal years prior to FY 1996 and October 1992 is the first month of FY 1993. If more than three fiscal years have elapsed since the release of the Report of the Chief of Engineers, an economic reevaluation must be the first item of work upon receipt of any funds intended to further project implementation.

(1) Dates and general guidance for decision requests. The pertinent dates for budgetary and investment decisions, along with guidance for various decision requests are specified below.

(a) New Start PED Budgeting. For all New Start PED funding requests the pertinent decision date is the submission of the budget request to HQUSACE. Benefit-to-cost ratios (BCR), which are required in support of budget requests, will be developed based on the latest approved

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[a] Identified by type

economic analysis, annualized at the specified discount rates. The current project costs should be deflated to the same price level as in the latest approved economic analysis, annualized at the current interest rate. The report and approval date of that analysis must be cited and should not be more than three fiscal years old. If more than three fiscal years have elapsed since the release of the Report of the Chief of Engineers, an economic reevaluation must be the first item of work upon receipt of PED funds. Follow-on funding will be contingent upon approval of the economic reevaluation.

(b) Continuing PED Budget requests. For all continuing PED funding requests the pertinent decision date is the Division submittal of the budget request to HQUSACE. The same methodology, deflating costs to the date of the approved economic analysis and adjusting costs and benefits for the budget year discount rate applying to New Start PED budget requests, should be used for continuing PED funding requests. The three year requirement for updates is also applicable.

(c) New Construction Start Budgeting. For all New Start Construction funding requests for projects and separable elements, the pertinent decision date is the submission of the Division budget request to HQUSACE. The same BCR computation and reporting requirements and the three year updating requirements previously discussed are applicable to New Construction Start Budgeting. If the reevaluation uncovers major changes that could affect project formulation or sizing, additional PED funds rather than construction funds should be requested to undertake a complete General Reevaluation (GRR) level evaluation.

(d) Project Cooperation Agreements. For all PCA's, the pertinent decision date is the submission of the final PCA to ASA (CW) for approval. If more than three fiscal years have elapsed since the approval date of the latest economic analysis, a reevaluation must be performed in sufficient detail with supporting documentation to show the project remains justified. The reevaluation may be presented in a Limited Reevaluation Report (LRR) which supplements the project document cited in the PCA. Submission of the LRR to HQUSACE for approval must be accomplished prior to submission of the draft PCA.

(e) Non-PCA Projects. The pertinent decision date for approval to initiate expenditures of Construction General appropriations for projects which do not require a PCA, such as inland navigation, is the submission date of the request to HQUSACE. The three fiscal year and reevaluation requirements for PCA's are also applicable to non-PCA projects.

(2). Definition of Last Approved Official Document. The approved official document for the Feasibility Report is the Report of the Chief of Engineers. Other approved official documents may include General (GRR) or Limited Reevaluation Reports (LRR). If other documents are to be used as the basis for obtaining budgetary or implementation approval, they must be approved by CECW.

(3) Plan for Economic Updates. Feasibility reports, General Reevaluation reports and other project decision (formulation) documents, shall include a plan for updating project benefits for future reporting and decision making. The economic update plan shall likewise be included in all Project Management Plans. The actions in the plan may be limited in that no major new analyses need be conducted but rather previous assumptions reviewed and updated with techniques such as surveys and sampling employed to develop a reasonable estimate of current project benefits provided no significant changes in without and/or with project conditions have occurred. However, in no event will simple indexing of overall benefits be acceptable. The plan shall include discussions of the data that will be required and the procedures that will be employed. Any rational set of procedures that result in a current analysis of benefits may be acceptable except procedures which amount solely to indexing of benefits. Examples of procedures that could be formulated during feasibility and other studies, and which could be useful in providing current analysis in the future are sampling and monitoring, partial benefit reanalysis, and limited indexing.

(a) Sampling or Monitoring. The focus of the effort should be on factors which are critical to project formulation and feasibility and are representative of the major benefit categories (i.e., inundation reduction benefits in a flood control project or transportation cost savings in a navigation project). For example, in a fully developed floodplain a sample of structures may be selected for development of replacement cost less depreciation of structure values using construction cost models. The values derived could then be used to represent values for the floodplain. For a navigation project, if feasibility depends critically on ships of given characteristics, a plan may be developed to monitor future use of these ships.

(b) Partial Benefit Reanalysis. This study will not have nearly the depth or breadth of a feasibility study. It could be informative regarding current benefits and may be accomplished at reasonable cost. For example, damage calculations at current prices for sampled structures provide valuable information on the current level of inundation reduction benefits.

(c) Limited Indexing. Use of generalized indices such as CWCCIS may be used for specific infrastructure benefit categories such as roads, bridges, and rail lines provided these benefit categories do not constitute a major portion of overall project benefits. Additionally, the reevaluation report must document that the infrastructure improvements are still present and used and are subject to comparable flood damages as in the latest report.

(4) Content of Limited Economic Reevaluation. Limited Reevaluation Reports (LRR) may be used to document the current economic evaluation of a project (or separable elements), or to report some other kinds of project changes.

(a) Scope and Documentation. The limited economic evaluation information submitted to HQUSACE for approval in a reevaluation document needs to be either complete within the

document or accompanied by the document it is updating. Limited economic reevaluations must include sufficient data to describe what was done in the previously approved document, what was done in the limited reevaluation, what differences there are and the reasons for the differences. Documentation should cover items which are not strictly socio-economic conditions such as changes in hydrology and hydraulic characteristics or periods of record and costs. This documentation should cover each benefit and cost item, and show net benefits and the benefit-cost ratio at the current discount rate.

(b) Format and Displays. A good format would start with brief summary description of the previous approved evaluation and the current reevaluation, accompanied by a tabular display of the changes, followed by support documentation explaining the changes. The following simple display format is a suggested guideline for the tabulation of current costs and benefits and economic justification in a structural flood control project.

Table D- 3: Tabulation of Current Costs and Benefits

| | Latest Approved[1] | Current Estimate | Difference | Reason for Difference |
|---|---|---|---|---|
| Benefit Category[2] | | | | |
| Inundation | | | | |
| Residential Structures | | | | |
| Residential Contents | | | | |
| Other | | | | |
| Cost Category | | | | |
| Construction | | | | |
| Lands | | | | |
| Other | | | | |
| Net Benefits | | | | |
| Benefit / Cost Ratio | | | | |

[1] Cite document, name, date, approval date, price level and interest rate.
[2] Use categories and sub-categories of benefits in latest approved document.

(5) Project Changes Requiring More Detailed Analysis. In some instances a more thorough reanalysis than specified in the economic update plan needs to be provided. Examples may include instances where the previously approved project document predates cost-shared feasibility study planning; an economic benefits update plan has not been approved; the project has not had seamless

funding; substantial changes in the without condition, project formulation, project design and/or project costs have occurred. The level of effort for the economic reevaluation should be based on whether the changed conditions warrant a reformulation of a project or a reaffirmation of the justification of the authorized plan. If reformulation, including evaluation of alternative sizes of a project, is warranted a GRR should be prepared and the economic reanalysis should be of similar scope as required for a feasibility study. If reformulation is not warranted a limited economic reevaluation shall be documented in an LRR.

(6) Summary. The policy of reporting and maintaining current estimates of project benefits and economic justification can most effectively be accomplished through quality cost estimates in feasibility reports, seamless funding, and development of economic update plans. Through such quality development in the early stages of planning and engineering, the necessity for laborious reevaluation and review can be diminished. Occasionally, more full reanalysis and review are warranted when conditions change and older projects are reintroduced into the system; the LRR and GRR are the appropriate vehicles for these reanalyses.

c. Benefits that Accrue During Project Construction.

(1) Benefits accruing during project construction should be documented and included in the benefit evaluation. These benefits should be brought forward from the time the benefits start to the beginning of the period of analysis, using the project discount rate. Benefits (and costs) first are stated in present worth terms as of the beginning of the period of analysis, and then are annualized.

(2) Benefits and costs during the construction period are calculated separately; it is not assumed that benefits accrued are offset by interest incurred, or vice versa.

d. Most Likely Non-Federal Alternative. The cost of the most likely alternative may be used to estimate NED benefits for a particular output if non-Federal entities are likely to provide a similar output in the absence of any of the alternative plans under consideration and if NED benefits cannot be estimated from market price or change in net income. This assumes that society would in fact undertake the alternative means. Estimates of benefits should be based on the cost of the most likely alternative only if there is evidence that the alternative would be implemented. The most likely alternative should in general be something other than a single-purpose project constructed at the same site by the non-Federal entity. In determining the most likely alternative, the planner should give adequate consideration to nonstructural and demand management measures as well as structural measures.

e. OMB-approved Survey Questionnaire. This paragraph provides guidance on the use of OMB-approved survey questionnaires for collection of planning data.

(1) The requirement for OMB approval of survey questionnaires is noted at several locations in this Appendix and in Appendix E.

(2) OMB has approved a group of questionnaire items for the collection of planning data. The questionnaire items cover the range of data that would generally be collected by survey in water resources studies.

(3) The approved questionnaire items are transmitted by memorandum every three years, as additions and revisions are made and OMB approval is renewed.

(4) The District Commander or his designee must thoroughly review the individual questionnaire for quality control purposes before it is used by the district. Currently, OMB requires that Corps questionnaires be submitted for their review and approval before implementation. The quality control review information below must be provided to OMB when seeking survey approval.

(5) Quality control review should be based upon the need for the questionnaire and the reasonableness and adequacy of:

(a) The research questions to be answered.

(b) The sampling strategy being employed.

(c) Data collection procedures being employed, and follow up procedures.

(d) Data analysis plan.

(6) Additional guidance for the conduct of questionnaire surveys is contained in the memorandum transmitting the approved questionnaire items.

f. Opportunity Cost of Time. This paragraph provides guidance for evaluating the opportunity cost of time, when time is saved or lost as a result of implementation of a project.

(1) Determine the amount of time savings or loss that results from implementation of a project for each economic activity.

(a) The amount of and circumstances resulting in the time savings or loss should be clearly expressed in the with and without project planning context.

(b) Savings and losses should be estimated by individual or unit economic activity. The number of individuals or economic activities should also be specified.

(2) Determine the alternative use of the time savings or losses. The alternate use will be valued as either work, social/recreation or other.

(3) The following table will be used for the determination of value of time saved in Corps planning studies. Thus, the value of time saved will be different depending on the purpose of the trip and the amount of time saved on each trip. The percentages shown in column (3) can be applied after the before-tax family income of drivers in the study area is estimated. The dollar values shown in column (2) are based on $32,191, the median family income for the U.S. in 1988 (U.S. Bureau of the Census). The value of time savings for work trips is on a per vehicle-occupant basis. Therefore, to calculate the total value of work time saved per vehicle requires multiplication by the adults per vehicle. For social/recreation, vacation, and other trips, the value of time saved is on a per vehicle basis. The value of time saved for these trip purposes should not be adjusted for the number of passengers.

Table D- 4: Value of Time Saved by Trip Length and Purpose

| | VALUE OF TIME SAVED ADJUSTED TO HOURLY BASIS ($/HOUR) | VALUE OF TIME SAVED ADJUSTED TO HOURLY BASIS (% OF HOURLY FAMILY INCOME OF DRIVER ) |
|---|---|---|
| LOW TIME SAVINGS (O-5 MINUTES) | | |
| WORK TRIPS | $0.99 | 6.4% |
| SOCIAL / RECREATION TRIPS | 0.20 | 1.3% |
| OTHER TRIPS | 0.01 | 0.1% |
| | | |
| MEDIUM TIME SAVINGS (6-15 MINUTES) | | |
| WORK TRIPS | 4.99 | 32.2% |
| SOCIAL / RECREATION TRIPS | 3.58 | 23.1% |
| OTHER TRIPS | 2.24 | 14.5% |
| | | |
| HIGH TIME SAVINGS (OVER 15 MINUTES) | | |
| WORK TRIPS | 8.33 | 53.8% |
| SOCIAL / RECREATION TRIPS | 9.29 | 60.0% |
| OTHER TRIPS | 9.98 | 64.5% |
| | | |
| VACATION | | |
| ALL TIME SAVINGS | 11.63 | 75.1% |

Note: Work trip is on per person basis while all other trip purposes are on a per vehicle basis.

g. Publication of Planning Data, Information and Guidance. Various data used in planning are circulated by Economic Guidance Memorandum. These data include:

(1) Federal water resources discount rate;

(2) Normalized agricultural prices;

(3) Unit day values for recreation;

(4) Areas eligible for NED benefits from employment of previously unemployed labor resources;

(5) National Flood Insurance Program operating costs;

(6) List of contacts for Corps of Engineers when seeking National Marine Fisheries Service (NMFS) input on measuring commercial fishing benefits; and

(7) Vessel operating cost estimates.

(8) Ability-to-pay factors for qualifying counties and counties eligible for price reductions on water storage contracts.

D-5. Financial Analysis.

a. Purpose. This Section provides procedures and responsibilities for financial analysis in support of construction recommendations. It also provides guidance on the relationship between project outputs and non-Federal sponsors' ability to finance projects. Approval authority for the financing plans has been delegated to Division commanders who have the authority to further delegate it to District commanders.

b. Definitions.

(1) Financial Analysis. A financial analysis consists of a non-Federal sponsor's statement of financial capability and financing plan and the District Commander's assessment of the non-Federal sponsor's financial capability.

(2) Financial Commitment. The financial commitment is the total financial obligation a non-Federal sponsor will be required to pay, including the acquisition of lands, easements, rights-of-way, relocations, and disposal areas; the costs of operation, maintenance, repairs, replacements and rehabilitation (OMRR&R), the cost of any associated work such as berthing areas for navigation projects or interior drainage for flood control projects, and the cost of debt service.

(3) Statement of Financial Capability. The statement of financial capability is a clear and convincing description, submitted by the non-Federal sponsor, of its capability to meet its financial obligations for the project in accordance with the project funding schedule.

(4) Financing Plan. A financing plan consists of a clear and convincing description of how the non-Federal sponsor plans to meet its financial obligations for the project in accordance with the project funding and OMRR&R schedules; the level of detail to be included should be commensurate with the scope and complexity of the project and financing mechanisms being considered. The financing plan is considered a working document to be used by the district commander in making his/her capability determination and should not be included in the PCA package.

(5) Assessment of Financial Capability. The District's assessment of the non-Federal sponsor's financial capability is to determine if it is reasonable to expect that ample funds will be available to satisfy the non-Federal sponsor's financial obligations for the project. Districts are expected to present rationale supporting the conclusion of the assessment. Appropriate rationale would include discussion of prior performance of the non-Federal sponsor on similar projects, certainty of revenue sources and method of payment, the overall financial position of the non-Federal sponsor and/or the credit worthiness of sponsor’s debt obligations as reported by independent credit rating service such as Moody’s or Standard & Poor’s. The district commander's assessment of financial capability and the Allocation of Funds Table must be included in the PCA package.

c. General Financial Analysis Philosophy. Financial analysis is required for any plan being considered for Corps of Engineers implementation that involves non-Federal cost sharing. The ultimate purpose of the financial analysis is to ensure that the non-Federal sponsor has a reasonable plan for meeting its financial commitment. The financial analysis should include:

(1) The non-Federal sponsor's statement of financial capability;

(2) The non-Federal sponsor's financing plan; and

(3) The district's assessment of the non-Federal sponsor's financial capability. Financial considerations can be expected to affect project scale as well as construction scheduling and phasing and OMRR&R expenses.

d. Procedures and Responsibilities.

(1) Specifically Authorized Projects. The parts of the financial analysis to be submitted to HQUSACE with the Project Cooperation Agreement (PCA) package include the District Commander's assessment of the non-Federal sponsor's financial capability and the Allocation of

Funds Table. The financing plan and the statement of financial capability should be prepared by the non-Federal sponsor, with assistance from the District. These two documents are considered to be working documents to be used by the District Commander in making his/her capability determination and should not be included in the PCA package. If the replacement and rehabilitation costs are significant, the sponsor should be provided schedules and costs of occurrence for assistance in their overall financial planning.

(2) Specifically Authorized Studies.

(a) Reconnaissance Phase. The reconnaissance phase is expected to provide an assessment of the level of interest and support of local interests in potential solutions. A letter from the non-Federal sponsor indicating his understanding of project cost sharing requirements should accompany the Reconnaissance Report. The letter should discuss, in general terms, the options available to the non-Federal sponsor for financing the non- Federal share of project construction.

(b) Feasibility Phase. The feasibility report should be accompanied by supporting financial information consisting of a preliminary financing plan and a statement of financial capability. The preliminary financing plan will consist of a letter from the sponsor stating potential funding sources and funding availability at the time of construction. The plan (letter) should show the total cost sharing breakdown, not necessarily by construction year.

(3) Continuing Authorities Studies. See Appendix F.

e. Non-Federal Sponsor's Financing Plan and Statement of Financial Capability.

(1) Scope.

(a) Financing Plan. Each financing plan should include the following information:

(1) A current schedule of estimated Federal and non- Federal expenditures by Federal fiscal year (see Table D-5), including Federal expenditures, non-Federal contributions, non-Federal lands, easements, rights-of-ways, relocations, and disposal areas (LERRD), and, for commercial navigation projects, non-Federal utility relocations and deep draft utility relocations. The total Federal and non-Federal shares displayed in the schedule should exactly reflect cost sharing policy and should agree with estimated cost figures in the PCA. Current cost sharing policy requires that the non- Federal funds (i.e. cash) be made available to the Federal Government in proportion to scheduled Federal obligations in each Federal fiscal year; also, if there are engineering and design costs to be cost shared, but which were not covered by a PED cost sharing agreement, then these are to be recovered in the first year of construction.

Table D- 5: Schedule of Estimated Federal and Non-Federal Expenditures

| Fiscal Year | FEDERAL | | NON-FEDERAL | | | |
|---|---|---|---|---|---|---|
| | CASH | LERRD | CASH | LERRD | Utility Relocation | Other |
| | | | | | | |

Notes:

1. Federal, Non-Federal cash and LERRD should be shown for each project purpose.
2. Any repayment for navigation projects should be shown in a footnote.
3. Include in other any associated costs such as berthing areas or interior drainage.

(2) A schedule of the sources and uses of non-Federal funds during and after construction (see Table D-6) by Federal fiscal year. The schedule should include project outlays and income as well as outlays and income related to project construction and financing. Outlays during construction include cash payments to an escrow account or the government; LERRD; associated costs; and, for bonds, various insurance-related costs and interest paid to bond holders during construction. Income during construction includes funds on hand, revenues, appropriations, grants, interest on unexpended balances, and, for bonds, bond proceeds. Outlays after construction include bond debt service, repayments to the government, and OMRR&R. The schedule of the sources and uses of funds should be consistent with the schedule of estimated Federal and non-Federal expenditures.

(b) The method of finance for all non-Federal outlays including OMRR&R associated with the project should be explained in the financing plan.

(c) Statement of Financial Capability. The non-Federal sponsor's statement of financial capability should provide evidence of the non-Federal sponsor's authority to utilize the identified source or sources of funds; and each statement of financial capability should provide information on the non- Federal sponsor's capability to obtain remaining funds, if any. This information will be at a level of detail necessary to demonstrate such capability for the particular project and the particular non-Federal sponsor.

(1) Where the non-Federal sponsor's capability is clear, as in the instances where the sponsor has sufficient funds currently available or has a large revenue base and a good bond rating, the statement of financial capability need only provide evidence of such.

(2) If capability is not clear and the non-Federal sponsor is relying on its full faith and credit to obtain remaining funds (as in the use of general obligation bonds, appropriations or a repayment agreement), the statement of financial analysis should include a credit analysis which demonstrates that the sponsor is credit worthy for the required amount and purpose.

(3) If the non-Federal sponsor is relying on non- guaranteed debt (e.g. a particular revenue source or limited tax, or bonds backed by such a source) to obtain remaining funds, the statement of financial capability should include an analysis that demonstrates that the projected revenues or proceeds are reasonably certain and are sufficient to cover the non-Federal sponsor's stream of costs through time.

(4) If the non-Federal sponsor is relying on third party contributions the statement should include comparable data for the third party together with evidence of it's legal commitment to the non-Federal sponsor.

(2) Preparation.

(a) The District should, with input from the non-Federal sponsor, prepare the schedule of estimated Federal and non-Federal expenditures including OMRR&R.

(b) Either the non-Federal sponsor or the District should prepare the schedule of the sources and uses of non-Federal funds, using information provided by the other.

(c) Either the non-Federal sponsor or its financial consultant should prepare the financing plan and the statement of financial capability. The appropriately empowered official representing the non-Federal sponsor should sign the statement of financial capability.

(d) A financing plan and statement of financial capability should be prepared for each non-Federal sponsor which is signatory to an PCA (this applies to continuing authority projects as well as specifically authorized projects). If a non-Federal sponsor's financing depends on the contributions of funds by a third party or parties, and the non-Federal sponsor does not have the capability or authority to meet its financial obligations without said contribution, a separate statement of financial capability and financing plan should also be provided for the contributions for the third party or parties. These should include sources of funds, authority and capability to obtain remaining funds, and evidence of the third party's legal obligation to provide its contribution.

Table D- 6: Schedule of Sources and Uses of Funds

| | FUNDS AVAILABLE FROM LOCAL SPONSOR | | |
|---|---|---|---|
| | Begin Balance<br>Plus Annual Income | Required Annual<br>Contribution | Fund<br>Balance |
| Balance on hand<br>construction initiated | | | |
| 1st year Revenues<br>Interest Income<br>Operating Revenues<br>Bond Sales<br>etc. | | | |
| 2nd year Revenues<br>Interest Income<br>Operating Revenues<br>Bond Sales<br>etc. | | | |
| 3rd year Revenues<br>Interest Income<br>Operating Revenues<br>Bond Sales<br>etc. | | | |
| .<br>.<br>. | | | |
| .<br>.<br>. | | | |
| Project Completion | | | |

Required Annual OMRR&R $_____ (Schedule of major replacement and rehabilitation costs should be included if they are significant cost items which sponsor must plan for.)

Source of Funds for OMRR&R _____

(e) The financing plan and the statement of financial capability may be combined in one document.

f. Assessment of the Non-Federal Sponsor's Financial Capability. The District's assessment of the non-Federal sponsor's financial capability should ascertain that it is reasonable to expect that ample funds will be available to satisfy the non-Federal sponsor's financial obligation for the project. Districts are expected to present rationale supporting the conclusion of the assessment. Appropriate rationale would include discussion of prior performance of the non-Federal sponsor on similar projects, certainty of revenue sources and method of payment, the overall financial position of the non-Federal sponsor and/or the credit worthiness of sponsor's debt obligations as reported by an independent credit rating service such as Moody's or Standard & Poor's.

g. Illustration of Financing Plan Outline.

The (enter non-Federal sponsor's name), non-Federal sponsor of the (enter project name), is capable of meeting cost sharing and other obligations as required under the terms of the draft Project Cooperation Agreement.

USES OF FUNDS

(Status of land acquisition including an estimate of the cost of real estate interests that have not yet been acquired.)

_____ (Total cash contribution required from the non-Federal sponsor for the project during construction.)

_____ (Annual cash required from the non-Federal sponsor for operation, maintenance and rehabilitation.)

_____ (Total cash required by the non-Federal sponsor for any project related requirements such as berthing areas for navigation projects and interior drainage for flood control projects.)

SOURCES OF FUNDS

_____ (Cash available for project.)

_____ (Financing to be obtained from bonds, if any.)

_____ (Financing to be obtained from other sources, e.g. operating revenues, tax revenues, interest earnings on funds dedicated to the project, etc.)

Figure D- 1: Illustration of Financing Plan Outline

h. Sample Bond Consultant's Letter. See Figure D-2.

"We have been working with the (enter non-Federal sponsor's name) to develop a well-planned approach toward financing the pending project. In this regard the (enter non-Federal sponsor's name) has taken significant steps over the years in implementing certain actions designed to make the project financially possible. Among these are (list actions taken)."

"We have developed financial projections that indicate the (enter non-Federal sponsor's name) has the financial capability to complete the project. Bonds, in the amount of (enter amount) have been/will be authorized on (enter date) and the (enter non- Federal sponsor's name) current bond rating according to (enter source) is (enter bond rating)."

Figure D- 2: Sample Bond Consultant's Letter

i. Continuity of Financing Responsibilities.

(1) Status of Local Sponsor's Financing Plan and Corps Responsibilities During PED. Between completion of the feasibility study and signing of the PCA the District Commander shall stay informed and current regarding the continuing ability and willingness of the sponsor to meet its financial responsibilities. This time can be used to firm up any aspects of the financing plan that may have been weak. In addition, a mechanism shall be agreed upon whereby the sponsor will inform the Corps of any material changes in its financing abilities. Likewise, it is the responsibility of the District Commander to inform the sponsor in a timely way of material changes in cost estimates resulting from PED studies, due to design changes or other reasons.

(2) Local Sponsor's Financing Responsibilities and Corps Responsibilities During Construction. Mutual responsibilities regarding information about financing abilities and changes in cost estimates continue after the PCA is signed and construction initiated. The District Commander shall stay informed and current regarding the sponsor's continuing ability to meet its financial obligations, especially so if the financing plan calls for using other than cash or direct appropriations, or if the sponsor intends to repay its cost share. A mechanism shall be agreed upon whereby the sponsor will inform the Corps of any material changes in its financing abilities. The District Commander continues to be responsible for informing the local sponsor of changes in construction costs.

j. Ability to Pay Determination. See the latest rule as reproduced in EGM 02-03 for procedures for determining cost shares for qualifying non-Federal sponsors under the ability to pay provisions of Section 103 of the WRDA of 1986, as amended. Section 204 of WRDA of 2000 expanded the applicability of ability to pay to allow non-Federal cost share reductions for feasibility studies. In addition, the purposes were expanded from flood control and agricultural water supply to also include environmental protection and restoration, navigation, storm damage protection, shoreline erosion, hurricane protection and recreation. Ability to pay will also include rules for application to Federally recognized tribal governments. A new rule to implement this section is under development.

k. Relationship Between the Feasibility Study (Economic) Analysis and Financial Analysis. The primary purpose of the financial analysis itself is to ensure that the non-Federal sponsor has a reasonable plan for meeting its financial commitment. Project related economic analysis can provide data and other information potentially important in developing the financial analysis.

(1) Relationship of Financing Plans to Project Outputs.

(a) Relationship of Project Outputs to Willingness to Pay. Project outputs create willingness to pay for the project on the part of direct beneficiaries equal to the total benefits. Frequently there are indirect beneficiaries. Willingness' to pay of both direct and indirect beneficiaries can potentially be captured by the local non-Federal sponsor, and can become a part of the non-Federal sponsor's financing plan. For example, flood control for a business or commercial area has direct damages avoided benefits, and may improve the general business climate such that property values outside the flooded area increase as well.

(b) Financing Plan Alternatives. Some non-Federal sponsors will finance projects in a way that directly uses the vendibility of project outputs. Examples are port user charges or user fees for other project outputs, special taxing districts, property tax surcharges, etc. Other financing plans will be indirectly related to project outputs. For example the non-Federal sponsor's general taxing or bonding indebtedness capabilities may be used with the expectation that the project's beneficial effects will create ability to pay. Others will finance in ways entirely unlinked to the captured value of project outputs. For example, the non-Federal sponsor may have sufficient funds available, a large revenue base or may rely on third party contributions.

(1) Procedures. The role of economic analysis in development of financing plans is to establish relationships between project outputs, willingness' to pay on the part of direct and indirect beneficiaries and ability to finance projects.

(a) Outputs of projects (or use of project outputs) for which there are identifiable beneficiaries with willingness to pay that can potentially be captured should be quantified. The

quantification should be to a degree of certainty that is useful to non-Federal sponsors in developing a financing plan. Examples are: numbers, locations, values, and physical and use characteristics of structures to be protected by a flood control project; expected visitation at recreation facilities; vessel names, registries, ownership, drafts and cargo carrying abilities of ships expected to benefit from harbor deepening, etc.

(b) Indirect effects of projects, e. g., local or regional development, should be identified and quantified to the degree practicable. Maximum use should be made of secondary sources (i.e., found in the literature) regarding average, or if available, location specific relationships between investment and induced economic activities, between investment and changes in property values, etc.

(c) Estimates of the willingness to pay of beneficiaries should be provided to local sponsors. These should be in a useful form and of a degree of certainty that is useful in developing financing plans. Examples are: average annual damages avoided for structures; willingness to pay for recreation visits; and transportation cost savings for the different beneficiaries identified in (a) above. If efforts to collect from beneficiaries would affect use of project outputs and the level of induced or secondary effects this information shall also be provided to local sponsors.

D-6 Interest Rate and Period of Analysis.

a. Conceptual Basis. Project NED benefits and costs shall be compared at a common point in time. The following information shall be presented in decision documents:

(1) Installation Period. The number of years required for installation of the plan. If staged installation is proposed over an extended period of time, the installation period is the time needed to install the first phase.

(2) Installation Expenditures. The dollar expenses expected to be incurred during each year of the installation period.

(3) Period of Analysis. The time horizon for project benefits, deferred installation costs, and operation, maintenance, repair, rehabilitation, and replacement (OMRR&R) costs. Use the same period of analysis for all alternative plans. Appropriate consideration should be given to environmental factors that may extend beyond the period of analysis.

(a) The period of analysis for comparing costs and benefits following project implementation is further defined and limited to the lesser of:

(1) The period of time over which any alternative plan would have significant beneficial or adverse effects;

(2) A period not to exceed 50-years except for major multiple purpose reservoir projects; or

(3) A period not to exceed 100-years for multiple purpose reservoir projects.

(b) In cases where alternatives have different implementation periods, a common base year will be established and costs and benefits will be compounded or discounted to that base year. Projects that accrue benefits during the implementation period should refer elsewhere in this document (paragraph D-4c) for specific guidance.

(4) Benefit Stream. The pattern of expected benefits over the period of analysis.

(5) OMRR&R Costs. The expected costs over the period of analysis for operation, maintenance, repair, rehabilitation, and replacement necessary to maintain the benefit stream and agreed-upon levels of mitigation of losses to fish and wildlife habitats.

(6) Discount Rate. The rate established annually for use in evaluating Federal water projects.

d. Calculating Net NED Benefits In Average Annual Equivalent Terms. Net NED benefits of the plan are calculated in average annual equivalent terms. To perform this calculation, discount the benefit stream, deferred installation costs, and OMRR&R costs to the beginning of the period of analysis using the applicable project discount rate. Installation expenditures are brought forward to the end of the period of installation by charging compound interest at the project discount rate from the date the costs are incurred. Use the project discount rate to convert the present worth values to average annual equivalent terms.

D-7. NED Benefit Evaluation Procedures: Unemployed or Underemployed Labor Resources.

a. Purpose. The economic effects of the direct use of otherwise unemployed or underemployed labor resources during project construction or installation may, under certain conditions, be included as a national economic development (NED) benefit. Because of the dynamic nature of unemployment situations, the appropriateness of these benefits will be determined in consideration of economic conditions existing at the time the project is submitted for authorization and for appropriations to begin construction. This section provides procedural guidance.

b. Conceptual Basis.

(1) The social cost of a project is less than the market contract cost in situations in which otherwise unemployed or underemployed labor resources are used in project construction. The opportunity cost of employing otherwise unemployed workers in project construction or installation is equal to the value of leisure time foregone by such workers. Because society does not give up any alternative production of goods and services and because it would be difficult to measure the value of leisure time foregone, a zero opportunity cost is used in these procedures. The opportunity cost of employing otherwise underemployed workers equals their without project earnings, which, by virtue of their underemployment, are less than their market cost. The most straightforward way to reflect the effects of employing unemployed or underemployed labor resources would be to reduce by the appropriate amount the project construction costs in the NED account, but this method would cause accounting difficulties in appropriations, cost allocation, and cost sharing. Therefore, these effects are treated as a project benefit in the NED account.

(2) Conceptually, any employment, anywhere in the Nation, of otherwise unemployed or underemployed resources that results from a project represents a valid NED benefit. However, primarily because of identification and measurement problems and because unemployment is regarded as a temporary phenomenon, only those labor resources employed onsite in the construction or installation of a project or a nonstructural measure should be counted. Benefits from use of otherwise unemployed or underemployed labor resources may be recognized as a project benefit if the area has substantial and persistent unemployment at the time the plan is submitted for authorization and for appropriations to begin construction. Substantial and persistent unemployment exists in an area when:

(a) The current rate of unemployment, as determined by appropriate annual statistics for the most recent 12 consecutive months, is 6 percent or more and has averaged at least 6 percent for the qualifying time periods specified in subparagraph (b) below and:

(b) The annual average rate of unemployment has been at least: (a) 50 percent above the national average for three of the preceding four calendar years, or (b) 75 percent above the national average for two of the preceding three calendar years, or (c) 100 percent above the national average for one of the preceding two calendar years.

(3) Only the portion of project construction activity located in such an area is eligible for employment benefits as calculated in accord with the procedures specified below. Any benefit claimed should be clearly justifiable both in terms of availability of amounts of unemployed and/or underemployed labor and their skills and occupations.

c. Planning Setting.

(1) Without Project Condition. The without project condition is the most likely condition expected to exist in the future in the absence of a project, including known changes in law or public policy. The evaluation of NED benefits associated with the use of otherwise unemployed and underemployed labor resources is linked to the number by which these resources would be reduced over time without a project.

(2) With Project Condition. The with project condition is the most likely condition expected to exist in the future with a given project alternative. There is a different with project condition and thus a different employment benefit for each alternative plan. Currently, the employment benefit cannot be estimated directly on the basis of a comparison of the size of the pools of unemployed and underemployed labor with and without a project. Instead, the benefit procedure implicitly projects the percentage of project labor hires estimated to come from the unemployed labor pool.

d. Evaluation Procedure.

(1) Step 1. Calculation of employment benefits is limited to onsite project construction or installation activity in eligible regions as defined in paragraph D-7b(2). The first step therefore is to determine whether a project is wholly or partially located in an eligible area.

(2) Step 2. Estimate the number of skilled and unskilled unemployed construction workers in the labor area. Construction labor pool data are usually available from local offices of State employment security agencies.

(3) Step 3. Determine the labor requirements for plan implementation as follows:

(a) Labor cost. The manpower requirements of water resource projects differ widely. Construction cost estimate data will provide the percentage of labor cost to total construction contract cost.

(b) Manpower requirements. Analyze the plan's construction work force and schedule to determine manpower requirements over the construction period for skilled and unskilled categories of workers. Convert these data to total construction wages in skilled and unskilled categories by year of construction. In addition, estimate the yearly wage bill of other workers needed on the project. Use the occupational tables in Table D-7 in this section to categorize different types of workers.

(4) Step 4. Compare the annual manpower requirements of the project to the size of the unemployed labor pool in eligible regions. If labor availability is significantly larger than labor

requirements, proceed to the next step. If not, reduce the percentages in the next step based on one or both of the following: expert interviews; or a careful match-up of requirements and availability for specific types of jobs (e.g., carpenters).

(5) Step 5. Calculate NED employment benefits.

(a) Standard method. The following percentages are derived from An Evaluation of the Public Works Impact Program (PWIP).[1] Although the projects studied in the PWIP report are not fully comparable to many typical water projects, the report does provide an empirical basis for relating public works expenditures to employment of unemployed workers. Case 1, below, covers situations in which there is no "local hire" rule; it is taken directly from the PWIP report, as PWIP has no local hire rule. Case 2 covers situations in which there is a local hire rule; the reference data are modified to account for an 80-percent local hire by scaling up the actual local hires (for skilled and unskilled workers) to 80 percent, but retaining the distribution of local hires previously employed to local hires previously unemployed.

(1) Case 1, NED benefits, no local hire rule. Multiply the total wages determined by categories of workers (skilled, unskilled, and other) by the following percentages to obtain NED benefits by year of construction:

Skilled--30
Unskilled--47
Other--35

(b) Case 2, NED benefits, local hire rule. Apply the following percentages in Case 2 situations:

Skilled--43
Unskilled--58
Other—35

Because the 80-percent local hire rule is a goal, not a requirement, support these percentages by data that indicate the local hire goal is likely to be met. If this is unlikely, reduce Case 2 percentages to numbers between the standard Case 1 and Case 2 percentages.

(2) Annual NED benefits. Convert the NED benefits by year of construction to an annual equivalent basis using the current discount rate.

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[1]Economic Development Administration, U.S. Department of Commerce. *An Evaluation of the Public Works Impact Program (PWIP).* Springfield, VA, National Technical Information Service (PB-263 098), January 1975.

(b) Alternative methods. The percentages of unemployment hires may be changed from those used in the standard method if the change can be supported by an empirical study that shows different percentages of unemployed and underemployed workers on a similar project, or on a segment of the same project, for labor market conditions similar to those of the proposed project. In using this method, it may be necessary to vary the categorization of construction workers used in the standard method. The opinions of experts such as local State employment security agencies, local construction firms, associations of contractors, and labor unions may not be substituted for empirical data. Studies used to document alternative percentages for specific types or locations of projects should be cited if not included in the project report.

(c) The percentages are used in the standard method to measure wages paid directly to previously unemployed workers. Previously employed workers may vacate jobs that then become available to unemployed workers, but there are no empirical data to support a quantification of such indirect effects, and no estimates of these effects should be included in the NED account.

e. Report and Display Procedures. Include the employment benefits of each alternative plan as a line item in the display of NED benefits in the system of accounts for any project or portion of a project located in an area that contains unemployed or underemployed resources.

f. Problems in Application.

(1) An IWR publication provides guidance for estimating benefits associated with the direct use of otherwise unemployed labor resources during project construction. The Report of Survey of Corps of Engineers Construction Workforce (IWR Research report 81-R05) provides an empirical basis for changing the percentages of unemployed specified in this section. The IWR report introduces a new evaluation technique and new techniques must be approved by the Water Resources Council. Therefore, if the approach in the IWR report is used, the techniques specified in this section should also be used to demonstrate the sensitivity of the results to the different methods.

(2) Unemployment benefits shall not be used in project formulation, scaling, or NED plan determination. These benefits shall not be used to justify a project where the BCR is otherwise less than unity.

Table D- 7: Occupational Tables
(For use in evaluation of unemployed or underemployed labor)

BLUE COLLAR UNSKILLED OCCUPATIONS

Bricklayer Apprentice
Carpenter Apprentice
- Apprentice Carpenter
- Carpenter Helper

Chairman
Deck Hand
Electrician Apprentice
- Apprentice Electrician
- Apprentice Wireman
- Electrician Trainer

Iron Worker Apprentice
Laborer
- Asphalt Distributor
- Assistant Carpenter
- Bottom Laborer
- Brick Tender
- Carpenter Aid
- Carpenter Helper
- Chainsawman
- Common Laborer
- Concrete Barker
- Concrete Laborer
- Concrete Saw
- Construction Laborer
- Ditch Laborer
- Drill Helper
- Flag Person
- Hod Carrier
- Kettleman
- Laborer
- Laborer Apprentice 3rd
- Laborer Group I
- Laborer Group V
- Labor Shop Man
- Laborer Topman
- Laborer Utilityman
- Landscape Laborer
- Mason Helper
- Mason Laborer
- Mason Tender
- Mortarman
- Mortarmier
- Pipe Layer
- Pipe Helper
- Pipe Fitter
- Plasterer Tender
- Powerman
- Pusher
- Rakeman
- Reboundman
- Road Laborer
- Roof Helper
- Sand Blaster
- Set-up-man
- Sprinkler Apprentice
- Stake Setter
- Tender
- Termite Operator
- Tile Setter Operator
- Vibrator Operator
- Water Truckman

Lumberman and Nurseryman
- Tree Thinner
- Treeman
- Treeplanter

Operating Engineer Apprentice
- B. M. Apprentice
- EO Group III
- EO Group 222

Plumber Apprentice
- Plumber Apprentice
- Plumber Helper

Painter's Helper
Sheet Metal Apprentice

Vibrator Operator
Watchman
    Night Watchman

BLUE COLLAR SKILLED OCCUPATIONS
Blaster
Boilermaker
Boilermaker Foreman
Bricklayer Foreman
    Block Layer
    Truckpointer
    Brick Mechanic
Carpenter
    Form Setter
    Journeyman Carpenter
    Soft Floor Layer
Carpenter Foreman
Carpenter Superintendent
Cement Mason
    Finisher
    Journeyman Finisher
Cement Mason Foreman
Diver
Driller
    Drill Rig Operator
Electrician
    Journeyman Electrician
    Mechanical Electrician
    Wireman
    Journeyman Wireman
Electrical Foreman
General Foreman
    General Labor Foreman
    Project Foreman
Glazier
Iron Worker
    Reinforcing Ironworker
    Structural Ironworker
    Steel Worker
    Steel Erector
    Steel Setter
    Reinforcing Steel Worker
Iron Worker Foreman
    Labor Foreman
    Construction Foreman
    Foreman
    Job Foreman
    Lead Foreman
Lather
Lather Foreman
Master Mechanic
Mechanic
    Mechanic Welder
    Repairman
Mechanic (Continued)
    Repairman Leadman
Oiler
Oiler Equipment Operator
    Oiler Operator Group II
    Oiler Track Type
Operating Engineer
    Asphalt Distributor Operator
    Asphalt Heaterman
    Backhoe Operator
    Blade Operator
    Bobcat Operator
    Bulldozer Operator
    Case Operator
    Class A Operator
    Class C Operator
    Crane Operator
    Digger Operator
    Distributing Operator
    Dragline Operator
    Equipment Operator
    Equipment Operator Group III
    Front End Lift Fork Operator

Heavy Equipment Operator
Hi-Lift Operator
Lift Fork Operator
Loader Operator
Maintenance Loadman
Motor Grader Operator
Operator Group III
Pan Operator
Park Equipment Operator
Power Drive Moister Operator
Power Equipment Operator
Operating Engineer Foreman
Leader Operator
Painter
Brush Painter
Roller Painter
Spray Painter
Painter Foreman
Pile Driver
Pipe Fitter
Sp. Box Man
Pipe Fitter Foreman
Sprinkler Foreman
Plasterer
Plasterer Foreman
Plumber
Pipe Layer
Plumber Foreman
Plumber General Foreman
Plumber Superintendent
Rigger Foreman
Roofer Sheet Metal Worker
Journeyman Sheet Metal
Sheet Metal Mechanic
Sheet Metal Operator

D-8. Social Effects.

a. Other Social Effects (OSE) Account. Most water and land resource plans have beneficial and adverse effects on social well-being. These effects reflect a highly complex set of relationships and interactions between inputs and outputs of a plan and the social and cultural setting in which these are received and acted upon. These effects will be reported as appropriate in the system of accounts for each alternative plan. The OSE account is a means of displaying and integrating into water resource planning information on alternative plan effects from perspectives that are not reflected in the other three accounts. The categories of effects in the OSE account include the following: Urban and community impacts; life, health, and safety factors; displacement; long-term productivity; and energy requirements and energy conservation.

b. Metric. With emphasis on their incidence or occurrence, beneficial effects on social well-being are contributions to the equitable distribution of real income and employment and to other social opportunities. Since they are integrally related to the basic values and goals of society, these effects are usually not subject to monetary evaluation. The normal market exchange process, however, produces monetary values which can be utilized to aid in measuring the distributional impacts of plans on real incomes.

c. Adverse Effects. Adverse effects of a plan have detrimental impacts on the equitable distribution of real income and employment or otherwise diminish or detract from the attainment of other social opportunities. Such adverse effects include not only those incurred in the designated planning area, but also include adverse consequences elsewhere in the Nation resulting from implementation of the plan.

(1) Measurement standards:

(a) Effects on income, employment, and population distribution, fiscal condition, energy requirements, and energy conservation may be reported on a positive or negative basis. Effects on life, health, and safety may be reported as either beneficial or adverse. Other effects may be reported on either a positive/negative basis or a beneficial/adverse basis.

(b) Effects that cannot be satisfactorily quantified or described with available methods, data, and information or that will not have a material bearing on the decision making process may be excluded from the OSE account.

(2) With and without analysis. Existing conditions encompassed by the relevant social factors will be described and presented in terms that best characterize the planning perceptions and social setting of the affected area in the situation without the plan. Planners will also prepare similar descriptions for future social conditions to be expected with and without the plan throughout the period of analysis. The situation existing before the initiation of planning will provide the data from which to evaluate significant social effects under alternative plans.

(3) Limitations. In evaluating well-being effects the obtaining of detailed breakdowns and analytically useful correlations relating to various indicators, index numbers, and similar comparative statistical indicators, as well as dollar values where possible, presents many complex definitional, data, and measurement problems. Consequently, planning studies should explicitly recognize the limitations of present methods and explore innovative approaches to the identification and measurement of the social well-being effects. Such procedures should be carefully documented in the report.

d. Urban and Community Impacts. A formal treatment of urban related impacts is not required for implementation studies. However, types and locations of significant impacts, broken down by salient population groups and geographic areas, may be reported in the Other Social Effects Account. The principle types of urban and community impacts are as follows:

(1) Effects on real incomes. Beneficial effects on real income occur when designated persons or groups receive income generated as a result of the plan. Current guidelines defining the family poverty line may be used as the data from which to measure and portray the estimated absolute and percentage increase toward meeting or exceeding this standard for specific geographic planning areas.

(2) Effects on employment distribution, especially the share to minorities;

(3) Effects on population distribution and composition;

(4) Effects on the fiscal condition of the State and local sponsor;

(e) Effects on educational, cultural, and recreational opportunities. Beneficial effects to this component include contributions to (1) improved opportunities for community services such as utilities, transportation, schools, and hospitals, (2) more cultural and recreational opportunities such as historic and scientific sites, lakes, and reservoirs, and recreations areas. Beneficial effects to improved community services may be described in appropriate quantitative terms, while increased cultural and recreational opportunities will be set forth as the numerical increase in the relevant facilities, otherwise accounting for size, use potential, and quality. Beneficial effects to improved community services may be described in appropriate quantitative terms, while increased cultural and

recreational opportunities will be set forth as the numerical increase in the relevant facilities, otherwise accounting for size, use potential, and quality. Conversely, adverse effects are identified and measured or described as detrimental effects on education, cultural, and recreational opportunities

(f) Effects on security of life, health, and safety. Beneficial effects include contributions to (1) reducing risk of flood, drought, or other disaster affecting the security of life, health, and safety; (2) reducing the number of disease-carrying insects and related pathological factors; (3) reducing the concentration and exposure to water and air pollution; and (4) providing a year-round consumer choice of food that contributes to the improvement of national nutrition. In those limited situations where historical experience is sufficiently documented to provide confidence in projecting likely future hazards, an estimate of the number of lives saved or the number of persons affected may be provided. In most instances, however, a descriptive-qualitative interpretation and evaluation of the improvement and expected results will be applicable.

(g) Displacement effects include the displacement of people, businesses, and farms.

(h) Long-term productivity effects include maintenance and enhancement of the productivity of resources, such as agricultural land, for use by future generations.

(i) Effects on emergency preparedness. Beneficial effects include contributions to (1) extending, maintaining, and protecting major components or the national water transportation system; (2) provision of flexible reserves of water supplies; (3) provision of critical power supplies (ample, stable, quickly responsive); (4) provision of reserve food production potential; (5) provision for the conservation of scarce fuels; (6) provision for dispersal of population and industry; and (7) supplying international treaty requirements. While these beneficial effects will be measured in appropriate quantitative units where readily practicable, they will be largely characterized in descriptive-qualitative terms. Conversely, adverse effects are identified and measured or described as overloading capacities of water resource systems and increasing the risk of interruption in the flow of essential goods and services needed for special requirements of national security.

(j) Other. Other effects on social well-being may be identified and displayed as relevant to alternative plans.

This amendment was approved by William R. Dawson, CECW-P, (202)761-0115

# APPENDIX E

Civil Works Missions and Evaluation Procedures

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# APPENDIX E

## Civil Works Missions and Evaluation Procedures

## SECTION I - Overview

E-1. Purpose. This chapter provides policy and planning guidance for project purposes of navigation, flood damage reduction, hurricane and storm damage reduction (shore protection), ecosystem restoration, hydroelectric power, recreation, water supply and multiple purpose projects. It covers Federal interest as defined by law and Army policies, types of improvements, specific policies, Federal and non-Federal participation and special considerations where applicable. (Note: Every effort has been made to eliminate all inconsistencies between the main body of the ER and the appendices. If any inconsistencies are found, the information in the main body of the ER will prevail over the one in the appendices. Please, notify CECW-PD immediately of any inconsistencies for correction.)

E-2. Project Purposes The term project purpose, as used above and elsewhere in this chapter, means a type or kind of project, the purpose for which it is undertaken. For example, flood damage reduction is a project purpose, as is navigation. Project purpose is also a convenient shorthand description; there may be a number of associated implications, such as a cost sharing formula, typically constructed features, a general notion of the type of outputs, and a legislative and institutional history. There also may be policies concerning individual project purposes. The term does not necessarily imply exclusive use of a particular kind or category of economic benefits however. Corps projects are formulated for specific project purposes, that is to produce specific outputs. This does not necessarily mean all project outputs will be exclusively those for which formulation occurs. Thus, a project formulated only for navigation (project purpose) could also have flood damage reduction benefits and recreation benefits.

E-3. General Policies.

a. The Planning Process. The Corps planning process follows the six-step process defined in the Principles and Guidelines (P&G) for Water and Related Land Resources adopted by the Water Resources Council. This process is a structured approach to problem solving which provides a rational framework for sound decision making. The six-step process shall be used for all planning studies conducted by the Corps of Engineers. The process is also applicable for many other types of studies and its wide use is encouraged. The six steps are:

Step 1 - Identifying problems and opportunities
Step 2 - Inventorying and forecasting conditions
Step 3 - Formulating alternative plans

Step 4 - Evaluating alternative plans
Step 5 - Comparing alternative plans
Step 6 - Selecting a plan

A description of each step is provided in the main body of this ER. Corps decision making is generally based on the accomplishment and documentation of all of these steps. It is important to stress the iterative nature of this process. As more information is acquired and developed, it may be necessary to reiterate some of the previous steps. The six steps, though presented and discussed in a sequential manner for ease of understanding, usually occur iteratively and sometimes concurrently. Iterations of steps are conducted as necessary to formulate efficient, effective, complete and acceptable plans. The following paragraphs provide additional guidance on selected steps.

(1) Step 1 - Identifying problems and opportunities. The first step in the planning process is the identification of (undesirable conditions to be solved) and opportunities (positive conditions to be improved) that the planning team seeks to address. Problems and opportunities should be defined in terms of their nature, cause, location, dimensions, origin, time frame, and importance. The planning team develops objectives and constraints based on those problems and opportunities. An objective is a statement of what an alternative plan should try to achieve, while a constraint is basically a restriction that the alternative plan should avoid. Objectives, as well as constraints, are written statements that should generally include the following four types of information: effect (the verb that expresses the intent to bring about an objective and not to violate a constraint); subject (what is to be changed for the better through meeting the objective or not changed through avoiding a constraint); location (often the study area, which defines where the objective is to be achieved); and timing and duration (often the study period of analysis, which define when and how long the objective is to be achieved or the constraint to be avoided). Developing specific, flexible, measurable, realistic, attainable, and acceptable objectives and constraints is critical to the success of the entire planning process. Objectives and constraints are used to guide information gathering, to help identify solutions and formulate alternative plans, to identify which plan effects will be evaluated, to compare the relative effectiveness of alternative plans, to assist in plan selection, and ultimately, in gauging the success of the plan implemented.

(2) Step 2 - Inventory of Existing Conditions and Forecast of Future Conditions. This entails quantifying and qualifying the planning area resources important to clearly define and characterize the problems and opportunities previously identified. Both existing conditions and future conditions expected to occur without a project must be characterized. The future without project condition forms the basis from which alternative plans are formulated and impacts are assessed. The information gathered at this step depends on the specific nature of the study.

However, at a minimum, information will be required to identify and adequately describe the problems and opportunities of the study area; to estimate life cycle project costs; and to describe important project effects. Gathering information about historic and existing resources requires an inventory. Gathering information about potential future conditions requires forecasts, which should be made for selected years over the period of analysis to indicate how changes in economic, social, environmental and other conditions are likely to impact problems and opportunities. Forecasting future conditions should be done in an iterative manner, seeking input from Federal and non-Federal entities and other stakeholders, in order to help build consensus about future without project conditions and what outputs the proposed project will and should produce. Forecasting may be especially critical in the case of a plan recommended for the protection of a given resource, where an argument must be made that there will be a decline or degradation of the resource unless protection is provided.

(3) Step 3 - Formulate Alternative Plans. Plan formulation is the process of developing management measures and plans that meet planning objectives and avoid planning constraints. A management measure is a feature (a structural element that requires construction or assembly on-site) or an activity (a nonstructural action) that can be implemented at a specific geographic site that is intended to cause a desirable change and results, preferably, in a positive output. Management measures are the building blocks of alternative plans. Alternative plans can be composed of a combination of various management measures or the same measures combined in significantly different ways. Plan formulation consists of three phases: 1) identifying management measures; 2) formulating alternatives by combining the management measures; and 3) iterative reformulation, during which alternative plans previously formulated are modified. Measures may be added, eliminated, re-scaled, or otherwise modified such that the reformulated plan will better achieve a planning objective or stay within the limits of a constraint.

(4) Step 4- Evaluate alternative plans. In this step, the significant contributions or effects of an individual plan are quantified and judged to determine which plans will continue to be considered during the planning process. All significant contributions and effects shall be quantified in order to succeed in evaluating the alternate plans. Significant contributions are identified on the basis of institutional, technical and public recognition. Institutional recognition of an effect means its importance is recognized and acknowledged in the laws, plans and policies of government, public agencies and private groups. Technical recognition of an effect is based upon scientific or other technical criteria that establish the significance of an effect. Public recognition means that some segment of the general public considers the effect important. The evaluation of alternative plans consists of four major tasks. The first task is to forecast the most likely with-project condition expected under each alternative plan. Each with-project condition will describe the same critical variables included in the without-project condition developed in step 2. Criteria to evaluate the alternative plans include all significant resources, outputs and plan effects, contributions to the Federal objective and the study planning objectives, compliance with environmental protection requirements, the P&G's four evaluation criteria (completeness,

effectiveness, efficiency and acceptability) and other criteria deemed significant by participating stakeholders. The second task is to compare each with-project condition to the without-project condition and document the differences between the two. The third task is to characterize the beneficial and adverse effects by magnitude, location, timing and duration. The fourth task is to identify the plans that will be further considered in the planning process, based on a comparison of the adverse and beneficial effects and the evaluation criteria.

(a) P&G Evaluation Criteria. The four evaluation criteria specified in the P&G are acceptability, completeness, effectiveness and efficiency.

(1) Acceptability is the workability and viability of the alternative plan with respect to acceptance by Federal and non-Federal entities and the public and compatibility with existing laws, regulations, and public policies. Two primary dimensions to acceptability are implementability and satisfaction. Implementability means that the alternative is feasible from technical, environmental, economic, financial, political, legal, institutional, and social perspectives. If it is not feasible due to any of these factors, then it can not be implemented, and therefore is not acceptable. An infeasible plan should not be carried forward for further consideration. However, just because a plan is not the preferred plan of a non-Federal sponsor does not make it infeasible or unacceptable *ipso facto*. The non-Federal partner's willingness or unwillingness to sign a Project Cooperation Agreement should not be the test of whether a plan is acceptable or not. The second dimension to acceptability is the satisfaction that a particular plan brings to government entities and the public. Obviously, the extent to which a plan is welcome or satisfactory is a qualitative judgement. Nevertheless, discussions as to the degree of support (or lack thereof) enjoyed by particular alternatives from a community, state Department of Natural Resources, Ducks Unlimited, or other national or regional organizations, for example, are additional pieces of information that can help planners evaluate whether to carry forward or screen out alternative plans.

(2) Completeness is the extent to which a given alternative plan provides and accounts for all necessary investments or other actions to ensure the realization of the planned effects. To establish the completeness of a plan, it is helpful to list those factors beyond the control of the planning team that are required to make the plan's effects (benefits) a reality.

(3) Effectiveness is the extent to which an alternative plan alleviates the specified problems and achieves the specified opportunities. An effective plan is responsive to the identified needs and makes a significant contribution to the solution of some problem or to the realization of some opportunity. It also contributes to the attainment of planning objectives. The most effective alternatives make significant contributions to all the planning objectives. Alternatives that make little or no contribution to the planning objectives can be rejected because they are relatively ineffective. Another factor that can impact the effectiveness of an alternative is whether there is substantial risk and uncertainty associated with the alternative. If the

functioning or success of an alternative is uncertain, or less certain than another alternative, its effectiveness may be compromised and should be discussed.

(4) Efficiency is the extent to which an alternative plan is the most cost-effective means of alleviating the specified problems and realizing the specified opportunities, consistent with protecting the Nation's environment (P&G Section VI.1.6.2(c)(3)).

(b) Four accounts are established in the P&G to facilitate the evaluation and display of effects of alternative plans. The national economic development account displays changes in the economic value of the national output of goods and services. The environmental quality account displays non-monetary effects on ecological, cultural, and aesthetic resources including the positive and adverse effects of ecosystem restoration plans. The regional economic development account displays changes in the distribution of regional economic activity (e.g., income and employment). The other social effects account displays plan effects from perspectives that are relevant to the planning process, but are not reflected in the other three accounts (e.g., community impacts, health and safety, displacement, and energy conservation). Display of the national economic development and environmental quality accounts is required. Display of the regional economic development and other social effects accounts is discretionary.

(c) Procedures to evaluate national economic development benefits for each civil works mission (i.e., navigation, flood damage reduction, recreation, etc.) are provided in subsequent sections of this appendix. Procedures to evaluate environmental impacts are provided in Appendix C. Procedures to evaluate the impacts of ecosystem restoration projects are provided in Section V of this appendix. Steps in these procedures may be abbreviated by reducing the extent of the analysis and amount of data collected where greater accuracy or detail is clearly not justified by the cost of the plan components being analyzed. The steps abbreviated and the reason for abbreviation shall be documented in the planning reports. Planners can pursue the use of alternative procedures when these would provide a more accurate estimate of benefits. The use of alternative procedures and the consideration of new benefit categories, including the procedures to be used to estimate them, require advance approval from HQUSACE (CECW-P).

(d) General Considerations in NED Benefit Evaluation.

(1) When an alternative procedure provides a more accurate estimate of a benefit, the alternative estimate may also be shown if the procedure is documented.

(2) Goods and Services: General Measurement Standard. The general measurement standard of the value of goods and services is defined as the willingness of users to pay for each increment of output from a plan. Such a value would be obtained if the "seller" of the output were able to apply a variable unit price and charge each user an individual price to capture the full value of the output to the user. Since it is not possible in most instances for the planner to measure the actual demand situation, four alternative techniques can be used to obtain an

estimate of the total value of the output of a plan: Willingness to pay based on actual or simulated market price; change in net income; cost of the most likely alternative; and administratively established values.

(a) Actual or Simulated Market Price. If the additional output from a plan is too small to have a significant effect on price, actual or simulated market price will closely approximate the total value of the output and may be used to estimate willingness to pay. If the additional output is expected to have a significant effect on market price and if the price cannot be estimated for each increment of the change in output, a price midway between the price expected with and without the plan may be used to estimate the total value.

(b) Change in Net Income. The value of the change in output of intermediate goods and services from a plan is measured by their total value as inputs to producers. The total value of intermediate goods or services to producers is properly measured as the net income received by producers with a plan compared to net income received without a plan. Net income is defined as the market value of producers' outputs less the market value of producers' inputs exclusive of the cost of the intermediate goods or services from a plan. Increased net income from reduced cost of maintaining a given level of output is considered a benefit since released resources will be available for production of other goods and services.

(c) Cost of the Most Likely Alternative. The cost of the most likely alternative may be used to estimate NED benefits for a particular output if non-Federal entities are likely to provide a similar output in the absence of any of the alternative plans under consideration and if NED benefits cannot be estimated from market price or change in net income. This assumes, of course, that society would in fact undertake the alternative means. Estimates of benefit should be based on the cost of the most likely alternative only if there is evidence that the alternative would be implemented. In determining the most likely alternative, the planner should give adequate consideration to nonstructural and demand management measures as well as structural measures.

(d) Administratively Established Values. Administratively established values are proxy values for specific goods and services cooperatively established by the water resources agencies. An example of administratively established values is the range of unit-day values for recreation.

(3) Goods and Services: Categories. The NED account includes goods and services in the following categories: municipal and industrial (M&I) water supply; agricultural floodwater, erosion and sedimentation reduction; agricultural drainage; agricultural irrigation; urban flood damage reduction; power (hydropower); transportation (inland navigation); transportation (deep draft navigation); recreation; and, commercial fishing.

(4) Other Direct Benefits. The other direct benefits in the NED benefit evaluation are the incidental direct effects of a project that increase economic efficiency and are not otherwise accounted for in the evaluation of the plan or project. They are incidental to the purposes for which the water resources plan is being formulated. They include incidental increases in output of goods and services and incidental reductions in production costs. For example, a project planned only for flood damage reduction and hydropower purposes might reduce downstream water treatment costs; this reduction in costs would be shown as another direct benefit in the NED account.

(5) Use of Otherwise Unemployed or Underemployed Labor Resources. The opportunity cost of employing otherwise unemployed and underemployed workers is equal to their earnings under the without plan conditions. Conceptually, the effects of the use of unemployed or underemployed labor resources should be treated as an adjustment to the adverse effects of a plan on national economic development. Since this approach leads to difficulties in cost allocation and cost sharing calculations, the effects from the use of such labor resources are to be treated as an addition to the benefits resulting from a plan.

(a) Beneficial effects from the use of unemployed or underemployed labor resources are limited to labor employed on site in the construction or installation of a plan. This limitation reflects identification and measurement problems and the requirement that national projections are to be based on a full employment economy.

(b) If the planning region has substantial and persistent unemployment and these labor resources will be employed or more effectively employed in installation of the plan, the net additional payments to the unemployed and underemployed labor resources are defined as a benefit.

b. Plan Recommendations.

(1) The National Economic Development (NED) Plan. Ordinarily the plan that reasonably maximizes net benefits, known as the NED plan, is recommended. Another plan may be recommended if it qualifies for a categorical exemption, or if a specific Secretarial exception from ASA(CW) is sought.

(2) The National Ecosystem Restoration (NER) Plan. For ecosystem restoration projects, a plan that reasonably maximizes ecosystem restoration benefits compared to costs, consistent with the Federal objective, shall be selected. The selected plan must be shown to be cost-effective and justified to achieve the desired level of output. This plan shall be identified as the National Ecosystem Restoration (NER) Plan.

(3) The Combined NED/NER Plan. Projects which produce both National Economic Development (NED) benefits and National Ecosystem Restoration (NER) benefits will result in a "best" recommended plan so that no alternative plan or scale has a higher excess of NED benefits plus NER benefits over total project costs. This plan shall attempt to maximize the sum of net NED and NER benefits, and to offer the best balance between two Federal objectives. Recommendations for multipurpose projects will be based on a combination of NED benefit-cost analysis, and NER benefits analysis, including cost effectiveness and incremental cost analysis.

(4) The Locally Preferred Plan. Projects may deviate from the National Economic Development Plan and/or the National Ecosystem Restoration Plan if requested by the non-Federal sponsor and approved by ASA(CW). In some instances, a non-Federal sponsor may not be able to afford or otherwise support the NED, NER or Combined NED/NER Plan. Plans requested by the non-Federal sponsor that deviate from these plans shall be identified as the Locally Preferred Plan (LPP). When the LPP is clearly of less scope and cost and meets the Administration's policies for high-priority outputs, an exception for deviation is usually granted by ASA(CW). In making a decision to recommend a LPP smaller in scope and costs than the NED, NER or Combined NED/NER plans, the district should assist the sponsor in identifying and assessing the financial capability of other potential non-Federal interests who may be willing and able to participate in plan development and implementation. In all cases, the LPP must have greater net benefits than smaller scale plans, and enough alternatives must be analyzed during the formulation and evaluation process to insure that net benefits do not maximize at a smaller scale than the sponsor's preferred plan. If the sponsor prefers a plan more costly than the NED plan, the NER Plan or the combined NED/NER Plan, and the increased scope of the plan is not sufficient to warrant full Federal participation, ASA(CW) may grant an exception as long as the sponsor pays the difference in cost between those plans and the locally preferred plan. The LPP, in this case, must have outputs similar in-kind, and equal to or greater than the outputs of the Federal plan. It may also have other outputs. The incremental benefits and costs of the locally preferred plan, beyond the Federal plan, must be analyzed and documented in feasibility reports.

(5) Categorical Exemption for Flood Control and Navigation Projects. If the non Federal sponsor identifies a constraint to maximum physical project size or a financial constraint due to limited resources, and if net benefits are increasing as the constraint is reached, the requirement to formulate larger scale plans in an effort to identify the NED plan is suspended. The constrained plan may be recommended. If the NED plan is identified at a physical size or cost which is less than the constraint, the NED plan requirement is satisfied and the NED plan should be recommended.

c. Cost Sharing.

(1) Applicability. Unless otherwise specified, the cost sharing provisions of Title I of the WRDA of 1986, as amended and as interpreted in subsequent guidance, applies to all projects and separable elements thereof. Specific Federal and non-Federal cost sharing requirements applicable to each civil works mission are discussed in subsequent sections of this appendix. Exhibit E-1, at the end of this appendix, summarizes these requirements.

(2) Separable Element. A separable element is any part of a project which has separately assigned benefits and costs, and which can be implemented as a separate action (at a later date or as a separate project). Separable elements so considered are similar to the planning concept of last added increments, with the added idea of separation or detachment of the increment from the whole. The Corps has used a separable element concept for many decades; the term itself was coined in the WRDA of 1986 to assist in the transition to new cost sharing formulas. The WRDA definition was more complex, yet more ambiguous than that above. There is little continuing need for that definition. For cases where the WRDA definition (see section 103(f)) appears necessary, consult HQUSACE; otherwise use the definition above. Separable elements usually must be incrementally justified.

(3) Waivers for Territories (Section 1156 of the WRDA of 1986). Local cost sharing requirements for all studies and projects in American Samoa, Guam, the Northern Mariana Islands and the Virgin Islands will be reduced by up to $200,000 for each study and project. Cost sharing for each study will first be established using the general cost sharing criteria; then the non-Federal share will be reduced by $200,000 or to zero if the non-Federal share is less than $200,000. A similar procedure will be followed for the non-Federal implementation cost share.

(4) Exceptions to the NED Plan. When the ASA(CW) grants an exception to selection of the NED plan, the costs for the granted exception will be shared on the same percentage basis as the NED plan.

(5) Locally Preferred Plans. Local interests may prefer a plan that is larger or smaller than the NED plan. A locally preferred plan may generally be recommended, except that in the geographic areas covered in (3) above, a larger than NED plan may not be recommended. The incremental cost between the Federally supportable plan (NED), and a larger locally preferred plan, is entirely a non-Federal responsibility. Recommended plans smaller or less costly than the NED plan will normally be granted an exception to NED plan selection, and cost shared on the same percentage basis as the NED plan.

d. Financing of Non-Federal Share of Project Costs. Guidance on the financing of the non-Federal share of project costs including payment options, deferral of payments, method of payments, source of non-Federal funds, and the rate of interest for deferred payments is contained in ER 1165-2-131.

e. Credit for LERRD. Specific guidance on crediting the value of LERRD toward the non-Federal share of project costs is contained in ER 1165-2-131.

f. Replacement Costs. Repair, replacement and rehabilitation costs must be identified and included in the estimated cost of operation and maintenance. The entity responsible for project operation and maintenance is responsible for all rehabilitation and replacement costs (except for some inland navigation projects, see Section II of this appendix).

g. Fish and Wildlife Mitigation.

(1) Allocating Costs. Fish and wildlife mitigation costs incurred after 17 November 1986 shall be allocated to the authorized purposes causing the need for mitigation in the same proportions as other allocable costs are allocated to those purposes.

(2) Mitigation LERRD. When lands, easements, rights-of-way, relocations or disposal areas (LERRDs) are a non-Federal responsibility for a project purpose, any LERRDs associated with mitigation for that purpose is likewise a non-Federal responsibility.

h. OMRR&R Mitigation. Non-Federal sponsors will be responsible for all costs of the operation and maintenance, repair, rehabilitation, and replacement of mitigation measures except for: (1) inland navigation projects and harbor projects with depths up to 45 feet, which have no requirement for non-Federal sharing of these costs, and (2) harbors with depths over 45 feet which require a 50 percent non-Federal share for those costs assigned to increments in excess of a 45-foot project.

i. Hazardous, Toxic and Radioactive Waste (HTRW). Policy is to avoid expenditure of Civil Works funds for HTRW remediation by avoiding contaminated areas where practicable. For water resource studies, emphasis should be placed on early problem identification. Reconnaissance and feasibility studies will include a phased and documented review to provide for early identification of HTRW potential. Efforts to determine the existence and extent of HTRW problems will be treated as study cost and shared accordingly. Consistent with the guidance in ER 1165-2-132, the Corps will not participate in clean up of materials regulated by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) or by the Resource Conservation and Recovery Act (RCRA). The cost of clean up of materials not covered by CERCLA and RCRA will be considered when determining if the proposed project is justified. While measures to improve water quality parameters may be included in projects with an ecosystem restoration component, the ecosystem restoration portion of these projects should not principally result in treating or otherwise abating pollution other compliance responsibility.

j. Brownfields. Brownfields are abandoned or under-utilized properties that are perceived to be or, at worst, are lightly contaminated. Brownfields may be included in the preliminary planning phase of projects where they are integral to solving water resources problems related to Corps mission areas and authorities. If the assessment determines that there are non-CERCLA types of materials or small, easily and cost effectively managed amounts of CERCLA controlled materials, then these sites may be included in project formulation and any remediation costs would be shared as project costs. If the assessment determines a CERCLA level clean-up is required, then the site will be removed from plan formulation for processing under CERCLA procedures. It is important that no unnecessary Federal liability be incurred when working within a Brownfield site.

E-4. Risk and Uncertainty-Sensitivity Analysis. Uncertainty and variability are inherent in water resources planning. For example, there is uncertainty in projecting such factors as stream flows, population growth, and the demand for water. Therefore, the consideration of risk and uncertainty is important in water resources planning. This paragraph provides guidance for the evaluation of risk and uncertainty in the formulation of water resources management and development plans.

a. Concepts.

(1) Risk. Situations of risk are conventionally defined as those in which the potential outcomes can be described in reasonably well known probability distributions. For example, if it is known that a river will flood to a specific level on the average of once in 20 years, a situation of risk, rather than uncertainty, exists.

(2) Uncertainty. In situations of uncertainty, potential outcomes cannot be described in objectively known probability distributions. Uncertainty is characteristic of many aspects of water resources planning. Because there are no known probability distributions to describe uncertain outcomes, uncertainty is substantially more difficult to analyze than risk.

(3) Sources of Risk and Uncertainty.

(a) Risk and uncertainty arise from measurement errors and from the underlying variability of complex natural, social, and economic situations. If the analyst is uncertain because the data are imperfect or the analytical tools crude, the plan is subject to measurement errors. Improved data and refined analytic techniques will obviously help minimize measurement errors.

(b) Some future demographic, economic, hydrologic, and meteorological events are essentially unpredictable because they are subject to random influences. The question for the

analyst is whether the randomness can be described by some probability distribution. If there is a historical data base that is applicable to the future, distributions can be described or approximated by objective techniques.

(c) If there is no such historical data base, the probability distribution of random future events can be described subjectively, based upon the best available insight and judgment.

(4) Degrees of Risk and Uncertainty. The degree of risk and uncertainty generally differs among various aspects of a project. It also differs over time, because benefits from a particular purpose or costs in a particular category may be relatively certain during one time period and uncertain during another. Finally, the degree of uncertainty differs at different stages of the analysis, for example, between initial screening and final detailed design, when more precise analytic methods can be applied.

(5) Attitudes. The attitudes of decision makers toward risk and uncertainty will govern the final selection of projects and of adjustments in design to accommodate risk and uncertainty. In principle, the government can be neutral toward risk and uncertainty, but the private sector may not be. These differences in attitudes should be taken into account in estimating the potential success of projects.

b. Application.

(1) The role of the planner.

(a) The planner's primary role in dealing with risk and uncertainty is to characterize to the extent possible the different degrees of risk and uncertainty and to describe them clearly so that decisions can be based on the best available information. The planner should also suggest adjustments in design to reflect various attitudes of decision makers toward risk and uncertainty. If the planner can identify in qualitative terms the uncertainty inherent in important design, economic, and environmental variables, these judgments can be transformed into or assigned subjective probability distributions. A formal model characterizing the relationship of these and other relevant variables may be used to transform such distributions to exhibit the uncertainty in the final outcome, which again is represented by a probability distribution.

(b) At all stages of the planning process, the planning can incorporate any changes in project features that, as a result of information gained at that stage, could lead to a reduction in risk and uncertainty at a cost consistent with improvement in project performance.

(2) Some risk and uncertainty are assumed in nearly every aspect of a water resources project. Some types of risk and uncertainty are dealt with in terms of national planning parameters; for example, ranges of population projections and other principal economic and demographic variables. Other types of risk and uncertainty are dealt with in terms of project or regional estimates and forecasts. When projects are related to other projects and programs in their risk and uncertainty aspects (e.g., interrelated hydrologic systems), reasonable attempts should be made to see that the same analyses and presumed probability distributions are used for all of them.

(3) The risk and uncertainty aspects of projects are likely to be seen and analyzed differently as planning proceeds from rough screening to detailed project proposals. An effort should be made, therefore, to relate the techniques used in characterizing and dealing with risk and uncertainty to the stage of the planning process.

(4) The resources available for analyzing aspects of risk and uncertainty should be allocated to those assessments that appear to be the most important in their effects on project and program design. Rather than assuming in advance that one or another variable is a more important source of risk and uncertainty, the planner should make a thorough effort to determine which variables will be most useful in dealing with measurement errors and natural sources of risk and uncertainty.

(5) The aspects of project evaluation that can be characterized by a probability distribution based on reasonably firm data, such as hydrologic risk, can be treated by standard methods of risk evaluation developed by Federal agencies and others.

(6) Most risk and uncertainty aspects of projects cannot be characterized by probability distributions based on well established empirical data. A first step in dealing with this problem is to describe why the project or specific aspects of it are uncertain, as well as the time periods in which different degrees of uncertainty are likely. A range of reasonably likely outcomes can then be described by using sensitivity analysis, the technique of varying assumptions as to alternative economic, demographic, environmental, and other factors, and examining the effects of these varying assumptions on outcomes of benefits and costs. In some cases and in some stages of planning, this approach, when accompanied by a careful description of the dimensions of uncertainty, will be sufficient. It can be accompanied by descriptions of design adjustments representing various attitudes toward uncertainty.

(7) It may be appropriate in some cases to characterize the range of outcomes with a set of subjective probability estimates, but the project report should make clear that the numerical estimates are subjective. Moreover, subjective probability distributions should be chosen and justified case by case, and some description of the impact on design of other subjective

distributions should be given. Design alternatives reflecting various attitudes toward uncertainty may be suggested.

(8) Utility functions may be used in conjunction with assessments of uncertainty to explore design adaptations reflecting specific preferences. Public preferences, if well known, may be used to illustrate to decision makers what the best design would be, given the uncertainties and preferences in a particular case. If public preferences are not well known, justification could be given for the selection of various utility functions, which can be used only to illustrate the effects on design of various preferences.

(9) At each level of analysis, the planner should take into account the differences in risk and uncertainty among project purposes and costs, among various time periods, and among different stages of planning.

(10) Adjustments to risk and uncertainty in project evaluation can be characterized as general or specific. General adjustments include the addition of a premium rate to the interest, overestimation of costs, underestimation of benefits, and limitations on the period of analysis. Such general adjustments are usually inappropriate for public investment decisions because they tend to obscure the different degrees of uncertainty in different aspects of projects and programs. Specific adjustments, including explicit assessments of different degrees of risk and uncertainty in specific aspects of a project or program and specific adjustments to them, are preferable.

(11) One guide to the use of the techniques discussed here is displayed in Table E-1. In general, more complex techniques are appropriate as planning proceeds from the initial development and the screening of alternatives to the analysis and presentation of the final set of alternative plans. For example, sensitivity analysis, testing the sensitivity of the outcome of project evaluation to variation in the magnitude of key parameters, may be most useful and applicable in the early stages of planning, when the concern is to understand single factors or relatively general multiple-factor relationships. Multiple-factor sensitivity analysis, in which the joint effects or correlation among underlying parameters are studied in greater depth, may be more appropriate in the detailed analytic stage than in the screening stage.

Table E- 1 Planning Task and Approaches to Risk and Uncertainty

| <----------Planning Tasks----------> |
|---|

| Approaches to Risk and Uncertainty | Screening Alternatives | Detailed Analysis of Projects | Final Presentation of Alternatives |
|---|---|---|---|
| Sensitivity analysis | X | X | X |
| Use of objective and subjective probability distributions | | X | X |
| *Illustrative applications of public preference and decision makers attitudes* | | X | X |

(12) Similarly, analysis of risk and uncertainty based on objective or subjective probability distributions would be more appropriate in the detailed analytic stage than in the early screening stage. Although hydrologic and economic probabilities may be used in the screening stage, the full use of independent and joint probability distributions, possibly developed from computer simulation methods, to describe expected values and variances, is more appropriately reserved for the detailed stage.

(13) Although decision makers' attitudes and decision rules can be used to give perspective on alternative designs through out the planning process, they are more appropriate at the stage of displaying alternative designs.

(14) The differences among the underlying degrees of risk and uncertainty, the design adaptations to them, and the preferences of decision makers should be kept clear throughout the analysis. The first two depend primarily on technical expertise; the last is the set of preferences based on various attitudes toward risk and uncertainty.

c. Report and Display. The assessment of risk and uncertainty in project evaluation should be reported and displayed in a manner that makes clear to the decision maker the types and degrees of risk and uncertainty believed to characterize the benefits and costs of the alternative plans considered.

## E-5. Project Cost Estimating and Scheduling.

a. Accuracy and Completeness. Accuracy and completeness of project cost estimates must be emphasized throughout the project development process, including the reconnaissance

and feasibility phases. Even in these early phases cost estimates should represent as complete and as accurate a picture as is practicable. This is necessary for Federal and non-Federal sponsor planning and budgeting processes.

(1) Elements. The project cost estimate is the total cost (Federal and non-Federal) of implementing the project and includes the construction costs, lands, easements, rights-of-way, relocations, disposal areas (if needed), mitigation, add-ons such as engineering and design, and supervision and administration. The project cost estimate will be developed on a constant dollar basis.

(2) Presentation. Project cost estimates during study phases are often perceived to be more accurate than they are, and therefore, project documents must include a discussion of the elements that make up the project cost estimate and of their variability. The presentation of the project cost estimate is of particular importance in the feasibility study as it forms the basis for local decisions on project commitment and financing. It is also the basis for developing budget requests for implementation (inflation allowances are added separately). The project estimate prepared during the feasibility phase is generally the one presented to the Congress for authorization, although it may be revised during the early stages of preconstruction, engineering and design depending on the authorization cycle. Section 902 of WRDA '86 limits the authorization of projects in the Act to a 20% increase in the cost of that project (with increases due to inflation and increased requirements of law allowed). Without firm cost estimates and schedules, neither the Federal government nor the non-Federal sponsors can make prudent financial and budgetary decisions.

b. Study Management of Cost Estimates. During the feasibility study phase, the team must ensure that plans are formulated in such a way that constructability and operability are assured, that major cost items are adequately assessed or appraised as in the case of real estate, and that the uncertainty associated with the estimate is properly presented. The team should also develop plans, with appropriate consideration for Corps plan formulation criteria under the Principles and Guidelines , with an awareness of the ultimate cost. With increased non-Federal financial responsibility for project planning and implementation and Federal emphasis on budgetary restraint, commanders must be sensitive to real financial constraints on project scale. Accurate estimates of the costs of alternative plans play a vital role in plan formulation and project scoping. In any case, financial considerations must not be the sole criteria on which plan development rests, as the NED plan must still be identified. The goal of this approach is to reduce significant design changes after the feasibility phase.

c. Uncertainty in Cost Estimates. Project cost estimates should be supported by a discussion of the scope of the estimate and the uncertainties associated with each major cost item in the estimate. Special attention will be given to large cost items and items that are sensitive to change. Such increased effort on these high risk components will increase the reliability of the overall project cost estimate. The goal is a final project cost that will be within 20 percent of the

estimated project cost in the feasibility report after appropriate adjustments for inflation. Based on such an approach, appropriate contingencies may be applied for each element to account for information that is lacking to more accurately establish its cost. General percentage contingencies applied to the entire project will not be used.

d. Life Cycle Costs. Life cycle costs will also be explicitly considered in the development of project cost estimates. These life cycle costs, including operation, maintenance, repair, replacement and rehabilitation (OMRR&R) costs as well as any necessary environmental monitoring and compliance inspection costs, play an important role in the trade-offs between high capital cost projects and those that have high operation and maintenance (O&M) costs. The sponsor's financial situation may accommodate one type of project better than another. The study management team should draw upon the O&M resources in the district to assist in developing accurate estimates for these costs. These costs should be presented on a constant dollar basis.

e. Full Funded Cost Estimates. Project cost estimates will also be developed on an inflated dollar basis.

f. Review of Cost Estimates. Project cost estimates will be prepared by or reviewed by the cost engineering element in the district and the chief of that unit will sign the estimate. Real estate estimates included in the project cost are reviewed, approved and signed by chief or designee of the Real Estate Office.

## SECTION II - Navigation

E-6. Federal Interest. The Federal interest in navigation derives from the Commerce Clause of the Constitution, and is limited to the navigable waters of the United States. Federal navigation improvements must be in the public interest and thus must be open to the use of all on equal terms. As a matter of law and policy, a distinction is made between general navigation features, and other features or facilities serving navigation. The Corps participates financially in general navigation features and Special Navigation Programs only (see below); all other features and facilities (e.g., piers) are non-Federal responsibilities.

E-7. Types of Improvements. General navigation features include channels, jetties or breakwaters; locks and dams; basins or water areas for vessel maneuvering, turning, passing, mooring or anchoring incidental to transit of the channels and locks. The also include dredged material disposal areas (except those for the inland navigation system, the Atlantic Intracoastal Waterway and the Gulf Intracoastal Waterway), and sediment basins. These are eligible for development as general navigation features of harbor or waterway projects. Special Navigation Programs include removal of wrecks and obstructions; snagging and clearing for navigation; drift and debris removal; bridge replacement or modification; and mitigation of project-induced damage.

a. Harbor and Waterway Projects. These projects are specifically authorized by Congress, except for Continuing Authorities Projects. Financial responsibility for project components is specified in Public Law 99-662. Harbors and waterways have separate cost sharing formulas.

(1) Harbors. Harbors are places that offer vessels shelter from weather. They are primarily places for vessels to put in as needed, although they may serve incidentally as connecting waterways. They are ports if they also offer port facilities. Provision of harbors offering only shelter (Harbors of Refuge) was historically an active Corps program; no new projects have been authorized in many years. Many of the existing harbors of refuge continue to be maintained however. While the terms “inland harbor” and “deep draft harbor” may be used in legislation, it is harbor depth and use which determine cost sharing, not location.

(2) Waterways. Waterways are routes used by vessels. They are rights-of-way enabling and aiding vessel movement; vessels also may stop and stay at facilities along waterways. Waterways may simply connect bodies of deep or shallow water, or they may be parts of riverine or coastal waterway systems.

(a) The waterways described in Public Law 95-502 as amended, and such other waterways that subsequently may be determined to be parts of the inland waterway system referred to in Public Law 99-662, are exempt from non-Federal cost sharing of studies.

(b) By action of Congress, construction (including PED) for PL 95-502 defined waterways or other waterways may be 100 percent Federal, the Inland Waterway Trust Fund may be used to fund all or part of the construction, and the waterway may be made subject to waterway fuel taxes. All other waterways are treated as harbors for cost sharing purposes.

b. Special Navigation Programs.
These navigation improvements are for specific purposes, and may be projects, elements of projects, or simply Corps activities. They are initiated and/or implemented on Congressional authority (specific or continuing). They are usually subject to program or project expenditure limits, with cost sharing as specified in the original authority or as amended. The following program expenditure limits and cost sharing are as amended by Public Law 99-662 unless otherwise stated.

(1) Removal of Wrecks and Obstructions (Section 19, River & Harbor Act of 3 March 1899). The Corps may remove sunken vessels and similar objects if they are determined to be obstructions to navigation. The cost is 100 percent Federal; it is recoverable from the vessel or object owner. Abandonment by the owner is not a bar to cost recovery. Sunken vessels and objects that are not obstructions to navigation but may be nuisances or otherwise undesirable, are treated as drift and debris removal.

(2) Snagging and Clearing for Navigation (Section 3, River & Harbor Act of 1945). Cost-sharing for this continuing authority is according to whether it is a harbor or inland waterway. There is no project limit, but the current program limit is $1,000,000 annually.

(3) Drift and Debris Removal (Section 202, Water Resources Development Act of 1976). The Corps has continuing authority to study and undertake projects to remove and dispose of derelict objects such as sunken vessels, waterfront debris and derelict structures, and other sources of drift that may damage vessels or threaten public health, recreation, or the environment at publicly maintained commercial boat harbors. The harbor need not be, but usually is a Corps project. Congressional authorization is required for projects with Federal costs of $400,000 or more. Cost sharing for the cleanup is one third non-Federal. Non-Federal sponsors are required to recover cleanup costs if there is an identifiable owner of the source. The recovery costs do not become part of the local share but can be applied to reduce total project cost. All costs of any disposal facility or area and its operation are cost shared according to project depth.

(4) Navigation Projects Under the Continuing Authorities Program. Refer to Appendix F for additional guidance concerning policies, procedures and authorities pertaining to navigation projects conducted under the CAP.

(a) Small Harbor and Waterway Projects, Section 107, River & Harbor Act of 1960. Small harbor or waterway projects constructed under this authority must be complete and capable of producing benefits as separate projects. They cannot be constructed in lieu of authorized elements of another navigation project. The requirements for study cost sharing, construction, and operation and maintenance are generally the same as those for specifically authorized studies and projects. Project and annual program Federal expenditure limits are $4,000,000 and $35,000,000.

(b) Mitigation of Shore Damage Due to Federal Navigation Projects (Section 101 of the WRDA of 1986 and Section 111, River and Harbor Act of 1968). The Corps can recommend measures for the prevention or mitigation of erosion or shoaling damages attributable to Federal navigation works. Costs are shared in the same proportion as is applicable to the project, which causes, or is projected to cause, the erosion or shoaling. The non-Federal interests shall agree to be responsible for O&M. Guidance for Section 111 projects is presented in Appendix F.

(5) Modification of Bridges that Obstruct Navigation (Public Law 67-647, the Bridge Alteration Act). The Bridge Alteration Act (1941), commonly called the Truman-Hobbs Act, applies only to existing highway and rail bridges. It provides authority to require bridge modification or replacement if a bridge causes an unreasonable obstruction to navigation, and it sets the apportionment of costs among the bridge owner, the Federal government, and non-Federal sponsor (if any). In 1966, responsibility for administration of the act was transferred from the Army to the Department of Transportation; the Secretary of the Army retains authority to determine whether a bridge causes unreasonable navigation obstruction.

(a) The bridge owner must bear the part of the cost attributable to direct and special benefits accruing to the owner; the remainder is apportioned between the U.S. and non-Federal sponsor (if any) according to the cost sharing that would apply at the harbor or waterway involved. (For details of cost sharing see the Act.) The bridge owner is required to absorb the cost of betterments and an apportionment of costs representing the expired service life of the obstructing bridge.

(b) Truman-Hobbs cost sharing applies as well when a new project or project improvement would cause an existing bridge to become an obstruction to navigation. The cost of constructing new bridges or replacing existing bridges over non-obstructed channels is 100 percent non-Federal. New bridges required because of land cuts for new or realigned channels are treated as general navigation features of those projects and cost shared accordingly.

(6) Beneficial Use of Dredged Material. When determining an acceptable method of disposal of dredged material, districts are encouraged to consider options that provide opportunities for aquatic ecosystem restoration. Where environmentally beneficial use of dredged material is the least cost, environmentally acceptable method of disposal, it is cost shared as a

navigation cost. Section 204 of the WRDA of 1992, as amended, provides programmatic authority for selection of a disposal method for authorized projects, that provides aquatic restoration or environmental shoreline erosion benefits when that is not the least costly method of disposal. The incremental cost of the disposal for ecosystem restoration purposes over the least cost method of disposal is cost shared, with a non-Federal sponsor responsible for 25 percent of the costs. Smaller projects typically will be pursued within the programmatic limits of Section 204, as amended. Section 207 of the WRDA of 1996 amended this authority. Section 207 will primarily be used with new navigation projects or in conjunction with maintenance dredging when the incremental cost is large. Projects pursued under Section 207 authority are separately budgeted and will not count towards the Section 204 programmatic limit. (See Section E-14 and Appendix F for additional information regarding Beneficial Use of Dredged Material).

(7) Environmental Dredging. Section 312 of the WRDA of 1990 as modified by Section 205 of the WRDA of 1996 provides programmatic authority for environmental dredging of sediments not classified as HTRW where the material lies outside and adjacent to Federal navigation channels, contributes to contamination of materials in the Federal navigation channel and it can be demonstrated the removal and remediation, if necessary, are economically justified based on savings in future operation and maintenance costs. Section 224 of the WRDA of 1999 amended this authority. Implementation guidance is under development.

E-8. Specific Policies. There are many components necessary to make a navigation project work, but there is Federal financial responsibility for only some of them. The components that are a Federal responsibility are cost-shared according to the project benefits and type of project (harbor, waterway) as shown in a subsequent paragraph. All other components are wholly non-Federal responsibilities.

a. General Application. For most project components, the responsibility and cost sharing has been determined by legislation, precedent, or practice. These components are described below.

(1) General Navigation Features. This category of structural components of harbors and waterways contains most of those components in which the U.S. will financially participate. The components may be constructed by the project sponsor with reimbursement for the Federal cost share if authorized by Congress under Section 204 of the WRDA of 1986.

(a) Locks and dams and river training works on coastal and inland waterways.

(b) Offshore, approach, and harbor entrance channels, which may have associated protective works such as breakwaters or jetties.

(c) Mainstem, or main and branch channels that are either waterways, or that connect harbor entrances with local facilities areas.

(d) Basins, areas, or widened channels for vessel maneuvering, turning, passing, or anchoring or mooring incidental to transit of locks or channels, and sediment basins.

(e) Bridges that are required by new or realigned channels that cut fast land. It is Corps policy to not recommend new navigation channels cutting fast land however.

(f) Ice control structures.

(2) Aids to Navigation. These are buoys, lights, ranges, markers, and other devices and systems required for safe navigation or to achieve the project benefits. Aids to navigation are provided by the Coast Guard, and are a Federal cost included in economic justification, but are not subject to project cost sharing. Absent sufficient Coast Guard funding, or adequate justification for the navigation aids, non-Federal interests may be required to provide them.

(3) Local Service Facilities. These are the responsibility of non-Federal interests, and they may be required as part of project cooperation agreements if they are necessary for project benefits to accrue. Examples are:

(a) Piers, wharves, floats, and other structures or devices at or near the shoreline, where vessels can moor or be held for the purpose of loading and unloading cargo and passengers, fueling, repairs and other servicing, or to await orders or use.

(b) Berthing, mooring, and anchorage areas where vessels can stay whatever time is required without obstructing the channels or other water areas provided for the movement of vessels.

(c) Port facilities or open areas, structures, or equipment on the shore for receiving, storing, and transferring cargo and passengers. Harbor facilities are for providing fuel, water, ice, provisions, repairs, and other services to vessels. Recreation facilities are for launching boats via ramps or equipment, storing boats on land, parking vehicles, and public access areas and restrooms.

(d) Utility services, such as telephone, water and power, and public services, such as police and fire protection.

(e) Land access via roadways or railroads.

(f) Access channels or, main or branch channel extensions providing access to facilities usable only by exclusive private interests, i.e., not open to the general public on equal terms.

(4) LERR. Non-Federal sponsors are required to provide all lands, easements, rights-of-way, and relocations for a navigation project or a harbor of any kind, and for waterways that are treated as harbors for cost sharing purposes. LERRD for "inland waterways" (includes disposal areas in this case) are 100 percent Federal, and may be funded up to 50 percent from the Inland Waterways Trust Fund for construction when so authorized by Congress.

b. Special Cases. Special cases that require a determination of policy, Federal responsibility, or cost sharing are described below.

(1) Access Channels. Subsidiary channels may be needed to connect main harbor channels or inland waterways with anchorages, mooring, or berthing areas not located adjacent to the primary channel. An access or connecting channel can be a Federal responsibility only if it provides access to two or more areas; or if access is provided to a single area it, must contain two or more facilities with separate owners, or a facility owned by a public entity. For a harbor project, the cost shares are determined by the depth of the access, or interior the channel. If an access channel serves an inland port or port facility it is cost shared based on its own depth, unless the channel is in an area included in the inland waterway system as described in Public Law 95-502, as amended, or as determined by Congress.

(2) Deeper Depths in Entrance Channels. Where an entrance channel is deeper than interior channels because of the more adverse navigation conditions of the entrance channel, cost sharing is the same as the deepest reach of the more protected interior channels.

(3) Barge Fleeting Areas. Barge fleeting areas are defined as mooring areas or temporary anchorages used for assembling tows, making barge transfers between tows, transferring supplies, awaiting arrival of additional barges or serving as a barge holding area. Barge fleeting areas should generally not be recommended for Federal participation. Moorages or temporary anchorage areas may be recommended if necessary to implement a non structural efficiency improvement, for example if reconstitution of tows is necessary to implement a ready to serve lockage policy. These areas should not be considered as fleeting areas in the traditional sense.

(4) Single Owner Situations and General Versus Special Interest Considerations. Section 2 of the River and Harbor Act of 5 June 1920 provides that the Chief of Engineers shall make a determination of the general versus the special interest in an improvement, and recommend an appropriate sharing of costs between Federal and non-Federal interests. When there is a general interest the cost sharing prescribed by Public Law 99-662 will be the basis for recommendations. If there is no general interest there is no Federal financial participation. The determination of general interest requires consideration of the number and type of properties served by a proposed project.

(a) Single Owner Situations. The Corps will not recommend Federal cost participation, establishment, or expansion of a Federal navigation project where the improvement would serve only property owned by a single firm, corporation or individual, or club or association with restrictive membership requirements. A single-owner situation exists when restrictive conditions of any sort permit the single property owner exclusive present and future enjoyment of project benefits. An example of exclusive benefits would be a privately owned port, even though used by several shippers. However, the Corps may recommend Federal cost participation where the improvement would serve only property owned publicly by a single state county, municipality or other duly appointed public entity. Table 1 in ER 1165-2-123 summarizes single-owner situation policy for a variety of Federal project purposes and types of improvement.

(b) Initial Single Non-Public-Owner, Later Multiple-Owner Situations. Federal participation may be recommended in a significant increment of improvement when the improvement would initially serve property by a single non-public-owner when reasonable prospect exists for the improvement to later serve multiple properties with different owners. A significant increment is defined as one involving major increases in project length, depth, or width.

(1) The test for reasonable prospect is controlled by factors such as availability, ownership, and suitability of adjacent waterfront land for development. Another test is location by other industries and users, availability of land transport and other essential services. Also, the area's economic potential; the intent of the land owner or the potential developer; and the determination that no restrictive conditions exist that would prohibit the improvement from serving or benefiting two or more single-owner properties (and property owners) in the foreseeable future.

(2) In these situations, non-Federal sponsors shall contribute annually, until such time as multiple properties/owners are served by the general navigation facility, 50 percent of the annual charges for interest and amortization of the Federal first cost of the improvement, exclusive of aids to navigation. For new channels or extensions to existing channels, the required annual contribution shall also include 50 percent of the operation and maintenance costs of the improvement until such time as multiple properties/owners are served. The requirement for annual contributions may end when the Secretary of the Army determines that the improvement is actually serving/benefiting at least two properties that are owned by at least two different owners. These cash contribution requirements are in addition to the other regular established requirements of non-Federal cooperation for commercial navigation projects.

(c) Progressive Development. The Federal interest is satisfied and the regular cost sharing requirements apply where the improvement serves/benefits two or more properties having different owners or one publicly-owned property at the outset, or if new properties/owners would be served immediately after project completion. A principle of progressive development also applies. Progressive development includes situations where the last small increment of a channel serves a non-public owner. The last property owner served may be "at the end" in terms

of length, depth, or width, necessitating some project investment in his service alone. This is treated as a multiple-owner situation unless a disproportionate incremental investment is required.

(5) Project Purpose and Benefits. Navigation projects may produce both recreational navigation outputs including sport fishing, and commercial navigation outputs including commercial fishing. Current Army policy precludes budgeting Army Civil Works resources for new recreation orientated projects. Civil Works funds may normally be used to support recreational development where the level of commercial navigation benefits is equal to or exceeds 50 percent of the average annual project cost.

(6) Entrance Channels Cost Sharing. Increased depths provided in entrance channels for transit of vessels between protected interior channels and the wave action zone, e.g., across an outer bar, will be cost shared the same as the deepest protected interior channel. Breakwaters, jetties and channel width increases are cost shared in the same manner.

(7) Navigation Versus Hurricane and Storm Damage Reduction. Some measures serving navigation may also reduce hurricane and storm damage and vice versa. The following policies apply to cost sharing of measures affecting one or both of the navigation, and hurricane and storm damage reduction purposes.

(a) Measures resulting in increases in net income of commercial navigation activities or in decreases in commercial transportation costs will be evaluated and cost shared as navigation measures (harbor). This includes measures to prevent wave induced damages to berthed commercial vessels and to docks, piers and slips used in commercial navigation activities. Measures to prevent wave induced damages to berthed non-commercial (recreational) vessels, and measures to prevent wave damages to docks, piers, slips and other shoreline facilities not used for commercial navigation, are to be evaluated and cost shared under the hurricane and storm damage reduction provisions of sections 103(c)(5) and 103(j) of Public Law 99-662. Measures to provide for safe and efficient movement of commercial and recreational vessels into and within a harbor, and measures to prevent loss or damage to vessels in transit (harbors of refuge) will continue to be evaluated and cost shared as navigation measures (harbor). The Corps does not financially participate in provision of docks, terminal or transfer facilities, or berthing areas (see paragraph E-8a.(3)).

(b) Above policy applies to existing berthed vessels and shoreline facilities and to vessels and facilities that would exist in the future without project condition at the project or an alternative location. For vessels that would not be present at any location in the without project condition, but would be present in the future as a result of the project, benefits are evaluated as commercial or recreational navigation benefits, as appropriate.

(c) Where measures serve both hurricane and storm damage reduction and navigation, an allocation of multiple purpose joint costs must be made and the joint costs shared in accordance with the purpose to which they are allocated, along with any specific costs for features which serve only one purpose. This cost allocation must include operation, maintenance, repair and replacement and rehabilitation responsibility under the hurricane and storm damage reduction purpose. No cost allocation is required where a measure is formulated to serve a single purpose but results in incidental benefits.

(8) Federal Assumption of Maintenance. Section 204(f) of the WRDA of 1986, as amended, and implemented by ER 1165-2-124, provides the basis for the Federal assumption of maintenance of navigation projects constructed by non-Federal interest. (Section 204(f) was previously Section 204(e). It was redesignated by Section 303(b)(1) of the WRDA of 1990.) Section 204(f) provides that a non-Federal project must be approved by the Secretary of the Army prior to construction for Federal assumption of maintenance. In view of the provisions of Section 204(f) and in recognition of budgetary constraints, the Corps will not seek study funding or authorization for Federal maintenance of existing non-Federal navigation projects. Only assumption of maintenance under provisions of Section 204(f) will be considered. This policy does not apply to traditional study, authorization and construction of improvements to non-Federal harbors, which may include subsequent Federal maintenance.

## E-9. NED Benefit Evaluation Procedures: Transportation Inland Navigation

a. Purpose. This section presents the procedure for measuring the beneficial contributions to national economic development (NED) associated with the inland navigation features of water resource projects and plans.

(1) Major Rehabilitation Projects. Construction of infrequent, costly structural rehabilitation or major works that will improve reliability or efficiency of a inland navigation project or a principal feature thereof are implemented under the Major Rehabilitation Program. Major rehabilitation projects are budgeted under the Construction General account. Rehabilitation is a major project feature restoration consisting of structural work on a Corps operated and maintained facility intended to improve reliability of an existing structure, the result of which will be deferral of capital expenditures to replace the structure. Rehabilitation is considered when it can significantly extend the physical life of a feature and can be economically justified by benefit-cost analysis.

(2) Major Rehabilitation Projects Evaluation Procedures. ER 1130-2-500 and EP 1130-2-500 document the requirements and procedures for major rehabilitation studies and projects.

b. Conceptual Basis. The basic economic benefit of a navigation project is the reduction in the value of resources required to transport commodities. Navigation benefits can be categorized as follows:

(1) Cost Reduction Benefit (same origin-destination; same mode). For traffic that uses a waterway both with and without a project, the benefit is the reduction in the economic cost of using the waterway. This reduction represents an economic efficiency or NED gain because resources will be released for productive use elsewhere in the economy; for example:

(a) Reductions in costs incurred from trip delays (e.g., reduced congestion by expanding lock sizes at congested facilities or by imposition of congestion fees).

(b) Reduction in costs because larger or longer tows can use the waterway (e.g., by channel straightening or widening).

(c) Reduction in costs by permitting barges to be more fully loaded (e.g., by channel deepening).

(2) Shift of Mode Benefit (same origin-destination; different mode). For traffic that would use a waterway with the project but uses a different mode, including a different waterway, without the project, the benefit is the difference between the costs of using the alternative mode without the project and the costs of using the waterway with the alternatives under consideration. The economic benefit of the waterway to the national economy is the savings in resources from not having to use a more costly mode.

(3) Shift of Origin-destination Benefit. If a project would result in a shift in the origin of a commodity, the benefit is the difference in total costs of getting the commodity to its place of use with and without the project. If a project would result in a shift in the destination of a commodity, the benefit is the difference in net revenue to the producer with and without the project. The shift of origin-destination benefit cannot exceed the reduction in transportation charges achieved by the project.

(4) New Movement Benefit. This benefit applies if a commodity or additional quantities of a commodity would be transported only because of lowered transportation charge with the project. The quantities are limited to increases in production and consumption resulting from lower transportation costs. An increase in waterway shipments resulting from a shift in origin or destination is not included. The new movement benefit is defined as the increase in producer and consumer surplus; practically, it can be measured as the delivered price of the commodity less all associated economic costs, including all of the costs of barge transportation other than those of the navigation project. This benefit, like the preceding one, cannot exceed the reduction in transportation costs achieved by the project.

(5) Use of Rates For Benefit Measurement. It is currently more difficult to accurately compute the long-run marginal costs of particular rail movements on the basis of cost estimation studies than to determine the rates at which railroad traffic actually moves. In competitive markets, rates (prices) correspond to marginal cost, and, given market stability, prices will settle at long-run marginal costs. Moreover, the rates actually charged determine the distribution of traffic among modes. For these reasons, rates will be used to measure shift of mode benefits. Section 7a of the Department of Transportation (DOT) Act of 1966 (Public Law 89-670) requires the use of prevailing rates, as described in paragraph E-9d(5). In the case of new waterways, this rate may or may not represent the best estimate of long-run marginal costs. In the case of existing waterways, prevailing competitive similar rates are the best available approximation of long-run marginal costs.

(6) Risk-based Analysis Procedure. Institute of Water Resources and HQUSACE staff are currently in the process of developing risk-based analysis procedures for inland navigation studies. Although these efforts are ongoing, preliminary indications are the following variables should be explicitly incorporated in risk-based analysis; 1) commodity forecasts, 2) alternative mode costs, 3) reliability of existing and proposed structures, and, 4) system delays associated with capacity constraints. Additional variables can be incorporated if appropriate for individual study areas. Districts are expected to incorporate risk-based analysis procedures in all inland navigation studies. Until risk-based procedures are fully developed, districts are expected to, at a minimum, perform sensitivity analysis of key variables.

c. Planning Setting.

(1) Without Project Condition. The without project condition is the most likely condition expected to exist in the future in the absence of the navigation project or any change in law or public policy. The without project condition includes any practice likely to be adopted in the private sector under existing law and policy, as well as actions that are part of broader private and public planning to alleviate transportation problems. The following specific assumptions are part of the projected without project condition:

(a) Assume that all reasonably expected nonstructural practices within the discretion of the operating agency, including helper boats and lock operating policies, are implemented at the appropriate time. Substantial analysis is required to determine the best combination of nonstructural measures to ensure the most effective use of an existing waterway system over time. This analysis should be documented in project reports to assure the reviewer that the best use of existing facilities will be made in the without-project condition and that the benefits of alternative with project conditions are correctly stated. The criteria for the best utilization of the system are overall public interest concerns, including economic efficiency, safety and environmental impact.

(b) User charges and/or taxes required by law are part of the without project condition. Proposed or possible fees, charges, or taxes are not part of the without project condition but should be considered as part of any nonstructural alternatives in the with project condition.

(c) The without project condition assumes that normal operation and maintenance will be performed on the waterway system over the period of analysis.

(d) In projecting traffic movements on other modes (railroad, highway, pipeline, or other), the without project condition normally assumes that the alternative modes have sufficient capacity to move traffic at current rates unless there is specific evidence to the contrary.

(e) Alternative modes should be analyzed as a basis for identifying the most likely route by which commodities will be transported in the future in the absence of waterway improvement.

(f) The without project condition normally assumes that only waterway investments currently in place or under construction are in place over the period of analysis.

(2) With Project Condition. The with project condition is the most likely condition expected to exist in the future if a project is undertaken. The same assumptions as for without project condition underlie the with project condition. The following discussion relates to the alternatives considered under the with project condition.

(a) Management of demand by the use of congestion or lockage fees is a nonstructural alternative, which alone or in combination with structural devices may produce an economic optimum in a congested waterway. Influencing marginal waterway users through a congestion fee can increase the net benefits of a waterway. Evaluate alternatives that influence demand on the same basis as supply-increasing (structural) alternatives. Because lockage time is a scarce commodity, the imposition of a congestion fee will work to allocate this commodity in an efficient manner. HQUSACE (CECW-PD) should be consulted for assistance in analyzing congestion fees.

(b) Additional nonstructural measures not within the current purview of the operating agency may be considered “supply management” measures. One example is traffic management. These supply-increasing (nonstructural) measures can be used alone or in combination with other structural or nonstructural measures.

(c) Project alternatives can differ in their timing as well as in their physical characteristics. Consider the optimal timing of projects and of individual project features in project formulation, so as to maximize net benefits over time.

(d) Consider improvements in alternative transportation modes as part of the without project condition only, as specified in paragraph E-9c.(1).

d. Evaluation Procedure: General. Use the following 10 steps to estimate navigation benefits. (See Figure E-1.) The level of effort expended on each step depends upon the nature of the proposed improvement, the state of the art for accurately refining the estimate, and the sensitivity of project formulation and justification to further refinement, especially as applied to steps 6, 7, and 8.

(1) Step 1--Identify the Commodity Types. Identify the types of commodities susceptible to movement on the waterway segment under consideration. The level of detail for each commodity is not pre-specified; for example, in some cases “grains” is detailed enough, while others, “corn,” “wheat” or “soybeans” is needed.

(a) New Waterways. Identify commodity types primarily by interviews of shippers and by resource studies. Interviews will identify primarily the benefit potentials of a shift of mode; resource studies will identify primarily the benefit potentials of shifts in origin-destination and in new movements.

(b) Existing Waterways. Identify commodity types primarily by analysis of data on existing use of the waterway segment under study; e.g., data from the Performance Monitoring System (PMS) and the Waterborne Commerce Statistical Center (WCSC).

(2) Step 2--Identify the Study Area. The study area is the area within which significant project impacts are incurred. The origins and destinations of products likely to use the waterway are normally included in the study area, broken out by river segments.

(3) Step 3--Determine Current Commodity Flow. Gather current data for commodity movements between origin-destination pairs susceptible to waterway movement as well as for commodities currently transported by waterway.

(a) New Waterways. Identify the total tonnage that could benefit from using the waterway. Obtain this information primarily by interviews of shippers. For benefits from shifts in origin and destination and from new movements, care must be taken to identify whether such movement would be likely to occur if waterway transportation were available; base this primarily on interviews. Give particular attention to delivered price from substitute sources in the case of benefits from shifts in origin and destination, and to resource and market analysis in the case of benefits from new movements. Assess current transportation costs in the area.

(b) Existing Waterways. Identify uses beyond the existing use of the waterway to identify commodities that might use the waterway in response to a reduced transportation charge.

(4) Step 4--Determine Current Costs of Waterway Use. Determine current costs of waterway use for all the tonnage identified in step 3. Include in the waterway transportation cost

the full origin-to-destination costs, including handling, transfer, demurrage, and prior and subsequent hauls for the tonnages identified in step 3. Consider the effect of seasonality on costs. In calculating the cost of prior and subsequent hauls, care must be taken to avoid inappropriate aggregations and averaging of the costs of movements in situations in which there is a wide geographic dispersion in ultimate origins and/or destinations, as in the case of grain traffic.

(a) New Waterways. The current cost of the proposed waterway use represents the with project condition; there are no without project costs for waterway transportation.

(b) Existing Waterways. Construct two arrays, one representing the without project and one the with project condition. The difference between the two arrays reflects the reduction in current delays and any gains in efficiencies resulting from the alternative under consideration.

(5) Step 5--Determine Current Cost of Alternative Movement. Determine the current cost of alternative movement for all the tonnages identified in step 3. The cost includes the full origin-to-destination costs, including costs of handling, transfer, demurrage, and prior and subsequent hauls. Consider the effect of seasonality on costs. In calculating the costs of gathering or distribution prior or subsequent to the primary line haul, care must be taken to avoid inappropriate aggregations and averaging of the costs of movements in situations in which the ultimate origins and/or destinations are widely dispersed, as the case of grain traffic. This procedure uses price data when available as a proxy for the long-run costs of movement by other modes. This step, combined with steps 3 and 4, generates a first approximation of the demand schedule for waterway transportation given (1) the costs of transportation by alternative modes, (2) current levels of production, and (3) the distribution of economic activity.

(a) New Waterways. In the case of rail movements, use the prevailing rate actually charged for moving the traffic to be diverted to waterways. For traffic induced by the waterway construct the rail rate as in step 5b.

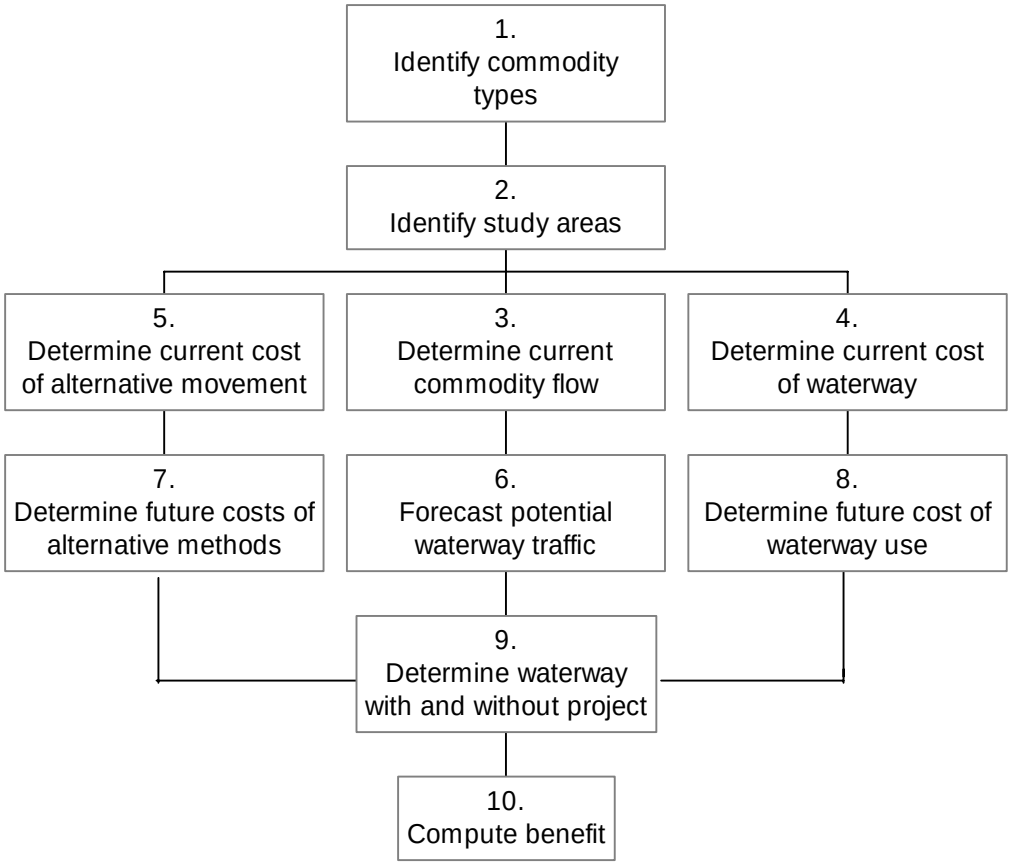



Figure E- 1 Inland Navigation Benefit Evaluation Procedure

(b) Existing Waterways. Use rate and other price data when available to estimate the cost of movement by alternative modes. In the case of rail movements, if the rate for that movement is not now used, use prevailing rates that are (1) competitive, and (2) for movements similar to the individual move that would occur without the project. Avoid the use of paper rates, i.e., rates at which no significant amount of traffic is actually moved. A rate is "competitive" to the extent that it is for traffic for which there is intra modal or intermodal competition within the relevant markets. In identifying a "similar" movement, the factors considered may include geographic location, degree of use, characteristics of terrain, backhaul, contract division, seasonality, ownership of rolling stock, and physical rail connection to the shipper. It is the responsibility of the analyst to select rates that, in his or her view, best represent the long-run marginal costs of the movement. Cost estimates for particular movements may be useful in selecting the rate or rates that best meet the criteria of competitiveness and similarity. If more than one competitive and similar rate is identified, an average may be used. Assume that all water-compelled or water-competitive rates are competitive and similar.

(6) Step 6--Forecast Potential Waterway Traffic by Commodity. Develop projects of the potential use of the waterway under study for selected years from the time of the study until the end of the project life, over time intervals not to exceed 10 years. Document commodity projects for the commodity groups identified in step 3.

(a) The usual procedure for constructing commodity projections is to relate the traffic base to some type of index over time. Indices can be constructed by many different methods, depending on the scope and complexity of the issue under consideration and the availability of data and previous studies.

(b) Generally, OBERS (now BEA) projections are the demographic framework within which commodity projections are made. There are many instances, however, in which a direct application of OBERS-derived indices is clearly inappropriate. Frequently, there are circumstances that distort the relationship between waterway flows and the economy described by OBERS. Even when total commodity flows can be adequately described through the use of indices derived from OBERS projections, factors such as increasing environmental concerns, changes in international relations and trade, resource depletion, and other factors, may seriously alter the relationship between waterway commodity flows and the economy described by OBERS.

(c) If problems of the type described in paragraph b. above are identified, undertake independent studies to ascertain the most appropriate method of projecting commodity flows. The assessment of available secondary data forms the basis of these independent studies. These data will assist in delineating the bounds on the rate of increase for waterway traffic, as well as facilitate a better understanding of the problem. Supplement these data with (1) interviews of relevant shippers, carriers, and port officials; (2) opinions of commodity consultants and experts; and (3) historical flow patterns. Commodity projections can then be constructed on the basis of the results of the independent studies.

(d) Generally, specific commodity studies are of limited value for projections beyond approximately 20 years. Given this limitation, it is preferable to extend the traffic projections to the end of project life through the use of general indices on a regional and industry basis. Such indices can be constructed from the OBERS projections or other generally accepted multi-industry and regional models.

(7) Step 7--Determine Future Cost of Alternative Modes.

(a) Future cost per unit of each commodity will normally be the same as current cost. As stated previously, the without-project condition normally assumes that the alternative modes have sufficient capacity to move traffic at current rates unless there is specific evidence to the contrary. This step combined with step 6 provides a time series of demand schedules specific to

a particular commodity origin-destination pattern. Address the projection of any change in future prices as indicated below.

(b) A future rate is a prevailing rate as defined in step 5. It reflects exclusively a shift in rates because of projected changes in the volume of shipments on a given mode or a shift from one mode to another (e.g., from rail to pipeline). To support such a shift, show that the increase in volume is likely to lead to a change in rate; do not assume, for example, that an increase in volume of traffic of a commodity from one area to another will automatically ensure a more favorable high-volume rate.

(8) Step 8--Determine Future Cost of Waterway Use. Two separate analyses make up this step. First, analyze the possibility of changes in the costs of the waterway mode for future years for individual origin-destination commodity combinations. Second, analyze the relationship between waterway traffic volume and system delay. Do this second analysis in the context of the total volume of traffic on the waterway segments being studied for with and without project conditions. This analysis will generate data on the relationship between total traffic volume and delay patterns as functions of the mix of traffic on the waterway; it may be undertaken iteratively with step 9 to produce a "best estimate."

(9) Step 9--Determine Waterway Use, With and Without Project. At this point the analyst will have a list of commodities that potentially might use the waterway segment under study, the tonnages associated with each commodity, and the costs of using alternate modes and the waterway, including system delay functions with and without the project over time. Use this information to determine waterway use over time with and without the project based upon:

(a) A comparison of costs for movements by the waterway and by the alternative mode, as modified by paragraph E-9d(7).

(b) Any changes in the cost functions and demand schedules comparing (1) the current and future without project conditions and (2) the current and future with project condition. Conceptually, this step should include all factors that might influence a demand schedule; e.g., impact of uncertainty in the use of the waterway; ownership of barges and special equipment; level of service; inventory and production processes; and the like. As a practical matter, the actual use of a waterway without a cost savings or nonuse of a waterway with a cost savings depends on the knowledgeable judgment of navigation economists and industry experts.

(c) Account for the "phasing in" or "phasing out" of shifts from one mode to another in the analysis. Base diversion of traffic from other modes to the waterway, and from the waterway to other modes as the waterway becomes congested, on expected rate savings as adjusted by any other factors affecting the willingness of users to pay or the speed of the response mechanism to changes in the relative attractiveness of alternative modes. Specifically, determine diversions

from congested waterways in the order of the willingness of users to pay for waterway transportation. Divert users with the lowest willingness to pay first.

(d) Consideration must also be given to potential shifts in origin and destination pair due to increased costs of future without project waterway use. Potentially, increased waterway costs less than alternate mode costs may cause some traffic to divert to different origin – destination pairs. This would be the case for commodities with relatively elastic demand for waterway transportation. In these cases the analysis must be expanded to address this shift in origin-destination pair.

(10) Step 10--Compute NED Benefits. Once the tonnage moving with and without a plan is know and the alternative costs and waterway costs are known, total NED navigation benefits can be computed at the applicable discount rate:

(a) For cost reduction benefits, the benefit is the reduction in cost of using or operating the waterway; the cost of the alternative mode is a factor in determining whether the tonnage would move both with and without the project but is not a factor in computing benefits. Cost reduction benefits are generally limited to evaluation of existing waterways. The benefits for current and future cost reductions are reflected by the difference in waterway costs (steps 4 and 8) with and without the project. Compare waterway cost data (steps 4 and 8) with the alternative mode costs (steps 5 and 7) in order to determine the traffic flow by mode over time (steps 3 and 6).

(b) For shift of mode benefits, the benefit is the reduction in costs when the alternative movement is compared with the waterway. These benefits apply to new or existing waterways. Cost differences between the alternative mode and the waterway mode (step 5 - step 4 x step 3 and step 7 - step 8 x step 6) will identify the shift of mode benefits over time.

(c) For shift or origin-destination benefits and new movement benefits, the benefit is the value of the delivered product less the transportation and production costs with the project. The transportation cost without the project (assuming the with project movement would have occurred) is a factor in categorizing these benefits but is not a factor in computing them. The upper limit of these benefits can normally be determined by computing reduction in transportation charges achieved by the project. These can be a reduction in waterway costs (steps 4 and 8) with and without the project or changes in mode (steps 5, 4, 7 and 8).

e. Evaluation Procedure: Problems in Application.

(1) Changes in System Delays. Differences in system delays resulting from project alternatives are difficult to compute. An assessment of system delays within the state of the analytic art is necessary for a comprehensive benefit analysis. Delays at all points in the system should be analyzed only to the extent that project formulation and evaluation are sensitive to such

refinements, and to the extent that the state of the art permits accurate refinement of the estimate. Appropriate proxy measures may be used in lieu of individual assessments at each element in the system when evaluating system delays.

(2) Interaction of Supply and Demand Schedules. The entire evaluation procedure (paragraph E-9d.) is based on an assumption that the supply and demand schedules are independent; but in fact, they are not. This problem is most acute when considering the variance in delays at high levels of lock utilization. Essentially, shippers will face not an expected delay value but rather a highly uncertain delay value. Shippers' response to uncertainty (as reflected in the demand schedule) may be quite different from their response to an expected shipping cost (as reflected by the intersect of the supply and demand schedules).

(3) User Fee Collection. The incremental collection of user charges, fees, or taxes is not a NED benefit. It is a transfer or resources between the private and public sectors of the economy, manifesting itself as resources committed to the proposed navigation system. The increased collection of these charges, fees, or taxes is therefore considered a decrease in the public sector's contribution to the proposed system.

(4) Sensitivity Analysis. Project benefits are calculated on the basis of "the most probable" with project and without project conditions. However, risk and uncertainty should be addressed in the analysis of NED benefits and costs. In particular, major uncertainty exists in the proper measure of savings to shippers, namely the difference in long-run marginal costs. To the extent that rates or other prices vary from long-run marginal costs, savings to shippers will contain a component of transfers varying from real resource savings. This element of uncertainty should always be identified or acknowledged in estimates of benefits. In dealing with uncertainty, three techniques may be used: establishing consistent sources of data, expanding the data-gathering, and estimating the range of benefits. Use the following two specific approaches to implement the third technique, and display the results in terms of their effects on project benefits in tabular form in the project report.

(a) Pre-specified sensitivity analysis. Compute the following and include it in the report:

(1) Current tonnage, new waterway. For new waterways, compute benefits for the recommended alternative on the basis of current phased-in tonnage (steps 3 and 9c), current rates, and current fleet characteristics.

(2) Current rates, fleet. For both new and existing waterways, compute benefits for the recommended alternative on the basis of tonnage over time, current rates (step 3), and current fleet characteristics.

(3) Growth beyond 20-year period. Compute the benefits for alternatives carried forward for final display assuming no growth in tonnage or changes in fleet characteristics beyond 20 years in the future.

(4) Interest rate. For projects whose authorized discount rate is different from the current discount rate, compute annualized benefits using the current rate.

(5) User charges. Estimate the effect on benefits of full recovery through user charges.

(b) Other. In addition, the report should contain such other sensitivity analyses as are necessary to meet the objective of a clear, concise report presenting a range of benefit levels that represent data and assumptions about which reasonable persons might differ. The following discussion summarizes key data sources, including problems in their use.

(1) Interviews. Interview data may be used in steps 1 through 8. (Use only forms approved by the Office of Management and Budget.) Collect data not available from secondary sources by personal interviews. Use statistically sound techniques for selecting the interview sample and for devising the questions. The questionnaire and a summary of responses should be compiled and displayed in the final report in such a way as to prevent the disclosure of individual sources. Describe the errors and uncertainty inherent in the sampling methods and responses.

(2) Other. The basic organizational source for systematically collected waterway data is the Office of the Chief of Engineers.

f. Report and Display Procedures. Clear presentation of study results, as well as documentation of key input data assumptions and steps in the analysis, will facilitate review of the report. Tables E-2 through E-5 are suggested presentations for all reports that include navigational objectives. In addition to detailed data on the NED benefits of a project, summary tables may present useful information on other aspects of the project such as its impact on commodity flows, on other modes of transportation, and on the location of economic activity. (See tables E-2 to E-5).

## E-10. NED Benefit Evaluation Procedures: Transportation, Deep-Draft Navigation

a. Purpose. This section presents the procedure for measuring the beneficial contributions to national economic development (NED) associated with the deep-draft navigation features of water resources plans and projects. Deep-draft navigation features include construction of new harbors and channels and improvements to existing or natural harbors on the seacoasts to meet the requirements of ocean going and Great Lakes shipping. Harbor improvements include such structural projects as the construction of breakwaters and jetties to protect exposed harbors and the provision of entrance channels, interior channels, turning basins, and anchorage areas. Nonstructural deep-draft measures include improved traffic management and pilotage

regulations. The Institute of Water Resources is currently developing risk-based analysis procedures for deep-draft navigation studies. Unlike the current risk-based flood damage model, the navigation model will integrate both benefit uncertainty, related to fleet and commodity forecasts and vessel operating costs, with cost uncertainty related to dredging and disposal costs. Districts are expected to continue to use risk and uncertainty techniques in all navigation studies, at least in the form of sensitivity analyses, before field release of the risk-based navigation models.

b. Conceptual Basis. The basic economic benefits from navigation management and development plans are the reduction in transportation costs for commodities and the increase in the value of output for goods and services. Specific transportation savings may result from the use of larger vessels, more efficient use of large vessels, more efficient use of existing vessels, reductions in transit time, lower cargo handling and tug assistance costs, reduced interest and storage costs such as from an extended navigation season, and the use of water transportation rather than an alternative land mode. Principal direct benefits are categorized as follows:

(1) Cost Reduction Benefits. If there is no change in either the origin or destination of a commodity, the benefit is the reduction in transportation costs of quantities of the commodity that would move with and without the plan resulting from the proposed improvement. Cost reduction benefits apply in the following situations:

Table E- 2 Summary of Annualized NED Benefits For Alternative Projects

(Applicable discount rate: ____ )

| | Alternatives | | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | X |
| Navigation benefits: | | | | |
| Cost reduction benefits | ..... | ..... | ..... | ..... |
| Shift of mode benefits | ..... | ..... | ..... | ..... |
| Shift in origin-destination benefits | ..... | ..... | ..... | ..... |
| New movement benefits | ..... | ..... | ..... | ..... |
| Total navigation benefits | ..... | ..... | ..... | ..... |
| Other purpose benefits | ..... | ..... | ..... | ..... |
| Total project benefits | ..... | ..... | ..... | ..... |
| Project costs | ..... | ..... | ..... | ..... |
| Net benefits | ..... | ..... | ..... | ..... |

## Table E- 3 Time Phasing of NED Benefits For Recommended Project[1]
(Applicable discount rate: ____ )

| | Time Period[1] | | | | | | |
|---|---|---|---|---|---|---|---|
| | Base Years Specify | Decade[2] | | | | | |
| | | 1 | 2 | 3 | 4 | 5 | AAE[3] |
| Navigation benefits: | | | | | | | |
| Cost reduction benefits: | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Traffic volume | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| ($10^3$ tons/year) ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Benefits ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Shift mode benefit: | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Traffic volume | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| ($10^3$ tons/year) ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Benefits ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Shift in origin-destination benefit: | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Traffic volume | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| ($10^3$ tons/year) ..... | ..... | ..... | ..... | ..... | | ..... | ..... |
| Benefits ..... | | | | | ..... | | |
| New movement benefit: | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Traffic volume | ..... | ..... | ..... | ..... | | ..... | ..... |
| ($10^3$ tons/year) ..... | | | | | ..... | | |
| Benefits ..... | ..... | ..... | ..... | ..... | | ..... | ..... |
| Total navigation benefits ..... | | | | | | | |
| Other purpose benefits ..... | | | | | | | |
| Total project benefits ..... | | | | | | | |

[1]Comparable tables may be made for all detailed alternatives.
[2]Value for last year of decade. [3]Average annual equivalent.

## Table E- 4 Waterway Traffic and Delays, Without Project Condition

| | Current Year | Base Year | Time Period[1] | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Decade | | | | | |
| | | | 1 | 2 | 3 | 4 | 5 | AAE[2] |
| Waterway traffic ($10^3$ tons/year)..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| (By major commodity group)..... | | | | | | | | |
| Delays (minutes/tow): | | | | | | | | |
| Study site ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Critical constraints ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Total system ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Delays (dollars/ton): | | | | | | | | |
| Study site ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Critical constraints ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Total system ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |

[1]Value for last year of decade.
[2]Average annual equivalent.

Table E- 5 Waterway Traffic and Delays, With Recommended Project[1]

(Applicable discount rate: ____ )

| | Time Period[1] | | | | | | |
|---|---|---|---|---|---|---|---|
| | Base Year | Decade[2] | | | | | |
| | | 1 | 2 | 3 | 4 | 5 | AAE[3] |
| Waterway traffic ($10^3$ tons/year)..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| (By major commodity group)..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Delays (minutes/tow): | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Study site ..... | | | | | | | |
| Critical constraints ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Total system..... | | | | | | | |
| Delays (dollars/ton): | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Study site ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Critical constraints ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Total system..... | | | | | | | |

[1]Comparable tables may be made for all detailed alternatives.
[2]Value for last year of decade.
[3]Average annual equivalent.benefits.

(a) Same commodity, origin-destination, and harbor. This situation occurs where commodities now move or are expected to move via a given harbor with or without the proposed improvement.

(b) Same commodity and origin-destination, different harbor. This situation occurs where commodities that are now moving or are expected to move via alternative harbors without the proposed improvement would, with the proposed plan, be diverted through the subject harbor. Cost reduction benefits from a proposed plan apply to both new and existing harbors and channels.

(c) Same commodity and origin-destination, different mode. This situation occurs where commodities that are now moving or are expected to move via alternative land modes without the proposed improvement would, with the proposed plan, be diverted through the subject harbor or channel. Cost reduction benefits from a proposed plan apply to both new and existing harbors and channels. Compute cost reduction benefits for alternate modes in accordance with methodology described in paragraph E-9b.(3).

(2) Shift of Origin Benefits. If there is a change in the origin of a commodity because of a proposed plan but no change in destination, the benefit is the reduction in the total cost of producing and transporting quantities of the commodity that would move with and without the plan.

(3) Shift of Destination Benefits. If there is a change in destination of a commodity because of a proposed plan but no change in origin, the benefit is the change in net revenue to the producer for quantities that would move with and without the plan.

(4) Induced Movement Benefits. If a commodity or additional quantities of a commodity are produced and consumed as the result of lowered transportation costs, the benefit is the value of the delivered commodity less production and transportation costs. More precisely, the benefit of each increment of induced production and consumption is the difference between the cost of transportation via the proposed improvement and the maximum cost the shipper would be willing to pay. Where data are available, estimate benefits for various increments of induced movement. In the absence of such data, the expected average transportation costs that could be borne by the induced traffic may be assumed to be half way between the highest and lowest costs at which any part of the induced traffic would move.

c. Planning Setting. The planning setting consists of the physical, economic, and policy conditions that influence and are influenced by a proposed plan or project over the planning period. The planning setting is defined in terms of a without project condition and with project condition.

(1) Without Project Condition. The without project condition is the most likely condition expected to exist over the planning period in the absence of a plan, including any known change in law or public policy. It provides the basis for estimating benefits for alternative with project conditions. Assumptions specific to the study should be stated and supported. The basic assumptions for all studies are:

(a) Nonstructural measures within the authority and ability of port agencies, other public agencies, and the transportation industry determine changes that are likely to occur. These measures consist of reasonably expected changes in management and use of existing vessels and facilities on land and water. Examples are lightering, tug assistance, use of favorable tides, split deliveries, topping-off, alternative modes and ports, and transshipment facilities.

(b) Alternative harbor and channel improvements available to the transportation industry over the planning period include those in place and under construction at the time of the study and those authorized projects that can reasonably be expected to be in place over the planning period.

(c) Authorized operation and maintenance is assumed to be performed in the harbors and channels over the period of analysis unless clear evidence is available that maintenance of the project is unjustified.

(d) In projecting commodity movements involving intermodal movements, sufficient capacity of the hinterland transportation and related facilities, including port facilities, is assumed unless there are substantive data to the contrary.

(e) A reasonable attempt should be made to reflect advancing technology affecting the transportation industry over the period of analysis. However, the benefits from improved technology should not be credited to the navigation improvement if the technological change would occur both with and without the plan.

(2) With Project Condition.

(a) The with project condition is the one expected to exist over the period of analysis if a project is undertaken. Describe the with project condition for each alternative plan. Since benefits attributable to each alternative will generally be equal to the difference in the total transportation costs with and without the project, the assumptions stated for the without project condition are used to establish the with project condition for each alternative.

(b) Management practices that are sometimes within the discretion of a public entity and are therefore subject to change in the with project condition include traffic management, pilotage regulations, addition of berths, and additions or modifications to terminal facilities.

(3) Display. In the planning report, present the derivation and selection of with and without project conditions in accordance with the following guidelines:

(a) State the assumptions specific to the study.

(b) Specify the significant technical, economic, environmental, social, and other elements of the planning setting to be projected over the period of analysis. Discuss the rationale for selecting these elements.

(c) Present the with and without project conditions in appropriate tabular and graphic displays with respect to the elements selected above and as exemplified by Tables E-6, E-8, and E-9.

d. Evaluation Procedures: General. Use the following steps to estimate navigation benefits. The level of effort expended on each step depends upon the nature of the proposed improvement, the state-of-the-art for accurately refining the estimate, and the sensitivity of

project formulation and evaluation to further refinement. A flow chart of navigation evaluation procedures is shown in Figure E-2. Additional detailed support material for conducting NED evaluation may be found in Deep Draft Navigation (IWR Report 91-R-13, October 1987). This manual provides an expanded description of benefit evaluation procedures for all commercial navigation projects not a part of the inland waterways system. It also provides sources of information to identify and estimate future project use. Policy statements in this regulation take precedence in any apparent contradiction suggested by information contained within this IWR report.

(1) Step 1--Determine the Economic Study Area. Delineate the economic study area that is tributary to the proposed harbor and channel improvement. Assess the transportation network functionally related to the studied improvement, including the types and volumes of commodities being shipped, in order to determine the area that can be served more economically by the improvement. Include foreign origins and destinations in this assessment. Consider diversion from or to adjacent competitive harbors as well as distribution via competing modes of transport. It should be recognized that the lines of demarcation for the economic study area are not fixed and that the area may expand or contract as a result of innovations or technological advances in transportation or production or utilization of a particular commodity. The economic study area is likely to vary for different commodities. Combinations of economic areas will result in a trade area delineated specifically for the improvement under study. However, in many cases, due to the close proximity of adjacent harbors to the proposed improvement, the economic study area may be the same as, or overlap with, such adjacent harbors. Therefore, the final delineation of the economic study area for a given improvement, should adequately discuss the trade area relative to adjacent ports and any commonality that might exist.

(2). Step 2--Identify Types and Volumes of Commodity Flow. To estimate the types and volumes of commodities that now move on the existing project or that may be attracted to the proposed improvement, analyze commerce that flows into and out of the economic study area. This analysis provides an estimate of gross potential cargo tonnage; the estimate is refined to give an estimate of prospective commerce that may reasonably be expected to use the harbor during the period of analysis in light of existing and prospective conditions. If benefits from economies of ship size are related to proposed deepening of the harbor, the analysis should concentrate on the specific commodities or types of shipments that will be affected. Thus, an historical summary of types and trends of commodity tonnage should be displayed. The considerations generally involved in estimating current volumes of prospective commerce are discussed in the following paragraphs.

(a) If the plan consists of further improvements to an existing project, statistics on current waterborne commerce will provide the basis for evaluation. For new harbors with no existing traffic, or for existing commodity movements that may be susceptible to diversion from adjacent

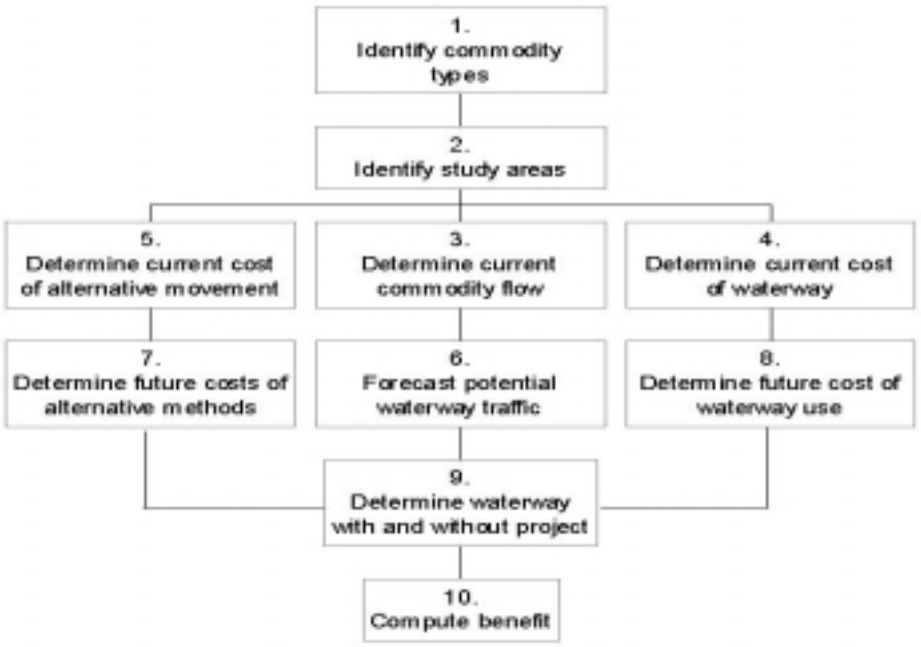



Figure E- 2 Deep-Draft Navigation Benefit Evaluation Procedure

harbors, basic information is collected by means of personal interviews or questionnaires sent to shippers and receivers throughout the economic study area. Secondary commercial data are usually available through State and local public agencies, port records, and transportation carriers. In the case of new movements, give attention of resource and market analyses.

(b) After determining the types and volumes of commodities currently moving or expected to move in the economic study area, it is necessary to obtain origins, destinations, and vessel itineraries in order to analyze the commodity types and volumes that are expected to benefit from the proposed improvement. Commodities that are now moving without the project but would shift origins or destinations with the project, as well as induced movements, should be segregated for additional analysis (see steps 5 and 6). A study should be made of various alternatives for the existing traffic and of new traffic susceptible to diversion from alternative harbors or other modes of transportation. The objective of such a study is to determine the type and volume of those commodities for which savings could be affected by movement via a proposed navigation improvement and the likelihood that such movements would occur. Cost reduction benefits sufficient to divert traffic from established distribution patterns and trade routes are navigation project benefits. In determining the likelihood of prospective commerce,

particular attention should be given to alternative competitive harbors in the case of new movements and to hinterland traffic. Elements of analysis of current tonnage include: size and type of vessel, annual volume of movements, frequency of movements, volume of individual shipments, adequacy of existing harbor and transportation facilities, rail and truck connections, and service considerations. Generally this prospective traffic is the aggregate of a large number of movements (origin-destination pairs) of many commodities; the benefit from the navigation project is the savings on the aggregate of these prospective movements.

(3). Step 3--Project Waterborne Commerce. Develop projections of the potential use of the waterway under study for selected years from the time of the study until the end of the project life, over time intervals not to exceed 10 years. Document commodity projections for the commodity groups identified in step 2.

(a) The usual procedure for constructing commodity projections is to relate the traffic base to some type of index over time. Indices can be constructed by many different methods, depending on the scope and complexity of the issue under consideration and availability of data and previous studies.

(b) Generally, Bureau of Economic Analysis (BEA), previously OBERS, projections are the demographic framework within which commodity projections are made. There are many instances, however, in which a direct application of BEA-derived indices is clearly inappropriate. Frequently, there are circumstances that distort the relationship between waterway flows and the economy described by BEA. Even when total commodity flows can be adequately described through the use of indices derived from BEA projections, factors such as increasing environmental concerns, changes in international relations and trade, resource depletion, and other factors, may seriously alter the relationship between waterway commodity flows and the economy described by BEA.

(c) If problems of the type described in paragraph (b) above are identified, undertake independent studies to ascertain the most appropriate method of projecting commodity flows. The assessment of available secondary data forms the basis of these independent studies. These data will assist in delineating the bounds on the rate of increase for waterway traffic, as well as facilitate a better understanding of the problem. Supplement these data with (1) interviews of relevant shippers, carriers, and port officials; (2) opinions of commodity consultants and experts; and (3) historical flow patterns. Commodity projections can then be constructed based on the results of the independent studies.

(d) Generally, specific commodity studies are of limited value for projections beyond approximately 20 years. Given this limitation, it is preferable to extend the traffic projections to the end of project life using general indices on a regional and industry basis. Such indices can be constructed from the BEA projections or other generally accepted multi-industry and regional

models. Describe projection methods selected in sufficient detail to permit a review of their technical adequacy.

(e) Sensitivity analysis of several levels of projections is used for the economic analysis. There may be high-level projection embodying optimistic assumptions and a low-level projection based on assumptions of reduced expectations. The high and low projections should bracket the foreseeable conditions. The third and fourth levels of projections can reflect the with- and without-project conditions based on the most likely estimates of the future. If a proposed plan would not induce commodity growth, one level of projection may be shown for both the with and without project conditions.

(f) The commodities included in the projections should be identified, if possible, according to the following waterborne modes: containerized, liquid bulk, dry bulk, break-bulk, etc. Projection-related variables include estimated value, density, and perishability. Imports, exports, domestic shipments, domestic receipts, and internal trade should also categorize the commodities. Projected tonnages by trade areas both with and without the project should be displayed at least for the study year, the base year, fifth year, tenth year, and then by decades over the period of the analysis.

(g) Most projections of waterborne commerce are static estimates of dynamic events; therefore, the projections should be sufficiently current to support the report conclusions.

(4) Step 4--Determine Vessel Fleet Composition and Cost.

(a) Vessel Fleet Composition. Key components in the study of deep-draft harbor improvements are the size and characteristics of the vessels expected to use the project. Present data on past trends in vessel size and fleet composition, and on anticipated changes in fleet composition over the project life. Use estimates of future fleet consistent with domestic and world fleet trends. Undertake studies to the extent necessary to determine the appropriate vessel fleet. The assessment of available secondary data forms the basis of the independent studies. Data may be obtained from various sources including the U.S. Department of Transportation (Maritime Administration), trade journals, trade associations, shipbuilding companies, and vessel operating companies, as well as forecasts collected and prepared by IWR. Determine the composition of the current and future fleet that would utilize the subject harbor with and without the proposed improvement. Provide adequate lead time for anticipated changes in fleet composition for vessels that are currently a small part of the world fleet. Size selection may vary according to trade route, type of commodity, volume of traffic, canal restrictions, foreign port depths, and lengths of haul. It may not be realistic to assume that the optimum size vessel is always available for charter; the preferred approach is a fleet concept that includes a range of vessels expected to call with and without the project. It is suggested that tabulations in the reports show composition of vessel fleets by deadweight tonnage for each type of vessel

beginning with the current fleet and by decades through the period of analysis. Historical records of trips and drafts of vessels calling at the existing project should also be displayed.

(b) Vessel Operating Costs. To estimate transportation costs, obtain deep-draft vessel operating costs for various types and classes of foreign and United States flag vessels expected to benefit from using the proposed improvement. Since vessel operating costs are not readily available from ocean carriers or from any central source, the Corps of Engineers, Water Resources Support Center, will develop and provide such costs on an annual basis for use in plan evaluation. Planners should determine to what extent these estimates of vessel costs must be modified to meet the needs of local conditions. Document and display selected vessel operating costs in the report.

(5) Step 5--Determine Current Cost of Commodity Movements. Determine transportation costs prevailing at the time of the study for all tonnage identified in Step 2. Transportation costs include the full origin-to-destination cost, including necessary handling, transfer, storage, and other accessory charges. Construct costs for the with and without project condition. The without project condition is based on costs and conditions prevailing at the time of the study. Transportation costs with a plan reflect any efficiencies that can be reasonably expected, such as larger vessels, increased loads, reduction in transit time and delays (tides), etc. Use competitive rates, rather than costs, for competitive movements by land (See paragraphs E-10b.(1)(c), E-9b.(5), and E-9d.(5)(b)). This concept also applies to Steps 6, 7, and 9 and elsewhere where a competitive movement by land is an alternative.

(6) Step 6--Determine Current Cost of Alternative Movement. Determine transportation costs prevailing at the time of the study for all tonnage identified in Step 2 for alternative movements. The cost includes the full origin-to-destination cost. Such alternatives include competitive harbors, lightering, lightening and topping-off operations, off-shore port facilities, transshipment terminals, pipelines, traffic management, pilotage regulations, and other modes of transportation. Consider competitive harbors with existing terminal facilities and sufficient capacities as possible alternatives for traffic originating in or destined to the hinterland beyond the confines of the harbor and for all other new commerce as well as all diverted traffic. Commerce with final origins and destinations within the confines of the study harbor is normally noncompetitive with other harbors and need not be considered for diversion unless unusual circumstances exist. Diversion of established commerce now moving through the existing harbor to or from the hinterland is dependent on many different cost and service factors; therefore, to ensure that all of these factors are included in the analysis, interviews, and consultations with shippers and receivers should be conducted prior to any determination concerning diversion of traffic. Factors to be considered in the analysis include transportation costs for both inland and ocean movement, handling and transfer charges, available service and schedules, carrier connections, institutional arrangements, and other related factors. In addition, for commodities with shifts in origins and destinations, as well as for new movements, collect data on the value of the delivered product as well as production and transportation costs for

shipments with the project. The specific data and method of collection will vary with the specific situation and the nature of the benefit.

(7) Step 7--Determine Future Cost of Commodity Movements. Estimate relevant shipping costs during the period of analysis and future changes in the fleet composition, port delays, and port capacity under the with and without project conditions for each alternative improvement under study. Base future transportation costs on the vessel operating cost prevailing at the time of the study. Additional data may be needed to analyze the relationship between total volume and delay patterns and the port capacity for the with and without project conditions for each alternative. Changes in costs due to the project should be identified and separated from changes due to other factors.

(8) Step 8--Determine Use of Harbor and Channel With and Without Project. At this point, the analyst will have a list of commodities that potentially might use the proposed improvement; potential tonnages of each commodity or commodity group; transportation costs for alternatives and for the proposed improvement; and present and future fleet composition with and without the proposed plan. To estimate the proposed harbor use over time, both with and without the project, compare costs, other than projects costs, for movements via the proposed plan and via each alternative. Analyze any changes in the cost functions and demand schedules in the current and future without condition and the current and future with condition. Conceptually, this step includes all factors that might influence a demand schedule. Determine the impact of uncertainty in the use of the harbor, the level of service provided, and existing and future inventories of vessels. Provide adequate lead time for adoption for vessels that are currently a small percentage of the world fleet.

(9) Step 9--Compute NED Benefits. Once the tonnage moving with and without a plan is known and the cost via the proposed harbor and via each alternative are known, compute total NED navigation benefits will be computed using the applicable discount rate.

(a) Cost Reduction Benefits.

(1) Traffic with same commodity, origin-destination, and harbor. For traffic now using the harbor or expected to use it, both with and without the proposed project, the transportation benefit is the difference between current and future transportation cost for the movement by the existing project (without project condition) and the cost with the proposed improvement (with project condition).

(2) Traffic with same origin-destination; different harbor. For commerce shifted to the proposed improvement from other harbors or alternatives, including future growth, the benefit is

any reduction in current and future costs when movement via the proposed improvement is compared with each alternative.

(3) Traffic with same commodity and origin-destination, different mode. For commerce shifted to the proposed improvement from other modes, the benefit is any reduction in current and future costs to the producer or shipper. (See paragraph E-10b(1)(c) when movement via the proposed improvement is compared with each alternative.)

(b) Shift of Origin Benefits. For commerce that originates at a new point because of the proposed improvement, the benefit is the difference between the total cost of producing and transporting the commodity to its destination with and without the plan.

(c) Shift of Destination Benefits. For commerce that is destined to a new point because of the proposed improvement, the benefit is the difference in net revenues to producers with and without the plan.

(d) Induced Movement Benefits. If a commodity or additional quantities of commodity are produced and consumed as a result of a plan, the benefit for each increment of induced production and consumption is the difference between the cost of transportation via the proposed improvement and the maximum cost the shipper would be willing to pay. To determine the maximum cost other shipper would be willing to pay, estimate how much of a price increase it would take to induce the producer to increase its output by each increment or how much of price decrease it would take to induce consumers to increase their consumption by each increment. In the absence of data suitable for incremental analysis, the expected average transportation costs that could be borne by the induced traffic may be assumed to be half way between the highest and lowest costs at which any part of the induced traffic would move.

e. Problems in Application.

(1) Multiport Analysis. This procedure calls for a systematic determination of alternative routing possibilities, regional port analyses, and intermodal networks that may require the use of computer modeling techniques. The data needed for such a determination are often difficult to obtain; therefore, interviews with knowledgeable experts will often have to be relied upon.

(a) The economic study area tributary to the proposed harbor project is likely to vary for different commodities because of differences in hinterland transportation costs and facilities, and presence of competing ports. The trade area for any given port must be defined in cognizance of trade areas for adjacent or competing ports.

(b) Potential reductions in transportation costs due to a proposed project result in transportation benefits with varying degrees of certainty. The certainty of the benefit is related to

the certainty that the commodity movements will take place, with benefits for existing movements most certain. Analysis of potential or prospective movements must consider competing ports, hinterland transportation, vessel itineraries, ultimate origins or destinations of commodities, and assess the certainty with which benefits will accrue.

(c) A port study must recognize the degrees to which the ships that call or might call at that port are part of a larger waterborne transportation system. Specifically, the characteristics of vessels and the composition of the vessel fleet are affected in varying degrees by changes in costs or conditions at one port. A proposed deepening at a particular port, for example, may have more effect on some ships calling there than others if the ships have different modes of operation. Some bulk carriers may be affected because only one other port is served, while container operations may not be much affected because several additional ports are served. The size and characteristics of ships expected to use a project shall be determined in light of the transportation systems in which they operate, as well as world and domestic trends in fleet composition.

(d) US ports operate in a system(s). A study that appropriately considers a port in isolation will be rare. In such a case the report shall document why systems considerations are not relevant.

(2) Ultimate Origins and Destinations. The procedure calls for an analysis of full origin-destination costs to determine routings as well as to measure benefits in some instances. Problems will arise in determining the ultimate origins and destinations of commodities and in determining costs. Therefore, the analyst should attempt to shorten the analysis to the most relevant cost items.

(3) Underkeel Clearance and Risk Analysis. The purpose of Corps of Engineers' underkeel design standards is to provide clearance between a ship's bottom and a channel's bottom, which minimizes the risk of grounding by a design vessel under design conditions in the design channel. That is, underkeel clearances are engineering judgment on the minimum amount of clearance to assure safety and do not necessarily reflect actual behavior. When ships appear to operate with substandard underkeel clearances, procedures for correct delineation of transportation costs and project benefits may seem ambiguous.

(a) The starting point in analysis is to develop an accurate picture of the existing conditions. Accurate information on operating practices is particularly important; without this, reasonable without-project and with-project conditions, and hence economic analysis, is not possible. Entering and departing vessel drafts in economic analyses shall reflect actual practices. Adherence to Corps' clearance standards shall not be assumed.

(b) Determine whether observed apparent deviations from underkeel clearance standards represent actual encroachments in the safety zone. Apparent encroachments may be due to ships' physical characteristics (e.g. size) and operating characteristics (e.g. speed, trim) which differ from the design ship's characteristics, or from navigation conditions (e.g., wave climate) less severe than the design conditions. Alternatively the apparent deviations may be due to use of favorable tides or lake levels, or to exploitation of actual channel depths which differ from authorized depths. Benefits shall be based on differences in transportation cost, taking into account without-project actual operating practices and with-project actual operating practices. Adjustments may be taken, as appropriate, to the extent that these practices themselves affect transportation costs (e.g., tidal delays, costs of reduced speed or changing trim).

(c) For cases where it is determined that encroachment in the safety zone is taking place, risk accepting behavior may be assumed. The following benefit evaluation logic will be used: Transportation firms will accept risk up until the point where the incremental revenue from accepting risk equals the incremental risk cost of doing so. Estimate the incremental revenue associated with navigation at successively deeper drafts (I. e. smaller clearances) for those ships which use the safety zone. Estimate the risk costs (e.g., probability weighted cost of grounding) for those ships. Equilibrium between incremental revenue and incremental risk cost may be assumed to occur at the actual operating drafts (clearances) of those ships. Benefits are the area under the incremental revenue curve and costs are the area under the incremental risk cost curve, between the without and with operating depths.

(4) User Fees. The Water Resources Development Act of 1986 enabled non-Federal interests, as a means of financing a harbor project's local cost share, to collect user fees from vessels. Non-Federal interests are not directed to use fees to finance the local cost share, but if a fee is used only the benefiting vessels may be assessed charges.

(a) At the time of feasibility studies it may not be known with certainty whether user fees will be charged. The with-project condition for economic analysis shall use planners' best appraisal regarding the likelihood of fees being assessed, taking into account the intentions of the non-Federal interest, practices at other ports, the willingness of vessels to pay user fees, and the competitiveness of alternative ports in light of fees at the project port.

(b) As a sensitivity, conduct an analysis using the alternative assumption.

(c) For cases with user fees, assess the effect of the fees on transportation rates and the levels of traffic at the project port, taking into account the type of use fee (e.g., ad valorem, lump sum, etc.). That portion of transportation charges to shippers that reflects user fees is credited as a benefit of the project. The fees are in effect a reimbursement of project costs which are otherwise accounted for in the benefit-cost analysis**.**

(5) Sensitivity Analysis. Districts are expected to use risk and uncertainty techniques in all deep draft navigation studies at least in the form of sensitivity analysis. The uncertainty in the estimates of critical variables should be analyzed. These variables specifically related to deep-draft navigation may be traffic projections, especially foreign shipments, fleet composition, and cost of commodity movements.

(6) Data Sources. The following discussion summarizes key data sources including problems in their use:

(a) Interviews. Collect data not available from secondary sources by personal interviews. (Use only interview forms approved by the Office of Management and Budget.) Display the questionnaire used and summary of responses in the project report in such a way that individual sources are not disclosed.

(b) Publications. Data concerning commerce in foreign trade, United States coastal shipping, and activities of U.S. flag vessels in foreign trade, together with limited data concerning the world fleet, are readily available from a number of Federal agencies, trade journals, and port publications. However, data concerning the foreign-flag fleet are often not regularly available in up-to-date form from sources in the United States. Principal governmental sources are the U.S. Army Corp of Engineers, the Maritime Administration and the Bureau of the Census. For more detailed background on world fleet trends, shipping outlooks, and vessel characteristics, available foreign literature must be carefully analyzed. A few of the available foreign ship registers and literature are listed below to illustrate the type of data available from foreign sources. Many of these sources are available through IWR.

- Lloyd's Register of Shipping, London (Annual).
- The Tanker Register, H. B. Clarkson (Annual).
- The Bulk Carrier Register, H. B. Clarkson (Annual).
- Shipping Statistics and Economics (and special reports), H. P. Drewry, London (Weekly).
- Fairplay International Shipping Journal (and special reports), London (Weekly).

f. Report and Display Procedures. Clear presentation of study results, as well as documentation of assumptions and steps in the analysis, will facilitate review of the report. Tables E-6 to E-9 are suggested. The number of displays will depend on the complexity of the study.

Table E- 6 Projected Vessel Fleet Size Distribution,[a]

Ft. Channel Plan

(by Percentage)

| Vessel size (D.W.T.) | Current[b] | Percentage of tonnage | | | | | |
|---|---|---|---|---|---|---|---|
| | | Base Year[c] | Year 5 | Year 10 | Year 20 | Year — | Year end |
| Total | | With Project | | | | | |
| Total | | Without Project | | | | | |

Table E- 7 Typical Vessel Dimensions of Vessel Fleet

by Type and Deadweight Tonnage

| Type | Vessel characteristics | | | |
|---|---|---|---|---|
| | DWT | Length | Beam | Draft, loaded |
| | | | | |

Table E- 8 Projected Commerce for Deep-Draft Traffic

| Commodity [1] | Current Year[2] | Base Year[3] | Year 5 | Year 10 | Year 20 | Year — | Year — | Year end | Average Annual |
|---|---|---|---|---|---|---|---|---|---|
| With project | | | | | | | | | |
| Without Project | | | | | | | | | |

[1]Commodities should be categorized by trade area.
[2]Study year.
[3]First year of project benefits.

Table E- 9 Projected Vessel Trips for Deep-Draft Traffic

| Commodity [1] | Current Year[2] | Base Year[3] | Year 5 | Year 10 | Year 20 | Year — | Year — | Year end | Average Annual |
|---|---|---|---|---|---|---|---|---|---|
| With project | | | | | | | | | |
| Without Project | | | | | | | | | |

[1]Commodities should be categorized by trade area.
[2]Study year. [3]First year of project benefits.

g. New Waterways. Determine the origins and destinations primarily by interviews of shippers and by resource studies.

h. Existing Waterways. Determine origins and destinations by analysis of data on existing use of the waterway segment under study; e.g., PMS and WCSC traffic traced to its ultimate origin and destination.

## E-11. NED Benefit Evaluation Procedure: Commercial Fishing

a. Purpose. This section provides procedural guidance for the evaluation of the national economic development (NED) benefits of water and related land resources plans to commercial fishing. These procedures apply to marine, estuarine, and fresh water commercial fisheries for both fish and shellfish.

b. Conceptual Basis.

(1) The NED benefits are conceptually measured as the change in consumers' and producers' surplus as a result of a plan. However, since proper measurement of these quantities ordinarily requires estimates of supply and demand elasticities, reasonable approximations may be obtained by the following methods:

(a) When no change in aggregate fish catch is expected as a result of a plan (perhaps because of an effective quota system), NED benefits may be measured as cost savings to existing fish harvests.

(b) When the fish catch is projected to change as a result of a plan, but the change is too small to affect market prices, a seasonally-weighted average of recent prices may be used to

value the without and with plan harvests. In this case, it may be convenient for computational purposes to break the total change in income into two parts: (a) the cost savings for the existing (without plan) catch; and (b) the change in net income associated with the incremental catch. This latter part may be measured as the change in total revenue due to the increased catch minus the change in total cost due to harvesting the increased catch.

(c) When the additional fish catch is expected to affect market prices, the change in net income may be estimated in two parts: (1) the cost savings for the existing, or without plan, catch; and (2) the change in net income associated with the incremental catch. The incremental gross revenue may be estimated by multiplying the change in catch by a price midway between expected without and with plan prices. The incremental cost of the harvest is then subtracted from the estimated incremental gross revenue.

(2) Harvest costs expected to vary between the with and without plan conditions should be analyzed.

(a) These include the cost of equipment ownership and operation; harvesting materials; labor and management; maintenance operation, and replacement. Examples of changed costs include reduced travel time, reduced travel time to safe moorage in storm conditions, reduced costs associated with more efficient or larger boats, reduced time awaiting favorable tides, damage reduction to vessels or facilities, reduced fish spoilage, and reduced maintenance expenditures. If costs associated with plan measures (e.g., dock costs, harbor facilities, etc.) are included in the plan cost analysis, exclude them from harvest costs.

(b) Value purchased input at current market prices. Value all labor, whether operator, hired or family at prevailing labor rates. Value management at 10 percent of variable harvest costs and interest at plan discount rates.

(c) Project current production costs to the selected time periods; any changes should reflect only changes in catch or physical conditions.

c. Planning Setting.

(1) Without Plan Condition. The without plan condition is the most likely condition expected to exist in the future in the absence of any of the alternative plans being considered. Several specific elements are included in the without plan condition:

(a) Habitat Condition. The biological resources consist of stocks of living resources subject to commercial fishing, any living resources ecologically related to the stocks, the migration pattern and reproduction rate of the stocks, and any physical characteristic of the environment essential to these living resources.

(b) The Institutional Setting. Existing and expected local, State, regional, national, and international policies and regulations governing the harvest and sale of the affected species, including the level of access to the fishery are included in the without plan condition. Other revisions of such policies and rules of the alternative plans being studied.

(c) Nonstructural Measures. The effects of implementing reasonably expected nonstructural measures. Nonstructural measures include prevention of pollution to the marine environment or relocation of shore facilities.

(d) Market Conditions. Information on the without plan situation includes the projected number of harvesters, the percentage of their time and capacity utilized, harvest technology, the markets in which they buy inputs, fishing efforts, probable harvests, harbors and channels utilized, ex-vessel price of harvests, and probable processing and distribution facilities. (See paragraph E-11c(1).) Project market conditions that are consistent with the projected biological and institutional conditions.

(2) With Plan Condition. The with plan condition is the most likely condition expected to exist in the future with a given alternative. The elements and assumptions included in the without plan condition are also included in the with plan condition. Special attention should be given to tracing economic conditions related to positive or negative biological impacts of the proposed plan.

d. Evaluation Procedure: General. Follow the steps described in the following paragraphs to estimate NED benefits to commercial fishing from water or related land resources plans. The level of effort expended on each step depends on the nature of the proposed project, the reliability of data, and the degree of refinement needed for plan formulation and evaluation (See Figure E-3). No specific risk-based procedures have been developed for commercial fishing evaluations. In studies where commercial fishing benefits constitute a significant portion of NED effects, FOAs are expected to perform, at a minimum, sensitivity analysis of key variables such as harvest costs, harvest rates an/or ex-vessel prices. FOAs should incorporate the key variables applicable to their specific study area in the risk-based analysis.

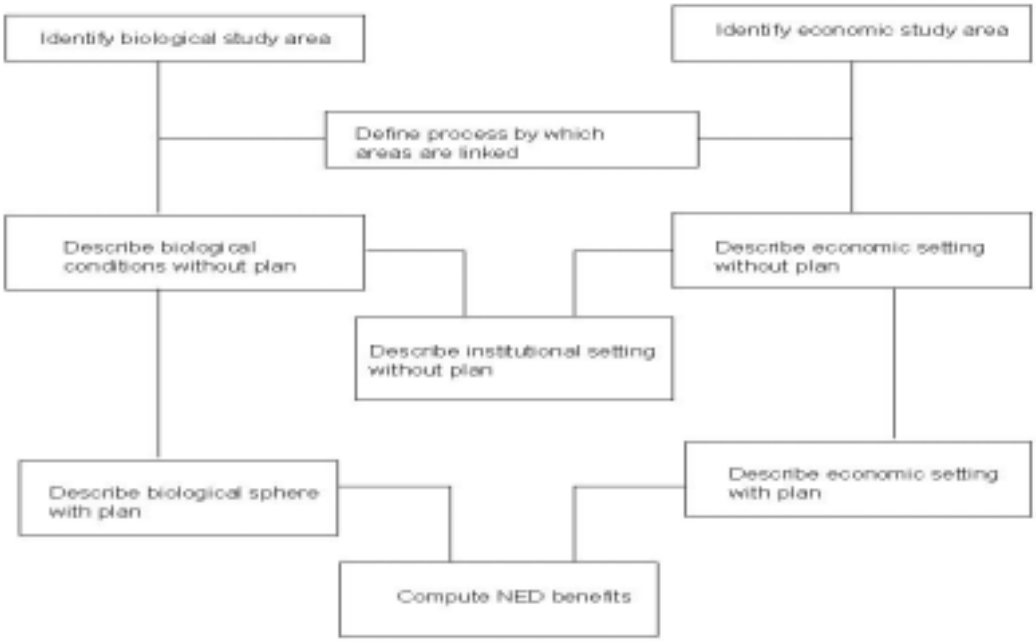



Figure E- 3 Commercial Fishing Benefits Evaluation Procedures

(1) Step 1: Identify the Affected Areas. Identify the areas which the proposed alternative plans will have biological impacts. Identify the areas in which the proposed alternative plans will have economic impacts. Describe the process by which the biological and economic study areas are linked.

(2) Step 2: Determine the Without Project Condition. Estimate the harvest of the relevant species in physical terms if a plan is not undertaken. Include a detailed description of the stock, including catch per unit of effort and whether the estimated harvest is at, or near, the range of absolute decreasing returns. Describe the most likely set of institutional conditions that would exist without a project. Estimate the total cost of harvesting the relevant species in each of the relevant years if a plan is not undertaken. For each relevant species, determine the current weighted ex-vessel price corrected for seasonal fluctuations.

(3) Step 3: Determine Conditions That Would Exist With an Alternative Plan. Estimate the harvest of the exploited stocks in each of the relevant years if an alternative plan is undertaken. Estimate the seasonally corrected current price of the harvested species and the total cost of harvesting in each of the relevant years if a plan is undertaken. This will require an understanding of the economics of entry and exit for the fish harvesting industry, as well as the effects of a change in harvest rates on the catch per unit of effort.

(4) Step 4: Estimate NED Benefits. Calculate the ex-vessel value of the harvest (output) for each alternative plan and for the without plan condition. Determine the harvesting costs, including non-project operation, maintenance, and replacement, for the level of catch (output) identified by each alternative plan and the without plan condition. Compute the NED benefit from an alternative plan as the value of the change in harvest less the change in harvesting cost from the without plan condition to the with plan condition.

e. Problems in Application.

(1) As the harvest rate of living stocks goes up, it is possible to reach a range in which the increases in annual harvesting efforts will actually produce a long-run decrease in the quantities harvested. In the absence of effective limits on harvesting, it is possible that commercial fishing will operate in this range of absolute decreasing returns. This is possible because individual operators will compare only their revenues and costs; they will not be concerned with the absolute productivity of the stock. This can be very important in determining NED benefits because what may appear to be a positive effect (something that encourages an increase in harvesting effort) may ultimately result in negative benefits (decreased total harvest and increased total cost per unit of harvest).

(2) The fact that fish are common, as opposed to private, property creates special problems in measuring NED benefits. Unless entry is restricted, excessive quantities of capital and labor may enter a fishery; that is, entry may continue until the “economic rent” from the living stock is dissipated. This excess entry will result in economic inefficiency in the utilization of fishery resources because the value of the resulting extra output will be less than the social opportunity cost of the entry. Some economic benefits may be realized but the total benefits will not be as large as they might be if entry were restricted. Although evaluation of this potential has been limited by the specification of the with and without plan condition in paragraph E-11c(1), three specific points are worth of separate mention.

(a) Transitory benefits. Because the benefits from harvesting open-access fisheries tend to be dissipated through entry of excess capital and labor, some NED benefits from commercial

fishing can be transitory. It will therefore be necessary to determine how many years these benefits will last and in what amounts for each year.

(b) Industry capacity. The excess capacity that will normally exist will make it difficult to obtain a proper estimate of changes in cost associated with changes in harvests. In some instances, idle boats will be available and the only additional costs will be operating costs. In other instances, vessels that are already operating will be able to harvest the extra catch without significant change in variable costs.

(c) Regulation. Because of the tendency of open-access fisheries to attract excess capital and labor which can deplete the stocks, most commercial fishing operations are currently subject to government regulations which stipulate the manner, time, place, etc., in which harvesting may take place. These stipulations usually result in harvesting activity that is not as economically efficient as it might be. These stipulations will therefore affect the size of NED benefits.

f. Data Sources.

(1) Data for annual harvests, demand, harvesting and processing costs, ex-vessel and other prices, physical production, biological modeling, models or information about management policies and regulations, and survey results are available from several Federal, State, and local government agencies, universities (especially those with sea grant programs), private organizations (such as industry groups, fishermen unions, or cooperatives), regional fisheries management councils, and international commissions or organizations.

(2) Initial contacts should be made with the National Marine Fisheries Service Regional Office, United States Coast Guard, State resource agencies having management or other responsibility for the fishery or resource in question, and all local or regional fishery councils, commissions, or institutes that have responsibility or jurisdiction or that are functioning within the area affected by the project. Fisheries dynamics biologists at universities or at National Marine Fisheries Service regional laboratories will be the best source of information on biological effects and their repercussion in the market.

g. Report and Display Procedures.

(1) Clear presentation of study results, as well as documentation of key input data assumptions and steps in the analysis, will facilitate review of the report. Table E-10 is a suggested method of data presentation. Its use will provide the reader with information on physical changes in output as well as value.

Table E- 10 Commercial Fishing Benefits

| Benefit | Years | | |
|---|---|---|---|
| | 1 | 2 | 3 |
| (1) Change in output..... | ..... | ..... | ..... |
| (2) Value of change in output (line 1 times expected price)..... | ..... | ..... | ..... |
| (3) Change in costs..... | ..... | ..... | ..... |
| (4) NED benefit (line 2 minus line 3)..... | ..... | ..... | ..... |

(2) Because the benefits are broken down into annual flows, it will be possible to determine if and when the open access nature of commercial fishing will lead to a dissipation of any NED benefits provided by the project.

E-12. Navigation: Small Boat Harbors.

a. Introduction. Small boat harbor projects consist of Federal features (e.g. channels, breakwaters), usually in combination with non-Federal features (e.g. docks, ramps, berthing or mooring areas, dredging). Project outputs are enhanced access to recreational boating and sport fishing opportunities, and commercial fishing activities. Benefit estimation for recreation boating and sport fishing is conceptually no different than for other forms of recreation, and any benefit estimation method may be employed as long as it reflects NED criteria. Charter fishing craft, head boats and similar recreation oriented commercial activities are considered commercial vessels for cost allocation purposes by law. Provided commercial recreation activities are evaluated based on changes in net income to the owner/operator, project output will be considered commercial navigation benefits. This change in net income measure of benefits is appropriate only for existing vessels currently using harbor facilities.

b. Recreational Boating. Section VII of this appendix identifies three evaluation methods for recreational boating: travel cost, contingent valuation (survey method) and unit day values. All are acceptable for evaluating boating recreation benefits. The unit day value method is applicable subject to restrictions (see paragraph E-48b.(4)(a).). The travel cost method employs expenditures associated with travel to and use of a resource as input data in determination of willingness to pay schedules. The contingent valuation method is a survey approach for determining willingness to pay. It can be useful for a wide variety of evaluation problems, and can be particularly applicable in valuing changes in quality (e.g. improved access in and out of harbor due to provision of breakwater) where changes in the scale of a project are not substantial.

Unit day values will ordinarily be chosen from the range of general recreation values (General Recreation or General Fishing and Hunting) although selection from the range of specialized recreation values (Specialized Fishing and Hunting and Specialized Recreation other than Fishing and Hunting) will sometimes be acceptable when participation in specialized activities is documented. Reduction of damage to boats and facilities may be a component of benefits. If damage reduction benefits are estimated, care should be taken to avoid double counting of benefits if other benefit estimation techniques are also used.

c. Commercial Fishing. Paragraph E-11 states that changes in net income to fish harvesters or boat operators is the appropriate measure of NED benefits. Two considerations, the habitat condition and the institutional setting, must be analyzed in planning reports. Reduction of damage to boats and facilities is frequently a component of commercial fishing benefits, and may apply as well to recreational boating. Reduced damages may be a part of the net income analysis or it may proceed as a separate analysis (e.g. damage reduced to public facilities not included in fish harvester's net income). It is frequently convenient to treat this damage on a probabilistic basis, i.e. product of probability of occurrence times dollar value of damage.

E-13. Federal and Non-Federal Participation.

a. Harbors and Waterways. Cost sharing is as modified by the Water Resource Development Act of 1986 (Public Law 99-662), as amended.

(1) Studies, Planning, Engineering, and Design. See Table E-11.

Table E- 11 Navigation, PED

Non-Federal Share: Studies, Preconstruction Engineering and Design (PED)

| Pre-construction Work | Commercial Navigation | Recreational Navigation | Inland Waterways |
|---|---|---|---|
| Reconnaissance Study | -0- | -0- | -0- |
| Feasibility Study | 50% | 50% | -0- |
| Preconstruction Engineering and Design | 25% | 25% | -0- |

(a) Section 105(a) of Public Law 99-662 specifies a 50 percent non-Federal cost share for all feasibility studies, except for studies of "inland waterway system" improvements. The law

does not define that system, and current Army policy is to limit the exemption to the waterways subject to waterway fuel taxes.

(b) Section 105(c) requires cost sharing of post-feasibility pre-construction engineering and design. Preconstruction engineering and design (PED), is all engineering, design, and planning, if any, accomplished after the feasibility phase. All preconstruction engineering and design for all projects authorized in or subsequent to Public Law 99-662 is to be cost shared at 75 percent Federal and 25 percent non-Federal.

(2) Construction, Operation, and Maintenance. Sections 101, 102 and 103(c)(4) of Public Law 99-662 specify the cost sharing for commercial harbor, inland waterway and recreational navigation projects.

(a) Harbors, General Navigation Features. (See Table E-12) Section 101 specifies cost shares for general navigation features that vary according to the channel depth: (20 feet or less, greater than 20 feet but not more than 45 feet, and greater than 45 feet). For general navigation features not changing depths, such as breakwaters, locks, channel widening, etc., cost sharing shall be at the percentage-applicable to the authorized or existing depth, whichever is greater. The percentage applies as well to mitigation and other work cost shared the same as general navigation features. The cost share is paid during construction. Section 101 also requires the project sponsor to pay an additional amount equal to 10 percent of the total construction cost for general navigation features. This may be paid over a period not to exceed thirty years, and LERRs may be credited against it.

(b) Waterways. Section 102 of PL 99-662 and subsequent legislation specify 100 percent Federal operation and maintenance on those parts of the inland waterways system paying fuel taxes. Section 102 also directs that 50% of the cost of construction is to come from the general fund of the treasury and 50% from the Inland Waterways Trust Fund. All other inland waterway construction is cost shared as commercial or recreational harbors depending on purpose. See the tables below, ER 1165-2-131, and Appendixes F and G for cost sharing percentages. If a project crosses cost share depth ranges, use each applicable range to determine overall cost share. Overdepth dredging is a maintenance strategy; cost sharing is at the nominal depth.

Table E- 12 Navigation, Construction and O&M

| | Non-Federal Share, Construction, Operation, and Maintenance | | | | |
|---|---|---|---|---|---|
| | Commercial Navigation | | | Recreation | Inland |
| | to 20’ | >20 to 45’ | >45’ | Navigation | Waterways |

| | | | | | |
|---|---|---|---|---|---|
| Construction | | | | | |
| Gen'l Nav.Features | 10+10%1/ | 25+10%1/ | 50+10%1/ | 50% | -0- |
| Aids to Navigation | -0- | -0- | -0- | -0- | -0- |
| Service Facilities | 100% | 100% | 100% | 100% | -0- |
| LERR | 100% | 100% | 100% | 100% | -0- |
| | | | | | |
| Operation & Maint. | | | | | |
| Gen. Nav. Features (incl mitigation) | -0- | -0- | 50% | 100% | -0- |
| Aids to Nav. | -0- | -0- | -0- | -0- | -0- |
| Service Facilities | 100% | 100% | 100% | 100% | 100% |
| LERRD | 100% | 100% | 100% | 100% | -0- |

1/ Ten percent (10%) post-construction contribution is reduced by credit amount for LERR.

b. Recreation. Section 103(c)(4) sets the non-Federal share of construction cost at 50 percent and O&M cost at 100 percent for recreation projects. For navigation projects these cost shares apply to separable recreation costs and costs allocated to recreation.

c. Special Navigation Programs. (See Table E-13.) Cost sharing is in accordance with program authorizations as amended by Public Law 99-662. Section 940 of Public Law 99-662 shifts all responsibility and costs for operation and maintenance of shore damage mitigation projects to a non-Federal public agency. Section 939 of Public Law 99-662 increases Corps authority to recover the cost of removing wrecks and obstructions from vessel owners, lessees, or operators.

d. Land Creation or Enhancement at Inland Harbors. Federal participation in inland waterway harbor improvements under the Civil Works program is not warranted when: (1) resale or lease of the lands used for disposal of excavated material can recover the cost of the improvements; or (2) the acquisition of land outside the navigation servitude is necessary for construction of the improvements, or would permit local interest to control access to the project. The latter case is assumed to exist where the proposed improvement consists of a new channel cut into land.

Table E- 13 Navigation, Special Navigation Programs

| Non-Federal Share, Special Navigation Programs |
|---|

| Program | Study | Construction | O&M |
|---|---|---|---|
| Removal of Wrecks, Obstruction | -0- | 100% recoverable | NA |
| Snagging and Clearing | 50% | 10+10% (<20') | NA |
| Drift & Debris Removal | 50% | one-third | 100% |
| Small Navigation Projects | | | |
| Commercial navigation | 50% | 10+10 (<20') | -0- |
| Recreational navigation | 50% | 50% | 100% |
| Modification of Bridges | -0- | project % (after cost apportionment to bridge owner) | 100% |
| Project Induced Damages | | | |
| Project damage only | -0- | project % | 100% |
| Additional Purposes | 50% | purpose % | 100% |
| Beneficial Uses of Dredged Material for Ecosystem Restoration | | | |
| (Section 204) | | Same as base plan | 100% |
| (Section 1135) | | 25% | 100% |

e. Land Creation at Harbors (Other Than Inland Harbors). Formulation and cost sharing of harbor projects that include land creation benefits must be in accordance with the following procedures.

(1) The NED plan relies on navigation benefits exclusively (land creation is not considered in the net benefit evaluation). Special cost sharing is required; it is based on the magnitude of land creation benefits relative to total benefits. The cost sharing formula is as follows:

(a) Assign LERR to the non-Federal sponsor. (Full credit of LERR toward 10% of GNF)

(b) Special non-Federal (GNF) cost sharing is equal to:

$$\text{GNF} = \frac{\text{(Land Creation Benefits for this plan)} \times \text{(GNF Costs)}}{\text{Total Benefits for this Plan}}$$

(c) Remaining costs are shared in accordance with Section 101 of PL 99-662, as amended, as described in Paragraph E-13a.

(2) Non-Federal requests for modification of the NED Plan formulated using navigation benefits may be allowed provided all additional implementation costs are non-Federal and the incremental navigation benefits equal or exceed the incremental O&M costs for the GNF. No additional cost sharing will be required for the land creation benefits associated with the project modifications beyond the NED Plan which are requested and paid for by non-Federal entities. The cost sharing formula by which this policy is to be applied is as follows:

(a) The non-Federal share shall be the non-Federal costs determined in paragraph E-13e.(1) plus 100 percent of the difference between the NED Plan and the cost of the requested modified plan; or all costs not assigned to the Federal government under paragraph (b) below, whichever is greater.

(b) The Federal share shall be the Federal costs determined in paragraph E-13e(1); or, when the modified NED Plan results in a cost for GNF that is less than the cost for GNF for the NED Plan, the Federal share of costs will be limited to the Federal percentage of the total GNF derived in paragraph E-13e(1), times the cost of the GNF for the modified NED Plan.

f. Land Creation Requirements. Reports proposing land creation, where the lands are necessary for development of port facilities to accommodate traffic, shall require the non-Federal sponsor to ensure the lands are retained in public ownership for uses compatible with the authorized purposes of the project. The non-Federal sponsor shall regulate the use, growth and development on such lands for those industries whose activities are dependent upon water transportation.

E-14. Special Considerations.

a. Study Authorities.

(1) Navigation Facilities Replacement. Continuing authority to study the replacement, reconstruction, or rehabilitation of Congressionally authorized navigation improvements is contained in Section 4 of the River & Harbor Act of 1884 as amended by Section 6 of the River & Harbor Act of 1909. This study authority is no longer used.

(2) Review of Completed Projects. Authority to study completed projects and report thereon to Congress, when advisable due to changed physical or economic conditions, is contained in Section 216 of the River & Harbor and Flood Control Act of 1970. Studies are initiated through the regular budget process as new reconnaissance starts.

(3) Special Programs. Continuing authority to study certain small or special purpose projects is contained in the legislation cited in “Special Navigation Programs” earlier in this section. Those study authorities are used routinely.

(4) Specific Authorization. All other projects require specific authorization in the form of legislation or resolutions by the appropriate committees of Congress.

b. Shoreline Changes. Pursuant to Section 5 of the River & Harbor Act of 1935 each investigation on navigation improvements potentially affecting adjacent shoreline will include analysis of the probable effects on shoreline configurations. A distance of not less than ten miles on either side of the improvement should be analyzed.

c. Charter Fishing Craft, Head Boats, and Similar Recreation-Oriented Commercial Activities. Section 119 of the River and Harbor Act of 1970 (Public Law 91-611), states, “The Chief of Engineers, For the purpose of determining Federal and non-Federal cost sharing relating to proposed construction of small-boat navigation projects, shall consider charter fishing craft as commercial vessels.” This Act applies only to cost allocation and cost apportionment and does not involve project evaluation in any way. Particularly, it does not determine consistency with Corps primary missions. This depends on whether the benefits are commercial navigation or recreation. Only if benefits to charter fishing craft are based on change in net income to the owner/operators of vessels which would exist and operate in the without project condition can commercial navigation benefits be claimed.

d. Subsistence Fishing. This is fishing, primarily for personal or family consumption, by those whose incomes are at or below the minimum subsistence level set by the Department of Commerce. For cost allocation purposes subsistence fishing is considered commercial fishing. Subsistence fishing is not a high priority output however.

e. Coast Guard Coordination. The U.S. Coast Guard is responsible For Federal aids to navigation and enforcement of navigation regulations. In addition to enforcing its own regulations, the Coast Guard also administers and enforces speed limits, anchorage areas, and other regulations issued under Corps authority. Corps districts should confer directly with the Coast Guard concerning establishment or alteration of aids to navigation, and the regulation of lighterage areas, anchorages and channels.

f. Permit Coordination. Formulation should consider whether associated or ancillary sponsor activities (or project user activities) are required to achieve project benefits, and whether Department of the Army (DA) permits are necessary. Examples are provision of mooring/berthing areas, dredge material containment areas and landside infrastructure. Once

activities are identified, a preliminary determination of whether they require DA permits, and of what types (i.e., an individual permit, a letter of permission, an existing general permit or a nationwide permit), will be made by the district regulatory element.

(1) When an activity likely will necessitate a DA permit it should be addressed in the environmental documentation of the project as required by NEPA, the Section 404 (b) (1) guidelines and other appropriate environmental statutes. It may be assumed that more detailed analysis for permitting purposes will proceed concurrent with PED studies.

(2) DA permitting activities should be discussed at public meetings or workshops held during planning or during PED. Public notices announcing meetings/workshops shall identify sponsor activities that could require DA permits. Public meetings or workshops should be coordinated with regulatory staff; coordination is particularly important if there is or will be an abbreviated processing procedure or a special management plan.

(3) Normally, Coastal Zone Management (CZM) concurrence or Section 401 water quality certification for an abbreviated processing procedure or special area management plan should be obtained concurrently with those required for the Corps project. It remains the responsibility of the project sponsor (or users) to obtain all required state and/or local permits.

g. Beneficial Use of Dredged Material. Construction and maintenance dredging of Federal navigation projects shall normally be accomplished in the least costly manner possible (ER 1130-2-520). Section 204 of the WRDA of 1992 established programmatic authority which allows the Corps to carry out ecosystem restoration projects in connection with dredging for construction, operation or maintenance of authorized navigation projects. Guidance for Section 204 is provided in Appendix F. Section 207 modifies Section 204 to allow the Corps select a disposal method that is not the least cost if determined that the incremental costs are reasonable in relation to the environmental benefits. Section 207 establishes an authority which is separate and distinct from the authority established by Section 204. Section 207 projects are not subject to the programmatic limitation of Section 204 and are budgeted through the standard appropriation process. Cost-sharing and decision making criteria are described in the following subparagraphs.

(1) Cost-Sharing. The cost-sharing for Section 207 projects is the same as Section 204 projects. The non-Federal interests must enter into a cooperative agreement in accordance with the requirements of section 221 of the Flood Control Act of 1970 in which the non-Federal interests agree to provide 25 percent of the cost associated with construction of the project for the protection, restoration, and creation of aquatic and ecologically related habitats, including provision of all lands, easements, rights-of-way, and necessary relocations; and pay 100 percent of the operation, maintenance, replacement, and rehabilitation costs associated with the project.

(2) Decision-Making Criteria. The decision making criteria is whether the incremental cost is reasonable in relation to the environmental benefits achieved. Where the incremental Federal costs is 25 percent of the total project cost or $300,000, whichever is less, the incremental costs are judged to be "reasonable" in relation to the environmental benefits without the need for detailed analysis. However, it must still be demonstrated that the environmental resources to be protected, restored, or created are valuable, the environmental outputs can be quantified and described and the environmentally beneficial disposal method is supported by Federal and state resource agencies. The environmental disposal method would be subject to appropriate National Environmental Policy Act requirements. For environmentally beneficial disposal methods that have incremental Federal costs which exceed 25 percent or $300,000, the incremental costs must be justified by demonstrating that the monetary and non-monetary benefits (outputs) of the ecosystem restoration project justify its incremental costs using cost effectiveness and incremental cost analysis. Where the environmentally beneficial use involves separable increments each increment must be justified. Refer to Section V of this appendix for further information on cost effectiveness and incremental cost analysis.

h. Placement of Dredged Material on Beaches for Hurricane and Storm Damage Reduction. When placement of dredged material (beach quality sand) on a beach is the least costly acceptable means for disposal, then such placement is considered integral to the project and cost shared accordingly. In cases were placement of dredged material on a beach is more costly than the least costly alternative, the Corps may participate in the additional placement costs when: (1) requested by the state; (2) the Secretary of the Army considers it in the public interest; and (3) the added cost of disposal is justified by hurricane and storm damage benefits (see Section IV of this appendix). When all local cooperation requirements are met the Corps may cost share the additional costs 50 percent (Section 933, WRDA 1986, as amended). In cases where the additional costs for placement of the dredged material is not justified, the Corps may still perform the work if the State requests it, and the state or other sponsor contributes 100 percent of the added cost. If the State requests, the Corps may enter into an agreement with a political subdivision of the State to place the sand on its beaches, with the subdivision responsible for the additional costs. The Corps should consider and accommodate to the degree reasonable and practicable a state’s or subdivision’s schedule for providing its cost share. Each placement event should be supported by a separate decision document. Subsequent decision reports may be supplements to the original Section 933 decision document.

E-15. Dredged Material Management Plans. All Federally maintained navigation projects must demonstrate that there is sufficient dredged material disposal capacity for a minimum of 20 years. A preliminary assessment is required for all Federal navigation projects to document the continued viability of the project and the availability of dredged material disposal capacity sufficient to accommodate 20 years of maintenance dredging. If the preliminary assessment

determines that there is not sufficient capacity to accommodate maintenance dredging for the next 20 years, then a dredged material management study must be performed.

a. Policy.

(1) General.

(a) Sound management of dredged material is a priority mission of the Corps.

(b) The Corps is committed to conducting dredging and managing dredged material in an environmentally sound manner.

(c) The interests of economic development and environmental sustainability will best be served when dredged material placement proceeds according to a management plan. Therefore each existing and proposed navigation project will have a dredged material management plan that ensures warranted and environmentally acceptable maintenance of the project.

(d) Beneficial uses of dredged material are powerful tools for harmonizing environmental values and navigation purposes. It is the policy of the Corps that all dredged material management studies include an assessment of potential beneficial uses for environmental purposes including fish and wildlife habitat creation, ecosystem restoration and enhancement and/or hurricane and storm damage reduction. Districts and MSCs will make every effort to ensure that sponsors and other interests understand the valuable contributions that beneficial uses can make to management plans and will maximize use of regional forums to share experiences of opportunities for beneficial uses.

(e) Dredged material management goals are to be achieved by District and Division Commanders within existing delegations of authority. Exceptions to this principal are when problems arise that are of such significance that HQUSACE or Administration commitment is required such as changes in dredged material management practices that require substantial capital investment.

(2) Requirements. Dredged Material Management Plans (Management Plans) shall be prepared, on a priority basis, for all Federal navigation projects, or groups of inter-related harbor projects, or systems of inland waterway projects (or segments).

(a) Priority will be given to projects for which existing dredged material disposal sites, including existing confined disposal facilities, are expected to reach capacity or to no longer be available sometime in the next 10 years, or

(b) Existing and projected navigation usage of the project indicates that continued maintenance of the project, or of any substantial increment thereof, may not be warranted.

(c) Management Plans shall identify specific measures necessary to manage the volume of material likely to be dredged over a twenty year period, from both construction and maintenance dredging of Federal channel and harbor projects. Non-Federal, permitted dredging within the related geographic area shall be considered in formulating Management Plans to the extent that disposal of material from these sources affects the size and capacity of disposal areas required for the Federal project(s). In those cases where two or more Federal projects are physically inter-related (e.g., harbors which share a common disposal area or a common channel) or are economically complementary, one Management Plan may encompass that group of projects.

(3) Base Plan. It is the Corps of Engineers policy to accomplish the disposal of dredged material associated with the construction or maintenance dredging of navigation projects in the least costly manner. Disposal is to be consistent with sound engineering practice and meet all Federal environmental standards including the environmental standards established by Section 404 of the Clean Water Act of 1972 or Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972, as amended. This constitutes the base disposal plan for the navigation purpose. Each management plan study must establish this “Base Plan”, applying the principles set forth below.

b. Management Plan Development Principles.

(1) Existing Projects.

(a) Process. Management Plans are intended to cost effectively and expeditiously support environmentally acceptable channel and harbor maintenance. Plan development shall employ a phased process determining the appropriate scope and detail of required assessment. This process will:

(1) Establish the Base Plan for the project;

(2) Include an assessment of the potential for beneficial uses of dredged material which is proposed to be undertaken as separate plan elements pursuant to separate authority; and,

(3) Establish the Management Plan for the project, or if approval by higher authority is required elsewhere in this guidance, the District Commander’s recommended Management Plan.

(4) Demonstrate continued maintenance is economically warranted based on high priority (non-recreation) benefits. If it cannot be demonstrated based on high priority benefits but would otherwise be warranted considering recreation benefits, recommendations will state that project is economically warranted using recreation benefits.

(b) Phases. Management Plan development shall proceed in the following phases:

(1) Preliminary Assessment. Preliminary assessments establish whether more detailed study is required to establish a management plan, and, if so, provides information to justify the study and permit its prioritization in the budgetary process. For many projects with readily available maintenance and usage information, a preliminary assessment, based on indicators such as annual O&M costs per ton of cargo, volume and frequency of traffic, and vessel dimensions, may establish the Base Plan and confirm that continued maintenance appears to be warranted. Where these conditions are met, the findings of the Preliminary Assessment would complete the requirement for a Management Plan. Where these conditions are not met, the Preliminary Assessment will recommend a Management Plan Study.

(2) Management Plan Studies. A Management Plan Study shall be required to establish the Base Plan and the recommended Plan if basic indicators are inconclusive, or if attempts to define the Base Plan disclose significant problems, a major new investment, or other significant increase in maintenance costs. For example, the provision of a new confined disposal facility or use of more distant ocean disposal site would trigger this requirement. Management Plan studies shall be conducted in two phases: initial and final. The initial phase concentrates on developing a detailed scope of work, and the final phase executes that scope of work.

(2) Proposed Projects. Feasibility and Pre-construction Engineering and Design (PED) studies for proposed projects shall include a Management Plan in accordance with the criteria and procedures herein, as applicable.

c. Study Authority. Preliminary Assessment and Management Plan studies shall be conducted pursuant to existing authorities for individual navigation project feasibility studies, PED, construction, or O&M, as provided in Congressional Committee study resolutions and public laws authorizing specific projects. These specific study and/or project authorities are supplemented by general authorities relating primarily to beneficial uses of dredged material, as set forth in paragraph E-15f. Where Management Plan studies disclose the need to consider expanding or enlarging existing projects, such studies may only be pursued under specific study authority or under authority of Section 216 of the Flood Control Act of 1970.

d. Responsibilities.

(1) Existing Projects. Operations functional elements have program management responsibility for administering Dredged Material Management Plan preparation efforts for existing Federal projects. Those responsibilities include prioritizing and budgeting studies and providing subject matter expertise and guidance as members of the interdisciplinary study team. Planning functional elements have study management responsibility for conducting the studies required to implement effective dredged material management. Both elements have joint functional responsibility to ensure efficient use of shared resources.

(2) Proposed Projects. Planning functional elements are responsible for administering and conducting Management Plan studies for proposed projects. The Operations functional elements are essential participants and assume on-going responsibility for dredged material management following project completion.

e. Study Components.

(1) Alternatives. Management plan studies shall consider the full range of measures for dredged material management including: management of existing disposal sites to extend their life; various combinations of new disposal sites involving different disposal methods, disposal area locations, and periods of use; and, measures to reduce dredging requirements, including reduced dimensions. The Federal interest in continued O&M of an existing project for its navigation purpose is defined by that project of maximum scale and extent, within project authorization, for which continued maintenance is warranted in terms of vessel traffic and related factors.

(2) Beneficial Uses. Each Management Plan study shall include an assessment of potential beneficial uses of dredged material, for meeting both navigation and non-navigation objectives, including fish and wildlife habitat creation and restoration, hurricane and storm damage reduction, and recreation. Where a beneficial use is part of the Base Plan, it shall be treated as a general navigation O&M component. Beneficial uses which are not part of the Base Plan shall be considered separable elements of the management plan, and will be pursued in accordance with guidance implementing other available authorities. However, even though funded from different sources, the beneficial use planning effort must be pursued in conjunction with the overall management plan effort to assure the timely availability of dredged material for the beneficial use project. The beneficial use project site must be available to meet maintenance dredging disposal needs.

(3) Study Involvement and Coordination. District Operations and Planning functions must jointly ensure appropriate involvement of all resources and affected non-Federal interests in Management Plan studies, as follows:

(a) Interdisciplinary Analysis. The relevant professional disciplines needed to ensure sound professional decisions are to be involved.

(b) Partnership. Project sponsors, local governments, port authorities, and other project users and beneficiaries are partners in dredged material management, and have a key role as the project proponents in building local consensus for the Management Plan. A potential key role is played by the state governor to mediate sometimes competing state environmental, regulatory and economic objectives. All those having a partnership interest must be informed and involved throughout the course of all management plan studies.

(c) Review and Consultation. Federal, State and other public agencies with legal review, consultation, or other regulatory responsibilities are to be involved. Dredged material disposal is a multi-faceted issue, which involves both the water resources development, and regulatory responsibilities of the Corps. It involves the regulatory, water quality, hazardous, toxic, and radiological waste responsibilities of the U.S. Environmental Protection Agency (EPA) and state agencies. It also involves the environmental resources protection and management responsibilities of the National Marine Fisheries Service, the U.S. Fish and Wildlife Service and various state agencies as well as the economic and regional economic development interests of states, local governments, port authorities, maritime users and shippers.

(d) Public Involvement. Members of the public who are interested, likely to be affected, or otherwise have a stake in outcomes are to be kept informed and appropriately involved.

(4) Environmental Consistency. Management Plans shall be consistent with protecting the Nation's environment, pursuant to national environmental statues, applicable executive orders, and other Federal requirements. Management Plan studies shall address the requirements of all applicable environmental statues for all disposal options considered, including the requirements of the National Environmental Policy Act, Section 404 of the Clean Water Act, Section 103 of the Marine Protection, Research and Sanctuaries Act, and the Coastal Zone Management Act. Any dredged material assessment to determine compliance with the Clean Water Act, Section 404(b)(1) guidelines, will be performed in accordance with the manual "Evaluation of Dredged Material Proposed for Discharge in Inland and Near Coastal Waters: Testing Manual". The manual "Evaluation of Dredged Material Proposed for Ocean Disposal: Testing Manual, commonly referred to as the "Green Book", will be used for assessing material proposed for ocean disposal under Section 102 of the Marine Protection, Research and Sanctuaries Act. Regional variations of these two manuals, where approved by both the Corps and EPA, may also be used.

f. Cost Sharing and Financing.

(1) Management Plan Studies.

(a) Existing Projects.

(1) General. The cost of Management Plan studies for continued maintenance of existing Federal navigation projects are O&M costs and shall be Federally funded. For harbor projects, including inland harbors, such costs shall be reimbursable from the Harbor Maintenance Trust Fund, subject to the following:

(a)Project sponsors, port authorities and other project users, are partners in dredged material management and must pay the costs of their participation in the dredged material management studies including participation in meetings, providing information and other coordination activities.

(b) Budgeting priority for the navigation purpose is limited to the Base Plan. Therefore, the cost for any component of a management plan study attributable to meeting local or state environmental standards that are not provided for by the requirements of Federal laws and regulations, shall be a non-Federal cost.

(c) Study activities related to dredged material management for the Federal project, but not required for continued maintenance dredging and dredged material disposal, will not be included in dredged material management studies unless funded by others.

(d) Studies of project modifications needing congressional authorization, including dredged material management requirements related to the modification, will be pursued as feasibility studies under the authority of Section 216 of the Flood Control Act of 1970.

(2) Beneficial Uses. The cost of studies for beneficial uses that are consistent with, and part of, the Base Plan are Federal O&M costs. However, study costs for beneficial uses, which are not part of the Base Plan, are either a non-Federal responsibility, or are a shared Federal and Non-Federal responsibility. These include reconnaissance level studies needed to identify these potential uses as part of management plan studies. Depending on the type of beneficial use, it might also include:

(a) Ecosystem Restoration. The incremental costs of studies beyond those required for the Base Plan for the use of dredged material to improve, restore and protect environmental resources, pursuant to Section 204 of the WRDA of 1992 or Section 207 of the WRDA of 1996 are not navigation O&M costs. If a potential environmental improvement or ecosystem

restoration beneficial use project exceeds the cost limitations of Section 204, it may be pursued as a cost shared feasibility study leading to specific authorization, in accordance with existing procedures.

(b) Placement of Materials on Beaches. The Corps of Engineers, under Section 933 of the Water Resources Development Act of 1986, may participate in the additional costs of placing clean sand or other suitable material on beaches. This may include material dredged by the Corps during construction or maintenance of Federal navigation projects, and the placement onto adjacent beaches or near-shore waters. This is only permitted if the added cost of placement is justified primarily by the benefits associated with the hurricane and storm damage protection provided by such beach or beaches, and the beach involved is open to the public with public access. The non-Federal sponsor must provide 50 percent of the incremental study costs.

(c) Other Beneficial Uses. Other potential beneficial uses include placement of dredged material for land creation or land enhancement for development purposes, disposal of material on beaches not meeting the criteria for Corps participation, and environmental enhancement projects not meeting the criteria for Corps participation. In these cases, all incremental study costs and implementation costs above those costs required for the Base Plan, must be paid by non-Federal interests.

(b) Proposed Projects.

(1) General. Management Plan studies to be included with feasibility studies shall be subject to the cost sharing provisions set forth in the Project Study Plan. Study cost sharing for projects in PED shall be in accordance with the specific PED cost sharing requirements for that project as authorized.

(2) Allocation of Study Costs. The costs of Management Plan studies will be allocated between the existing project and the feasibility study for the project modification. Costs will be allocated by first identifying all costs that would be associated with planning for dredged material management for the existing authorized Federal project at existing depths and widths. These costs will be allocated to maintenance of the existing project and be funded from the Operation and Maintenance (O&M), General, appropriation at 100% Federal cost. Increments of dredged material management study costs above those required for planning for continued maintenance of the existing project, shall be allocated as feasibility study costs. Those costs which are associated with disposal of dredged material from construction of the project modification or increments of new maintenance cost attributable to the project modification, shall also be allocated as feasibility study costs. The definition of the required dredged material management studies and the allocation of the costs of these studies between the existing project and the feasibility study must be a carefully coordinated effort involving Planning and Operations elements and the non-

Federal sponsor. While the costs for dredged material management are allocated between O&M and the feasibility study, the dredged material management studies will be conducted as a unified study within the context of the feasibility study.

g. Implementation.

(1) Operation and Maintenance.

(a) Existing Projects. Costs for implementing Management Plans for existing projects are O&M costs and shall be shared in accordance with navigation O&M cost sharing provisions applicable to the project as authorized. Dredged material disposal facility costs shall be shared in accordance with Section 201 of the Water Resources Development Act of 1996 (P.L. 104-303). The cost for any component of a Management Plan attributable solely to meeting state water quality standards which are more restrictive than those upon which the Base Plan is based, shall be non-Federal cost.

(b) Proposed Projects. Costs for implementing management plans for proposed projects are O&M costs and shall be shared in accordance with navigation O&M cost sharing provisions of the Water Resources Development Act of 1986. The cost for any component of a Management Plan attributable solely to meeting state water quality standards which are more restrictive than those upon which the Base Plan is based, shall be non-Federal cost.

(2) Beneficial Uses. Costs for beneficial uses consistent with, and part of, the Base Plan are O&M costs and shall be shared in the same manner as other navigation O&M costs. Where beneficial uses involve an incremental cost over the Base Plan, these incremental costs are either a non-Federal responsibility or are a shared Federal and non-Federal responsibility depending on the type of beneficial use, as follows:

(a) Environmental Improvement and Ecosystem Restoration. The incremental costs above the Base Plan for the use of dredged material to improve, restore and protect environmental resources, pursuant to Section 204 of the WRDA of 1992 or Section 207 of the WRDA of 1996 must be shared in accordance with procedures set forth in Section E-14g.(1) of this Appendix.

(b) Placement of Materials on Beaches. Under the authority of Section 145 of the Water Resources Development Act of 1976, as amended by Section 933 of WRDA 86, the additional cost, beyond the cost of the Base Plan, for the placement of materials on beaches must be shared 50 percent Federal and 50 percent non-Federal. The non-Federal sponsor must provide (without cost sharing) any necessary additional lands, easements, rights-of-way, and relocations.

h. Procedures for Existing Projects.

(1) Phased Plan Development Process. A phased process will be used to determine the need for, and to develop, Management Plans on a priority basis; to manage existing projects in the interim while Management Plans are being developed; and, to review, approve and implement the Management Plans.

(2) Preliminary Assessment. Preliminary assessments shall be undertaken for all navigation projects. Priority shall be given to projects for which maintenance is expected to be required within the next ten years. Preliminary assessments shall include the following components:

(a) An economic assessment to determine whether continuing O&M of the overall project and separable increments appears to be warranted;

(b) A preliminary assessment of potential impediments to continuing maintenance;

(c) An evaluation of the consistency of existing environmental compliance documents with ongoing O&M activities; and,

(d) An assessment of need for Management Plan studies;

(e) Summary of Findings and Recommendations. Preliminary assessments will produce a summary of Findings and Recommendations, prepared in accordance with the format and guidance presented herein, and signed by the District Commander. If applicable, the District Commander may request for funds to initiate Management Plan studies in accordance with instructions in annual guidance for preparation of the program and budget request.

(3) Management Plan Studies.

(a) General Requirements. The purpose of Management Plan studies (studies) is to ensure timely and economical completion of quality reports that recommend implementable solutions to identified management problems, in the form of Management Plans. The Management Plan shall include sufficient detail to ensure unimpeded maintenance, with respect to dredging, for a 20-year time horizon. The study shall be conducted in two phases: initial and final. The initial phase shall be completed within 12 months of receipt of funds by the district, and shall produce a Scope of Work for the final phase of the study.

(b) Scoping. Management Plan studies are intended to cost effectively and expeditiously support project maintenance. The scoping of the final phase of the study is the most important activity in the initial phase. The scope of the final phase is dictated by the study objective of formulating a plan for the continued O&M of the Federal project.

(1) The most important scoping factor, and therefore the focus of the initial phase, is the degree of engineering, environmental and economic risk and uncertainty associated with the project.

(2) Related activities, such as surveys of bottom sediments outside the limits of the Federal project, identification and elimination of sources of contamination, and control of non-point sources of pollution, shall be included only if these activities are funded by local, state or other Federal agencies.

(3) In some cases, the need for a project modification requiring Congressional authorization (for example the need for an enlarged project to meet increased shipping demands) may be identified. Studies to support recommendations for authorization of such modifications are outside the scope of Management Plan studies. In these cases, a new feasibility study (General Investigations funded new start Reconnaissance) under authority of Section 216 of the Water Resources Development Act of 1970 should be sought through the budget process. O&M study funding should be terminated unless there is an immediate need for additional planning for continued maintenance of the existing project pending the project modification.

(c) Scope of Work. A Scope of Work (SOW) shall be prepared during the initial phase to ensure that the work required for the final phase has been carefully developed and considered.

(1) The SOW shall be the basis for estimating the total study cost and local share, if any, and shall allow not longer than 36 months to complete the final phase. The SOW will guide the allocation of study funds among tasks to assure that all interests are given adequate attention.

(2) As a minimum, the SOW should address the work tasks, their milestones, negotiated costs, and responsibility for their accomplishment. The SOW should also address the Corps and other professional criteria to assess the adequacy of the completed work effort; the schedule of performance; the coordination mechanism between the Corps and the non-Federal sponsor; and references to regulations and other guidance that will be followed in conducting the tasks.

(3) The SOW will address the level of technical and scientific detail required for the final phase. Technical studies and analysis should be scoped to the minimum level needed to establish project features and elements that will form an adequate basis for the plan implementation

schedules and cost estimate. Risk and uncertainty should be sufficiently identified and addressed to provide the basis for appropriate contingencies.

(4) The SOW should include the work items typically necessary to support the review process from the signing of the report through approval. These items could include answering comments, attending Washington Level meetings (including the non-Federal sponsor), and minor report revisions as a result of review by higher authority. Any significant increase in study scope shall require HQUSACE approval in accordance with guidance provided as conditions of approval of the Scope of Work.

(d) Management Plan Reports. Management Plan Reports (reports) should be complete decision documents that present the results of both study phases. The reports will:

(1) Provide a complete presentation of study results and findings, including those developed in the initial phase so that readers can reach independent conclusions regarding the reasonableness of recommendations;

(2) Indicate how compliance with applicable statutes, executive orders and policies is achieved; and

(3) Provide a sound and documented basis for decision makers at all levels to judge the recommended Management Plan. The reports shall, at a minimum, address the subject matter outlined in Table E-14, and shall identify all necessary agreements (Federal, sponsor, real estate, etc.) and procedural requirements (appropriate NEPA documentation, long-term permits, certifications, etc.) necessary to cover, at a minimum, the next twenty years of project maintenance. The reports shall include executed copies of all such agreements or schedules for obtaining them. District Commanders shall sign and submit Management Plan Reports to the Division Commander for appropriate action.

Table E- 14 Management Plan Report Outline

| |
|---|
| **Project Description(s)** *[include project map(s)]*<br><br>**Scope of Study** *[indicate whether single project or group of projects; relationship to permittee dredging, etc.]*<br><br>**Authorization and Development History** *[include all project authorizations, Section 221 agreements, Project Cooperation Agreements (PCAs), other agreements entered into, easements obtained, fee acquisition, construction dates, etc.]* |

**Description of existing conditions**

**Projections of future conditions in the absence of a Management Plan**

**Concise statement of specific problems and opportunities**

**Alternative plans:**

X Alternative disposal measures to address identified problems and opportunities
X Beneficial uses alternatives
X Reasons for selecting and combining measures to form alternative plans

**Evaluation of Alternative Plans**

**Trade-off analysis**

**Selection of final plan** *[discuss rationale for selection, sensitivity analysis, and risks and uncertainties]*

**Description of selected Management Plan**

X Plan components
X Implementation requirements and schedules
X Consistency with the Base Plan

**NEPA documentation, as required**

**Results of coordination with local, state and Federal agencies**

**Recommendations**

(e) Issue Resolution Conferences. Issue Resolution Conferences (IRCs) with HQUSACE and laboratory participation shall be held for all Management Plan studies whenever significant problems or issues require higher level guidance or concurrence during the course of the study. Issue Resolution Conferences may be called by Division Commanders at their discretion. Upon review of the SOW, HQUSACE may call for an IRC to resolve pertinent issues. HQUSACE participation shall include at a minimum, senior staff of both CECW-0 and CECW-P. IRCs shall identify required follow-up actions and assign responsibilities for their execution. These actions and assigned responsibilities shall be documented explicitly.

(f) Review and Approval. Division Commanders shall ensure full technical review of Management Plan reports, and may approve Management Plans except in those cases where one or more of the following conditions apply:

(1) Implementation of the Management Plan will require a non-recurring item of work or aggregate item of related work which qualifies as major maintenance as defined in the annual guidance for preparation of the program and budget request.

(2) Implementation of the Management Plan requires an adjustment to the District's funding targets (a Corps-wide Priority Incremental Request, CPIR) as defined in the annual guidance for preparation of the program and budget request.

(3) Implementation requires additional congressional authority. Where one or more of the above conditions apply, the Division commander will transmit the final report and associated NEPA documentation by concurring endorsement to HQUSACE, CECW-0 for review and approval. Upon approval of the report, the Major Subordinate Commander shall prepare the draft Record of Decision following the completion of the final NEPA review, and if required, shall file the final NEPA documentation.

(g) Implementation.

(1) Project Cooperation Agreement and Financing Plan.

(a) For Management Plans that involve new capital investments, (such as a new confined disposal facility) relocations, or acquisition of interests in real estate, and require the execution of a Project Cooperation Agreement (PCA), a draft PCA and financing plan shall be developed in connection with preparation of the Management Plan report and submitted therewith in accordance with procedures outlined in ER 1165-2-131.

(b) The full implication of PCA requirements should be discussed with the local sponsor. The first draft PCA is prepared, by the District Commander, in coordination with the local sponsor. However, no commitments relating to a construction schedule or specific provisions of the draft PCA can be made to the local sponsor on any aspect of the project until the Management Plan report and the draft PCA have been approved.

(c) Once the Management Plan has been approved, the District Commander shall begin final negotiations with the local sponsor and submit the PCA package for review by HQUSACE, attention CECW-A, and approval by the ASA(CW).

(2) Monitoring and Periodic Review. Division Commanders shall ensure monitoring and review of approved Management Plan implementation.

(3) Curtailment and Disposition. Curtailment refers to the indefinite discontinuance of maintenance of a project or a substantial portion thereof (e.g., segment or length, depth, width increment of channel or turning basin). Curtailment requires the development of a plan for disposition of the project. Disposition requirements and procedures generally are project specific; and guidance thereon should be obtained from HQUSACE. Where continued O&M of a project, or substantial portion thereof, is determined by the District Commander to no longer be warranted, the District Commander shall submit, subject to concurring endorsement by the Division Commander, a report recommending disposition of the project, to HQUSACE (attn: CECW-P).

(h) Budgeting and funding.

(1) General Requirements. Study activities required to develop Preliminary Assessments for all eligible projects shall be funded from available project O&M funds in accordance with priorities established annually by HQUSACE. Requests for funding to accomplish Management Plan studies to cost no more than $150,000 to complete shall be included in project O&M funding requests, provided that a Summary of Findings and Recommendations has been completed in accordance with the requirements of outlined in this section. Requests for funding to initiate Management Plan studies to cost more than $150,000 will be considered on a national priority basis, commensurate with the urgency and significance of impediments to continued maintenance. These will be considered upon HQUSACE review of submission documents, in accordance with annual budget guidance, as may be supplemented by guidance to be provided periodically by HQUSACE.

(2) Limitations. Preliminary Assessments shall be limited to an expenditure of $20,000 per project, or multiples thereof for assessments involving more than one deep draft project. If more than $20,000 (or multiple thereof) is required, written approval must be requested from HQUSACE (attention CECW-O). The request must include sufficient information to justify the additional expenditure.

(i) Ongoing Studies. Ongoing O&M studies for planning, managing or regulating dredging and dredged material disposal activities shall be phased into conformity with the procedures and guidance of this ER. This includes any O&M studies of disposal options including studies of alternative open water disposal sites or studies of sites for new confined disposal facilities. The following procedures shall be used to bring the existing studies into conformity with the new procedures.

(1) Review of Continuing Economic Justification. Continuation of ongoing dredged material management studies is conditioned on a confirmation that continued maintenance is warranted. Therefore, for each ongoing study, a review of indicators of continued economic justification will be conducted.

(2) Scope of Work. For each ongoing study, the district shall prepare a review of studies accomplished to date, and a SOW for studies yet to be accomplished. This SOW, along with the results of the review of indicators of continued economic justification, will be included in the Preliminary Assessment or the Management Plan Report, as appropriate.

(3) Management Plan Report. The results of ongoing studies, when completed, will be presented in a management Plan report conforming with the guidance for preparation, review and approval of such reports as presented in this appendix.

i. Procedures for Proposed Projects. Feasibility reports recommending Congressional authorization of new navigation projects or modifications of existing projects shall include a plan for management of dredged material associated with the construction and maintenance of the new project or project modification, consistent with the requirements for Management Plans for existing projects. This plan shall satisfy all identified dredged material management requirements associated with the project, to include construction dredging, projected maintenance dredging for the established project economic life, and other dredged material disposal requirements (for example dredging of berthing areas) needed to realize project benefits.

## SECTION III - Flood Damage Reduction

E-16. Federal Interest. The Flood Control Act of 1936 established the policy that flood control on navigable waters or their tributaries is in the interest of the general public welfare, and is therefore a proper activity of the Federal Government. It provided that the Federal Government, cooperating with state and local entities, may improve streams or participate in improvements "for flood control purposes, if the benefits to whomsoever they may accrue are in excess of the estimated costs, and if the lives and social security of people are otherwise adversely affected." The 1936 Act, as amended, and more recently the Water Resources Development Act of 1986 and other acts, specify the details of Federal participation.

E-17. Types of Improvements.

a. Structural Measures. These include dams with reservoirs, dry dams, channelization measures, levees, walls, diversion channels, ice-control structures, and bridge modifications.

b. Nonstructural Measures. Section 73 of the 1974 Water Resources Development Act requires consideration of nonstructural alternatives in flood damage reduction studies. They can be considered independently or in combination with structural measures. Nonstructural measures reduce flood damages without significantly altering the nature or extent of flooding. They do this by changing the use made of the flood plains, or by accommodating existing uses to the flood hazard. Examples are flood proofing, relocation of structures, flood warning/preparedness systems, and regulation of flood plain uses.

(1) Permanent Relocation/Evacuation Plans. These plans provide for permanent evacuation and relocation/demolition of flood plain structures. There are no damages avoided claimable as benefits for the properties which are relocated or evacuated. Benefits accrue in four ways: a) the value of new use of the vacated land; b) reduction in damage to public property, such as roads and utilities; c) reduction in emergency costs; and d) reduction in the administrative costs of the National Flood Insurance Program and disaster relief. Benefits from future use of the vacated flood plain (usually recreation) will generally be the dominant NED benefit. Non-monetary benefits accruing from ecosystem restoration may also be considered. For evacuation plans that are clearly formulated for flood damage reduction there is no limitation on the amount of recreation benefits, as may exist for structural projects. Thus for these plans the recreation benefits may exceed 50 percent of the benefits needed for justification. Separable costs for improvements necessary to achieve ecosystem and or recreation benefits are cost shared in accordance with specific cost-sharing provisions for those purposes.

(2) With Project Land Use and Benefit Evaluation for Nonstructural Projects. The central fact about nonstructural projects, changes in land use, has several important implications. First, eliminating the existing land uses eliminates all services previously provided in the area, not just the flood damages. That is, all housing services, all retailing or commercial services and all other services provided by the removed structures (and associated activities) will also be eliminated. Second, in most cases, most of the benefits for the nonstructural project will be associated with new uses of the vacated land, yet frequently little effort is devoted to forecasting and evaluating the new land uses. Recreational and environmental uses will be the most common post-project uses. If non structural projects are to be justified, plans for the post-project land use will generally be needed. In other words, just simply stating that post-project land use will be "open space" will not be sufficient to support the benefits of the nonstructural projects. Third, land use changes will have spillover effects, that is, they can affect nearby property values. Most frequently, spillover effects are negative and are used to justify zoning changes, but spillover effects for nonstructural projects will be, in all likelihood, positive and the task is therefore not to prevent them through zoning but to estimate their magnitude through analysis.

(3) Flood Proofing Measures. These are modifications of structures to minimize flood damages by such methods as elevating buildings, sealing walls, closing off openings, protecting plumbing and utilities and installing pumps and valves. Corps participation in flood proofing plans is permitted as long as they address two or more structures.

(4) Flood Warning Systems.

(a) The typical flood warning system consists of methods for determining the flood threat, methods for disseminating the flood warning, and a preparedness plan detailing the response to that warning. The Corps involvement in development of methods for determining the flood threat and disseminating the warning can include selection, siting, installation, and calibration of gages and other equipment to collect, evaluate and disseminate pertinent data. In addition, the Corps can provide assistance and guidance to ensure that the preparedness plan is adequate and will provide the necessary response to minimize the possibility of loss of life, and to reduce damages. This includes coordinating with local officials, providing technical advice and planning guidance, and developing adequate mapping to identify flood threatened areas, evacuation routes, temporary shelters, etc.

(b) A flood warning system can be recommended as a stand-alone project, or as a component of a more complex, flood damage reduction plan. For example flood warning could be combined with levee closing devices or with a channel modification. In addition, a flood warning system can be proposed as an interim measure until other structural or non-structural measures can be implemented.

(5) Regulation of Flood Plain Uses. Adoption and enforcement of regulations for flood plain management are entirely a local responsibility. However, the Corps can provide technical assistance and planning guidance in conjunction with a flood control project. Also, flood plain management planning assistance is continuously available through the Corps Flood Plain Management Services Program.

c. Major Drainage. Drainage projects are usually undertaken in rural areas to increase agricultural outputs. Some portions of drainage improvements may be considered flood control measures in accordance with Section 2 of the 1944 Flood Control Act. The typical drainage system consists of drainage ditches, dikes, and related work. An outlet structure is provided at the downstream end where the system empties into a larger channel. The Federal interest in these projects is normally limited to the outlet works. Drainage in urban areas can also qualify under the 1944 Act if the major outlet works do not substitute for works that are a local responsibility, such as municipal storm sewer improvements.

d. Groundwater. Section 403 of the WRDA of 1986 expands the definition of flood control to include flood prevention improvements for protection from groundwater induced damages. Budget and authorization support is not available for a groundwater induced damage reduction program.

E-18. Specific Policies.

a. Without Project Condition.

(1) Assume flood plain communities belong to the National Flood Insurance Program administered by the Federal Emergency Management Agency. To participate in the program a community must preclude new development in the regulatory floodway, and require that new development outside the floodway, but within the median discharge 1% chance flood plain, be constructed with first floor elevations at or above the median discharge 1% chance flood level.

(2) Uncertainties in without project conditions must be explicitly considered. For example, for any particular damage reduction study there may be other Federal or non-Federal flood control or drainage plans, which are authorized or in various stages of planning but, which are not yet constructed. Whether or not some other project will actually be constructed can be quite uncertain; when present this uncertainty should be explicitly treated in Project Study Plans (PSP). Any such uncertainties potentially affecting study recommendations must be similarly addressed.

b. Flood Plain Management (E.O. 11988). This executive order was issued in 1977 and remains in effect. The intent is to avoid flood plain development, reduce hazards and risk associated with floods, and restore and preserve natural flood plain values (ER 1165-2-26). In

the event there is no alternative to construction in the flood plain, as is the case with flood control projects, the Corps is required to minimize the adverse impacts induced by construction of the project. In considering adverse impacts, the following should be addressed:

(1) Induced new development in the flood plain or induced improvements to existing development in the flood plain that would increase potential flood damages; and,

(2) The detrimental effect of induced activities on natural flood plain values.

c. Project Performance and Risk Framework.

(1) Projects are analyzed and described in terms of their expected performance, not in terms of levels of protection. Contingencies are acknowledged and residual risk is not routinely reduced by overbuilding or by inclusions of freeboard. A levee, for instance, is described as having a probability of overtopping of x percent in any given year, without implication for level of protection. If there are particular floods of reference or interest, the levee is described as having a probability y of containing the z percent flood, and so on. For example, a levee of a given height is described as having a (say) two percent chance of being overtopped in any year. If the one percent flood flow is of interest, the levee is said to have a (say) twenty-five percent chance of containing the one percent flow event, should it occur.

(2) There is no minimum level of performance or protection or size required for Corps projects. The smaller in size or the lower the level of performance however, the higher the residual risk. Residual risk must therefore be carefully analyzed and communicated. Departures from the NED plan may be considered options to manage this risk; in addition, explicit risk management alternatives may be formulated. . Documentation requirements for deviation from the NED plan for flood control projects should be based primarily on consideration of residual risk. Other considerations can include reducing the non-Federal eligibility requirements for the National Flood Insurance Program and /or unique characteristics of the protected area such as historic structures, hospitals and public buildings essential to the operation of government or essential public service. In all cases the incremental costs for the higher level of protection must be shown to be reasonable with respect to total project costs.

(3) Flood damage reduction studies are conducted using a risk-based analytical framework. Models, data, and measurement and many physical, social, economic and environmental conditions are subject to variation and uncertainty. This has been long known, if in the past incompletely acknowledged. Management by routine overbuilding and freeboard are not affordable. The risk framework captures and quantifies the extent of the risk and uncertainty, and enables quantified tradeoffs between risk and cost. Decision making considers explicitly what is gained at what cost.

d. Existing Levees/Dams. If there is any question about the reliability of an existing levee, reliability should be specifically included in the risk analysis (see ER 1105-2-101). The Corps is moving toward a risk-reliability framework for evaluation of dam reliability; methods development is just beginning. Downstream consequences are analyzed in a risk framework however.

e. Residual Damages. Levees interrupt interior drainage, and levee benefit analysis should reflect any residual damages. Interior damages can be mitigated by ponding areas or pumping. The amount and kind of recommended mitigation should be that which maximizes net benefits, unless other considerations override.

f. Induced Flooding. When induced flooding results in induced damages, mitigation should be investigated and recommended if appropriate. Mitigation is appropriate when economically justified or there are overriding reasons of safety, economic or social concerns, or a determination of a real estate taking (flowage easement, etc.) has been made. Remaining induced damages are to be accounted for in the economic analysis and the impacts should be displayed and discussed in the report.

g. Minimum Flows, Minimum Drainage Area and Urban Drainage. In urban and urbanizing areas provision of a basic drainage system to collect and convey local runoff is a non-Federal responsibility. Water damage problems may be addressed under flood control authorities downstream from the point where the flood discharge is greater than 800 cubic feet per second for the median discharge 10 percent chance flood. Drainage areas of less than 1.5 square miles are assumed to lack sufficient discharge to meet the above criterion. Exceptions may be granted in areas of hydrologic disparity, that is areas producing limited discharge for the median discharge 10 percent chance event but in excess of 1800 cubic feet per second for the one percent event (See ER 1165-2-21).

h. Single Properties. The Corps will not participate in structural flood control for a single private property. Nor will it participate in nonstructural flood control measures, unless single property protection is part of a larger plan for structural or nonstructural measures benefiting multiple owners collectively The Corps may consider participation in structural and nonstructural flood control measures protecting a single, non-Federal, public property. Public facilities, which are separable portions of larger protection plans, must have their own distinct presentations in budget requests so that they compete for limited study and construction funds.

i. Recreation at Non-Lake Projects. Recreation activities must have a strong, direct relationship to the proposed flood control measures, for example trails along the channel or levee right-of-way. Constraints on development and requirements for participation are discussed in Section VII of this appendix.

j. Environmental Mitigation. There are adverse impacts associated with practically all flood control projects. If these impacts are significant, mitigation measures should be evaluated. If justified by tangible and intangible benefits, the measures can be included in the recommended plan. Specific policies and planning guidance for consideration of environmental mitigation are discussed in Appendix C.

k. Agricultural Flood Protection. The Corps flood control programs apply to agricultural as well as urban flood damages. Usually the NED plan for agricultural areas provides only a low degree of flood prevention. The Food Security Act of 1985 (Public Law 99-198), as amended by the Federal Agriculture Improvement and Reform Act of 1996 (PL 104-127), contains so-called "Swampbuster" provisions (affecting conversion of wetlands) that may be triggered with implementation of a flood protection project.

l. Land Development. The following general policy principles apply to land development benefits at structural flood damage reduction projects.

(1) Projects or separable increments producing primarily land development opportunities do not reduce actual flood damages and therefore have low budget priority. Federal participation in these projects will not be recommended.

(2) The NED plan is formulated to protect existing development, but inclusion of vacant property interspersed with existing development is acceptable. The NED plan may also provide for the protection of vacant property that is not interspersed with existing development,if it can be demonstrated that the vacant property would be developed without the project, and benefits are based on savings in future flood proofing costs or reduction in damages to future development.

(3) If no project or separable project increment can be economically justified to protect existing development, interspersed vacant property and/or property that would be developed without the project, there is no interest in expanding the area of protection to achieve land development (location) benefits, even if net benefits are increased and economic justification can be achieved.

(4) A special case can be considered where the cost of protecting existing development can be substantially reduced if some vacant property not interspersed with existing development

is included in the protected area. Such cases will be considered on their individual merits. Compatibility with Executive Order 11988 must be demonstrated.

m. Groundwater-Induced Damages. Prevention of groundwater induced damages is not a traditional mission; restricted budgets prevent taking on this new mission.

n. Flood Insurance Considerations. Flood damage reduction projects can greatly impact what is required of a local community for participation in the National Flood Insurance Program. In addressing these impacts, the following should be considered:

(1) During development of the Project Management Plan (PMP) in reconnaissance, and in concert with the sponsor, consideration should be given to including work items to develop flood maps and flood profiles depicting post-project conditions. The information should be in a form useful to FEMA in revising flood insurance rate maps.

(2) The appropriate FEMA Regional office should be notified of proposed flood protection works or of changes to established flood protection works.

## E-19. NED Benefit Evaluation Procedures: Urban Flood Damage

a. Purpose. This section presents the procedure for measuring the beneficial contributions to national economic development (NED) associated with the urban flood hazard reduction features of water resource plans and projects.

b. Conceptual Basis.

(1) General. Benefits from plans for reducing flood hazards accrue primarily through the reduction in actual or potential damages associated with land use.

(2) Benefit Categories. While there is only one benefit standard, there are three benefit categories, reflecting three different responses to a flood hazard reduction plan.

(a) Inundation Reduction Benefit. If floodplain use is the same with and without the plan, the benefit is the increased net income generated by that use. If an activity is removed from the floodplain, this benefit is realized only to the extent that removal of the activity increases the net income of other activities in the economy. Engineering Regulation 1105-2-101, Risk-Based Analysis for Evaluation of Hydrology/Hydraulic and Economics in Flood Damage Reduction Studies, requires risk-based analysis in all flood-damage reduction studies. The regulation and the complementary Engineering Manual 1110-2-1619 provide the evaluation framework to be used in these studies. The regulation identifies key variables that must be explicitly incorporated into the risk-based analysis. At a minimum, the stage-damage function for economic studies

(with special emphasis in structure first floor elevation, and content and structure values for urban studies); discharge associated with exceedence frequency for hydrologic studies; and conveyance roughness and cross-section geometry for hydraulic studies must be incorporated in the risk-based analysis. The ER further requires a probabilistic display of benefits and eliminates freeboard to account for hydraulic uncertainty.

(b) Intensification Benefit. If the type of floodplain use is unchanged but the method of operation is modified because of the plan, the benefit is the increased net income generated by the floodplain activity.

(c) Location Benefit. If an activity is added to the floodplain because of a plan, the benefit is the difference between aggregate net incomes (including economic rent) in the economically affected area with and without the plan

(3) Types of Flood Damage. Flood damages are classified as physical damages or losses, income losses, and emergency costs. Each activity affected by a flood experiences losses in one or more of these classes.

(a) Physical Damages. Physical damages include damages to or total loss of buildings or parts of buildings; loss of contents, including furnishings, equipment, [motor vehicles,] decorations, raw materials, materials in process, and completed products; loss of roads, sewers, bridges, power lines, etc.

(b) Income Loss. Loss of wages or net profits to business over and above physical flood damages usually results from a disruption of normal activities. Estimates of this loss must be derived from specific independent economic data for the interests and properties affected. Prevention of income loss results in a contribution to national economic development only to the extent that such loss cannot be compensated for by postponement of an activity or transfer of the activity to other establishments.

(c) Emergency Costs. Emergency costs include those expenses resulting from a flood what would not otherwise be incurred, such as the costs of evacuation and reoccupation, flood fighting**,** cleanup including hazardous and toxic waste cleanup**,** and disaster relief; increased costs of normal operations during the flood; and increased costs of police, fire, or military patrol. Emergency costs should be determined by specific survey or research and should not be estimated by applying arbitrary percentages to the physical damage estimates.

c. Planning Setting.

(1) General. The benefit of flood hazard reduction plans is determined by comparison of the with and without project conditions.

(2) Without Project Condition. The without project condition is the land use and related conditions likely to occur under existing improvements, laws, and policies. There are three significant assumptions inherent to this definition:

(a) Existing and authorized plans. Existing flood hazard reduction plans are considered to be in place, with careful consideration given to the actual remaining economic life of existing structures. Flood hazard plans authorized for implementation but not yet constructed are evaluated according to the relative likelihood of actual construction. If there is a high likelihood of construction, the authorized plan is considered to be in place.

(b) Flood Disaster Protection Act. The adoption and enforcement of land use regulations pursuant to the Flood Disaster Protection Act of 1973 (Public Law 93-234) is assumed.

(1) Regulation certified or near certification. If the local land use regulation has been or will be certified, partially waived, or adjusted by the Flood Insurance Administration (FIA) as adequate under 24 CFR 1910.3(c) and/or (d) and 24 CFR 1910.5, that regulation defines the without project condition.

(2) Regulation not yet certified. It is assumed that the local jurisdiction will adopt in the near future land use regulations certifiable to FIA under the without project condition as a datum and under the with project condition if a residual hazard will remain. This applies to floodplains regulated under 24 CFR 1910.3(a) and (b); to floodplains regulated by local ordinances independent of FIA; and to floodplains with no flood regulation in effect. For riverine situations, the following two crucial features are included: no future confinement or obstruction of the regulatory floodway; and no future occupancy of the flood fringe unless residences are elevated to or above 100-year (.01 annual probability) flood level and nonresidential buildings are flood proofed to that level.

(3) Application. It is assumed that flood proofing costs will be incurred if an activity decides to locate in the floodplain.

(4) Executive Orders. Compliance with E.O. 11988, Floodplain Management and E.O. 11990, Protection of Wetlands, is assumed.

(5) Individual actions. In addition to the three assumptions stated above, the analyst shall consider the likelihood that individuals will undertake certain flood hazard reduction

measures, such as flood proofing, when the cost of such measures is reasonable compared to the costs of potential flood damages.

(3) With Project Condition. The with project condition is the most likely condition expected to exist in the future if a specific project is undertaken. There are as many with project conditions as there are alternative projects.

(a) In projecting a with project condition, the analyst must be sensitive to the relationship between land use and the characteristics of the flood hazard for the alternative project being analyzed.

(b) The same assumptions underlie the with project condition and without project conditions.

(c) Consideration should be given to both structural and nonstructural alternatives and to alternatives incorporating a mix of structural and nonstructural measures. Non structural measures include:

(1) Reducing susceptibility to flood damage by land use regulations, redevelopment and relocation policies, disaster preparedness, flood proofing, flood forecasting and warning systems, floodplain information, floodplain acquisition and easements; and

(2) On-site detention of flood waters by protection of natural storage areas such as wetlands or in manmade areas such as building roofs and parking lots.

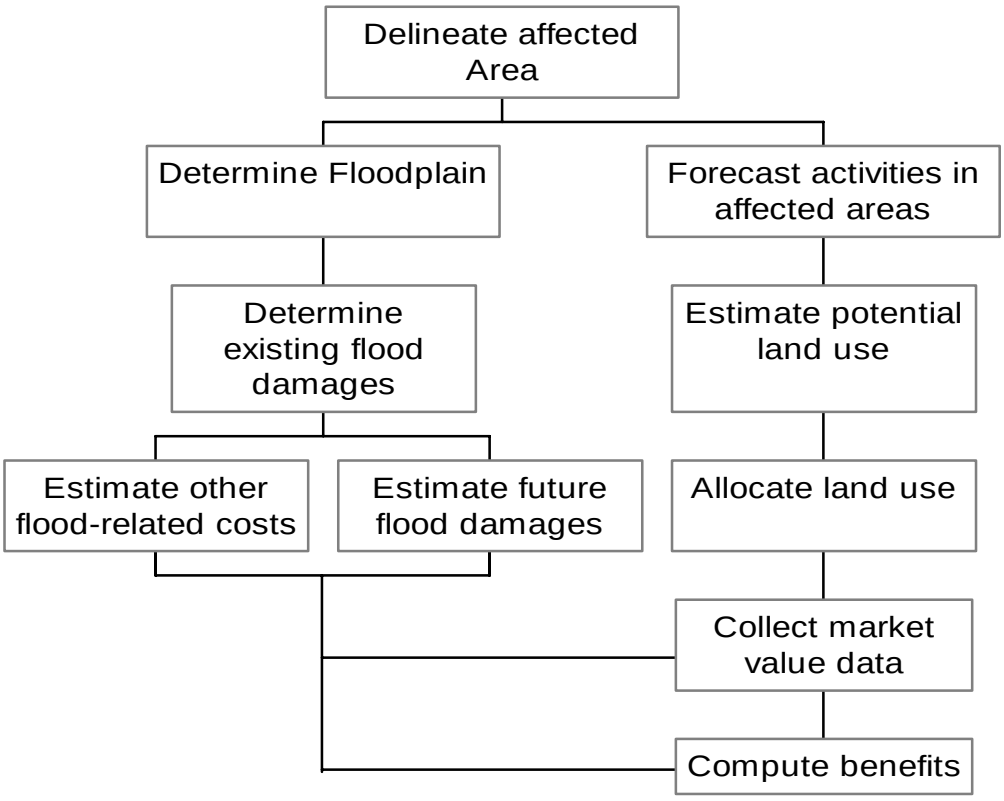
(3) Since project alternatives can differ in their physical characteristics, the optimal timing of projects and of individual project features should be considered in project formulation.

commercial. If the potential use of the floodplain includes industrial use within a standard metropolitan statistical area (SMSA**)** (now called metropolitan statistical area (MSA)), the entire SMSA (MSA) is the affected area; for residential use, even within an SMSA (MSA), a much smaller area may be designated the affected area.

d. Evaluation Procedure: General. Ten steps are involved in computing benefits (see Figure E-4). The steps are designed primarily to determine land use and to relate use to the flood hazard from a NED perspective. The level of effort expended on each step depends on the nature of the proposed improvement and on the sensitivity of the project formulation and justification to further refinement. The first five steps result in a determination of future land use; emphasis is on the overall reasonableness of local land use plans with respect to OBERS (OBERS no longer exist, but population, income and economic projections can still be obtained from the U.S.

Department of Commerce, Bureau of Economic Analysis) and other larger area data, and to recognition of the flood hazard.

Figure E- 4 Urban Flood Damage Benefit Evaluation Procedure



e. Step 1--Delineate Affected Area. The area affected by a proposed plan consists of the floodplain plus all other nearby areas likely to serve as alternatives sites for any major type of activity that might use the floodplain if it were protected.

f. Step 2--Determine Floodplain Characteristics. The existing characteristics of the floodplain must be determined before its actual use can be estimated; therefore, undertake an inventory of the floodplain to determine those characteristics that make it attractive or unattractive for the land use demands established in steps 3 and 4, with emphasis on those characteristics that distinguish the floodplain from other portions of the affected area. Use the following categorizations as a guide:

(1) Inherent Characteristics of a Floodplain. Floodplain characteristics may include:

(a) Flooding. Describe the flood situation, including a designation of high hazard areas. The description should include characteristics of the flooding, such as depths, velocity, duration, and debris content; area flooded by floods of selected frequencies, including 100-year frequency [.01 annual probability]; historical floods, and, where applicable, larger floods. [Description of flood characteristics for a given frequency or discharge should be based on the median probability discharge. The regulatory floodplain as defined by the National Flood Insurance Program will always be described.]

(b) Floodway, Natural Storage. Describe and delineate those areas which, if urbanized or structurally protected, would affect natural storage, velocity, or stage, or would affect flood flows elsewhere.

(c) Natural and Beneficial Values. Many floodplains, particularly those near urban areas, are potential sites for recreation, open space, wetland, or wildlife preserves. This potential should be recognized and presented.

(d) Transportation. Floodplains near navigable streams have inherent attractiveness for industries that demand water-oriented transportation. Floodplains also serve as sites for railroads, highways, pipelines, and related facilities that are not susceptible to serious flood damage but have a tendency to attract industry to the area. [Flood damage to transportation systems and the resulting transportation delay costs may be an important damage category in many urban settings. Care should be taken to adequately address transportation delay costs in both the without and with project condition.]

(e) Other Attributes. Other inherent attributes of floodplains may include soil fertility, reliability of water supply, waste disposal, and sand, mineral, and gravel deposits.

(2) Physical Characteristics. Describe pertinent physical characteristics, including slope, soil types, and water table.

(3) Available Services. Most activities require some or all of the following services: transportation (highway and rail), power, sewerage, water, labor, and access to markets. Indicate the availability of such services in or near the floodplain, including comparisons with similar services available in other portions of the affected area.

(4) Existing Activities. Include in the inventory of the floodplain a list of existing activity types, the number of acres, and the density, age, and the value of structure of each activity-type by flood hazard zone.

g. Step 3--Project Activities in Affected Areas. Base economic and demographic projections on the most recent available studies and include the following: population, personal income, recreation demand, and manufacturing, employment, and output. Additional projections may be necessary for any given area, depending on the potential uses of these projections. Base projections on assessment of trends in larger areas and appropriate data (e.g., OBERS) [Bureau of Economic Analysis]; the relationship of historical data for the affected area to trends projected for larger areas; and consultation with knowledgeable local officials, planners, and others. The basis for the projections should be clearly specified in the report. [Estimates of future growth benefits shall be based on current unbiased economic growth indices. Whenever possible the growth indices should be independent estimates. Paragraph E-19c. requires that for the without project condition, floodplain communities will be assumed to belong to the National Flood Insurance Program (NFIP), administered by the Federal Emergency Management Agency. In order to participate in this program, the local community must preclude new development in the regulatory floodway as defined by the community, and require that new development in the NFIP regulatory floodplain outside of the floodway be constructed with first floor elevations at or above the .01 annual probability 100-year elevation. Therefore, future development will be assumed to be protected to the .01 probability 100-year discharge at the end of the period of analysis. The .01 probability discharge and elevation will be determined by the Corps consistent with levee certification guidance. If individual communities have floodplain restrictions more stringent than NFIP criteria, projections of future development should reflect the local criteria. However, under no circumstances, will future development be assumed in any area subject to flooding in the present and future median .01 probability flood.]

h. Step 4--Estimate Potential Land Use. Estimate potential land use within the affected area by converting demographic projections to acres. The conversion factors can normally be derived from published secondary sources, from agency studies of similar areas, or from empirical and secondary data available in the affected area. The categories of potential land use

need be only as detailed as necessary to reflect the incidence of the flood hazard and to establish the benefits derived from a plan.

i. Step 5--Project Land Use. Allocate land use demand to floodplain and non floodplain lands for the without project condition and for each alternative floodplain management plan.

(1) Basic Factors. Base the allocation on a comparison of the floodplain characteristics, the characteristics sought by potential occupants, and availability of sought-after characteristics in the non floodplain portions of the affected area.

(2) Criteria. The floodplain should not be used unless it has characteristics that give it a significant economic advantage to the potential user over all other available sites within the affected area. If such advantages exist, determine whether they overcome potential flood losses, potential flood proofing costs, and the costs of other related hazards. Flood losses and costs should be specific to the zone of the floodplain being considered.

j. Step 6--Determine Existing Flood Damages. Existing flood damages are the potential average annual dollar damages to activities affected by flooding at the time of the study. Existing damages are those expressed for a given magnitude of flooding or computed in the damage frequency process. No projection is involved. The basis for the determination of existing damages is losses actually sustained in historical floods; therefore, specify the year and month of all significant recorded discharges above zero point of damage and indicated the damages actually sustained by reach or zone and type of property and activity. Historical data are often incomplete; urbanization and other changes will have occurred over the years. Many streams and reaches do not have gaging stations. Therefore, data on historical flood losses should be carefully scrutinized and supplemented by appraisals, use of area depth-damage curves, and an inventory of capital investment within the floodplain. Further, estimates of damages under existing conditions should be computed for floods of magnitude that have not historically occurred. Estimate average annual losses by using standard damage-frequency integration techniques and computer programs that relate hydrologic flood variables such as discharge and stage to damages and to the probability of occurrence of such variables. Annual hydrologic data are normally sufficient for urban drainage estimates. Access flood damages by activity-type and by whether they are borne by the owner or by the public at large.

k. Step 7--Project Future Flood Damages. Future flood damages are the dollar damages to economic activities identified in step 3 that might use the floodplain in the future in the absence of a plan. Use this step in combination with step 5 (land use) to determine land use and associated damages for each future with project and without project condition. “Future” is any time period after the year in which the study is completed; in order to relate costs ultimately to benefits, however, future damages must be discounted to the base year. Determine future flood

damages on the basis of losses sustained both by the floodplain occupant and by others though insurance subsidies, tax deductions for casualty losses, disaster relief, etc.

(1) Hydrologic Changes. Changes in basin land use may result in major alteration of drainage characteristics, particularly surface runoff; project such hydrologic changes for the planning period. Average future hydrologic conditions should not be used, since they obscure situations in which the level of protection afforded by a project may be significantly different from average conditions by the end of the planning period.

(2) Economic Changes. Economic changes can be expected to result in a change in the level of future flood losses. A benefit-cost ratio for the existing condition should always be shown. If the ratio is greater than 1:1, the projection of future benefits may be accomplished in abbreviated form unless it would distort the comparison of alternative projects or the cost allocation and cost sharing in multipurpose projects. In the latter situation, the detail and accuracy of the estimates of flood control benefits should be comparable to the estimates of benefits for other water resources purposes.

(3) Projection of Physical Damages. Base measurement and projection of flood damages on the establishment of actual, observed relationships between damages, flood characteristics, and those indicators used for measurement and projection. These relationships should be modified as appropriate by consideration of constraints that change the historically derived relationship between flood damages and a given indicator. The relationships should be made explicit in the report and their accuracy and representativeness supported, to the extent possible, by empirical evidence. Use three steps in measuring flood damages for a future year: estimate the number and size of physical units; estimate the future value of units; and determine the damage susceptibility of units.

(a) Physical Units. The first step in measuring flood damages for a future year is to determine from step 2 (paragraph E-19f.) the number and size of physical units with potential to use the floodplain by hazard zones for each activity type. Care must be taken to determine whether existing structures will continue to occupy the floodplain over the period of analysis and, if not, the future land use and damage potential of new structures.

(b) Value per Physical Unit. This step involves estimating future unit value. Increases in the value of property in the floodplain may result from the expansion of existing facilities or the construction of new units. The following guidance applying to content value is derived from an empirical study of flood-prone property.

(1) Existing development. Use the OBERS [Bureau of Economic Analysis] regional growth rate for per capita income as the basis for increasing the real value of residential contents in the future.

(2) Future development. Project the value of contents within new residential structures from the year each unit is added.

(3) Translation to future flood damages. Use the projected rate of increase in the value of flood-susceptible household contents as the basis for increasing the future unit flood damage to household contents.

(4) Limit. The value of contents should not exceed 75 percent of the structural value of the residence unless an empirical study proves that a special case exists (e.g., trailer parks), nor should the increase in value of household contents be projected beyond project year 50. [Current guidance on content-to-structure ratios is provided in paragraph E-19q.]

(5) Commercial and industrial property. The procedure described for residential contents does not apply to commercial and industrial categories.

(c) Damage susceptibility. The third step in measuring future flood damages is to determine the damage susceptibility of units. Once the number of physical units and the value associated with each unit are known, examine possible future changes, if any, in damage susceptibility relationships as a function of the total value of each physical unit and the stream's flood characteristics, such as velocity, depth, duration, volume, debris load, and salinity. Some of the determinants of damage susceptibility are type of activity, vertical development, location within the floodplain, nature of flood proofing, construction material used, and individual response.

(1) Projection of Income Losses. Income losses may be projected to increase on the basis of projected land use. Increases in physical losses should not be used to project income losses.

(2) Projection of Emergency Costs. Emergency costs encompass a wide variety of programs. Some, such as emergency shelter and food, are primarily a function of occupancy of the floodplain but not of the value of development in the floodplain. Emergency costs should not be projected to increase as a direct function of physical losses.

(4) Use of Assessed Value Real Estate Appraisal and Market Value Data in Flood Damage Reduction Studies. Flooding causes physical damages to structures. In the past the Corps frequently estimated damages and cost of repair directly. The Corps now uses a risk-based procedure as defined by ER 1105-2-101. This procedure requires the use of depth-damage

curves, which express an average relationship between depth of flooding and damages. Damages are expressed as a percentage of structure value. When depth-damage curves are used, the correct measure of structure value, consistent with cost-benefit concepts, is replacement cost less depreciation to the existing (pre-flood) structure.

(a) Replacement cost is the cost of physically replacing (reconstructing) the structure (only). Depreciation accounts for deterioration occurring prior to flooding, and variation in remaining useful life of structures.

(b) Assessed value, real estate appraisal and market value data do not necessarily provide acceptable and directly useable estimates of replacement cost less depreciation, even when separate land and improvement values are reported. A variety of particular causes may make the data inappropriate, but the fundamental reason is that these data are produced for and primarily used for purposes other than estimation of flood damages, that is for other than NED benefit estimation purposes.

(c) Such data has some advantages for Corps planners as it is generally available and can be relatively inexpensive. Furthermore, in many cases such data may be useable, either directly or as modified. The appropriateness of the data must be verified however.

(d) When real estate appraisals are used as a source of basic data, the appraisal process shall be documented.

(e) Requirement. When structure value data is obtained from sources other than direct estimation of cost of physical replacement less depreciation, these data shall be verified as being reasonable estimates of replacement cost less depreciation. This can be done using a sampling procedure to select a relatively small number of structures for direct estimation of replacement cost less depreciation. The results can be used to compare to, and if appropriate, adjust the data obtained from other sources.

l. Step 8--Determine Other Costs of Using the Floodplain. The impact of flooding on existing and potential future occupants is not limited to flood losses. Some of the impacts are intangible but others can be translated into NED losses. These latter include the following:

(1) Flood Proofing Costs. High flood hazards lead to high flood costs. Therefore, compute the flood proofing costs of different activity-types and different flood hazard zones.

(2) National Flood Insurance Costs. A national cost of the flood insurance program is its administration. The cost of servicing flood insurance policies in effect at the time of the study is the average cost per policy, including agent commission, and the costs of servicing and claims adjusting. FIA should be contacted to obtain these costs.

(3) Modified Use. In some cases, the flood hazard has caused structures to be used less efficiently than they would be with a project. For example, the first floor of garden apartments may not be rented because of a flood hazard, or property may be configured in a different way with the plan compared to without a plan.

m. Step 9--Collect Land Market Value and Related Data. If land use is different with and without the project, compute the difference in income for the land. This is generally accomplished by using land market value data. Provide supporting data in the situations described in the paragraphs below.

(1) Land Use is Different With Project. If land use is different with compared to without the project, collect the following data as appropriate to complete step 10.

(a) Comparable Value. If the plan does not result in a major addition to the supply of land in the area, the value with protection is the market value of comparable flood-free land. If the plan results in a major addition to the supply of land, the effect on the price of land should be taken into account in estimating the value of floodplain lands with protection. The flood-free land should be comparable in terms of physical and infrastructural characteristics.

(b) Existing Value. Use the value of nearby floodplain sites or, as appropriate, the current value of the floodplain. In either case, report the current and, if available, past market values of the floodplain. Use actual market values, not capitalized income values. Therefore, it should not be assumed that the value of land being used for agriculture in an urban or urbanizing situation is the capitalized value of agricultural returns or that any value higher than this is due to speculation that a Federal project will be constructed or lack of knowledge. On the contrary, without project land values in excess of agricultural land values should be expected, reflecting the probability of future use as well as existing and anticipated infrastructural investments.

(c) Net Income Data. The net income (earned) with a project may be estimated directly based on an analysis of a specific land use with the project. This approach would be used, for example, for lands to be developed for recreation; the projected recreation benefits would constitute the gross income earned on the floodplain and would be shown as a project benefit.

(d) Encumbered Title Market Value. Estimate the market value of land with an encumbered title for inclusion as a benefit in step 10 in situations in which the floodplain is to be evacuated, no specific public use is planned, and the land could be resold with an encumbered title (which would ensure that future uses would be consistent with Executive Order 11988--Floodplain Management, May 24, 1977).

(2) Land Use is Same But More Intense With Project. If land use is the same but more intense, as when an activity's use of the floodplain is modified as a result of the project, base determination of the increase in income on increased land values or direct computation of costs and revenues.

(3) Evacuation Plan. In the case of an evacuation plan, changes in market value of properties adjacent to a restored floodplain may reflect recreation or open-space benefits to occupants of those properties. Document such an NED benefit by empirical evidence. Care must be taken to avoid double counting of benefits.

(4) Market Value is Lowered by Flood Hazard. If the market value of existing structures and land is lower because of the flood hazard, restoration of the market value represents a quantification of otherwise intangible benefits. In such cases, the benefit is the difference between increased market value and that portion of increased market value attributable to reductions in flood damages. Careful attention should be given to ensuring that factors not related to the flood hazard are not included as project benefits.[1]

(5) No Projected Increase in Market Value. Projected increase in the market value of land over the project life with and without a plan should not be used to measure flood hazard reduction benefits because the current market value of land theoretically captures the expected stream of income over time.

n. Step 10--Compute NED Benefits. At this point in the analysis, enough information is available to compute NED benefits for structural and nonstructural measures. Table E-15 displays the types of benefits claimable for three of the major flood hazard reduction measures and the steps in the procedure that provide the necessary data. The table applies generally; specific cases may vary. Discount and analyze all benefits at the appropriate discount rate to the beginning of the period of analysis. Benefits are categorized in the following way:

(1) Inundation Reduction Benefits. To the extent that step 5 indicates that land use is the same with and without the project, the benefit is the difference in flood damages with and without the project (step 7), plus the reduction in flood proofing costs (step 8), plus the reduction in insurance overhead (step 8), plus the restoration of land values in certain circumstances (step 9). To the extent that step 5

Table E- 15 Guide to Types of Benefits

| Type of Benefit (and step) | Structural | Floodproofing | Evacuation |
|---|---|---|---|
| Inundation: | | | |
| Incidental Flood damages (step 6) | Claimable..... | Claimable..... | Claimable..... |
| Primary Flood damages (step 6) | Claimable..... | Claimable..... | Not Claimable.. |
| Floodproofing cost reduced (step 7) | Claimable..... | Not Claimable..... | Not Claimable.. |
| Reduction in Insurance overhead (step 7) | Claimable..... | Claimable..... | Claimable..... |
| Restoration of land value (step 9) | Claimable..... | Claimable..... | Not Claimable.. |
| Intensification (steps 7 and 9) | Claimable..... | Claimable..... | Not Claimable.. |
| Location: | | | |
| Difference in use (step 9) | Claimable..... | Claimable..... | Not Claimable.. |
| New use (step 9) | Not Claimable..... | Not Claimable..... | Claimable..... |
| Encumbered title (step 9) | Not Claimable..... | Not Claimable..... | Claimable..... |
| Open space (step 9) | Not Claimable..... | Not Claimable..... | Claimable..... |

indicates a difference in land use for an evacuation plan, the benefit is the reduction in externalized costs of floodplain occupancy that are typically borne by taxpayers or firms providing services to floodplain activities. Examples of such costs are subsidized flood insurance; casualty income tax deductions; flood emergency costs; and flood damages to utility, transportation, and communication systems. Reduction of costs not borne by the floodplain activities may be a major benefit of projects to evacuate or relocate floodplain activities. Reduction of flood damages borne by floodplain activities should not be claimed as a benefit of evacuation or relocation because they are already accounted for in the fair market value of floodplain properties.

(a) All damages avoided by flood mitigation measures are beneficial effects. Evacuation and relocation projects provide a special case for economic analysis because the effect of damage reductions are present in measures of both benefit and cost, therefore, double counting of this

benefit must be carefully avoided. IWR Research Report 85-R-1, Assessment of the Economic Benefits from Flood Damage Mitigation by Relocation and Evacuation, provides a comprehensive discussion of NED benefit evaluation procedures for relocation and evacuation projects. In planning for, and evaluation of, relocation and evacuation projects considerable attention should be paid to the with project use of land which is to be evacuated, as the benefit, associated with such use may be crucial to project feasibility.

(b) Benefit from Saving Insurance Costs. One category of costs that can be avoided by a removal plan is public compensation for private flood damages through the subsidized Federal Flood Insurance Program. Expressing savings in these externalized costs as project benefits is appropriate for properties in communities that participate in the Federal Flood Insurance Program or are expected to participate under the without project condition. This benefit is the reduction of insurable flood damages projected over the life of the project with careful attention to the projected without project condition.

(c) Insurable Flood Damages. Base the projection of insurable flood damages on traditional depth-damage-frequency relationships used in projecting total flood damages. Then reduce projected total damages by subtracting: Losses that are noninsurable either because they are in noninsurance loss categories or because they exceed the coverage limits of the subsidized program; the deductible portion of each expected flood damage event; and the annual cost of the insurance premium paid by the policyholders. For this benefit calculation, assume that all eligible parties purchase subsidized insurance. This assumption is appropriate because the market value of properties, which determines project costs, reflects the availability of the program, not the extent of its utilization by current floodplain occupants.

(2) Intensification Benefits. If step 5 indicates that land uses are the same with and without the project but activity is more intense with the project, measure the benefit as the increase in market value of land from step 9 or changes in direct income from step 6. Care must be taken to avoid double counting.

(3) Location Benefits. If step 5 indicates that land use is different with and without the project, measure the benefit by the change in the net income or market value of the floodplain land and certain adjacent land where, for example, the plan creates open space (step 9).

o. Evaluation Procedure: Problems in Application. There are six major problem areas in computing flood hazard reduction benefits:

(1) Income Losses. The loss of income by commercial, industrial, and other business firms is difficult to measure because of the complexity involved in determining whether the loss is recovered by the firm at another location or at a later time. Direct interview and empirical post-flood studies are the most appropriate data sources for analyzing whether a real resource

loss, such as the idle capital or decaying inventories, is involved. The loss of income because of idle labor may be measured from the point of view of the firm or the household, but care must be taken to avoid double-counting. Loss of income because of idle labor must be net of income to labor employed in cleanup and repair of damages; unemployment compensation and other transfer payments to idle labor are not income from an NED perspective.

(2) Intensification Benefits. This category of benefits is theoretically applicable to urban situations, but there are to date few documented case studies. This benefit cannot exceed the increased flood damage potential when the existing activity is compared to the intensified activity (without the proposed plan).

(3) Location Benefits. This benefit cannot exceed the increased potential damages with the changed land use but without the project, or the costs of fill/flood proofing, whichever is less. The limitation applies to floodplain but not floodway land. The prohibition of development in floodways reduces land value by more than can be attributed to flood risk alone. That is, land value would have been higher in the absence of development prohibition. Thus, the lessor of limitation is not an upper bound on the increase in land value due to a flood control project since the project removes both the flood risk and the development restrictions**.**

(4) Risk. The analysis of response to a flood hazard is based on a probability weighing of floods off various magnitude. This implies that floodplain occupants are risk-neutral, but many occupants, individually or as a group, either avert or accept risk. Therefore, responses to actual and potential flood damages should be viewed broadly in determining land use, mode of conducting business, and even benefits. Explain any significant deviations from expected behavior based on actual or potential flood damages computed on a risk-neutral basis.

(5) Sensitivity Analyses. The report should contain sensitivity analyses that present a range of benefit levels representing data and assumptions about which reasonable persons might differ. Report the benefit level that is most probable; present other levels for public information. If increases in damages are based on increases in value, conduct a sensitivity analysis of value per structure under the alternate assumption that there is no increase in the average value of structure of contents and that increases in damages are due solely to increases in the number of structures and/or shifts from one type of structure to another. If explicit risk-based analysis has been used in the report, sensitivity analysis are not required. Sensitivity analyses could be performed as necessary to describe the sensitivity of the formulation to inherent assumptions.

(6) Existing Levees that do not Meet Corps Criteria. Problems have often arisen in the benefit evaluation of flood damage reduction studies when there are existing levees of uncertain reliability. Specifically, the problem is one of engineering judgment but has implications for benefit evaluation: engineering opinion may differ or be uncertain on the ability of the levees to

contain flows with water surface elevations of given heights. This may lead to difficulty in arriving at a clear, reasonable and agreed upon without project condition.

(a) General. Investigations for flood damage prevention involving the evaluation of the physical effectiveness of existing levees and the related effect on the economic analysis shall use a systematic approach to resolving indeterminate, or arguable, degrees of reliability. Reasonable technical investigations shall be pursued to establish the minimum and, to the extent possible, the maximum estimated levels of physical effectiveness. Necessary information and summary of analyses shall be included in report presentations of plan formulation and shall be documented in appropriate supporting materials.

(b). Sources of Uncertainty. Studies involving existing levees will focus on the sources of uncertainty (likely causes of failure). Other than overtopping, levees principally fail due to one or a combination of four causes: surface erosion, internal erosion (piping), underseepage, and slides within the levee embankment or foundation soils. Reasonable investigations, commensurate with the level of detail suitable to the planning activity underway, shall determine the condition of existing levees with respect to the factors that can lead to failure, if this information does not already exist.

(c). Performance Record. Existing levees either have or have not failed during previous flood events or have shown evidence of distress such as various degrees of piping, underseepage and sloughing. Information regarding their performance is relevant and vitally important in forming judgments regarding future performance. However, it should not be assumed that because a levee has passed a flood of a given frequency it will always do so in the future or vice versa, assuming the levee has been repaired.

(d) Reliability.

(1). Reliability judgments should be based solely on physical phenomena. The question to be answered is: what percent of the time will a given levee withstand water at height x? This means that considerations such as meeting FIA regulatory requirements, induced damages, induced flood heights, potential for increased risk of loss of life due to false sense of security, etc., are not included. These considerations will be dealt with separately during the plan formulation process.

(2). The purpose of the reliability determination is to be able to estimate the without-project damages. Its purpose is not to make statements about the degree of protection afforded by the existing levees. The preferred procedure is to estimate the reliability from the levee base to its top. As a minimum, information shall be gathered to enable the identification of two points on the existing levees. The first point is the highest vertical elevation on the levee

such that it is highly likely that the levee would not fail if the water surface elevation were to reach this level. This point shall be referred to as the Probable Non-failure Point (PNP). The second point is the lowest vertical elevation on the levee such that it is highly likely that the levee would fail. This point shall be referred to as the Probable Failure Point (PFP). As used here, "highly likely" means 85+ percent confidence. As defined, the PNP will be at a lower elevation than the PFP. When there are unresolved uncertainties or differences of opinion, consideration should be given to having the range of uncertainty extend from the lower of arguable PNPs to the higher of arguable PFPs. Because of lack of information or other reasons, if the PFP cannot be determined then the PFP shall be the low point in the levee where the levee is first overtopped. When determining the low point in the levee, assume that closure actions have taken place.

(3) Further technical guidance on reliability determinations is available in Engineering Technical Letter 1110-2-556, Risk Based Analysis in Geotechnical Engineering for Support of Planning Studies, 28 May 1999.

(e). Benefit Evaluation Procedure. Even if no PNP is claimed for an existing levee, it does, most likely, provide some benefits. Assessment of these benefits must be in some degree arbitrary in the absence of illuminating engineering or statistical analyses. The function of identifying the probable failure and non-failure points is to create a range of water surface elevations on the levee over which it may be presumed that the probability of levee failure increases as water height increases. The requirement that as the water surface height increases the probability of failure increases, incorporates the reasonable assumption that as the levee becomes more and more stressed it is more and more likely to fail. If duration information is known, explicit incorporation of the information is encouraged. If the form of the probability distribution is not known, a linear relationship is an acceptable approach for calculating the benefits associated with the existing levees. For benefit evaluation, assume all flood damages will be prevented below the PNP; and no damages will be prevented above the PFP.

p. Data Sources. The following paragraphs summarize problems associated with two key data sources.

(1) Interviews. The primary use of personal interviews is to collect flood damage data, but interviews may also be used to collect other necessary data not available from secondary sources. Use only interview forms approved by the Office of Management and Budget. Use statistically sound techniques for selecting the interview sample and for devising the questions. The questionnaire and a summary of responses should be compiled and displayed in the final report in a way that protects the source of individual disclosures. Describe the errors and uncertainty inherent in the sampling methods and responses.

(2) Local Land Use Plans. Local land use plans and zoning ordinances are valuable guides to future land use in the floodplain, but caution must be exercised in the use of such plans

and ordinances. First, the demographic implications of local plans and ordinances must be consistent with, or convincingly distinguished from, trends in a larger area, e.g., OBERS [Bureau of Economic Analysis]. Second, a local plan is not an acceptable projection for the without project condition if it ignores the flood hazard. Third, the status, date, and likelihood of change of local plans vary. Finally, local plans may not contain sufficiently detailed information to be of direct use in benefit analysis.

(3) IWR Reports. Additional detailed support material for conducting NED evaluation for urban flood damage may be found in the following reference documents. Policy statements in this regulation take precedence in any apparent contradiction suggested by information contained within these IWR reports.

(a) Urban Flood Damage (IWR Report 88-R-2, March 1988)--This manual provides an expanded description of urban flood damage reduction benefit procedures.

(b) Urban Flood Damage, Volume II, Primer for Surveying Flood Damage for Residential Structures and Contents (IWR Report 91-R-10, October, 1991)--This manual is a primer for conducting comprehensive flood damage and related surveys. It explains how basic principles of survey research can be applied to data collection for flood damage studies. Two prototype questionnaires (one in person and one mail with a preliminary telephone supplement) for collecting residential flood damage and related information are presented. Examples from previous applications of these questionnaires provide insight as to how they may be adapted and implemented for future flood damage studies.

q. Urban Flood Damage - Additional Procedures.

(1) Content Value.

(a) For feasibility studies, residential content-to-structure ratios should be based on either site-specific surveys or surveys of comparable floodplains. In areas where surveys of comparable floodplains are used, at a minimum, qualitative rationale will be provided to demonstrate comparability of the survey to the study floodplain. Districts may request deviation from this guidance if can reasonably demonstrate lack of site specific content surveys will not effect plan formulation. Rationale for deviation from this guidance should be submitted to HQUSACE (CECW-PD) with accompanying Project Management Plan.

(b) Commercial, industrial and public content-to-structure ratios should be based on either site-surveys or surveys of comparable business or structure types. In areas where surveys of comparable types are used, at a minimum, qualitative rationale will be provided to demonstrate comparability of the survey to the study floodplain. Districts may request deviation

from this guidance if it can reasonably demonstrate lack of site specific content surveys will not effect plan formulation. Rationale for deviation from this guidance should be submitted to HQUSACE (CECW-PD) with accompanying Project Study Plan.

(2) Depth-Damage Relationships. For feasibility studies, depth-damage relationships should be developed based on site-specific data or from comparable floodplain data. In areas where depth-damage relationships are based on comparable floodplain data, at a minimum, qualitative rationale will be provided to demonstrate the reasonableness of use of the depth-damage relationship in the study area. Districts may request deviation from this guidance if they can reasonably demonstrate lack of site-specific depth-damage relationships will not effect plan formulation. Rationale for deviation from this guidance should be submitted to HQUSACE (CECW-PD) with accompanying Project Study Plan.

(a) In FY 2000 the Corps began releasing generic depth-damage relationships developed through the Flood Damage Data Collection Program. In flood damage reduction studies where site-specific or comparable floodplain depth-damage information is not readily available these curves are approved for use. As these curves are intended for nation-wide use no rationale is required to demonstrate applicability in individual floodplains. The curves are developed for specific building types, i.e., residential one-story without basement, and cannot be substituted for other building types.

(b) These generic depth-damage curves relate content damages directly to structure values. When generic depth-damage curves are used no valuation of contents is required. Districts are therefore not required to collect or report content valuations for flood damages analyzed through the use of generic curves.

(3) Documentation Requirements for Location Benefits. A location benefit is the increase in aggregate net income (increases less decreases) due to efficiencies of a floodplain location compared to the best non floodplain location. The P&G says estimated change in floodplain land price is an acceptable benefit measure, but care must be taken that decreases in price elsewhere are accounted for. Alternatively, when change in net income to the occupying activities is directly estimated, accounting for compensating changes in land prices is not relevant.

(a) Provide the following documentation in addition to that required by paragraphs E-19e. to E-19n.

(1) Document alternative sites for activities that might occupy the floodplain. Include sites which are available or would likely be available for development over the planning horizon, but which may not typically be included in a real estate study that focuses on comparable sales. There is usually substantial industrial/commercial land available in a typical urban area.

(2) Document specific characteristics of the protected floodplain which make it attractive in comparison to alternative non floodplain locations, such as availability of services, etc. Some idea of the likely nature of the occupying activity is required. Compare floodplain and non floodplain alternative locations on a characteristic by characteristic basis.

(3) Based on economic projections for the overall area, and on the potential for land use change in the overall area, allocate land use to floodplain and non floodplain locations in without and with project conditions. The allocation must be explicitly based on the comparisons of subparagraph (2) above. Significant economic advantage of the floodplain location must be apparent as a basis for attributing predicted changes in land prices to locational advantage.

(4) If predicted changes in floodplain land values are to be the measure of benefits, the data and procedures by which the benefit estimate results from analysis of comparable sales must be documented.

(a) Choose comparable sales based on their similar characteristics to floodplain locations. These data are used in estimating NED benefits as discussed in paragraphs E-19m. and E-19n. Also, compare these sale prices to asking prices of non floodplain alternative locations identified in subparagraph (1) above. If alternative location asking prices are less, assess whether this means such sites would be preferable to floodplain sites. For example, if non floodplain asking prices are lower, it must be shown that floodplain site characteristics are sufficiently advantageous to outweigh the lower cost of non floodplain alternative sites.

(b) The spatial allocation and benefit estimates are supported when comparisons of both relative locational characteristics and relative land prices indicate floodplain locations are superior.

(5) If allocations are supportable by both comparisons of the locational characteristics and comparable sales data, it should be assumed that use of floodplain land is phased in as demand for additional land develops. Floodplain land should not be assumed to increase in value instantaneously.

(b) Required sensitivity on the reasonableness of benefits estimated by land value comparisons, and test of the non practicability of non floodplain locations.

(1) For representative activities estimate directly the change in net income that would accrue when a floodplain location is chosen over the best non floodplain location. Use these calculations to support benefits based on land value projections and for findings of non practicability of non floodplain locations.

(2) Estimate the increased damages which would accrue on the newly developable land in the floodplain if the development occurred in the without project condition.

(4) Documentation Requirements for Lost Net Income and Lost Wages. The P&G allow income loss as an NED benefit only when it can be demonstrated that postponement or transfer does not occur. This is exceedingly difficult to demonstrate. If lost net income or lost wages is to be claimed as a benefit, an estimating procedure must be developed and submitted to HQUSACE CECW-PD for approval prior to inclusion of the benefits in feasibility reports or other decision documents. The PSP is an appropriate vehicle for documenting proposed procedures when it is desired to include lost income or lost wages benefits in feasibility studies.

(5) Documentation Requirements for Savings in Floodproofing Costs on Alluvial Fans. Alluvial fans are triangular or fan shaped, gently sloping land forms which provide attractive development sites due to their commanding views. Alluvial fans primarily occur in the southwestern U.S. Active fans exhibit braided channels and erratic flowpaths that are typical of a young fan formation. These fans have severe flood hazards which exhibit unpredictable flow paths and high velocities that usually occur with little advance warning time. Flooding on the fan can cause considerable erosion in some areas and deposit large amounts of sediment and debris in other areas.

(a) The Federal Emergency Management Agency (FEMA) has provided guidance on techniques and strategies for minimizing losses from the flood hazards when building and developing on an alluvial fan (Alluvial Fans: Hazards and Management, May 1989) and additionally has placed restrictions on housing developments in Special Flood Hazard Areas (SFHA). The creation of an overall development master plan, drainage maintenance and floodplain management is encouraged by FEMA. The Federal Register dated March 7, 1989, 44 CFR states "topographic alterations alone, by fill or other means, will not serve as a basis for removing SFHA designations from alluvial fans." The procedures necessary for FEMA to recognize that a flood control measure is effective in removing or reducing the size of a SFHA on an alluvial fan have associated costs. To ensure that development projects are protected from alluvial fan flood hazards, FEMA's review criteria requires that the construction include elements which: do not cause the disturbance of natural flood processes on the fan; allow for safe collection, passage and disposal of flood related water, sediment and debris without negative impact to adjacent property; address erosion, scour, deposition, impact and hydrostatic forces; provide that the design and maintenance of project elements be coordinated with the local jurisdiction and/or agency responsible for flood control within the community.

(b) Cost associated with development compliance in accordance with FEMA alluvial fan regulations are NED costs where it can be demonstrated that these costs will occur in the without project condition. Removal of these costs through regional flood control solutions would therefore be an NED benefit. FOAs must, however, carefully document the without project

condition. It can reasonably be expected that without project development will not occur in some areas of an alluvial fan because of prohibitively high compliance costs. This is likely true in the high velocity areas approaching the apex of the fan. In studies where alluvial fan compliance cost benefits constitute a major portion of total benefits, districts are required to quantitatively demonstrate that development will occur in the without project condition. An example of an appropriate quantitative analysis would be a comparison of developer costs and expected profits in project alluvial fan and non-alluvial fan areas. Additionally, districts must document historic floodproofing costs and explain any deviation from those projected for the benefit analysis.

r. Report and Display Procedures. Include in the report enough data to enable the reviewer to follow the key steps above and, more important, the underlying rationale for the project.

(1) Report Procedures For Risk and Uncertainty. To assist reviewers in assessing response to risk, summarize the following separately and display the information in tabular form:

(a) Remaining Flood Damage Situations: Categorizations. The remaining damages are those expected to occur even with a floodplain management plan in operation. Remaining damages include:

(1) Damages to activities that would occupy the floodplain with as well as without the plan;

(2) Damages to activities that would occupy the floodplain only with the plan; and

(3) Increased damages to activities outside the protected area with and without the plan. This includes downstream flooding, if any, caused by the plan or project.

(b) Flood with two-tenths of 1 percent chance of occurrence. Fully describe the flood with two-tenths of 1 percent chance of occurrence (500-year frequency) with and without the plan. The report should contain, for example, two-tenths of 1 percent flood damages; the number of people and towns affected; the number of structures and acres by land-use type; disruption of essential services (e.g., water, power, fire protection, and sanitary services) and distance to unaffected essential services; anticipated warning time; flood depths, velocity, duration, debris content, etc.; and other indicators pertinent to catastrophic flooding. The .02 probability flood description will be based on the median probability discharge. If protection against the .02 probability event is recommended, the Standard Project Flood (SPF) shall also be analyzed and described, if it is larger than the .02 probability flood.

(2) Summary Tables. Tables E-16 through E-19 are suggested presentations for all reports that include flood hazard reduction as a purpose. The summary tables should include

pertinent land use data for computing not only NED benefits, but also environmental, social, and regional impacts. Also present other floodplain data pertinent to the evaluation on one or more maps: Flood limits and depths with and without the project; current and future land use; and 100-year [.01 annual probability] and other flood limits and depths.

E-20. NED Benefit Evaluation Procedures: Agriculture

a. Purpose. This section provides procedures for the evaluation of agricultural benefits from water resources plans. The benefits attributable to flood damage reduction, drainage, irrigation, erosion control and sediment reduction should be evaluated separately to the extent practical.

b. Conceptual Basis.

(1) NED Benefits. The NED benefits are the value of increases in the agricultural output of the Nation and the cost savings in maintaining a given level of output. The benefits include reductions in production costs and in associated costs; reduction in damage costs from floods, erosion, sedimentation, inadequate drainage, or inadequate water supply; the value of increased production of crops; and the economic efficiency of increasing the production of crops in the project area.

(2) Basic and Other Crops.

(a) Basic crops (rice, cotton, corn, soybeans, wheat, milo, barley, oats, hay, and pasture) are crops that are grown throughout the United States in quantities such that no water resources project would affect the price and thus cause transfers of crop production from one area to another. The production of basic crops is limited primarily by the availability of suitable land.

(b) On a national basis, production of crops other than basic crops is seldom limited by the availability of suitable land. Rather, production is generally limited by market demand, risk aversion, and supply factors other than suitable land. Thus, production from increased acreage of crops other than basic crops in the project area would be offset by a decrease in production elsewhere. In some parts of the Nation analysis of local conditions may indicate that the

Table E- 16 Summary of Annualized NED Benefits and Costs for Alternative Projects

(Applicable discount rate: _____)

| Project benefits and costs | Alternatives | | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | X |
| | | | | |

| | | | | |
|---|---|---|---|---|
| Flood hazard reduction benefits | | | | |
| Inundation: | | | | |
| Physical ..... | ..... | ..... | ..... | ..... |
| Income..... | ..... | ..... | ..... | ..... |
| Emergency..... | ..... | ..... | ..... | ..... |
| Total ..... | ..... | ..... | ..... | ..... |
| Intensification ..... | ..... | ..... | ..... | ..... |
| Location: | | | | |
| Floodplain ..... | ..... | ..... | ..... | ..... |
| Off Floodplain..... | ..... | ..... | ..... | ..... |
| Total | ..... | ..... | ..... | ..... |
| Total flood benefits | ..... | ..... | ..... | ..... |
| Benefits from other purposes | ..... | ..... | ..... | ..... |
| Total project benefits | ..... | ..... | ..... | ..... |
| Project costs | ..... | ..... | ..... | ..... |
| Net benefits | ..... | ..... | ..... | ..... |

Table E- 17 Flood Damages by Decade, Alternative Projects

(Applicable discount rate: ____)

| Project | Time Period[1] | | | |
|---|---|---|---|---|
| | P0 | P10 | P20 etc | AAE [2] |
| No. 1..... | ..... | ..... | ..... | ..... |
| No. 2..... | ..... | ..... | ..... | ..... |
| No. 3..... | ..... | ..... | ..... | ..... |

[1]The designations P10 and P20 identify the 10th and 20th years, respectively, of project life
[2]Average annual equivalent

Table E- 18 Flood Damages by Decade Without Project

(Applicable discount rate: ____)

| Property Type | Time Period[1] | | | | | | |
|---|---|---|---|---|---|---|---|
| | P50 | P40 etc | Existing | pn | P10 | PN | AAE[2] |
| a (Subclassification of residential..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| b..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| c..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Commercial ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Industrial..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Other..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Total..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |

[1]The designations P10 and P20 identify the 10th and 20th years, respectively, of project life, P50 is 1932, P40 is 1942, etc.
[2]Average annual equivalent

Table E- 19 Number of Acres (or Structures), Floodplain Without Project

| Property Type | Existing | Time Period[1] | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | P0 | P10 | P20 | P30 | P40 | P50 | P100 |
| a (Subclassification of residential units..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| b ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| c ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Commercial ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Industrial ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Semipublic ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Transportation ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |

[1]Comparable tables may be made for all alternatives, if pertinent.
[2]The designations P10 and P20 identify the 10th and 20th years, respectively, of project life

production of other crops is limited by the availability of suitable land. (Suitable land is land on which crops can be grown profitably under prevailing market conditions.) In this case, crops other than basic crops listed above may also be treated as basic crops when measuring intensification benefits by farm budget analysis. (See paragraph E-20e(4) to determine when other crops may be treated as basic crops.)

(3) Benefit Categories. Agricultural benefits are divided into two mutually exclusive categories, depending on whether there is a change in cropping pattern:

(a) Damage reduction benefits, that is, benefits that accrue on lands where there is no change in cropping pattern between the with and without project conditions; and

(b) Intensification benefits, that is, benefits that accrue on lands where there is a change in cropping pattern. There is also a subcategory of intensification benefits called efficiency benefits, which accrue from reduced costs of production.

(4) Measurement of NED Benefits.

(a) Damage reduction benefits. Damage reduction benefits are the increases in net income due to the plan, as measured by farm budget analysis. These income increases may result from increased crop yields and decreased production costs. ER 1105-2-101 requires risk-based

analysis in all flood damage reduction studies. This includes studies where the primary damages occur to agricultural crops. The ER identifies key variables that will be specifically incorporated into the risk-based analysis. The identified hydrologic/hydraulic variables, discharge associated with exceedence frequency and conveyance roughness and cross-section geometry, apply to agricultural studies. However, the economic variables do not identify the key areas of uncertainty related to the stage-damage relationship in agricultural studies. The ER suggests that key variables in agricultural areas may be seasonality of flooding and cropping patterns. FOAs should incorporate the key variables that apply to their specific area in the risk-based analysis. Documentation of the key variables and the method of analysis should be incorporated in the PSP. Districts are under no requirement to use the economic variables identified in the ER (structure first floor elevation, content and structure values) for agricultural damages or to perform explicit risk-based analysis of agricultural structures if they do not affect the formulation of the project

(b) Intensification benefits. Intensification benefits are measured either by farm budget analysis or by land value analysis. Intensification benefits from increased acreage of basic crops and other crops that are constrained by the availability of suitable land in the WRC assessment subarea (ASA) are measured as the net value of the increased production. Intensification benefits from increased acreage of other crops (except for acreage of crops to be treated as basic crops because they are land constrained) result when there are production cost savings. These production cost savings are called efficiency benefits and are measured as the difference between production costs in the project area and production costs on land elsewhere in the ASA.

(1) Farm budget analysis. On land where the intensification benefit is solely from increased acreage of basic crops (and crops to be treated as basic crops), benefits are measured as the change in net income (see paragraphs E-20e.(3). through E-20e.(6).). On land where the intensification benefit is from increased acreage of other crops, use the efficiency procedure found in paragraph E-20e(8).

(2) Land value analysis. Intensification benefits alternatively may be measured as the difference in the value of benefiting lands with and without the plan. The market value of a parcel of land reflects the capitalized value of the expected net income that can be derived from the land. Therefore, the difference in market value of two parcels of land that are identical except for the provision of improved water conditions reflects the present value of the additional net income (i.e., the intensification benefit) that can be attributed to improved water management or supply. (See paragraph E-20e(9))

c. Evaluation Components. Evaluation of the impact of water management practices or control measures should consider the following components:

(1) Cropping Patterns. Project the most probable cropping patterns expected to exist with and without the project. If project measures are designed to reduce damage or associated cost problems without changing cropping patterns, project the current cropping pattern into the future for both with and without project conditions.

(2) Prices. Use normalized crop prices issued by the Department of Agriculture to evaluate NED agricultural benefits; adjustments may be made to reflect quality changes caused by floods or drought. The Department of Agriculture provides commodity prices, and indexes of prices paid by farmers for purchased inputs, to Federal water resource agency planners for estimating benefits from water projects. In the past, for each crop two prices and for each purchased input two price indexes were reported. One was market clearing prices with Government crop support programs, the other was market clearing prices without the programs. As a result of Section 632 of Public Law 100-460 market clearing prices without Government crop support programs will no longer be reported. Economic evaluation will therefore necessarily use only prices with the support programs**.** For crops not covered above, statewide average prices over the three previous years may be used.

(3) Production Costs.

(a) Analyze production costs that can be expected to vary between the with and without project conditions. These may include the costs of equipment ownership and operation; production materials; labor and management; system operation, maintenance, repair, rehabilitation and replacement (OMRR&R); and interest payments. If costs associated with project measures (e.g., on-farm drainage or water distribution costs) are included in the project cost analysis, exclude them from production costs.

(b) Value purchased inputs at current market prices. Compute interest at the project discount rate. Value all labor, whether operator, family, or hired, at prevailing farm labor rates. Estimate management cost on the basis of the type of farming operation. The estimate normally is expected to be at least six percent of the variable production cost (the cost of equipment ownership and operation, production materials and labor, but excluding the cost of land and added capital improvements).

(4) Crop Yields. Project current yields with average management in the project area to selected time periods. Adjust future yields to reflect relevant physical changes (e.g., erosion, drainage, water supply, and floodwater runoff) in soil and water management conditions. Increases in yields due to future improvements in technology may be included in the evaluation when realization of these benefits is dependent upon installation of the project. The costs associated with these improvements in technology should be accounted for in the analysis.

Changes in yields, both with and without the project, should be projected consistently with the water management and production practices accounted for in the production cost analysis.

(5) Livestock Production. In geographically isolated areas increased livestock production may depend on installation of the water resources project. Where this can be demonstrated, net income from additional livestock production may be included as a benefit. The test for dependency is whether the livestock feeds can economically be transported into or out of the area. Benefits cannot exceed the delivered cost of the livestock feed if it were purchased for use in the project area. Such purchase prices would automatically include the costs of transporting the feeds into the area.

(6) Comparable Lands. Comparable lands are lands that have climate, aspect, slope, soil properties and water conditions similar to those of a given category of lands benefitting from a plan.

(7) Land Values. The market value of lands method for estimating the economic benefits of alternative plans requires the involvement of qualified land appraisers with local experience. Use of this procedure is appropriate when:

(a) Lands to be affected by the proposed alternative plan are comparable to lands elsewhere which can be appraised;

(b) Water resources conditions on comparable lands are similar to those to be provided on lands affected by an alternative plan, and they can be identified and evaluated;

(c) Current market data are used to determine the value of capital improvements and other factors when making adjustments for these factors on comparable lands; and

(d) The estimated value of lands to be affected by the plan is not changed by speculation that Federal action is anticipated.

d. Planning Setting.

(1) The without project condition, including conservation measures, is the condition expected to exist in the absence of an alternative plan.

(2) The with project condition is the condition expected to exist with each alternative plan under consideration.

(3) Agricultural income and production costs should be determined for various conditions or levels of land and water quantity and/or quality use. (Include other resources

associated with changes in land and water quantity and/or quality.) The level of use to be evaluated initially is the without-plan condition. Other levels of use to be evaluated will depend on the number of alternative plans selected for analysis.

e. Evaluation Procedure: Crops. This procedure is for the evaluation of benefits to crop production that would accrue from an alternative plan. Steps in this procedure are summarized in Figure E-5.

(1) Step 1. Identify Land Use and Cropping Patterns With and Without a Plan. This information is generally developed for segments of the plan area with significantly different characteristics. Collect appropriate data about the current and historic cropping patterns and yields in the project area. When appropriate, collect similar data on other areas with comparable soils to determine conditions expected with alternative plans. Analyze trends and expected changes for without project conditions. Project future cropping patterns and yields under without plan conditions. Include the effects of conservation and structural and nonstructural measures expected under existing programs. Project future cropping patterns and yields for each alternative plan. For analytical purposes, separate land in the project area into two categories: lands on which the cropping pattern is the same with and without the plan; and lands on which there would be a change in cropping pattern with the plan. To estimate crop production benefits on lands where there would be a change in cropping pattern, go to Step 3. To estimate crop production benefits on lands where there would not be a change in cropping, proceed with Step 2.

(2). Step 2. Determine Damage Reduction Benefit. For land on which the cropping pattern would not change, determine the change in net income with and without a plan. This is the damage reduction benefit. Income increases may result from increased crop yields and decreased production costs. They are measured as reduced damage to crops from excessive soil moisture, water inundation, drought and erosion, and reduced costs associated with using water and land resources for the production of crops.

(a) Estimate reduced damage to crops from excessive soil moisture on the basis of the change in frequency and duration of excessive soil moisture. Estimate reduced damage to crops from water inundation on the basis of the change in frequency, depth, and duration of inundation. Estimate reduced damage from drought on the basis of the change in frequency and duration of inadequate soil moisture during the growing season. Estimate reduced damage from erosion on the basis of the change in land voiding from gully and streambank erosion and on the basis of the

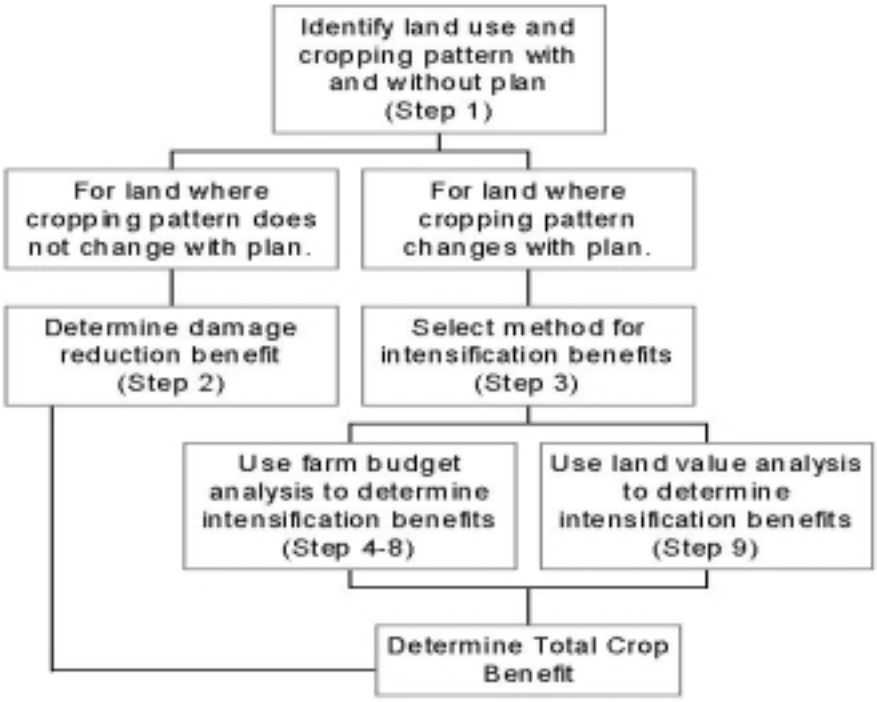



Figure E- 5 Agricultural Benefits Evaluation Procedure

change in productivity losses from floodplain scour, sheet erosion, overbank deposition, and swamping.

(b) Estimate reduced costs associated with using water and land resources for the production of crops on the basis of the changes in the costs of equipment ownership and operation; production materials; labor and management; and system operation, maintenance, and replacement.

(c) Use farm budget analysis to measure changes in net income from reduced damage to crops and reduced costs of production.

(3). Step 3. Select Evaluation Method for Estimating Intensification Benefits. For land on which the cropping pattern would change, select either farm budget analysis or land value analysis as the method for measuring intensification benefits. If land value analysis is selected, go to Step 9. If farm budget analysis is selected, proceed with Step 4.

(4) Step 4. Determine Whether Other Crops Are to be Treated as Basic Crops. If the change in cropping pattern increases the acreage in production of other crops and if it is believed that the production of other crops is constrained by the availability of suitable land, the following test may be applied to determine whether these crops should be treated as basic crops in the benefit analysis. If the test is not applied, go to Step 8.

(a) Select a representative sample of farm operations on lands comparable to lands benefitting from the project under with project conditions where there would not be a change in cropping pattern, proceed with Step 2.

(b) For each farm operation determine the respective acreage of basic and other crops.

(c) Use these data to compute the proportion of other crop acreage to total crop acreage for each farm.

(d) Use farm budget analysis to identify the top 25 percent of farms in the representative sample in terms of expected net income per acre.

(e) The average of the proportions of other crop acreage to total crop acreage for the top 25 percent of farm operations is defined as the “optimal proportion”. The optimal proportion for these farm operations will reflect risk and uncertainty, returns to management, and prevailing market conditions.

(f) If it can be demonstrated through standard statistical tests that the optimal proportion is not statistically different from the proportion computed as the average of individual farm operation proportions for the complete sample, then the production of other crops can be considered to be constrained by the availability of suitable land in the ASA and, therefore, treated as basic crops. Otherwise it can be inferred that production of other crops is not land constrained in the ASA. When the crops are not land constrained, go to Step 8; otherwise, proceed with Step 5.

(5) Step 5. Determine Limit on Acreage of Other Crops That May be Treated as Basic Crop Acreage. If the production of the other crops is found to be constrained by availability of suitable land in the ASA, then multiply the acreage of comparable land in the project area by the optimal proportion found in Step 4(a). This is the maximum acreage of other crops that may be analyzed using the steps that apply to basic crops (Steps 6 and 7). To analyze benefits for any acreage of other crops in excess of this maximum acreage, go to Step 8.

(6) Step 6. Project Net Value of Agricultural Production With and Without the Plan. Use information from farm budget analysis to estimate the net value of agricultural production under without plan conditions. Estimate the net value of agricultural production associated with each of the alternative plans. Account for variable costs related to production. Include non-project OM&R costs and associated costs for each alternative plan.

(7) Step 7. Compute Intensification Benefits for Acreage of Basic Crops and Other Crops to be Treated as Basic Crops. Compute intensification benefits as the change in net income between the without project condition and conditions with an alternative plan. Express these intensification benefits in average annual equivalent terms. This completes the analysis of benefits for lands with increased acreage of basic crops and other crops that are to be treated as basic crops.

(8) Step 8. Determine Efficiency Benefits. Compute efficiency benefits for acreage producing other crops not treated as basic crops as the sum of:

(a) The difference between the cost of producing the crops in the project area and the cost of producing them on other lands in the ASA; and

(b) The net income that would accrue from production of an appropriate mix of basic crops on those other lands. Express this efficiency benefit in average annual equivalent terms.

(9) Step 9. Land Value Analysis. When estimating intensification benefits on the basis of land value analysis, base appraisals on market values, not on capitalized income values.

(a) Obtain appraisals of the current market value of lands that would benefit from the plan. These lands should be divided into various categories where values differ significantly.

(b) Obtain and appropriately adjust appraisals of non-project lands in the ASA that are comparable to lands in each category of project lands and that have water conditions comparable to those that would result from each alternative plan.

(1) Adjust the value of these comparable lands for facilities and other capital improvements that are not present on project lands. For example, subtract the current market value of improvements such as investments in orchards.

(2) In the case of irrigation projects, add to the appraised value of comparable lands the present value of water costs incurred by the operator. These water costs include both payments to outside suppliers and the cost of self-supplied water. Use the project discount rate to calculate the present value of these costs.

(3) Control for other factors that may affect the value of land, such as kinds of crops grown, distance to urban areas, availability of transportation facilities, presence of utilities, zoning regulations, and special property tax rates. This control may be achieved by using totally comparable parcels of lands; by collecting a sample large enough so that differences will be averaged out; or by a statistical means such as regression analysis.

(c) Subtract the value in paragraph E-20e(9)(a) from the adjusted value in paragraph E-20e(9)(b). This is the intensification benefit.

(d) Annualize the intensification benefit found in the subparagraph (c) above at the project discount rate.

f. Damage Reduction For Other Agricultural Properties and Associated Agricultural Enterprises.

(1) Determine Damage Reduction for Other Agricultural Properties. The term “other agricultural properties” includes physical improvements associated with various farm enterprises and the agricultural community. Measure benefits to such properties as reduction in damages in the future with the project compared to without the project. The following discussion identifies key analytical steps in the evaluation. Benefits accrue through alterations in water conditions or in altering the susceptibility of the property to damage (e.g., flood proofing).

(a) Inventory Damageable Improvements. Identify the location, type, number, and value of other agricultural properties within the area that are subject to damage. This information is most easily obtained through interviews of farmers and field reconnaissance.

(b) Determine Damage to Improvements. Gather historical data on damages to other agricultural properties, such as equipment, improvements, and agricultural enterprises.

(c) Determine Average Annual Equivalent Damage to Improvements. Use appropriate data to determine average annual equivalent damage to improvements. For example, use depth-damage relationships for each reach, integrated with hydrologic data, to develop average annual flood damages with and without the plan. Include consideration of the frequency and duration of the damage.

(2) Determine Damage Reduction Benefits for Associated Agricultural Enterprises. Associated agricultural enterprises are economic activities that may be affected by changed water supply or water management conditions. Evaluate damages of this type as reduced net income under without project and with project conditions. An example of this type of damage is delay in spring planting on flood free lands because of flooding of access roads.

(3) Calculate Average Annual Equivalent Benefits. The damage reduction benefit is the difference between average annual equivalent damages with and without the plan.

g. Off-site Sediment Reduction. Determine average annual equivalent sediment damages by adding the costs in constant dollars of removing sediment from roads, culverts, channels, etc., over a representative period of time and dividing by the years of record. The difference in damages with and without the project is the benefit. Extending the useful life of an existing reservoir is another type of sediment reduction benefit. Discount the net value of the extension to present values, and amortize it over the project life. The increased cost of providing goods and services (e.g., additional treatment costs for removing sediment from municipal water) can also be used to evaluate damages. Reductions in the costs of sediment removal or water treatment provide the basis for assessing benefits with the plan.

h. Evaluation Procedures: Problems in Application.

(1) Damage Reduction Benefits. Damage reduction benefits are measured by farm budget analysis. Proper measurement of such benefits requires accurate estimates of with and without plan soil, water, and land use conditions. Changes in physical conditions take place at different rates and over different time periods. Analysis can be improved by projecting changes in physical conditions to selected time periods, analyzing net income for the time periods, and converting net income for the time periods to an average annual equivalent value. In farm budget analysis, double counting can be avoided by taking a holistic approach (including all soil, water and land use conditions in a single farm budget analysis).

(2) Determination of Land Constraint. Intensification benefits for other crops are measured either as a change in net income or as an efficiency gain depending on whether there is an adequate supply of suitable land in the region for growing crops other than basic crops (that is, whether production is land constrained). This determination requires a regional (ASA) analysis of comparable lands. In order to make this determination properly, care must be exercised to ensure that lands being evaluated are fully comparable. Care must also be exercised in order to obtain the proper determination of aggregate acreage of basic and other crops for the top 25 percent of the farms. (See paragraph E-20e(4))

(3) Benefit Attribution. In flatland watersheds, drainage and flood damage reduction benefits cannot be separated analytically. Therefore, they are arbitrarily allocated on a 50/50 basis. The value of benefits in other categories is determined on the basis of changes in physical conditions with and without the plan. The benefits are assigned according to the following: the proportion of the change in net income attributed to changes in soil moisture, water inundation, drought and erosion; the proportion of land use changes attributed to each of the above; and changes in production costs attributed to each of the above. Except for the problem with drainage and flood damage reduction in flatland watersheds, benefits can be measured independently if proper assumptions are made to avoid double counting. Double counting can be avoided by making sure that total benefits measured independently do not exceed total benefits from a holistic farm budget analysis.

(4) Residual Damages. In evaluating with plan conditions, care must be taken to consider residual damages, that is, damages that would still occur with implementation of the plan.

(5) Land Value Analysis. Because proper real estate value(s) analysis is dependent on accurate appraisals, the land analysis must be based on appraisals performed by qualified appraisers. Adjustment of comparable real estate to project lands requires detailed knowledge of local physical and financial conditions to account for capital improvements, costs of water supply, and other factors affecting the values.

(6) Agricultural intensification benefits cannot exceed the increased flood damage potential when the existing cropping pattern is compared to the intensified cropping pattern (without the proposed plan).

(7) Agriculture: Swampbuster. The Food Security Act of 1985 (Public Law 99-198) contains provisions known collectively as "Swampbuster". Their intent is to discourage conversion of farm wetlands. The Swampbuster provisions were implemented as a USDA final rule (7 CFR 12), effective 17 September 1987.

(a) Conversion of wetlands is discouraged by imposing penalties on farmers who plant commodity crops on lands that were converted from wetlands after 23 December 1985. The penalty is loss of a wide variety of Agriculture Department program benefits, including all types of price supports or payments; crop insurance; access to loans made, insured, or guaranteed by FMHA; and others. If imposed, the penalty applies to all holdings of the farmer, not just to the acres that were converted and cropped.

(b) More information about the purposes, policies, and procedures of the Swampbuster program are contained in the final rule cited above. Details about the program, and its management and administration, as well as determinations of its applicability to specific Corps projects can be obtained through the regional offices of the USDA Soil Conservation Service.

(c) Without and With Project Analysis. The effects of the Swampbuster program shall be explicitly considered in without and with project conditions.

(1) Benefit Evaluation. The effects of the program will operate through farm operator decisions to convert and cultivate on-farm wetlands. Particularly important for benefit evaluation is with project condition analysis, as a Corps project may by itself convert wetlands to non wetlands, or may make additional private conversion investments more profitable. The Swampbuster program, however, may modify incentives sufficiently to alter with project cropping plans, and may even affect support for particular projects.

(2) Incremental Cost of Mitigation Analysis. Swampbuster will have no effect procedurally on the analysis of the incremental cost of mitigation. It may affect the amount of wetland loss expected in the without project condition, the amount of any wetland preservation

credit due the project, and through these the total amount that will be considered for mitigation. (See Appendix C.)

i. Evaluation Procedure: Data Sources.

(1) Interviews. Interviews with farmers and other area residents are important for most of the categories of benefits to be evaluated. Interviews should not be confined to farmers in the project area. Data collected outside the project area serves as a comparative basis for estimating damages and yields in the project area. Use only interview forms approved by the Office of Management and Budget. In the project report, the questionnaire and a summary of responses should be compiled and displayed in such a way as to prevent the disclosure of individual sources.

(2) Physical Specialists. Agronomists and soil scientists can provide data to establish yield estimates by soil type and the effects on production of soil depletion or sediment deposition.

(3) Universities and Federal Agencies. Many universities and the Department of Agriculture have developed typical enterprise budgets that can be modified to reflect conditions in the area being studied.

(4) Land Appraisers. Market values of project lands and comparable lands should be provided by qualified real estate appraisers. The market values must be processed through the appropriate real estate division.

**(**5) IWR Report. Additional detailed support material for conducting NED evaluation may be found in Agricultural Flood Damage (IWR Report 87-R-10, October 1987). This manual provides an expanded description of agricultural benefit evaluation procedures. Policy statements in this regulation take precedence in any apparent contradiction suggested by information contained within this IWR report**.**

j. Report and Display Procedures. A clear presentation of the study results will facilitate review. Tables E-20 and E-21 are suggested presentations.

E-21. Federal and Non-Federal Participation. As a general rule, a PCA must be executed between Federal and non-Federal participants prior to advertising and award of the contract.

a. Structural Measures. The 1986 and 1996 Water Resources Development Acts modified the basic requirements for non-Federal participation in flood control projects. The requirements for structural projects are essentially as follows:

(1) Provide a cash contribution equal to 5 percent of structural flood control features costs.

(2) Provide all lands, easements, rights-of-way, relocations (except existing railroad bridges and approaches thereto) and suitable borrow and dredged material disposal areas (referred to as LERRD).

(3) If the sum of the above two items is less than 35 percent of the costs assigned to flood control, non-Federal sponsors will pay the difference in cash. If it is greater than 35 percent, total non-Federal costs shall not exceed 50 percent of total project costs assigned to flood control. Contributions in excess of 50 percent will be reimbursed by the Federal Government to the non-Federal sponsor. Total contributions in excess of 30 percent may be reimbursed to the Federal government over a period not to exceed 15 years.

(4) Operate, maintain, repair, replace and rehabilitate the project after completion without cost to the United States in accordance with regulations prescribed by the Secretary of the Army.

(5) Hold and save the United States free from damages due to the construction or subsequent operation and maintenance of the project, except those damages due to the fault or negligence of the United States or its contractors.

(6) Prevent future encroachment or modifications, which might interfere with proper functioning of the project.

(7) Participate in the National Flood Insurance Program and other applicable Federal flood plain management programs.

(8) Provide guidance and leadership to prevent unwise future development in the flood plain.

b. Nonstructural Measures.

(1) Provide thirty-five percent of total project costs. A five percent cash contribution is not required.

(2) Provide all LERRDs, credited to sponsor's share. If credited LERRDs are less than thirty-five percent, sponsor will pay the difference in cash. Payments during construction are preferred, but an option exists for payment beginning upon construction completion. Deferred payments require ASA(CW) agreement. If LERRDs are more than thirty-five percent, the excess is reimbursed by the Federal Goverment.

(3) When LERRDs are more than thirty-five percent an agreement between the sponsor and the Federal Government on the most efficient and practical means for acquiring the excess LERRDs is required.

(4) Operate, maintain, repair, replace and rehabilitate completed project including, for a flood warning system, development and adoption of a detailed response plan. This plan must be acceptable to the Corps.

(5) Participate in the National Flood Insurance Program and other applicable Federal flood plain management programs.

(6) Nonstructural measures are always cost shared as nonstructural measures, even if they are mitigating for damages induced by structural measures of the same project.

(7) Other standard items included under structural measures will apply where appropriate.

Table E- 20 Summary of Crop Benefits (Farm Budget Analysis Method)

| Item | Current | Base | Year[a] | Year[a] | Year[a] | Year[a] | Year[a] | Annualized Value[b] |
|---|---|---|---|---|---|---|---|---|
| Without Plan | | | | | | | | |
| Acres: | | | | | | | | |
| basic crops | | | | | | | | |
| other crops | | | | | | | | |
| Value of agricultural production | | | | | | | | |
| Agricultural production costs | | | | | | | | |
| With Plan | | | | | | | | |
| Acres: | | | | | | | | |
| basic crops | | | | | | | | |
| other crops | | | | | | | | |
| Value of agricultural production | | | | | | | | |
| Agricultural production costs | | | | | | | | |
| NED BENEFITS | | | | | | | | |

[a]Annual value at the given year.
[b]Annualized at ____ percent discount rate.

Table E- 21 Intensification Benefits (Land Value Analysis Method)

| Item | Current Year | Annualized[a] |
|---|---|---|
| Without Plan | | |
| Value of agricultural land | | |
| With plan | | |
| Value of agricultural land | | |
| INTENSIFICATION BENEFIT | | |

[a]Annualized at ____ percent discount rate

c. Cost Sharing - Special Cases.

(1) Betterments. Non-Federal interests normally pay the incremental cost for all desired betterments. Examples include the cost of flood control channel covering not needed for safety (ER 1165-2-118), and the costs of departures from the NED plan not part of an exception granted by ASA(CW).

(2) Highway Bridges. Alterations to highway bridges necessitated by a flood control project are considered part of LERRD and are a non-Federal responsibility. However, protection by reinforcement, underpinning, or construction to ensure the structural integrity of the bridge foundations, piers, or abutments, are considered construction costs, and are subject to standard cost-sharing rules. But, if new piers, foundations or abutments are required for additional spans in the bridge crossing, the work will be considered a relocation and a non-Federal responsibility. Highway bridges over channel cuts in fast lands are highway relocations and part of LERRD.

(3) Railroad Modifications. Existing railroad bridge (and approaches thereto) relocations and alterations, required as part of a flood control project, are considered construction costs and not relocations for cost-sharing purposes. This is in accordance with the intent of Section 3 of the 1946 Flood Control Act. Any required modification to the bridge approaches can also be evaluated as a construction cost. However, for railroad lines that are not bridges, relocation or alteration is considered a non-Federal responsibility. An example is a rail line passing through a reservoir site. New railroad bridges over a channel cut in fast lands that are included in feasibility reports are considered LERRD unless specifically authorized as a construction cost item.

(4) Abandoned Bridges/Buildings. Removal costs are considered construction costs.

(5) Covers for Flood Control Channels. If needed for safety the costs are considered construction costs. Otherwise the costs are non-Federal and are not credited towards total project costs.

(6) Utility Lines Under Proposed Levees. If the relocation is required as a matter of just compensation, these costs are considered LERRD. Otherwise, such costs are removals and are considered construction costs.

(7) Pedestrian Bridge Over Proposed Levee. A bridge provided because a levee interrupts pedestrian traffic is considered a relocation under LERRD.

(8) Relocation of Existing Recreation Facilities. If a proposed levee passes through an existing park and recreation facilities will be impacted, relocated facilities are a non-Federal responsibility under LERRD.

(9) Lands Needed for F&W Mitigation. There are no special rules for F&W mitigation costs. All land costs are LERRD and costs of plantings or other modifications are construction costs.

(10) Intercepted Interior Drainage. Interception and conveyance of drainage through or over a flood control work with measures such as intercepting ditches, ponding areas, pumping plants, gravity outlets, and pressurized conduits, are part of project construction, with the costs shared as construction costs. All lands associated with measures for interior drainage are part of LERRD. Any costs of increasing the size of the facilities to meet special local needs, as for betterments, are non-Federal costs.

(11) Stormwater/Sanitary Sewer Collection Systems and Interceptor Storm Sewers. Stormwater/Sanitary collection systems consisting of sewer pipes are utilities, and alterations of such systems are part of LERRD. Interceptor sewers and associated features may be more efficient than a number of separable sewer alterations, and such features are also LERRD. Efficient design may result in a single project feature to accommodate blocked interior drainage and the requirements for stormwater/sanitary sewers collected via interceptors. In such cases, the costs will be apportioned on a fair share basis between LERRD and construction costs. The fair share is to be based on the costs associated with separable facilities. The costs of measures that provide for positive flood control, such as gated sewers, outlets and gate well structures are project construction costs to be shared by non-Federal sponsors.

(12) Headwall Structures. Accommodation of pipes through the side slopes of channel projects may be accomplished along with project construction, but any identifiable added costs for end treatment of sewer pipes is part of LERRD.

(13) Levee Crossings. Where a levee or floodwall intersects a transportation facility, and a crossing structure is necessary, a closure structure or a ramp structure will be selected on the basis of efficiency and the appropriateness of a closure structure in view of the flood characteristics of the area. The closure structure or an appropriate section of the ramp structure along the line of protection (i.e., the volume of the ramp structure that would be a part of the flood control structure in the absence of a transportation feature) shall be classified as a construction item. Any additional work necessary to provide a ramp structure included in the selected plan shall be classified as a LERRD item.

(14) Credit for LERRD Specific guidance on crediting the value of LERRD toward the non-Federal share of project costs is contained in ER 1165-2-131.

(15) Windfall Benefits. Projects that provide land enhancement benefits of unconscionable magnitude to a few beneficiaries are subject to special cost sharing. Usually a

cash contribution is required, equal to 50 percent of the cost allocated to the windfall benefits. In those cases where windfall benefits are minor and incidental to implementation of the project, no special cost sharing is required. Potential windfall benefit situations should be surfaced as early as possible in the planning process and addressed by higher authority but no later than the FRC.

(16) Other Special Cost Sharing. Section 2 of the 1920 River and Harbor Act indicates that every report submitted to Congress should discuss special or local benefits which accrue to localities with a recommendation as to what local cooperation should be required, if any, on account of such benefits. This authority may be used to recommend special cost sharing for reasons of equity. The act predates the "a-b-c" requirements of the 1936 Flood Control Act and the landmark cost sharing requirements of the WRDA 1986. But, it remains relevant in that it signifies that Congress is concerned with, and directs the Corps to address, equity issues arising when identifiable localities or communities are beneficiaries to a far greater degree than they are cost sharers.

(17) General Credit for Flood Control. Section 104 of the 1986 WRDA establishes guidelines for crediting sponsors for constructing portions of a flood control project. ER 1165-2-29 outlines the procedures for crediting sponsor construction work. Sponsor work must receive ASA (CW) approval prior to initiation of construction to be eligible for credit. Work eligible for approved credit should be addressed in report recommendations, and recommendations must be supported by specific report documentation of compliance with the Economic and Environmental Principles and Guidelines for Water and Related Land Resource Implementation Studies (for example, documentation of economic justification).

## SECTION IV – Hurricane and Storm Damage Prevention

E-22. Federal Interest. Congress has authorized Federal participation in shore protection projects to prevent or reduce damages caused by wind and tidal generated waves and currents along the Nation's ocean coasts and Great Lakes shores.

E-23. Types of Improvements. The improvements are usually structural measures including such features as beachfill, groins, seawalls, revetment, breakwaters, and bulkheads. Nonstructural measures, such as property acquisition, may also be appropriate.

E-24. Specific Policies. These policies are presented in more detail in ER 1165-2-130.

a. Geographic Applicability. The shore protection authority is applicable to the shores of the Atlantic and Pacific Oceans, the Gulf of Mexico, the Great Lakes, estuaries, and bays directly connected therewith of each of the States, the Commonwealths of Puerto Rico and the Northern Mariana Islands, and the possessions of the United States. The authority extends only that distance up streams where the dominant causes of damage are storms or ocean tidal action (or Great Lakes water motion) and wind-generated waves. The program does not address damages caused by streamflows or vessels.

b. Beach Restoration and Protection and Historic Shoreline. Existing authority provides for restoration and protection of beaches. It does not provide for extending a beach beyond its historic shoreline unless the extension is desirable for engineering reasons, is environmentally acceptable, and is an economically justified means to prevent or reduce storm damage behind the historic shoreline.

c. Formulation and Establishing Corps Participation. Shore protection projects are formulated to provide hurricane and storm damage reduction. Recreation is incidental. The Corps participates only in those projects formulated exclusively for hurricane and storm damage reduction, and justified (BCR $\geq$ 1.0 ) based solely on damage reduction benefits, or a combination of damage reduction benefits plus (at most) a like amount of incidental recreation benefits. In other words, recreation benefits useable to establish Corps participation may not be more than fifty percent of the total benefits required for justification, which in turn means they may not exceed an amount equal to fifty percent of costs. If the criterion for participation is met, then all recreation benefits are included in the BCR. Costs incurred for other than the damage reduction purpose, i.e. to satisfy recreation demand, are a 100% non-federal responsibility.

d. Public Use and its Relation to Federal Participation. Federal involvement in shore protection developed historically in a beach context, generally with efforts to stabilize, create or restore beaches. It was intended that beaches receiving public aid should not provide exclusively private benefits, and therefore, whenever a hurricane and storm damage reduction project involves beach improvements, real estate interest to insure public use of the Federal project is required. (See Table E-22.) Items related to public access are discussed below.

(1) User Fees. Reasonable beach recreation use fees used to offset the local share of project costs are allowable.

(2) Parking. Lack of sufficient parking facilities for the general public (including nonresident users) located reasonably near and accessible to the project beaches may constitute a restriction on public access and use, thereby precluding eligibility for Corps participation. Generally, parking on free or reasonable terms should be available within a reasonable walking distance of the beach. The amount of parking should be consistent with the attendance used in benefit evaluation. In some instances non-Federal plans may encourage or direct substitution of public transportation access for private automobile access. Reports considering public transportation must indicate how the public transportation system would be adequate for the needs of projected beach users.

(3) Access. Provision of reasonable public access rights of way, consistent with attendance used in benefit evaluation is a condition of Corps participation. Reasonable access is access approximately every one-half mile or less.

(4) Beach Use by Private Organizations. Federal aid to private shores owned by beach clubs and hotels which limit beach use to members or guests is contrary to the intent of Public Law 84-826.

(5) Public Shores with Limitations. Publicly owned beaches, which limit use to residents of the community or a group of communities, are not considered to be open to the general public and are treated as private beaches.

e. Shore Lines Owned by Federal Agencies.

(1) Work to provide shore protection to lands under the jurisdiction of another Federal agency is accomplished only on a reimbursable basis, upon request from the agency. In the event protection has not been requested and such lands are within the study area, Civil Works funds may be used if including them in a project is more cost effective than excluding them.

(2) Protection of (non Civil Works) Department of the Army lands is accomplished with military funds, not civil works funds. If the lands are a minor part within the study area, Civil Works funds may be used if including them in a project is more cost effective than excluding them.

f. Evaluation. This paragraph provides general principles for evaluation of benefits from hurricane and storm damage prevention projects.

Table E- 22 Shore Ownership and Levels of Federal Participation

| Shore Ownership (4) and Project Purposes or Benefits | Maximum Level of Federal Participation Construction (2) | Operation Main,Repair,Replace Rehabilitation (OMRR&R) |
|---|---|---|
| I. Federally owned (1) | | |
| HSDR on Developed Lands | 100% | 100% |
| HSDR to Undeveloped Lands | 100% | 100% |
| Recreation (Separable Costs) (7) | 100% | 100% |
| II. Publicly and privately owned (protection results in public benefits) (3) | | |
| HSDR on Developed Lands | 65% (8) | 0% |
| HSDR to Undeveloped Lands | | |
| Public lands (5) (6) | 50% (8) | 0% |
| Private lands | 0% | 0% |
| Recreation (Separable Costs) (7) | 50% (8) | 0% |
| III. Privately owned, use limited to private interests | | |
| HSDR on Developed Lands (9) | 0% (8) | 0% |
| HSDR to Undeveloped Lands | 0% | 0% |
| Recreation (Separable Costs) (7) | 0% | 0% |

(1) See paragraph E-24e on protecting other Federal agency shores.
(2) Periodic nourishment is considered “construction.”
(3) Privately owned shores under public control, as through a sufficiently long-term lease assuring realization of public benefits throughout the economic life of the project.
(4) The status of Indian shores depends upon the particular treaty provisions pertaining to the lands in question and will need to be examined in each instance. Specific cases should be referred to CECW-P for guidance.
(5) Non-Federal public shores dedicated to recreation or fish and wildlife purpose.
(6) Adjusted by the ratio of public to total shore protection benefits along the protected shore.
(7) Department of Army Policy precludes civil works funding of separable recreation measures at shore protection projects.
(8) The fair market value of LERRD is included in these cost sharing percentages, unless the land has no value or special benefit situation considerations apply.
(9) Federal participation in construction could be 65 percent if project is only for inundation reduction or wave damage reduction and does not provide beach erosion control or shoreline protection. Note that no Federal participation in beach fill or restoration would be allowed due to the absence of public benefits.

(1) Systems Analysis. Because shoreline processes are dynamic, shore protection measures may generate both beneficial and adverse impacts beyond immediate project sites. Impacts elsewhere may occur as a consequence of the design and implementation of site specific hurricane and storm damage reduction projects, and navigation projects may impact or be impacted by such projects. These impacts must be evaluated, and this requires expansion of the study area to include reaches adjacent to the project site. Generally, the adjacent reaches are bounded by natural features that interrupt or substantially limit the natural littoral processes (e.g., bays, sounds, inlets, geomorphic features, etc.). For studies which may not require a full systems approach, the justification shall be documented in the feasibility report. A systems analysis approach will include the following components:

(a) Physical Processes. Develop a sediment budget for the segment of coast under investigation based on modeling of sediment movements, empirical data, and estimates of gross and net shoreline change rates over the past fifty year period, as well as rates of change during the most recent decade. Ascertain the effects and probability of occurrence of relevant storm events. Identify the magnitude of the average annual volumetric changes in beach area and volume.

(b) Coastal Alterations. Identify man-made alterations to the shore (jetties, sand-bypassing and recycling, dredging, seawalls, groins, breakwaters, beach nourishment, etc.) and estimate their contribution to the balance of littoral processes and shoreline changes. This information, and knowledge of the physical processes, establishes the historical and existing conditions.

(c) Forecast Shoreline Changes. Forecast shoreline changes (including changes in nourishment requirements, if appropriate) and navigation related dredging requirements for the economic life of the proposed measure. Forecast this for future without and with project conditions.

(d) Economic Benefits and Costs. Inventory potential damage centers and locations of other project induced benefits or costs. For without and with project conditions estimate the costs of maintaining shore protection and navigation projects. At the project site and other impacted sites assess the extent of damages to property through analysis of storm surge and wave damage; assess changes in recreation (if any); and evaluate project impacts to jetties, channels and other navigation features.

(2) Evaluation Procedure. The steps to evaluate benefits for hurricane and storm damage prevention projects are described in the following paragraphs. (See Figure E-6.) The level of effort expended on each step will depend on the scope and nature of the proposed improvement, the state of the art to accurately develop the estimates and the sensitivity of project formulation and evaluation to further refinement.

(a) Step 1 – Delineate the Study Area. The study area is that area affected by storms and erosion problems and by proposed alternatives. It includes areas indirectly affected by the

problems and projects such as downdrift areas and navigation and other projects outside the immediate project site.

(b) Step 2 – Define the Problem. In this step, existing storm damage and erosion problems are identified and described. The description of existing conditions should include a history of the economic and social effects of storm damage and erosion problems in the area, a history of storms and erosion trends and historical floods and wave attack problems. A determination of the degree of protection afforded by existing structures is also made as part of this step. This includes an assessment of the level of protection actually provided by the structure, its structural integrity, the remaining useful life and operation and maintenance requirements.

(c) Step 3 – Select Planning Shoreline Reaches. Reaches are the primary economic sub-unit of analysis. Geomorphic conditions, land uses and type or level of existing protection are criteria used in the designation of reaches.

(d) Step 4 – Establish Frequency Relationships. Two types of frequency relationship are developed for the analysis. These are elevation-frequency relationship and erosion-frequency relationship. The first one shows the relationship between wave and water level and frequency of occurrence and is used to derive expected annual inundation damages. The second one shows the relationship between periodic erosion (or accretion) and frequency of occurrence and is used to estimate erosion-induced damages.

(e) Step 5 – Inventory Existing Conditions. An inventory of affected properties, including land, is performed to estimate potential damages. The inventory is done by land use activities (i.e., residential, commercial, industrial, etc.) and includes variables such as value, use, ground elevation, distance from the water, construction materials, area, and number of stories. Areas likely to be developed in the future or where land use changes could occur are also identified.

(f) Step 6 – Develop Damage Relationships. Damage relationships describe the expected value of structural or contents damages caused by various factors, such as depth of flooding, duration of flooding, sediment load, wave heights, amount of shoreline recession and warning time. Generalized or site-specific damage relationships can be used depending on the scope of the study and the availability of applicable generalized relationships. Generalized damage relationships are those developed for other geographic areas with similar characteristics to the study area. Site-specific damage relationships are usually required to estimate wave attack and erosion damages. These damage relationships are developed using actual damage data from past storm events. Estimates of losses for buildings, roads, protective works, and other features are developed at current price levels for existing development. Damage relationships are developed for each land use

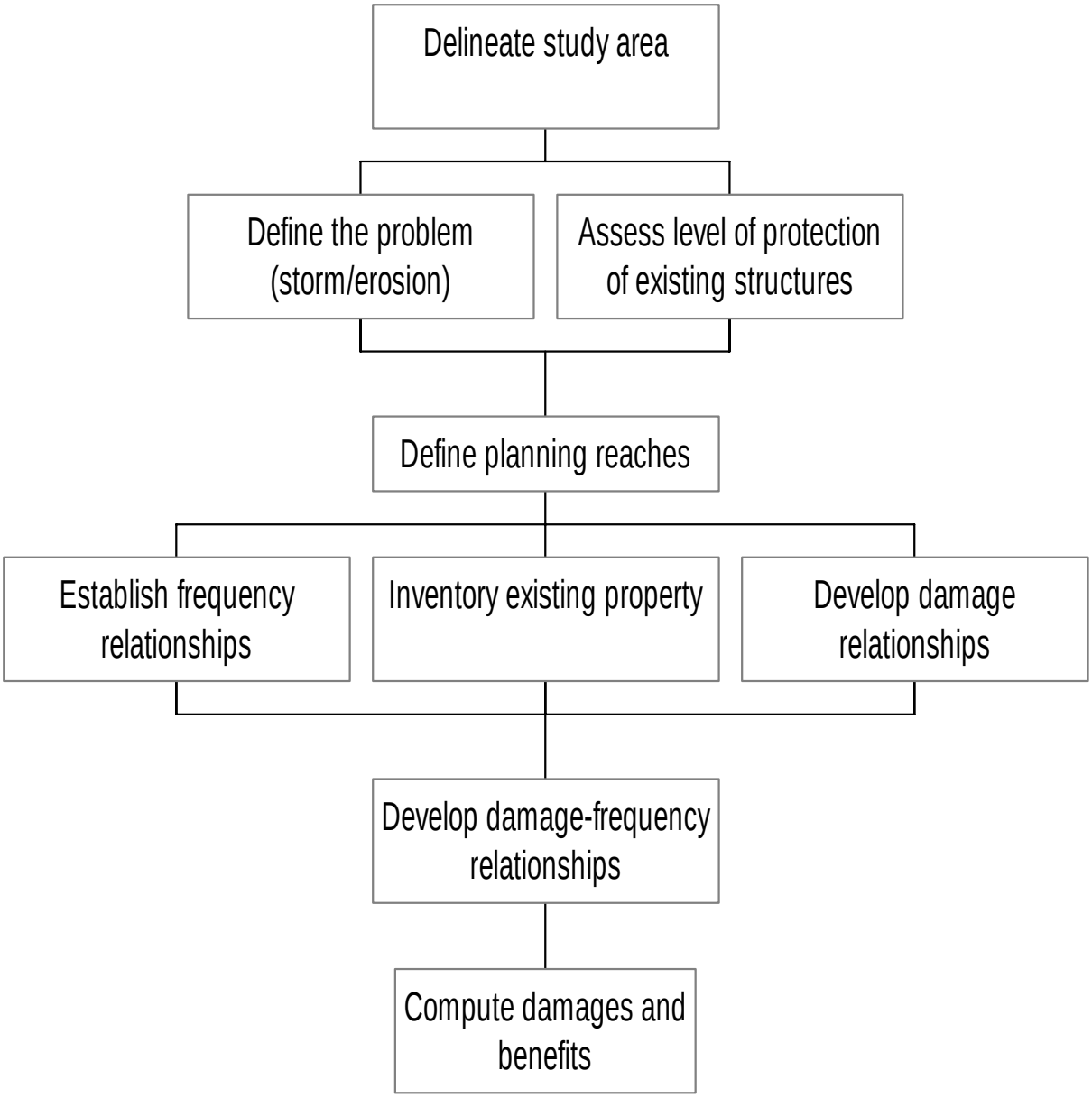



Figure E- 6 Hurricane and Storm Damage Prevention Benefits Evaluation

category. Anticipated damages from land loss due to erosion are computed as the market value of the average annual area expected to be lost. Nearshore land values are used to estimate the value of land lost. A risk-based analytical framework should be used to develop the damage relationships.

(g) Step 7 – Develop Damage-Frequency Relationships. The damage-frequency relationships represent how the damage associated with a given event (i.e., storm, wave, erosion)

is related to the frequency of that event (probability of occurrence). The damage relationships developed in step 7 are combined with the frequency curves (developed by the hydraulic and hydrologic engineers) to estimate the damage-frequency relationships. Damage-frequency relationships (curves) are developed for each of the applicable damage mechanisms, i.e., long-term erosion, recession, inundation and wave attack and for each land use category. These relationships should be developed using a risk-based analytical framework.

(h) Step 8 – Calculate Expected Annual Damages and Benefits. The expected annual damage is the expected value of erosion losses and storm damages in any given year. Expected annual damages are calculated by computing the area under the damage-frequency curve using a life-cycle approach. Expected annual damages are calculated for the with- and without-project conditions. The difference between the with- and without-project expected annual damages represents the benefit associated with the project.

(3) Other Data Source. Additional detailed support material for conducting benefit evaluation procedures for prevention of coastal storm damage and erosion is in IWR report 91-R-8, dated August 1991. Policy statements in this regulation take precedence in any apparent contradiction suggested by information contained in the IWR report.

(4) Risk Analysis. Storm damage reduction studies should adopt a life cycle approach and probabilistic analysis (and display) of benefits and costs. Key considerations are listed below; at a minimum, those with the greatest effect on plan formulation should be explicitly incorporated in the analysis.

(a) The erosion damage function (with special emphasis on structure values and land values)

(b) The stage-damage function (with special emphasis on structure first floor elevation, content and structure values.

(c) The wave-damage function by structure class

(d) Storm-related parameters such as peak wave height and period storm duration, peak surge elevation, and timing with respect to tidal phasing

(e) Wave height above the dune

(f) Wave penetration

(g) The shoreline retreat or eroded volume

(h) The natural post-storm recovery

g. Periodic Nourishment. Public Law 84-826 provides that Federal participation in periodic beach nourishment may be appropriate when it comprises a more suitable and economical remedial measure for shore protection than retaining structures such as groins. Under such conditions periodic nourishment can be considered construction for cost sharing purposes. Retaining structures may be recommended, but then any required periodic nourishment is not considered construction and is not cost shared by the Federal government. Projects with structures included to maintain a shore alignment, but not to materially prevent littoral drift (which may nourish downdrift beaches), such as low-profile groins and offshore breakwaters, are eligible for periodic nourishment.

(1) New Projects. Federal participation in periodic nourishment may be recommended to continue for the shortest of: (a) project economic life; (b) physical life of cooperating structural features; (c) fifty years.

(2) Existing Projects.

(a) General. When the authorized period of Federal participation in periodic nourishment at existing projects expires, it may be extended without further Congressional action for a period not to exceed 50 years after the date of initial construction. (Section 934 of Public Law 99-662). Reevaluation is necessary using current evaluation guidelines and policies. Prior to the expiration of the existing periodic nourishment period the sponsor must request the extension and express a willingness to cost share in accordance with Public Law 99-662. This Section 934 authority does not apply to projects using sand bypassing plants.

(b) Section 934 Studies.

(1) The basic purpose of a Section 934 study is to determine if continued Federal participation in the authorized project is economically justified given current conditions. Justification is determined using current evaluation guidelines and policies. The cost of Section 934 studies will initially be financed by the Federal government using construction general funds. If extension of periodic nourishment is feasible, the cost of the study will be shared in accordance with PL 99-662 cost sharing for hurricane and storm damage reduction projects. The non-Federal sponsor will reimburse its share of study costs to the Federal government when the first re-nourishment occurs.

(2) Only an extension of periodic nourishment can be implemented under Section 934. Nevertheless, other alternatives should be evaluated as part of the Section 934 study. This alternatives analysis should be similar in scope to an initial appraisal under Section 216 of the 1970 FCA.

(3) If the analysis indicates that the NED plan formulated for hurricane and storm damage reduction differs from the authorized plan, additional studies should be considered. If additional studies are needed, the Section 934 study should place an appropriate time limit on the extension of Federal participation.

(4) The basic purpose of a Section 934 study is to determine if continued Federal participation in the authorized project is justified given current conditions. Thus, the without project beach profile should reflect the conditions that existed just prior to initial construction. The following is required: estimate current benefits (new surveys or updating of recently estimated benefits but no indexing of benefits) of the existing project to determine justification and consistency with current policy; develop alternatives (size and timing) for nourishment; and recommend the most cost effective nourishment scheme for the authorized project.

(5) Environmental documentation requirements are determined by the likely impact that Federal action would have on the environment. The extent and nature of environmental studies therefore depends on what is expected to occur without Federal participation. If nourishment would occur anyway, as is likely for well justified projects, incremental effects due to Federal participation would appear less consequential. If nourishment would not occur there may be more substantial environmental differences in the without Federal participation and with Federal participation conditions. This would in turn require more substantial analyses. In either case the environmental documentation must be coordinated with Federal and State agencies and others. This coordination provides the opportunity to identify environmental concerns. Comments from the Fish and Wildlife Service (at a level commensurate with a Planning Aid Report), Environmental Protection Agency, National Marine Fisheries Service, the state's coastal agency and the state's water quality agency should be included.

(c) Reporting. Section 934 reevaluation reports with the division commander's recommendation will be forwarded to HQUSACE (CECW-P) for preparation of a recommendation to the Assistant Secretary of the Army for Civil Works (ASA(CW)). If ASA (CW) concurs in continued participation, an amended draft project cooperation agreement (PCA) should be developed. Extension or modification of any Section 221 agreement will require approval by the Secretary of the Army and the signature level will be determined at the time of approval.

h. Mitigation of Shore Damage Due to Federal Navigation Projects. Shore protection measures undertaken using the authority of Section 111, Rivers and Harbors Act of 1968 shall generally follow the policies provided in Appendix F.

i. Placement of Dredged Materials on Beaches. See paragraph E-14h.

j. Outer Continental Shelf Mineral Resources. If mineral resources from the outer continental shelf are proposed for use in civil works projects, the Corps and Minerals Management Service (MMS), U.S. Department of Interior, must enter into a memorandum of agreement. The sponsor must also negotiate a noncompetitive lease with the MMS. Section 215 (b) of the WRDA of 1999 amended Section 8(k)(2)(B) of the Outer Continental Shelf Lands Act to exempt State and local government agencies, in addition to Federal agencies, from the assessment of fees for the use of Outer Continental Shelf sand, gravel and shell resources in a shore protection, beach restoration or coastal wetlands project or program, or in any other project

funded or authorized by the Federal Government. The MOA and lease must be executed prior to PCA approval and execution. This is addressed in more detail in ER 1165-2-131.

k. Sea Level Rise. The National Research Council (NRC) study on sea level change (Responding to Changes in Sea Level: Engineering Implications, 1987) is a practical and rational review of data on relative sea level changes and the resulting impact on engineering structures. The study should be used by the Corps for technical guidance until more definitive data are available. The NRC study recommended that feasibility studies for coastal projects should consider the high probability of accelerated sea level rise. Since precise estimates of future sea level rise are unknown, the risks associated with a substantial rise should be addressed. Feasibility studies should consider which designs are most appropriate for a range of possible future rates of rise. Strategies that would be appropriate for the entire range of uncertainty should receive preference over those that would be optimal for a particular rate of rise but unsuccessful for other possible outcomes.

(1) Potential relative sea level change should be considered in every coastal and estuarine (as far inland as the new head of tide) feasibility study that the Corps undertakes. The degree of consideration that the possible change receives will depend upon the historical record for the study site. Areas which are already experiencing relative sea level rise or where increases are predicted should undertake an analysis as part of the study. Plans should be formulated using currently accepted design criteria.

(2) For now, planning should consider what impact a higher relative sea level rises rate would have on the design based on the historical rate. A sensitivity analysis should be conducted to determine what effect (if any) changes in sea level would have on plan evaluation and selection. This analysis should be based, as a minimum, on the extrapolation of the local, historical record of relative sea level rise as the low level and Curve III from the NRC report as the high level.

(3) If the plan selection is sensitive to sea level rise, then design considerations could allow for future modification when the impacts of future sea level rise can be confirmed. It may be appropriate to consider plans that are designed for today's conditions but that incorporate features to facilitate future changes, or plans designed for future conditions. In these cases, an evaluation of the timing and the cost of potential changes should be conducted during the plan selection process.

## E-25. Federal and Non-Federal Participation

a. General Requirements.

(1) The Federal approach to participation in shore protection is similar to that for participation in riverine flood damage reduction. Highest priority is for reducing damages to existing development. Reducing flooding on or erosion to undeveloped lands is not high priority. Federal participation in the protection of private undeveloped shores is prohibited by law.

(2) In the past, particularly prior to the WRDA of 1986, beach fill or beach restoration was frequently considered an erosion control measure, and erosion control was thought of, perhaps rather inexact, as a project output or project purpose. As a result of enactment of the law, however, erosion control has no separate status as a project purpose or as a project output. Thus, erosion control measures (beaches) are purely means to the ends of hurricane and storm damage reduction or recreation, just as breakwaters or revetments are.

(3) Beaches can be a factor complicating analysis and decision making, however, for in addition to reducing damages they also provide for recreation, and are in themselves highly desired amenities. Because of these characteristics, when hurricane and storm damage reduction plans include beach fill or restoration, Federal cost participation depends on shore ownership, use, and types and incidence of benefits.

(4) Construction costs are assigned, as appropriate, to the purposes of hurricane and storm damage reduction or recreation, and shared in the percentages designated in Section 103 of Public Law 99-662, with any adjustments required to reflect conditions of ownership as discussed below and summarized in Table E-22.

b. Project Purposes.

(1) Hurricane and Storm Damage Reduction. The Federal share is 65 percent of the costs assigned to hurricane and storm damage reduction. The non-Federal share is 35 percent. Participation in the National Flood Insurance Program and other applicable Federal floodplain management programs is required. Non-Federal interests must provide LERRDs; fair market value is credited to the non-Federal share. When the value of LERRD is less than 35 percent the difference must be provided in cash during construction. When the value is more than 35 percent the excess will be refunded.

(2) Recreation. Federal participation in separable recreation measures is not permitted by current budget policies. Recreation related access facilities such as bathhouses, roads, ramps, toilets, parking areas and so on are a non-Federal responsibility. Costs for the facilities are not included as project costs unless they are required for recreation benefits claimed by the project, and the costs are not being “offset” by user fees.

c. Shore Ownership.

(1) Private Shores. All costs for hurricane and storm damage protection on privately owned shores (where use of such shore is limited to private interests) are non-Federal; except that benefits to private shores beyond project limits, if trivial in amount, are considered incidental for cost-sharing purposes.

(2) Losses of Undeveloped Private Lands. All costs for hurricane and storm damage reduction measures of any kind assigned to the prevention of losses of undeveloped private lands are non-Federal.

(3) Federal Shores. All costs assigned to the protection of Federally owned shores are Federal.

(4) Non-Federal Public Shores (Park and Conservation Areas). Park and conservation areas produce recreation outputs, and cost sharing established in law is a maximum 50 percent Federal share. Policy precludes participation in projects not principally justified by hurricane and storm damage reduction however.

## E-26. Recommendations in Feasibility Reports.

a. Cost Sharing. In a shore protection feasibility report, which includes measures for beach creation, restoration or preservation or for beach fill, recommendations on the percentage of construction costs to be borne by local interests or the Federal Government must be qualified as tentative. Final apportionment will be based on conditions of ownership and project purpose at the time of construction or subsequent nourishment.

b. Authorization Language. Authorization for shore protection projects that call for periodic beach fill will refer to an initial construction cost and an average annual cost for periodic nourishment as a part of construction. The recommendation wording should be as follows:

> "The project for shoreline protection, (project name), as described in the Report (report to be cited for authorization), at an initial total cost of ($100,000), with an estimated Federal cost of ($75,000) and an estimated non-Federal cost of ($25,000), and an average annual cost of ($600) for periodic beach nourishment over the (50) year life of the project, with an estimated annual Federal cost of ($450) and an estimated annual non-Federal cost of ($150)."

Projects thus authorized would be subject to two cost limits in accordance with Section 902 of the WRDA of 1986, as described in Appendix G.

## SECTION V - Ecosystem Restoration

E-27. Federal Interest. Numerous Federal laws and executive orders establish National policy for and Federal interest in the protection, restoration, conservation and management of environmental resources. These provisions include compliance requirements and emphasize protecting environmental quality. They also endorse Federal efforts to advance environmental goals, and a number of these general statements declare it national policy that full consideration be given to the opportunities which projects afford to ecological resources. Recent water resources authorizations have enhanced opportunities for Corps involvement in studies and projects to specifically address objectives related to the restoration of ecological resources and ecosystem management. Specific authorities for new individual studies and projects to restore ecological resources have also been provided in legislation. Examples of legislation that broadly supports Federal involvement in the restoration and protection of ecological resources include:

- Federal Water Project Recreation Act of 1965, as amended
- Water Resource Development Acts of 1986, 1988, 1990, 1992, 1996 and 1999
- Coastal Wetlands Planning, Protection and Restoration Act of 1990 (Title III of P.L. 101-646)

a. The Corps ecosystem restoration policy is described in more detail in ER 1165-2-501 and EP 1165-2-502. This policy applies to all ecosystem studies and projects. The focus of projects implemented under this section of the guidance is the restoration of ecosystems and ecological resources and not restoration of cultural and historic resources, aesthetic resources, or clean up of hazardous and toxic wastes. Corps ecosystem restoration projects may not be able to address every functional and structural characteristic, nor may it be necessary where the nature and degree of impairment are limited to only one or a few of these parameters. Some restoration projects may only be able to address the symptoms of the disturbance or degradation, and not the cause(s).

b. The authorities through which the Corps can participate in ecosystem restoration and protection studies and project implementation are summarized below.

(1) Congressionally authorized studies, pursued under General Investigations (i.e., new start reconnaissance and feasibility studies) for single-purpose ecosystem restoration or multiple purpose projects which include ecosystem restoration as a purpose.

(2) Programmatic authorities for study, design and implementation of ecosystem restoration and protection projects: 1) Section 1135, Project Modifications for Improvement of the Environment Water Resources Development Act, WRDA of 1986, as amended; 2) Section 206, Aquatic Ecosystem Restoration WRDA of 1996, as amended; 3) Section 204, Beneficial Uses of Dredged Material, WRDA of 1992, as amended; 4) dredging of contaminated sediments under Section 312, WRDA of 1990, as amended; and 5) Flood Mitigation and Riverine Restoration Program Section 212 of WRDA of 1999. Sections 1135, 206 and 204 are discussed

in Appendix F. Section 312 of WRDA of 1990 is discussed in Section II of this appendix. Flood Mitigation and Riverine Restoration is discussed in Appendix G.

(3) Additional opportunities for ecosystem restoration and protection may also be pursued through existing project authorities for the management of operating projects; e.g., through water control changes, or as part of natural resources management.

E-28. Definitions.

a. Ecosystem. An ecosystem is the dynamic and interrelating complex of plant and animal communities and their associated nonliving environment, considered as an integrated unit. Implied within this definition is the concept of structure and function unified through life processes. An ecosystem may be characterized as a viable unit of community and interactive habitat. Ecosystem restoration can be directed at different sized ecosystems within the nested set, and may encompass multiple states, more localized watersheds, or a smaller complex of aquatic habitats.

b. Environmental Restoration. Care should be taken in the use of this term, which is often used interchangeably with “ecosystem restoration”. However, in the context of Corps of Engineers programs and missions, “environmental restoration” is more commonly associated with "cleanup" measures undertaken to achieve compliance with state and/or Federal laws or regulations to clean up hazardous, toxic and radioactive wastes. Environmental restoration generally refers to actions such as Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) remedial actions, Resource Conservation and Recovery Act (RCRA) corrective actions, and cleanups related to underground storage tanks.

c. Mitigation. Mitigation consists of those measures taken to avoid, minimize or compensate for adverse environmental impacts. Mitigation measures are authorized by Congress or approved by HQUSACE or MSCs to compensate for ecological resources unavoidably affected by a Corps project or activity. Appendix C discusses natural resources mitigation in more detail, along with other environmental compliance requirements.

d. Enhancement. Historically the term “enhancement” has been used as an indication of a net habitat improvement over the without project condition. However, this term now implies making the habitat better for some species than it would have been naturally in the absence of human intervention. Since this goes beyond the goal of ecosystem restoration, the use of the term “enhancement” is rarely appropriate in Corps documents.

e. Net Ecosystem Restoration Benefits.

(1) The recommended plan should be the justified alternative and scale having the maximum excess of monetary and non-monetary beneficial effects over monetary and non-monetary costs. This plan occurs where the incremental beneficial effects just equal the incremental costs, or alternatively stated, where the extra environmental value is just worth the

extra costs. This plan should be called the NER plan. In making these value and cost comparisons it is assumed that each plan and scale is the minimum cost way of achieving that level of output; i.e., that an appropriate least cost or cost effectiveness algorithm was used in their development. Deviations from the NER Plan requires justification.

(2) For plans having both economic and restoration benefits, the plan with the greatest net sum of economic and restoration benefits is to be selected, consistent with protecting the Nation's environment, unless ASA(CW) grants an exception when there is some overriding reason for selecting another plan, based upon other Federal, State, local, and international concerns. (For plans having both NER and NED outputs, see Section IX of this appendix for policies and procedures related to multipurpose projects.)

E-29. Types of Improvements. Recommendations for ecosystem restoration projects will emphasize improving degraded ecosystem function and structure through the application of the Corps' engineering and other technical expertise related to solving water and related land resources problems, as opposed to projects that primarily rely on land acquisition to achieve the projected outputs. Those restoration opportunities that are associated with wetlands, riparian and other floodplain and aquatic systems are most appropriate for Corps involvement. The roles of various plant and animal populations and related habitats shall be considered in the larger context of community and ecosystem frameworks rather than maximizing habitat benefits for a single species or a resource commodity. A wide range of improvements is possible including, but not limited to, use of dredged material to restore wetlands, restoring floodplain function by reconnection of oxbows to the main channel, providing for more natural channel conditions including restoration of riparian vegetation, pools and riffles and adding structures, modification of obstructions to fish passage including dam removal, modifications to dams to improve dissolved oxygen levels or temperature downstream, removal of drainage structures and or levees to restore wetland hydrology, and restoring conditions conducive to native aquatic and riparian vegetation.

E-30. Policies. The policies specific to ecosystem restoration planning are summarized below.

a. The objective of Civil Works ecosystem restoration is to restore degraded significant ecosystem structure, function, and dynamic processes to a less degraded, more natural condition. However, partial restoration may be possible, with significant and valuable improvements made to degraded ecological resources. The needs for improving or re-establishing both the structural components and the functions of the natural area should be examined. Restored ecosystems should mimic, as closely as possible, conditions which would occur in the area in the absence of human changes to the landscape and hydrology. Indicators of success would include the presence of a large variety of native plants and animals, the ability of the area to sustain larger numbers of certain indicator species or more biologically desirable species, and the ability of the restored area to continue to function and produce the desired outputs with a minimum of continuing human intervention. Those restoration opportunities that are associated with wetlands, riparian and other floodplain and aquatic systems are most appropriate for Corps involvement.

b. Protection may be included as part of Civil Works ecosystem restoration initiatives, when such measures involve efforts to prevent future degradation of elements of an ecosystem's structure and functions. Protection consists of measures undertaken to protect and preserve elements of an ecosystem's structure and functions against future degradation. Such measures are most appropriate if they require the Corps' engineering expertise in accomplishing the protection measure.

c. Planning for Ecosystem Restoration. Restoration projects should be conceived in a systems context, considering aquatic (including marine, estuarine and riverine), wetland and terrestrial complexes, as appropriate, in order to improve the potential for long-term survival as self-regulating, functioning systems. This system view will be applied both in examination of the problems and the development of alternative means for their solution. Consideration should be given to the interconnectedness and dynamics of natural systems, along with human activities in the landscape, which may influence the results of restoration measures. Projects for restoring ecological resources may be recommended, based on the monetary and non-monetary benefits anticipated from the measures recommended. Ecosystem restoration can be included as part of multipurpose plans, which can produce both economic and environmental outputs. The planning for ecosystem restoration objectives is essentially the same as for other water resources development purposes. However, there are some special considerations because of limitations in understanding the complex interrelationships of the components of ecological resources and services which are the focus of these studies, and because the environmental outputs considered in the evaluation process are typically not monetized. The consideration of significant resources and significant effects is integral to plan formulation and evaluation for any type of water resources development project. In ecosystem restoration planning, the concept of significance of outputs plays an especially important role because of the challenge of addressing non-monetized benefits.

d. Mitigation. Ecosystem restoration projects should be designed to avoid the need for fish and wildlife mitigation. Projects implemented using restoration authorities may not be used as wetland banks or mitigation credit for the non-Federal sponsor.

e. Public Interest. For projects where the land on which the majority of the physical ecosystem restoration will occur is in the ownership of a single firm, individual, club, or association with restrictive membership requirements, it must be demonstrated clearly that the restoration benefits are in the overall public interests and that the benefits do not accrue primarily to the property owner.

f. Land Acquisition. Land acquisition in ecosystem restoration plans must be kept to a minimum. Project proposals that consist primarily of land acquisition are not appropriate. As a target, land value should not exceed 25 percent of total project costs. Projects with land costs exceeding this target level are not likely to be given a high priority for budgetary purposes.

g. Water Quality. Water quality is an important component of ecosystem structure, and good water quality is generally integral to healthy functioning ecosystems. An important Corps contribution in rehabilitating ecosystems, where water characteristics are a critical structural component of those ecosystems, may involve improvement of water quality characteristics using engineering solutions. Corps restoration and protection projects may involve cost effective solutions to improve aeration, temperature, turbidity, acidity, sedimentation and other water quality parameters. Consideration should be given to whether the water quality improvements will accomplish restoration of the system, because in many instances, other functional or structural ecosystem components may require attention as well. The Corps will not propose, for Civil Works implementation, any restoration projects or features that would result in treating or otherwise abating pollution problems caused by other parties where they have, or are likely to have, a legal responsibility for remediation or other compliance responsibility. (See EP 1165-2-502.)

h. Recreation. It is important that proposed recreation features are appropriate in scope and scale to the opportunity provided by ecosystem restoration projects, and that the recreation development and anticipated use be compatible with the ecosystem restoration purpose of the project. The recreation potential may be satisfied only to the extent that recreation does not significantly diminish the ecosystem outputs that justify the ecosystem restoration project. More detailed information on policy regarding recreation development at ecosystem restoration projects is provided in Section VII of this appendix and in Appendix B of EP 1165-2-502. A list of approved facilities for ecosystem restoration projects is provided in Exhibit E-3.

i. Monitoring and Adaptive Management.

(1) Monitoring may be necessary to determine if the predicted outputs are being achieved and to provide feed back for future projects. The information obtained from monitoring can be used to ascertain whether: 1) the project is functioning as per its objectives; 2) adjustments for unforeseen circumstances are needed; and , 3) changes to structures or their operation, or management techniques are required.

(2) Cost shared post-implementation monitoring will rarely be required. If cost shared post-implementation monitoring is being considered, it must be clearly defined, justified and shall be limited to no more than five years following completion of construction. The cost of monitoring included in the total project cost and cost shared with the non-Federal sponsor should normally not exceed one percent of the first cost of the ecosystem restoration feature(s).

(3) For complex specifically authorized projects that have high levels of risk and uncertainty of obtaining the proposed outputs, adaptive management may be recommend. The cost of the adaptive management action, if needed, will be limited to 3 percent of the total project cost excluding monitoring costs. Appendix F contains guidance for the CAP.

j. Real Estate Considerations. The analysis of the nature and extent of real estate requirements must be conducted in accordance with Chapter 12 of ER 405-1-12, including

consideration and identification of the specific interests, estates, and acreage required. After coordination and consultation with the non-Federal sponsor, the government will determine the lands, easements, rights-of-way, utility or public facility relocations, and dredged or excavated material disposal areas (LERRD) required for the implementation, operation, and maintenance of the project.

(1) Generally fee title is required for ecosystem restoration projects in accordance with ER 405-1-12. An easement estate may be appropriate based on the extent of the interest required for the implementation, operation and maintenance of the project. However, if an estate less than fee is recommended consideration should be given to the preservation of the physical integrity of the ecosystem restoration project and to risks associated with achieving benefits that serve to justify the project cost.

(2) A comprehensive Real Estate Plan (REP) prepared in accordance with the requirements of Chapter 12 of ER 405-1-12 must be included in the feasibility report or other decision document for the project. The level of detail required will vary depending on the scope and complexity of the project.

k. Operational Effectiveness. Because self-regulation is a key goal of ecosystem restoration, it is generally more desirable to pursue ecosystem restoration projects that have limited maintenance requirements. However, because of irreversible cultural modifications in the landscape, there will be instances where O&M measures may be essential to the functioning of the project. Operation and maintenance costs should be considered in evaluating the costs and benefits for alternatives for ecosystem restoration projects.

E-31. Federal and Non-Federal Participation.

a. Cost Sharing. For specifically authorized ecosystem restoration projects the costs of the Feasibility phase are shared equally with the non-Federal sponsor. The non-Federal share will be 35 percent of the project or separable element implementation costs (preconstruction, engineering and design, and construction), or total implementation costs of a multiple purpose project allocated to ecosystem restoration. Non-Federal sponsors shall provide 100 percent of LERRDs, and operation, maintenance, repair, rehabilitation, and replacement (OMRR&R). The value of LERRD shall be included in the non-Federal 35 percent share. Where the LERRD exceeds the non-Federal sponsor’s 35 percent share, the sponsor will be reimbursed for the value of LERRD which exceeds their 35 percent share. For more detailed discussion of these requirements see ER 1165-2-501 and EP 1165-2-502. For information about cost sharing related to the Continuing Authorities Program see Appendix F.

b. In the identification of ecosystem restoration opportunities, Corps field offices shall seek the advice and cooperation of Federal, state, and tribal resource agencies, as well as input from interested non-governmental environmental organizations. The assistance of these agencies and other interests should be used in identifying the "boundaries" and parameters of the ecosystem, or portions thereof; prioritizing ecosystem restoration needs taking into account

national and regional priorities; identifying the existing and without project future conditions of selected ecosystem(s), or parts thereof; and in defining the restoration goals and objectives desired. See Appendix B for guidance on public involvement in planning studies.

E-32. Planning Process.

a. Consideration of ecosystems within (or encompassing) a watershed provides a useful organizing tool to approach ecosystem-based restoration planning. Ecosystem restoration projects that are conceived as part of a watershed planning initiative or other regional resources management strategy are likely to more effectively meet ecosystem management goals than those projects and decisions developed independently. Independently developed ecosystem restoration projects, especially those formulated without a system context, may only partially and temporarily address symptoms of a chronic systemic problem. Not all restoration studies will be "watershed studies", but all Corps studies should have a watershed perspective.

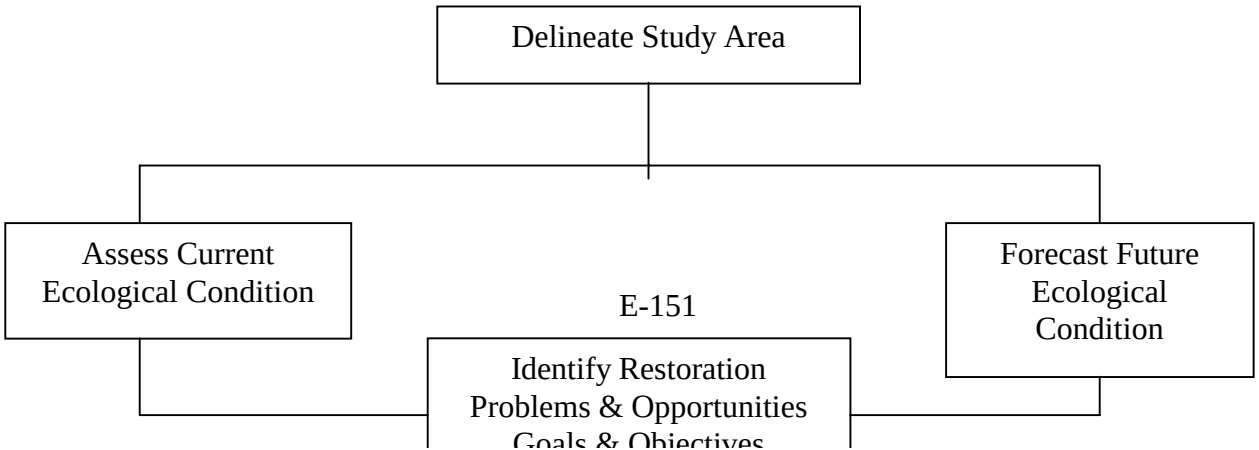
b. Six Steps. The six-step planning process as discussed in Chapter 2 of the main body of this ER and defined in the P&G applies to ecosystem restoration. These steps are summarized in the subsequent paragraphs. (See Figure E-7.)

E-33. Planning Steps 1 and 2.

a. Objective and Constraints. Problems and opportunities should be defined in terms of their nature, cause, location, dimensions, origin, time frame, and importance. The planning team develops objectives and constraints based on those problems and opportunities. Developing specific, flexible, measurable, realistic, attainable, and acceptable objectives and constraints is critical to the success of the entire planning process.

b. Inventory of Existing Conditions and Forecast of Future Conditions. Both existing conditions and future conditions expected to occur without a project must be characterized. The future without project condition forms the basis from which alternative plans are formulated and impacts are assessed.

(1) Selection of Assessment Methods. Many methods and models are available to measure existing ecosystem resource conditions and to estimate future conditions of those resources. Habitat models developed for individual species may have limitations when used to assess ecosystem restoration problems and objectives. They do not consider communities of organisms and typically consider habitat in isolation from its ecosystem context. Single species



habitat models may be limiting if used to optimize for a particular species, but they can be useful when carefully applied in the ecosystem context in which the habitat is situated. They can be helpful in identifying important influential functions or structural components for ecosystem projects to address. The assessment methodology chosen for a study should be governed by how well the technique meets the needs of the study goals and objectives and level of detail for a given study. The assessment methodology may include habitat models, or information derived from community or ecosystem assessments using other scientifically based methods that are generally accepted by state or Federal resource agencies.

(2) Gathering information about historic and existing resources requires an inventory. Gathering information about potential future conditions requires forecasts, which should be made for selected years over the period of analysis to indicate how changes in environmental conditions are likely to impact problems and opportunities. Forecasting future conditions in an ecosystem may be subjective and can be very difficult, but is essential in order to formulate restoration projects. It should be done in an iterative manner, seeking input from State and Federal resource agencies and the environmental community, in order to help build consensus about future without project conditions and what outputs the restoration project will produce. Forecasting may be especially critical to a case for protection where an argument must be made that there will be a decline or degradation of the resource unless protection is provided.

E-34. Planning Step 3 – Formulation of Alternative Plans. Plan formulation consists of three phases: 1) identifying management measures; 2) formulating alternatives from mixing and matching the management measure building blocks; and 3) iterative reformulation, during which alternative plans previously formulated are changed for one or more reasons. Measures may be added, dropped, re-scaled, or otherwise modified such that the reformulated plan will better achieve a planning objective or stay within the limits of a constraint.

E-35. Planning Step 4 - Evaluation of Alternative Plans. The inability to quantify ecosystem benefits in the familiar metric of dollars probably makes the evaluation of plan effects (planning step 4) the single biggest challenge in ecosystem planning.

a. The evaluation of effects is a comparison of the with-plan and without-plan conditions for each alternative. At a minimum, two categories of effects will be evaluated: costs and outputs. Environmental outputs are the desired or anticipated measurable products or results of restoration measures and plans. The term “outputs” is often used interchangeably with “benefits.” Ecosystem restoration proposals may possess multiple output categories, as well as other effects that may need to be considered, but the evaluation must at least address cost and an output category that has been determined to reasonably represent ecosystem restoration benefits. The evaluation is conducted by assessing or measuring the differences between each with- and without plan condition and by appraising or weighting those differences. Evaluation consists of four general tasks: (1) forecast the most likely with-project conditions expected under each alternative; (2) compare each with-project conditions to the without-project conditions and document differences between the two; (3) characterize the beneficial and adverse effects by magnitude, location, timing, and duration; and (4) qualify plans for further consideration.

b. All Corps water resources development projects be evaluated in terms of acceptability; completeness; effectiveness; efficiency. Ecosystem restoration alternatives are also evaluated on the basis of cost effectiveness and incremental cost analyses of the possible restoration alternatives and significance of ecosystem outputs. How each of these criteria is used to evaluate alternatives is explained in the following paragraphs.

E-36. Cost Effectiveness and Incremental Cost Analyses (CE/ICA). CE/ICA are two distinct analyses that must be conducted to evaluate the effects of alternative plans. First, it must be shown through cost effectiveness analysis that an alternative restoration plan's output cannot be produced more cost effectively by another alternative. "Cost effective" means that, for a given level of non-monetary output, no other plan costs less, and no other plan yields more output for less money. Subsequently, through incremental cost analysis, a variety of implementable alternatives and various-sized alternatives are evaluated to arrive at a "best" level of output within the limits of both the sponsor's and the Corps' capabilities. The subset of cost effective plans are examined sequentially (by increasing scale and increment of output) to ascertain which plans are most efficient in the production of environmental benefits. Those most efficient plans are called "Best Buys". They provide the greatest increase in output for the least increases in cost. They have the lowest incremental costs per unit of output. In most analyses, there will be a series of Best Buy plans, in which the relationship between the quantity of outputs and the unit cost is evident. As the scale of Best Buy plans increases (in terms of output produced), average costs per unit of output and incremental costs per unit of output will increase as well. Usually, the incremental analysis by itself will not point to the selection of any single plan. The results of the incremental analysis must be synthesized with other decision-making criteria (for example, significance of outputs, acceptability, completeness, effectiveness, risk and uncertainty, reasonableness of costs) to help the planning team select and recommend a particular plan.

a. There are a number of ways of conducting CE/ICA, thereby determining which plans are cost effective, and, from the set of cost effective plans, identifying those plans which are most efficient in production (i.e., "Best Buys"). In relatively uncomplicated cases, these analyses may simply be performed by hand with pencil and paper. In slightly larger or more complex situations, user-built and generated spreadsheet models may suffice. In still larger and more involved calculations, planners may need to use more sophisticated software applications specifically designed for CE/ICA.

b. The Corps' Institute for Water Resources (IWR) has developed procedures and software to assist in conducting CE/ICA. Please refer to the following IWR reports for detailed discussion of CE/ICA: IWR Report 94-PS-2, *Cost Effectiveness Analysis for Environmental Planning: Nine EASY Steps*; IWR Report 95-R-1, *Evaluation of Environmental Investments Procedures Manual Interim: Cost Effectiveness and Incremental Cost Analyses*; and IWR Report 98-R-1, *Making More Informed Decisions in Your Watershed When Dollars Aren't Enough.* Two software packages are also available to assist in performing CE/ICA: *ECO-EASY*, a DOS-based software application, and Windows-based *IWR-PLAN* Decision Support Software. These

reports and the *IWR-PLAN* software package are available from the IWR web site at http://www.wrsc.usace.army.mil/iwr.

c. CE/ICA Procedures:

(1) Step 1. Before starting CE/ICA, the planning team should have already identified potentially implementable solutions for achieving the desired ecosystem outputs. The solutions must be described in terms of their effects on costs and outputs. That is, an estimate of the cost of each management measure/scale combination and an estimate of the environmental output it will produce must be developed. All costs should be calculated in terms of present worth using the appropriate discount rate and annualized (see Appendix D on Economic and Social Considerations for more detailed information). Ecosystem restoration outputs are not discounted, but should be computed on an average annual basis, taking into consideration that the outputs achieved are likely to vary over time. For example, if one of the outputs is a mature oak forest, the full benefits may not be realized for 30 years. Note that the output values listed are the differences between with- and without-project conditions, not total values before and after the project is implemented. The management measures, scales, costs, and outputs should then be listed.

(2) Step 2. After estimating the costs and outputs of each solution, the next step is to formulate all possible combinations of management measures and scales. Each possible combination may be considered an alternative plan.

(a) By definition, scales within a management measure are mutually exclusive; they represent the application or implementation of different amounts of a given management measure. Formulating all possible combinations requires choosing one scale from each of the management measures to combine in turn with one scale from each of the other management measures, until all possible permutations have been combined. The “No action” possibility for each management measure should also be included in the permutations.

(b) When measures and scales are combined, the cost and output of each constituent part of the combination is summed. Each combination thus has an associated total cost and total output.

(3) Step 3. The next step is to sort all possible combinations of management measures and scales (which are, in effect, all possible alternative plans) in terms of increasing output. This is done as a prelude to cost effectiveness analysis. All possible plan combinations are listed and sorted in terms of increasing output. Costs and outputs of combined solutions may be additive or synergistic. It is important to document the rationale for determining which of these cases applies.

(4) Step 4. Once all possible plans have been formulated and sorted by increasing output, the next step is conducting cost effectiveness analysis. Cost effective means that, for a

particular level of output, no other plan costs less. Furthermore, no plan yields more output for the same or less cost.

(a) Graphing cost effective plans in terms of their respective costs and outputs can help visually display the relationship between the increasing financial investment required for increasing environmental outputs.

(b). Each of the cost effective plans produces its associated level of output at the least cost; no other plan can provide as much output for the same level of investment. This is an important point to make in ecosystem restoration evaluations, and an important criterion in qualifying plans for further evaluation.

(5) Step 5.

(a) The next step is to examine the efficiency of each of the cost effective plans, which is accomplished through incremental cost analysis. In incremental analysis those cost effective plans that are most efficient in production are identified. These plans, known as "Best Buy" plans, provide the greatest increase in output for the least increase in cost. They have the lowest incremental costs per unit of output. The concept of incremental changes in costs and outputs is analogous to the concept of marginal changes, i.e., the differences in cost or output between one plan or alternative and the next one in succession.

(b) The decision rule in incremental analysis is to select the plan with the lowest cost per unit (i.e., the first "Best Buy" from a production perspective, producing output at the lowest unit cost) and then remove from consideration (in this analytical process) any plans that provide a smaller output level than the selected plan (they are less efficient in production, producing a lower level of output at a higher unit cost).

(c) To conduct incremental cost analysis, start with the subset of cost effective plans ranked by increasing output. Beginning with the "No Action" alternative, compute the incremental cost, incremental output, and incremental cost per unit of incremental output advancing from the No Action alternative to each successive alternative. The incremental cost is the additional cost incurred in selecting one plan over another, or in this case the difference in cost between each alternative and No Action. Similarly, the incremental output is the additional output gained in selecting one plan over another, or in this case the difference in output between each alternative and No Action. The incremental cost per unit of incremental output is the incremental cost divided by the incremental output. It shows the change in cost from No Action to each other alternative plan in a per unit basis.

(6) Step 6. The next step is to recalculate the incremental cost per unit of incremental output of implementing each remaining plan instead of the last selected plan

(a) The same decision rule still applies: of the remaining plans (all larger than the first Best Buy plan), select the plan with the lowest incremental cost per unit of incremental output,

then remove from consideration (in this analytical process) any plans that provide a smaller output level than the selected plan.

(b) This process of recalculating incremental cost per incremental unit for each remaining plan over the last selected Best Buy plan is reiterated until the incremental unit cost for the last remaining plan has been recalculated. The number of iterations is dependent upon the number of plans and on the respective cost and output data of each.

(c) It should be noted that the iterative process of selecting successively larger Best Buy plans is an arbitrary, but rational, decision process based on production efficiency. Situations could arise where the most efficient plan produces such a large quantity of output that its total cost makes it infeasible due to cost constraints. However, because the plan is the most efficient in production, all plans that produce smaller output levels (possibly at lower and acceptable cost levels) would be eliminated from consideration in the iterative process. In such situations, it may useful to remove such a large scale plan from consideration and repeat the Best Buy iterative process. The purpose of the iterative process is not to eliminate plans from the possibility of being selected, but rather to identify those plans (and their corresponding level of output) where there is a marked increase in production costs. By identifying where significant increases in production costs occur as output levels are increased, better information is provided to assist in determining desirable project scale.

(7) Step 7. The final step in the CE/ICA process is to tabulate and graph the incremental costs.

(a) It is not necessary to display all such iterations in ecosystem restoration report documentation. What should be provided, however, is a table that summarizes the pertinent incremental cost and output information associated with the increasing size (in terms of output) of the Best Buy plans.

(b) Graphing the Best Buy plans can help visually display the relationship between the increasing financial investment required for increasing environmental outputs. Figure E-8 shows the incremental costs of alternative plans (in $1000) on the y-axis and the average annual environmental benefits (in habitat units) on the x-axis. A similar one should be provided in ecosystem restoration report documentation.

d. CE/ICA as Evaluation Criteria. Neither cost effectiveness analysis nor incremental cost analysis include a “one plan” selection rule similar to the “NED plan” selection rule for NED evaluations. In the absence of such a decision-making rule, neither analysis dictates what choice to make. However, the information developed by both analyses can inform decision-making by progressively proceeding through the available levels of output to ask whether the

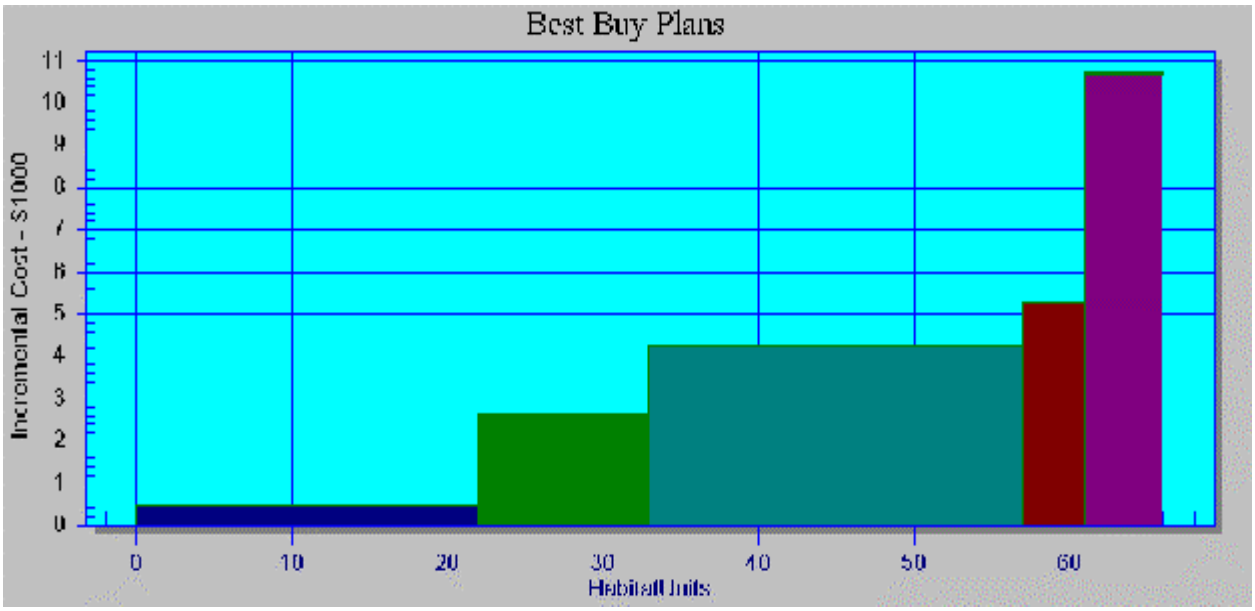



Figure E- 8 Best Buy Plans

next level is “worth it”; that is, whether the environmental benefit of the additional output in the next level is worth its additional cost. In the example shown in the graph, Figure E- 6, the question is whether the first increment of 22 habitat units are worth $440 each, as opposed to No Action of 0 habitat units at $0 each. If it is judged that 22 habitat units are worth $440 each, then proceed to the next level of output and repeat the questioning. At the next level there is a total of 33 habitat units, or 11 additional habitat units over the last level at a cost of $2,600 for each additional habitat unit. Again, if the case can be made that the additional 11 habitat units are worth $2,600 each, then proceed to the next increment.

(1) Often this questioning process will tend to continue to conclude that successive levels of output are “worth it” until an unusual increase in incremental costs, beyond the general range of preceding costs, is encountered. In the CE/ICA graph, Figure E-8, the last increase represents a jump in incremental costs of $10,700 per habitat unit for each of the last five habitat units. This doubling of unit cost for additional output (from the preceding increment) most likely presents a situation where the value of increasing outputs to this level should be explained, supported, or otherwise considered in more detail than previous increases.

(2) The following general decision-making guidelines related to outputs, costs, and the display curves should be applied to the results of cost effectiveness and incremental cost analyses to assist in making “Is it worth it?” arguments:

(a) Curve anomalies (abrupt breakpoints, spikes, peaks, jumps, inflection points, or changes in cost effectiveness and incremental cost curves) identify potential points that provide decision-makers with reasons to question the causes of the changes, and whether additional incremental costs are worth it.

(b) Output Target. If a study has established a specific resource output target to be met, then a decision rule can be developed to meet some portion of that target. For example, a habitat unit target could be marked on an incremental cost bar graph to provide a picture of the relationship between the target and possible solutions. The display may be useful in focusing on whether the incremental costs of the solutions leading to the target are worth it.

(c) Output Thresholds. In some cases it may be necessary to first produce a minimum base amount of output, and any lesser amount would not be successful. Similarly, there may also be a "maximum threshold" level of output where production beyond that output would no longer contribute to the achievement of planning objectives. If minimum or maximum output thresholds exist, they can be used to bound the range of acceptable solutions.

(d) Cost Affordability. If implementation funds are a constraint, either from the perspective of the Corps' or the local sponsor's funding limitations, then decision makers can review both the cost effectiveness curve and the incremental cost curve for information to help them judge the best investment for the funds available.

(e) Unintended Effects. Decisions to recommend a particular cost effective or best buy plan are not made in isolation. Other factors that matter in terms of selecting one alternative over another could include, for example, land ownership, effects on other outputs, and effects on nearby stakeholders. It is possible that the unintended consequences could be just as important as the primary project purpose of ecosystem restoration. The importance and magnitude of these unintended effects will of course vary from study to study.

(3) The results of cost effectiveness and incremental cost analyses are intended to help decision makers make better informed decisions. In all but the most unusual cases, the NER Plan should be derived from the final set of Best Buy solutions. Other solutions, identified as non-cost effective in cost effectiveness analysis; as well as cost effective plans identified as relatively less efficient in production ("non-Best Buys") in incremental analysis, may continue to be considered for selection. In some cases, the economic and environmental models used to estimate the effects of ecosystem restoration plans are not capable of capturing the full range of such effects, or considerable uncertainty may accompany the estimates of such effects. Other evaluation criteria, such as environmental significance, acceptability, completeness, and effectiveness also impact the decision process. For example, concerns about endangered species, support by a local sponsor or other interest group, unintended effects on other economic and ecological resources, and other factors may lead to the continuing consideration and selection of solutions that may not be the most cost effective, or that may incur substantial incremental costs

E-37. Significance of Ecosystem Outputs. Because of the challenge of dealing with non-monetized benefits, the concept of significance of outputs plays an important role in ecosystem restoration evaluation. Along with information from cost effectiveness and incremental cost analyses, as well as information about acceptability, completeness, and effectiveness, information on the significance of ecosystem outputs will help determine whether the proposed environmental investment is worth its cost and whether a particular alternative should be recommended. Statements of significance provide qualitative information to help decision-makers evaluate whether the value of the resources of any given restoration alternative are worth the costs incurred to produce them. The significance of restoration outputs should be recognized in terms of institutional, public, and/or technical importance. This basically means that someone, some entity, some law/policy/regulation, or scientific evidence indicates that a particular resource is important. How to determine and characterize institutional, public, and/or technical significance is an important point and explained in greater detail in the paragraphs below. Detailed procedures for determining and describing the significance of environmental resource(s), including a hypothetical restoration study example as well as sample significance statements, is found in IWR Report 97-R-4, *Resource Significance Protocol for Environmental Project Planning*.

a. Institutional Recognition. Significance based on institutional recognition means that the importance of an environmental resource is acknowledged in the laws, adopted plans, and other policy statements of public agencies, tribes, or private groups. Sources of institutional recognition include: (1) public laws, executive orders, rules and regulations, treaties, and other policy statements of the Federal government; (2) plans, laws, resolutions, and other policy statements of states with jurisdiction in the planning area; (3) laws, plans, codes, ordinances, and other policy statements of regional and local public entities with jurisdiction in the planning area; and (4) charters, bylaws, and other policy statements of private groups.

(1) Examples of sources of information that can assist in identifying and describing significant resources at the Federal level include the threatened and endangered plant and animal species listed by the Endangered Species Act of 1973, as amended; the species lists of the U.S. Fish and Wildlife Service, Office of Migratory Bird Management; species listed in the Anadromous Fish Conservation Act of 1965; species protected by the Marine Mammal Protection Act of 1972; the waterfowl habitat areas and habitat joint ventures of the North American Waterfowl Management Plan; the wetlands designated in the National Wetlands Priority Conservation Plan; the rivers identified by the National Wild and Scenic Rivers Act of 1968 - Nationwide Rivers Inventory; and the estuaries designated under the National Estuary Program.

(2) Examples of sources of regional level information include the wetlands designated under the Coastal Wetlands Planning, Protection, and Restoration Act of 1990 -- Annual Coastal Wetlands Restoration Plan and Priority Project List; the rivers identified in the Northwest Power Act of 1980 - Protected Areas Program; the aquatic habitats identified through the Water Resources Development Act of 1986 (Section 1103) -- Upper Mississippi River System Environmental Management Program; the marine habitats designated by the Coastal America

Partnership; the aquatic resources identified through the Chesapeake Bay Program; and marine resources identified in the Gulf of Mexico Program.

(3) On the state level, examples of sources of information may include the species and habitats identified in state natural heritage programs; species listed under state endangered species programs; habitats designated in state wetlands priority plans; marine resources identified in state coastal zone management programs; and habitats identified by state chapters of the Nature Conservancy.

(4) Local level sources may include zoning ordinances; wetlands regulations; master plans; shoreline regulations; and habitat conservation plans.

b. Public Recognition. Public recognition means that some segment of the general public recognizes the importance of an environmental resource, as evidenced by people engaged in activities that reflect an interest or concern for that particular resource. Such activities may involve membership in an organization, financial contributions to resource-related efforts, providing volunteer labor, and correspondence regarding the importance of the resource.

(1) The public expresses its recognition of resource significance through membership in many local, regional, state, national and international organizations (e.g., Arlingtonians for a Clean Environment, Ducks Unlimited, local chapters of the Nature Conservancy, the National Audubon Society, World Wildlife Fund); and through participation in many activities, whether they be resource-specific (e.g., focusing on a river, a type of fish, a watershed), user-based (e.g., fishing, bird-watching, hiking, camping), or conservation- or management-based (e.g., wetlands restoration projects, posting signs for no-wake zones, planting seedlings).

(2) Another form of public recognition is the role of the resource in the public's customs and traditions. For example, some communities may hold annual festivals, fairs and seasonal celebrations in association with a resource that reflects its importance to the community. In the Pacific Northwest, many tribal ceremonies revolve around salmon runs, indicating the importance of salmon to the culture and traditions of these Native American Indian tribes.

(3) Public and agency records (e.g., newspaper articles, letters written to the Corps) and scoping meetings with the general public as well as non-profit organizations with an interest in the resource may help Corps planners identify sources of public recognition of resource significance.

c. Technical Recognition. Technical recognition means that the resource qualifies as significant based on its "technical" merits, which are based on scientific knowledge or judgement of critical resource characteristics. Whether a resource is determined to be significant may of course vary based on differences across geographical areas and spatial scale. While technical significance of a resource may depend on whether a local, regional, or national perspective is undertaken, typically a watershed or larger (e.g., ecosystem, landscape, or ecoregion) context should be considered. Corps planners should describe technical significance in terms of one or

more of the following criteria or concepts: scarcity, representativeness, status and trends, connectivity, critical habitat, and biodiversity.

(1) Scarcity. This is a measure of a resource's relative abundance within a specified geographic range. Generally, scientists consider a habitat or ecosystem to be rare if it occupies a narrow geographic range (i.e., limited to a few locations) or occurs in small groupings. Unique resources, unlike any others found within a specified range, may also be considered significant, as well as resources that are threatened by interference from both human and natural causes.

(2) Representativeness. This is a measure of a resource's ability to exemplify the natural habitat or ecosystems within a specified range. The presence of a large number and percentage of native species, and the absence of exotic species, implies representativeness, as does the presence of undisturbed habitat.

(3) Status and Trends. This concept involves evaluating the occurrence and extent of the resource over time, how it has changed, and why. Documenting the status, or health, of the resource, includes describing its physical attributes, the extent of degradation, and human alterations of the resource. The trends associated with the degradation of the resource should indicate whether the resource is declining, recovering, or maintaining a steady status, as well as how quickly the resource is changing. Different variables may be used to describe the status of the resource and include: the presence of pollution; biodiversity; abundance of distress-loving and exotic species; extent of man-made barriers and other disturbances; and degree and immediacy of threats. In general, Corps planners can consider a potential restoration site that has declining trends and an imperiled status to be more significant than one that is recovering. Planners should also consider the "recoverability" (i.e., the ability of human intervention to restore the natural productivity or condition of the ecosystem) of a degraded resource in examining a resource's status and trends.

(4) Connectivity. This is a measure of the potential for movement and dispersal of species throughout a given area or ecosystem, and should be considered in the context of an entire landscape or watershed. The variation and quality of links between habitats in a landscape or watershed determine the level of connectivity. Landscape spatial patterns that effect the level of connectivity include the existence and suitability of habitat corridors, the degree and pattern of habitat fragmentation, and the presence of natural and man-made barriers. Often, rivers, waterways, and riparian forests serve as highly functional habitat corridors, and aquatic ecosystems inherently serve a connective function to other waterways and terrestrial landscapes. Corps planners may recognize as technically significant those restoration alternatives that serve to improve connectivity by creating or re-establishing habitat corridors; eliminating or addressing the pattern of fragmentation; or removing barriers, such as dams and other water blockages, that disrupt otherwise contiguous habitats.

(5) Limiting Habitat. This is habitat that is essential for the conservation, survival, or recovery of one or more species. Limiting habitat may serve as a criterion for both institutional and technical significance. Under the Endangered Species Act, the Secretary of the Interior has

designated critical habitat for a portion, but not all, of the species listed as threatened or endangered. In that context, critical habitat is an example of limiting habitat with both institutional and technical significance. Since the term "critical habitat" has specific legal and regulatory ramifications, it should only be used in relation to Federally listed threatened or endangered species. The protection or restoration of limiting habitat for non-designated or non Federally listed species may be technically significant.

(6) Biodiversity. Most simply defined, biodiversity is a measure of the variety of distinct species and the genetic variability within them. It can be measured at the individual level (genetic variation), population level (species variation), and the community level (variation of biological communities and interaction of ecosystem functions). In measuring diversity, biologists usually attempt to describe species richness (i.e., the number of species found in a community) as well as the distribution of individuals among species (i.e., how evenly the total number of individuals is divided among species). Diversity is greater if individuals are more evenly distributed. Corps planners may recognize as technically significant those restoration alternatives that serve to improve biodiversity within a specified area.

(7) In summary, the case can be made that environmental resources are significant based on technical recognition when, within a specified geographic range, those resources are either scarce; are representative of their respective ecosystems; will improve connectivity or reduce fragmentation of habitat; represent limiting habitat for important species; will improve or increase biodiversity; or trends indicate that the health of the resource is imperiled and declining, but can be recovered through human intervention.

E-38. Acceptability, Completeness, Effectiveness, and Efficiency. Acceptability, completeness, effectiveness, and efficiency are the four evaluation criteria specified in the P&G (Paragraph 1.6.2(c)) in the screening of alternative plans. Alternatives considered in any planning study, not just ecosystem restoration studies, should meet minimum subjective standards of these criteria in order to qualify for further consideration and comparison with other plans. These concepts are discussed in more detail in Section I of this appendix.

a. Acceptability. An ecosystem restoration plan should be acceptable to State and Federal resource agencies, and local government. There should be evidence of broad based public consensus and support for the plan. A recommended plan must be acceptable to the non-Federal cost-sharing partner. However, this does not mean that the recommended plan must be the locally preferred plan.

b. Completeness. A plan must provide and account for all necessary investments or other actions needed to ensure the realization of the planned restoration outputs. This may require relating the plan to other types of public or private plans if these plans are crucial to the outcome of the restoration objective. Real estate, O&M, monitoring, and sponsorship factors must be considered. Where there is uncertainty concerning the functioning of certain restoration features and an adaptive management plan has been proposed it must be accounted for in the plan.

c. Efficiency. An ecosystem restoration plan must represent a cost effective means of addressing the restoration problem or opportunity. It must be determined that the plan's restoration outputs cannot be produced more cost effectively by another agency or institution.

d. Effectiveness. An ecosystem restoration plan must make a significant contribution to addressing the specified restoration problems or opportunities (i.e., restore important ecosystem structure or function to some meaningful degree).

E-39. Risk and Uncertainty Considerations. When the costs and outputs of alternative restoration plans are uncertain and/or there are substantive risks that outcomes will not be achieved, which may often be the case, the selection of a recommended alternative becomes more complex. It is essential to document the assumptions made and uncertainties encountered during the course of planning analyses. Restoration of some types of ecosystems may have relatively low risk. For example, removal of drainage tiles to restore hydrology to a wetland area. Other activities may have higher associated risks such as restoration of coastal marsh in a area subject to hurricanes. When identifying the NER plan the associated risk and uncertainty of achieving the proposed level of outputs must be considered. For example, if two plans have similar outputs but one plan costs slightly more, according to cost effectiveness guidelines, the more expensive plan would be dropped from further consideration. However, it might be possible that, due to uncertainties beyond the control or knowledge of the planning team, the slightly more expensive plan will actually produce greater ecological output than originally estimated, in effect qualifying it as a cost effective plan. But without taking into account the uncertainty inherent in the estimate of outputs, that plan would have been excluded from further consideration. This topic is discussed in more detail in Section I of this appendix.

E-40. Planning Step 5 - Plan Comparison. Alternative plans that qualified for further consideration will be compared against each other in order to identify the plan to be recommended for implementation. A comparison of the effects of various plans must be made and tradeoffs among the differences observed and documented to support the final recommendation. The effects include a measure of how well the plans do with respect to planning objectives including NED and NER benefits and costs. Effects required by law or policy and those important to the stakeholders and public are to be considered. Previously, in the evaluation process, the effects of each plan were considered individually and compared to the without-project condition. In this step, plans are compared against each other, with emphasis on the important effects or those that influence the decision-making process. The comparison step concludes with a ranking of plans.

E-41. Planning Step 6 - Selection of Ecosystem Restoration Plan. When selecting a single alternative plan for recommendation from all those that have been considered, the criteria used to select the National Ecosystem Restoration (NER) plan include all the evaluation criteria discussed above. Selecting the NER plan requires careful consideration of the plan that meets planning objectives and constraints and reasonably maximizes environmental benefits while passing tests of cost effectiveness and incremental cost analyses, significance of outputs,

acceptability, completeness, efficiency, and effectiveness. Additional factors to consider include the following items.

a. Partnership Context. Restoration projects that were planned in cooperation with other Federal resource agencies, and where those agencies also have a significant role in implementing the project, using their authorities and funding, should receive higher priority than those that do not, assuming they also satisfy the other criteria. Similarly, restoration projects that make a significant contribution to regional or national interagency programs (e.g., North American Waterfowl Management Plan, Coastal America, Marine Fish Habitat Creation and Restoration Program, Chesapeake Bay Program, etc.) should also receive priority.

b. Reasonableness of Costs. All costs associated with a plan should be considered. Even after tests of cost effectiveness and incremental cost analysis have been satisfied, the decision-maker must ascertain that the benefits to be realized are really worth the costs. This will almost always be a subjective decision and ultimately must rely on experience, reasonableness and common sense.

c. Rarely will the NER plan not be among the best buy plans identified during the cost effectiveness and incremental cost analyses. If the recommend plan is not the NER plan its selection must be justified. The reasons for such a selection should be clearly explained in the supporting documentation as well as the potential implications for cost sharing.

## SECTION VI - Hydroelectric Power

E-42. Federal Interest. Hydroelectric power development may be included in formulation of water resources projects when certain criteria are met.

E-43. Types of Improvements.

a. New Federal Projects. Hydroelectric power development may be considered during planning for multipurpose projects involving dams and lakes and may be recommended if non-Federal development would be impractical. The Corps does not construct single purpose hydroelectric power projects. No single purpose hydropower studies may be initiated for new sites unless specifically directed and funded by the Congress. Non-Federal sponsors must agree to share the cost of the feasibility study with the explicit understanding that any resultant project will be financed by non-Federal funds.

b. Additions to Existing Projects. Existing Corps projects without hydroelectric power facilities may have them added, either through Congressionally authorized Federal development, or preferably through Federal Energy Regulatory Commission (FERC) licensed non-Federal development.

c. Pumped Storage. Pumped storage may be investigated where non-Federal development would be impractical. Pumped storage facilities are either integral or adjoining. Integral facilities frequently consist of a conventional powerhouse with reversible units (the same turbines alternately generate power and pump water). Adjoining facilities usually consist of an upper or lower reservoir and powerhouse and intake separate from the multipurpose project dam (and conventional powerhouse, if any). Adjoining facilities may be the only practical way to add pumped storage to an existing project.

d. Minimum Facilities for Future Power Installations. To support future hydropower development, penstocks and some other features, classified as minimum facilities, may be included in initial project construction, while installation of full facilities is postponed. This authority applies even to projects where hydropower is not an authorized purpose (Flood Control Act of 1938 and subsequent authorizing acts). It requires approval by the Secretary of the Army, on recommendation of the Chief of Engineers and the Federal Energy Regulatory Commission (FERC). Recommendations for minimum facilities should be based on estimates of future economic and financial viability of power, and the expected willingness of non-Federal interests to finance the facilities (or repay). The rationale for this authority is the greater dam modification costs, and the potentially foregone project outputs while modification takes place, compared to the cost of initial provision of minimum facilities. Procedures for report processing and approval are contained in ER 1110-2-1.

e. Transmission Facilities. Transmission lines and substations must be considered with other project effects. Transmission investment plus operation and maintenance costs may be included as project costs, or accounted for in benefit estimates (i.e., through the effect of

differences in transmission requirements between hydropower and other (typically thermal) alternatives).

f. Hydroelectric Development at Non-Corps Sites. The Corps of Engineers has no general authority to participate in hydroelectric development at non-Corps sites.

g. Major Rehabilitation Projects. Construction of infrequent, costly structural rehabilitation or major replacement works that will improve reliability or efficiency of a hydropower generating plant or a principal feature thereof are implemented under the Major Rehabilitation Program. Major rehabilitation projects are budgeted under the Construction General account. Rehabilitation is a major project feature restoration consisting of structural work on a Corps operated and maintained facility intended to improve reliability of an existing structure, the result of which will be a deferral of capital expenditures to replace the structure. Rehabilitation is considered as an alternative when it can significantly extend the physical life of the feature and can be economically justified by benefit-cost-analysis. ER 1130-2-500 and EP 1130-2-500 document the requirements and procedures for major rehabilitation studies and projects. A summary of the procedures to evaluate this type of projects is provided in Section X of this appendix.

## E-44. Specific Policies

a. Non-Federal Development Encouraged. Corps policy is to encourage non-Federal development where feasible, and thus development should ordinarily proceed under FERC procedures. Pursue Federal action only when non-Federal development is impractical.

b. Practicability. A hydropower project is impractical for non-Federal development if there are compelling physical, operational, legal, competing use, institutional, environmental or economic reasons preventing development or operation, or if non-Federal development would be significantly less productive than Federal development (i.e., produce significantly fewer net NED benefits considering all project outputs).

c. Economic Justification Requirements. Before hydropower can be included in a multiple purpose project, the project must be economically justified based on other outputs (flood damage reduction or navigation). If included, however, hydropower scale is not limited by policy.

d. Conditions of Non-Federal Payment or Repayment.

(1) The cost of Federal hydropower development is a non-Federal responsibility. The Corps of Engineers determines the development costs, including cost allocations, if any. The Separable Cost-Remaining Benefit method (SCRB) is the preferred cost allocation procedure (Corps, Interior, FERC interagency agreement).

(2) Payment via reimbursement is permissible in law, but Corps policy is to seek payment concurrent with construction. Under non-Federal sponsor financing, all or some of the vendible power outputs may be ceded to the sponsor, or, the law permitting, the sponsor may

receive revenue from the Federal power marketing agency selling the power. Traditional reimbursement by Federal power marketing agencies is unlikely because of budget restraints.

(3) Although the Corps constructs and operates power facilities, the power itself is either sold by a Federal power marketing agency or conveyed to a sponsor. Thus, plan formulation, financing and other implementation requirements should be coordinated with the power marketing agency or sponsor, if any.

## E-45. NED Benefit Evaluation Procedure

a. Purpose. This section describes procedures for the evaluation of national economic development (NED) benefits of hydropower features of water resources projects and plans. These features include single-purpose hydropower (when Congressionally authorized), the inclusion of hydropower as a function in new multipurpose projects, addition of hydropower power-generating facilities to existing water resource projects, and expansion of existing power plants

b. Conceptual Basis.

(1) The conceptual basis for evaluating the benefits from energy produced by hydroelectric power plants is society's willingness to pay for these outputs. If this is not possible or cost effective, benefit information may sometimes be obtained through examination of market prices. Although utility pricing of electricity is complex and usually based on average cost rather than marginal cost, in cases where it can be determined that market price to the final consumer is based on marginal production costs, this may be used as a measure of benefits. When using market price as a measure of benefits the increment in supply should ordinarily be relatively small compared to the total (i.e., little change would be expected in market price due to the incremental supply). Continued movement of retail electricity pricing towards marginal cost approximations (e.g., seasonal rates, time of day rates, etc.) may make market prices more relevant for benefit evaluation in the future. In the absence of such direct measures of marginal willingness to pay, the benefit from energy produced by hydroelectric powerplants is measured by the resource cost of the most likely alternative to be implemented in the absence of the alternatives under consideration. Non-Federal investment analysis generally does not provide an adequate basis for evaluation of potential investments of Federal resources in hydroelectric power. This is because non-Federal investments reflect financial conditions, insurance, and tax incentives that differ from those applying to Federal investments. The procedure that follows allows the planner to construct an NED benefit estimate based on real resource cost of the most likely non-Federal alternative. Simplifications are encouraged for small-scale hydropower projects. An alternative hydropower benefit evaluation procedure is provided for single-purpose projects that are to be 100 percent non-federally financed, provided that there are no significant incidental costs.

(2) The real resource cost of the most likely alternative can also be used to compute benefits from nonstructural measures. However, the net benefits of certain nonstructural

measures that alter the electric power load cannot be measured effectively by the alternative cost procedures for the following reasons:

(a) Structural measures and many nonstructural measures (except those that alter the load) result in similar plan outputs, whereas load-altering measures (e.g., revised rate structures) may change levels of output; and,

(b) Load-altering measures may have fewer direct resource costs than measures based on higher levels of output. Because of this lack of comparability, the benefits from such load-altering nonstructural measures should not be based on the cost of the most likely alternative. Attempts to measure the benefits of load-altering nonstructural measures on the basis of direct willingness to pay are encouraged.

c. Planning Setting.

(1) Without Project Condition. The without project condition is the most likely condition expected to exist in the future in the absence of a project, including any known changes in law or public policy. The without project condition includes the following specific assumptions:

(a) Existing Resources. Existing generating resources are part of the without project condition. Make adjustments to account for anticipated plant retirements and changes in plant output due to age or environmental restrictions associated with existing policy and regulations.

(b) Existing Institutional Arrangements. Existing and reasonably expected future power system and water management contracts, treaties, and non-power river operating criteria are part of the without project condition. If revision of these arrangements is part of an alternative plan, the new arrangement (revised contract, criteria, etc.) would be considered in the with project condition.

(c) Alternative Actions Anticipated or Under Way. The without project condition includes those generating resources that can reasonable be expected to be available in the forecast period.

(d) Nonstructural Measures and Conservation. The without project condition includes the effects of implementing all reasonably expected nonstructural and conservation measures.

(2) With Project Condition.

(a) The with project condition is the most likely condition expected to exist in the future with the plan under consideration. Examples of alternative plans include: alternative combinations of projects in a basin study; alternative sites in a reach study; alternative plant sizes at a specific site; alternative reservoir sizes at a reservoir site; use of reregulation and/or pumpback to increase firm capacity; and reallocation of storage to increase firm energy output.

(b) Nonstructural alternatives to hydropower may be used alone or in combination with structural measures. Nonstructural measures include but are not limited to reducing the level and/or time pattern of demand by time-of-day pricing; utility-sponsored loans for insulation; appliance efficiency standards; education programs; inter-regional power transfers; and increased transmission efficiency.

d. Evaluation Procedure

(1) Follow the steps shown in Figure E - 9 and described in the following paragraphs to estimate NED benefits that would accrue whenever the plan would be cost shared. When single-purpose hydropower alternatives being studied would be 100 percent non-federally financed, the market-based procedure specified in paragraph E-45 may be used. Non-federally financed means that all construction and operating costs would be financed entirely from sources other than federally appropriated funds. The level of effort expended on each step depends upon the nature of the proposed development, the state of the art for accurately refining the estimate, and the likely effect of further refinement on project formulation and justification. For the purpose of ensuring efficiency in the use of planning resources, simplifications of the procedures set forth in this section are encouraged in the case of single-purpose, small scale hydropower projects (25 MW or less), if these simplifications lead to reasonable approximations of NED benefits and costs. In addition, an analysis of marketability may be substituted for determination of need for future generation for hydropower projects up to 80 MW at existing Federal facilities.

(a) Step 1 - Identify System For Analysis. Because of the trend toward interconnection and coordination among utilities and power systems, it is most appropriate to evaluate NED benefits for hydropower on a system basis, rather than on the needs of an individual utility or local area. The size of the system would depend on the situation but could consist of a power pool, a National Electric Reliability Council (NERC) regional area, the marketing area of a Federal Power Marketing Administration, or other geographic region. In some cases, physical or institutional constraints may limit the analysis to a smaller area, but care must be taken to ensure that benefits are not misstated by such analysis.

(b) Step 2 - Estimate Future Demand For Electric Power. Forecast electric power loads in terms of the annual peak demand period. When a high proportion of the generation is from hydropower, a forecast of annual energy demand should be made. Also forecast weekly load shapes to represent a minimum of three periods in the year (e.g., typical summer, winter, and spring/fall days) to assist in determining the type of load that a hydropower project could carry. Load forecasts should reflect the effects of all load management and conservation measures that, on the basis of present and future public and private programs, can reasonably be expected to be

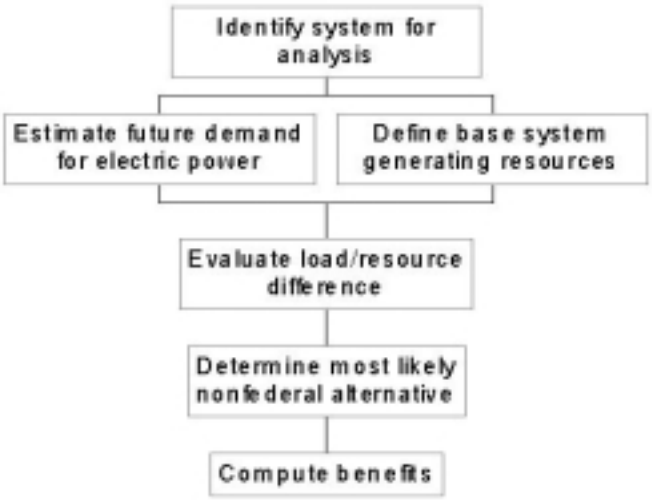



Figure E- 9 Flowchart of Hydropower Benefit Evaluation Procedures

implemented during the forecast period. Load forecasts should be made and analyzed by sectoral use (e.g., residential, commercial, industrial). Estimate loads at increments of no more than 10 years from the present to a time when the proposed plant will be operating in a state representative of the majority of its project life. In the case of staged hydropower development or where generation system resource mixes may change markedly, load forecasts may be appropriate for 20 years or more beyond the initial operation date. Account for system exports and reserve requirements.

(c) Step 3 - Define Base System Generating Resources. Project future generating resources and imports at various points in time without the proposed plan or any alternative plan. Estimate resources for the time periods stated in step 2. Provide information on peak capacity and on average annual energy production where a high proportion of the systems generation is hydropower. Data are readily available on projected system resources for about 10 years. Base projected resource additions beyond that time on system studies. Account for retirement of older plants as well as the reduction of output of some plants due to age or environmental constraints.

(d) Step 4 - Evaluate Load/Resource Difference. Compare the loads identified in step 2 with the resources identified in step 3 to determine: (1) when generating resource deficits will occur, (2) the magnitude of these deficits, and (3) what portion of these deficits could be met by the hydropower project. If nonstructural measures are components of an alternative plan and these measures reduce system loads, the amount of such reduction lessens system deficits. Hydropower sites can be developed to provide either a base load, mid-range, or peaking service. Evaluate the system demand for each class of hydropower generation. Simple tabulation of annual peak and energy loads and resources is generally adequate for preliminary studies. Use

system load-resource models that account for load characteristics and generating plant operating capabilities, if available, to evaluate accurately the usability of specific projects.

(e) Step 5 - Determine the Most Likely Non-federal Alternative.

(1) General. Select the one alternative most likely to be implemented in the absence of the proposed Federal project. Begin identification of the most likely alternative to the plan being considered with the least costly alternative. If an alternative with a lesser cost is passed over for a more expensive one, justify not selecting the lower cost plan.

(2) Screen Alternatives. The alternatives to a specific hydropower project must be viable in terms of engineering, environmental quality, and other national policy considerations. Engineering viability limits thermal alternatives to commercially available electric powerplants. Environmental viability implies that plant costs include all equipment required to meet environmental quality criteria. National policy considerations include factors such as legal limitations on the use of oil, natural gas, and other "scarce" fuels for electric power generation. Each alternative need not in itself deliver service similar in kind to the hydropower project, but the total power system with the alternative must deliver service similar in kind to the system with the hydropower project. If nonstructural measures or conservation are components of an alternative plan and these measures reduce the need for additional capacity or for additional power, the amount of such reduction constitutes provision of service similar in kind; this ensures that evaluation procedures will not be biased against the selection of an alternative that utilizes nonstructural measures.

(3) Identify the Most Likely Alternative. Compare the system with the hydropower project under consideration to alternatives capable of meeting system loads within established criteria of system reliability. Base the comparison on the basis of cost and other factors to determine the most likely alternative, i.e., the structural and/or nonstructural measures that will be implemented if the project under consideration is not implemented. If institutional obstacles to implementation are noted, an alternative plan should still be considered the most likely if the barriers are substantially within the power of the affected users to correct. A detailed description of the institutional obstacles should be included, with a discussion of the basis for the conclusion that the obstacles cannot be overcome. If the most likely alternative includes new thermal plants, use those plants' capacity costs (including amortized investment costs, transmission costs and fixed operating and maintenance (O&M) costs) as the measure of the value of the hydropower project's generating capacity, and use the thermal plants' energy costs (primary variable O&M costs and fuel costs) as the measure of the value of the hydropower project's energy production.

(f) Step 6 - Compute Benefits.

(1) Compute Hydropower Plant Annual Benefits. Compute annualized benefits based on the costs of the most likely alternative for each hydropower development and installation component. Base the calculation of alternative costs to be used as a measure of NED benefits on the following: (i) calculate all interest and amortization costs charged to the alternative on the basis of the Federal discount rate; (ii) charge no costs for taxes or insurance to the alternative; and (iii) in calculating costs of the most likely alternative, use assumptions and procedures that parallel those used to calculate the costs of the plan being evaluated. In many cases, benefits may vary over the life of a project. This may be due to such factors as staged development of the hydropower project, changes in operating of the hydropower project resulting from changes in the resource mix in the total generating system, and real escalation in fuel costs (if the most likely alternative system includes a thermal plant). Compute project benefits by time intervals and discount these values to derive annualized power benefits. When applicable, the evaluation shall reflect differences in the cost of transmission, distribution, and other facilities compared to the most likely alternative. Occasionally, the initial output of a hydropower project is large compared to annual growth in system load; two or more years may be required to fully absorb its output into the load. In these cases adjust the credit (benefit) to reflect the generating capacity and energy actually used in the load in the early years of project life.

(2) Energy Value Adjustment. Account for the effect on the system production expenses when computing the value of hydroelectric power. Adding structural or nonstructural measures of a plan to a system instead of adding an alternative power source may result in greater or lesser system production expenses than if a particular thermal capacity were added; the effect on production expenses can be determined by performing a system analysis. If there is a difference in system production expenses, adjust the energy value in the economic analysis of the plan. If the alternative plan would increase system production expenses, the adjustment would be positive. Consider system production expenses in determining the most likely alternative.

(3) Capacity Value Adjustment. The physical operating characteristics of hydropower projects differ significantly from alternative thermal plants. Appropriate credit may be given to hydropower projects to reflect their greater reliability and operating flexibility. When the value of these characteristics cannot otherwise be quantified, an adjustment can be made to the alternative plant capacity costs. Typically, the adjustment per kilowatt of capacity ranges from 5 to 10 percent of the cost per kilowatt of thermal capacity, depending on the operating characteristics of the hydropower project and alternatives that include thermal capacity. The adjustment may be applied by increasing the capacity cost of the most likely alternative by the appropriate percentage determined by the Federal Energy Regulatory Commission (FERC).

(4) Intermittent Capacity Adjustment. The dependable capacity of hydropower project is based on the load-carrying capacity of the project under the most adverse combination of system

loads, hydrologic conditions, and plant capabilities. This very conservative approach is unrelated to the dependable capacity of a hydropower project's alternative if thermal capacity is included and given no credit for the value of capacity that is available a substantial amount of the time. When power system operation studies show that there is an intermittent capacity value to the system, a capacity adjustment should be made.

(5) Price Relationships. Assume relative price relationships and the general level of prices prevailing during the planning study to hold generally for the future, unless specified studies and considerations indicate otherwise. Examples of the latter include escalation of relative fuel cost (e.g., due to increasing scarcity) or increased capital costs expected to result from changed environmental or safety criteria. Fuel costs used in the analysis should reflect economic prices (market clearing) rather than regulated prices.

e. Data Sources. Data on existing and planned resources, loads, marketability criteria, and alternative costs are available from various agencies and groups, including the Department of Energy, NERC regional councils, FERC regional offices, Federal power marketing administrations, State energy agencies, utility companies, and regional planning groups. If specific operating characteristics of individual plants are not available, generalized data can be obtained from other sources, including the Electric Power Research Institute. Load-resources models based on simulated system operation may be used if available. Some of these models are available from various sources, including FERC, Federal power marketing administrations, and a number of consulting services.

f. Alternative Procedure: Financial Evaluation.

(1) General. This section provides an alternative hydropower benefit evaluation procedure that may be used for evaluating single-purpose projects that are to be 100 percent nonfederally financed, provided that there are no significant incidental costs. This approach employs market data based on long-run (10 or more years) utility wholesale prices as an estimate of the cost of producing equivalent power from the most likely alternative. These prices may be used to evaluate and compare the financial feasibility of alternative plans, provided that they are consistently applied to all of the alternatives. Through this process, the most financially attractive alternative is identified. Because the benefits and costs of all alternative plans are evaluated in a consistent way, the most financially attractive plan can be identified as the NED plan.

(2) Industry Long-run Wholesale Prices. The market approach must be carefully applied to ensure that the long-term (10 or more years) contract prices reflect the energy and capacity characteristics of the proposed hydropower project. In screening contracts for applicability, a number of factors should be examined, including: term of contract, power and energy availability (daily, weekly, seasonally), geographic relationship, delivery voltage, power factor, point(s) of delivery (busbar, high voltage grid, load center), interconnecting facilities, reliability

standards and emergency backup. Information on long-term wholesale power contracts may be obtained from FERC, State public service commissions, the Federal power marketing administrations, and electric generating and distribution utilities.

g. Report and Display Procedures.

(1) Tables E-23 through E-25 are suggested for presentation for reports that include federally financed hydropower measures. Table E-23 summarizes the output of all plans by peaking capacity and system load factor, and presents the costs of each alternative plan. Tables E-24 and E-25 summarize the output of the structural component of each alternative, the benefits of the structural components, and the resource costs of all structural and nonstructural components of each alternative plan. The number of benefit categories included will carry from project to project. Not all projects will have intermittent capacity, for example, and in some cases it will be appropriate to account separately for firm and secondary energy. System energy costs are sometimes included in the unit energy values; in those cases such costs would not have to be accounted for separately.

(2) Table E-25 is suggested if the nature or magnitude of hydropower benefits changes substantially over time. Examples are: staged construction of the hydropower project; change in the role of hydropower in the system over time; and situations in which several years are required to absorb a large project into the system. When the alternative financial evaluation procedure is used to evaluate financial feasibility of plans that are to be 100 percent non-Federally financed (see paragraph E-45f), physical data similar to that found in Tables E-23 through E-25 should be displayed. Capacity and energy values, as developed through the financial analysis, should also be displayed in a manner facilitating comparison among alternatives. These displays are in lieu of the standard presentation of hydropower benefits and project costs in the NED account. Also display any incidental benefits and costs of the alternatives. However, no benefit-cost ratio can be presented, because the analysis of the hydropower project's financial feasibility is not comparable to economic analysis.

h. Major Rehabilitation Projects Evaluation Procedures. Benefits associated with major rehabilitation projects are increases in reliability and efficiency improvements. Procedures to estimate these benefits are found in ER 1130-2-500 and EP 1130-2-500.

E-46. Special Considerations. Upon request, districts may provide reimbursable technical services to states or State subdivisions on hydropower development at sites where hydropower is not an authorized purpose (Intergovernmental Cooperation Act of 1968; see ER 1140-1-211). Assistance is limited to technical services; separate authority to construct or operate and maintain hydropower facilities is required. The Corps Center of Expertise for hydropower projects is located in Northwestern Division (NWD).

b. Coordination Initiatives.

(1) FERC Coordination-Costs of Alternatives. Ordinarily the Corps collaborates with FERC in estimating costs of alternatives to Corps hydropower projects, and frequently has adopted FERC values as benefits. The Corps is under no requirement to use FERC values however; if a district can perform superior analysis, it should do so.

(2) Marketing Agencies. The Corps does not market the power it produces; marketing is done by the Federal power marketing agencies (Southeastern Power Administration, Southwestern Power Administration, Western Area Power Administration, Bonneville Power Administration, Alaska Power Administration) through the Secretary of Energy. The rates are set by the marketing agency to: (a) recover costs (producing and transmitting) over a reasonable period of years (50 years usually); and (b) encourage widespread use at the lowest possible rates to consumers, consistent with sound business principles. The law requires that preference for sale be given to public bodies and cooperatives. Rates are determined by the marketing agency and approved by FERC (Section 5 Flood Control Act 1944, Public Law 78-534; see ER 1130-2-324). In compliance with Section 103(c)(1) of the Water Resources Development Act of 1986 (Public Law 99-662), any proposal to Congress for hydroelectric power authorization must contain statements of the appropriate power marketing agency regarding its marketing of the power to recover all costs allocated to power and any other costs assigned for power cost recovery pursuant to law.

Table E- 23 Electric Power Supply Alternatives

[Period of analysis, price level, discount rate]

| | Annualized cost[1] ($1,000) | Peak power supplied conserved, and system load factor (MW)[2] by time period[3] | | | |
|---|---|---|---|---|---|
| | | $P_1$ | $P_2$ | $P_3$ | $P_N$ |
| Most likely alternative ..... | ..... | ..... | ..... | ..... | ..... |
| Recommended plan..... | ..... | ..... | ..... | ..... | ..... |
| Other plans analyzed..... | ..... | ..... | ..... | ..... | ..... |

[1]Annual equivalent cost includes system costs.
[2]For example, for the summer season, an entry "90 10 .6" would represent the 100 MW deficit in the summer peak use identified in the without-project condition by supplying 90 MW and reducing the quantity used by 10 MW; the system load factor for the entire system for the summer would be .6.
[3]Show by time period and season where there are seasonal variations

Table E- 24 Summary of Annualized NED Benefits for Structural Measures and NED Costs for Structural and Nonstructural Measures[1]

[(Thousands of month, year dollars) Applicable discount rate: ____]

| | Alternative | | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | X |
| Plant data: | | | | |
| Installed capacity, MW | ..... | ..... | ..... | ..... |
| Dependable capacity, MW | ..... | ..... | ..... | ..... |
| Intermittent capacity, MW | ..... | ..... | ..... | ..... |
| Average annual energy, gWh | ..... | ..... | ..... | ..... |
| Average annual capacity factor (percent) | ..... | ..... | ..... | ..... |
| Benefits: | (.....) | (.....) | (.....) | (.....) |
| Unit capacity | ..... | ..... | ..... | ..... |
| Dependable capacity benefits | ..... | ..... | ..... | ..... |
| Intermittent capacity benefits | | | | |
| Unit energy value (mills/kWh) | (.....) | (.....) | (.....) | ..... |
| Energy benefits | ..... | ..... | ..... | (.....) |
| Unit system energy adjustment (mills/kWh) | (.....) | (.....) | (.....) | ..... |
| System energy cost adjustment | ..... | ..... | ..... | (.....) |
| Real fuel cost escalation rate (percent) | (.....) | (.....) | (.....) | (.....) |
| Period of real fuel cost adjustment (yrs) | ..... | ..... | ..... | ..... |
| Real fuel cost adjustment | | | | |
| Total hydro benefits | ..... | ..... | ..... | ..... |
| Other purpose benefits (list) | ..... | ..... | ..... | ..... |
| Annualized cost | ..... | ..... | ..... | ..... |
| Structural measures | ..... | ..... | ..... | ..... |
| Nonstructural measures | ..... | ..... | ..... | ..... |
| Net annualized benefits | ..... | ..... | ..... | ..... |

[1]Note that benefits from load-altering nonstructural measures are excluded. This table may be used for displaying the benefits of nonstructural measures that do not alter the load (see 2.5.2(b)).

Table E- 25 Time Distribution of NED Electric Power Benefits

for Structural Measures of Alternatives[1](Applicable discount rate: ____)

| | Alternative | | | | |
|---|---|---|---|---|---|
| | $P_1$ | $P_2$ | $P_3$ | $P_X$ | AAE[3] |
| Plant data: | | | | | |
| Installed capacity, MW ..... | ..... | ..... | ..... | ..... | ..... |
| Dependable capacity, MW.. | ..... | ..... | ..... | ..... | ..... |
| Intermittent capacity, MW.. | ..... | ..... | ..... | ..... | ..... |
| Average annual energy, gWh | ..... | ..... | ..... | ..... | ..... |
| Average annual capacity factor (percent)..... | ..... | ..... | ..... | ..... | ..... |
| Benefits: | | | | | |
| Unit capacity..... | (.....) | (.....) | (.....) | (.....) | (.....) |
| Dependable capacity benefits | ..... | ..... | ..... | ..... | ..... |
| Intermittent capacity benefits | ..... | ..... | ..... | ..... | ..... |
| Unit energy value (mills/kWh) | (.....) | (.....) | (.....) | (.....) | (.....) |
| Energy benefits ..... | ..... | ..... | ..... | ..... | ..... |
| Unit system energy adjustment (mills/kWh) ..... | (.....) | (.....) | (.....) | (.....) | (.....) |
| System energy cost adjustment | ..... | ..... | ..... | ..... | ..... |
| Real fuel cost escalation rate (percent) | (.....) | (.....) | (.....) | (.....) | (.....) |
| Period of real fuel cost adjustment (yrs)..... | (.....) | (.....) | (.....) | (.....) | (.....) |
| Real fuel cost adjustment.... | ..... | ..... | ..... | ..... | ..... |
| Annualized benefits..... | ..... | ..... | ..... | ..... | ..... |

## SECTION VII – Recreation

E-47. Federal Interest. The legislative basis for Federal participation in recreation development is found in the Flood Control Act of 1944, as amended, the Federal Water Project Recreation Act of 1965 (Public Law 89-72), and the Water Resources Development Act of 1986 (Public Law 99-662). These give broad authority to include recreation as a project purpose. Policy limits exercise of these authorities however. Recreation is a low priority output and thus the Corps will not plan for (formulate for) single purpose recreation unless a sponsor is willing to pay one hundred percent of the associated implementation costs. For projects with other purposes to which separable recreation is added, the statutory cost sharing requirement is just fifty percent. The Corps will plan for and implement projects serving other purposes (hurricane and storm damage reduction for example) and these may have incidental recreation benefits. Benefits are incidental when: (1) a project is formulated for other primary purposes and recreation benefits are less than 50% of total benefits, or (2) a project is formulated for other primary purposes and average annual recreation benefits are less than 50% of the average annual benefits required for justification. This is equivalent to saying the recreation benefits, which are required for justification, must be less than an amount equal to 50% of project costs. There may be additional recreation benefits if they are not required for justification. In addition, for multiple purpose projects recreation may be included as a primary purpose if there is a non-Federal sponsor. For cases 1 and 2, recreation benefits are considered incidental; cost sharing (and cost allocation, if any) is based on the formula for the primary purpose only.

E-48. Types of Improvements

a. Vendible Outputs and Services and Non-Federal Facilities. Improvements providing outputs or services generally considered vendible are non-Federal responsibilities. Marina facilities and telephone services are examples. Any improvement or service not closely and directly related to enjoyment of the natural resource itself (or created resource itself) is a non-Federal responsibility, even if it is not generally considered vendible. Examples are tennis courts and accommodations for viewing sporting or cultural events taking place on or near a lake.

b. Federal Participation, Joint Facilities and Cost Sharing. If there is no non-Federal recreation sponsor, facilities or project modifications may not be recommended unless justified by other project purposes, in which case recreation benefits are considered incidental. Minimum facilities needed to maintain public health or safety, are permissible. These are limited to road end turnarounds, guardrails, barricades, warning signs, public safety fencing and vault toilets (unless upgrades are required by Federal or state regulations). Boat ramps and trailer parking justified by project operations requirements may be provided. Costs are joint costs and allocated to project purposes.

c. Facilities Justification and Cost Sharing. When there is a recreation sponsor economically justified facilities are cost shared 50 percent Federal and 50 percent non-Federal.

d. Check List of Facilities. Exhibit E-2 contains a list of recreational facilities which may be provided in recreation developments at Corps water resources projects with requirements for funding each as either: (1) joint facilities cost-shared jointly with other project features; (2) separable recreation features dependent upon the water resource project that may be cost-shared at 50 percent Federal and 50 percent non-Federal with the recreation sponsor; and/or, (3) separable recreation facilities for which there will be no Federal cost-sharing and which must be provided at 100% non-Federal cost.

E-49. Specific Policies

a. Lakes (man-made).

(1) Lakes, or reservoirs, are impoundments created behind dams, or behind navigation locks and dams if lands not subject to navigation servitude are needed for water storage. Recreation policies applicable to lakes are not applicable to dry dams, that is those dams not providing permanently impounded water. The Federal government may participate in basic recreation facilities on project lands or separable recreation lands if a non-Federal sponsor will participate and cost share as outlined in paragraph E-51. The same conditions apply to separable lands acquired for future recreation development.

(2) Recreation costs may not exceed one-half of total costs.

(3) If recreation is a project purpose, several scales of development must be formulated and evaluated.

(4) Reallocation of Storage. Storage reallocations for recreation which significantly affect other authorized purposes, or involve major structural or operational changes, require Congressional approval. Costs reallocated to recreation and subject to cost sharing will be set to the highest of: benefits foregone; revenues foregone; replacement costs; updated cost of storage. Cost sharing of facilities is 50/50.

b. Other Types of Projects. These include works or improvements for commercial and recreational navigation, hurricane and storm damage prevention, non-lake projects for flood damage prevention and ecosystem restoration. The benefits and costs of recreation are considered incremental. Specific policies and exceptions are provided in the following paragraphs.

(1) Non- lake Projects.

(a) At non lake projects basic recreation facilities exploiting project created opportunities may be provided, but only on lands acquired for non recreation purposes.

(b) The Federal government will not participate in acquiring lands for recreation purposes. A special case may exist when the real estate interest required for other project purposes is insufficient for recreation development. The sponsor may obtain real estate interest sufficient for recreation and receive a credit for the incremental cost. For example, if an easement is adequate for other project purposes, but fee acquisition is necessary for recreation development, the sponsor may receive credit for the incremental cost of fee acquisition. This real estate upgrade policy does not apply to temporary construction easements, nor to disposal or borrow areas.

(c) If there is to be recreation development, then beyond real estate interest upgrades the only other Federal participation in land acquisition is for providing access to project lands, parking, potable water, sanitation and related developments for public control and for health and safety.

(d) Unlike lake projects, at non lake projects there is no routine Federal interest in provision of minimum facilities for public health and safety. That is, if no recreation development is sponsored by a non-Federal entity, there is no Federal participation in minimum facilities.

(e) The Federal cost of a project including recreation may not exceed the Federal cost of the project excluding recreation by more than ten percent without prior approval by the Secretary of the Army.

(2) Shore Protection Project. Except for Federal shores the Corps will not participate in the cost of beach use recreation developments. Local cooperation requirements shall include the provision and maintenance of roads, parking, sanitary facilities and any other on-shore recreation development necessary to accommodate anticipated beach users needed to realize recreational benefits claimed. Also, Army policy precludes the addition of sand to a beach solely to increase its potential for recreation.

(3) Nonstructural Flood Damage Reduction Projects. The formulation of nonstructural flood damage reduction projects is not constrained by the limitation of increased Federal cost for recreation development described above. This is because such projects are justified mainly by creating new uses for floodplains, and the most important new use is frequently recreation.

(4) Recreation at Ecosystem Restoration Projects. Recreation at ecosystem restoration projects should be compatible with these types of projects and enhance the visitation experience

by taking advantage of natural values. The social, cultural, scientific, and educational values should be considered within the framework of the ecosystem restoration project purpose. Recreation development at an ecosystem restoration project shall be totally ancillary to the primary purpose, appropriate in scope and scale, and shall not diminish the ecosystem restoration outputs used to justify the project. Recreation facilities may be added to take advantage of the education and recreation potential of the ecosystem restoration project but the project shall not be formulated for recreation. The recreation potential may be satisfied only to the extent that recreation does not adversely impact the ecosystem restoration purpose, and the recreation facilities are justified. The recreational experience shall build upon the ecosystem restoration objective and take advantage of the restored resources rather than detract from them. Ecosystem restoration projects should not encourage public use if there is no non-Federal sponsor to cost share recreation. Federal participation in recreation development at ecosystem restoration projects will be limited to the facilities shown in Exhibit E-3 of this appendix. Specific policies stated in paragraph E-49b also apply to recreation development at single purpose ecosystem restoration projects.

(5) Multipurpose Projects. For multipurpose projects that include nonstructural flood damage reduction, ecosystem restoration and recreation, the cost of recreation associated with the non-structural flood damage reduction features may not exceed one-half of the total cost for flood damage reduction plus recreation; and, for recreation associated with ecosystem restoration, the Federal cost of ecosystem restoration plus the Federal cost of recreation may not exceed by more than 10 percent the Federal cost of the ecosystem restoration project without prior approval of the ASA(CW). For example, a multipurpose project with a total cost of $8 million for nonstructural flood damage prevention and Federal cost of $2 million for ecosystem restoration, may include recreational facilities associated with the nonstructural flood damage prevention project with a cost not to exceed $8 million and recreational facilities associated with the ecosystem restoration projects with a Federal cost not to exceed $200,000.

(6) Continuing Authorities. Flood control, navigation and shore protection continuing authorities are subject to the same recreation policies and conditions of participation as specifically authorized projects. Additionally, all costs in excess of the statutory limitation of Federal expenditures for these projects are entirely a local responsibility.

## E-50. NED Benefit Evaluation Procedure

a. Purpose. This section provides the procedures for evaluating the beneficial and adverse effects of water project recreation on national economic development (NED). The Federal Water Project Recreation Act of 1965 requires that full consideration is given to the opportunities that Federal multipurpose and other water projects afford for outdoor recreation and associated fish and wildlife enhancement.

b. Conceptual Basis.

(1) General.

(a) Benefits arising from recreation opportunities created by a project are measured in terms of willingness to pay. Benefits for projects (or project features) that increase supply are measured as the willingness to pay for each increment of supply. Benefits for projects (or project features) that alter willingness to pay (e.g., through quality changes) are measured as the difference between the without and with project willingness to pay. Willingness to pay includes entry and use fees actually paid for site use plus any unpaid value (surplus) enjoyed by consumers. (Payment for equipment, food, transportation costs, or lodging associated with recreation activity cannot be used as direct estimates of willingness to pay, because these payments are not specifically for site use.) The total willingness to pay is represented as the area under the demand curve between the old and new supply. Because most recreation is publicly provided, it is usually not possible to estimate demand directly from observed price-consumption data. This section describes procedures for estimating use and willingness to pay by means of travel behavior, user surveys, and other quantifiable measures.

(b) Many proposed projects subject to NED benefit-cost analysis involve both recreation gains and recreation losses. Section 928 of the Water Resources Development Act of 1986 requires, for projects having recreation benefits, analysis of the effects of the proposed project on existing recreation resources. For example, stream and land-based recreation may be lost because of the project, or recreation may be transferred to the proposed site from a more distant site. Net recreation benefits are the value of the gains minus the value of the losses; benefits may be positive or negative. Since reliable empirical methods for estimating willingness to accept compensation for losses have not been developed, measures of willingness to pay are used to value both gains and losses. Evaluation procedures should be based on sound economic rationale and have an empirical basis that permits an objective and reproducible analysis of benefits and costs. Reports shall include:

(1) A description of the alternative or competing facilities and their existing and future use, with and without the proposed project. Describe alternative resource use at a level of detail

roughly similar to that used to describe use of the proposed project. For example, if peak and non-peak attendance, types of facilities and categories of use, etc., are used to characterize the proposed project, a similar level of detail shall also be used to describe the competing resources.

(2) Analysis of the proposed project which takes into account use of the alternative resources. Estimate benefits of the proposed project net of benefits of the alternative facilities. For example, beach recreation benefits for a proposed project are net of benefits from use of an alternative beach in the without project condition.

(2) Criteria for an Acceptable Evaluation Procedure. An acceptable evaluation procedure has the following characteristics:

(a) Evaluation is based on an empirical estimate of demand applied to the particular project.

(b) Estimates of demand reflect the socioeconomic characteristics of market area populations, qualitative characteristics of the recreation resources under study, and characteristics of alternative existing recreation opportunities.

(c) Evaluation accounts for the value of losses or gains to existing sites in the study area affected by the project (without project condition).

(d) Willingness to pay projections over time is based on projected changes in underlying determinants of demand.

(e) Development of recreation facilities for non-reservoir projects must be on the land required for the basic project with the exception that additional recreation land may be acquired if needed for access, parking, potable water, sanitation, and related development for health, safety and public access.

(3) Description of Evaluation Methods. The procedures described in this section incorporate three evaluation methods. They are the travel cost method (TCM), contingent valuation method (CVM), and unit day value (UDV) method. The use of any other method should be justified as conforming to the characteristics listed in paragraph E-50b and the selection process described in paragraph E-50b(4).

(a) Travel Cost Method. The basic premise of the travel cost method is that per capita use of a recreation site will decrease as out-of-pocket and time costs of traveling to the site increase, other variables being constant. TCM consists of deriving a demand curve by using the variable

costs of travel and the value of time as proxies for price. This method may be applied to a site-specific study or a regional model.

(b) Contingent Valuation Method. The contingent valuation method estimates NED benefits by directly asking individual households their willingness to pay for changes in recreation opportunities at a given site. Individual values may be aggregated by summing willingness to pay for all users in the study area. This method may be applied to a site-specific study or a regional model. Contingent value techniques shall not be used to estimate existence, "option", bequest or other such non-use values, due to several factors including the conjectural nature of estimated values and the high difficulty in controlling bias.

(c) Unit Day Value. The unit day value method relies on expert or informed opinion and judgment to estimate the average willingness to pay of recreational users. By applying a carefully thought-out and adjusted unit day value to estimated use, an approximation is obtained that may be used as an estimate of project recreation benefits.

(4) Selection of Evaluation Procedure. Select a procedure for evaluating each of the following two categories of project-related use: (1) total or gross expected use of project facilities, including transfers of use from other sites; (2) and existing site use displaced or destroyed by project facilities. The criteria for selecting the appropriate procedure for each category are set out in Figure E-10. Application of the criteria may result in selection of different procedures for the two categories. The criteria given in Figure E-10 consider several dimensions of project evaluation situations: Three measures of the absolute and relative size of the recreation benefit created, displaced, or transferred by the proposed project, and the nature of the recreation activities affected. If either use category specified above involves more than 750,000 annual visits, use either a regional model or site-specific study to evaluate benefits or benefits foregone. If recreation in an important project component relative to other outputs and costs, or if specialized activities (those for which opportunities in general are limited, intensity of use is low, and users' skill, knowledge, and appreciation is great) are affected, the criteria also require greater accuracy in benefit estimates. If both specialized activities and general recreation are affected by the project, the choice between a regional model and a more limited site-specific study is at the discretion of the agency, based on consideration of the relative importance of the specialized activity, the advantages of the respective methods, and cost considerations.

(a) Restrictions on UDV Use. The general principle for the recreational analysis is, the more important recreation benefits are in plan formulation and/or plan selection and the more costly recreation components are, the more important is economically sound and empirically defensible analysis. The arguments for employing the user day approach can be based on two foundations: (1) Infeasibility for technical reasons or due to study cost considerations; or, (2) formulation or plan selection not materially affected by willingness to pay value or by expected

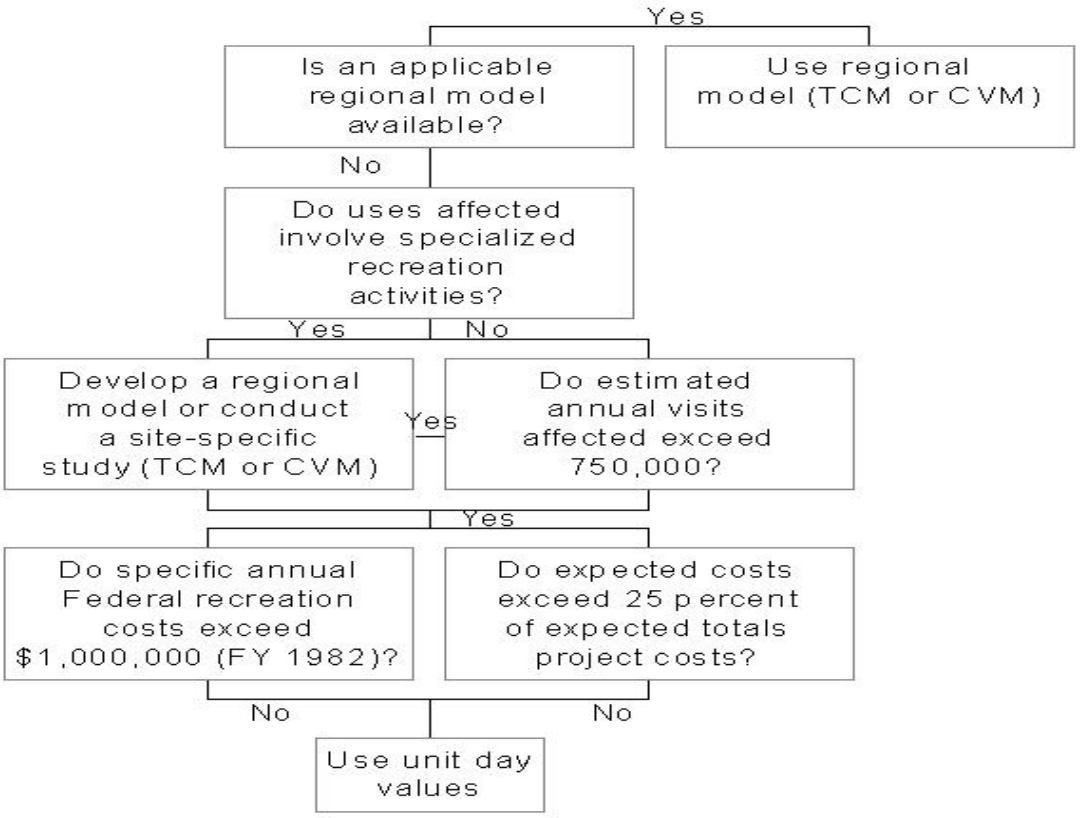



Figure E- 10 Criteria for Selecting Procedures for Evaluating Recreation Benefits

visitation. Study cost considerations do not simply mean the least study cost method is chosen; quality of analysis and results must be considered. The reasons for choosing a particular benefit evaluation method must be documented in the planning reports.

(b) Required Visitation Documentation. The UDV approach in recreation benefit analysis consists of two parts: estimating visitation and determining value per visit. Both must be documented in planning reports. Of the two parts, the determination of UDV is subjective; the visitation is not. Projected visitation must be based on data, either at the existing project or by comparisons with other similar resources. Historic and existing visitation and the capacity of the proposed project and its substitutes should be displayed. Expected visitation at the proposed project, in the without project and with project conditions, should be analyzed taking into account transfers from substitute recreation resources. Reasonableness of visitation should be established. This can sometimes be done via comparisons to other verifiable data (e.g. visitation at other similar resources, comparison to statewide participation data, references to other credible modeling studies, smaller scale surveys than would be required in CVM, etc). The key elements are reasonableness and documentation.

(c) Required Procedure for Determining Willingness to Pay Surrogate. Unit day values are to be developed using a point rating scale. Use of a particular point rating scale is not limited to the one presented at the end of this section. Additional or substitute rating criteria are allowed and encouraged. Resource and socioeconomic characteristics similar to those that would form the independent variables in a willingness-to-pay model are candidates for additional/substitute rating criteria. Similar recreation resources in the region should be surveyed for comparison to the proposed project. The main constraint is the range of monetary values. Point ratings are developed in a systematic, consistent and documented process; public participation in assigning point values lends credibility to this essentially subjective process. Changes in the quantity and quality of a recreation experience must be directly related to the nature of the Federal project. For example, changes in the ease of use or convenience of a small boat harbor have no effect on the environmental quality of the primary resource (ocean, bay, etc). Note that unit day value does include entry and use fees actually paid for the site. Therefore, entry and use fees should not be added to the unit day value to determine total willingness to pay.

(5) Additional Reference Material. Additional detailed support material for conducting NED evaluation may be found in a series of documents prepared by the Institute of Water Resources (add net site). Policy statements in this regulation take precedence in any apparent contradiction suggested by information contained within these IWR reports.

c. Planning Setting.

(1) General. Determine changes in recreation use and value resulting from alternative plans through analysis or without project and with project conditions in the study area over the prescribed period of analysis.

(2) Without Project Condition. The without project condition is the pattern of recreation activity expected to prevail over the prescribed period of analysis in the absence of the recreation project or plan. The without project condition includes existing water and related land recreation resources, and projects and additional recreation resources currently being developed or both authorized and likely to be developed during this period.

(3) With Project Condition. The with project condition is the pattern of recreation activity expected to prevail over the prescribed period of analysis with a recreation plan or project. Recreation resources included in the without project condition provide the basis for the with project condition. Analysis of the with project condition considers recreation opportunities that will be diminished in quality or quantity because of project development and operation. This will be accomplished in assessing the use of the proposed recreation development.

d. Evaluation Procedure. Use the following procedure to determine the benefit from recreation resource use with a plan or project. (See Figure E-11). The benefit is based on the gross value of recreation use of the resource for the with project condition less the gross loss in recreation use caused by the project or plan. The recreation benefit is measured in nine steps. The level of effort expended on each step depends on the nature of the proposed improvement, the state of the art for accurately refining the estimate, and the sensitivity or project formulation and justification to further refinement.

e. Step 1 - Define the Study Area. Determine changes in recreation use and value resulting from alternative plans through the analysis of without project and with project conditions in the study area over the prescribed period of analysis. The impacts should relate to the geographical recreation “market” defined by the location of actual and potential user populations. Definition of the study area should be justified with respect to the particular characteristics and quality of the site and the availability of similar alternative recreation opportunities. Reference to statistical evidence regarding the spatial distribution of trip generation is encouraged.

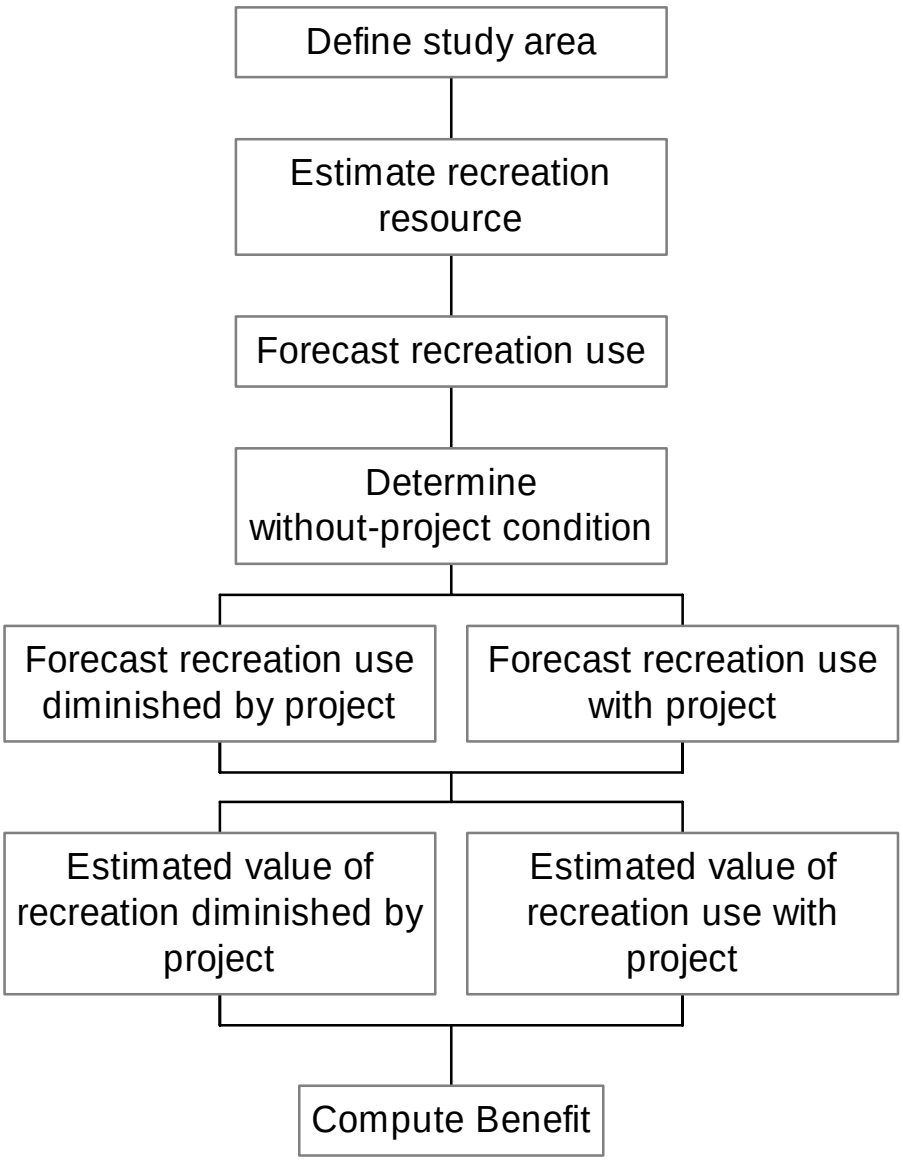



Figure E- 11 Recreation Benefit Evaluation Procedures

f. Step 2 - Estimate Recreation Resource.

(1) Include in estimates of the recreation resource capacity for the study area all sites that provide recreation activities similar to those displaced or provided by the project. The recreation resource in the study area is the system of water and related land recreation sites that influence the demand for the proposed project and are influenced in turn by the demand at the existing site.

(2) Include in the inventory of water and related land recreation sites in this study area those Federal, State, county, local, and private sites that are in varying stages of development or that are authorized and likely to be developed in the forecast period.

(3) Identify the ability of recreation alternatives to provide different recreation activities and assess the quality of the alternative recreation experiences.

g. Step 3 - Forecast Potential Recreation Use in the Study Area. Potential use is the expected visitation at prevailing prices unconstrained by supply. Forecast of total recreation use in the study area should be made for each activity currently provided at the project site and for each activity proposed in the plan or project. The potential use for a specified outdoor water and related land recreation activity will depend on the size and characteristics of the study area population and the availability of the specified recreation activity and other types of recreation in the study area.

(1) The recreation use of the site's resources will depend not only on the attributes of the site and its proximity to population centers, but also on its location in relation to the location of other water and related land resources providing similar or complementary types of recreation with the study area.

(2) Forecasting potential future participation in recreation activities for the study area involves four steps: (1) Collect data on explanatory variables that influence the demand for recreation activities; (2) Relate potential use to these variables by means of some use estimating techniques as described in paragraph E-50i; (3) Forecast values of the explanatory variables over the period of analysis. Justify projections and explain any simplifying assumptions. Reference to statistical evidence on trends in encouraged; (4) Calculate expected use for the study area using the values obtained in Step (3) and the relationships determined in Step (2).

h. Step 4-Determine the Without Project Condition. Determine the without project condition for the study area on the basis of a comparison of the available recreation resources as specified in step 2 and the recreation resource use as specified in step 3 for each activity currently

provided at the project site and each activity proposed in the plan or project. Compare the capacities of all sites, including the site without the proposed project, to produce recreation activities with the expected demand for each activity.

i. Step 5 - Forecast Recreation Use With Project.

(1) General. Forecast recreation use with the project as a basis for estimating project recreation values. Project use over time by calculating the change in use induced by anticipated changes in the variables that determine use. Explain values employed for projecting future demand and any simplifying assumptions. For the capacity method , use is constant over time as determined by the capacity constraint. Explain use projections and any simplifying assumptions. Reference to statistical projections of recreation participation is encouraged.

(2) Use Estimating Techniques. Use one or more of the following approaches for estimating recreation use for the with project and/or without project conditions. The use of any other method should be justified as conforming to the characteristics listed in paragraph E-50b. References to statistical estimates are encouraged.

(a) Regional Use Estimating Models. Regional use estimating models are statistical models that relate use to the relevant determinants based on data from existing recreation sites in the study area. The use of regional models can economize on resources required for site-specific studies. In the absence of a regional model, estimate use by one of the site-specific methods described below. If a use-estimating model has already been developed for the region in which a proposed project is to be located, use estimates should be obtained by the following procedure:

(1) Delimit the areas of origin for the proposed project (use of counties or parts of counties as origin areas will facilitate gathering of data in subsequent steps).

(2) Compute measures of the explanatory variables in the use equation for each origin area and for each year for which an estimate is required.

(3) Calculate use from each area for each year.

(4) Aggregate use from each area to get estimated annual use.

(b) Site-specific use estimating models. The preferred site-specific method of estimating use is a use estimating model (UEM) that relates use per 1,000 of origin population to distance traveled, socioeconomic factors, and characteristics of the site and alternative recreation opportunities. Use estimating models yield regression coefficients estimated from data gathered at a comparable existing site or cross section of existing sites. The coefficients are used to estimate visitation at a proposed site in the same way as described for regional models. Factors that influence demand for recreation, such as characteristics of user populations and availability of alternative opportunities, are explicitly taken into account by variables in the model. Because of the influence of congestion during heavy use periods, it is desirable to distinguish use during summer weekends and holidays. If data limitations do not permit disaggregation, explain treatment of seasonal use variation and any simplifying assumptions.

(c) Application of information from a similar project.

(1) If a UEM is not available and cannot be estimated because of data limitations, use may be estimated by the similar project method. This method assumes that recreation demand for a proposed project can be estimated from observations of visitation patterns at one or more existing projects with similar resource, operations, and use characteristics. The alternatives under study are compared with water resource projects and recreation resource areas for which trip generation and other statistics are known. It is important to obtain as close a match as possible in type, size, and quality of project; market area demographic and socioeconomic characteristics; existence and location of competing recreation opportunities; and other variables that influence demand.

(2) The most efficient and technically sound similar project procedure is based on per capita use curves (i.e., regression curves relating per capita rate of use to travel distance) from which use estimates are derived. The similar project method involves the following steps:

(a) Evaluate the characteristics of a proposed project or other area under study.

(b) Select a similar project or area by comparing characteristics of the proposed project with available information for existing sites; include evaluation and comparison of the respective recreation market areas.

(c) Adjust the per capita use curve to account for the differences between the similar project and the proposed project.

(d) Determine the county populations within the market area for the years in question, and derive per capita use rates for each county population by measuring road mile distance from the

project to the center of the most populated city within the county (proxy for centroid of county population).

(e) Multiply each county per capita rate by county population and sum to get total use.

(f) Determine the percentage of total use that the foregoing estimate represents; if 100 percent, use as is; if less, adjust accordingly.

(3) Justify assumptions used to adjust or modify per capita use curves.

(4) Capacity method of determining use. If data on use determining variables are unavailable and are not cost effective to obtain, and if it can be demonstrated that sufficient excess demand exists in the market area to accommodate the additional capacity supplied by a proposed project, use may be assumed to be equal to capacity. Since this method provides no information on trip generation, willingness to pay cannot be evaluated by the travel cost method.

j. Step 6 - Estimate Value of Use With the Project. As noted in E-52b, three alternative methods can be used to estimate recreation benefits:

(1) Travel Cost Estimate of Willingness To Pay Based on Use Estimating Model or Per Capita Use Curves.

(a) Conditions under which TCM may not be used are discussed in the following paragraphs.

(1) Use was not estimated by a technique relating trip-generation to distance to the site;

(2) There is insufficient variation in travel distances to allow parameter estimation (for example, urban sites); or

(3)The project site is typically only one of several destinations visited on a single trip.

(b) Construction of a TCM demand curve. The area under a demand curve based on travel costs to a site approximates the willingness to pay for access to the recreation opportunities there. This estimate involves the following calculations:

(1) Convert round-trip distance from each origin into monetary values by suing the most recent U.S. Department of Transportation average variable costs in cents per mile to operate an automobile, plus the opportunity cost of leisure time spent in travel and on the site. Time costs vary according to the alternative uses of time available to visitors and are correlated with income,

age, education, occupation, time of year, and day of week. Explain values assigned to time and any simplifying assumptions.

(2) Construct a demand curve that relates "prices" to total visits. Given a relationship between travel costs and annual visitation from a use estimating model or a per capita use curve, construct a demand curve by gradually increasing travel cost and calculating the total visitation associated with each increase, until visitation falls to zero for all origins.

(3) Compute the area under the demand curve plus any user charges or entrance fees. This value measures the annual total willingness to pay for recreation activities available at the site.

(2) Contingent Valuation (Survey) Estimate of Willingness To Pay.

(a) Use of Contingent Valuation Method for Daily or Annual Values. CVM may obtain either daily or annual estimates of willingness to pay. Multiply daily estimates by annual use obtained previously. Annual estimates do not require use estimation except to demonstrate the net increase in recreation use in the market area.

(b) Five steps are involved in designing and using simulated markets to identify the value of recreational resources as if actual markets existed as discussed in the following paragraphs.

(1) Establish a market to the respondent.

(2) Permit the respondent to use the market to make trades and establish prices or values reflecting the respondent's individual evaluation of the recreation opportunities bought or sold.

(3) Treat the values reported by the respondent of individual values for recreation, contingent upon the existence of the market.

(4) Given willingness to pay bids from an unbiased sample of users in the market area, the socioeconomic characteristics of respondents, distance to the site, and available alternative recreation opportunities for each origin, obtain multiple regression estimates of average household value for the proposed change in recreation opportunities for households in each group.

(5) Multiply this value by the number of households in the group and sum the group values to estimate the aggregate willingness to pay if the average values are annual; multiply this value by estimated annual use if average values are daily.

(c) Obtaining Individual Bids from Personal Interviews or Mail Surveys. The preferred format is one in which the respondent is required to answer "yes" or "no" to questions if he or she is willing to pay a stated amount of money to obtain a stated increment in annual recreation opportunities. The value is increased gradually until the highest amount that the respondent is willing to pay is identified.

(d) Developing Regional Contingent Valuation Models. Regional models may be developed with CVM as well as use estimating models. All survey forms are subject to the clearance procedures of the Office of Management and Budget.

(3) Unit Day Value Approximation of Willingness to Pay.

(a) Application of Unit Day Values. See paragraph E-50b.

(b) Selection of Value. If the UDV method is used for economic evaluations, select a specific value from the range of values agreed to by Federal water resource agencies. The product of the selected value times the difference in estimated annual use over the project life relative to the without project condition provides the estimate of recreation benefits.

(1) If evidence indicates that a value outside the agreed-to range is more accurate, a regional model or site-specific study should be conducted. Explain the selection of any particular value within the published range.

(2) To explain the selection of a specific value, a point rating method may be used to reflect quality, relative scarcity, ease of access, and esthetic features. Appropriate use should be made of studies of preferences, user satisfaction, and willingness to pay for different characteristics; particular efforts should be made to use estimates derived elsewhere from applications of the TCM and CVM techniques.

(c) Account for site transfers in choosing unit day values.

k. Step 7 - Forecast Recreation Use Diminished With Project. Using the appropriate method described in E-52i, forecast the recreation resource sues that would be diminished due to physical displacement expected because of the plan or project.

l. Step 8 - Estimate Value of Recreation Use Diminished With Project. Using the appropriate methods described in paragraph E-50j and selected by the appropriate criteria described in paragraph E-50b, estimate the value of the recreation uses that would be diminished by the physical displacement expected to occur as a result of the plan or project. In determining project net benefits, account for changes in recreation use of an existing resource and/or project as a result of transfers to the plan or project under study.

m. Step 9 - Compute Net Project Benefits. Compute the project benefit as the difference between the gross value of recreation use as estimated in paragraph E-50j and the value of recreation use diminished as estimated in paragraph E-50l. However, if excess capacity for any activity exists in the study area, benefits are the user cost savings plus the value of any qualitative differences in recreation.

n. Report and Display Procedures. Tables E-26 and E-27 are suggested presentations for reports that include recreation as a purpose.

o. Recreation Evaluation Techniques in Detail. More detail on recreation benefit estimation techniques is in the P&G http://www.wrsc.usace.army.mil/iwr/pdf/p&g.pdf.

Table E- 26 Recreation Capacity and Use (19__)[1]

| | Without project | | | With project | | |
|---|---|---|---|---|---|---|
| | Capacity | Use | Surplus or Deficit | Capacity | Gross use | Displaced use |
| Plan 1 ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Plan 2 ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Plan 3 ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Plan 4 ..... | ..... | ..... | ..... | ..... | ..... | ..... |

[1]Prepare for representative project years.

Table E- 27 Annualized Recreation Benefits, Recommended Plan

| | Value of gross use | Value of displaced use | Net value |
|---|---|---|---|
| Specialized..... | ..... | ..... | ..... |
| General..... | ..... | ..... | ..... |

E-51. Federal and Non-Federal Participation. Costs allocated to recreation shall be apportioned to Federal and non-Federal interests as below:

a. Recreational Developments at Lakes.

(1) Federal. The Federal Government will assume not more than one-half of the separable first costs of construction of initial and future recreation facilities, including one-half of the cost of lands acquired specifically for recreation and access. All joint construction costs allocated to recreation shall be assumed by the Federal government.

(2) Non-Federal. The non-Federal entity must assume at least one-half of the separable first costs of construction of recreation facilities, including project lands acquired specifically for recreation and access, and all cost and full responsibility for the operation, maintenance, replacement, and management of recreation lands, areas, and facilities. Costs of revenue-producing facilities to be provided by private enterprise under Federal or third party agreements are not eligible for cost sharing.

b. Recreational Developments at Other Types of Projects. Agreements to participate with a non-Federal entity in the development of basic recreational facilities will require the non-Federal entity to:

(1) Acquire in its name in fee title, and dedicate to public outdoor recreation use, lands on which cost shared recreation facilities and improvements for access, parking, potable water, sanitary facilities and related developments for health and safety are provided, with credit as specified below.

(2) Make an additional contribution sufficient to raise the non-Federal share to at least 50 percent of the total first cost of adding recreation to the project if the appraised value of the creditable lands amount to less than that percentage.

(3) Operate, maintain and replace without cost to the Federal Government, for the economic life of the project, the recreation areas and all facilities installed pursuant to the agreement.

## SECTION VIII - Water Supply

E-52. Federal Interest. The Flood Control Act of 1944 and the Water Supply Act of 1958, as amended, among other pieces of legislation, define the Federal interest in water supply. The current policy was defined by Congress in Section 932 of the WRDA of 1986. This policy is based on a recognition that states and non-Federal entities have the primary responsibility in the development and management of their water supplies. The policy also recognizes a significant but declining Federal interest in the long range management of water supplies and assigns the financial burden of supply to users. The Corps may, however, participate in developing water supplies in connection with water resource improvements for construction, operation, maintenance, and modification of Federal navigation, flood control, or multiple purpose projects when certain conditions of non-Federal participation are met. Existing legislation give the Corps authority to use its reservoirs for surplus water, for municipal and industrial (M&I) water supply and for agricultural water supply . The Corps is also authorized to provide emergency water and assist states and local interest in their water supply planning process.

E-53. Types of Improvement

a. Multiple Purpose Project. In order to include M&I as a project purpose in a multiple purpose project, benefits from water supply can not exceed the following limits depending on the type of project:

(1) The project has justified, separable storage for flood control or navigation or agricultural water supply. In this case the sum of benefits for these purposes must be at least ten percent of total NED benefits. If M&I water supply exceeds 90% of total benefits the project is considered single purpose water supply and thus not eligible for Federal participation.

(2) The project has no separable storage for flood control or navigation or agricultural water supply. In this case the sum of benefits for these purposes must be at least twenty percent of total NED benefits. If M&I water supply exceeds 80% of total benefits the project is considered single purpose water supply and thus not eligible for Federal participation.

b. Single-Purpose Project. The Corps will not conduct single purpose water supply studies, except for analysis of existing data under Section 22 of the Water Resources Development Act of 1974. This constraint does not apply to single purpose water supply modifications to previously constructed projects having flood damage reduction or navigation purposes. Also, the Corps may conduct reimbursable single purpose water supply studies for non-Federal interests under provisions of the Intergovernmental Cooperation Act of 1968.

E-54. Specific Policies

a. Municipal and Industrial Water Supply. Section 301 (a) of the Water Supply Act of 1958, as amended, established a policy of cooperation in development of water supplies for domestic, municipal, industrial, and other purposes. Section 301(b) is the authority for the Corps to include municipal and industrial water storage in reservoir projects. The terms "municipal and industrial," while not defined in the legislative history of the Water Supply Act, have been defined by the Corps as supply for uses customarily found in the operation of municipal water systems and in industrial processes. Irrigation is not ordinarily found among customers of a municipal system and, therefore, is not eligible to be included in a project under the M&I authority unless specifically authorized by Congress. Other policies applicable to this category of water supply are as follows:

(1) Storage. Corps provided water supply service normally means reservoir space for storing water, and where necessary, facilities in the project structure for releasing or withdrawing the stored water for water supply purposes. The non-Federal sponsor must repay all costs allocated to water supply storage space.

(2) Water Conduits. Conduits for release or withdrawal of stored water may be designed as an integral part of the dam structure. Cost of water conduits are specific water supply costs and the users must repay 100 percent of investment and annual costs. A non-Federal sponsor must contract for the costs if the features are to be included in construction. For existing projects with conduits, any remaining unpaid conduit cost shall be prorated just as storage costs are prorated unless one or more entities agree to repay the entire cost.

(3) Seasonal Operations for Water Supply. Congress has not provided general authority for including storage space in Corps projects for seasonal M&I use, either as withdrawals or to improve groundwater supplies. The Corps may consider seasonal operations for water supply when specifically authorized by Congress. In addition, project operations may be modified to enhance ground water replenishment, to increase downstream flows, or to otherwise enhance usage of projects for M&I purposes. These modifications must be consistent with authorized project purposes and law. Pricing policy for M&I water supply driven changes in project operations require the non-Federal sponsor be responsible for:

(a) 100 percent of new construction costs and new operations costs;

(b) A share of joint use operation maintenance and replacement cost based on use-of-facilities cost allocation;

(c) Benefits foregone;

(d) Compensation to others for losses in their operations (may be same as (c) above); and,

(e) Payment of an amount equal to one-half the savings to non-Federal interests (least cost alternative minus the specific cost of the modifications). In any case, the cost to the non-Federal sponsor should not exceed the costs derived for permanent reallocation of storage (see paragraph E-57d(2)).

(4) Limits on Future Use Storage. The Water Supply Act of 1958, as amended, states that no more than 30 percent of total construction costs can be allocated to water supply for future use. In addition, Corp policy is to obtain full payment of allocated capital costs from water supply sponsors prior to or during construction, or failing this to negotiate a repayment agreement, payments to begin immediately after construction completion. Thus, formulation of water supply storage without a current sponsor willing to participate is an exception requiring prior approval. Forward requests for exception to HQUSACE CECW-P.

(5) Water Rights. Potential encroachment on the water rights of lawful downstream water users by the operation of water supply storage must be carefully considered and coordinated with responsible state and local interests. The Corps will not acquire water rights necessary for use of stored water. This is a responsibility of the water users. Nor should the Corps become involved in resolving conflicts among water users concerning rights to use stored water, but will look to responsible state agencies to resolve such conflicts. Where there is more than one water user, it is recommended to arrange for payment for the entire water supply storage from a single agency, if this is practical.

(6) Permanent Rights to Storage. Under the authority of the Permanent Right to Storage Act of 1963, the non-Federal sponsor acquires a permanent right to the use of storage as long as the space is physically available. The sponsor must have completed or be making payments pursuant to its agreement with the government. It must also agree to continue to pay its share of annual allocated operation and maintenance costs, together with its share of costs allocated to necessary reconstruction, rehabilitation, or replacement of project features. Equitable reallocations of storage space may be necessitated by sedimentation.

(7) Water Quality. The Federal Government makes no representation and assumes no responsibility with respect to the quality or the treatment of the water.

b. Irrigation (Agricultural Water Supply). Water storage for agricultural irrigation, to meet entire needs or as a supplement to natural supplies, may be considered in plan formulation.

(1) Western States. Section 8 of the Flood Control Act of 1944 provides that Corps lakes may include irrigation as a project purpose upon recommendation of the Secretary of the Interior

(DoI). Section 8 also states that the DoI may provide the irrigation works needed to make use of the irrigation storage. The DoI is responsible for constructing, operating and maintaining the additional irrigation works, as well as to contract for the storage space. If allocated irrigation costs exceed the amount that can be repaid by water users, the excess amount will be stated. Specific Congressional authorization is required for projects where irrigation costs exceed water users' repayment ability. Section 8 applies only to the 17 Western States defined as those 17 contiguous states lying west of the 98$^{th}$ meridian .

(2) Areas Outside the Western States. The Corps may include irrigation storage in reservoirs in areas outside the 17 Western States provided the non-Federal sponsor assumes thirty five (35) percent of the costs of the reservoir allocated to irrigation.

E-55. NED Benefit Evaluation Procedure

a. Purpose. This section provides procedures for the evaluation of NED benefits of municipal and industrial (M&I) water supply features of water resource plans. The procedures presented apply to both structural and nonstructural elements of such plans. Risk-analysis techniques are required in all formulation, evaluation and investment decision studies. No specific risk-based procedures have been developed for municipal and industrial water supply analysis. For studies and projects where water supply benefits constitute a substantial portion of total benefits, analysts are expected to perform, at a minimum, sensitivity analysis of key variables such as least cost alternative cost, future demand for water and future availability of water supplies.

b. Conceptual Basis.

(1) The conceptual basis for evaluating the benefits from municipal and industrial water supply is society's willingness to pay for the increase in the value of goods and services attributable to the water supply. Where the price of water reflects its marginal cost, that price is used to calculate willingness to pay for additional water supply. In the absence of such direct measures of marginal willingness to pay, the benefits from a water supply plan are measured instead by the resource cost of the alternative most likely to be implemented in the absence of that plan.

(2) The benefits from nonstructural measures are also computed by using the cost of the most likely alternative. However, the net benefits of certain nonstructural measures that alter water use cannot be measured effectively by the alternative cost procedure for the following reasons: (1) Structural measures and many nonstructural measures (except those that alter use) result in similar plan outputs, whereas use-altering measures (e.g., revised rate structures) may change levels of output; and (2) use-altering measures may have fewer direct resource costs than

measures based on higher levels of output. Because of this lack of comparability, the benefit from such use-altering nonstructural measures should not be based on the cost of the most likely alternative. Attempts to measure the benefits of use-altering nonstructural measures on the basis of willingness to pay are encouraged, although the display of such benefits is not required.

c. Planning Setting.

(1) Without Project Condition. The without project condition is the most likely condition expected to exist in the future in the absence of the proposed water supply plan, including any known changes in law or public policy. Several specific elements are included in the without project condition.

(a) Existing Water Supplies. Existing water supplies are included in the without project condition. Adjustments are made to account for anticipated changes in water supply availability because of the age of facilities or changed environmental requirements.

(b) Institutional Arrangements. Existing and expected future water systems and water management contracts and operating criteria are considered part of the without project condition unless revision of these systems, contracts, or criteria is one of the alternative plans being studied.

(c) Additional Water Supplies. The without project condition includes water supplies that are under construction or authorized and likely to be constructed during the forecast period.

(d) Probability of Water Supply. Include calculation and specification of the probability of delivery for each source of water supply in the analysis.

(e) Water Quality. Water use is based on both the quantity and the quality of water supply. Different uses may require different qualities as well as quantities of water. Supplies also vary according to quality and quantity. Because water quality is a critical factor in water supply, it should be specified in any consideration or presentation related to water quantity. The degree of detail used to describe water quality should be suitable to permit differentiation among water sectors or available water supply sources.

(f) Nonstructural Measures and Conservation. The without project condition includes the effects of implementing all reasonably expected nonstructural and conservation measures. These measures include:

(1) Reducing the level and/or altering the time pattern of demand by metering, leak detection and repair, rate structure changes, regulations on use (plumbing codes), education programs, drought contingency planning;

(2) Modifying management of existing water development and supplies by recycling, reuse, and pressure reduction; and

(3) Increasing upstream watershed management and conjunctive use of ground and surface waters.

(2) With Project Condition. The with project condition is the most likely condition expected to exist in the future with the Federal water supply plan under consideration. The six elements and assumptions addressed in the without project condition should also be addressed in the with project condition. Nonstructural water supply measures may be used alone or in combination with structural measures. If the proposed measures are already in the process of implementation, they are part of the without project condition.

d. Evaluation Procedure

(1) General. Follow the steps described in the following paragraphs to estimate NED benefits that would accrue to one or more alternative plans for providing an M&I water supply (see Figure E-12). The level of effort expended on each step depends on the nature of the proposed development, the state of the art for accurately refining the estimate, and the sensitivity of project formulation and justification to the estimate.

(2) Step 1 - Identify the Study Area. The study area is the area within which significant project impacts will accrue from the use of M&I water supplies, including areas that will receive direct benefits and/or incur costs from the provision of M&I water supply.

(3) Step 2 - Estimate Future M&I Water Supplies. Prepare an analysis of all sources of supply expected to be available to the M&I water user. Data may be obtained from various sources, including water utilities, State and local planning agencies, and State water resources agencies. This analysis should be by time period and include existing water supplies, institutional arrangements, additional water supplies, probability of water supply, and water quality.

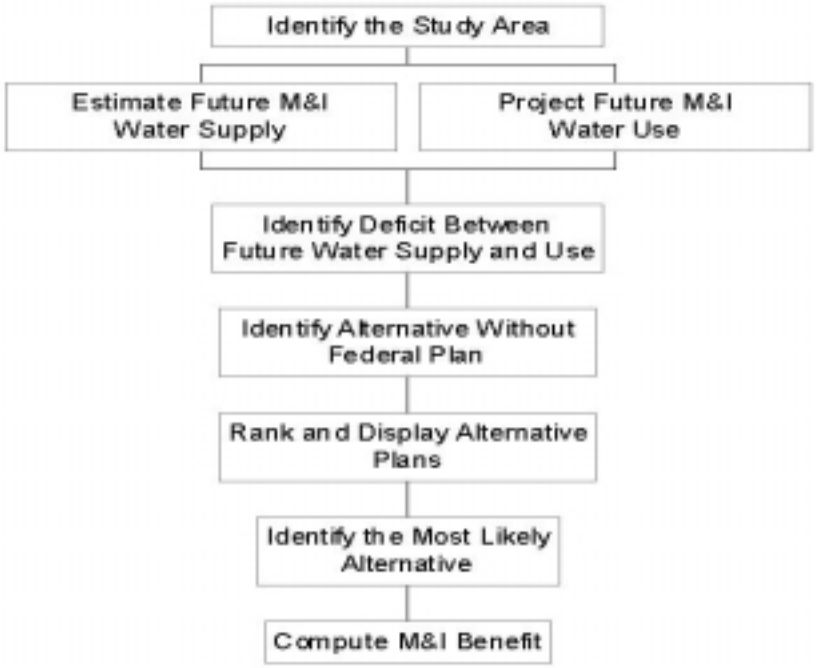



Figure E- 12 Flowchart of M&I Water Supply Benefit Evaluation Procedure

(4) Step 3 - Project Future M&I Water Use. Project future water use by sector in consideration of seasonal variation. Base projections on an analysis of those factors that may determine variations in levels of water use.

(a) Sector Analysis. Project future water use for the same time periods as for the supply projections for each of the following sectors: Residential (include indoor use and outdoor uses such as lawn irrigation and car washing); commercial (include water use for retail and wholesale trade, offices, hospitals, schools, medical lab (include all water used by manufacturing industries as an input in the production process); and additional uses (include public service use and unaccounted-for losses.

(b) Analysis by Time of Use. Identify seasonal variations in use for each of the above sectors and maximum day use for the system for each season.

(c) Related Factors Analysis.

(1) Identify the determinants of demand for each sector. Use such determinants as price of water and sewer service, income, number and type of housing units and population per unit, industrial mix, and level of economic activity. Explain the variable projection of these factors as well as the extent to which they influence projection of water use in various sectors.

(2) Determine the relationship expected to exist between future levels of water use and the relevant determinants of water demand. Develop and use a forecast or forecasts of future levels of the determinants to project alternative future water use by sector and explain the choice of the particular forecast used.

(3) Aggregation of Projections. Aggregate separate projections for each sector to a single projection by time period. (This is not a deterrent to meeting the needs of each sector by separate alternatives.)

(5) Step 4 - Identify the Deficit Between Future Water Supplies and Use. Compare projected water use with future water supplies to determine whether any deficits exist in the study area. Make an analysis of the intensity, frequency, and duration of the expected deficits. Address deficits in three basic options: (1) Reduce projected water use by implementation of nonstructural or conservation measures that are not part of the without project condition; (2) increase and/or more efficiently use water supplies through structural measures; and (3) accept and plan to manage water supply shortages. Plans generally are formulated to include some or all of these options.

(6) Step 5 - Identify Alternatives Without Federal Plan. Identify alternative plans that are likely to be implemented by communities and/or industries in the absence of any Federal alternative. Test various alternatives to the Federal plans for acceptability, effectiveness, efficiency, and completeness. These plans should be identified through analysis of the total water resources of the region, allowing for present and expected competing uses. Consideration of alternative plans is not limited to those that would completely eliminate the projected gap between supply and demand. Plans that do not completely satisfy water supply objectives should also be considered. Include in such plans measures to minimize and allocate shortages when they occur (drought management measures). Balance the increased risk of occasional shortages against the savings from lesser investments that would increase the probability of occasional shortages. The costs of shortages include the costs of implementing drought management measures and the costs of related public health and safety measures.

(a) Alternative plans need not be based on the development of a single source of supply at one time. They may consist of the development of a single source or the conjunctive development of several sources with increments phased to match anticipated growth in water use.

(b) If institutional obstacles to implementation are noted, the plan should still be considered if the barriers are substantially within the power of the affected water users to correct. Include a detailed description of the institutional obstacles, with a discussion of the basis for any conclusion that the obstacles cannot be overcome.

(7) Step 6 - Rank and Display the Alternative Plans Based on Least Cost Analysis.

(a) Rank all of the alternatives in order from the highest cost alternative to the lowest. Calculate the annualized costs of the alternatives on the basis of the service (depreciable) life of the facility or the period of analysis, whichever is less.

(b) Calculate costs of the alternatives on the following basis. Analyze all costs charged to the alternative on the basis of the Federal discount rate, no costs for taxes or insurance should be charged to the alternative; and all other assumptions and procedures used in calculating the costs of the alternatives, including external diseconomies, should be parallel to those employed in calculating the costs for the proposed Federal project.

(8) Step 7 - Identify the Most Likely Alternative. Begin identification of the most likely alternative with the least costly. If an alternative with a lesser cost is passed over for a more expensive one, present the justification for not selecting the lower cost plan.

(9) Step 8 - Compute M&I Water Supply Annualized Benefits.

(a) Annualized benefits of the Federal water supply plan are equal to the annualized cost of the most likely alternative. When applicable, the evaluation should reflect differences in treatment, distribution, and other costs compared to the most likely alternative.

(b) The alternative cost of providing a water supply for smaller communities (population of 10,000 or less) may be extremely expensive on a per capita basis because these communities lack the efficiencies of large-scale development. If such communities are not able to afford an alternative water supply comparable to the Federal water supply plan as identified in the procedure described above, the alternative should not be used as the basis for evaluating the benefits of the Federal water supply plan. In this case, the benefit may be considered equal to the cost of the separable M&I facilities plus an appropriate share of the remaining joint cost of the project. Provide documentation of the without project condition.

(10) Problems in Application of NED Evaluation Procedure.

(a) Two major problems exist in the application of this procedure. The first is identification of the value of conservation and other nonstructural measures. Examples of evaluation of conservation strategies, pricing methods, and drought management measures are available in technical publications.

(b) A second major problem will arise over the disaggregation of water use by sectors. Some communities do not collect water use data by sectors. Where the system is fully metered, such data can be obtained by coding customer accounts and accumulating data on use for at least one year. Water use by unmetered customers may be estimated by extrapolating experience with similar metered systems, recognizing that unmetered customers face a price of zero. Verify that data and/or forecasts obtained from all sources are reliable and reasonable.

e. Report and Display Procedures. Tables E-28, E-29, and E-30 are suggested presentations for reports that include municipal and industrial water supplies. Tables E-28 and E-29 summarize by time period (and season, if applicable) the projected use by sector, projected supply by source, and the difference between the two for average day and maximum day, respectively. Table E-30 shows the costs of alternative plans and the quantity supplied under each alternative by time period (season, if applicable).

## E-56. Federal and Non-Federal Participation

a. Impacts of Section 932 of the Water Resources Development Act of 1986. This law further amends the Water Supply Act of 1958 (Public Law 85-500) as follows: Eliminates the 10-year interest free period for future water supply; modifies the interest rate formula; limits repayments to 30 years; and requires operation, maintenance, and replacement costs to be reimbursed on an annual basis. The amendments are applicable only to Corps projects.

b. Repayment Rate. The repayment rate used to calculate annual payment for storage in new projects, reallocated storage, and surplus water will be the yield rate defined in Section 932 of the Water Resources Development Act of 1986.

c. Repayment Period. The maximum repayment period for existing M&I storage, reallocated storage, and surplus water agreements will be 30 years from the date in which storage is available. For existing storage, this date will be the plant-in-service date or the date the first storage agreement is signed, whichever is later. For reallocated storage, the date will generally be the date the agreement is signed by the Assistant Secretary of the Army (Civil Works).

Table E- 28 M&I Water Supplies—Without Project Condition
Average Day Use and Capacity

| Projected average day water use[1] | Time Period[2] | | | |
|---|---|---|---|---|
| | $P_1$ | $P_2$ | $P_3$ | $P_N$ |
| Residential (mgd) ..... | ..... | | | |
| Commercial (mgd) ..... | ..... | | | |
| Industrial (mgd) ..... | ..... | | | |
| Additional (includes public services and unaccounted for losses) (mgd) ..... | ..... | | | |
| Total ..... | ..... | | | |
| Average day water supply capacity | | | | |
| Without a plan: | | | | |
| Source 1 (mgd) ..... | ..... | | | |
| Source 2 (mgd) ..... | ..... | | | |
| Source 3 (mgd) ..... | ..... | | | |
| Source X (mgd) ..... | ..... | | | |
| Total ..... | ..... | | | |
| Difference between projected average day water use and supply without a plan (mgd) ..... | ..... | | | |

[1]Include effects on nonstructural and conservation measures
[2]Show by time period and season where there are seasonal variations.

Table E- 29 M&I Water Supplies—Without Project Condition
Maximum Day Use and Capacity

| Projected average day water use[1] | Time Period[2] | | | |
|---|---|---|---|---|
| | $P_1$ | $P_2$ | $P_3$ | $P_N$ |
| Residential (mgd) ..... | ..... | | | |
| Commercial (mgd) ..... | ..... | | | |
| Industrial (mgd) ..... | ..... | | | |
| Additional (includes public services and unaccounted for losses) (mgd) ..... | ..... | | | |
| Total ..... | ..... | | | |
| Average day water supply capacity Without a plan: | | | | |
| Source 1 (mgd) ..... | ..... | | | |
| Source 2 (mgd) ..... | ..... | | | |
| Source 3 (mgd) ..... | ..... | | | |
| Source X (mgd) ..... | ..... | | | |
| Total ..... | ..... | | | |
| Difference between projected average day water use and supply without a plan (mgd) ..... | ..... | | | |

[1]Include effects on nonstructural and conservation measures
[2]Show by time period and season where there are seasonal variations.

Table E- 30 M&I Water Supply Alternatives

[Period of analysis, price level, discount rate]

| Alternatives | Annualized cost (in thousands of dollars) | Quantity supplied (mgd) time period[1] | | | |
|---|---|---|---|---|---|
| | | $P_1$ | $P_2$ | $P_3$ | $P_N$ |
| Most likely alternative ..... | ..... | ..... | ..... | ..... | ..... |
| Recommended plan..... | ..... | ..... | ..... | ..... | ..... |
| Other plans ..... | ..... | ..... | ..... | ..... | ..... |

[1]Show by time period and season where there are seasonal variations

d. Water Withdrawal Agreements. The Corps of Engineers is not to use Section 501 of the Independent Offices Appropriations Act of 1952 to obtain reimbursement for water supply withdrawals. Existing contracts or agreements should be allowed to expire and not be extended.

e. Annual Operation and Maintenance Expense. The non-Federal sponsor is responsible for all water supply costs allocated to operation and maintenance. These costs must be paid yearly in advance, based on estimated expenditure. Appropriate adjustment will be made at the end of each year.

f. Repayment Period for Major Replacement and Major Rehabilitation Costs. Major replacement and major rehabilitation costs are to be paid either during construction or in lump sum upon completion of construction. The non-Federal sponsor should be encouraged to establish a sinking fund to cover these costs when they occur.

g. New Construction Starts. Cost sharing and financing will be based on construction new start guidance provided in the annual budget guidance circular. This applies to water supply included in projects considered for new start, projects funded for construction but which are not started, resumptions and separable elements of ongoing projects. Authorized but not constructed single purpose M&I projects will not be proposed for construction.

E-57. Other Authorities.

a. Interim Use of Water Supply for Irrigation. Section 931 of the WRDA of 1986 provides that the Secretary of the Army may allocate water at Corps lakes currently allocated to

M&I purposes but not under contract to irrigation purposes, on an interim basis. In accordance with the WRDA of 1986, the non-Federal sponsor cost share is 35 percent of the original project investment cost allocated to M&I water supply. The time period for computing annualized payments is 30 years. The non-Federal sponsor is responsible for 100 percent of the operation and maintenance expense, major replacement cost, and major rehabilitation cost allocated to the storage space contracted for.

(1) Investment Cost Computation. The investment cost for this interim use irrigation storage/water is calculated by multiplying 0.35 (35 percent) by the percentage of the interim use storage to the total M&I water supply storage (as determined by the use of Facilities cost allocation method). This factor is then multiplied by the original M&I water supply investment cost which would include accrued interest after a 10-year interest free period from the plant-in-service date. The project water supply interest rate in effect when the project went under construction is to be used for all interest computations including the repayment amortization schedule for the interim use storage agreement. In the case of projects that went under construction after 17 November 1986, the rate will be as established in Section 932, WRDA of 1986 and will be adjusted at 5-year intervals. The term of the agreement for this interim use shall not exceed five years. An option for incremental five year extensions is allowed with the basic agreement only if recalculations for annual O&M, major replacements and major rehabilitation costs are performed at the end of each five year increment.

(2) Annual Cost Computation. The annual O&M cost for the required interim use storage/water may be estimated if the expected annual O&M cost is relatively low and would not justify annual billing procedures. Otherwise, reimbursement of applicable actual project O&M expenses would be required. An estimated annual major replacement and major rehabilitation cost is to be determined and included as a part of the annual repayment costs.

(3) Credit. Future sponsors for municipal and industrial use of the storage space shall not receive any credit from the interim use payments toward repayment of investment cost when such interim use is for agricultural water supply.

(4) Agreements. Agreements for such interim use of the water supply storage for irrigation shall follow the same reporting requirements as those for water supply storage agreements (see paragraph E-58). A report shall accompany the draft agreement. The report shall document the exact use of the water to assure that it will not be used for municipal and industrial purposes. It will also explain the manner in which the annual costs in the agreement were developed and show the impacts of the interim use of the water supply for irrigation on the currently existing uses of such storage. Further, it will include an appropriate analysis describing and assessing any adverse and/or beneficial environmental impacts that are expected to result

from the interim use of storage for irrigation purposes, that were not discussed in the FEIS for the project.

b. Surplus Water.

(1) Authority. Under Section 6 of the Flood Control Act of 1944, the Secretary of the Army is authorized to make agreements for surplus water with states, municipalities, private concerns, or individuals at such prices and on such terms as he may deem reasonable. These agreements may be for domestic, municipal, and industrial uses, but not for crop irrigation, from surplus water that may be available at any reservoir under the control of the Department of the Army.

(2) Classification.

(a) Surplus water will be classified as either:

(1) water stored in a Department of the Army reservoir that is not required because the authorized use for the water never developed or the need was reduced by changes that occurred since authorization or construction; or

(2) water that would be more beneficially used as municipal and industrial water than for the authorized purpose and which, when withdrawn, would not significantly affect authorized purposes over some specified time period.

(b) An Army General Counsel opinion of March 13, 1986, states that Section 6 of the Flood Control Act of 1944 empowers the Secretary of the Army to make reasonable reallocations between different project purposes. Thus, water stored for purposes no longer necessary can be considered surplus. In addition, the Secretary may use his broad discretionary authority to reduce project outputs, envisioned at the time of authorization and construction, if it is believed that the municipal and industrial use of the water is a higher and more beneficial use. However, surplus water declarations citing use for higher beneficial purposes should be made with caution and only on a fixed period agreement for temporary use. When the user desires long term use, a permanent storage reallocation should be performed under the authority of the Water Supply Act of 1958, as amended.

(3) Requirements and Restrictions. Surplus water declarations will only be made when related withdrawals will not significantly affect authorized purposes. Surplus water agreements shall be accompanied by a brief letter report similar to reallocation reports and shall include how and why the storage is determined to be surplus. Surplus water agreements will normally be for small amounts of water and/or for temporary use as opposed to storage reallocations and

permanent right to that storage. Normally, surplus water agreements will be limited to 5 year periods. Use of the Section 6 authority should be encouraged only where non-Federal interests do not want to buy storage because the need of the water is short term or the use is temporary pending the development of the authorized use. The views of the affected state(s) will be obtained, as appropriate, prior to entering into any agreement under Section 6. The annual price deemed reasonable for this use of surplus water is to be determined by the same procedure used to determine the annual payment for an equivalent amount of reallocated storage plus an estimated annual cost for operation and maintenance, repair, replacement, and rehabilitation. The total annual price is to be limited to the annual costs of the least cost alternative, but never less than the benefits foregone (in the case of hydropower, revenues foregone). Declaration of surplus irrigation water in the 17 Western states will require appropriate coordination and consultation with the Department of the Interior (Bureau of Reclamation).

c. Drought Contingency Water Supply. Drought and other emergencies affecting municipal and industrial water supplies will likely generate requests for water stored in Corps reservoirs. When these situations occur, requests may require immediate action. Section 6 of the Flood Control Act of 1944 provides an opportunity to be responsive with surplus water. The preferred approach is for a State or subdivision to enter into a agreement with the Secretary of the Army and to agree to act as wholesaler for all of the water requirements of individual users. This places the local governments in a position to help their citizens and minimizes the potential for problems that could arise if the Secretary were to determine who is entitled to shares of surplus water. District commanders should take the initiative to make Section 6 assessments of the availability of storage for limited withdrawals (up to 99 acre-feet of storage may be reallocated by the District Commander). This assessment can be made prior to any specific request in order to be ready to respond to urgent requests in a timely manner. The assessment should also summarize the impacts of such withdrawals and should be kept on file. Preferably, one agreement for each reservoir with the State or political subdivision can be used to distribute the water to small users. If this is not possible, individual agreements may be executed. Project managers are authorized to sign these agreements. However, if the user will be installing water lines or other facilities or equipment, an appropriate real estate instrument must be issued as required in ER 405-1-12. Drought contingency agreements for greater than 50 acre-feet should follow the cost and contracting format for surplus water agreements.

d. Reallocation of Storage.

(1) Approval Authority. Reallocation or addition of storage that would have a severe effect on other authorized purposes or that would involve major structural or operational changes requires Congressional approval. Providing the above criteria are not violated, 15 percent of total storage capacity allocated to all authorized project purposes or 50,000 acre feet, whichever is less, may be allocated from storage authorized for other purposes or may be added to the project to serve as storage for municipal and industrial water supply at the discretion of the

Commander, USACE. For reallocations up to 499 acre-feet the Commander, USACE has delegated approval authority to the Division commanders. Reallocations which exceed the Commander's authority may be approved at the discretion of the Secretary of the Army if such reallocations do not require Congressional approval as described above. All reallocations or additions of storage should be to serve immediate needs. All reallocations or additions of storage must be accompanied by a report that includes:

(a) Purpose of the report and Background, including map

(b) Pertinent project data table

(c) Water supply needs analysis

(d) Test of financial feasibility

(e) Cost of storage analysis

(f) Analysis of alternatives considered to address the water supply needs

(g) Appropriate NEPA documentation of environmental impacts

(h) Pertinent letters from affected Federal, state and local interests, including documentation of public review and comment. Opportunities for public review and comment must be provided.

(i) Commander's recommendation

(2) Cost of Storage. The cost allocated to the non-Federal sponsor (i.e., the price to be charged for the capital investment for the reallocated storage) will normally be established as the highest of the benefits or revenues foregone, the replacement cost, or the updated cost of storage in the Federal project.

(a) Benefits Foregone. Benefits foregone are generally estimated using standard Corps NED economic evaluation criteria in compliance with the P&G. For small reallocations from hydropower (i.e., within the Chief of Engineers discretionary authority), benefits may be based on current estimates of long term power rates. These may be obtained from in house power value estimating procedures or otherwise in accordance with the P&G. For large reallocations, estimates should be calculated in accordance with P&G procedures for evaluation of hydropower benefits.

(b) Revenues Foregone. Revenues foregone to hydropower are the reduction in revenues accruing to the Treasury as a result of the reduction in hydropower outputs based on the existing rates charged by the power marketing agency. Revenues foregone from other project purposes are the reduction in revenues accruing to the Treasury based on any existing repayment contracts.

(c) Replacement Costs.

(1) If the reallocation is from flood control it is appropriate to utilize the replacement cost of equivalent protection. This would not be appropriate for reallocations within the Corps discretionary authority which by definition do not have severe impacts.

(2) For reallocation from hydropower the replacement cost of power should normally be considered equal to the benefits foregone and calculated in accordance with P&G procedures for evaluating hydropower benefits. In cases where the power marketing agency has existing customer contracts, the replacement cost of power may be estimated as the agency's cost of obtaining power from the lowest cost alternative source for the duration of the contracts. Once the contracts expire and for the remainder of the period of analysis the replacement cost of power should be equal to the benefits foregone. Documentation of the contracts and estimates of replacement costs of power to fulfill them should be included in the reallocation report.

(d) Updated Cost of Storage. The costs to be reallocated to the water supply storage are determined by first computing the costs at the time of construction by subtracting the specific costs from the total construction cost and multiplying the result by the ratio of storage reallocated (ac-ft) to total usable storage space (ac-ft). In this computation, usable storage does not include space set aside for sediment distribution or for hydropower head. The cost allocated to the storage on this basis is then escalated to present day price levels by use of the Corps of Engineers Civil Works Construction Cost Index System (CWCCIS). This index is maintained in EM 1110-2-1304. Because the CWCCIS does not cover all items, however, the Engineering News Record (ENR) Construction Index will be used for indexing three cost categories: relocations; buildings, grounds, and utilities; and permanent operating equipment. Land values will be updated, on a case-by-case basis, by a qualified Corps of Engineers real estate appraiser. The value of the land is not to include enhancement due to the presence of the existing project. Since the CWCCIS dates back only to 1967, the ENR Construction Index will be used to update the cost of older projects to the 1967 time frame. Costs are to be indexed from the midpoint of the physical construction period to the beginning of the fiscal year in which the agreement for the reallocated storage is approved. In this manner, interest during construction is not used in this updating procedure.

(3) Cost Accounts. All income and expenses (investment, operation, maintenance, and replacement) associated with the water supply function shall be separately identified in the official cost account record. When there is a loss of revenue of existing purposes, or additional

operation and/or maintenance expense to existing purposes are incurred because of the new water supply addition, such charges shall be shown as a direct charge against the water supply function. This will affect the appropriate cost reductions in the existing project purposes and all revenues from the new addition will be credited to the new purpose. If hydropower revenues are being reduced as a result of the reallocation, the power marketing agency will be credited for the amount of revenues to the Treasury foregone as a result of the reallocation assuming uniform annual repayment. In instances where existing contracts between the power marketing agency and its customer would result in a cost to the Federal Government to acquire replacement power to fulfill the obligations of contracts, an additional credit to the power marketing agency can be made for such costs incurred during the remaining period of the contracts. Such credits should not actually be made for replacement costs until the costs are incurred and documented by the power marketing agency.

(4) Annual Costs. The non-Federal sponsor shall also be responsible for an appropriate share of the specific and joint-use operation, maintenance, replacement and major rehabilitation (OMR&R) costs. In those cases where the cost of water supply is based on hydropower replacement costs, the OMR&R increment of such cost is to be deleted from the total charge and then billed separately based on a pro rata share of the actual experienced project costs.

(5) Financial Feasibility. As a test of financial feasibility, the governing annual cost of storage derived, as determined above, should be compared to the annual cost of the most likely, least costly alternative that would provide an equivalent quality and quantity of water which the non-Federal interest would undertake in the absence of utilizing the Federal project. This analysis is to be included in M&I storage reallocation reports.

(6) Funding for Reallocation Studies. Feasibility studies of storage reallocation should be conducted using the framework of the Principles and Guidelines . The study will have two phases, reconnaissance and feasibility. The reconnaissance phase should be sufficiently detailed to determine if a feasibility study is warranted and if Congressional authorization is required for reallocation or addition of M&I storage. The reconnaissance phase is normally done using Operation and Maintenance, General funds. Use of Section 216 authority and regular survey authority are also options however. If O&M funds are utilized and Congressional authorization is required, cost sharing of the additional studies with the non-Federal sponsor is required in accordance with WRDA 86. The Federal share of the additional studies or the feasibility phase cost in the case of a Section 216 or regular survey authority comes from the General Investigations appropriation. If at the start of the study it appears likely the proposed reallocation will require Congressional authorization, contact HQUSACE (CECW-P) for additional guidance on requesting funds for the feasibility phase. If the reallocation is determined to be warranted, but does not require additional studies or Congressional authorization, then Operation and Maintenance, General funds may be used to complete the reallocation at Federal expense.

e. Reallocation of Flood Control Storage.

(1) Introduction. When reallocations of storage from the flood control pool would impact existing water supply and hydropower users, the need to provide Dependable Yield Mitigation Storage (DYMS) to compensate the existing water supply users must be considered in the analysis. Also to be considered, where appropriate, is the need to compensate hydropower users through operational changes. The following paragraphs provide procedures and requirements for implementation of the DYMS analysis.

(2) Compensation to Existing Municipal and Industrial Water Users.

(a) Mitigation Storage. Whenever the conservation pool of a reservoir project is expanded into the flood control pool, the critical period dependable yield (which is produced from storage and inflow) per unit of storage will be reduced. This occurs because, even though there is more conservation storage available from which to draft water, the inflow into the reservoir remains the same. Since more users will be sharing the same inflow, the yield per unit of storage decreases even though the total yield of the project increases. While water storage contracts (agreements) do not guarantee a yield, due to fairness and possible legal liability, the Corps should not make additional (and discretionary) storage reallocations in a project which impose measurable negative impacts on existing water supply contracts by reducing their critical period yields. To avoid such negative impacts, sufficient storage would be reallocated to meet the needs of the new user and to maintain the dependable yield of the existing water supply contract holders. This additional storage required to keep existing users whole is termed Dependable Yield Mitigation Storage (DYMS). The new user of the new water supply storage space (i.e., the water supply requestor) will pay for all costs associated with DYMS. Cost of storage is computed using the same procedure as for any other reallocation. Instructions on how to compute DYMS are provided in the following paragraph. For a discussion of storage-yield relationships, see EM 1110-2-1420. Districts should determine when storage-yield curves need to be updated as part of their normal operations.

(b) Computation of DYMS. Computation of DYMS requires an understanding of the use of project yield curves. During the formulation of projects that provide conservation storage, curves are typically developed that depict critical period dependable yield. The resultant curve is a conditional relationship which is based on a given bottom elevation for the conservation pool storage zone. Any point on the curve then, defines the relationship for storage and yield for a specific project. To apply this relationship to any project, either the total conservation pool storage or desired yield is selected and the other corresponding value is read from the yield curve. No further use is made of the yield curve unless a different total conservation pool is to be evaluated. The total yield of the given conservation pool storage then, is prorated among the various users based on the percentage of the total conservation pool storage that they have

contracted for or that is allocated to them. In many cases it will be required that project critical period dependable yield curves be developed. This will be the case if a curve does not exist or there is any doubt as to the assumptions or source of an existing yield curve. The important consideration in DYMS computations is that all yield estimates for all water supply storage agreements and storage allocations for other purposes are on the same basis. The storage adjustments that are made, in many cases, will be quite small. Great care then must be taken to prevent presentation of data that would confuse the users and would be difficult to explain. There are many computer programs available that can be used to determine the critical period dependable yield by simulation of the operation of a reservoir operated either independently or in a multiple reservoir system. Again, however, it is important that the same program and input data be used throughout the analysis. Examples of DYMS computations are provided in Exhibit E-4.

(c) Adjustments to Water Supply Agreements. Districts should decide when to adjust water supply agreements. To avoid the excessive amount of work required to change every agreement each time a new reallocation is made, a suggested alternative is that changes be made at the same time the interest on the unpaid balance is adjusted. In the sample water supply agreement, Article 5 – Payments, this adjustment is made at 5-year intervals for reallocated storage agreements pursuant to Section 932 of the 1986 WRDA of 1986.

(3) Compensation to Hydropower Users.

(a) Financial Credits. When hydropower is adversely impacted by reallocation of the flood pool to satisfy additional water supply needs, hydropower losses can be mitigated through the provision of financial credit. In this case, credits will be provided to the hydropower account from a portion of the water supply storage proceeds. This credit is based on revenues foregone to the United States Treasury for repayment of the hydropower costs assigned to the project. Revenues foregone reflect the allocated costs to power upon which the rates are based. When reallocation is accomplished through this credit approach, in essence, the allocation of costs is adjusted without performing a laborious new cost allocation. Additionally, where existing Federal power delivery contracts require market purchases of power as a result of storage reallocations and withdrawals, the power marketing agency may obtain an additional credit for the funds expended for those purchases upon demonstration that they were made as a direct result of the reallocation.

(b) Operational Changes.

(1) General. While financial credits have historically been used to compensate for hydropower losses, the Power Marketing agencies (PMAs) have continued to express concern that such credits do not adequately compensate for losses, particularly for capacity losses.

Capacity losses are more critical from a marketing standpoint since they are the principle basis for contractual agreements with their customers. Project operational modifications, where appropriate, could be an effective mechanism for compensating for hydropower losses. Modification of operating rules should be considered only where the new water supply storage is reallocated from the existing flood control pool. The implementation of operational changes will help marketing agencies fulfill their Federal contractual agreements and will not financially impact new water supply users. They will also result in a reduction of the financial credit to the marketing agencies. The following paragraphs describe policies and procedures for the consideration of operational changes in reallocation studies. Other operational changes may be considered by districts on an ongoing basis. Operational changes for compensating hydropower users suggested in this regulation are over and above normal operational practices.

(2) Reservoir Regulation Schedule. The term reservoir regulation schedule refers to a compilation of operating criteria, guidelines, rule curves and specifications that govern basically the storage and release functions of a reservoir. In general, schedules indicate limiting rates of reservoir releases required during various seasons of the year to meet all functional objectives of the particular project, acting separately or in combination with other projects in a system. Schedules are usually expressed in the form of graphs and tabulations, supplemented by concise specifications and are prepared and implemented by Corps Water Control Management staffs.

(3) Water Control Plans. Water control plans include coordinated reservoir regulation schedules for project/system regulation and such additional provisions as may be required to collect, analyze and disseminate basic data, prepare detailed operating instructions, assure project safety and carry out regulation of projects in an appropriate manner. ER 1110-2-240 require that necessary actions be taken to keep approved water control plans up-to-date. While water control plans and their documentation in water control manuals are developed for specific projects and reservoir systems, they will be revised as necessary to conform with changing requirements resulting from developments in the project area and downstream, improvements in technology, new legislation and other relevant factors. The instructions contained in ER 1110-2-240 are to be followed when modifications to water control plans become necessary due to reallocations of flood control storage to water supply. Funding of reallocation studies and associated modifications to water control plans/manuals is an internal decision to be made by each district. The reallocation report shall describe the proposed modifications to the water control plan/manual as a result of the reallocation action, if applicable.

(4) Criteria for Evaluation and Selection of Operational Change. The following criteria will be used for evaluating and selecting an operational change.

- The operational change shall not adversely affect flood damage reduction capability or any other project purposes.

- The objective of the operational change is to diminish as much as reasonably possible the loss in dependable capacity (and also energy if possible, but not probable), but not to increase dependable capacity beyond the level prior to the reallocation action.

- Consider to the maximum extent possible, making only seasonal changes to the operation plan (i.e., to the time of year when flood control is less likely to be needed and hydropower capacity is most critical).

- The change in the elevation of the conservation pool should not exceed (or significantly exceed) what the elevation would otherwise be if DYMS was provided for hydropower.

(5) Legal Considerations. There are three primary legal considerations that need to be addressed when project operational changes are recommended to compensate the hydropower purpose. The first relates to downstream impacts (i.e., flood control is jeopardized) and the second two considerations are related to the potential impacts of raising of the lake level. In this later action, raising of the lake could adversely impact the environment (e.g., impacts on trees and other vegetation, habitats, etc.) and it could impact on the real estate interest of surrounding land owners (e.g., marinas, residents, etc.). The impacts on these three items (flood control, environment and real estate) must be adequately addressed in the reallocation report . Resolution of these issues will require extensive coordination with all stakeholders and users of the reservoir. If significant legal problems are encountered as related to these or other items, a decision must be made whether the action can proceed under the discretionary authority, or if Congressional action is needed.

(4) Coordination Requirements. ER 1110-2-240, which implements Section 5 of WRDA of 1988, requires that before the Corps may modify a reservoir water control plan which will result in or require a reallocation of storage space or significantly affect any project purpose, it shall provide an opportunity for public review and comment to include public meetings. This coordination requirement, as previously described, applies to all reallocation actions.

f. Addition of Storage. When water supply storage is added to an existing project and storage is not reallocated, a willingness to pay concept is used to assign costs to the new water supply purpose. Under this concept the non-Federal sponsor is responsible for 100 percent of the new construction costs allocated to water supply. This is to be paid during the construction period. In addition, payments equal to 50 percent of the sponsor's savings are required. The sponsor's savings are construed as the cost of the most likely alternative which would be constructed by the non-Federal sponsor in lieu of the proposed modification, less the sponsor s share of the cost of the modification to the Corps project. This cost is to be repaid at the water supply rate current at the start of project modification. It is to be adjusted at 5-year intervals

within the remaining physical life of the project, but not to exceed 25 years from completion of project modification; or if water supply is already a project purpose, within 30 years from the time the project was first used for water supply. Total local capital contributions (original project plus modification) should not exceed the sum of the local share of the new construction costs, plus the Federal construction costs of the original project. The non-Federal sponsor shall also be responsible for an appropriate share of the specific and joint use operation, maintenance, replacement and major rehabilitation costs.

E-58. Water Supply Agreements. All revenues received, from agreements with non-Federal sponsors, shall be deposited into the Treasury of the United States as miscellaneous receipts.

a. Agreement Formats.

(1) Water Storage. Part 1 of the Model Formats for Agreements and Permits (see www.hq.usace.army.mil/cecc/ccpca.htm) is to be used in entering into agreements under the authority of the Water Supply Act of 1958, as amended. Bracketed language may be changed as appropriate and material particular to either present or future use storage may be deleted if such storage is not included in the agreement. Non-Federal parties to water storage agreements must meet the requirements of Section 221 of the Flood Control Act of 1970, as amended.

(2) Surplus and Agricultural Water Supply. The sample format set forth in Part 2 of the Model Formats for Agreements and Permits (see www.hq.usace.army.mil/cecc/ccpca.htm) is to be used for agreements under the authority of Section 6 of the Flood Control Act of 1944 and Section 931 of the WRDA of 1986. A agreement for either can also be tailored to the format of Part 1. The primary factor in deciding which format to use is whether the non-Federal sponsor wants storage space or water. Agreement terms are normally for 5 years with an option for a 5 year extension, until the space is needed for the authorized purpose, or until the authorized purpose is deauthorized.

(3) Drought Contingency. Agreements for small amounts of water (withdrawals from 100 acre-feet of storage or less) may be accomplished via the form provided as Part 3 of the Model Formats for Agreements and Permits (see www.hq.usace.army.mil/cecc/ccpca.htm). Larger amounts and long term arrangements should be the subject of a Section 6 agreement in accordance with this regulation, unless written approval by HQUSACE (CECW-P) is obtained.

(4) Disclosure of Lobbying Activities. Water supply agreements will be accompanied by a signed Certificate Regarding Lobbying and, if applicable, a completed Disclosure of Lobbying Activities. These forms must be thoroughly discussed with the sponsor prior to signature by the Contracting Officer. Completed forms will be attached to the agreement prior to its signature by the Contracting Officer, and kept on file by the district for later submittal to HQUSACE, if requested.

b. Submittal and Review.

(1) Water Storage.

(a) During initial negotiations leading to a draft agreement, significant departures from policy or complex interpretations of policy or legislation are to be submitted to HQUSACE (CECW-P) before spending time and resources negotiating a draft agreement.

(b) The first storage agreement on any project will be approved by the Assistant Secretary of the Army (CW), as will all agreements, which deviate from the approved model (other than editorial changes.) Approval authority for subsequent agreements and reallocation reports which do not require Congressional approval has been delegated to the Commander, USACE, and to Division and District commanders in accordance with Table E-31. Under these delegations, two copies of all agreements, draft and final, along with appropriate reallocation reports must be submitted to HQUSACE (CECW-AR). One will be retained in HQUSACE files and the other will be provided to ASA(CW). Draft agreements and reallocation reports which require ASA(CW) review (or approval), and final agreements requiring HQUSACE or ASA(CW) approval must be accompanied by four copies.

(c) The cutoff point for incorporation of policy changes into water supply agreements will be the date of draft agreement approval by the ASA(CW). An approved agreement will be exempt from application of policy changes provided a final agreement is signed by the local sponsor within six months of the date of draft agreement approval. An exception may be granted to the six-month limitation; however, a request for a longer time period should accompany the draft agreement and must contain a complete justification.

Table E- 31 Water Supply Storage Agreement Approval Authority [1]

| Drafts | | | | |
|---|---|---|---|---|
| Acre – Feet [2] | | Storage Agreements [3] | | Reallocation Reports [5] |
| From | To | Without Reallocation | With [4] Reallocation | |
| 0 | 99 | District [6] | District [6] | District |
| 100 | 499 | Division [6] | Division [6] | Division |
| 500 | 999 | Division [6] | ASA(CW) | HQUSACE [7] |
| 1000 | & up | ASA(CW) | ASA(CW) | HQUSACE [7] |
| Finals [8] | | | | |
| Acre – Feet [2] | | Storage Agreements | | |
| From | To | Without Reallocation | With [4] Reallocation | |
| 0 | 499 | District | District | |
| 500 | 999 | District | HQUSACE | |
| 1000 | & up | HQUSACE | HQUSACE | |

Footnotes:

[1] A copy of all approved agreements will be provided to ASA(CW).

[2] In any particular agreement, the acre-feet of storage needed to produce the water under agreement on a dependable basis.

[3] At projects where storage agreements have been previously approved. The first storage agreement on any project will be approved by the ASA(CW).

[4] For reallocations which do not require Congressional approval, i.e., no significant effect on other authorized purposes and/or no major structural or operational changes.

[5] When the cumulative amount of storage reallocated exceeds the lesser of 4000 ac-ft of 10% of available storage, reports will be submitted to ASA(CW) prior to approval.

[6] When using approved model or approved model with editorial changes only. Agreements involving other changes will be submitted to ASA(CW) for approval.

[7] Submitted to ASA(CW) with the draft agreement prior to approval.

[8] When using the approved draft agreement and local signature within six months of draft approval. If beyond six months or if changes are made, the final agreement will be resubmitted for approval to the office with approval authority for the draft. If the proposed agreement involves changes other than editorial changes, the agreement will be submitted to ASA(CW) for approval. The ASA(CW) reserves the right to retain approval authority of any final agreement he approved as a draft. In cases where that right will be exercised in advance, the draft agreement will so note.

Table E- 32 Surplus Water Agreement Approval Authority [1]

| Drafts | | | |
|---|---|---|---|
| Acre - Feet [2] | | Agreement [3] | Letter Report [4] |
| From | To | | |
| 0 | 99 | District [5] | District |
| 100 | 499 | Division [5] | Division |
| 500 | 999 | Division [5] | HQUSACE [6] |
| 1000 | & up | ASA(CW) | HQUSACE [6] |
| Finals [7] | | | |
| Acre - Feet [2] | | Agreement [3] | |
| 0 | 499 | District | |
| 500 | 999 | District | |
| 1000 | & up | HQUSACE | |

Footnotes:

[1] A copy of all approved agreements will be provided to the ASA(CW).

[2] The storage needed to produce the agreed to water on a dependable basis.

[3] Not affecting authorized purposes (water not being used for an authorized purpose). When surplus water agreements involve water being used for an authorized purpose, they will be treated like a reallocation agreement and report (See Table E-31).

[4] When the cumulative amount of storage reallocated exceeds the lesser of 4000 acre-feet or 10% of available storage, reports will be submitted to ASA(CW) for approval.

[5] When using approved model or approved model with editorial changes only. Agreements involving other changes will be submitted the ASA(CW) for approval.

[6] Submitted to ASA(CW) with the draft agreement prior to approval.

[7] When using the approved draft agreement and local signature within six months of draft approval. If beyond six months or if changes are made, the final agreement will be resubmitted for approval to the office with approval authority for the draft. If the proposed agreement involves changes other than editorial changes, the agreement will be submitted to ASA(CW) for approval. The ASA(CW) reserves the right to retain approval authority of any final agreement he approved as a draft. In cases where he will exercise that right in advance, the draft agreement will so note.

(2) Surplus and Agricultural Water Supply. Procedures similar to those described above for water storage shall be applied to both agricultural and surplus water agreements. Delegations for surplus water are described in Table E-32. Agreements submitted to HQUSACE shall be accompanied by a brief letter report explaining the method used in determining the dollar values in the agreement, together with the recommendation of the division commander. Two copies of all agreements, draft and final, approved under delegated authority must be submitted to HQUSACE (CECW-AR).

## SECTION IX - Multiple Purpose Projects

E-59. Federal Interest.

a. General. Federal interest in water resources development is established by law. Within the larger Federal interest in water resource development, the Corps of Engineers is authorized to carry out projects in seven mission areas: navigation, flood damage reduction ecosystem restoration, hurricane and storm damage prevention, water supply, hydroelectric power generation and recreation. Navigation projects include both inland and deepwater projects. Ecosystem restoration projects provide restored habitat for terrestrial and aquatic species. Wherever possible and subject to budgetary policy and Congressional authorization, projects shall combine these purposes to formulate multiple purpose projects. For example, flood protection projects could include ecosystem restoration and recreation. As another example, navigation projects could include hydroelectric power generation and ecosystem restoration. In addition, efforts to solve problems within these mission areas should consider the full range of programs as solutions. For example, flooding problems may be addressed by implementing solutions within the purview of the congressionally authorized projects, the Continuing Authorities Program, the Flood Plain Management Services Program or emergency authorities.

b. Watershed Approach. Watershed planning takes a systems view of water resources and opportunities over a large hydrologic region commonly called a river basin or a watershed. Watershed studies will usually be multiple purpose and multiple objective investigations. Watershed studies will likely involve participation of other Federal, State and local agencies and groups with interests and authorities to address problems and opportunities beyond the Corps missions. It is fundamental to the planning process to investigate the full range of solutions to problems, and to develop multiple purpose solutions to problems. Comprehensive systems planning, including watershed and river basin planning will improve our opportunity for sound water resource management.

E-60. Types of Improvements. The types of improvements to be considered in multiple purpose/multiple objective studies include, but are not limited to, the ones identified in previous paragraphs for each of the Civil Works mission area. Other types of improvements identified by other members of the planning team (representatives from other Federal agencies, State and local governments, tribal governments, non-profit organizations and the general public) will also be considered during the planning process. Corps participation in these type of improvements might be limited by law or policy.

## E-61. Specific Policies

a. General. Specific policies and procedures for each of the Civil Works mission areas described in previous sections of this appendix apply to projects that are formulated for multiple purposes.

b. Cooperation with other Agencies. The cooperative efforts of multiple Federal agencies as well as non-Federal interests will generally be necessary to achieve multi-purpose economic and ecosystem goals. Corps multi-purpose planning efforts should complement and be complemented by the various authorities of other Federal and State agencies, Native American tribes and private groups, such that common objectives are identified early in the study process. The Corps will, in some instances, lead in the development of alternative restoration plans, and in other instances play only a supporting role. The Corps can provide assistance in planning, study management, engineering, construction, environmental science and analysis, and in economic analysis of plans generated by others.

c. Plan Selection. When a project has both NED benefits and NER effects the recommended plan should be "best" in the sense that no alternative plan or scale has a higher excess of NED benefits plus NER effects over total project costs. This plan should be called the combined NED/NER plan.

## E-62. Benefit Evaluation Procedure

a. Conceptual Basis. The conceptual basis for evaluating NED benefits is society's willingness to pay for the increase in the value of goods and services attributable to improvements for navigation, flood damage reduction, hurricane and storm damage prevention, ecosystem restoration (in circumstances where the outputs can be monetized), hydroelectric power generation, recreation, and water supply. The conceptual basis for evaluating non-monetized NER benefits is society's value toward the increase in ecosystem services.

b. Planning Setting. The planning setting should be broadly conceived to include geographic scales compatible with watershed plans. Multiple programs and authorities for both the Corps and non-Federal participants should be considered to maximize the net beneficial effects of alternative plans.

c. Evaluation Procedure. The general evaluation principles described for each Civil Works mission area shall be followed in the evaluation of multiple purpose projects. Monetary and nonmonetary benefits will be estimated following the steps applicable to each mission area under consideration. One key element in the evaluation of multiple purpose projects is the potential need for tradeoffs between NED and NER outputs. Distinct implementation actions may produce only NED outputs or only NER outputs, and involve no conflicts of space

utilization, water utilization or land use, and if so no question of trading off one output for another arises. In other cases, more of one output (say, NER) can only be obtained by accepting less of another (say, NED). In these cases, tradeoffs between NED outputs and NER outputs are permissible, and should be made as long as the value of what is gained exceeds its implementation cost plus the value of what is foregone. Thus, it is acceptable to trade NED benefits in favor of NER outputs as long as the incremental (subjective) value of the NER outputs exceeds the sum of NED benefits foregone plus incremental costs. Incremental costs equal added cost necessary to realize added environmental outputs less reduced cost permitted by reduced NED outputs. Trades of one output for another shall be made until it is not possible to make further trades improving the total project. Naturally, the potential trades go in both directions, more NER output for less NED output and more NED output for less NER output. This is a formulation-evaluation process by which the Combined NED/NER Plan is discovered.

(1) Benefit-cost ratios are not relevant for environmental projects, and environment specific costs are not included in the benefit-cost ratio for a multiple purpose project. Displays in Tables E-33, E-34 and E-35 illustrate several cases. In the first example, Table E-33, the project produces only NED benefits.

(2) In the second example, Table E-34, the project produces only environmental benefits. In this example, several plan scales are shown so that the public and decision makers know at what level of incremental and total output the costs of the incremental units just equals the subjective valuation of their worth. Since a recommendation depends on this subjective evaluation of worth, which is not readily displayed in a table, no recommended plan is indicated.

(3) In the third example, E-35, the project produces NED and NER outputs. For the first two displayed plan scales there is no interaction between NED and environmental outputs and thus no tradeoff. The third plan scale indicates that the next increment of environmental outputs requires an additional environmental implementation cost of $5 and the foregoing of $10 in NED benefits, resulting in incremental adverse effects of $15. For this plan to be recommended the subjective worth of the additional environmental outputs would need to be (at least) $15. Total project costs are $150 but the benefit-cost ratio is based only on costs associated with the NED benefits, $110. Any of the displayed plans could be the recommended plan, provided that the economic development plan under consideration maximizes NED benefits or that the restoration plan under consideration is shown to be most cost effective.

Table E- 33 Project Produces only NED benefits

| BENEFITS ($) | COSTS (4)* | BENEFIT-COST RATIO |
|---|---|---|
| 150 | 100 | 1.5 |
| *Includes justified mitigation cost, if any. | | |

Table E- 34 Project produces only NER outputs

| Environmental Outputs (Units) | Costs ($) | Cost per Unit ($) | Incremental Cost per Unit ($) |
|---|---|---|---|
| 40 | 80 | 2.00 | Not Available |
| 50 | 105 | 2.10 | 2.50 |
| 60 | 135 | 2.25 | 3.00 |

Table E- 35 Project Produces NED and NER Outputs

| NED Benefits ($) | Costs ($) | B/C | Net Benefits ($) | NEQ Outputs (Units) | Costs ($) | NED Benefits Foregone ($) | Total Adverse ($) | Cost per Unit | Inc Cost per Unit ($) | Total Project Cost ($) |
|---|---|---|---|---|---|---|---|---|---|---|
| 140 | 110 | 1.3 | 30 | 40 | 30 | 0 | 30 | 0.75 | NA | 140 |
| 140 | 110 | 1.3 | 30 | 43 | 35 | 0 | 35 | 0.81 | 1.67 | 145 |
| 130 | 110 | 1.2 | 20 | 50 | 40 | 10 | 50 | 1.00 | 2.14 | 150 |

E-63. Federal and Non-Federal Participation

a. Cost Sharing. Multiple-purpose studies and projects are cost shared in accordance with the cost sharing policies applicable to each project purpose under consideration. Before determining the required cost sharing for projects, an allocation of total project costs to each purpose must be accomplished. The following paragraphs describe the requirements and procedures used by the Corps for allocating costs of multiple purpose projects.

b. Cost Allocation. The need for cost allocation stems from pricing and cost-sharing policies that vary among purposes. Cost allocation is the process of apportioning total project financial costs among purposes served by a plan. Financial costs are implementation outlays, transfer payments such as replacement housing assistance payments, and the market value of contributions in kind, e.g., lands. Financial costs are to be allocated to those purposes for which the plan is formulated. These purposes do not include other direct benefits and use of otherwise unemployed or underemployed labor resources. All purposes are to be treated comparably.

c. Definitions.

(1) Separable cost for each purpose in a plan is the reduction in financial cost that would result if that purpose were excluded from the plan. This reduction in cost includes:

(a) The financial cost of measures serving only the excluded purpose; and

(b) Reductions in the financial cost of measures serving multiple purposes. In some cases removal of a purpose would result in selection of different measures to address the remaining purposes.

(2) Joint cost is the total financial cost for a plan minus the sum of separable financial costs for all purposes.

(3) Alternative cost for each purpose is the financial cost of achieving the same or equivalent benefits with a single-purpose plan.

(4) Remaining benefit for each purpose is the amount, if any, by which the NED benefit or, when appropriate, the alternative financial cost exceeds the separable financial cost for that purpose. The use of alternative cost is appropriate when alternative financial cost for the purpose is less than the NED benefit, or when there are project purposes that do not address the NED objective.

d. Cost Allocation Standard. Costs allocated to each purpose are the sum of the separable cost for the purpose and a share of joint cost as specified below:

(1) Joint cost may be allocated among purposes in proportion to remaining benefits.

(2) Joint cost may be allocated in proportion to the use of facilities, provided that the sum of allocated joint cost and separable cost for any purpose does not exceed the lesser of the benefit or the alternative cost for that purpose.

e. Allocation of Constituent Cost. Cost-sharing policies for some purposes pertain to cost constituents such as construction costs, and operation and maintenance costs. Costs for each cost constituent specified in the relevant cost-sharing policy should be allocated among purposes.

f. Requirements for Cost Allocations. There are two types of cost allocation studies: Preliminary cost allocations and firm cost allocations. This paragraph prescribes policies and requirements common to both. A cost allocation is required for any multipurpose project with a reimbursable project purpose.

(1) General. Cost allocation studies shall identify specific facilities. The results of such studies shall be summarized to show the percentage of joint-use costs which, together with specific facilities costs, comprise the total allocation to each project purpose. Joint-use cost percentages are derived separately for construction expenditures and for operation and maintenance expenditures. Percentages for construction shall also be applicable to replacement and rehabilitation costs when these occur. As a general rule, percentages are to be rounded to the nearest tenth of one percent.

(2) Responsibility for Cost Allocations. Allocation of total costs among purposes of a project is the responsibility of the Commander, USACE for projects planned and constructed under his jurisdiction. Where cost allocation is assigned by law to another Federal agency, HQUSACE will furnish cost data to such agency, together with views concerning appropriate allocation.

(3) Purposes and Objectives to Which Costs Are Allocated. Preliminary cost allocations may allocate costs to all project purposes, recognized by current executive guidelines, which encompass the direct services or outputs of the project as recommended. In firm cost allocations reports, costs may be allocated only to the project purposes authorized by Congress, or those added under general authority.

(4) Costs Included in the Allocation.

(a) Costs to be allocated include the total construction expenditures, value of lands and property transferred without cost to the project, interest during construction, operation and maintenance costs (including replacement costs necessary to maintain conditions as constructed throughout the project life).

(b) The cost allocation computation shall be computed on the basis of annual costs and benefits, with all expenditures and benefit accruals reduced to a common time basis and equivalent annual values over the period of analysis.

(c) Interest during construction is computed on expenditures during the construction period, in accordance with prescribed procedures for cost estimating or cost accounting requirements.

(d) Deferred costs shall be included in the allocation only if they are an integral component of the plan and its justification, and if they are integral to the investment decision to initiate construction. Deferred recreation costs and benefits dependent thereon (both discounted to the initial project operation date) which do not meet these criteria, may be included only if a cost-sharing contract, including designated future facilities and a construction schedule, is signed and approved in advance of initiation of construction. If deferred costs are included the allocated costs should be presented in a breakdown as to initial and future costs.

(e) Funds allocated for Continued Planning and Design (CP&E) prior to authorization are not included in project costs if the funds were obligated prior to 1 October 1985. Funds allocated for CP&E obligated on or after 1 October 1985 and all advance engineering and design funds shall be made a part of the cost allocated to project purposes and of the cost apportionment between Federal and non-Federal shares.

(5) Costs Excluded from the Allocation.

(a) There are certain project costs included in the appropriations required for construction which by law or administrative regulation are excluded from economic analysis and shall not be allocated to the purposes of the water resources plan. These include the following:

(b) Highway betterments, pursuant to Section 208(c) of Public Law 87-874.

(c) Postauthorization costs of cultural resources mitigation, pursuant to Section 7 of Public Law 93-291, up to one percent of total funds authorized for appropriation, and costs in excess of one percent authorized by waiver pursuant to Section 208 of Public Law 96-515.

(d) Cost excluded from the allocation shall be shown in the allocation data by separate line item or footnote. The allocation data should identify the costs, including an appropriate share of Engineering and Design (E&D) and supervision and Administration (S&A), with sufficient information to permit a cost accounting determination consistent with the derivations in the cost allocation study.

(6) Addition of Purpose to Existing Project (Completed or Under Construction). All added costs incurred by the addition of a new purpose shall be allocated to that purpose and a recommendation shall be made for approval by HQUSACE as to how all purposes should share in the joint-use costs of the original plan considering comparative benefit accruals over the new period of analysis.

g. Preliminary Cost Allocation Studies.

(1) Allocation Study Reported in the Feasibility Report. The preliminary cost allocation study is to provide information to those responsible for reimbursement as to the magnitude and share of reimbursable costs which may be part of the local cooperation requirements and to develop an estimate of Federal costs. Supporting allocation data should be in the detail comparable to other economic analyses in the planning report, and should be available for reviewing officers to verify the reasonableness of the cost allocation. These percentages from the preliminary cost allocation study in the feasibility report shall be used in budget presentations for initial funds for preconstruction, engineering and design, unless and until an updated preliminary allocation is completed during preconstruction engineering and design, or as part of a restudy of an inactive or deferred project.

(2) Cost Allocation Study in Preconstruction, Engineering and Design. The division commander shall determine the need for updating the preliminary cost allocation study. An updated preliminary cost allocation study shall be based on current cost allocation standards and other planning and engineering studies current at the time of preparation. This cost allocation is particularly important for the following reasons:

(a) It provides the cost allocation data to be presented to local sponsors and other agencies as a basis for updated letters of intent or cost-sharing contracts required prior to initiation of construction.

(b) It provides the information on reimbursable and non-reimbursable costs to be included in budget presentations during implementation of a plan, until a firm allocation has been approved.

(c) It provides the information on allocated percentages of joint-use costs which will be used in project cost accounting until a firm allocation is adopted.

(3) Coordination of Preliminary Cost Allocation Studies. Interagency Coordination of preliminary cost allocations shall be accomplished as deemed necessary by the commander, or as specifically required for project purposes.

(a) Coordination of preliminary and firm cost allocation studies with hydropower as a purpose is required with the marketing agency to permit its determination of financial feasibility. Preliminary coordination should be accomplished by the district commander, and final field level coordination is the responsibility of the division commander.

(b) In Reclamation States, the division commander shall insure that preliminary and firm cost allocation studies are coordinated with the regional office of the Bureau of Reclamation which has the responsibility for determining financial feasibility and repayment capacity for irrigation.

h. Firm Cost Allocation Study.

(1) Requirements of a Firm Cost Allocation. The firm cost allocation shall be prepared as a separate report. The report shall present a summary description of the water resources plan, its purposes, and operational characteristics in sufficient detail for a reviewer to understand the relationship between the derived allocation and the formulation objectives. The supporting tables shall present relevant data on benefits, costs, and derivation of the cost allocation.

(a) A firm cost allocation is required at the time the first reimbursable purpose of a multipurpose project becomes operational. However, because projects often become operational before final contracts are awarded and final real estate purchases are made, the division commander may authorize a delay of up to one year in submission of the firm cost allocation report. Authorization of longer delays must have the concurrence of the Director of Civil Works.

(b) A project will be nearing completion of construction when a firm cost allocation report is prepared. The report shall reflect the actual expenditures up to the time the firm allocation study is made and provide a schedule for any remaining estimated expenditures.

(c) Interest during construction will be computed in accordance with accounting practices (ER 37-2-10) which provide for interest from the middle of the month in which expenditures are made to the in-service date of the function or separable unit thereof. The in-service date is the first of the month following availability for service.

(d) Estimates of alternative costs required for the cost allocation shall be developed to a level of detail and to a scope consistent with the plan to be implemented.

(e) Benefits for all project purposes shall be adjusted to a price level representative of the period during which the project was constructed.

(f) The interest rate to be used in the firm cost allocation study is the project evaluation rate, established by applicable laws and regulation.

(2) Review and Approval of Firm Cost Allocation Reports. The Chief of Engineers is the approving authority for firm cost allocation reports. The Division Commander, however, has review and coordination responsibilities as follows:

(a) District commanders shall submit firm cost allocation reports to the Division Commander for review and interagency coordination at the regional level.

(b) The Division Commander shall resolve all conflicts surfaced in review and coordination of the report, to the maximum extent feasible and shall forward the report with recommendations to HQUSACE (CECW-P). Division commanders are not to coordinate the report with the Federal Energy Regulatory Commission (FERC) regional offices. Formal coordination with FERC will be accomplished by HQUSACE.

(c) Upon adoption by the Chief of Engineers, notice will be given by CECW-P to CERM-FC and to the District and Division commanders. Retroactive adjustment of cost accounts will be made as required, in accordance with EP 37-2-1. The joint use cost percentages of the adopted report shall also be used for allocations of all remaining expenditures, for future additions, rehabilitations and replacements, and for operations and maintenance expenditures.

i. Cost Allocation - Detailed Guidance. The remaining paragraphs of this section provide detailed guidance for and examples of allocation of cost among the purposes served by a multipurpose project.

(1) Definitions. The definitions presented in this paragraph are those specific to this section. General definitions of items, such as costs and benefits, are included in other sections of this regulation.

(a) Alternative Costs. The costs of alternative projects with one purpose eliminated, to determine separable costs, or the costs of single purpose projects necessary to obtain the same benefits for the corresponding purpose as in the multipurpose project. The cost of the most economical alternative means for obtaining the same service for any one project purpose frequently is used as the measure of that project benefit.

(b) Cost Allocation. A systematic distribution of costs among the project purposes of a multipurpose project.

(c) Joint-use Costs. Total project costs less all specific costs.

(d) Joint-use Facilities. All project facilities which cannot be identified as specific facilities.

(e) Joint Costs. The total project costs less the summation of separable costs. These are sometimes called "residual costs."

(f) Separable Costs. Costs incurred to add a purpose to a project. These costs are normally calculated as a step in project (plan) formulation in considering the economic feasibility of including a purpose in a joint project. The separable cost is the minimum amount which should be considered for allocation to a given purpose. The separable cost for any specified purpose is determined by subtracting from the cost of the multipurpose project the cost of the most economical alternative project to obtain the same benefits for the other purposes with the specified purpose omitted.

(g) Specific Costs. The costs of identifiable project features normally serving only one purpose, such as a powerhouse or switch yard. These costs are the total cost of identifiable project features for that purpose.

(h) Specific Facilities. Identifiable project features normally serving only one purpose.

(i) Total Costs. All costs for planning, design and construction of the project following completion of the feasibility report. These costs include the estimated value of all items transferred or furnished without cost to the United States government. Also included is accrued interest on these expenditures and values until the project becomes operational.

(2) Purpose of Cost Allocation. Cost allocations are made to derive an equitable distribution of project costs among authorized project purposes, or those proposed for authorization. Laws and regulations requiring reimbursement or cost-sharing generally specify recovery of costs incurred for the service or function. Cost allocation is, therefore, required for most multipurpose projects with a reimbursable purpose. An exception may apply where recreation is the only reimbursable purpose. Under present policy, reimbursement for recreation is limited to one-half of the separable costs. A complete cost allocation study normally would not be required to determine separable costs. However, it could be required to demonstrate that not more than 50 percent of project costs are allocated to recreation as required by Public Law 89-72 and the WRDA of 1986.

(a) The cost allocation is an essential part of the multipurpose planning process where cost-sharing will be required. It provides information needed to determine the magnitude and share of estimated project costs that are reimbursable. This information is essential to the tests of financial feasibility and plan acceptability. During subsequent planning and construction, it provides the information required for allocating actual expenditures and insures that cost accounts are maintained consistent with the plan formulation and allocation principles.

(b) The significant outputs of the cost allocation study are the percentages for allocating joint-use costs among purposes. Although each allocation study derives the amount of cost allocated to each purpose (by cost of specific facilities and allocated joint-use cost), the amounts are pertinent only to the cost estimate used in the study. As total project costs change during the planning and construction phases, revised amounts allocated to each purpose are derived by application of the joint-use percentages contained in the allocation study.

(3) Purposes and Objectives to Which Costs Are Allocated. The recognized services which can be included in a Federal water resources project plan and to which costs may be allocated include the following: environmental quality, navigation, flood control, storm damage reduction, coastal erosion control, irrigation, power, water supply, recreation (including fish and wildlife recreation), fish and wildlife enhancement, streamflow regulation and, in limited cases, water quality. In some cases bank stabilization may also be included.

(4) Method of Cost Allocation.

(a) The separable costs-remaining benefits method (SC-RB) of cost allocation was adopted by interagency agreement in March 1954 as the preferred method for allocating costs of Federal multipurpose water resource projects. Current Executive guidelines endorse its continued use. Under some circumstances, other methods may be used.

(b) Under the SC-RB method, each purpose included in a project is allocated at least its separable costs, i.e., the incremental costs associated with including the purpose in the project. Benefits limited by alternative justifiable expenditures are the upper limit of allocation to each purpose. Remaining benefits (i.e., benefits in excess of separable costs) provide the basis for equitably apportioning joint costs among purposes. A description of the method, extracted from the "Green Book" on "Proposed Practices for economic Analysis of River Basin Projects," is presented in paragraph E-63i(23).

(5) Addition of Purposes to Existing Projects (Completed or Under Construction). Modification of existing projects to accommodate a new purpose may result from a change in planned operation at no additional cost, or from a physical addition to or modification of project facilities, or both. If the added purpose is reimbursable, or would have an effect on existing

reimbursable purposes, the report in justification of the modification should include a determination of costs or charges to be assessed against the new purpose and any proposed reallocation of costs to existing purposes.

(a) The approach to be used in the analysis includes consideration of benefits of the new purpose, alternative costs to obtain the benefits, effects on benefits and revenues of existing purposes, change in project operation, reallocation of storage space, and changes in the physical scope and cost of the project.

(1) The significance of the added purpose should be clearly defined, both as to its benefits and its effects on all existing project outputs.

(2) A new period of analysis should be established when adding a project purpose. The period should be the lesser of the remaining physical life of the reformulated project, or 100 years from the time the purpose is added.

(3) Repayment period and interest rates should be discussed in the report setting forth the proposed addition of a reimbursable purpose. The repayment period should not exceed the new period of analysis, as established in accordance with a(1)(b) above. Normally, the interest rate will be the current year project formulation rate when considering addition of a new purpose to a project. Exceptions should be cleared individually with HQUSACE (CECW-PD).

(b) The economic principles of evaluation and cost allocation are the same as those relating to the previously approved project analysis. Benefits form the addition of a purpose to an existing project must equal or exceed the incremental costs of adding the purpose. These latter costs also include the opportunity costs of the reduction in the beneficial outputs of the existing project as operated. Allocation of costs to the purpose should cover, as a minimum, any additional or incremental costs; the total cannot exceed the lesser of the benefits or the justifiable alternative expenditure.

(c) Two different procedures or approaches are acceptable for applying these principles to derivation of charges for added purposes. The first of these approaches sets forth guidance to be followed where addition of a purpose is of incidental significance, involving only minor losses to other purposes, and there is no change in plan scope. The second approach deals with the addition of a purpose where the change is significant and the effect on other purposes creates a need for a new distribution of costs. Use of these two approaches is applicable to addition of any purpose with the exception of deferred recreation facilities developed at reservoir projects pursuant to Section 5 of the Federal Water Projects Recreation Act, and, for non-reservoir projects pursuant to Section 4 of the Flood Control Act of 1944, as amended, by Section 207 of the Flood Control Act of 1962.

(1) These approaches do not require a determination of the extent to which originally allocated costs of existing purposes have been reimbursed or amortized. Status of reimbursement for existing purposes should be adjusted as required in cost accounts relative to any reallocation.

(2) In no case should costs allocated to existing purposes be increased unless the physical magnitude of their outputs has been increased by a change in project operation.

(d) Addition of a Project Purpose with Insignificant Effect on the Authorized Project. When the addition of a project purpose is incidental and has no significant effect on other project purposes, and the general scope of the project is not altered, a cost allocation need not be made. Consideration will be given to added benefits, incremental costs, and benefits foregone by authorized project purposes using current conditions and interest rates. A procedure for determination of price when reallocating an insignificant storage volume to water supply is included in Section VIII of this appendix (Water Supply).

(e) Addition of a Purpose with Significant Effect on the Existing Project.

(1) When the addition of a new purpose entails identifiable costs and significant changes in expected benefits to other purposes, a cost allocation should be performed. Examples of situations that could require reallocation of costs are addition of power, addition of recreation which involves redistribution of storage allocations and not merely the addition of specific recreation facilities, or addition of water supply when it entails significant loss of flood control or other benefits.

(2) In addition to all modification costs required to add a new purpose to an existing project, joint-use costs equivalent to benefits foregone by pre-existing authorized project purposes should be assigned to the new purpose. These benefits and cost assignments should be computed using the current year interest rate and benefit levels for all purposes. (Should this computation result in an annual cost exceeding annual benefits for the added purposes, it obviously would not be economically justified. Joint-use costs assumed by the new purpose would be at current price (benefit) levels, establishing equity for that purpose. Cost reductions to pre-existing authorized purposes would be in proportion to lost benefits which should be proportional to any repayment capabilities lost by these purposes). Every effort should be made to avoid modifications to existing cost-sharing contracts. If a contract is impacted, equity must be maintained.

(6) Cost Allocations for Specific Project Purposes: Water Supply.

(a) Allocation of costs will be made in recognition of benefits and costs for future water supply that will be realized from storage included in the initially constructed plan.

(b) Where a project provides for both immediate and future water supply, the amount allocated to the future use component should be presented. The ratio of this amount to total estimated construction costs should also be given to demonstrate that allocation to future use does not exceed 30 percent of total estimated project construction cost, which is a limitation imposed by the Water Supply Act of 1958.

(7) Interest Rate for Cost Allocations: Water Supply. For water supply, the reimbursement rate may be different than the plan evaluation interest rate. The cost allocation study establishes the basis for allocation of construction costs to project purposes, and as such, the project evaluation interest rate should be used for the allocation. Cost accounts and reimbursement contracts should compute interest during construction and annual interest and amortization at the applicable reimbursement rate.

(8) Cost Allocation Prior to Initiation of Construction: Water Supply.

(a) Where water supply for immediate use is included in a plan, contracts should be executed with water users prior to initiation of construction or purchase of lands. Water users' responsibilities are fixed in terms of the percentages of specific and joint-use costs from the cost allocation report to be applied to actual cost as constructed.

(b) In most cases, a cost allocation under these circumstances will be based on preconstruction, engineering and design studies. However, costs, benefits, and all other aspects of the project should reflect the latest approved estimates.

(9) Addition of Water Supply to Completed Project. When addition of water supply is incidental and of no severe effect on other project purposes, and the project scope is not altered, a cost allocation should not be performed. Determination will be made as to appropriate charges for water supply. Adjustments to existing project purposes should be made by an internal bookkeeping credit as detailed in paragraph E-63i(9)(b) An example of appropriate charge determination when storage is reallocated is described below. This approach may be used on allocations for additions of other plan purposes, as determined appropriate by the District Commander subject to approval from HQUSACE. Questions on the use of this approach may be addressed to HQUSACE (CECW-P).

(a) Price of Water Supply Storage. The cost to the non-Federal interests for reallocated storage is established as the incremental increase in operations and maintenance costs plus the highest of benefits or revenues foregone, replacement costs, or the updated cost of storage in the Federal project.

(1) Benefits Foregone. Benefits foregone are estimated using a standard Corps NED economic evaluation using a constant price level, the Federal discount rate, and conditions projected for the remaining economic life of the project or 50 years, whichever is greater.

(2) Revenues Foregone. Revenues foregone to hydropower are the reduction in revenues accruing to the U. S. Treasury, based on existing rates charged by the power marketing agency as a result of the reduction in the hydropower.

(3) Replacement Cost. For reallocations from hydropower, the long-term replacement cost of power should normally be the same as benefits foregone. In some instances, however, where the power marketing agency has existing contracts with their customers, the replacement cost of power may be determined by the estimated cost to the power marketing agency to obtain outputs from alternative sources to fulfill the Federal Government contractual obligations for the duration of the contracts. Once the contracts expire, the replacement cost of power should be equal to the benefits foregone for the remainder of the period of analysis.

(4) Updated Cost of Storage. The costs to be reallocated to the water supply storage are determined by first computing the costs at the time of construction by using the Use of Facilities cost allocation procedures as follows:

| |
|---|
| (Total construction cost - specific costs) x [Storage reallocated (ac-ft)/Total usable storage (ac-ft)] |

The cost allocated to the storage on this basis is then escalated to present day price levels. Costs are to be indexed from the midpoint of the physical construction period to the beginning of the fiscal year in which the contract for the reallocate storage is approved. By use of this procedure, interest during construction is eliminated from consideration. The cost of storage determined by this method is compared against the cost of the least costly alternative as determined in subparagraph (5) below. Based on this comparison, the FOA should recommend a cost for the water storage space, and provide justification for that recommendation. Operation, maintenance and major replacement costs should be computed annually by the Use of Facilities Method and added to the cost of the storage to determine the total yearly payment.

(5) Financial Feasibility. As a test of financial feasibility, the governing annual cost of storage derived as determined above should be compared to the annual cost of the most likely, least costly alternative that would provide an equivalent quality and quantity of water which the local interest would undertake in absence of utilizing the Federal project. This analysis is to be included in reports which request the reallocation of storage for municipal and industrial water supply.

(b) Cost Accounts. All income and expenses (investment, operation, maintenance, and replacement) associated with the water supply function should be separately identified in the official cost account record. When there is a loss of revenue to existing purposes, or additional operation and/or maintenance expense to existing purposes are incurred because of the new water supply addition, such charges should be shown as a direct charge against the water supply function. This will effect the appropriate cost reductions in the existing project purposes and all revenues from the new addition will be credited to the new purpose.

(c) Hydropower Credit. While existing signed contracts between the power marketing agency and their power customers are in force the power marketing agency may be given credit for the incremental increase in costs incurred to obtain power for these contracts (revenues foregone plus the incremental increase in the cost to purchase power, i.e. replacement cost). After the expiration of current contracts, the power marketing agency will be credited for the amount of revenues to the U.S. Treasury foregone as a result of the reallocation (as determined in (2) above assuming uniform annual repayment.

(10) Cost Allocations for Specific Project Purposes: Recreation and Fish and Wildlife Enhancement. The allocation of recreation costs is made in light of the following:

(a) Recreation developed as a purpose pursuant to Public Law 89-72 or by the project authorization will bear its full and equitable share of joint-use costs. However, if recreation development must be eliminated from initial project construction because of lack of sponsorship, its later addition does not require reallocation of a share of joint-use costs to recreation. Lands may be acquired for possible future recreation and fish and wildlife development pursuant to Section 3 of Public Law 89-72. No lands, however, will be acquired under this authority unless a non-Federal public body has agreed to the same project cooperation requirements applied to all recreation lands and facilities.

(b) The inclusion of recreation in a plan pursuant to authority of the 1944 Flood Control Act does not constitute a purpose to which joint use costs are allocated. Only the cost of specific facilities and any other related costs specifically for recreation may be allocated to recreation in these cases, unless a project reformulation has been presented to Congress with costs otherwise allocated.

(c) Exceptions may be made for projects not yet constructed, if recreation is proposed as a purpose in postauthorization planning prior to the initiation of construction. These cases should be brought to the attention of the HQUSACE with a revised project reformulation and preliminary cost allocation report incorporating allocation of costs to recreation as a purpose.

(11) Lake Recreation Benefits. Recreation, sports fishing and wildlife enhancement, which are derived primarily from availability and use of the lake, should be treated as a single purpose in the cost allocation process, if required to properly identify separable lake costs for their common use. Suballocation of separable costs should be made as necessary to identify cost-sharing requirements for different sponsors.

(12) Downstream Benefits: Recreation and Fishery. Recreation and fishery benefits accruing downstream as a result of lake releases are not usually associated with the plan formulation and operational aspects that produce the lake recreation and fishery. When they are, derivation of an equitable apportionment of costs for these benefits would require separate consideration. The total allocation to recreation would then be presented as a combination of the two separately determined amounts. Information on plan formulation which is pertinent to the cost allocation process will dictate when this approach is to be utilized.

(13) Fish Mitigation Benefits. Fishery mitigation facilities required by plan construction are not a specific or separable cost of fishery enhancement. Even though enhancement may be realized incidentally from mitigation facilities, the separable enhancement costs calculated by SC-RB procedures are limited to incremental facilities for enhancement over and above mitigation requirements. Contributions of mitigation facilities to realization of enhancement benefits is recognized in the allocation of separable and joint costs to the enhancement purpose.

(14) Addition of Recreation and Fish and Wildlife Enhancement to Completed Projects. The provisions of Section 5 of the Federal Water Projects Act permit acquisition of lands for deferred recreation and fish and wildlife enhancement development at reservoir projects. These lands will be acquired only if a non-Federal entity agrees, prior to acquisition, to local cooperation and cost sharing requirements applied to all recreation lands and facilities. Further authorization is not required if facilities are subsequently developed. Federal costs of lands and facilities are allocable to recreation and fish and wildlife, and these are subject to cost-sharing requirements as specified by the Federal Water Projects Act. The repayment obligation begins at the time non-Federal sponsors sign a contract indicating their intent to meet the cost-sharing requirements. In plans where only this type of development is added, no joint-use costs are to be allocated. However, if a modification to the dam and lake is proposed, all modification costs for the purpose of adding recreation and fish and wildlife enhancement to the project are chargeable to the added purpose.

(15) Interest Rate: Recreation. The reimbursement rate for recreation may be different than the project evaluation interest rate. The cost allocation study establishes the basis for allocation of construction costs to project purposes, and as such, the project evaluation interest rate will be used in its preparation. Cost accounts and reimbursement contracts will compute or recompute interest during construction, and annual interest and amortization, at the applicable reimbursement rate.

(16) Incidental Fish and Wildlife Enhancement. Costs should not be allocated to fish and wildlife enhancement if such enhancement is not an authorized project purpose and the benefits to fish and wildlife are incidental to meeting other project purpose goals.

(17) Cost Allocations for Specific Project Purposes: Hydroelectric Power. Cost allocations for multipurpose projects with hydroelectric power should be coordinated with the Federal Energy Regulatory Commission (FERC). This will usually be in the form of a proposed cost allocation report. The Corps should also provide FERC with information to assist FERC in its responsibilities for specifying charges in its permits and licenses.

(18) Annual Notification of Power Marketing Agency. The appropriate power marketing agency should be notified annually as to the amount of credit, if any, that should be deducted from power reimbursement requirements based on adjustments in cost accounts.

(19) Construction Period and Price Level for Alternative Power Projects. The construction period for alternative power projects should be the average period for projects of the type and size used in the FERC analysis to determine economic benefits. The price level for the power alternative in firm cost allocations should be at a point in time one-half of the alternative project construction period back from the initial power-on-line date. The latest available price level shall be used in preliminary cost allocations.

(20) Cost Allocations for Specific Project Purposes: Navigation Projects Producing Commercial, Recreational and Land Enhancement Benefits. The costs of specific or separable project features will be allocated to the purposes served. The costs of jointly used general navigation facilities producing commercial, recreational, or land enhancement benefits, will be allocated to each use in proportion to the remaining benefits expected to accrue to each use. Thus, the costs of breakwaters would be allocated to commercial and recreational navigation, and the cost of dredging to these uses and to land enhancement as well.

(21) Cost Allocations for Specific Project Purposes: Mitigation Cost-Sharing. In the general case of multipurpose projects, for which all project costs are allocated by the separable costs-remaining benefits method (SC-RB), the mechanical procedures which lead to appropriate mitigation cost-sharing conforming to our policy are not susceptible to appreciable variation. The annual costs for mitigation measures are entered into the computations along with the annual costs for all other project features, and when these have been allocated to the several purposes the several increments of annual costs are translated back into their first cost and annual operation and maintenance (or management) cost components. These are then apportioned to Federal and non-Federal interests based on the established legislative and policy requirements for each individual purpose.

(22) Single Purpose Procedures. In the case of single purpose projects (navigation or flood control) which, on the surface, are simpler because they do not involve any elaborate allocations of costs to purposes, future reports should use the following procedure:

(a) Basic project costs (less mitigation), first costs and annual operation, and maintenance**,** repair, rehabilitation and replacement costs, will first be apportioned to Federal and non-Federal sponsors based on the established legislative and policy requirements for the project purpose.

(b) The Federal/non-Federal percentages for sharing mitigation costs will then be determined on the basis of the respective sums of basic project costs apportioned to each entity: first costs plus the capitalized (present worth) value of annual operation, maintenance, repair, rehabilitation and replacement costs.

(c) These percentages will then be applied to the sum of estimated mitigation costs: first costs for mitigation measures plus the capitalized value of annual operation, maintenance, repair, rehabilitation and replacement (or management) costs for the mitigation plan.

(d) The Federal/non-Federal share of mitigation first costs will then be adjusted as appropriate depending upon which entity is assigned actual performance of operation, maintenance, repair, rehabilitation and replacement (or management) for mitigation; that entity receiving credit, against its apportioned responsibility for total mitigation costs, for the capitalized value of the estimated costs for the annual work it will perform.

(23) Separable Cost-Remaining Benefit Method (SC-RB). This recommended method of cost allocation is extracted verbatim from: Report to the Inter-Agency Committee on Water Resources, Proposed Practices for Economic Analysis of River Basin Projects (The "Green Book", prepared by the Subcommittee on Evaluation Standards, May 1958).

> "The separable costs-remaining benefits method of cost allocation is a method for obtaining an equitable distribution of the costs of a multipurpose project among the purposes served. Briefly, it provides for: (1) assigning to each purpose its separable costs, i.e., the added costs of including the purpose in the project; and (2) assigning to each purpose a share of the residual or remaining joint costs in proportion to the remaining benefits; i.e., the benefits (as limited by alternative costs) less the separable costs. Thus, the method provides for an equitable sharing among the purposes in the savings resulting from multiple-purpose development.
>
> "The separable costs-remaining benefits method described in detail below is recommended for general use in allocating costs of Federal multiple-purpose river basin

projects. It differs from the generally recognized benefits method in that the amount of benefits used as a basis for the allocation in the recommended method is limited by the costs of available single-purpose alternative projects. In this respect it resembles closely the alternative justifiable expenditure method, except that the concept of specific costs for each purpose is replaced by the concept of separable costs for each purpose. The separable costs for each purpose are determined as part of the procedures recommended herein for project formulation, so that no added work should be required by this method of cost allocation. Since separable costs include all specific costs and generally include other added costs, residual joint costs to be allocated are usually smaller under the separable costs-remaining benefits method than under the alternative expenditure method. Thus, the separable costs-remaining benefits method maximizes the direct allocation of costs and minimizes the residual costs to be apportioned.

Description of Method

"The method consists of (1) determining the separable cost of including each function in the multiple-purpose project, and (2) determining an equitable distribution of costs incurred for several purposes in common. It makes allowance for any economic significance attributable to the peculiarities of any one purpose in its use of facilities or its prior right to project services. Thus, the use of benefits as a basis for cost allocation under this method makes allowance for both the use made of conditions assumed with respect to those factors. Furthermore, the separable costs determined through project formulation reflect the costs of providing facilities used by each purpose as explained more fully below.

"Separable Costs. The separable cost for each project purpose is the difference between the cost of the multiple-purpose project and the cost of the project with the purpose omitted. Separable costs include more than the direct or specific costs of physically identifiable facilities serving only one purpose, such as an irrigation distribution system. They also include all added costs of increased size of structures and changes in design for a particular purpose over that required for all other purposes, such as the cost of increasing reservoir storage capacity. In effect, separable costs are computed from a series of project cost estimates, each representing the multiple-purpose project with one purpose omitted. Such information will be readily available when the recommended practices of project formulation have been followed. Where project formulation has not been of the detail suggested in the recommended procedure and separable costs are not available, specific costs may be used in lieu of separable costs (as in the alternative justifiable expenditure method).

"Distribution of Residual or Remaining Joint Costs. Residual costs are here defined as the difference between the cost of the multiple-purpose project as a whole and the total of the separable costs for all project purposes. Residual costs thus represent a remaining joint cost attributable to all or several purposes. The amount of project benefits used as a basis for allocation of residual costs to any purpose is limited by the cost of providing equivalent services from the most likely economically feasible alternative source available in the area to be served. From such benefits for each purpose, separable costs are deducted to give remaining benefits. Then residual costs are distributed in proportion to the remaining benefits for each purpose. The distribution of residual costs in proportion to the excess of benefits over separable costs assigns to each purpose an equitable share of project savings.

"If the total separable costs of all purposes should exceed the cost of the multiple-purpose project, there are in effect no residual costs as defined above, but rather a joint saving, which can be distributed among purposes by reducing separable costs to obtain the allocation to each purpose instead of by adding a portion of residual costs to each separable cost as illustrated herein.

"Total Allocation. The sum of the separable costs and the allocated residual cost for each purpose constitutes the total allocation to that purpose. Under the separable costs-remaining benefits method, the total cost allocated to each purpose will not be less than the cost of including that purpose in the project (unless the total of separable costs for all purposes exceeds the multiple-purpose project costs as explained in preceding paragraph), and will not be more than the benefits of that purpose or the cost of the most economical single-purpose alternative."

j. Reporting Requirements: Firm Cost Allocation Study. The following paragraphs provide the format for the firm cost allocation report. Give name of project and location by river, State and nearby community. Indicate current status; as under construction, in operation, etc. Cite purposes of project to which costs are allocated.

(a) Plan of Improvement.

(1) Authorized Plan. Review authorizing legislation for the original plan of improvement and subsequent authorizations which modify the scope. The outline should fully cover any aspects of project authorization which have a bearing on the allocation of costs to the various purposes. Pertinent parts of authorizing legislation and recommendations in project documents should be referenced.

(2) Related Improvements. If the project is a unit in an overall development, its relationship to other units in the plan should be described. Modifications in purposes and operations contemplated when additional units in the plan are added should be explained to the extent that they are pertinent to the allocation of costs. The relationship of the project to upstream or downstream developments which have been constructed, or which are proposed for construction by others, should be outlined. If any payment for downstream benefits pursuant to the provisions of the Federal Power Act is anticipated, explain how such prospective payments have been taken into account in the cost allocation. Refer to drawing(s) included with the studies showing locations of the project and related improvements.

(3) Operational Requirements. Outline the manner in which the project is to be operated to achieve the various objectives, describing the requirements for, and relationships of, the individual purposes as they pertain to such operation. Include explanation of any use to be made of seasonal or multiple use storage, and limitations to be imposed on operations for the various purposes.

(4) Description of Project. Refer to drawings and briefly describe major features of the project such as type of construction, length, and height of dam and spillway structures; reservoir capacity; initial and ultimate power generating facilities; etc. Refer to Table E-36 for additional information. Identify facilities which are used specifically for one project purpose, facilities which are used for several but not all project purposes, and facilities used for all project purposes. Identification should be referenced to the breakdown of costs into specific and joint-use classifications given on a table entitled "Summary of Construction Expenditures" (Table E-37).

(5) Construction Program. The planning and construction program for the multipurpose project should be outlined under this paragraph. Dates when planning and construction were initiated should be stated. Dates upon which the project became, or is scheduled to become, partially and fully available for each of the major purposes should be given and related to the in-service dates used in the cost allocation.

(6) Project Costs and Charges.

(a) Construction Expenditures. Give estimate of construction expenditures for the multipurpose project, the value of items furnished without cost to the Federal Government, and amounts assigned for specific and joint-use features. Identify facilities provided in initial construction for future use and give estimated cost and bases for estimates. (See Table E-37 for breakdown of costs.) The following remarks pertain to Table E-37. This table should clearly identify specific and joint-use costs, and facilitate a comparison of the cost of similar items in the

multiple purpose and alternative projects, both single purpose and multipurpose with each purpose omitted. Costs should be segregated in this table generally in accordance with the classification of permanent features as outlined in ER 37-2-10.

- Funds allocated for CP&E prior to authorization are not included in project costs if the funds are obligated prior to 1 October 1985. Funds allocated for CP&E obligated on or after 1 October 1985 and all advance engineering and design funds shall be made a part of the cost allocated to project purposes and of the cost apportionment between Federal and non-Federal shares, except where exempted by law.

- Costs for Engineering and Design and for Supervision and Administration will be distributed to the applicable project features.

- Costs will be recorded against sub-features necessary to identify the source of specific and joint-use costs.

- Care should be exercised in identifying specific and joint-use features because of the relationship between the breakdowns made for the cost allocation report and subsequent accounting of actual costs.

- Fish facilities should be segregated as between mitigation and specific enhancement facilities.

- Any specific recreation costs for lands or other items not under the recreation account should be identified.

- Wildlife enhancement lands should be shown as a separate line item.

- Costs not allocable to project purposes, such as certain highway improvement costs and certain costs related to cultural resources, should be identified and carried as separate line items.

Table E- 36 Cost Allocation Report: Lake Pertinent Data

| Item | Unit | Multiple-purpose Project (as constructed) | Alternative single-purpose Project (Power) | Alternative multiple-purpose project | |
|---|---|---|---|---|---|
| | | | | Without Power | Without Flood Control |
| **General** | | | | | |
| Location: | | Middle Fork Willamette River | Middle Fork Willamette River | Middle Fork Willamette River | Middle Fork Willamette River |
| RM above Mouth of Middle Fork Willamette | Mile | 47.8 | 47.8 | 47.8 | 47.8 |
| RM above Lookout Point Dam | Mile | 26.5 | 26.5 | 26.5 | 26.5 |
| Drainage Area | Sq. mile | 389 | 389 | 389 | 389 |
| **Reservoir** | | | | | |
| Elevation: | | | | | |
| Full & Max. Pool | Ft MSL | 1,543 | 1,536 | 1,524 | 1,541 |
| Flood Control Pool | Ft MSL | 1,543 | - | 1,524 | - |
| Max. Conservation Pool | Ft MSL | 1,541 | - | 1,522 | 1,541 |
| Max. Secondary FC Pool | Ft MSL | 1,480 | - | - | - |
| Min. FC Pool | Ft MSL | 1,448 | - | 1,414 | - |
| Min. Power Pool | Ft MSL | 1,414 | 1,411 | - | 1,414 |
| Stream bed at dam axis | Ft MSL | 1,244 | 1,244 | 1,244 | 1,244 |
| Minimum tailwater | Ft MSL | 1,223 | 1,223 | 1,223 | 1,223 |
| Reservoir area: | | | | | |
| Maximum Pool | Acre | 2,735 | 2,650 | 2,480 | 2,715 |
| Flood Control Pool | Acre | 2,735 | - | 2,480 | - |
| Conservation Pool | Acre | 2,715 | - | 2,450 | 2,715 |
| Max. Secondary FC Pool | Acre | 1,930 | - | - | - |
| Min. FC Pool | Acre | 1,575 | - | 1,320 | - |
| Min. Power Pool | Acre | 1,325 | 1,300 | - | 1,325 |
| Storage capacity: | | | | | |
| Total | Acre-foot | 356,000 | 337,000 | 307,000 | 350,000 |
| Flood Control, primary | Acre-foot | 145,000 | None | 200,000 | - |
| Flood Control, Secondary | Acre-foot | 55,000 | - | - | - |
| Power | Acre-foot | 49,000 | 233,000 | None | 243,600 |
| Dead + Inactive | Acre-foot | 107,000 | 104,000 | 107,000 | 107,000 |
| Summer Flood Control | Acre-foot | 5,400 | - | 5,400 | - |
| **Dams & Appurtenances** | | | | | |
| Dam: | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Type | | | Earth and Gravel Fill | Earth and Gravel Fill | Earth and Gravel Fill | Earth and Gravel Fill |
| Elevation, top of dam | Ft MSL | | 1,548 | 1,541 | 1,529 | 1,546 |
| Length | Feet | | 2,150 | 2,135 | 2,105 | 2,135 |
| Height (from stream bed) | Feet | | 304 | 297 | 285 | 302 |
| Spillway: | | | | | | |
| Type | | | Gated chute | Gated chute | Gated chute | Gated chute |
| Elevation of crest | Ft MSL | | 1,495.5 | 1,486.7 | 1,476.5 | 1,491.7 |
| Number of gates | | | 3 | 3 | 3 | 3 |
| Size of gates | | Feet | 42x47.3 | 42x49.5 | 42x47.5 | 42x49.3 |
| Spillway design flood (reservoir inflow) | | c.f.s. | 151,000 | 151,000 | 151,000 | 151,000 |
| Spillway design capacity | | c.f.s. | 141,600 | 151,000 | 141,600 | 151,000 |
| Fish Facilities: | | | | | | |
| At site | | | None | None | None | None |
| At existing Leaburg Hatchery | | | Added ponds | Added ponds | Added ponds | Added ponds |
| Outlet conduits: | | | | | | |
| Type | | | Tunnel | Pipe | Tunnel | Pipe |
| Diameter of tunnel or pipe (bypass) | | | | | | |
| Operating gates (or bypass valve) | | | 13’9” | 2’0” | 13’9” | 2’0” |
| Emergency gates (or bypass valve | | each | 2-6’6”x12’6” | 1-24” | 2-6’6”x12’6” | 1-24” |
| Penstocks: | | each | 2-6’6”x12’6” | 1-24” | 2-6’6”x12’6” | 1-24” |
| Number | | | 1 | 1 | - | 1 |
| Diameter | | feet | 12 | 12 | - | 12 |
| **Power Plant** | | | | | | |
| Powerhouse: | | | | | | |
| Type | | | Indoor | Indoor | - | Indoor |
| Dimension | | | 55’3”x118’6” | 55’3”x118’6” | - | 55’3”x118’6” |
| Installed capacity: | | | | | | |
| Number of generating units | | | 2 | 2 | - | 2 |
| Capacity of units, each | | KW | 15,000 | 15,000 | - | 15,000 |
| Installed capacity | | KW | 30,000 | 30,000 | - | 30,000 |
| In-service dates: | | | | | | |
| 1st unit | | | May 1962 | May 1962 | | May 1962 |
| 2nd unit | | | May 1962 | May 1962 | | May 1962 |
| **Power Data** | | | | | | |
| Operating gross head: | | | | | | |
| Maximum | | Feet | 317 | 310 | - | 315 |
| Minimum | | feet | 188 | 185 | - | 186 |
| Net regulated flow: | | | | | | |
| Average critical period net power flow | | c.f.s | 746 | 724 | - | 746 |
| Power available (31 months) | | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| Continuous power, critical hydro. Period | Kw | 13,100 | 13,100 | - | 13,100 |
| Dependable power, critical hydro. Period | Kw | 16,400 | 16,400 | - | 16,400 |
| Minimum peaking capability | Kw | 24,200 | 24,000 | - | 23,400 |
| Primary energy per year | Kwh | 114,756,000 | 114,756,000 | - | 114,756,000 |
| Total energy per year | Kwh | 162,279,000 | 162,279,000 | - | 162,279,000 |
| Load factor critical period | Percent | 80 | 80 | - | 80 |

## Table E- 37 Cost Allocation Report: Lake Summary of Construction Expenditures

| Permanent Features | Multiple Purpose Project (as constructed) Specific Cost Power | Joint Use Cost | Total Cost | Alternative Single-Purpose Project Power | Alternative multiple purpose-projects Without Power | Without Flood Control |
|---|---|---|---|---|---|---|
| Lands and Damages | -- | $743,100 | $743,100 | $743,100 | $715,300 | $743,100 |
| Relocation | -- | 9,858,200 4/ | 9,858,200 | 9,858,200 | 9,593,200 | 9,830,200 |
| Reservoirs | -- | 1,024,300 | 1,024,300 | 992,300 | 928,800 | 1,016,800 |
| Dams | $3,137,600 | 26,946,800 | 30,084,400 | 25,709,500 | 24,025,900 | 26,918,500 |
| Main dam | | (23,947,900) | (23,947,900) | (22,505,900) | (21,207,900) | (23,659,900) |
| Outlet Works (exclusive of power) | | (2,943,900) | (2,943,900) | (66,000) 3/ | (2,763,000) | (66,000) 3/ |
| Power Intakes works | (3,124,600) | -- | (3,124,600) | (3,124,600) | -- | (3,124,600) |
| Domestic and powerhouse fire Protection water supply inlet | (13,000) 1/ | (55,000) 2/ | (68,000) | (13,000) 1/ | (55,000) 2/ | (68,000) |
| Fish Facilities (for Mitigation) | -- | 140,500 | 140,500 | 140,500 | 140,500 | 140,500 |
| Power Plant | 3,412,000 | -- | 3,412,000 | 3,412,000 | -- | 3,412,000 |
| Roads, Railroads, and Bridges | -- | 130,500 | 130,500 | 130,500 | 70,000 | 130,500 |
| Buildings, Grounds, & Utilities | -- | 227,800 | 227,800 | 227,800 | 227,800 | 227,800 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Permanent Operating Equipment | -- | 97,100 | 97,100 | 72,100 | 64,200 | 72,100 |
| Project Cost 2/ | $6,549,600 | $39,168,300 | $45,717,900 | $41,118,000 | $35,765,700 | $42,491,500 |
| Credit | | | | | | |
| Transfer of property without cost | 300 | -17,600 | -17,300 | -- | -- | -- |
| TOTAL EXPENDITURE OF PROJECT FUNDS | $6,549,900 | $39,150,700 | $45,700,600 4/ | $41,118,000 | $35,765,700 | $42,491,500 |

Note: The alternative single-purpose flood control project is substantially the same as the alternative multiple-purpose project without power, as shown above. The alternative multiple-purpose projects without irrigation and without navigation are identical to the overall multiple-purpose project shown above.

1/ Fire protection facilities.
2/ Water supply facilities for possible future use.
3/ Increased size of bypass pipe (for conservation releases) 20" to 24".
4/ Exclusive of $500,000 non-allocable highway improvement costs.

(b) Interest During Construction. Refer to tables on "Interest During Construction" and explain method by which interest during construction for the multipurpose project has been calculated. Interest during construction will be separately identified for the cost of specific facilities (Table E-38) and the cost of joint-use facilities (Table E-39). Computations will be based on scheduled construction expenditures (including value of items transferred), either actual or estimated. Interest will be computed from the middle of the month in which expenditures are incurred until the first of the month following the availability for service. Interest on any additional expenditures after the in-service date will be an operating expense. The various features and sub-features of a project will be considered in service progressively as they are completed and the project is available for serving the corresponding purposes. For this purpose, is not contemplated that features and sub-features related to a project purpose will be reported individually as sub-items but will be treated essentially as a unit, such as the specific flood control facilities being considered in service at the time the project is completed to the extent that it is available for flood control. The in-service date for a feature or sub-feature will be considered as the first of the month following the availability for service. In-service dates will be documented by memorandums to files or reported to higher authority as provided in other regulations. At the time the project is available for serving a particular purpose, the total cost of the joint-use facilities allocated to that purpose will be considered in-service, and interest during construction on those costs will be discontinued. For a multiunit power installation, each generating unit together with its proportionate share of joint-use facilities will be considered separately for purposes of computing interest during construction. Thus, when the first unit of a four unit power installation is available for service, interest during construction will be discontinued on one-fourth (assuming 4 identically sized power units) of the total cost of the specific power facilities, as well as interest on one-fourth of the total

(c) Investment Cost. The total project investment cost consisting of construction expenditures, (including value of items transferred without cost to the Federal government) plus interest during construction, will be summarized. If the project includes non-allocable costs, this will be noted and total investment subject to allocation will be emphasized.

(d) Annual Costs.

- Interest and Amortization. Interest rate and economic life at which costs are amortized will be specified and the amount of annual interest and amortization costs will be cited. The basis for establishment of the project interest rate will be presented.

Table E- 38 Cost Allocation Report: Lake Interest During Construction - Specific Power Facilities

| Period | | Expenditures | | | | Interest During Period |
|---|---|---|---|---|---|---|
| Beginning D.M.Y. | End D.M.Y. | During Period | At Beginning of Period | | | |
| | | | Total | In Operation | Interest Bearing | |
| 010352 | 300652 | 6,927 | | Dollars | | 28 |
| 010752 | 300653 | 37,277 | 6,927 | | 6,927 | 638 |
| 010753 | 300654 | 20,926 | 44,204 | | 44,204 | 1,366 |
| 010754 | 300655 | 22,270 | 65,130 | | 65,130 | 1,906 |
| 010755 | 300656 | 39,740 | 87,400 | | 87,400 | 2,680 |
| 010756 | 300657 | 133,690 | 127,140 | | 127,140 | 4,849 |
| 010757 | 300658 | 289,441 | 260,830 | | 260,830 | 10,138 |
| 010758 | 300659 | 95,148 | 550,271 | | 550,271 | 14,945 |
| 010759 | 300660 | 2,197,143 | 645,419 | | 645,419 | 43,599 |
| 010760 | 300661 | 2,643,727 | 2,842,562 | | 2,842,562 | 104,110 |
| 010761 | 301161 | 706,918 | 5,486,289 | | 5,486,289 | 60,829 |
| 011261 | 300562 | 261,187 | 6,193,207 | 1/ | 6,193,207 | 79,047 |
| 010662 | 300662 | 13,024 | 6,454,394 | 6,549,600 | 95,206- | |
| 010762 | 300663 | 57,618 | 6,467,418 | 6,549,600 | 82,182- | |
| 010763 | 300664 | 5,896 | 6,525,036 | 6,549,600 | 24,564- | |
| 010764 | 300665 | 18,653 | 6,530,932 | 6,549,600 | 18,668- | |
| 010765 | 300666 | 15 | 6,549,585 | 6,549,600 | 15- | |
| 010352 | 000000 | 6,549,600 | | | | 324,135 |

## Table E- 39 Cost Allocation Report: Lake Interest During Construction - Joint-Use Facilities

| Period | | Expenditures | | | | Interest During Period | Comments |
|---|---|---|---|---|---|---|---|
| Beginning D.M.Y. | End D.M.Y. | During Period | At Beginning of Period | | | | |
| | | | Total | In Operation | Interest Bearing | | |
| 010352 | 300652 | 40,044 | | Dollars | | 166 | |
| 010752 | 300653 | 215,459 | 40,044 | | 40,044 | 3,694 | 1/ In-service, functions other than power: |
| 010753 | 300654 | 120,951 | 255,501 | | 255,501 | 7,898 | |
| 010754 | 300655 | 128,727 | 376,454 | | 376,454 | 11,020 | .7525 x 39,169,300 = 29,473,656 |
| 010755 | 300656 | 333,567 | 505,176 | | 505,176 | 16,798 | |
| 010756 | 300657 | 2,098,401 | 838,741 | | 838,741 | 47,198 | 2/ Interest during construction of joint-use facilities other than power: |
| 010757 | 300658 | 7,428,851 | 2,937,144 | | 2,937,144 | 426,075 | |
| 010758 | 300659 | 13,354,128 | 10,365,995 | | 10,365,995 | 684,509 | Interest to date: 2,595,700 |
| 010759 | 300660 | 7,320,636 | 23,720,123 | | 23,720,123 | 846,149 | |
| 010760 | 300661 | 5,610,555 | 31,040,759 | | 31,040,759 | 385,954 | 29,474,000 x $2,595,700 - $2,042,800<br>37,452,000 |
| 010761 | 301161 | 800,654 | 36,651,314 | | 36,651,314 | 103,828[2] | |
| 011261 | 300562 | 664,157 | 37,451,968 | 29,473,656[1] | 7,978,312- | | Interest during construction of joint-use facilities chargeable to power: |
| 010662 | 300662 | 96,312 | 38,116,125 | 39,168,298 | 1,052,173- | | |
| 010762 | 300663 | 272,625 | 38,212,437 | 39,168,298 | 955,861- | | |
| 010763 | 300664 | 651,222 | 38,485,062 | 39,168,298 | 683,236- | | $2,699,600 - $2,042,800 = $656,800 |
| 010764 | 300665 | 30,392 | 39,136,284 | 39,168,298 | 32,014- | | |
| 010765 | 300666 | 1,624 | 39,166,676 | 39,168,298 | 1,622-- | | 3/ Both power units to service. |
| 010352 | 000000 | 39,168,300 | 39,168,300 | | | 2,699,627 | INOPERATION DATES OF FACILITIES<br>Power units Nos. 1 & 2 1 June 1962<br>Function other than power<br>1 December 1961 |
| | | | | | | | Trial percentages for allocation of joint costs: |
| | | | | | | | Functions other than power 75.25%<br>Power 24.75% |

- Operation and Maintenance. Give estimates of total average annual cost for operation and maintenance of the multipurpose project and the amounts assigned to specific and joint-use classifications. Give basis for these estimates. Refer to table "Summary of Average Annual Operation and Maintenance Costs" for breakdown (Table E-40). Costs for Operation and Ordinary Maintenance should be segregated in this table generally in accordance with the classification in ER 37-2-10.

- Major Replacements. A breakdown of major replacements in accordance with the Rehabilitation accounts is not normally necessary in cost allocation reports as the item is small and usually is estimated empirically. As with construction expenditures, the classification of specific and joint-use costs should be carefully prepared so that insofar as practicable the cost allocation report will be consistent with actual recorded costs. Amounts should be included in a separate line item in Table E-40.

- Total Annual Costs. Cite amount and refer to appropriate tables showing specific and joint-use costs summary (Table E-41).

(7) Project Benefits. By separate subparagraph for each purpose, give amounts of estimated benefits and reference planning reports which explain bases of estimates. Any major deviation from planning reports must be explained.

(8) Alternative Projects. Describe why estimates of alternative single purpose projects and of alternative projects with a purpose omitted are needed for the allocation study. By single or separate subparagraph describe briefly the alternative projects, costs, and investments. Refer to Tables E-36, E-37, E-40, E-41and E-42 and drawings as appropriate. In regard to interest during construction for alternative projects, the computation of such on the basis of a year-by-year analysis of costs is often impractical. In such cases the reporting offices should furnish estimates of interest during construction which they consider to be appropriate. If basic information on alternative projects or features is not of the scope indicated in the illustrative tables, in explanation should be furnished.

Table E- 40 Cost Allocation Report: Lake Summary of Annual Operation & Maintenance and Replacement Costs

| | Multiple-purpose project | | | | Alternative multiple-purpose projects | |
|---|---|---|---|---|---|---|
| | Specific Costs | | | | | |
| | Power | Control | Joint use | Total | Without power | Without Flood Control[1] |
| Operation and Maintenance | | | | | | |
| Dam, Reservoir | -- | -- | $26,000 | $26,000 | $26,000 | $26,000 |
| Real Estate Management | -- | -- | 1,000 | 1,000 | 1,000 | 1,000 |
| Roads, Railroads, and Bridges | -- | -- | 1,000 | 1,000 | 1,000 | 1,000 |
| Buildings, Grounds, Utilities, Operating Equipment | $3,000 | -- | 8,000 | 11,000 | 8,000 | 11,000 |
| Power Plant | 28,000 | -- | -- | 28,000 | -- | 28,000 |
| Fish and Wildlife Facilities | -- | -- | 18,000 | 18,000 | 18,000 | 18,000 |
| Condition and Operation Studies | 3,000 | $2,000 | 20,000 | 25,000 | 20,000 | 20,000 |
| Supervision, Administration, and Reports | 3,000 | 1,900 | 5,000 | 9,900 | 5,000 | 5,000 |
| Surveys and Layouts | -- | -- | 1,000 | 1,000 | 1,000 | 1,000 |
| Subtotal - Operation and Maintenance | $37,000 | $3,900 | $80,000 | $120,900 | $8,000 | $111,000 |
| Major Replacements | 14,000 | -- | 7,000 | 21,000 | 7,000 | 20,600 |
| Total | $51,000 | $3,900 | $87,000 | $141,900 | $87,000 | $131,600 |

1/ Also applicable to the alternative single purpose power project

## Table E- 41 Cost Allocation Report: Lake Summary of Costs, Charges, and Benefits

| | Multiple-Purpose Project[3/] | Alternative Projects | | |
|---|---|---|---|---|
| | | Single Purpose | Multiple-Purpose | |
| | Total | Power | Without Power[1/] | Without Flood Control |
| Construction Costs | $45,717,900 | $41,118,000 | $35,765,700 | $42,491,500 |
| Interest During Construction | | | | |
| Specific facilities costs | | | | |
| Power | 324,100 | 2,677,000 | -- | 324,100 |
| Joint-use facilities | 2,699,700 | -- | 2,365,500 | 2,486,400 |
| Total | 3,023,800 | 2,677,000 | 2,365,500 | 2,810,500 |
| Federal Investment | 48,741,700 | 43,795,000 | 38,131,200 | 45,302,000 |
| Average Annual Charges | | | | |
| Interest and amortization | 1,718,600 | 1,544,200 | 1,344,500 | 1,597,400 |
| Operation and maintenance | 120,00 | 111,000 | 80,000 | 111,000 |
| Major replacements | 21,000 | 20,600 | 7,000 | 20,600 |
| Total | 1,860,500 | 1,675,800 | 1,432,500 | 1,729,000 |
| Average Annual Benefits | | | | |
| Flood control | 3,945,000 | -- | 3,945,000 | -- |
| Irrigation | 258,100 | -- | 258,100 | 258,100 |
| Power | 793,500 | 793,500 | 7,000[2/] | 793,500 |
| Navigation | 33,500 | -- | 33,500 | 33,500 |
| Recreation | 167,000 | -- | 167,000 | 167,000 |
| Total | 5,197,100 | 793,500 | 4,410,600 | 1,252,100 |
| Benefit-to-Cost Ratio | 2.79 to 1 | | | |

[1/]Alternative single-purpose flood control project would be the same as the multiple purpose project without power.
[2/]Downstream power.
[3/]Exclusive of non-allocable highway improvement costs: construction $500,000; investment $530,000; interest and amortization $18,700

Note: Recreation was not a purpose to which joint costs were allocated. There were no costs for specific facilities. If recreation facilities had been included, these would have been charged as a specific recreation cost.

- Alternative Single Purpose Projects. The most likely single purpose alternatives should in general be something other than a single purpose project constructed at the same general site as the multipurpose project. For example, the most economical single purpose alternative for power is likely to be a steam, nuclear, combustion turbine, or combined cycle plant. A likely alternative for water supply that would be developed in absence of the multipurpose project is a tributary site development or wells. An alternative project for recreation might be one or a number of smaller lakes at other nearby sites. The alternative costs used in the allocation process as a limitation on benefits should be determined on the basis of financing costs comparable to the Federal plan. The alternative used to limit benefits should be available at the same time as the multipurpose project, or where benefits are based on future need, at the time the alternative project would be required to satisfy the need. Discounting based on future use may be a factor if the entire project purpose is based on a future requirement, or if the requirement is for an increasing project output and construction of the alternative single purpose project would be staged by the non-Federal sponsor. An example of the matter would be adding wells to an alternative water supply project as the demand for water increased. In some cases, the development of detailed data on alternative single purpose plans may not be required; for example, where it can be conclusively established that costs would be greatly in excess of benefits and hence would not be a limitation on the amount allocated to the purpose.

- Alternative projects with a purpose omitted should briefly describe significant differences from the multipurpose project as constructed to permit understanding of the separable costs determination. Reference should be made to appropriate tables. A derivative table (Table E-43) showing separable costs of each function, for construction, investment, OM&R and total annual costs, should be presented.

(9) Discussion of Cost Allocation Method. The cost allocation method will be briefly described, referring to steps of the allocation and the conversion of cost allocation results to cost accounting application in terms of specific facilities costs and allocated joint-use costs. Reference should be made to the cost allocation table (Table E-44).

(a) If costs included in the allocation cover both initial and future costs, results in Table E-44 will include subheadings (1) and (2) under table line item 5g to show breakdown between initial construction cost and additional future costs (present worth value if appropriate) respectively. It may be desirable to present a summary tabulation (Table E-46), particularly if the cost allocation has included both initial and future costs. In such cases, Table E-45 would be limited to initial costs, providing a better understanding of results for cost accounting use.

Table E- 42 Cost Allocation Report: Lake Annual Benefits, Multipurpose Project

| | | | |
|---|---|---|---|
| 1. | FLOOD CONTROL | | $3,945,000 |
| 2. | NAVIGATION | | 33,500 |
| 3. | POWER | | |
| | a. At site | | |
| | Capacity: 16,400 x 19.29 x .955 | $302,100 | |
| | Energy: 162,279,000 x .00386 x .965 | 604,500 | |
| | Less cost of transmission: 34,500 x 3.48 - | 120,000 | |
| | Net benefit at load center | | 786,500 |
| | b. Downstream | | |
| | Capacity | | |
| | Energy: 2,800,000 kwh at 2.5 mills | | 7,000 |
| 4. | IRRIGATION | | 258,100 |
| 5. | RECREATION | | 167,000 |
| | TOTAL | | $5,197,100 |

(b) Proper understanding of the cost allocation requires inclusion of data as presented in tables E-36 through E-45. The data should generally be presented in the format shown to provide understanding of the relations between the multipurpose project and alternative projects as to pertinent data, costs, and benefits. Additional tables as required should be included on computation of interest during construction (IDC) for all purposes with specific facilities.

(c) The procedures for computation as illustrated in the tables required that an approximate determination be made of percentages for allocating joint-use construction costs in order to derive project investment. Interest during construction is partially dependent on the allocation, yet the estimated investment is required before the cost allocation can be made. The approximation can be made using construction expenditures instead of investment, or by approximating percentage for placing plant in service in computing interest during construction on joint-use costs. Where the approximate percentages do not differ more than one-half of one percent from the final percentages determined for allocating construction cost, no further adjustment is necessary. Where the deviation is greater than one-half of one percent, a subsequent refinement shall be made in the computations. It is not necessary to include the trial allocation in the report. However, the table showing interest during construction on joint-use facilities should state the trial percentages used in placing purposes in service, and other data as required for understanding the computation of interest during construction (reference footnotes on Table E-39).

(10) Summary of Cost Allocation Findings.

(a) The final paragraphs of the text should present the percentages for cost accounting use, including those for joint-use construction costs and for O&M costs rounded to the nearest one-tenth of one percent. It should be specified that percentages for operation and maintenance are also applicable to replacement costs.

Table E- 43 Cost Allocation Report: Lake Determination of Separable and Joint Costs

| Item | Construction Expenditures | Investment | Annual Charges | | | | |
|---|---|---|---|---|---|---|---|
| | | | Operation and Maintenance | Interim Replacements | | Interest and Amortization | Total |
| MULTIPLE-PURPOSE PROJECT | | | | | DOLLARS | | |
| As Constructed | 45,717,900 | 48,741,662 | 120,900 | 21,000 | | 1,718,631 | 1,860,531 |
| Without Flood Control | 42,491,500 | 45,301,869 | 111,000 | 20,600 | | 1,597,343 | 1,728,943 |
| Without Irrigation | 45,717,900 | 48,741,661 | 120,900 | 21,000 | | 1,718,630 | 1,860,530 |
| Without Navigation | 45,717,900 | 48,741,661 | 120,900 | 21,000 | | 1,718,630 | 1,860,530 |
| Without Power | 35,765,700 | 38,131,227 | 80,000 | 7,000 | | 1,344,507 | 1,431,507 |
| SEPARABLE COST | | | | | | | |
| Flood Control | 3,226,400 | 3,439,793 | 9,900 | 400 | | 121,288 | 131,588 |
| Power | 9,952,200 | 10,610,435 | 40,900 | 14,000 | | 374,124 | 429,024 |
| Total Separable Costs | 13,178,600 | 14,050,230 | 50,800 | 14,400 | | 495,414 | 560,614 |
| RESIDUAL COSTS | 32,539,300 | 34,691,432 | 70,100 | 6,600 | | 1,223,217 | 1,299,917 |

Apparent minor discrepancies are caused by electronic data processing equipment being programmed to drop all the digits to the right of the units column in computed values instead of rounding and adjusting the number in the units column.

Table E- 44 Cost Allocation Report: Lake Allocation by Separable-Cost-Remaining-Benefit Method[1]

| Item | Function | | | | |
|---|---|---|---|---|---|
| | DOLLARS, unless otherwise noted | | | | |
| | Flood Control | Irrigation | Navigation | Power | Total |
| 1. Allocation of annual costs: | | | | | |
| a. Average annual benefits | 3,945,000 | 256,100 | 33,500 | 793,500 | 5,030,100 |
| b. Alternate costs | 1,430,300 | | | 1,675,000 | |
| c. Limited benefits | 1,430,300 | 258,100 | 33,500 | 793,500 | 2,515,400 |
| d. Separable costs | 131,588 | | | | 560,614 |
| e. Remaining benefits | | | | | |
| (1) Amount | 1,298,712 | 258,099 | 33,499 | 364,476 | 1,954,786 |
| (2) Percent of total | 66.44 | 13.20 | 1.71 | 18.65 | 100.00 |
| f. Allocated joint costs | 863,633 | 171,633 | 22,276 | 242,373 | 1,299,917 |
| g. Total allocation | 995,221 | 171,634 | 22,277 | 671,397 | 1,860,531 |
| 2. Allocation of operation and maintenance costs: | | | | | |
| a. Separable costs | 9,900 | | | 40,900 | 50,800 |
| b. Allocated joint costs | 46,572 | 9,255 | 1,201 | 13,070 | 70,100 |
| c. Total allocation | 56,472 | 9,255 | 1,201 | 53,970 | |
| 3. Allocation of major replacements: | | | | | |
| a. Separable costs | 400 | | | 14,000 | |
| b. Allocated joint costs | 4,384 | 871 | 113 | 1,230 | |
| c. Total allocation | 4,784 | 871 | 113 | 15,230 | |

Apparent minor discrepancies are caused by electronic data processing equipment being programmed to drop all the digits to the right of the units column in computed values instead of rounding and adjusting the number in the units column.

Table E-44 (cont.). Cost Allocation Report: Lake Allocation by SC-RB Method

| Item | Function | | | | |
|---|---|---|---|---|---|
| | DOLLARS, unless otherwise noted | | | | |
| | Flood Control | Irrigation | Navigation | Power | |
| 4. Allocation of investment: | | | | | |
| a. Annual investment cost | 933,965 | 161,508 | 20,963 | 602,197 | |
| b. Allocated investment | 26,487,946 | 4,580,487 | 594,526 | 17,078,757 | |
| 5. Allocation of construction expenditures: | | | | | |
| a. Special investment | | | | 6,873,735 | |
| b. Investment in conventional joint-use facilities | 26,487,946 | 4,580,487 | 594,526 | 10,205,022 | |
| c. Interest during construction on conventional joint-use facilities | 1,708,911 | 295,517 | 38,356 | 656,845 | |
| d. Construction expenditure in conventional joint-use facilities | 24,779,035 | 4,284,970 | 556,170 | 9,548,177 | |
| e. Percent of construction expenditures in conventional joint-use facilities | 63.26 | 10.94 | 1.42 | 24.38 | |
| f. Construction expenditures in specific facilities | | | | 6,549,600 | |
| g. Total construction expenditures | 24,779,035 | 4,284,970 | 556,170 | 16,097,777 | |

[1/] Exclusive of non-allocable highway improvement costs, as noted in Table 7.

Table E- 45 Cost Allocation Report: Lake

| Item | Flood Control | Irrigation | Power | Navigation | Total |
|---|---|---|---|---|---|
| | Thousands of Dollars | | | | |
| Construction expenditures:[1/] | | | | | |
| Total allocation | $24,779.0 | $4,285.0 | $16,097.8 | $556.1 | $45,717.9 |
| Specific expenditures | 0 | 0 | 6,549.6 | 0 | 6,549.6 |
| Allocated joint-use expenditures | 24,779.0 | 4,285.0 | 9,548.2 | 446.1 | 39,168.3 |
| Percent of joint-use expenditures | 63.3 | 10.9 | 24.4 | 1.4 | 100.0 |
| Operation and ordinary maintenance: | | | | | |
| Total allocation | 56.4 | 9.3 | 54.0 | 1.2 | 120.9 |
| Specific costs | 3.9 | 0 | 37.0 | 0 | 40.9 |
| Allocated joint-use costs | 52.5 | 9.3 | 17.0 | 1.2 | 80.0 |
| Percent of cost of conventional joint-use facilities | 65.6 | 11.6 | 21.3 | 1.5 | 100.0 |

[1/] Exclusive of $500,000 highway improvement costs.

Table E- 46 Cost Allocation Report: Lake Summary of Cost Allocation Findings

| | CONSTRUCTION 1/ | O&M 2/ |
|---|---|---|
| Flood Damage Prevention | 63.3 | 65.6 |
| Power | 24.4 | 21.3 |
| Irrigation | 10.9 | 11.6 |
| Navigation | 1.4 | 1.5 |

1/ Non-allocable highway relocation costs are not included, but costs in the amount of dollars are set aside as a highway improvement cost.
2/ Applicable also to replacements costs.

(b) Appropriate reference should be made to separable recreation costs relative to specific costs. If they differ, information must be presented to permit accounting identification of separable costs consistent with the cost allocation findings. Identification will be by designation of sub-features or proportionate part, as may be appropriate. The summary findings should also make reference to any non-allocable costs. If final amounts are known at the time of the allocation study, these should be cited. Otherwise, information should be provided as to how final determination will be made, with reference to a percentage of appropriate feature or sub-feature costs.

(c) The summary, with reference to the project cost allocation, should be presented as in Tables E-44 and E-45. For application to financial records, the percentages for allocations of joint-use costs are summarized as in Add cost allocation file here.

## SECTION X - Major Rehabilitation Studies

E-64. Background. Major Rehabilitation projects began to be budgeted under Construction, General and Flood Control, Mississippi River and Tributaries (construction element) appropriation accounts beginning in FY 1993. Major Rehabilitation new starts have to compete with other types of new construction starts for scarce resources. To successfully compete as new starts, Rehabilitation Evaluation Reports and supplemental information sheets will have to provide a level of detail and evidence of criticality commensurate with other civil works new starts. The following steps outline generic procedures which can be used to evaluate major rehabilitation projects. Although these guidelines have primarily been used in evaluating hydropower and inland navigation projects, they are applicable to other project purposes.

a. Federal Interest. For the majority of cases, the Federal interest in an existing project will be obvious. However, reasonable argument which shows a Federal interest, and in some cases, a non-Federal interest (i.e. proposed cost sharing), will be provided in the report. Emphasis shall be placed on project outputs and whether they serve priority purposes as defined in the Annual Program and Budget request for Civil Works Activities, Corps of Engineers.

b. Base Condition. The base condition is the alternative which all other plans will be measured against. In comparison to other Corps planning studies, the base condition is synonymous with the without project condition. The base condition assumes that the project will be operated in the most efficient manner possible without the proposed rehabilitation. This treatment of the base condition is uniquely defined and applicable only to analysis of major Rehabilitation projects. Should the project benefit stream be interrupted due to unsatisfactory feature performance, it is assumed that emergency funds will be available to fix the feature. For the economic analysis, allowance must be made for the effect of the repair on the reliability of the feature. Considerable risk and uncertainty is inherent in the base condition. The timing, frequency, and consequences of system disruption are all unknown and must be estimated. The analysis should explicitly show the effects of reasonable alternative assumptions concerning these variables. Portray the base condition in the following manner.

(1) Step 1. Based upon the reliability index calculated for the current physical condition select the probability of unsatisfactory performance for each feature, or component, from the Target Reliability Indices Table in the annual Major Rehabilitation Guidance. If the probability of unsatisfactory performance is due to a combination of events, provide the method used to determine these probabilities. Both the probability of unsatisfactory performance of a feature and the probability of occurrence of an event which results in load conditions causing the unsatisfactory performance shall be explicitly discussed and displayed. Reporting requirements to support the reliability analysis are also addressed in the Major Rehabilitation Guidance.

(2) Step 2. Based on the existing physical condition of, and the current and forecasted demands on the features, estimate the frequency of service disruption and the physical consequences resulting over the planning period. Frequencies and consequences should be expressed in terms which are unambiguous and which facilitate analysis. For example, estimate the percent chance of disruption per year (annual probability) or probability of disruption per event (per event probability).

(3) Step 3. Develop an event tree. A useful way of presenting information of alternative future pathways is an event tree diagram. The event tree is used to display the possible outcomes from some initiating event.

(4) Step 4. Estimate All Costs Necessary to Correct the Service Disruption. The repair should be the least cost fix necessary (as considered reasonable for the circumstances) to continue service.

(5) Step 5. Estimate the Economic Cost for Each Disruption. (The economic cost for different project purposes should be calculated using the guidelines contained in other sections of this appendix)

(6) Step 6. Combine the frequency of service disruption with the consequences of disruption. Monte Carlo simulation is one technique for combining risks and determining expected values. This technique is especially useful when the arithmetic of the expected value calculation is highly complex or intractable. Under some, perhaps many situations, the standard statistical procedure of summing the products of the probabilities and corresponding consequences is sufficient. That is, calculating the value analytically may be more expedient and transparent than estimating by simulation. An advantage of the Monte Carlo approach is that it yields both the expected value and the variance. The fundamental point of the analysis however, is to explicitly consider the likelihood and consequences of the base condition.

c. With Rehabilitation Condition.

(1) General. As previously stated, the base condition should not describe an immediate or certain failure. Nor is the only project alternative immediate and full scheduled rehabilitation. There are a variety of intermediate strategies that should be evaluated. In addition, the rehabilitation decision must give consideration to the choice of timing and extent of rehabilitation. Therefore, the approach is to develop alternatives to solve the problems. This does not predetermine that one major rehabilitation scenario is the only alternative.

(2) Alternatives Considered. Discuss the alternatives considered. The narrative should address the level of detail developed for each alternative, the data available, assumptions made

and the level of reliability, risk and uncertainty associated with the alternative. Present the results of the analysis for each alternative. The following represent some potential alternative plans that should be evaluated and compared.

- Advance maintenance strategy. Advance maintenance consists of expenditures in excess of routine O&M that reduces the likelihood of some emergency repairs and temporary service losses, or the rate of service degradation. Under this scenario, one must evaluate the effect that probabilities and consequences of the strategy have on expected service disruptions and reliability.

- Scheduled repair strategy. Assess the components of the feature in terms of the service disruption probabilities and consequences to the reliability of the structure. Based on this assessment, stockpile replacement parts and make other preparations on this assessment to reduce the time of expected project service disruption.

- Scheduled rehabilitation strategy. The scheduled rehabilitation strategy requires that the optimum rehabilitation timing be identified based on service disruption rates, service degradation and their economic cost.

- Immediate rehabilitation strategy.

d. Summary Statistics. Provide a table to illustrate the cost, benefits, net benefits and benefit to cost ratios of the base condition and each alternative considered.

e. For additional information on the Major Rehabilitation Program and applicable procedures refer to ER 1130-2-500 and EP 1130-2-500.

Exhibit E- 1 Summary of Federal/non-Federal Cost Sharing by Civil Works Mission

| **Authority** | **Provisions** | **Cost Sharing (Federal/ Non-Federal** | |
|---|---|---|---|
| | | **Construction** | **OMRR&R** |
| Navigation<br>**Harbors**<br>Sections 101&214, WRDA '86<br>Section 13, WRDA '88<br>Section 201, WRDA 96 | For primary access channels, anchorages, turning basins, locks and dams, harbor areas, jetties, and breakwaters. | Down to 20 ft below mlw—10% non-Federal<br><br>Over 20 ft and down to 45 ft below mlw—25% non-Federal<br><br>Exceeding 45 ft below mlw –50ft non-Federal | 100% Federal<br><br>100% Federal<br><br>50% of incremental costs for O&M associated with project depths in excess of 45 ft. |
| | Projects (GNF) with no channel deepening | GNF is cost shared at the same depth zones as the existing project depth or, if no existing project, the natural controlling depth | |
| | Channel deepening limited to one depth zone (40 to 45 feet) | Entire cost of GNF is shared at the depth zones of the improved depth | |
| | Channel deepening not limited to one depth zone (40 to 50 feet) | The existing and improved main channel depths will be used to determine cost sharing. The GNF costs of non-depth related features will be assigned to the depth zones in the same proportion that dredging costs are assigned to each zone | |

Exhibit E-1 (Continued)

| **Authority** | **Provisions** | **Cost Sharing (Federal/ Non-Federal)** | |
|---|---|---|---|
| | | **Construction** | **OMRR&R** |
| Navigation, Harbors (Cont) | Where more than one disposal site is used for a specific reach in one dredging operation and each disposal site has a different unit cost.<br><br>Where more than one disposal site will be used for a specific reach of channel when dredging will be done in phases. | The cost of disposal for deepening that reach will be assigned to the depth zones proportionally.<br><br>Each depth zone will be assigned its actual cost of disposal. | |
| | Channel deepening is in segments and segments are in 2 different cost-sharing zones. | Entire cost of GNF associated with deepening segment is determined by improved depth for that segment.<br>GNF costs for non-depth related features will be assigned to the depth zones in the same proportion that dredging costs are assigned.<br>Where non-depth features are associated with only one channel segment, cost is shared in accordance with that segment. | |

Exhibit E-1 (Continued)

Additional Considerations for Navigation, Harbors
Non-Federal sponsor shall:
Provide all LERR for construction and maintenance.
Hold and save US free from damages due to construction, operation and maintenance.
For all depths, provide additional cash contribution of 10% of GNF, which includes dredged material disposal construction costs. These costs may be financed over a period not exceeding 30 yrs. Sponsor costs for LERR, except utilities, are credited against 10% cash contribution.
The owner of a utility requiring relocation as part of an improvement deeper than 45 ft below mlw must fund 50% of the costs thereof.
Removal of a utility is at the owner's expense. The owner of a bridge requiring modification must share the costs according to the principles of the Truman-Hobbs Act (P.L. 77-647); the balance is cost shared as part of the GNF.

| **Authority** | **Provisions** | **Cost Sharing (Federal/ Non-Federal** | |
|---|---|---|---|
| | | **Construction** | **OMRR&R** |
| **Dredged Material Disposal Facility**<br><br>Section 217, WRDA '96 | The SA may at the request of the non-Federal interest, add capacity at a dredged material disposal site being constructed by the SA.<br><br>Disposal plan which consists of construction of a rehandling facility for dewatering and stabilization of dredged material, evacuation from the rehandling facility and transportation to a commercial landfill and payment of the tipping fee. | 100% costs for additional capacity paid by non-Federal sponsor.<br><br>The costs for the disposal plan are shared as GNF for both disposal of material from O&M of an existing Federal project or disposal of material from construction of a Federal harbor improvement. | |

Exhibit E-1 (Continued)

| **Authority** | **Provisions** | **Cost Sharing (Federal/Non-Federal)** | |
|---|---|---|---|
| | | **Construction** | **OMRR&R** |
| **Navigation, Inland Waterways**<br><br>Section 102, WRDA ’86 and Section 206, Inland Waterways Revenue Act ’78, as amended by Section 1405, WRDA ’86 | Lock and dam replacements are studied and recommended for specific Congressional authorization; other extensive work is normally accomplished under the major rehabilitation program Dredging and Disposal facilities. | If the waterways users are subject to fuel taxes paid into the IWTF – 100% non-Federal<br><br>Inland channels not specifically designated by Congress as part of the taxable system will be cost shared according to the terms of harbors. | 100% Federal<br><br>O&M will be cost shared according to the same terms as harbors. |
| | | | |
| **Navigation, Recreational**<br><br>Section 103(c)(4), WRDA ‘86 | | All ancillary shoreside facilities including interior access channels and berthing areas – 100% non-Federal<br><br>All related LERRD for construction and maintenance, except to the extent that the value may exceed 50% of the total (separable and joint) recreational navigation costs – 100% non-Federal<br><br>Cash contribution plus LERRD = 50% non-Federal | 100% non-Federal |

Exhibit E-1 (Continued)

| **Authority** | **Provisions** | **Cost Sharing (Federal/ Non-Federal** | |
|---|---|---|---|
| | | **Construction** | **OMRR&R** |
| **Structural Flood Control**<br><br>Sections 1 & 3, FCA ’36<br>Section 2, FCA ’41<br>Section 103(a), WRDA ’86<br>Section 202(a), WRDA ‘96 | Federal Government should participate in improvements for flood control purposes if the benefits to whomsoever they may accrue exceed the estimated costs | All LERRD uncontaminated with hazardous and toxic wastes, and minimum cash contribution amounting to 5% of the flood control features of TPC -–non-Federal.<br><br>For projects authorized on or before 10/12/96: If the value of LERRD plus cash is less than 25 % of TPC, non-Federal provides additional cash to make 25% of TPC.<br><br>For projects authorized after 10/12/96: If value of LERRD plus 5% is less than 35% of TPC, then non-Federal provides cash to make 35 % of TPC. Maximum non-Federal contribution will not exceed 50% of TPC (5% cash, 45% LERRD). | 100% non-Federal |
| Additional Considerations for Structural Flood Control:<br>Non-Federal cost sharing may be reduced under the ability to pay rule.<br>Funding LERRD in excess of 45% will be covered in PCA. Generally, this excess LERRD is reimbursed.<br>There is a $200,000 credit for flood control for territories other than Puerto Rico.<br>Non-Federal will hold and save U.S. free from damages due to construction, operation and maintenance.<br>Community has to participate in FEMA’s NFIP and comply with requirements of the program.<br>Community must prepare a floodplain management plan which must be adopted within one year of signing PCA.<br>Non-Federal will prevent future encroachment or modification that might interfere with proper functioning of the project. | | | |

Exhibit E-1 (Continued)

| **Authority** | **Provisions** | **Cost Sharing (Federal/ Non-Federal)** | |
|---|---|---|---|
| | | **Construction** | **OMRR&R** |
| | | | |
| **Nonstructural Flood Control**<br><br>Section 73, WRDA '74<br>Section 103(b), WRDA '86<br>Section 202(a), WRDA '96 | In Corps planning, consideration will be given to nonstructural alternatives to prevent or reduce flood damages. | For projects authorized on or before 10/12/96: non-Federal sponsor must provide all LERRD, except to the extent that the value thereof may exceed 25% of TPC for nonstructural measures.<br><br>For projects authorized after 10/12/96, non-Federal sponsor must provide all LERRD, except to the extent that the value thereof may exceed 35% of TPC for the nonstructural measures.<br><br>If the value of the non-Federal contribution is less than 25% or 35% of TPC, a cash contribution must be made, that when combined with LERRD value equals 25% or 35% of TPC | 100% non-Federal |
| Additional Considerations for Nonstructural Flood Control:<br>If LERRD is greater than the 25% or 35% prescribed, the excess will be reimbursed.<br>Recreation can provide up to 50% of the benefits of a project.<br>Non-Federal sponsor will hold and save U.S. free form damages due to construction, operation and maintenance.<br>Community has to participate in FEMA's NFIP and comply with requirements of the program.<br>Community must prepare a floodplain management plan which must be adopted within one year of signing PCA.<br>Non-Federal will prevent future encroachment or modification that might interfere with proper functioning of the project. | | | |

Exhibit E-1 (Continued)

| **Authority** | **Provisions** | **Cost Sharing (Federal/ Non-Federal)** | |
|---|---|---|---|
| | | **Construction** | **OMRR&R** |
| | | | |
| Emergency<br><br>Section 5a, FCA ’41, as amended<br><br>Emergency Flood Control Funds Act of ’55<br><br>P.L. 87-874, RHA ’62<br><br>P.L. 93-523, Safe Drinking Water Act ’74<br><br>P.L. 95-51<br><br>Section 917, WRDA ’86<br><br>Section 302, WRDA ’90<br><br>Section 204(e), WRDA ‘96 | Planning preparedness for all natural disasters. Flood fighting and rescue operations. Emergency repair and restoration of flood damaged or destroyed flood control works. Nonstructural alternatives to the repair or restoration of flood damaged flood control works. Emergency protection of the Federal hurricane or shore protection project structures damaged or destroyed by extraordinary storm occurrences. Emergency supply of clean drinking water where source is contaminated. Emergency supply of water for human consumption in drought distressed areas. | LERRD – 100% non-Federal<br><br>Construction costs, including S&A, excluding E&D for repair or restoration of non-Federal flood control works – 20% non-Federal | 100% non-Federal in connection with any flood control measures undertaken pursuant to Section 5(a) of the FCA ’41, as amended. |
| Additional Considerations for Emergency:<br>Advance measures are undertaken only to supplement state and local efforts (when their capabilities are exceeded).<br>The sponsor may be asked, in connection with these or any other of the efforts authorized under Section 5(a) of the FCA '41, as amended, to provide such other measures of cooperation that, in the discretion of the Chief, would be appropriate to the specific case. | | | |

Exhibit E-1 (Continued)

| **Authority** | **Provisions** | **Cost Sharing (Federal/ Non-Federal)** | |
|---|---|---|---|
| | | **Construction** | **OMRR&R** |
| | | | |
| **Floodplain Management Services Program**<br><br>Section 206, FCA '60 | General authority to provide floodplain information and planning assistance to state, county and city govts., and other Federal agencies.<br>Flood and floodplain information is also provided to private citizens, corporations and groups.<br>Flood proofing and general floodplain management guidelines are developed and published.<br>Hurricane evacuation studies and flood warning preparedness studies are conducted jointly with other Fed. Agencies for state and local governments. | Non-Federal public entities may not pay the Corps for these services; private citizens and other Federal agencies may. | |

Exhibit E-1 (Continued)

| **Authority** | **Provisions** | **Cost Sharing (Federal/ Non-Federal)** | |
|---|---|---|---|
| | | **Construction** | **OMRR&R** |
| | | | |
| **Hurricane and Storm damage Reduction, Shore Protection, General Authority (including beach erosion control)**<br><br>1946 Shore Protection Cost Sharing Act, as amended<br><br>Sections 103(c)(5) and (d), WRDA ’86<br><br>Section 55, WRDA ’74<br><br>Section 14, WRDA ’88<br><br>WRDA 99 | Federal policy to assist in construction but not maintenance of works for the improvement and protection of shores of the U.S. against erosion by waves and currents. Provide technical and engineering assistance to non-Federal public interests in developing structural methods of preventing damages attributable to shore and streambank erosion. Corps projects must be formulated primarily for hurricane and storm damage reduction. | LERRD – 100% non-Federal<br><br>Costs assigned to protection of federally owned lands and shores – 100% Federal<br><br>Costs assigned to privately owned lands (undeveloped) and shores (where use of the shores is limited to private interests) – 100% non-federal.<br><br>Costs assigned to privately owned, developed lands where criteria for public access and public use of the shores are met – 35% non-Federal.<br><br>Costs assigned to non-federal public shores used for parks and recreation -–50% non-Federal. | 100% non-Federal for non-Federal shores |
| Additional considerations for hurricane and storm damage reduction:<br>The non-Federal LERRD will be credited against the sponsor’s total (percent) responsibility or sharing construction costs; any excess of LERRD will be reimbursed to the sponsor.<br>Sponsors must comply with Federal flood insurance and floodplain management programs requirements. | | | |

Exhibit E-1 (Continued)

| **Authority** | **Provisions** | **Cost Sharing (Federal/ Non-Federal)** | |
|---|---|---|---|
| | | **Construction** | **OMRR&R** |
| | | | |
| **Hurricane and Storm Damage Reduction, Shore Protection, Periodic Nourishment**<br><br>1956 Beach Nourishment Act<br><br>WRDA '99 | Federal assistance in periodic beach nourishment is provided on the same basis as new construction when it would be the most suitable and economical remedial measure. | Costs are shared in the same proportion as the initial project construction costs. | 100% non-Federal for non-Federal shores. |
| | | | |
| **Hydroelectric Power, General**<br><br>Section 103(c)(1), WRDA '86 | Corps policy is to maximize sustained public benefits from each of its projects for all desirable purposes, including power. Power developed at Corps projects surplus to project's needs is turned over to DoE for marketing. | All capital investment and OMRR&R allocated to power are reimbursable. DoE's PMAs establish power rates that will recover costs over time (usually 50 years).<br><br>Cost sharing will be in accordance with existing law, currently 100% non-Federal. | |
| Additional Considerations for Hydropower, General:<br>The Corps can survey the potential and methods of rehabilitating former industrial sites for use as hydroelectric facilities and provide technical assistance in dredging projects to rehabilitate the sites that have been surveyed. In return, the non-Federal entity will receive power produced, or an equivalent value of power for 30 years.<br>Non-Federal power development may be conducted at Corps projects through FERC licensing procedures, and it is Corps policy to encourage non-Federal interests to develop such hydropower potential where it is feasible and not authorized for Federal development.<br>No general authority exists for Corps development of hydropower at non-Corps sites, although this has been done through specific Congressional authority. | | | |

Exhibit E-1 (Continued)

| **Authority** | **Provisions** | **Cost Sharing (Federal/ Non-Federal)** | |
|---|---|---|---|
| | | **Construction** | **OMRR&R** |
| | | | |
| **Hydroelectric Power Facilities for Future Power Installations (Minimum Provisions)**<br><br>Section 4, FCA ’83 and subsequent authorizing acts | Penstocks and other similar facilities may be included in the initial construction of projects where power is not authorized. Requires approavl of the SA, on recommendation of the Corps and FERC. Probability of future economic and financial viability and willingness to pay of the non-Federal interest to finance or contract for the facilities must be determined. Purpose of this authority is to preclude loss of hydropower viability and to provide significant future construction savings. | Costs allocated to hydropower are reimbursable.<br><br>The DoE PMAs establish rates that recover costs over time (usually 50 years) when power is ultimately developed. | |

Exhibit E-1 (Continued)

| **Authority** | **Provisions** | **Cost Sharing (Federal/ Non-Federal)** | |
|---|---|---|---|
| | | **Construction** | **OMRR&R** |
| | | | |
| **Water Supply Storage**<br><br>Water Supply Act ’58<br><br>P.L. 88-140, Permanent Rights to Storage<br><br>Section 932, WRDA ’86<br><br>Section 103(c(2) and (3), WRDA ‘86 | Grants permanent rights to use the storage space to the sponsor upon completion of the payments of the cost of storage. | Sponsor must contract to provide 100% reimbursement of the costs allocated to water supply within the life of the project but not more than 30 years from the initial use of the projects for water supply.<br><br>For new projects reimbursement is based on the actual development costs allocated to water supply storage and shall be made during the period of construction. For reallocations, reimbursement is based on the highest of benefits or revenues foregone, the replacement cost or the updated cost of storage. | 100% reimbursement of the O&M on an annual basis and repairs, reconstruction and major rehabilitation and replacements, as they are required for storage allocated to water supply. |
| Additional Considerations for Water Supply Storage:<br>10% of benefits for new projects must be flood control or navigation. | | | |

Exhibit E-1 (Continued)

| **Authority** | **Provisions** | **Cost Sharing (Federal/ Non-Federal)** | |
|---|---|---|---|
| | | **Construction** | **OMRR&R** |
| | | | |
| **Water Supply, Surplus Water**<br><br>Section 6, FCA '44 | ASA(CW) can enter into contracts with states, private concerns and individuals at prices and terms ASA(CW) finds reasonable, to provide surplus water or temporary use of available storage from Corps reservoirs for domestic and industrial uses, rather than reallocating and granting a permanent right to storage. | For the period of use, user pays an annual amount based on the updated cost of storage plus OMRR&R. | |
| Additional Considerations for Water Supply, Surplus Water:<br>The storage must have been provided in the reservoir for some other purpose not yet being realized, or the water would have been more beneficially used as M&I water than for authorized purposes. The use must not significantly affect the authorized purposes. Such contracts are normally limited to 5 years, with provisions for an additional 5-year extension. | | | |
| | | | |
| **Water Supply, Minor Emergency Withdrawals**<br><br>Section 6, FCA '44 | When a governor of a state has declared an emergency due to drought, withdrawals of up to 50-acree feet of storage may be permitted for domestic and industrial uses for a period of up to 1 year. | The cost assigned to the water is based on the current value of the storage, with a minimum of $50 per year. The project manager signs the permit. | |
| | | | |

Exhibit E-1 (Continued)

| **Authority** | **Provisions** | **Cost Sharing (Federal/ Non-Federal)** | |
|---|---|---|---|
| | | **Construction** | **OMRR&R** |
| | | | |
| **Recreation, Lake Projects**<br><br>Section 4, FCA, as amended<br><br>Federal Water Project Recreation Act '65, as amended<br><br>Section 103(c)(4), WRDA '86<br><br>Section 2804, Reclamation Projects Authorization and Adjustments Act '92 | Projects must be under the control of the Army.<br>Requires non-Federal cost sharing.<br>If there is no willing cost sharing partner, Corps may only provide minimum facilities.<br>The Corps may also provide type "C" visitor centers, handicap access and operational boat ramps. | 50% first costs of all recreational features, except when those costs are paid from SRUF funds – non-Federal.<br><br>Upgrading sanitary facilities on Corps operated areas – 100% Federal<br><br>LERRD – 100 % non-Federal | 100% non-Federal |
| Additional Considerations for Recreation, Lake Projects:<br>ASA(CW) requires the sponsor share to be provided during construction.<br>Minimum facilities are joint costs and are shared among the project purposes in accordance with Section 103(c)(4), WRDA '86.<br>Non-Federal sponsor will hold and save the U.S. free from damages due to construction, operation and maintenance. | | | |

Exhibit E-1 (Continued)

| **Authority** | **Provisions** | **Cost Sharing (Federal/ Non-Federal)** | |
|---|---|---|---|
| | | **Construction** | **OMRR&R** |
| **Recreation, Non-lake Projects**<br><br>Section 4, FCA '44<br><br>Federal Water Project Recreation Act '65<br><br>Section 103(c)(4), WRDA '86<br><br>Section 313, WRDA '90 | Requires non-Federal cost sharing.<br>Recreation benefits do not influence project formulation. Non-lake structural projects must attain a benefit to cost ratio greater than unity without recreation.<br>Facilities must be on lands required for basic project. Separable lands may be acquired at flood control projects for access, parking and facilities required for health and safety.<br>Recreational development costs at structural flood control projects may not increase the Federal project cost by more than 10% without prior approval by ASA(CW).<br>Facilities are not provided at shore protection projects.<br>Corps can expend up to $2 million annually to mitigate for adverse impacts on recreation from the maintenance, repair, rehabilitation or reconstruction of a project. | Separable costs – 50% non-Federal<br><br>For harbor and channel projects, 50 % of the joint and separable costs allocated to recreational navigation – non-Federal.<br><br>LERRD – 100% non-Federal | OMRR&R for all types of projects – 100% non-Federal |
| Additional Considerations for Recreation, Non-lake Projects:<br>ASA(CW) requires the sponsor share to be paid during construction.<br>Facilities that are eligible for cost sharing must be on the facilities checklist in Appendix E. Other qualifications and guidance is also provided in this document. | | | |

Exhibit E-1 (Continued)

| **Authority** | **Provisions** | **Cost Sharing (Federal/ Non-Federal)** | |
|---|---|---|---|
| | | **Construction** | **OMRR&R** |
| | | | |
| **Ecosystem Restoration and Protection**<br><br>Section 210, WRDA '96 | Address ecosystem restoration needs and opportunities, as a single objective or one of multiple objectives, as per provisions of the specific authorization. | 35% implementation costs (LERRD, post feasibility phase design, including plans and specifications, materials and project construction – non-Federal<br><br>The value of LERRD is credited towards the 35% share of total first costs, and the Corps will reimburse the sponsor for the amount that LERRD exceeds 35% of first costs.<br><br>The sponsor must pay the difference between the LERRD and the 35% in cash. | 100% non-Federal |
| Additional Considerations for Ecosystem Restoration and Protection:<br>The sponsor can not receive credit for work-in-kind for post-feasibility phase design, plans and specifications, materials or project construction.<br>50% non-Federal feasibility costs can be work-in-kind (i.e., 25% of total feasibility cost).<br>Non-Federal will hold and save the U.S. free from damages due to construction, operation and maintenance. | | | |

Exhibit E-1 (Continued)

| **Authority** | **Provisions** | **Cost Sharing (Federal/ Non-Federal)** | |
|---|---|---|---|
| | | **Construction** | **OMRR&R** |
| | | | |
| **Mitigation, Fish and Wildlife**<br><br>F&W Coordination Act '58<br><br>Section 906, WRDA '86 | Requires projects to include justifiable means and measures of mitigation.<br>Requires Congressional authorization of land acquisition except for authority provided by Section 906(b), WRDA '86.<br>Requires the Corps to determine justification and desirability of project modification. | Costs are assigned to appropriate project purposes and are shared accordingly. | O&M responsibilities are project specific, but the following is generally true:<br><br>For projects owned and operated by the Corps, OMRR&R will be paid by the Federal Gov.<br><br>For projects that will be turned over to the sponsor to be operated, OMRR&R will be paid by the sponsor. |
| Additional Considerations for Mitigation, Fish and Wildlife:<br>Water rights: If required by state water laws, rights for the use or release of stored water, to maintain reservoir pools or regulate stream flows for fish and wildlife mitigation shall be provided by the non-Federal sponsor. Reasonable costs of rights for water to accomplish initial filling of the reservoir, including water for mitigation requirements, are eligible for credit in cost-sharing determinations. The computation is dependent on the manner of repayment. Non-Federal sponsors are also required to furnish assurance that appropriate action will be taken to prevent downstream withdrawals of water that would negate fishery benefits credited to such releases. | | | |

Exhibit E-1 (Continued)

| **Authority** | **Provisions** | **Cost Sharing (Federal/ Non-Federal)** | |
|---|---|---|---|
| | | **Construction** | **OMRR&R** |
| | | | |
| **Mitigation, Cultural and Historic Resources**<br><br>Section 7(a) of P.L. 93-291 | Funds expended during feasibility for sample surveys, intensive surveys, or other needed historic preservation investigations are cost shared.<br>These costs may be treated as planning costs and thus, are not accountable under the statutory 1% limit on expenditures. | Mitigation, including data recovery and all other mitigation treatments or measures – 100% Federal up to 1% of construction costs.<br><br>Costs in excess of 1%, with a waiver, may be cost shared according to project purposes. | O&M responsibilities are project specific, but the following is generally true:<br><br>For projects owned and operated by the Corps, OMRR&R will be paid by the Federal Gov.<br><br>For projects that will be turned over to the sponsor to be operated, OMRR&R will be paid by the sponsor. |

Exhibit E-1 (Continued)

| **Authority** | **Provisions** | **Cost Sharing (Federal/ Non-Federal)** | |
|---|---|---|---|
| | | **Construction** | **OMRR&R** |
| | | | |
| **Aesthetic Resources**<br><br>Section 232, WRDA '96 | Corps shall consider measures to preserve and enhance scenic and aesthetic qualities in the vicinity of water resources projects. | Costs will be cost shared in the same proportion as the associated project.<br><br>Any incremental aesthetic costs associated with a recreation project will be allocated to that purpose and cost shared with the non-Federal sponsor on a 50% basis.<br><br>In multi-purpose projects, costs will be shared in accordance with the purpose to which the costs are allocated. | 100% non-Federal |
| | | | |
| **Review of Completed Projects**<br><br>Section 216, FCA '70 | Review of completed projects, when found advisable due to changed physical, economic or environmental conditions. A report is made to Congress on advisability for modifying structures or operations. | Project construction cost sharing determined by project purpose | |

Exhibit E-1 (Continued)

| **Authority** | **Provisions** | **Cost Sharing (Federal/ Non-Federal)** | |
|---|---|---|---|
| | | **Construction** | **OMRR&R** |
| **Planning Assistance to States**<br><br>Section 22, WRDA '74, as amended<br><br>Section 605, P.L. 96-597<br><br>Section 221, WRDA '96 | Provide technical assistance to support state, territories and tribal preparation of comprehensive water and related land resources development plans, including watershed and ecosystem planning. Assist in conducting individual studies supporting these plans. Assistance is provided at the request of non-Federal entity and upon availability of Corps expertise. | No construction will be accomplished under this program. | |
| Additional Considerations for Planning Assistance to States:<br>Technical services, rather than grants, are provided without charge or cost sharing.<br>Nationwide annual funds may not exceed $10 million, with not more than $500,000 in any one year in any one non-Federal entity.<br>The Corps can provide assistance to state and local governments in disaster preparedness, response and recovery efforts.<br>Section 22 can not be used to supplement other ongoing or pending efforts, or to offset required state contributions to Federal grant programs. | | | |

Notes:
WRDA – Water Resources Development Act
Mlw- mean low water
LERR –Lands, easements, rights-of-ways and relocations
GNF – general navigation features
ASA(CW) – Assistant Secretary of the Army for Civil Works
IWTF – Inland Waterways Trust Fund
LERRD – Lands, easements, rights-of-ways, relocations and disposal/borrow areas
NED – National Economic Development
PCA – project Cooperation Agreement
OMRR&R – Operation, maintenance, repair, replacement and rehabilitation
PMA – Power Marketing Agency
FERC – Federal Energy Regulatory Commission
S&A – Supervision and administration
E&D – Engineering and design
P.L.- Public law
DoE – Department of Energy
SA – Secretary of the Army
FCA – Flood Control Act
TPC – Total Project Cost
RHA – Rivers and Harbors Act
SRUF – Special recreation user fees
F&W – Fish and wildlife

Exhibit E-2 Recreation Facilities Checklist

| Activity/Facility | Joint Cost 2/ | Cost Shared 3/ | 100% Other 4/ |
|---|---|---|---|
| I. Access and Circulation | | | |
| Roads 5/ | | x | x |
| Turnarounds | x | x | x |
| Trails | | | |
| Hiking | | x | x |
| Exercise | | | x |
| Bicycle/Jogging | | x | x |
| Equestrian/without jumps | | x | x |
| Snowshoe | | x | x |
| Cross County Ski | | x | x |
| Ski Slopes | | | x |
| Chairlifts/Tows | | | x |
| Snowmobile | | x | x |
| Off-Road Vehicles | | x | x |
| Water | | x | x |
| Slalom | | | x |
| Artificial White Water | | | x |
| Parking 5/ | | x | x |
| Bridges and Culverts | | x | x |
| Boat Launching Devices | | | |
| Mechanical | | | x |
| Surfaced Ramps | x | x | x |
| Boat Piers (Fixed or Floating) | | x | x |
| Walks | | x | x |
| Steps (Outdoor) | | x | x |
| Pedestrian Ramps | | x | x |
| Fishing piers and attendant facilities | | x | x |
| Footbridges 9/ | | x | x |

Exhibit E-2 (Continued)

| Activity/Facility | Joint Cost 2/ | Cost Shared 3/ | 100% Other 4/ |
|---|---|---|---|
| II. Structures | | | |
| Sanitation | | | |
| Vault Toilets | x6/ | x | x |
| Comfort Station | x6/ | x | x |
| Comfort Station w/showers | x | x | |
| Laundry Room | | | x |
| Bath-Changehouse | | x | x |
| Fish Cleaning Station | | x | x |
| Shelters | | | |
| Picnic | | x | x |
| Overlook | | x | x |
| Trail | | x | x |
| Group Camp | | | |
| Cabins and Dormitories | | | x |
| Dining Hall | | | x |
| Infirmaries | | | x |
| Amphitheaters | | x | x |
| Caretaker Quarters | | | x |
| Outdoor Cooking | | x | x |
| Beaches | | x | x |
| Docks | | x | x |
| Camping pads | | x | x |
| Swimming Beaches | | x | x |
| Visitor Center | x2/ | | x |
| Nature Center | | | x |
| Historical Centers | | | x |
| Archeological Centers | | | x |
| Environmental-Education Centers | | | x |
| Lodges/Cabins | | | x |
| Hotels/Motels | | | x |
| Restaurants/Snack Bars | | | x |
| Stores/Commissaries | | | x |
| Bait/Tackle Shops | | | x |

Exhibit E-2 (Continued)

| Activity/Facility | Joint Cost 2/ | Cost Shared 3/ | 100% Other 4/ |
|---|---|---|---|
| Marina | | | x |
| Docks/Piers | | | x |
| Fuel Dispensing/Storage | | | x |
| Repair Facilities | | | x |
| Storage Facilities | | | x |
| Swimming Pools | | | x |
| Clubhouse | | | x |
| Stables | | | x |
| Corrals | | | x |
| Equestrian Jumps/Courses | | | x |
| Fountains/Statuary | | | x |
| Decorative Lakes/Ponds | | | x |
| Decorative Promenades | | | x |
| Maintenance and Operation | | | |
| Vehicle and Material Storage | | | x |
| Garages | | | x |
| Work Shops | | | x |
| Utility Buildings | | | x |
| Inflammable Storage | | | x |
| Administrative Facilities | | | x |
| Gate House, Control Structures | | | x |
| Boat Storage | | | x |
| Employee Quarters | | | x |
| Bulk Storage | | | x |
| III. Utilities | | | |
| Water Supply | | | |
| Municipal System | | x | x |
| Wells | | x | x |
| Treatment Plant | | x | x |

Exhibit E-2 (Continued)

| Activity/Facility | Joint Cost 2/ | Cost Shared 3/ | 100% Other 4/ |
|---|---|---|---|
| Storage | | x | x |
| Distribution | | x | x |
| Fountain and Outlets | | x | x |
| Irrigation System (manual) | | x | x |
| Irrigation System (automatic) | | | x |
| Camp Site Hook-ups | | x | x |
| Sewage and Waste Water Disposal | | | |
| Municipal System | | x | x |
| Septic Tanks and Tile Fields | | x | x |
| Treatment Plants | | x | x |
| Oxidation Lagoon | | x | x |
| Sanitary Dump Station (Boats and Camping Trailers) | | x | x |
| Camp Waste Water and Garbage Disposal | | x | x |
| Storm Drainage | | x | x |
| Public Telephone | | x2/ | x |
| Electrical | | | |
| Lighting | | x | x |
| Lift Pumps | | x | x |
| Camp Site Hook-ups | | x | x |
| Gas, Natural/Propane | | x | x |
| Land Fill | | | x |
| Incinerator | | | x |
| IV. Site Preparation and Restoration | | | |
| Clearing and Grubbing (Includes vista clearing) | | x | x |
| Grading and Land Form | | x | x |
| Tree Planting | | x | x |
| Shrub Planting | | x | x |

Exhibit E-2 (Continued)

| Activity/Facility | Joint Cost 2/ | Cost Shared 3/ | 100% Other 4/ |
|---|---|---|---|
| Other Planting | | x | x |
| (Perennial, etc.) | | | x |
| Turf Establishment | | x | x |
| Reforestation | | x | x |
| V. Park Furniture | | | |
| Picnic Tables | | x | x |
| Grills and Fireplaces | | x | x |
| Campfire Circles | | x | x |
| Trash Receptacles/Holders | | x | x |
| Benches | | x | x |
| Camping Pads | | x | x |
| Flag Poles | | | x |
| Lantern Hangers | | x | x |
| VI. Play Facilities | | | |
| Courts | | | |
| Multiple Use | | x7/ | x |
| Tennis | | | x |
| Basketball | | | x |
| Handball | | | x |
| Shuffleboard | | | x |
| Volleyball | | | x |
| Horseshoe-Pits | | | x |
| Sports/Play Fields | | | |
| Baseball Diamond with Backstop | | x | x |
| Bleachers | | | x |
| Dugouts | | | x |

Exhibit E-2 (Continued)

| Activity/Facility | Joint Cost 2/ | Cost Shared 3/ | 100% Other 4/ |
|---|---|---|---|
| Fencing | | | x |
| Lighting | | | x |
| Playfield Area (open space) | | x | x |
| Marking/Goals | | | x |
| Play Equipment | | | |
| Standard | | x | x |
| Elaborate 8/ | | | x |
| Golf Course/Putting Greens | | | x |
| VIII. Signs | | | |
| Entrance-Directoral-Marked | | x | x |
| Traffic Control (Vehicular and Pedestrian) | | x | x |
| Instruction (Includes Fire Danger Notices) | | x | x |
| VIII. Interpretive Guidance and Media | | | |
| Display Boards | | x | x |
| Display Cases | | | x |
| Interpretive Markers (Natural, Historical Archeological, etc.) | | x | x |
| Electronic Audio-Visual Devices | | x | |
| Exhibit Space | | | x |
| Bulletin Boards | | x | x |
| IX. Protection, Control, Health and Safety | | | |
| Protection and Control | | | |

Exhibit E-2 (Continued)

| Activity/Facility | Joint Cost 2/ | Cost Shared 3/ | 100% Other 4/ |
|---|---|---|---|
| Gates and Barricades | x | x | x |
| Cattle Guards | | x | x |
| Walls and Fencing | | x | x |
| Guardrails | x | x | x |
| Breakwaer-fishing walkways | | x | x |
| Entrance Stations | | x | x |
| Buoys/Waterways Markers | | x | x |
| Fire Fighting and Protection | | | x |
| Communication | | | x |
| Vandalism and Theft Control Devices | | | x |
| Campground Registration Box | | x | |
| Health and Safety | | | |
| Lighting | | x | x |
| Life Guard Stand (Where life guard services are authorized) | | | x |
| First Aid Station | | | x |
| Handrails | | x | x |

1/ Includes new and completed lakes, local protection projects, navigation projects, etc. Facilities not listed must be justified and approved prior to commitments made to cost sharing partners. This check list will be modified as appropriate.

2/ The facilities to be provided are to be limited to those required for minimum health and safety; beyond these the Corps will also provide type "C" visitor center and operational boat ramps. Handicapped access will be a consideration.

3/ Facilities to be cost shared are limited to standard designs that do not include embellishments such as decorative stone work, planters, elaborate designs or pretentious space.

4/ Includes facilities which may not be resource oriented, are revenue producing or are over and above that which would normally be provided at a water resource project.

5/ When roads and/or parking are to be used and/or designed for use under more than one financing category, cost will be allocated on the basis of estimated use by function. The discretion of the D.E. is to be applied.

6/ Minimum sanitary facilities are limited to those that meet minimum Federal and local health requirements.

7/ Grading and paving, to the extend they represent least cost alternatives to stabilizing floodways, may be used by local interests for recreational activities or facility developments not eligible for cost sharing. Such grading and paving may be done by the Corps to specifications more costly than necessary for floodway stabilization provided the additional cost is met by a non-Federal sponsor.

8/ Includes extensive specialized play equipment over and above basic climbing, swinging and sliding apparatus.

9/ Footbridges are to be austere and used only when other crossing methods are impractical. Footbridges which are the center of a recreation experience are to be at local costs.

Exhibit E-3 Checklist of Facilities which may be Cost Shared in Recreation Developments at Environmental Protection and Ecosystem Restoration Projects[1]

I. Access and Circulation

Roads
Turnarounds
Trails (multiple-use)
Parking
Bridges and Culverts
Walks
Steps/ramps
Footbridges [2]

II. Structures

Sanitation - Vault Toilets, Comfort Stations
Shelters - Picnic, Trail

III. Utilities

Water Supply - Municipal System [3] , Wells, Drinking Fountains and Faucets
Sewage and Waste Water Disposal - Municipal System, Septic Tanks and Tile Fields
Storm Drainage
Public Telephone

IV. Site Preparation/Restoration

Clearing and Grubbing
Grading and Land Form
Vegetative restoration - includes native trees, shrubs and turf establishment

V. Park Furniture

Picnic Tables
Trash Receptacles/Holders
Benches

Exhibit E-3 (Continued)

VI. Signs

Entrance-Directional-Marker
Traffic Control (Vehicular and Pedestrian)
Instructional (Includes Fire Danger Notices)

VII. Interpretive Guidance and Media

Display Boards
Interpretive Markers (Natural, Historical, Archeological, etc.)
Bulletin Board

VIII. Protection, Control, Health and Safety

Gates and Barricades
Cattle Guards
Walls and Fencing
Guardrails
Entrance Stations
Lighting
Handrails

1/ Facilities to be cost shared are limited to standard designs consistent with the natural environment of the surrounding area but should not include embellishments, elaborate designs, or be ostentatious.

2/ Footbridges are to be austere and used only when other crossings methods are impractical. Footbridges which are the center of recreation experience are to be a non-Federal cost. Pedestrian bridges at highways or railroads are normally a non-Federal cost; however, if they are integral to the recreation feature and the most cost effective alternative, they may be cost shared.

3/ Connection to an existing municipal system.

Exhibit E-4 Examples of DYMS Computations

1. Hypothetical Situation. The first example is a hypothetical situation. For this example the assumptions as shown in Table E-47 are made on an exaggerated bases for computational ease.

Table E- 47 DYMS Hypothetical Example

| Item | Existing project | Expanded project |
|---|---|---|
| Total conservation storage | 100,000 a-f | 300,000 a-f |
| Critical period dependable yield | 200 cfs | 300 cfs |
| Unit yield | 2 cfs per 1000 a-f | 1 cfs per 1000 a-f |
| Contracted storage (user # 1) | 100,000 a-f | 200,000 a-f |
| Dependable yield (user # 1) | 200 cfs | 200 cfs |
| Contracted storage (user # 2) | none | 100,000 a-f |
| Dependable yield (user # 2) | none | 100 cfs |
| DYMS | none | 100,000 a-f |

In this example, user #1 had a prior contract for 100,000 a-f of storage, which was the entire conservation pool of the existing project. The estimated critical period dependable yield for that storage was 200 cfs. Subsequently, a second user requested storage in the project sufficient to provide an estimated critical period dependable yield of 100 cfs. The sum of the required critical period dependable yield for both users would then be 200 + 100 = 300 cfs. Reading of the yield curve at 300 cfs indicated a required total conservation storage of 300,000 a-f. In the expanded project, user #1 requires 200,000 a-f rather than the contracted 100,000 a-f to provide an estimated critical period dependable yield of 200 cfs. The difference (200,000 - 100,000 = 100,000 a-f) is the DYMS. User #2 requires 100,000 a-f of storage to provide an estimated critical period dependable yield of 100 cfs. The water supply contract for user #1 would be amended at no cost to him to provide that his share of the conservation pool is 200,000 a-f and 2/3 of the total. The contract with user #2 would provide that his share of the conservation pool is 100,000 a-f and 1/3 of the total. User #2, however, would be required to pay for 200,000 a-f. The 100,000 a-f provided to him by the contract and the 100,000 a-f of DYMS storage required to maintain the critical period dependable yield of user #1.

Exhibit E-4 (Continued)

2. The following paragraphs describe two procedures to estimate DYMS manually for a project without storage allocated to hydropower (Table E-48) and for one with storage allocated to hydropower (Table E-49). It is assumed that the project yield curve already exists.

Table E- 48 Procedure for a Project Without Storage Allocated to Hydropower

| Step | Procedure |
|---|---|
| 1 | Tabulate the conservation storage allocated to each existing user. The sum of these should be equal to the total existing conservation storage. |
| 2 | Read the yield curve corresponding to the total existing conservation storage to obtain the total yield. |
| 3 | Prorate the total yield among the existing users on the basis of the percentage of the total conservation storage that is allocated to each user. |
| 4 | Add the yield required by the new user to the total yield provided by the existing conservation storage to arrive at the total yield to be provided by the expanded project. |
| 5 | Read the yield curve corresponding to the total yield to be provided by the expanded project to obtain the total conservation storage of the expanded project.. |
| 6 | Prorate the total conservation storage of the expanded project to each of the existing users and the new user on the basis of the percentage of their yield to the total yield of the expanded project. The storage so determined will be each user's allocation. |
| 7 | The DYMS (the new user is responsible for paying for the DYMS) is the increase in storage determined in Step 6 over that provided in Step 1 for each of the users in the existing project. |

Exhibit E-4 (Continued)

Table E- 49 Procedure for a Project With Storage Allocated to Hydropower

| Step | Procedure |
|---|---|
| 1 | Tabulate the conservation storage allocated to each existing user including hydropower. The sum of these should be equal to the total existing conservation storage. |
| 2 | Read the yield curve corresponding to the total existing conservation storage to obtain the total yield. |
| 3 | Prorate the total yield among the existing users and hydropower on the basis of the percentage of the total conservation storage that is allocated to each user. |
| 4 | Assume a value for the total conservation storage of the expanded project. This value will be greater than the total conservation storage of the existing project. |
| 5 | Read the yield curve for the assumed total conservation storage of the expanded project to obtain the corresponding total yield. |
| 6 | Determine the storage required in the assumed expanded project for each of the water supply users in the existing project by using the percentage their existing yield is to the total yield of the expanded project. The storage required by the new use would be similarly obtained using the desired yield of the new user. The storage so determined would be each water supply user's allocation in the assumed expanded project. The remaining storage (assumed total conservation storage minus the sum of the water supply storage for each user) would be for hydropower. If this value is not equal to the hydropower storage tabulated in Step 1, repeat Step 4 through Step 6. |
| 7 | The DYMS (the new user is responsible for paying for the DYMS) is the increase in storage determined in Step 6 over that provided in Step 1 for each of the water supply users in the existing project. |

The procedure in the above example is straightforward whenever the entire conservation pool of the existing project is allocated to water supply storage. However, when the existing project has some or the entire existing project allocated to hydropower, the procedure requires a trial and error reading of the yield curve with various assumptions of total conservation storage. This is required for two reasons: (1) it is Corps policy that, to the extent possible, impacts to hydropower will be compensated through means other than the application of DYMS (financial

Exhibit E-4 (Continued)

credits and operational modifications, if possible); and, (2) to comply with the requirement that critical period dependable yield be prorated to all users on the basis of the percentage of the total conservation pool that is allocated to each. The computations of DYMS should not be performed manually because of their tedious nature and more importantly to avoid round off errors in the storage adjustments.

3. Example with Hydropower Storage Held Constant. The next example is an actual case for the Greers Ferry Project in the Little Rock District. In this example, hydropower storage is held constant because of the policy that DYMS does not apply to hydropower storage. This discussion is relative to a proposed expansion of the conservation pool at Greers Ferry Lake, AR. Greers Ferry Lake is a multiple purpose project, which had the storage allocations as shown in Table E-50 prior to the proposed expansion.

Table E- 50 Greers Ferry Lake Storage Allocations, Prior to Expansion

(Example with Hydropower Storage Held Constant)

| Item | Elevation (Feet NGVD) | Storage Capacity (Acre-Feet) |
|---|---|---|
| Top of flood pool | 487 | 2,844,500 |
| Top of power pool | 461 | 1,910,500 |
| Bottom of power pool | 435 | 1,194,000 |
| Flood pool zone | 461-487 | 934,000 |
| Conservation pool zone | 435-461 | 716,500 |
| Hydropower storage | | 714,367 |
| Water supply storage | | 2,133 |
| Heber Springs W.S. agreement | | 1,008 |
| CWS water supply agreement | | 225 |
| Clinton water supply agreement | | 900 |

Exhibit E-4 (Continued)

Community Water System (CWS) had requested additional storage sufficient to yield 6.8 MGD. They needed this storage in two phases, with an initial request of 3.3 MGD. The example only addresses the 3.3 MGD request and the determination was made that it should be provided by an expansion into the flood pool. A detailed daily sequential reservoir routing computer program was utilized to determine the points on the dependable yield curve. This program was selected because the hydrologic data was already available and because the program had been used for numerous flood control and hydropower studies in the past. The detail required for hydropower analyses generally dictates that a weekly or daily reservoir routing model be utilized. Again, the most important consideration is not which routing model is used but rather that the same model and data set be used for the entire study.

The results of the routings produced four points on the dependable yield curve as shown in Table E-51. These data encompasses a 50,000 acre-foot expansion (the Corps' discretionary reallocation limit) into the flood pool.

Table E- 51 Routing Results

(Example with Hydropower Storage Held Constant)

| Dependable Yield (cfs) | Required Conservation Storage (acre-feet) |
|---|---|
| 909.2 | 716,500 |
| 914.0 | 722,200 |
| 930.5 | 741,500 |
| 952.0 | 766,500 |

The results of the analysis assuming that hydropower storage is held constant (the equivalent of the policy that DYMS does not apply to hydropower storage) are shown in Table E-52. The DYMS was computed as the sum of the difference of required storage (expanded project - existing project) for prior water supply storage contracts. The DYMS for this example is barely significant. CWS would be responsible for all costs of the added storage. The 4,031 acre-foot required to provide their phase 1 request and the 4 acre-feet DYMS required. After rounding to the nearest 1 acre-foot, the DYMS is distributed as 2 acre-feet for Heber Springs and 2 acre-feet for Clinton to maintain the yield of prior water supply contracts.

Exhibit E-4 (Continued)

Table E- 52 DYMS Holding Hydropower Storage Constant

| Item | Existing Project | | Expanded Project | | DYMS |
|---|---|---|---|---|---|
| | Acre-feet | cfs | acre-feet | cfs | acre-feet |
| Total conservation storage | 716,500 | | 720,535 | | |
| Critical period dependable yield | | 909.0 | | 912.6 | |
| Allocated storage (hydropower) | 714,367 | | 714,367 | | 0 |
| Dependable yield (hydropower) | | 906.5 | | 904.8 | |
| Contracted storage (Heber Springs) | 1,008 | | 1,010 | | 2 |
| Dependable yield (Heber Springs) | | 1.3 | | 1.3 | |
| Contracted storage (CWS – prior) | 225 | | 225 | | 0 |
| Dependable yield (CWS - prior) | | 0.3 | | 0.3 | |
| Contract storage (Clinton) | 900 | | 902 | | 2 |
| Dependable yield (Clinton) | | 1.1 | | 1.1 | |
| Contracted storage (CWS - phase 1) | None | | 4,031 | | |
| Dependable yield (CWS - phase 1) | | none | | 5.1 | |
| DYMS | | | | | 4 |

Exhibit E-4 (Continued)

4. Example with Hydropower Yield Held Constant The next example assumes that hydropower yield is held constant. While it is not Corps policy to maintain hydropower yield constant, these computations are necessary in order to determine the maximum limit of operational changes that could be implemented to minimize the impacts on hydropower and to determine the adjustments to the financial credits provided to the power marketing agencies. In addition, this example is included for the evaluation of alternatives that incidentally preserve the hydropower yield (e.g., an alternative that increases the average head and actually provides greater hydropower benefits than the existing project). The information in Table E-53 shows the results of the analysis assuming that hydropower yield is held constant. The DYMS was computed as the sum of the difference of required storage (expanded project - existing project) for prior water supply storage contracts and hydropower.

Exhibit E-4 (Continued)

Table 1 (E-53) Holding Hydropower Yield Constant

| Item | Existing Project | | Expanded Project | | DYMS |
|---|---|---|---|---|---|
| | acre-feet | cfs | Acre-feet | cfs | acre-feet |
| Total conservation storage | 716,500 | | 722,562 | | |
| Critical period dependable yield | | 909.0 | | 914.3 | |
| Allocated storage (Hydropower) | 714,367 | | 716,388 | | 2,021 |
| Dependable yield (Hydropower) | | 906.5 | | 906.5 | |
| Contracted storage (Heber Springs) | 1,008 | | 1,011 | | 3 |
| Dependable yield (Heber Springs) | | 1.3 | | 1.3 | |
| Contracted storage (CWS - prior) | 225 | | 226 | | 1 |
| Dependable yield (CWS - prior) | | 0.3 | | 0.3 | |
| Contracted storage (Clinton) | 900 | | 903 | | 3 |
| Dependable yield (Clinton) | | 1.1 | | 1.1 | |
| Contracted storage (CWS - phase 1) | none | | 4,035 | | |
| Dependable yield (CWS - phase 1) | | none | | 5.1 | |
| DYMS | | | | | 2,028 |

DEPARTMENT OF THE ARMY
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# APPENDIX F

# CONTINUING AUTHORITIES PROGRAM

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# APPENDIX F

## Continuing Authorities Program

## SECTION I – PROGRAM OVERVIEW

F-1. Purpose and Applicability.

a. Purpose. This appendix provides the policy and procedural guidance for planning, design, and implementation of projects pursued under the legislative and administrative provisions of the Continuing Authorities Program.

b. Applicability. The new project implementation processes in this Appendix will apply to all CAP projects initiated (received initial work allowance) after 31 January 2006. In addition, Table F-1 describes the transition of any ongoing CAP project (received initial work allowance prior to 31 January 2006) to the new CAP project implementation processes. For the purpose of applying Table F-1:

(1) A "decision document" means: a Detailed Project Report for Section 204, 206, and 1135 projects if Federal costs exceed $1M; a Planning and Design Analysis (PDA) for Section 204, 206, and 1135 projects with Federal costs less than $1M; and a PDA for Section 14 and 208 projects. A Preliminary Restoration Plan is not considered a decision document.

(2) Because a PDA consists of all the planning and design activities to demonstrate that Federal participation is warranted and no formal report is required, "the approval date for the decision document" is the date on which the district determines to proceed with design activities. Further, for ongoing PDAs it will be necessary to separate the costs incurred for feasibility activities from those incurred for design activities by the district allocating the total costs incurred for the PDA between the costs of the planning portion of the PDA (feasibility phase costs) and the design portion of the PDA (design costs).

(3) A "work allowance" is a work allowance issued by HQUSACE located in Washington. A reprogramming action initiated by the district or the division is not considered a work allowance.

| TABLE F-1 CAP TRANSITION | |
|---|---|
| **Project Status as of 31 January 2006 (under Old Procedures)** | **Procedures for Further Work on Project** |
| All Sections – Work not started | Follow new procedures for entire project. |
| Sections 103,107,111, and 205 -- 100% Federal portion ($100,000) of feasibility study was under way | Complete 100% Federal portion of feasibility study. Follow new procedures for remainder of study and design/construction of project. |
| Sections 103, 107, 111, and 205 – Feasibility Cost Sharing Agreement (FCSA) was executed and decision document was not approved | Follow new procedures for remainder of study and design/construction of project. |
| Sections 206 and 1135 with Federal costs exceeding $1M – Feasibility study was under way and decision document was not approved<br><br>Sections 206 and 1135 with Federal costs NTE $1M -- Feasibility level work on PDA was under way (district had not determined to proceed with design level work) | Complete feasibility study with 100% Federal financing of feasibility costs. Follow new procedures for design/construction of project. However, all feasibility costs will be included in total project costs in the Project Cooperation Agreement (PCA). |
| Section 204 with Federal costs exceeding $1M – Feasibility study was under way and decision document was not approved<br><br>Section 204 with Federal costs NTE $1M, Section 14, and Section 208 -- Feasibility level work on PDA was under way (district had not determined to proceed with design level work) | If decision document is approved by 31 January 2007 -- Complete feasibility level work with 100% Federal financing of feasibility costs. Follow new procedures for design/construction of project. However, the PCA should include provision that all feasibility costs in excess of $100K are shared 50/50 with sponsor.<br><br>If decision document is not approved by 31 January 2007 – Stop all feasibility level work by 31 January 2007, except for negotiation of FCSA. Resume feasibility level work after FCSA execution. FCSA should include normal provision that all feasibility costs in excess of $100K, including feasibility costs incurred prior to execution of FCSA, are shared 50/50 with sponsor. |
| Sections 204, 206, and 1135 with Federal costs NTE $1M, Section 14, and Section 208 -- Design level work on PDA was under way (district had determined to proceed with design level work and PCA was not executed)<br><br>Sections 204, 206, and 1135 with | Continue design with 100% Federal financing of design costs in FY 2006, and in each consecutive year thereafter that the project receives a work allowance.<br><br>If design is funded in consecutive years until fully funded, complete design at 100 percent Federal financing. Negotiate a PCA.<br><br>If design level work is not fully funded, and there is a |

| | |
|---|---|
| Federal costs exceeding $1M, and Sections 103, 107, 111, and 205 – Design (P&S) underway and PCA was not executed | fiscal year when the project does not receive a work allowance, stop all design work by March 31 of that fiscal year, except for negotiation of a PCA. Resume design level work after PCA execution.<br><br>For Section 204, 206, and 1135 projects, include all feasibility and design costs in total project costs under the PCA.<br><br>For Section 14 and 208 projects, include all feasibility and design costs, in excess of $40K, in total project costs under the PCA.<br><br>For Section 103, 107, 111, and 205 projects, include all design costs, but no feasibility costs, in total project costs under the PCA. |
| All Sections – PCA was executed | New procedures will not apply. |

F-2. Definitions.

a. The term “Continuing Authorities Program” or “CAP” means a group of 10 legislative authorities under which the Secretary of the Army, acting through the Chief of Engineers, is authorized to plan, design, and implement certain types of water resources projects without additional project specific congressional authorization. Table F-2 lists the CAP authorities and their project purposes.

b. The term “decision document” means the consolidated documentation of technical and policy analyses, findings, and conclusions upon which the District Commander bases the recommendation to the Major Subordinate Command Commander to approve the recommended project for implementation. The decision document will be used to support the PCA. Minimum decision document requirements are listed in Section II, paragraph F-10.f. (2) of this Appendix.

c. The term “feasibility phase” means the project formulation phase during which all planning activities are performed that are required to demonstrate that Federal participation in a specific project is warranted, culminating in approval of the decision document. All plan formulation must be completed during this phase, including all technical analyses, policy compliance determinations, and Federal and non-Federal environmental and regulatory compliance activities required for approval of the decision document.

d. The term “design and implementation phase” means the phase of the project during which all post feasibility phase activities (except for operation, maintenance, repair, rehabilitation, or replacement activities) are performed including negotiation and execution of the PCA, final design, preparation of contract plans and specifications,

construction, and any other activities required to construct or implement the approved project.

e. The letters “LERRD” mean lands, easements, rights-of-way, relocations, and dredged or excavated material disposal areas.

f. The letters “LERR” mean lands, easements, rights-of-way, and relocations.

g. The letters “LER” mean lands, easements, and rights-of-way.

h. The letters “OMRR&R” mean operation, maintenance, repair, rehabilitation, and replacement.

i. The letters “HQ RIT” mean a Regional Integration Team located in HQUSACE, Washington, D.C.

j. The letters “PED” mean preconstruction engineering and design.

k. The letters “GI” mean General Investigations.

l. The letters “MSC” mean Major Subordinate Command.

TABLE F-2 CAP AUTHORITIES

| AUTHORITY | US CODE | PROJECT PURPOSE |
|---|---|---|
| Section 14, Flood Control Act of 1946, as amended | 33 USC 701r | Streambank and shoreline erosion protection of public works and non-profit public services |
| Section 103, River and Harbor Act of 1962, as amended (amends Public Law 79-727) | 33 USC 426g | Beach erosion and hurricane and storm damage reduction |
| Section 107, River and Harbor Act of 1960, as amended | 33 USC 577 | Navigation improvements |
| Section 111, River and Harbor Act of 1968, as amended | 33 USC 426i | Shore damage prevention or mitigation caused by Federal navigation projects |

| TABLE F-2 CAP AUTHORITIES | | |
|---|---|---|
| Section 145, Water Resources Development Act of 1976, as amended | 33 USC 426j | Placement of dredged material on beaches |
| Section 204, Water Resources Development Act of 1992, as amended | 33 USC 2326 | Beneficial uses of dredged material |
| Section 205, Flood Control Act of 1948, as amended | 33 USC 701s | Flood control |
| Section 206, Water Resources Development Act of 1996, as amended | 33 USC 2330 | Aquatic ecosystem restoration |
| Section 208, Flood Control Act of 1954, as amended (amends Section 2, Flood Control Act of August 28, 1937) | 33 USC 701g | Removal of obstructions, clearing channels for flood control |
| Section 1135, Water Resources Development Act of 1986, as amended | 33 USC 2309a | Project modifications for improvement of the environment |

F-3. General Principles.

a. Purpose. The purpose of the CAP is to plan and implement projects of limited size, cost, scope, and complexity. Although there is no specific minimum project size or cost, very small projects should not be pursued under CAP as they should be implemented by other Federal or non-Federal entities. Further, District Commanders, in coordination with the MSC Commanders, should consider termination of CAP feasibility activities when the estimated or actual total cost of feasibility studies equals or exceeds the estimated implementation cost including LERRD value. Finally, large or complex problems should be pursued under the specifically authorized programs.

b. General Requirements. Projects recommended for implementation pursuant to CAP authorities must be justified in accordance with the requirements of the applicable project purpose as discussed in Appendix E of this regulation and must be implemented in accordance with the applicable legal and policy requirements as further discussed in Section III of this Appendix.

c. Using CAP at Projects Specifically Authorized by Congress. CAP authorities may be used to provide additional improvements to a completed portion of a specifically authorized project so long as they do not impair or substantially change the purposes or functions of the specifically authorized project.

d. Multi-purpose Projects. Multi-purpose projects may be formulated using CAP authorities in accordance with procedures stated in Section IX of Appendix E of this regulation and as discussed in Section II, paragraph F-18 of this Appendix.

e. Plan Formulation, Evaluation, and Selection Principles.

(1) General. Plan formulation, evaluation, and selection will follow the procedures developed for specifically authorized studies and projects as discussed in Appendix E of this regulation, at a level of detail appropriate for the scope and complexity of the proposed CAP project. District staff, in coordination with MSC staff, will determine the appropriate level of detail of analyses required to produce a quality project in a reasonable time and at a reasonable cost. Simplified evaluation procedures may be adopted for low risk/low cost projects and when the consequences of failure are minimal and do not pose a threat to human life or safety. However, District and MSC Commanders cannot deviate from legislative requirements, or from policy or regulatory requirements of HQUSACE, the Department of the Army, Department of Defense, or other Federal agencies.

(2) Formulation and Evaluation. Alternative plans should be developed to the level of detail necessary to select a justified, acceptable, and implementable plan that is consistent with Federal law and policy and, to the extent that law and policy permit, consistent with the goals of the non-Federal sponsor. Benefit and cost, risk and uncertainty, cost effectiveness, and incremental cost analyses will be undertaken using procedures appropriate for the scope and complexity of the project. Further, as required by the National Environmental Policy Act of 1969 (NEPA) and other applicable statutes, when formulating measures and plans that will result in the recommendation for a project, the project delivery team must consider opportunities to reasonably avoid or minimize adverse environmental impacts and mitigation requirements.

(3) Guidance on model certification will apply to models used in the planning of CAP projects.

(4) Environmental Sustainability. As expressed in ER 200-1-5 (30 October 2003), in implementing the USACE Environmental Operating Principles and associated doctrine, the Corps must strive to achieve environmental sustainability, which is defined as “a synergistic process whereby environmental and economic considerations are effectively balanced through the life cycle of project planning, design, construction, operation and maintenance to improve the quality of life for present and future generations.” For all CAP projects, and particularly for those not implemented under the ecosystem restoration authorities, this principle is best satisfied through forethought in the formulation stage of project development. The goal is to design projects that will not degrade existing ecosystem quality while eliminating or minimizing the need for compensatory mitigation measures. Section II, paragraph F-20 of this Appendix provides basic guidance for formulation of ecosystem restoration projects and references to other environmental related guidance.

(5) Selection of a Plan. Plan selection will be in accordance with the guidance in Appendix E of this regulation for the applicable project purpose(s). Further, if a locally preferred plan (LPP) is proposed by a non-Federal sponsor, a decision document recommending such LPP may only be approved after a waiver has been obtained in accordance with Section II, paragraphs F-10.f.(3) and F-10.f.(4) of this Appendix.

(6) Guidance on Collaborative Planning will apply to the multipurpose project planning (Combined Plans) described in Section II, paragraph F-18 of this Appendix. In particular, the plan selection concepts will be incorporated into the plan development and recommendation process.

f. Modification of Design and Construction Standards.

(1) General. Corps design and construction standards can be modified to reduce project costs for CAP projects provided that the application of modified standards has no more than minimal increased risk to public health and safety, and has no more than a minimal impact on the operation, structure, or purposes of any existing Corps project. Modifications cannot result in adverse impacts or effects extending beyond the CAP project area. The basis for a modification of standards is a comparison of the risk of failure or improper functioning with the consequences of failure or improper functioning. However, modification of mandatory standards requires a waiver in accordance with ER 1110-2-1150. If a State permit is required for the non-Federal sponsor to operate the project, the applicable State engineering standards must be met.

(2) Coordination with non-Federal sponsors. Modification of standards pursuant to paragraph F-3.f.(1) of this Appendix must be discussed with the non-Federal sponsor so it recognizes and understands any risk that it may be assuming as part of its responsibilities under the PCA, including any potential effect on its OMRR&R responsibilities.

g. Project Implementation Process. CAP projects will be implemented in two phases: the feasibility phase and the design and implementation phase. Each phase is carried out under the provisions of a separate cost sharing agreement executed by the District Commander and the non-Federal sponsor. Guidance addressing these two phases is set forth in Section II, paragraphs F-10 and F-11 of this Appendix.

h. Requirements to serve as a non-Federal Sponsor.

(1) For projects pursued under Sections 14, 103, 107, 111, 145, 205, and 208, non-Federal sponsors must be public agencies able to enter into cost sharing agreements in accordance with the requirements of Section 221 of the Flood Control Act of 1970, as amended. Section 221 specifies that the non-Federal sponsor must be “a legally constituted public body with full authority and capability to perform the terms of its agreement and to pay damages, if necessary, in the event of failure to perform.” The

non-Federal sponsor's responsibilities include paying its required share of project costs; provision or performance of LERRD (or LERR, as applicable) for the project; and performance of OMRR&R for the project, as applicable.

(2) For projects pursued under Sections 204, 206, and 1135, a non-Federal sponsor may be an entity that meets the "public body" requirement of Section 221, or may be a non-profit entity. In either event, the non-Federal sponsor must have the full authority and capability to perform the terms of its agreement and to pay damages, if necessary, in the event of failure to perform. As with a public body non-Federal sponsor, a non-profit entity that serves as the non-Federal sponsor must be able to demonstrate not only its capability to participate during design and implementation of the project but also its long-term commitment and capability to finance and perform any necessary OMRR&R activities. Further, as required by Federal statute, the affected local government must consent to a non-profit entity being the non-Federal sponsor for a Section 204, 206, or 1135 project.

i. Federal Funds Used As Part of Non-Federal Sponsor Share. The non-Federal sponsor must not use Federal program funds to meet its obligations, including LERRD, for a project unless the Federal agency providing the Federal portion of such funds verifies in writing that expenditure of such funds for such purpose is expressly authorized by Federal law. The term "Federal program funds" includes the funds or grants provided by a Federal agency as well as any non-Federal matching share or contribution that was required by such Federal program or grant.

F-4. Restrictions on Program Eligibility.

a. Studies. CAP will not be used for study only activities.

b. Specifically Authorized Projects. CAP will not be used to implement or replace any portion of a project specifically authorized by Congress.

c. Existing Non-Federal Responsibilities. CAP will not be used to nullify or change an existing condition of non-Federal responsibility required for a project specifically authorized by Congress or implemented under a CAP authority.

d. Non-Federal Operation and Maintenance. CAP will not be used to adopt a non-Federal project for future maintenance at Federal expense, to restore completed Corps projects to their authorized dimensions, or to accomplish required non-Federal maintenance at a Federally constructed project.

e. Design Deficiencies. CAP will not be used to correct design deficiencies on another CAP project or a specifically authorized project.

F-5. Coordination Account. The Coordination Account is provided to District Commanders by authority line item under procedures established by the HQUSACE

Programs Integration Division (CECW-I). This account will be used for all initial contacts and site investigations with local interests until a potential Federal interest is identified and a decision by the non-Federal sponsor and the Corps is made to initiate the feasibility phase. The account should be used to screen out ineligible situations or cases where it is unlikely that a project eventually will be implemented. This account may also be used for internal coordination prior to establishing a project account, or non-project specific coordination activities such as participation in regional or national CAP review meetings. These funds may also be used for participation in regional meetings and interagency coordination where the primary means of Corps participation is through CAP projects. However, Coordination Account funds are not to be used as supplements for coordination activities which receive line item funding, such as EPA's National Estuary Program or the Coastal America initiative. Coordination account funds are not cost shared, will be counted against the authority's statutory annual program limit, but will not be counted against any specific per project limit. Coordination activities related to specific on-going projects will be accomplished using that project's funding account, and shared accordingly.

F-6. Program Cost Sharing.

a. Feasibility Phase. This phase will be initially Federally funded up to $100,000. Any remaining feasibility phase costs will be shared 50/50 with the non-Federal sponsor pursuant to the terms of a CAP FCSA. If the feasibility phase can be completed for less than $100,000, a CAP FCSA is not required. The Federally funded $100,000 can only be used in the feasibility phase. Any unused portion of the Federally funded $100,000 is not transferable to the design and implementation phase.

b. Design and Implementation Phase. All costs beyond the feasibility phase are considered total project costs and will be shared as specified in the authorizing legislation for that purpose. The specific requirements for each individual project must be detailed in the project's PCA.

F-7. Statutory Federal Participation Limits.

a. General. The CAP legislative authorities contain specific Federal financial participation limits which apply to (1) the amount of Federal participation allowed for each specific project implemented under a CAP authority (per project limit); (2) the amount of Federal participation under a CAP authority in any one fiscal year (annual program limit); or (3) both a per project limit and an annual program limit. Table F-3 displays the applicable per project and annual program Federal participation limits for each CAP authority. All Corps funds expended for feasibility and design and implementation activities are counted against the statutory per project and annual program limits. For Sections 204, 206, and 1135, expenditures by other Federal agencies on feasibility and design and implementation activities are included in the Federal share of the project cost and counted toward the Federal per project limits and annual program limits. For Sections 14, 103, 107, 111, 145, 205, and 208, expenditures of other Federal

agencies under their own authorities are not included in these Federal per project limits and annual program limits. For Section 107 projects for commercial navigation, Federal expenditures for operation and maintenance of the general navigation features are not counted toward the Federal per project limit and annual program limit. In no event will Civil Works funds be allotted to a project for the feasibility or design and implementation phases if the allotment would result in the applicable per project or annual program limit being exceeded. Refer to Section III, paragraph F-26.g of this Appendix for instructions regarding the Section 111 Federal participation limit. HQUSACE will monitor the annual program limits and will issue guidance on how to proceed in the event an annual program limit is approached. The amounts shown below as the annual program limit for Sections 204, 206, and 1135 is the limit on annual appropriations from Congress (and on obligation of those appropriations) for that authority. For the remaining authorities, the amounts shown below as the annual program limit is the annual limit of allotments from HQUSACE for that authority.

b. Costs in Excess of the Statutory Federal Per Project Participation Limit. There is no limit on the total project costs of a project implemented under CAP. However, Army policy does not permit continuing with planning of a project pursuant to CAP when after application of the appropriate Federal/non-Federal cost sharing percentages, it is estimated that the Federal share would exceed the applicable per project limit.

(1) If this is discovered before execution of the PCA, the study may be converted to the GI program in accordance with paragraph F-9 of this Appendix. As an alternative to conversion to the GI program (except in the case of Section 111), the non-Federal sponsor may offer to contribute funds for any costs that would normally be part of the Federal share but are over the per project limit. If the MSC Commander supports this offer, the MSC Commander shall treat the offer as a proposal for a policy deviation in accordance with Section II, paragraph F-10.f.(4) of this Appendix. In no event will Federal funds in excess of the per project limit be allotted to a project even if the non-Federal sponsor proposes to reimburse the Government for any amount in excess of the per project limit.

(2) If this is discovered after execution of the PCA, the non-Federal sponsor must contribute funds in accordance with the terms of the PCA for any costs that would normally be part of the Federal share but are over the per project limit or the PCA will be terminated (Table F-3).

| TABLE F-3 STATUTORY FEDERAL PARTICIPATION LIMITS | | |
|---|---|---|
| Authority | Per Project Limit ($) | Annual Program Limit ($) |
| Sec 14 | 1,000,000 | 15,000,000 |
| Sec 103 | 3,000,000 | 30,000,000 |
| Sec 107 | 4,000,000 | 35,000,000 |
| Sec 111 | 5,000,000 | N/A |
| Sec 145 | N/A | N/A |
| Sec 204 | N/A | 15,000,000 |
| Sec 205 | 7,000,000 | 50,000,000 |
| Sec 206 | 5,000,000 | 25,000,000 |
| Sec 208 | 500,000 | 7,500,000 |
| Sec 1135 | 5,000,000 | 25,000,000 |

F-8. Converting GI Funded Studies or PED to CAP.

a. General. The MSC commander may approve transfer of an ongoing GI funded study or PED to CAP. However, the MSC commander may not use GI and CAP funds simultaneously on any study.

b. Converting GI 905(b) Studies to CAP. A new CAP study may be initiated based on the analyses of a GI 905(b) investigation which found that there is likely a Federal interest in pursuing further planning analyses.

(1) For a new CAP study that will continue with evaluation of the same or generally similar project that was the subject of the GI 905(b) investigations, the GI 905(b) investigations will be considered the initially Federally funded portion of the CAP feasibility phase. Therefore, the initial amount of such new CAP study that would be funded at 100 percent Federal expense will be reduced by the amount of funds expended for the GI effort. If it is determined that the cost of the GI efforts equaled or exceeded $100,000, then all costs of the new CAP study will be shared with the non-Federal sponsor. None of the GI expenditures will be counted against the applicable CAP per project or annual program limits.

(2) For a new CAP study that will evaluate a project that is one of many that could result from a more encompassing GI 905(b) investigation (such as a watershed study), only that portion of the GI effort that is allocated by the district to the project being pursued under the new CAP study will be considered as the initially Federally funded portion of the CAP feasibility phase. Therefore, the initial amount of such new CAP study that would be funded at 100 percent Federal expense will be reduced by the

amount of funds expended for the GI effort that the district allocates to the project being studied. If it is determined that the cost of the GI efforts equaled or exceeded $100,000, then all costs of the new CAP feasibility study shall be shared with the non-Federal sponsor. None of the GI expenditures will be counted against the applicable CAP per project or annual program limits.

c. Converting GI Funded Cost Shared Feasibility to CAP. Prior to converting to CAP, work for the GI cost shared feasibility study should be terminated in an orderly manner pursuant to the provisions of the existing GI FCSA. However, the MSC Commander may find it more appropriate to complete the ongoing GI effort and convert to CAP upon completion of the feasibility study. In any event, a conversion to CAP would require executing a CAP FCSA for any remaining feasibility phase items required to proceed to execution of a PCA. All costs of the CAP feasibility phase activities will be shared with the non-Federal sponsor. None of the GI expenditures will be counted against the applicable CAP per project or annual program limits.

d. Converting GI Funded PED to CAP. Prior to converting to CAP, work for a GI PED (pre-authorization) should be terminated in an orderly manner pursuant to the provisions of the existing Design Agreement. However, the MSC Commander may find it more appropriate to complete the ongoing GI effort and convert to CAP upon completion of the PED phase. In any event, a conversion to CAP would require execution of a PCA to address any remaining design activities and to proceed with construction. All remaining costs of the CAP design and implementation phase will be shared with the non-Federal sponsor. None of the GI expenditures will be counted against the applicable CAP per project or annual program limits. Conversion of a GI funded PED to CAP is only applicable for a project that has not been specifically authorized for construction by Congress. If a project has been specifically authorized for construction, it will not be transferred for implementation under CAP until Congress specifically deauthorizes the project or Congress specifically funds its implementation under a CAP authority in law.

F-9. Converting CAP Feasibility Studies to GI.

a. General. CAP studies must be converted to GI once it has been determined that the solution will be beyond the scope of CAP. If possible, any such determination should be made during that portion of the feasibility phase that is 100 percent Federally funded. The determination and supporting analyses will be documented.

b. Conversion to GI Prior to Execution of a CAP FCSA. If further study is required to complete a decision document, after the determination that a CAP study should be converted to the GI program, a new GI reconnaissance or feasibility phase study, as appropriate, will be started following the process for new GI studies. The process for new GI studies can be found in the annual Budget EC.

c. Conversion to GI After Execution of a CAP FCSA but Before Completion of the Feasibility Phase. If it is determined after execution of the CAP FCSA that a project should be converted to the GI Program, work under the CAP FCSA will be terminated in an orderly manner pursuant to the terms of the CAP FCSA, and a new GI feasibility phase study will be started following the process for new GI studies.

d. Conversion to GI After Feasibility Phase but Prior to Execution of PCA. If it is determined after completion of the feasibility phase but before execution of the PCA that a project should be converted to the GI Program, a new GI PED will be started following the process for new GI PED.

## SECTION II – PROJECT IMPLEMENTATION

F-10. Feasibility Phase.

a. General. The feasibility phase encompasses the entire range of planning activities required to demonstrate that Federal participation in a project is warranted and justified. This phase will be initially Federally funded up to $100,000. Any remaining feasibility phase costs will be shared 50/50 with the non-Federal sponsor pursuant to the terms of a CAP FCSA. If the feasibility phase can be completed for less than $100,000, a CAP FCSA is not required. The Federally funded $100,000 can only be used in the feasibility phase. Any unused portion of the Federally funded $100,000 is not transferable to the design and implementation phase.

b. Initiation of Feasibility Phase.

(1) Request for Assistance. A feasibility phase is normally initiated based on receipt of a letter from a potential non-Federal sponsor stating its desire to participate in a solution, and acknowledging its financial responsibilities for the study and the project, if one is recommended.

(2) Legislative Action. A feasibility phase may also be initiated based on directions contained in authorization or appropriations act language or committee report language accompanying such legislation and receipt of a letter from a potential non-Federal sponsor stating its desire to participate in a solution, and acknowledging its financial responsibilities for the study and the project, if one is recommended.

c. Procedures to Obtain Federal Funding for Feasibility Phase.

(1) 100% Federally Funded Portion of Feasibility Phase. After the decision by the non-Federal interest and the Corps to initiate the feasibility phase, the district should request the funds necessary for the $100,000 Federally funded portion of the feasibility phase.

(2) Cost Shared Portion of Feasibility Phase. Upon execution of the CAP FCSA (see paragraph F-10.d. of this Appendix), the district should request the remainder of the Federal funds (above the $100,000 Federally funded portion) required for the feasibility phase.

(3) Funds Requests. The district should prepare and send the requests for funds, through the MSC Programs Office, to the appropriate HQ RIT for coordination with HQ Programs Integration Division (CECW-IP). Each request should identify the name of the project, the PWI, the CAP authority it will be implemented under, the total amount of funds requested, and, if the remainder of the feasibility phase will extend beyond one fiscal year, the amount of funds needed by fiscal year. The study should be entered into PRISM and P2 as soon as possible.

d. Feasibility Cost Sharing Agreement (FCSA). No CAP FCSA is required if the feasibility phase can be completed for $100,000 or less. Any feasibility phase costs in excess of $100,000 will be shared 50/50 with the non-Federal sponsor pursuant to the terms of a CAP FCSA executed by the District Commander and the non-Federal sponsor. The model CAP FCSA will be used. Authority to approve a CAP FCSA, including any deviations, and to execute the CAP FCSA will be in accordance with the implementation memo for the CAP FCSA. The CAP FCSA must be negotiated and executed during the 100 percent Federally funded portion of the feasibility phase and no funds in excess of $100,000 will be allotted to a project until the CAP FCSA is executed. Subsequent to execution of the CAP FCSA, no work may be initiated until the non-Federal sponsor's appropriate proportional share of costs over $100,000 has been made available either in cash or through an agreement on a schedule for and estimated value of non-Federal feasibility work (see paragraph F-15 of this Appendix) that is necessary for the feasibility phase.

e. Required Milestones. The purpose of the two required milestones listed below is to assure that continuing work on the feasibility phase is consistent with the policies, principles, priorities, procedures, and constraints of CAP, thus preventing excessive expenditures on questionable projects. The MSC Commander shall develop requirements, to be submitted by the district to the MSC, for the information necessary to support the determinations made at these milestones. These requirements should be consistent with the scope and scale of the situation under study. The MSC Commander may establish additional milestones as deemed necessary for each study.

(1) Federal Interest Determination. The first milestone is the determination that study efforts are likely to lead to project implementation. The purpose is analogous to that served by a 905(b) Report. The review would include consideration of problem specification, identification of Federal interest and potential for solution(s) that would result in a policy consistent project of a scope appropriate for CAP, with a willing and capable sponsor. This determination will be accomplished early enough in the Federally funded portion of the feasibility phase to ensure that there are no impediments to proceeding with the project.

(2) Alternatives Formulation Briefing. The second milestone is an Alternatives Formulation Briefing (AFB) that takes place after the alternative plans have been formulated and prior to the release of the draft decision document for public review. The purpose of the AFB is to ensure that plans have been properly formulated, legal and policy issues have been identified and a consensus on resolution has been reached, and the MSC concurs with the plan that will likely proceed into the design and implementation phase.

f. Decision Document Requirements and Approval.

(1) General. Subject to the minimum requirements set forth in paragraph F-10.f.(2) of this Appendix, the MSC Commander will establish decision document requirements and formats. The guidance in Appendix G of this regulation covering feasibility report content should help guide technical and policy decision document requirements.

(2) Decision Document Requirements. The minimum decision document and supporting documentation requirements are: a clear description of the recommended plan; demonstration of the project justification based on standard Corps project justification criteria for the particular project purpose in accordance with the general guidance applicable to the project purpose(s); documentation of the results of any request for a waiver of policy under paragraph F-10.f.(4) of this Appendix; documentation of compliance with appropriate Federal, State, and local environmental and regulatory requirements such as NEPA, etc., normally included in a feasibility study specifically authorized by the Congress; a completed Real Estate Plan consistent with the requirements of Chapter 12, ER 405-1-12; the non-Federal sponsor financial analysis and financing plan at a level of detail appropriate to the scale of the project; District Real Estate certification that the non-Federal sponsor has the capability to acquire and provide the required real estate interests; a detailed description of the non-Federal sponsor's local cooperation requirements; identification of the anticipated operation, maintenance, repair, replacement, and rehabilitation activities, including estimated costs; the feasibility level ITR certification; and the District Counsel statement of legal sufficiency for the decision documentation and NEPA process.

(3) Locally Preferred Plans. Projects may deviate from the NED and/or NER plan if requested by the non-Federal sponsor and approved by ASA (CW). The decision document may recommend locally preferred plans (LPP) formulated using the same procedures for specifically authorized projects described in paragraph 2-3.f.(4) of this regulation. Before a decision document recommending a LPP may be approved, a waiver request prepared in accordance with paragraph F-10.f.(4) of this Appendix must be approved by ASA (CW). When the LPP is clearly of less scope and cost and meets the Administration's policies for high priority outputs, a waiver is usually granted. For those cases, in which the LPP has costs in excess of the NED or NER plan, the decision document must describe and compare the NED or NER plan and the LPP and specify the

difference in the costs of the two plans and that the non-Federal sponsor agrees to pay all costs over the Federal share of the NED or NER plan. The LPP, in this case, must have outputs similar in-kind, and equal to or greater than the outputs of the Federal plan.

(4) Waiver for Deviation from Policy.

(a) Policy Waivers Identified During Feasibility Phase. The MSC Commander must seek a waiver for any deviation from policy and obtain a response coordinated through Headquarters and OASA (CW) staff before he or she can approve a decision document containing a deviation from policy. Waivers are required for any proposed deviation from general policy including but not limited to policies regarding plan formulation and cost sharing, as well as the specific policies on statutory Federal per project participation limits (see Section I, paragraph F-7.b.(1) of this Appendix), recommendation of a LPP (see paragraph F-10.f.(3) of this Appendix), limits on recreation costs (see paragraph F-19 of this Appendix), limits on cost shared monitoring (see paragraph F-21 of this Appendix), and implementing a Section 107 project (see Section III, paragraph F-25.d. of this Appendix). The MSC Commander must submit the waiver request to the appropriate HQ RIT together with a full explanation of the circumstances for the waiver. The appropriate HQ RIT will prepare a letter responding to the MSC request, which will be coordinated through Headquarters staff and the OASA (CW) staff. In no event will the decision document be approved until all deviations from policy have been addressed through waiver requests and the written response from the HQ RIT has been received by the MSC.

(b) Policy Waiver Identified After the Feasibility Phase but Before Execution of the PCA. The only waiver request that will be considered after approval of the decision document is a waiver of the specific policy on statutory Federal per project participation limits (see Section I, paragraph F-7.b.(1) of this Appendix) due to cost escalation identified during any design performed prior to execution of the PCA. The MSC Commander must submit the waiver request to the appropriate HQ RIT together with a full explanation of the escalation of costs between the approval of the decision document and the identification of the need for a waiver and the non-Federal sponsor's offer to contribute funds for any costs that normally would be part of the Federal share but are over the per project limit. The appropriate HQ RIT will prepare a letter responding to the MSC request, which will be coordinated through Headquarters staff and the OASA (CW) staff. In no event will the PCA be executed until the written response from the HQ RIT has been received by the MSC.

(5) Decision Document Approval. Approval of the decision document will be by letter of the MSC Commander to the District Commander, with a copy furnished to the appropriate HQ RIT. This authority may not be further delegated to the District Commander. The approval letter will certify that the requirements specified in this Appendix for approving the decision document have been satisfied; summarize the findings, conclusions, and rationale for approving the decision document; and certify that

the project addressed in the decision document is justified and is policy compliant or has received the necessary policy waivers.

g. Completion of the Feasibility Phase. The feasibility phase is completed when 1) the decision document, addressing a plan formulated in accordance with the Principles and Guidelines, has been approved by the MSC Commander or 2) the feasibility phase is terminated.

h. Termination of the Feasibility Phase. Following coordination with affected non-Federal interests, the feasibility phase should be terminated if analyses indicate a lack of Federal interest or a lack of public support or if a satisfactory letter of intent is not received from a potential non-Federal sponsor within a reasonable length of time (as determined by the MSC Commander in consultation with the District Commander). The phase is officially terminated when the District Commander so advises the MSC Commander and the appropriate HQ RIT of termination of the study. The District Commander will also notify Congressional delegations and non-Federal interests when the study has been officially terminated.

F-11. Design and Implementation Phase.

a. General. This phase follows completion of the feasibility phase and includes all of the activities that would normally be included in the PED and construction phases of specifically authorized projects. All costs incurred for this phase will be shared with the non-Federal sponsor in accordance with the cost sharing requirements of the applicable CAP authority.

b. Initiation of Design and Implementation Phase. This phase begins upon the MSC Commander approval of the decision document that recommends proceeding into the design and implementation phase. The first action of the design and implementation phase is negotiation and execution of a PCA.

c. Procedures to Obtain Federal Funding for Design and Implementation Phase.

(1) Initial Work Allowance to Negotiate and Execute PCA. Upon approval of the decision document by the MSC Commander, thus completing the feasibility phase, the district shall submit a request for funds, not to exceed $50,000, to pay the Federal costs of negotiating the PCA and initiating design. While these costs are 100% Federally funded prior to the PCA, once the PCA is executed the Federal costs to negotiate the PCA and initiate design will be included in total project costs and shared with the non-Federal sponsor pursuant to the terms of the PCA. No additional funds in excess of $50,000 will be allotted to a project until the PCA is executed.

(2) Remainder of Design and Implementation Phase. After execution of the PCA, the district should request the remaining funds required for the design and implementation phase as appropriate to comply with budgetary and contracting guidance.

(3) Funds Requests. The district should prepare and send the requests for funds, through the MSC Programs Office, to the appropriate HQ RIT for coordination with HQ Programs Integration Division (CECW-IP). Each request should identify the name of the project, the PWI, the CAP authority it will be implemented under, the total amount of funds requested, and if the design and implementation phase will extend beyond one fiscal year, the amount of funds needed by fiscal year. The request should also contain a current CAP Fact Sheet. The project information in PRISM and P2 should be updated as soon as possible.

d. PCA. The design and implementation phase will be conducted under the provisions of the PCA executed by the District Commander and the non-Federal sponsor. The appropriate model PCA will be used. Authority to approve the PCA, including any deviations, and to execute the PCA shall be in accordance with the implementation memo for the appropriate model.

(1) Design. The design portion will conclude with completion of the plans and specifications for the project. Compliance with all applicable environmental laws and regulations, including, but not limited to NEPA and Section 401 of the Federal Water Pollution Control Act (33 U.S.C. 1341) must be verified and documented during the design portion.

(2) Implementation. Once the design portion has been completed, the parties must decide whether to proceed with implementation of the project, or terminate the PCA, in an orderly manner pursuant to the provisions of the PCA. However, no Government or non-Federal sponsor construction work shall be initiated prior to compliance with all applicable environmental laws and regulations.

e. Solicitations for Contracts.

(1) Solicitations for contracts will not be issued prior to execution of the PCA unless approved in advance by the MSC Commander following the District's written request.

(2) Further, solicitations for construction contracts should not be issued until the District Chief of Real Estate has certified in writing that sufficient real property interests are available to support construction under such contracts. However, in exceptional circumstances the District Commander may proceed and issue a solicitation contrary to this general policy after full assessment of the risks and benefits of proceeding.

(3) In those cases where solicitations are issued without sufficient real property interests, or prior to PCA execution, as allowed above, the solicitation documents should advise potential bidders of such facts.

f. Contract Bid Opening.

(1) No contract bids will be opened prior to execution of the PCA and prior to receipt of the non-Federal sponsor's required cash contribution. In no event will this policy be waived.

(2) If the District Commander issued a solicitation for a construction contract without sufficient real property interests to support a construction contract as described in paragraph F-11.e.(2) of this Appendix, sufficient real property interests must be available to support implementation under that contract before submitted bids may be opened and considered. The MSC Commander may approve opening bids prior to sufficient real property interests being available after receipt and review of a District's written request that includes adequate justification and full risk and benefit assessment. Due to concerns regarding liability and fairness to potential bidders, approval of such requests are discouraged and should be granted only in exceptional circumstances.

g. Award of Construction Contracts. Construction contracts will not be awarded until the District Chief of Real Estate has certified in writing that sufficient real property interests are available to support implementation under that contract. HQUSACE will consider limited exceptions to this policy only after submission of a written request by the District, through and with the concurrence of the MSC Commander, to the appropriate HQ RIT that contains clear and persuasive evidence that the outstanding real property interests will be obtained in a timely manner, that proceeding to award poses no significant liability or risk to the Government, and that approval is otherwise appropriate considering all relevant facts and circumstances.

h. Completion of the Design and Implementation Phase. The design and implementation phase is completed when 1) the District Commander determines that project construction and any cost shared monitoring, to be performed after physical construction, is complete or 2) the PCA is terminated, in an orderly manner pursuant to the provisions of the PCA, prior to completion of project construction.

i. OMRR&R of the Project. Upon physical completion of the project, the District Commander will notify the non-Federal sponsor in writing that construction of the project is complete, and will provide the non-Federal sponsor with an Operation, Maintenance, Repair, Rehabilitation, and Replacement (OMRR&R) Manual. Upon receipt of the notice of completion of construction of the project, the non-Federal sponsor will operate, maintain, repair, rehabilitate, and replace the project in accordance with the OMRR&R Manual.

j. Project Completion Report. After project completion, including any cost shared monitoring to be performed after physical construction is complete, and the final audit and project closeout, the District Commander will transmit a project completion report to the MSC. The report will contain a short description of the project, the final Federal and non-Federal feasibility and design and implementation costs by phase, and the date that

the non-Federal sponsor was provided notice of physical completion in accordance with the terms of the PCA.

F-12. Approval Authorities for Decision Documents and Agreements.

a. Decision Documents. As discussed in detail in paragraph F-10.f. of this Appendix, the MSC Commander is authorized to approve project decision documents that he or she certifies are in compliance with law and policy including those where necessary policy waivers have been received (see paragraph F-10.f.(4) of this Appendix). Decision document approval authority may not be delegated to the District Commander.

b. Agreements.

(1) Authorities With Approved Model Agreements. The authority to approve a CAP FCSA or PCA, including any deviations thereto and the authority to execute such agreements, will follow the authorities and procedures outlined in the implementation memo for the applicable model.

(2) Authorities Without Approved Model Agreements. In cases where there is not an approved model, the MSC Commander, must forward to the appropriate HQ RIT one hardcopy and an electronic copy of a PCA package each containing the following: a clean copy of the negotiated draft agreement; a copy of the negotiated draft agreement with the deviations indicated by redline/strikeout from the Section 205 structural flood damage reduction model; a list of the deviations from the Section 205 structural flood damage reduction model and detailed reasons for the deviations; Certificate of Legal Review signed by the District Counsel; CAP PCA Checklist; and current letter of intent from the non-Federal sponsor. All documents requiring signatures (CAP checklist, Certificate of Legal Review, and letter of intent) must be scanned so that required signatures are contained in the electronic files.

F-13. Post Implementation Federal and Non-Federal Sponsor Responsibilities. Once any CAP project or separable element, under any CAP authority, has been completed, the project will be treated in the same manner as a completed project that was specifically authorized by the Congress. This includes assuring non-Federal sponsor compliance with PCA responsibilities and the periodic inspection of projects.

F-14. After Action Reviews. As part of the Headquarters responsibility to monitor policy and procedural compliance in this program, HQUSACE and MSC CAP managers will meet to conduct policy and procedural after action reviews of projects with PCAs executed in the past year. The procedural reviews shall be based on HQUSACE and existing MSC documentation requirements for decision-making. In addition to monitoring policy and procedural compliance, these reviews will serve as a forum for identification of management and procedural problems, general policy issues, and successes which will in turn form the basis for any needed corrective action and continued evolution of program operating principles.

F-15. Non-Federal Feasibility Work and Non-Federal Design and Implementation Work.

a. General. Non-Federal feasibility work and non-Federal design and implementation work is planning, design, or implementation activities performed by the non-Federal sponsor in lieu of the Federal Government during the feasibility phase or design and implementation phase, respectively. Such work is often referred to as "work-in-kind". Neither non-Federal feasibility work nor non-Federal design and implementation work includes activities the non-Federal sponsor must perform as required in the CAP FCSA or PCA, respectively, such as participation on the study coordination team or Project Coordination Team, performance of activities related to acquisition of LERRD, investigation or response actions under the Hazardous Substances article, and certain audit-related activities. Credit may be afforded only for non-Federal feasibility work or non-Federal design and implementation work performed after execution of the applicable agreement (CAP FCSA or PCA). Non-Federal sponsors will not be afforded credit against the non-Federal share of a CAP study or project or reimbursed for any work undertaken, or contributed, or provided, for a CAP study or project except as described below.

b. Feasibility Phase. In accordance with the principles of Section 105(a) of the Water Resources Development Act of 1986, as amended, the non-Federal sponsor may be afforded credit against its share of study costs for the value of non-Federal feasibility work performed during the feasibility phase.

(1) Performance of non-Federal feasibility work and affording of credit toward the non-Federal sponsor's share is only applicable for the portions of feasibility studies beyond the first $100,000 in cost, and for non-Federal feasibility work performed subsequent to execution of the CAP FCSA.

(2) Credit afforded in accordance with the principles of Section 105(a) is limited to credit for non-Federal feasibility work that does not result in any reimbursement to the non-Federal sponsor. Therefore, the credit for non-Federal feasibility work can only be applied toward the additional cash requirement. To determine the additional cash requirement, subtract from the total required non-Federal share of total study costs the costs that the non-Federal sponsor must incur under the CAP FCSA for participation in the study coordination team and certain audit-related activities. Any amount of non-Federal feasibility work that exceeds the additional cash requirement must be included in total study costs but will be a 100 percent non-Federal sponsor responsibility.

c. Implementation Phase. Pursuant to Section 215 of the Flood Control Act of 1968, as amended, the non-Federal sponsor may be afforded credit against its share of total project costs for the value of non-Federal design and implementation work performed during the design and implementation phase.

(1) In the CAP program, the policy is that the maximum amount of credit that can be afforded for non-Federal design and implementation work is limited so that it does not

result in any reimbursement to the non-Federal sponsor. Therefore, the credit for non-Federal design and implementation work can only be applied toward the additional cash requirement. To determine the additional cash requirement, subtract from the total required non-Federal share of total project costs the sum of the value of LERRD and the costs that the non-Federal sponsor must incur under the PCA for participation in the Project Coordination Team, investigations or response actions under the Hazardous Substances Article, and certain audit-related activities. Any amount of non-Federal design and implementation work that exceeds the additional cash requirement will be included in total project costs but will be a 100 percent non-Federal sponsor responsibility.

(2) For Section 1135 projects, no more than 80 percent of the non-Federal sponsor's share may be non-Federal design and implementation work.

(3) For Sections 14, 205 (structural), and 208 projects, non-Federal design and implementation work cannot be credited toward the 5 percent cash requirement.

d. Eligible Parties to Perform Non-Federal Feasibility Work or Non-Federal Design and Implementation Work. Non-Federal feasibility work and non-Federal design and implementation work for credit may only be provided by the non-Federal sponsor, and can be accomplished by the hired labor of the non-Federal sponsor or by contract administered by the non-Federal sponsor.

e. Determination of Value. The value of the non-Federal feasibility or design and implementation work will be estimated prior to the initiation of the effort. For the purposes of estimating total study costs or total project costs and projecting the non-Federal sponsor's cash requirement, the Corps and the non-Federal sponsor will agree upon a value for such work at the beginning of the study or design and implementation, as applicable. The actual amount of credit to be afforded for non-Federal feasibility or design and implementation work will be subject to an audit to determine reasonableness, allowability and allocability of the costs and will not exceed the actual costs incurred or the amount of the Government estimate of such work if the work had been performed by the Government, whichever is less. The Corps shall apply applicable Federal regulations, including OMB Circular A-87 or A-122 (for non-profit sponsors). The non-Federal sponsor must comply with applicable Federal and state laws and regulations, including the requirement to secure competitive bids for all work to be performed by contract.

f. Ineligible Activities. The non-Federal sponsor may not receive credit for supervision and administration of work performed by the Government or the Government's contractors. Many of the tasks included in the Supervision and Administration account during the design and implementation phase, including most of the contract management related activities, are inherent Government functions which may not be contracted out or assigned to others to perform (see Federal Acquisition Regulation subpart 7.5). The non-Federal sponsor will receive credit for supervision and

administration of any contracts that it awards subject to an audit to determine reasonableness, allowability, and allocability of the costs.

g. Other Contributions. Contributions of cash, funds, materials and services from other than the non-Federal sponsor may be accepted for ecosystem restoration projects (Sections 204, 206, and 1135) under the provisions of Section 203 of the WRDA of 1992. However, the value of such contributions will not be included in total project costs and will not be credited toward the non-Federal sponsor's share of total project costs.

F-16. Real Estate.

a. Real Estate Plan Requirements. The analysis of the nature and extent of real estate requirements must be conducted in accordance with Chapter 12 of ER 405-1-12, including consideration and identification of the specific interests, estates, and acreage required for the project. While all CAP decision documents must contain a Real Estate Plan (REP) prepared in accordance with Chapter 12, the level of detail required for each topic required to be discussed in the REP will vary depending on the scope and complexity of the project. The level of detail contained in the REP generally should match the level of detail contained in the balance of the project decision document.

b. Existing Projects. For projects involving modification of existing projects, the interests and estates acquired for the existing project, as well as any outgrants, must be analyzed by the District Real Estate Division to determine if sufficient rights are available for the project modification. A standard lease format has been prepared for Section 1135 projects and is included in Chapter 8 of ER 405-1-12.

c. Credit. The value and amount of credit given for LERRD required to be provided by the non-Federal sponsor will be determined after review and preliminary approval by the District Real Estate Division after consultation with the Project Manager.

F-17. Beneficial Uses of Dredged Material. There is a new budget category of work that includes Section 145, as amended and Section 204, as amended. The primary purpose of budgeting these types of projects under one line item is that beneficial use of dredged material and sediment management requires an integrated, systematic approach using all applicable authorities. This budgetary approach enhances the consideration and use of these authorities during dredging activities. Guidance on each individual authority is located in Section III of this Appendix.

F-18. Multi-Purpose CAP Projects.

a. General. In an effort to promote comprehensive collaborative planning, the formulation of multipurpose projects may be accomplished under CAP. The term "multi-purpose project" often is used to describe two different types of situations, each involving different formulation. In the first situation, a project is formulated as either a NED plan with incidental NER benefits or a NER plan with incidental NED benefits and costs are

shared according to one cost sharing formula. In the second situation, often referred to as "Combined Plans", an NED plan and an NER plan are formulated together, i.e. have interdependent features, using a trade-off analysis. Combined Plans require complex evaluation and tradeoff analyses not normally consistent with the limited scope and complexity associated with CAP projects. Each of these two approaches is appropriate for consideration under CAP.

b. Cost Allocation Between Purposes for Combined Plans. If the districts wish to engage in the formulation and evaluation of Combined Plans, they should follow the procedures stated in Section IX of Appendix E of this regulation. However, in no case will the cost for a purpose included in the Combined Plan exceed the statutory Federal per project limit for that purpose under its applicable CAP authority. The cost for each purpose will include the separable costs, plus the joint costs allocated to each purpose. Cost allocation will be performed using the SCRUB method as described in Appendix E of this regulation. The costs for each purpose will be shared in accordance with the cost sharing formula for the applicable CAP authority. For accounting purposes, it is critical to keep track of the costs assigned to each purpose. Consultation with HQ is required prior to proceeding with the Combined Plan approach.

c. Limitations. Sections 14 and 1135 will not be used for multi-purpose planning under the CAP Program. Section 111 will not be used in conjunction with any other CAP authority besides Section 103. Further, Sections 145 and 204 will not be used in conjunction with any other CAP authorities besides Section 107.

d. Recreation. As used in this paragraph, the addition of recreation does not result in a "multi-purpose project". For procedures and limitations for adding recreation to CAP projects, see paragraph F-19 of this Appendix.

F-19. Recreation.

a. General. Recreation features may be added to any project implemented under the CAP authorities (except for Section 14 and Section 208), if appropriate. Any recreation features should be formulated in accordance with current policies and procedures governing recreation (see Section VII of Appendix E of this regulation).

b. Limits on Inclusion of Recreation Features. For each CAP authority, justified separable recreation features may be added (except for Section 14 and Section 208) if the cost of such measures does not increase the Federal share of total project costs by more than 10 percent of the Federal share of total project costs without the added recreation, except as follows:

(1) When adding recreation to a multi-purpose project, the recreation costs must not exceed 10 percent of the total Federal cost of the combined purposes;

(2) Where the non-Federal sponsor has waived reimbursement of the value of LERRD as described in paragraph F-20.c.(5) of this Appendix, the 10 percent amount will be calculated on total project cost that does not include the value of LERRD for which the non-Federal sponsor waives reimbursement;

(3) The formulation of non-structural flood damage reduction projects is not constrained by the limitation of increased Federal cost for recreation; and

(4) Where a policy waiver has been approved in accordance with paragraph F-10.f.(4) of this Appendix.

c. Cost Sharing. Separable recreation features will be cost shared 50/50 with the non-Federal sponsor.

F-20. Ecosystem Restoration Policies Applicable to Section 204, Section 206, and Section 1135.

a. General. A discussion of policies applicable to ecosystem restoration may be found in Appendix E of this regulation, in ER 1165-2-501, and in EP 1165-2-502. This paragraph describes policies for projects formulated under Section 204, Section 206, and Section 1135.

b. Considerations in Determining Real Estate Requirements. Paragraph F-16 of this Appendix presents the general principles for determining real estate requirements for CAP projects. However, the formulation of ecosystem restoration projects generally can present challenges with regard to determining the acreage, interests, and estates required to support the implementation of ecosystem restoration projects under CAP authorities. Accordingly, the following policies, procedures, and three part analyses must be applied in determining the real estate requirements for such projects.

(1) Acreage Required. Identification of the acreage directly and physically required to implement and operate and maintain ecosystem restoration project features typically is similar to the efforts in non-ecosystem restoration projects and presents few unusual difficulties. However, determining what additional acreage may be required outside of the "footprint" of project features to reasonably ensure the production of the benefits upon which the project was formulated may be more complex. The need to include, and the amount of, acreage in addition to the footprint of project features and immediately surrounding areas should be carefully evaluated by the project delivery team. Factors to consider in making this determination include the physical integrity of the project, cost effectiveness, incremental costs, operation and maintenance requirements, and the risks associated with not including the additional acreage. For example, there may be an acceptable minimal risk that future land use detrimental to the project will occur on the land adjacent to the project footprint where it is owned in fee by a public agency whose mission is compatible with project outputs or where development of the adjacent land is legally restricted for the foreseeable future to purposes consistent

with project outputs. Inclusion of acreage in addition to that required for the footprint of project features must be directly tied to identified and measurable planning and implementation objectives, must not be simply assumed to be required for the project, and must be properly documented and justified. In some cases, an interest in all of the land benefiting from the project may not be required to reasonably ensure that the outputs justifying the project are obtained.

(2) Interest Required.

(a) General Policy. Determination of required interests (fee or permanent easement) must be driven by program, policy, and project requirements that ensure achievement of ecosystem benefits and protection of the Federal interest in a manner that best serves the public interest. As a matter of Corps policy, and as stated in ER 405-1-12, fee title is required as a general rule for all lands required for the construction and operation and maintenance of the project. The rationale for this general rule is that the land use requirements for implementation of CAP restoration projects, and the significant restrictions on remaining non-project land uses, generally are tantamount to fee ownership and to fee value. Further, where the restoration project provides the opportunity for use by the general public in ways consistent with the ecosystem restoration purpose, members of the general public should not be excluded from project lands that have been purchased, or otherwise provided, with public funds. Finally, fee title greatly reduces the risk that incompatible uses on project land will occur over the period of OMRR&R and, when compared to easement interpretation and enforcement that may vary from state to state, ensures that ownership rights vested in the project are clear and enforceable.

(b) Exceptions to General Policy Requiring Fee. Notwithstanding that fee title is generally the interest that must be provided to support CAP ecosystem restoration projects, there are circumstances where it may be appropriate to utilize permanent easements instead of fee. Such circumstances include:

i. where only select and easily identifiable and narrow affirmative rights are required for successful implementation of the project (for example, channel improvement rights or the right to flood);

ii. where project lands consist of the bed and immediate bank of a watercourse for the installation of features that improve habitat for aquatic resources (for example, root wads, shallow excavations, riffles, etc.);

iii. where the acreage of project lands, as assembled, is relatively small, is limited to that acreage necessary to construct and operate and maintain project ecosystem restoration features, and does not provide the opportunity for use by the general public in ways consistent with project purposes either because the lands are isolated from lawful public access (such as a public road, adjacent public lands, or publicly accessible watercourse) or because of the configuration of the project lands; or

iv. where project lands are owned in fee by public agencies other than the non-Federal sponsor and the owning agency cannot convey fee title and will not serve as a co-sponsor of the project; foreseeable future uses of the land by the public agency fee owner are compatible with project purposes; and public access is provided otherwise or is not compatible with project purposes.

(c) Approval Authority. Where one or more of the circumstances described above in sub-paragraph (2)(b) exist, and the project decision document, or other written request of the District, persuasively describes the need for an exception from the general policy rule, the MSC may approve use of a permanent easement instead of fee for the implementation of the CAP ecosystem restoration project where use of such easement will satisfy project requirements and protect the project benefits. All other requests for an exception to require easement rather than fee are discouraged and must be forwarded to the appropriate HQ RIT for review, coordination within HQUSACE, and approval.

(3) Estate Required. Once the appropriate interest is determined as described above, the corresponding standard estate must be used as explained and identified in Chapter 12 to ER 405-1-12. Except as otherwise provided in Chapter 12, all non-standard estates must be approved at HQUSACE with requests for such approval forwarded to the appropriate HQ RIT for review, coordination within HQUSACE, and approval.

c. Eligibility Limitations.

(1) Work on Other Federal Agency Lands. In the absence of specific legislative authority or direction of the Department of the Army, restoration projects will not be implemented on other Federal lands. Where incidental restoration benefits may accrue to lands owned by another Federal agency, these incidental benefits may be identified, but not included in the benefit evaluation.

(2) Remediation. Recommended projects will be for ecosystem restoration, not remediation of pollution problems covered by other statutes or for which others are liable. Remediation is typically for the purpose of meeting target criteria for contaminants or regulatory conditions related to human health and safety, rather than for ecosystem quality.

(3) Eradication of non-native or invasive species. Projects may be implemented for control of noxious or invasive species in situations where there is not another applicable Corps authority. This will be limited to a single action at any location. However, during formulation, the likelihood of obtaining positive outputs in sufficient quantity and/or for a sufficient period of time to justify the costs must be considered.

(4) Section 206 and Section 1135 projects with high LERRD values. The Corps ecosystem restoration mission is to apply its planning, hydrologic and engineering

expertise to solve large and/or complex restoration problems. Projects with very limited manipulation of the ecosystem that utilize extensive tracts of land appear to present themselves as preservation measures rather than restoration measures. Such projects are not appropriate civil works ecosystem restoration investments. Therefore, as an indicator of this potential situation, land values for a restoration project generally should not exceed 25 percent of total project costs. If the estimated LERRD value for a proposed project exceeds 25 percent of total project costs, the MSC must evaluate the project formulation to ensure that the project properly utilizes Corps expertise and is not land intensive. As part of its evaluation, the MSC must ensure that the project plan requires only the lands necessary to implement the project and to reasonably assure that the benefits sufficient to justify the project are achieved.

(5) Voluntary waiver of reimbursement of LERRD value in excess of non-Federal sponsor's percentage share for Section 206 and Section 1135 projects. If the MSC determines that the project properly utilizes Corps expertise, that the project plan is not land intensive, but that the estimated LERRD value exceeds 25 percent of total project costs (e.g., due to high land values in urban areas) the MSC may approve the project for implementation if the non-Federal sponsor provides a letter of intent to voluntarily waive reimbursement for the value of LERRD that exceeds the non-Federal sponsor's percentage share of total project costs. If the non-Federal sponsor does not voluntarily waive reimbursement for the value of LERRD that exceeds its percentage share of total project costs, any further efforts on the project should be suspended. Work on such suspended projects will continue only to the extent Congress provides funding specific to the project. If the non-Federal sponsor does provide the necessary letter of intent, the project decision document must clearly describe that the non-Federal sponsor has voluntarily agreed to waive reimbursement for the value of LERRD above its percentage share of total project costs, and the PCA must contain provisions for implementing this concept. Notwithstanding that the non-Federal sponsor has agreed to such a waiver, compliance with the following principles must continue:

(a) The project must be formulated so that only the lands necessary to implement the project and reasonably assure benefits sufficient to justify the project are required for the project;

(b) The estimated value of all project LERRD must be considered in comparison of alternatives for plan selection; and,

(c) The non-Federal sponsor must comply with all applicable provisions of Public Law 91-646, as amended and implementing regulations, for all LERRD that it must acquire to implement the project.

F-21. Monitoring and Adaptive Management.

a. Monitoring. Monitoring to be performed after physical construction is complete is rarely appropriate for CAP. Such monitoring will only be appropriate where

the uncertainty of achieving the projected outputs is high. All proposed monitoring to be performed after physical construction is complete must be clearly defined and justified in the project decision document. Such monitoring will be limited to no more than five years after completion of physical construction. The cost of such monitoring will be included in total project costs and shared with the non-Federal sponsor and will not exceed one percent of the costs included in total project costs for the features that are to be monitored minus the costs for monitoring. A waiver is needed pursuant to paragraph F-10.f.(4) of this Appendix to increase either of these limits (costs or duration). Monitoring will not be performed on recreation features. The non-Federal sponsor will be responsible for performance of OMRR&R during the monitoring period.

b. Adaptive Management. Adaptive management will not be performed and will not be a cost shared item in CAP projects.

F-22. Design Deficiency Corrections.

a. Design Deficiency Criteria. The engineering criteria described in ER 1165-2-119 for establishing the existence of a design deficiency apply to the establishment and correction of design deficiencies for CAP projects. Costs for all design deficiency corrections at non-Federally operated and maintained projects will be shared with the non-Federal sponsor in accordance with the current cost sharing for that purpose as established in the Water Resources Development Act of 1986, Public Law 99-662, as amended, unless, in the case of a project implemented with different cost sharing, an exception is granted by ASA (CW) during the investigation of the design deficiency.

b. Design Deficiency Correction for Uncompleted Project. Where the District Commander has not notified the non-Federal sponsor of completion of construction of the project in accordance with the terms of the PCA, the investigation and remediation of any design deficiency correction will be carried out and cost shared under the project PCA. The Federal share of all work on the project, including the deficiency correction, cannot exceed the statutory Federal per project participation limit.

c. Design Deficiency Correction for Completed Project. The following procedures will be followed where the District Commander already has notified the non-Federal sponsor of completion of the project. The MSC Commander may initiate a reconnaissance-level study of the project with the sole purpose of determining whether the improper functioning is the result of a design deficiency. This study will be funded at 100 percent Federal expense under Inspection of Completed Works and will be limited to no more than $100,000. If the study concludes that a deficiency exists, the corrective works will be processed as a new project decision. Design and implementation work will be carried out under the original PCA, once it has been modified to reflect the addition of the deficiency correction work under the new decision document, and will be cost shared in accordance with the current cost sharing formula for that purpose as established in the Water Resources Development Act of 1986, Public Law 99-662, as amended, unless, in the case of a project implemented with different cost sharing, an exception is granted by

ASA(CW) during the reconnaissance-level study. However, if there is not an existing PCA for the project, one will be prepared to cover design and implementation work necessary to correct the design deficiency. The Federal share of all work on the project, including the deficiency correction, cannot exceed the statutory Federal per project participation limit. None of the costs of the work financed under Inspection of Completed Works will be counted against the applicable CAP per project limit.

## SECTION III - SPECIFIC GUIDANCE FOR PROJECT AUTHORITIES

F-23. Section 14, Flood Control Act of 1946, as amended - Streambank and Shoreline Erosion Protection of Public Works and Non-Profit Public Services.

a. General. This program is designed to implement projects to protect public facilities and facilities owned by non-profit organizations that are used to provide public services that are open to all on equal terms. These facilities must have been properly maintained but be in imminent threat of damage or failure by natural erosion processes on stream banks and shorelines, and are essential and important enough to merit Federal participation in their protection. The streamlined formulation and justification procedures outlined in this paragraph are in recognition of the urgency of addressing such projects.

b. Eligible Facilities. Eligible facilities are: highways, highway bridge approaches, public works, churches, public and private non-profit hospitals, schools, and other public or non-profit facilities offering public services open to all on equal terms; and known historic properties whose significance has been demonstrated by a determination of eligibility for listing on, or actual listing on, the National Register of Historic Places. The historic property (ies) must be open to all on equal terms.

c. Restrictions. Although the facilities may be eligible for protection, the following situations are not eligible for implementation: work designed solely to protect undeveloped land or to protect non-essential, temporary, or mobile facilities; bank failure clearly not related to stream flow, storm, or wind driven waves; inadequate drainage (groundwater, surface runoff, overland flow, poor drainage undermining the facility itself and springs); facilities that are the cause of erosion (e.g. exfiltrating sewer-lines, drains, water lines, lagoons); erosion clearly and directly caused by the operation of a man-made project or facility (e.g. the use of navigation facilities or the operation of water control structures); levees or other facilities for which the owner has a contractual agreement with the Federal government to maintain; construction, repair, restoration, relocation, or modification of the facility to be protected; work within the limits of Corps projects which are operation and maintenance responsibilities of those projects; and work benefiting other Federal agencies, which will be accomplished on a cost reimbursable basis under other Corps programs.

d. Formulation and Justification. Following a finding of eligibility, and given the narrow geographic focus, low cost of these projects, and the imminent threat to the facilities, the formulation and evaluation should focus on the least cost alternative solution. The least cost alternative plan is considered to be justified if the total costs of the proposed alternative is less than the costs to relocate the threatened facility.

e. Valuation of LERRD. The valuation of LERRD for crediting purposes for a Section 14 project is the same as for any other project, except when the lands, easements or rights-of-way are part of the tract of land that includes the facility or structure being protected. In such cases, the non-Federal sponsor will not receive credit for the value of LERRD it provides that are part of the tract of land on which the facility or structure to be protected is located, if such tract of land is owned by either the non-Federal sponsor or the owner of the facility or structure on the date that the PCA is executed.

f. Project Cost Sharing. Projects implemented under this authority have the same project cost sharing requirements as structural flood damage reduction projects implemented under specific congressional authorization. The non-Federal sponsor is responsible for a minimum of 35 percent of total project costs to a maximum of 50 percent of total project costs during the design and implementation period. In accordance with the terms of the PCA, the non-Federal sponsor must pay 5 percent of total project costs in cash, provide all LERRD required for the project, participate in the Project Coordination Team, perform necessary non-Federal audits, and perform investigations necessary to identify the existence and extent of hazardous substances on LER required for the project. If the value of the non-Federal sponsor's contributions listed above is less than 35 percent of total project costs, the non-Federal sponsor must pay additional cash so that its contributions equal 35 percent of total project costs. OMRR&R is a 100% non-Federal responsibility. The non-Federal sponsor's required share determined above could increase if the Federal costs of planning, design, and implementation for the project exceed the statutory Federal per project participation limit for this authority and the non-Federal sponsor agrees to contribute funds for any costs that would normally be part of the Federal share but are over the per project limit (see Table F-3 and Section I, paragraph F-7.b. of this Appendix).

F-24. Section 103, River and Harbor Act of 1962, as amended - Beach Erosion and Hurricane and Storm Damage Reduction.

a. Eligibility. This authority may be used for protecting multiple public and private properties and facilities and single non-Federal public properties and facilities against damages caused by storm driven waves and currents. All projects must be formulated for hurricane and storm damage reduction, in accordance with current policies and procedures governing projects of the same type which are specifically authorized by Congress (see Section IV of Appendix E of this regulation). Any policies and procedures applicable to Federal participation in projects involving beach nourishment must apply to Section 103 projects involving beach nourishment.

b. Project Cost Sharing. Projects implemented under this authority have the same project cost sharing requirements as hurricane and storm damage reduction projects implemented under specific congressional authorization. The non-Federal sponsor is responsible for 35 percent of total project costs assigned to hurricane and storm damage reduction, plus 50 percent of total project costs assigned to recreation plus 100 percent of total project costs assigned to privately owned shores (where use of such shores is limited to private interests) during the design and implementation phase. Any costs assigned to protection of Federally owned shores are 100 percent Federal. See Appendix I of this regulation and ER 1165-2-130 for more detailed guidance regarding cost sharing of hurricane and storm damage reduction projects. In accordance with the terms of the PCA, the non-Federal sponsor must provide all LERRD required for the project, participate in the Project Coordination Team, perform necessary non-Federal audits, and perform investigations necessary to identify the existence and extent of hazardous substances on LER required for the project. If the value of the non-Federal sponsor's contributions listed above is less than the non-Federal sponsor's required share, the non-Federal sponsor must make a cash payment so that its contributions equal the required share. OMRR&R on non-Federally owned shores is a 100% non-Federal responsibility. The non-Federal sponsor's required share determined above could increase if the Federal costs of planning, design, and implementation for the project exceed the statutory Federal per project participation limit for this authority and the non-Federal sponsor agrees to contribute funds for any costs that would normally be part of the Federal share but are over the per project limit (see Table F-3 and Section I, paragraph F-7.b. of this Appendix).

F-25. Section 107, River and Harbor Act of 1960, as amended - Navigation Improvements.

a. General. Section 107 projects are to be formulated for commercial navigation purposes in accordance with current policies and procedures governing projects of the same type which are specifically authorized by Congress (see paragraph 3-2.d.(2) of this regulation and Section II of Appendix E of this regulation).

b. As modified by Section 201 of WRDA 1996, Public Law 104-303, Section 101 of WRDA 1986, Public Law 99-662, requires that the term "general navigation features" include dredged material disposal facilities required for construction or operation and maintenance of the other general navigation features. Accordingly for Section 107 projects, both the Federal costs of initial construction and the Federal costs of construction for subsequent dredged material disposal facilities count toward the per project limit. Studies of projects for which the per project limit would be reached as a consequence of the construction of future dredged material disposal facilities should be converted to a GI study unless a waiver is obtained pursuant to Section I, paragraph F-7.b(1) and Section II, paragraph F-10.f.(4). of this Appendix.

c. Project Cost Sharing. Projects implemented under this authority have the same project cost sharing requirements as commercial navigation projects implemented under specific congressional authorization.

(1) Commercial Navigation. The non-Federal sponsor is responsible for 10 percent of total costs of construction of the general navigation features (GNF) (including costs of construction of dredged material disposal facilities) for depths, excluding associated over-depth and entrance channel wave allowances, less than or equal to 20 feet, 25 percent of total costs of construction of the GNF (including costs of construction of dredged material disposal facilities) for depths, excluding associated over-depth and entrance channel wave allowances, in excess of 20 feet but equal to or less than 45 feet, and 50 percent of total costs of construction of the GNF (including costs of construction of dredged material disposal facilities) for depths, excluding associated over-depth and entrance channel wave allowances, in excess of 45 feet during the design and implementation period. In accordance with the terms of the PCA, the non-Federal sponsor will participate in the Project Coordination Team, perform necessary non-Federal audits, and perform investigations necessary to identify the existence and extent of hazardous substances on LER required for the project. If the value of the sponsor's contributions listed above is less than the non-Federal sponsor's required share, the non-Federal sponsor must make a cash payment so that non-Federal contributions equal the required share. In addition, the non-Federal sponsor must pay an additional 10 percent of the total costs of construction of the GNF (including costs of construction of dredged material disposal facilities) which will be offset by the value of LERR provided by the non-Federal sponsor for the project. Further, the non-Federal sponsor will be responsible for the construction and operation and maintenance of any local service facilities required for the project. Operation and maintenance (O&M) of the GNF will be a Federal responsibility. For projects in excess of 45 feet, the non-Federal sponsor is responsible for 50 percent of the increased costs of operation and maintenance. The non-Federal sponsor's required share determined above could increase if the Federal costs of planning, design, and implementation for the project exceed the statutory Federal per project participation limit for this authority and the non-Federal sponsor agrees to contribute funds for any costs that would normally be part of the Federal share but are over the per project limit (see Table F-3 and Section I, paragraph F-7.b. of this Appendix). The costs of O&M of the GNF are not counted toward the statutory Federal per project participation limit for Section 107.

(2) Recreational Navigation. The non-Federal sponsor is responsible for 50 percent of total project costs during the design and implementation period. In accordance with the terms of the PCA, the non-Federal sponsor must provide all LERRD required for the project, participate in the Project Coordination Team, perform necessary non-Federal audits, and perform investigations necessary to identify the existence and extent of hazardous substances on LER required for the project. If the value of the non-Federal sponsor's contributions listed above is less than 50 percent of total project costs, the non-Federal sponsor must make a cash payment so that its contributions equal 50 percent of total project costs. OMRR&R is a 100% non-Federal responsibility. The non-Federal

sponsor's required share determined above could increase if the Federal costs of planning, design, and implementation for the project exceed the statutory Federal per project participation limit for this authority and the non-Federal sponsor agrees to contribute funds for any costs that would normally be part of the Federal share but are over the per project limit (see Table F-3 and Section I, paragraph F-7.b. of this Appendix).

d. A Section 107 fact sheet including a project map must be prepared for all proposed Section 107 projects and submitted electronically to the appropriate HQ RIT for review, coordination within HQUSACE (including CECW-I), and consultation with OASA(CW) during the Federally funded portion of the feasibility phase. The CAP FCSA or the PCA (if a CAP FCSA is not required or has already been executed as of 31 January 2006) will not be executed until the OASA (CW) has concurred or non-concurred in proceeding with the project. However, in the event of non-concurrence, work on the project may proceed only to the extent that Congress makes specific allocations to the project. See page 43 of this Appendix for sample format of fact sheet.

e. If the decision document determines that the project is not economically justified, no further action shall be taken under this authority.

F-26. Section 111, River and Harbor Act of 1968, as amended - Shore Damage Prevention or Mitigation Caused by Federal Navigation Projects.

a. Purpose. This authority authorizes the planning of a justified level of work for prevention or mitigation of damages to both non-Federal public and privately owned shores to the extent that such damages can be directly identified and attributed to Federal navigation works located along the coastal and Great Lakes shorelines of the United States, and shore damage attributable to the Atlantic Intracoastal Waterway and the Gulf Intracoastal Waterway. Further, the Corps is authorized to implement such a project without specific Congressional authorization if the Federal share of the first cost of implementation is $5,000,000 or less.

b. Eligible work. Under this authority, Federal funds may only be used to address the shore damages caused by the Federal navigation works. If there are multiple causes for the damages, Federal participation in a Section 111 solution may continue only if the non-Federal sponsor agrees to bear all costs associated with correcting the shore damage not attributed to the Federal navigation works or if the integrated solution is pursued under both Section 111 and Section 103 as a Combined Plan in accordance with Section II, paragraph F-18 of this Appendix or under an authorized hurricane and storm damage reduction study or project. However, when there is a larger shore damage problem caused by more than just the Federal navigation works, a complete solution may be formulated under either an authorized hurricane and storm damage reduction study and project, or under Section 103. Section 111 cost sharing would apply to those portions of the project addressing damages caused by the Federal navigation works.

c. Coordination.

(1) Implementation measures proposed under this authority will be coordinated with other Federal and non-Federal shore protection projects in the same geographic area.

(2) To the extent practicable, any Section 111 projects and shore protection pursued under other authorities in the same area will be combined into a comprehensive regional project.

d. Restrictions.

(1) Geographic Limitation. Work under this authority extends only to the geographic limit of damages that can be directly identified and attributed to the navigation project.

(2) Construction, Operation, and Maintenance on Federally Owned Land. The Corps may not use this authority to provide shore damage control measures on Federally owned property when the Federal Government would be the major beneficiary. The Corps may include Federal property to be protected if the property is a small but integral part of the shore damage control measure but the Corps will not bear any financial responsibility for the share of project or maintenance costs attributable to these lands.

(3) Erosion Process. Works for prevention or mitigation of shore damages such as those caused by riverbank erosion or vessel generated wave wash will not be addressed under this authority.

e. Level of Mitigation. The target degree of mitigation is the reduction of shore damage to the level which would have existed without the influence of navigation works at the time such navigation works were accepted as a Federal responsibility. This authority will not be used to restore shorelines to historic dimensions.

f. Periodic Nourishment. Policy and procedures applicable to Federal participation in periodic nourishment for shore protection projects will apply to Section 111 projects with periodic nourishment.

g. Limit on Delegated Corps Implementation Authority. Section 111 provides the Secretary of the Army the authority to implement projects for which the estimated Federal first cost is $5,000,000 or less (Feasibility phase costs are shared 50/50 with the non-Federal sponsor in accordance with Section I, paragraph F-6.a. of this Appendix; these costs are not included in computing the estimated Federal first cost). If the Federal share of implementation costs for a Section 111 project, including periodic nourishment during the period of analysis, would exceed $5,000,000, the project may not proceed as a Federal undertaking without specific congressional authorization. This provision applies even if the non-Federal sponsor is willing to be responsible for the amount of the Federal share exceeding $5,000,000. If at any time it becomes apparent that the Federal share of

total project costs would definitely exceed $5,000,000, the Section 111 works may not proceed or continue as a Federal undertaking without specific Congressional authorization, and the work should be converted to GI in accordance with Section I, paragraph F-9 of this Appendix.

h. Items of Non-Federal Cooperation.

(1) Total Project Cost. The costs of implementing measures under this section must be shared in the same proportion as the cost sharing provisions applicable to the project causing the shore damage.

(2) Real Estate. The non-Federal sponsor's responsibility for providing interests in real estate, and for performance of facility or utility relocations, required for projects pursued under Section 111 will be the same as for the project causing the shore damage. HQUSACE should be consulted early in the formulation process if there are questions regarding this issue.

(3) Operation and Maintenance. The non-Federal sponsor is required to operate and maintain the mitigation measures, and, in the case of interests in real property acquired in conjunction with non-structural measures, to operate and maintain the property in accordance with regulations prescribed by the Corps.

(4) General. The above are items that are generally required to implement a project under this authority. However, given the wide variety of circumstances that could exist for Section 111 projects such items may not be appropriate for all projects. Therefore, for any projects proposed for implementation under this authority it is recommended that the details of the project be coordinated with the MSC, appropriate HQ RIT, and HQ Policy Compliance Division, early in the feasibility phase, to ensure that the appropriate items of cooperation are identified for the project.

F-27. Section 145, Water Resources Development Act of 1976, as amended – Placement of Dredged Material on Beaches.

a. General. The purpose of this authority is to provide for placement of beach quality sand, that has been dredged in constructing or maintaining navigation inlets and channels adjacent to such beaches, when the costs are greater than the least cost disposal plan, provided that (1) a State requests it, (2) the Secretary of the Army considers it to be in the public interest, (3) the additional cost of disposal is justified by reduction in potential hurricane and storm damages, (4) the non-Federal sponsor is willing to contribute the appropriate share of the additional costs, and (5) requirements for public use and access are provided. In cases where the additional costs for placement of the dredged material is not justified, the Corps may still perform the work if the State requests it, and the State or other non-Federal sponsor contributes 100 percent of the additional costs. Consideration must be given to the schedule of a State, or a political

subdivision of a State, for providing its share of funds for placing sand on beaches, and, to the extent practicable, accommodation of such schedule.

b. Feasibility Phase. There is no requirement to identify the NED plan for a Section 145 project. However, there is a need to demonstrate efficient use of Federal funds. The additional costs of the requested disposal must be justified by the NED benefits associated with the protection of the beach upon which the sand is placed and must meet all other related policies and procedures associated with storm damage reduction including but not limited to public access, environmental acceptability, cost sharing, and the provision of LERRDs. These analyses will be performed during the feasibility phase and shared 50/50 with the non-Federal sponsor.

c. Project Cost Sharing. The non-Federal sponsor is responsible for 35 percent of the additional costs of placement of the material. In accordance with the terms of the PCA, the non-Federal sponsor must provide all LERRD required for the project, participate in the Project Coordination Team, perform necessary non-Federal audits, and perform investigations necessary to identify the existence and extent of hazardous substances on LER required for the project. However, the non-Federal sponsor will not receive credit for the value of LERRD required for the project – only the incremental placements costs are shared by the Government. OMRR&R on non-Federally owned shores is a 100% non-Federal responsibility.

F-28. Section 204, Water Resources Development Act of 1992, as amended - Beneficial Uses of Dredged Material.

a. General. The purpose of this authority is to carry out projects for the protection, restoration, and creation of aquatic and ecologically related habitats, including wetlands, in connection with dredging for construction, operation, or maintenance by the Secretary of an authorized navigation project.

b. Determination of Base Plan. Disposal of dredged material associated with construction or maintenance dredging of navigation projects should be accomplished in the least costly manner consistent with sound engineering practice and meeting all Federal environmental requirements. This constitutes the base plan for the navigation purpose. If the base plan (least cost disposal alternative) includes disposal of material in a manner benefiting the environment the costs for this disposal are included in total costs of the general navigation features and funded accordingly. Where the disposal of material in a manner that benefiting the environment is not part of the base plan for the navigation purpose, the base plan shall serve as a reference point for determining the incremental costs of the ecosystem restoration features that are attributable to the environmental purpose.

c. Section 204(e) of WRDA 1992, as amended (often referred to as Section 207). Although it amends Section 204 of WRDA 1992, Section 207 of WRDA 1996 is a separate authority, which authorizes for navigation projects, subject to certain

requirements, the use of a disposal method that is not the least cost option if the incremental costs are reasonable in relation to the environmental benefits. Implementation of Section 207 is not covered by this Appendix. Therefore, the MSC and district should consult with the appropriate HQ RIT and the HQ Policy Compliance Division for appropriate guidance prior to considering use of this authority.

d. Project Cost Sharing. Any incremental costs above the cost of the base plan will be shared with the non-Federal sponsor. The non-Federal sponsor is responsible for 25 percent of total project costs of the Section 204 project during the design and implementation period. In accordance with the terms of the PCA, the non-Federal sponsor must provide all LERRD required for the project, participate in the Project Coordination Team, perform necessary non-Federal audits, and perform investigations necessary to identify the existence and extent of hazardous substances on LER required for the project. If the value of the non-Federal sponsor's contributions listed above is less than 25 percent of total project costs of the Section 204 project, the non-Federal sponsor must make a cash payment so that its contributions equal 25 percent of total project costs of the Section 204 project. OMRR&R is a 100% non-Federal responsibility.

F-29. Section 205, Flood Control Act of 1948, as amended - Flood Control.

a. General. Projects implemented under this authority are formulated for structural or non-structural measures for flood damage reduction in accordance with current policies and procedures governing projects of the same type which are specifically authorized by Congress (see Section III of Appendix E of this regulation).

b. Project Cost Sharing. Projects implemented under this authority have the same project cost sharing requirements as structural flood damage reduction projects or non-structural flood damage reduction projects implemented under specific congressional authorization.

(1) Structural Flood Damage Reduction Projects. The non-Federal sponsor is responsible for a minimum of 35 percent of total project costs to a maximum of 50 percent of total project costs during the design and implementation period. In accordance with the terms of the PCA, the non-Federal sponsor must pay 5 percent of total project costs in cash, provide all LERRD required for the project, participate in the Project Coordination Team, perform necessary non-Federal audits, and perform investigations necessary to identify the existence and extent of hazardous substances on LER required for the project. If the value of the non-Federal sponsor's contributions listed above is less than 35 percent of total project costs, the non-Federal sponsor must pay additional cash so that its contributions equal 35 percent of total project costs. OMRR&R is a 100% non-Federal responsibility. The non-Federal sponsor's required share determined above could increase if the Federal costs of planning, design, and implementation for the project exceed the statutory Federal per project participation limit for this authority and the non-Federal sponsor agrees to contribute funds for any costs that would normally be part of

the Federal share but are over the per project limit (see Table F-3 and Section I, paragraph F-7.b. of this Appendix).

(2) Non-Structural Flood Damage Reduction Projects. The non-Federal sponsor is responsible for 35 percent of total project costs during the design and implementation period. In accordance with the terms of the PCA, the non-Federal sponsor must provide all LERRD required for the project, participate in the Project Coordination Team, perform necessary non-Federal audits, and perform investigations necessary to identify the existence and extent of hazardous substances on LER required for the project. If the value of the non-Federal sponsor's contributions listed above is less than 35 percent of total project costs, the non-Federal sponsor must make a cash payment so that its contributions equal 35 percent of total project costs. OMRR&R is a 100% non-Federal responsibility. The non-Federal sponsor's required share determined above could increase if the Federal costs of planning, design, and implementation for the project exceed the statutory Federal per project participation limit for this authority and the non-Federal sponsor agrees to contribute funds for any costs that would normally be part of the Federal share but are over the per project limit (see Table F-3 and Section I, paragraph F-7.b. of this Appendix).

c. If the decision document determines that the project is not economically justified, no further action shall be taken under this authority.

F-30. Section 206, Water Resources Development Act of 1996, as amended - Aquatic Ecosystem Restoration.

a. General. The purpose of this authority is to develop aquatic ecosystem restoration and protection projects that improve the quality of the environment, are in the public interest, and are cost effective in accordance with current policies and procedures governing projects of the same type which are specifically authorized by Congress (see Section V of Appendix E of this regulation).

b. Project Cost Sharing. Projects implemented under this authority have the same project cost sharing requirements as ecosystem restoration projects implemented under specific congressional authorization. The non-Federal sponsor is responsible for 35 percent of total project costs during the design and implementation period. In accordance with the terms of the PCA, the non-Federal sponsor must provide all LERRD required for the project, participate in the Project Coordination Team, perform necessary non-Federal audits, and perform investigations necessary to identify the existence and extent of hazardous substances on LER required for the project. If the value of the non-Federal sponsor's contributions listed above is less than 35 percent of total project costs, the non-Federal sponsor must make a cash payment so that its contributions equal 35 percent of total project costs. OMRR&R is a 100% non-Federal responsibility. The non-Federal sponsor's required share determined above could increase if the Federal costs of planning, design, and implementation for the project exceed the statutory Federal per project participation limit for this authority and the non-Federal sponsor agrees to

contribute funds for any costs that would normally be part of the Federal share but are over the per project limit (see Table F-3 and Section I, paragraph F-7.b. of this Appendix).

F-31. Section 208, Flood Control Act of 1954, as amended - Snagging and Clearing for Flood Damage Reduction.

a. General. This authority provides for minimal measures to reduce nuisance flood damages caused by debris and minor shoaling of rivers. This authority is treated as a flood damage reduction project for policy eligibility and cost sharing purposes.

b. Restrictions. Work under this authority is limited to clearing and snagging or channel excavation and improvement with limited embankment construction by use of materials from the channel excavation. If investigation indicates that placement of revetment is needed to provide a complete and fully effective project, this work will be accomplished at the expense of the non-Federal sponsor.

c. Project Cost Sharing. Projects implemented under this authority have the same project cost sharing requirements as structural flood damage reduction projects implemented under specific congressional authorization. The non-Federal sponsor is responsible for a minimum of 35 percent of total project costs to a maximum of 50 percent of total project costs during the design and implementation period. In accordance with the terms of the PCA, the non-Federal sponsor must pay 5 percent of total project costs in cash, provide all LERRD required for the project, participate in the Project Coordination Team, perform necessary non-Federal audits, and perform investigations necessary to identify the existence and extent of hazardous substances on LER required for the project. If the value of the non-Federal sponsor's contributions listed above is less than 35 percent of total project costs, the non-Federal sponsor must pay additional cash so that its contributions equal 35 percent of total project costs. OMRR&R is a 100% non-Federal responsibility. The non-Federal sponsor's required share determined above could increase if the Federal costs of planning, design, and implementation for the project exceed the statutory Federal per project participation limit for this authority and the non-Federal sponsor agrees to contribute funds for any costs that would normally be part of the Federal share but are over the per project limit (see Table F-3 and Section I, paragraph F-7.b. of this Appendix).

F-32. Section 1135, Water Resources Development Act of 1986, as amended - Project Modifications for Improvement of the Environment.

a. Purpose. This authority provides for the review and modification of structures and operations of water resources projects constructed by the Corps for the purpose of improving the quality of the environment when it is determined that such modifications are feasible, consistent with the authorized project purposes, and will improve the quality of the environment in the public interest. In addition, if it is determined that a Corps water resources project has contributed to the degradation of the quality of the

environment, restoration measures may be implemented at the project site or at other locations that have been affected by the construction or operation of the project, if such measures do not conflict with the authorized project purposes.

b. Eligible Projects. A project must fit at least one of the categories described in the following sub-paragraphs.

(1) Modification of an Existing Corps Project. These are projects that incorporate modifications in the structures or operations of a permanent water resources project constructed by the Secretary of the Army in response to a Corps construction authority. For projects in this category, there is no requirement to demonstrate that the Corps project contributed to degradation.

(2) Restoration Projects. Restoration projects may be undertaken at those locations where the construction or operation of an existing Corps project has contributed to the degradation of the quality of the environment. These projects do not need to modify an existing Corps project.

(3) Joint projects. Where a project was constructed or funded jointly by the Corps and another Federal agency, those elements constructed or funded by the other Federal agency may be modified using the Section 1135 authority. Where the construction or operation of the joint project has contributed to the environmental degradation, projects may be undertaken which contribute to the restoration of the degraded ecosystem.

c. Project Cost Sharing. The non-Federal sponsor is responsible for 25 percent of total project costs during the design and implementation period. In accordance with the terms of the PCA, the non-Federal sponsor must provide all LERRD required for the project, participate in the Project Coordination Team, and perform necessary non-Federal audits. The non-Federal sponsor also must perform investigations necessary to identify the existence and extent of hazardous substances on LER required for the project except for the investigations necessary to identify the existence and extent of hazardous substances on LER owned by the United States and administered by the Corps. If the value of the non-Federal sponsor's contributions listed above is less than 25 percent of total project costs, the non-Federal sponsor must make a cash payment so that its contributions equal 25 percent of total project costs. OMRR&R is a 100% non-Federal responsibility. The non-Federal sponsor's required share determined above could increase if the Federal costs of planning, design, and implementation for the project exceed the statutory Federal per project participation limit for this authority and the non-Federal sponsor agrees to contribute funds for any costs that would normally be part of the Federal share but are over the per project limit (see Table F-3 and Section I, paragraph F-7.b. of this Appendix).

d. Non-Federal Design and Implementation Work. For all Section 1135 projects, the value of non-Federal design and implementation work that can be credited toward the

non-Federal sponsor's share of total project costs is limited to 80 percent of the non-Federal sponsor's share of total project costs.

e. OMRR&R. For Section 1135 projects, the costs of OMRR&R are a 100 percent non-Federal responsibility and the work is usually performed by the non-Federal sponsor. However, upon request by the non-Federal sponsor, the Government may perform the OMRR&R of a Section 1135 project modification on behalf of the non-Federal sponsor, if the entire Section 1135 project modification is on lands for which the Corps has the necessary real estate interest and is responsible for operation and maintenance (i.e. the land has not been leased to another agency for fish and wildlife purposes). In such event, the non-Federal sponsor must pay the Government, in advance of performance of such work, for the costs of OMRR&R attributable to the Section 1135 project modification. The decision to perform OMRR&R, on the behalf of the non-Federal sponsor, should be documented in the decision document and appropriate language should be included in the PCA addressing Government performance of OMRR&R.

f. Cost Allocation. The Section 1135 project features are in addition to the existing Corps project features, and they are distinct from mitigation. Therefore, the costs of the Section 1135 project feature will not be allocated to the existing Corps project, but must be shared in accordance with the provisions of Section 1135 of WRDA 1986, as amended.

# SAMPLE - SECTION 107 PROJECT FACT SHEET

1. Project Name: Official Name of Project

2. a. Corps District:

   b. Sponsor:

3. Congressional Delegation: List affected House and Senate members. Include congressional District numbers.

4. Location: Provide one or two sentences, sufficient to locate the vicinity of the study/project area.

5. Problem: Briefly describe the problem and the scope of the study/project in general terms.

6. Alternative Plans Considered. Briefly list the features of each alternative, explain why the alternative was not selected, and state whether the alternative met policy criteria.

7. Description of Likely Recommended Plan. Include a brief narrative description of the likely recommended plan, including major features and expected outputs. Give full coverage to features sensitive to the eligibility criteria of paragraph 3-2.d.(2) of ER 1105-2-100.

8. As of the date of this fact sheet, are there any policy waivers required, including a waiver for deviation from the NED Plan? If so, provide rationale for waiver and highlight waiver request in transmittal.

9. Scheduled Initial Construction Award (FY):

10. Authorization, appropriations act, or report language: Cite specific provisions, and attach copies of language.

11. Financial Information:

   a. Feasibility Study Cost: $ (Federal share: $ )

   b. GNF Costs:
      Total: $ (Federal share: $ )
      (Plans and specifications: $ )
      (Construction: $ )

c. LERR Costs: $

d. Local Service Facilities (LSF) costs: $

e. Ultimate Federal Cost: $

f. Benefit/Cost ratio:

g. Average Annual O&M Costs: $

12. Complete Funding History by FY (Include one line for each additional FY):

| | AMOUNTS SPECIFIED ("NAMED") BY CONGRESS | NET ALLOCATIONS FOR FISCAL YEAR |
|---|---|---|
| FY | | |
| FY | | |
| FY | | |

13. Supplemental Information: Any additional information which may impact on an implementation decision on this project.

14. Project Map: Attach a map of the project area showing the navigation servitude boundaries superimposed over the general navigation features and local service facilities. The boundaries between the GNF and LSF must be clearly delineated.

# APPENDIX G

## Planning Reports and Programs

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# APPENDIX G

## Planning Reports and Programs

G-1. Purpose. This appendix provides guidance and procedures for the management and conduct of planning studies, activities and programs.

## SECTION I - Types of Studies and Reports

G-2. Types of Studies and Reports**.**

a. Reconnaissance Studies (Phase). The objective of reconnaissance studies is to determine whether or not planning to develop a project should proceed to the more detailed feasibility stage. These studies are 100% Federally funded.

b. Feasibility Studies (Phase). The objective of feasibility studies is to investigate and recommend solutions to water resources problems. These studies are 50% Federally funded and 50% funded by a non-federal sponsor.

c. Reports. Reports prepared for initial authorization are based on the studies discussed above.

(1) Section 905(b). Section 905(b) Analysis documents the reconnaissance study, and provides a basis for determining whether a study should proceed to the feasibility phase.

(2) Feasibility Reports. Feasibility reports document the feasibility study, and provide the basis for a decision on construction authorization of a project. The feasibility report includes either an environmental assessment (EA) or an environmental impact statement (EIS) to comply with the National Environmental Policy Act (NEPA) (see ER 200-2-2).

d. General Reevaluation Studies. These studies are to affirm, reformulate or modify a plan, or portions of a plan, under current planning criteria. General reevaluation studies frequently are similar to feasibility studies in scope and detail.

e. Limited Reevaluation Studies. The scope for Limited Reevaluation Studies is limited when compared to the General Reevaluation Study. For example, a Limited Reevaluation Study may address only economic justification, environmental effects, effects of revised policy or (more rarely) project formulation. Limited Reevaluation Studies ordinarily should require only

modest resources and documentation. If any part of the reevaluation will be complex, or will require substantial resources, or if the recommended plan will change in any way, a General Reevaluation is required.

f. Other Types of Studies and Reports.

(1) Legislative Studies. Various Water Resources Development Acts have authorized specifically named projects. Studies under these authorities are to be conducted in accordance with this regulation, and reports are to be similar to a feasibility report.

(2) Reallocation Studies. See Appendix E.

(3) Postauthorization Changes.

(4) Flood Insurance Studies. See paragraph G-23.

(5) Section 22 Studies. See Section VI.

(6) Continuing Authorities Program Studies. See Appendix F.

(7) Review of Completed Projects Studies. This type of study is in response to the standing authority of Section 216 of the Flood Control Act of 1970, which authorizes studies to review the operation of completed Federal projects and recommend project modifications "when found advisable due to significantly changed physical or economic conditions…and for improving the quality of the environment in the overall public interest". An initial appraisal is conducted using Operation and Maintenance (O&M) General funds to determine whether or not a study is warranted. If it is determined that further study is warranted, these studies are conducted using the two-phase study process described for feasibility studies.

G-3. Classification of Studies and Reports**.** In order to keep an accounting of the status of authorized studies and projects, they are classified into several categories as discussed below.

a. Studies. Division commanders may approve classification of authorized studies according to the categories listed below. If studies are not funded for five full fiscal years, they are deauthorized.

(1) Active. These are authorized studies that are funded or authorized but not funded having significant non-Federal support and reasonable prospects for a Federal project.

(2) Inactive. These are authorized studies that are not funded and have no non-Federal

support, or have few prospects for a Federal project.

b. Projects. Uncompleted authorized projects are classified in three categories as listed below. Division commanders may approve reclassification to a lower category. Upward reclassification requires approval of HQUSACE (RIT). Additional information is contained in ER 11-2-240. Projects for which no funds have been obligated within the times specified in Section 1001, WRDA '86, shall be submitted to Congress for deauthorization.

(1) Active. Projects which are: funded; economically justified; engineeringly feasible without requiring modification of the authorized plan beyond the discretionary authority of the Chief of Engineers; supported by a non-Federal sponsor as evidenced by recent statements of ability and willingness by responsible bodies to provide local cooperation; and with no anticipated major problems of compliance with requirements of local cooperation.

(2) Deferred.

(a) Projects with doubtful or marginal economic justification, and for which a restudy is necessary to determine whether an economically justified and locally supported plan of authorized scope can be developed.

(b) Projects not generally opposed by non-Federal interests, but having sponsors currently unable to furnish the required cooperation, where it is expected the cooperation difficulties will be resolved in the near future.

(c) Projects that could be significantly affected by an ongoing feasibility study, and which should not be undertaken pending the outcome of Congressional action based on the feasibility study.

(3) Inactive.

(a) Economically unjustified projects where a restudy would not develop an economically justified plan.

(b) Projects which, as authorized, no longer meets current and prospective needs, and which require such substantial modifications and involve such increased costs to obtain an adequate project that they cannot proceed without new authorization.

(c) Projects without a non-Federal sponsor.

(d) Projects, or parts thereof, which have been accomplished by local interests or another

agency, or which have been superseded by another project, or for other reasons are no longer required.

c. Reclassification. Reclassification of studies and projects is accomplished as the need develops. An annual review of classifications is required by ER 11-2-220 (studies) and ER 11-2-240 (projects) to determine whether studies and projects are appropriately classified. A change in classification of a project may be accomplished by one of the following methods.

(1) By means of a restudy, funded with GI funds. The procedure for obtaining funds for this purpose and accomplishing the necessary restudy is contained in ER 11-2-220.

(2) Where an ongoing reconnaissance or feasibility study investigating associated improvements develops sufficient information on which to base the reclassification of the authorized project, a recommendation for such reclassification is to be made on that basis, without further separate study.

(3) Where a desirable change in project classification can be determined at such nominal cost that a specific allocation of funds is not required, a brief investigation may be undertaken. For example, where a project was classified as deferred or inactive based on opposition to the project, or on the lack of willingness or ability of the non-Federal sponsor to furnish the required cooperation, and where the situation changes such that the non-Federal sponsor desires the work and demonstrates willingness and ability to participate as required, a letter supporting a new classification will suffice.

(4) Review. Whenever it becomes apparent that a study or project in the active category no longer meets the qualifications for retention in that status, a letter supporting a recommendation that the project be reclassified will suffice.

G-4. Naming of Studies and Projects. The study or project title shall generally be based on the name of a nearby geographic feature (e.g., town, river, mountain). HQUSACE provides the official name for the study or project in the assignment letter. Impounded bodies of water shall be referred to as lakes instead of reservoirs. Whenever the name of a project is established by separate legislation, that designation shall be used exactly as stated in the law.

SECTION II - Study Procedures and Reports

G-5. Purpose. This section provides guidance for conducting reconnaissance and feasibility studies and preparing studies; it applies to all two-phase studies, cost shared or not.

G-6. General Requirements for Reconnaissance and Feasibility Phases.

a. Study Conduct. Studies conducted in accordance with all applicable laws and policies.

b. Study Conversion. If, upon completion of the reconnaissance phase or during the feasibility phase, it appears one or more projects could be pursued more efficiently under the Continuing Authorities Program (CAP), that approach is encouraged. The MSC commander may approve transfer of an ongoing specifically authorized study to the CAP.

c. Study Management. Per ER 5-1-11, Division commanders shall establish, in a standard operating procedure or regulation, appropriate uniform procedures for managing two phase studies. As a minimum, a system should be early established that monitors actual versus scheduled performance and costs. Prospective sponsor(s) for the anticipated feasibility study should be identified early enough during the reconnaissance study to establish a well defined study management structure. Although the Corps is responsible for the reconnaissance study, efficient execution of the feasibility study requires a cooperative effort during the reconnaissance phase as well. Therefore, the time to begin assembling the study management structure should be as early in the reconnaissance phase as possible. The management structure will be finalized in the FCSA. Project management must be initiated during the reconnaissance study period to permit smooth implementation into subsequent phases to the extent it establishes accountability for study and project costs and schedules, and more effectively reconciles Corps performance with the concerns and expectations of the non-Federal sponsor.

d. Study Documentation. Commanders will maintain complete documentation of coordination, negotiations, and agreements between the Corps and study sponsor, and any subsequent changes in those agreements. The documentation must show how consideration was given to the desires and capabilities of the non-Federal interests and that they were advised of the Corps procedures and policies.

e. No Implementable Plan. A letter report will ordinarily be adequate. The report will rely on information developed up to the time further study was terminated; additional work is not required simply to satisfy a reporting requirement. However, the report must clearly describe the reasons why the study was terminated in view of the criteria in the previous subparagraph. Terminated interim studies are excepted from this reporting and processing

requirement; they will continue to be incorporated into the final report of their parent study.

f. Issue Resolution Conference (IRC) and In-Progress Review (IPR). The objective of these meetings is to ensure orderly progress of the study or preparation of a report. This is accomplished by identifying, discussing and resolving technical and policy questions before they unduly affect the progress of the study.

g. General Evaluation Guidelines. The general evaluation guidelines, presented in Exhibit G-1, describe the information to be included in reports and in other materials which are provided to ensure agency endorsement of the reconnaissance and feasibility study findings. These guidelines will also be used by reviewers at the IRCs for the reconnaissance and feasibility phases as well as for policy review. Adaptations of these guidelines may also be useful in conducting studies, particularly in conjunction with requirements for report content in Exhibits G-2 and G-3.

| Exhibit G-1. General Evaluation Guidelines | |
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| | |
| 1. Formulation/Design Criteria | a. The water resource related problems and opportunities addressed in the study will be fully and clearly described. |
| | b. The key assumptions underlying the forecasted without project condition over time will be explained and documented as the most likely without project parameters. |
| | c. The feasibility report will document that all reasonable alternatives for addressing the identified problems, including non-structural measures and measures beyond the authority of the Corps to implement, have been systematically formulated and evaluated in accordance with the P&G. A well-documented formulation process is essential to ensure that the scale (level of output) and scope (geographic extent) of the project are appropriate and that the cost effective means of providing the recommended level of output or service is identified. |
| | d. For each alternative project, the key assumptions underlying the predicted with project conditions over time will be documented and justified as the most likely with project parameters. |
| | e. Federal participation in the proposed project is not to be recommended unless the outputs used in comparing the benefit to cost ratio, or the (environmental) outputs when justification is not dollar benefit based, are in accord with |

| Exhibit G-1. General Evaluation Guidelines | |
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| | departmental policies governing Federal participation. |
| | |
| 2. Sensitivity Analysis | The sensitivity of project justification to key with and without project assumptions should be displayed. As a minimum, the benefit to cost ratio (BCR) for the recommended plan, assuming conditions projected to prevail in the first year of project operation, is to be displayed |
| | |
| 3. Economic, Financial, And Effectiveness Criteria | a. Scaling and scoping of the recommended project must be determined using NED criteria, except as modified by non-Federal financial resource limitations or other explicitly stated criteria in accordance with the P&G, including consistency with protecting the Nation's environment. Explain any deviation from incremental analysis of separable elements. Scaling and scoping of ecosystem restoration projects are supported by cost effectiveness and incremental cost analysis, combined with subjective estimates of output value. |
| | b. Provide adequate supporting documentation to allow reviewers to understand the models and assumptions used to estimate benefits and costs. For commercial navigation studies, the systems models used in the estimates of navigation benefits are to be fully described and their strengths and limitations presented. For flood damage reduction studies, the source of the depth damage relationships is to be provided. If approved generic curves are not used or the source of the relationships is not actual damage data for the study area, the rationale for using other relationships must be provided. For ecosystem restoration studies, both inventory and forecasting of past, present and future environmental conditions require that some form of quantitative measurement be used and defined in the report. Where indicators or other units of measure of ecosystem function or structure are used, the models used to develop them, along with their strengths and weaknesses must be fully described. |
| | c. Identification of the NED plan is to be based on consideration of the most effective plans for providing |

| Exhibit G-1. General Evaluation Guidelines | |
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| | different levels of output or service. Where two cost-effective plans produce no significantly different levels of net benefits, the less costly plan is to be the NED plan, even though the level of outputs may be less. For ecosystem restorations studies, project costs and outputs are measured in both monetary and non-monetary terms. Restoration plans must be justified through a determination that the plan is the most cost-effective for a given level of outputs and that the benefits (outputs), or losses restored or prevented, justify the cost of the last increment added. |
| | d. If Secretarial exception is sought to recommend a plan other than the NED or NER plan, the basis for the request is to be fully documented. |
| | e. For projects having non-Federal sponsors, a preliminary financial analysis must be included that shows the sponsor's current and projected ability to finance its share of the project cost and to carry out project implementation, operation, maintenance, repair, replacement and rehabilitation responsibilities. |
| | |
| 4. Cost Estimates | a. For economic analysis, project first cost estimates are to be developed on a constant dollar basis. Costs and benefits are to be compared on the same, current price levels. For financial analysis, an inflated dollar basis is to be used for the sponsor's information. |
| | b. Life cycle project cost estimates in appropriate Code of Accounts format are to include all financial outlays associated with preconstruction engineering and design, construction and operation, maintenance, repair, replacement and rehabilitation costs. This will include cash expenditures previously incurred. (Note that some costs included in the economic analysis may not be part of the project implementation expenditures. The converse also may be true. Examples include the economic cots of unmitigated losses and current market value of lands previously acquired by the sponsor.) |
| | c. Contingency factors are to be consistent with extent of detail in estimating procedure and physical investigations to ensure high probability of achieving implementation within |

| Exhibit G-1. General Evaluation Guidelines | |
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| | estimated costs. |
| | d. Tradeoffs between risk and costs are to be explicitly identified as areas for detailed evaluation in project design. For example, for flood damage reduction, relationships between the design reliability and costs; and for navigation, tradeoffs between channel dimensions and cost. |
| | e. Cost estimates consistent with efficient project implementation are to be projected so information can be incorporated into cost performance monitoring system. |
| | |
| 5. Legal/Institutional Criteria | a. The non-Federal sponsor's acceptance of, or desired departures from, the terms of the applicable model PCA must be presented, including: 1) applicable cost sharing and financial policies; 2) policies regarding provision and valuation of non-Federal lands, easements, rights-of-way, and disposal areas provided by non-Federal sponsors; 3) policies governing non-Federal project construction; and, 4) other provisions required by law and policy for new start construction projects. |
| | b. The non-Federal sponsor must either state that it possesses all authorities necessary to implement its responsibilities under the PCA or submit a plan to obtain those authorities. |
| | c. The preliminary cost allocation for a multipurpose project is to be presented. |
| | d. Legal and institutional problems to project implementation are to be identified, and a plan to resolve them is to be presented. |
| | e. Physical criteria for satisfactory project performance that can be used as a basis for establishing the non-Federal sponsor's operation, maintenance, repair, replacement, rehabilitation and land use management responsibilities must be identified. These responsibilities may include preservation of the structural integrity of complementary structures such as highway embankments to ensure successful performance of the total functional project. |
| | |
| 6. Environmental Criteria | a. Compliance with the NEPA process and other applicable |

| Exhibit G-1. General Evaluation Guidelines | |
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| | Federal and State environmental laws and regulations is to be fully documented; specific issues that require resolution before the feasibility study is completed are to be identified; and any environmental compliance matters that may remain and need resolution in preconstruction engineering and design must be specified. |
| | b. Ecosystem restoration and fish and wildlife habitat mitigation measures are to be formulated incrementally, and an explicit justification for the recommended amount and type of mitigation or restoration is to be presented. Required coordination with other concerned Federal and State agencies on mitigation and other ecological, cultural and historical preservation matters, is to be documented. |

h. Reports.

(1) Two basic reports are produced in the two phase planning process: the reconnaissance phase Preliminary Analysis and the feasibility phase Feasibility report. Their similarities are discussed here; unique requirements are covered in Reconnaissance Study and Section 905(b) Analysis and Feasibility Studies sections. Report objectives are to:

(a) Present study results and findings so that the readers can reach independent conclusions regarding the reasonableness of the recommendations.

(b) Document compliance with applicable statutes and policies; and ,

(c) Provide a sound basis for decision makers to initiate feasibility phase studies, or make recommendations to Congress; or, in the case of Congress, to enact legislation authorizing project construction.

(2) The District Commander to whose District a particular study is assigned shall be responsible for the required reports. The Division Commander may recommend, and the Director of Civil Works may designate, another District to assume study and reporting responsibility. The District Commander or other designated person shall sign and date the report, prior to reproduction, immediately below the recommendations.

(3) The District Commander shall transmit the reports to the Division Commander, except for reports on the Mississippi River and Tributaries (MR&T) project or features thereof,

in which case the report shall be transmitted to the President, Mississippi River Commission (MRC).

(4) Reports shall provide direct, concise, and orderly presentations. Narratives generally shall be in the active voice; use tabular and graphic displays for support. Narratives shall have adequate paragraphing, with headings and subheadings that are descriptive of the subject matter. Text formats will conform to the requirements of AR 335-15.

(5) Displays, such as maps, graphs, tables, drawings, photographs, and other graphics shall be used to facilitate the presentations.

G-7. Reconnaissance Study and Section 905(b) Analysis.

a. Purpose. The reconnaissance study and Section 905(b) Analysis are components of the reconnaissance phase. The study and report shall accomplish the following six essential tasks:

(1) Determine if the water resource problem(s) warrant Federal participation in feasibility studies. Defer comprehensive review of other problems and opportunities to feasibility studies;

(2) Define the Federal interest based on a preliminary appraisal consistent with Army policies, costs, benefits, and environmental impacts of identified potential project alternatives;

(3) Complete a 905(b) Analysis (Reconnaissance Report);

(4) Prepare a Project Management Plan (PMP);

(5) Assess the level of interest and support of non-Federal entities in the identified potential solutions and cost-sharing of feasibility phase and construction. A letter of intent from the local sponsor stating the willingness to pursue the cost shared feasibility study described in the PMP and to share in the costs of construction is required; and

(6) Negotiate and execute a Feasibility Cost Sharing Agreement (FCSA).

b. Cost Sharing. The entire reconnaissance phase is conducted at full Federal expense, exclusive of any costs incurred by non-Federal interests in volunteered work or services during the phase. Costs incurred by non-Federal interests during the reconnaissance phase are not creditable toward the non-Federal sponsors share of the feasibility phase.

c. Basic Requirements.

(1) The Expedited Reconnaissance Study will address the requirements of Section 905(b) of the WRDA of 1986, as amended. This provision requires that the reconnaissance study will include an analysis of the Federal interest, costs, benefits, environmental impacts of proposed action(s), and an estimate of the costs of preparing the feasibility report.

(2) The expedited reconnaissance study normally will cost no more than $100,000 and should be completed as expeditiously and efficiently as possible. By law, the duration of the reconnaissance phase shall normally be no more than 12 months and in all cases is to be limited to 18 months.

(3) The development of a PMP is an essential task in the Expedited Reconnaissance Study. The PMP shall be developed in accordance with guidance provided by CECW-CB.

(4) Existing, readily available data should be used during the Expedited Reconnaissance Study. Sponsor, other agency, State, and local government sources of available data must be used to the maximum extent possible.

(5) The accomplishment of the tasks under G-7a.(1)(2), shall be based on professional and technical judgment, utilizing an experienced study team. Special attention must be given to identifying the problem, project purposes, types of outputs, and whether the intended project purpose and/or likely outputs are consistent with Army/ Corps implementation and budgetary policies. While sound judgment and limited analytical approaches should be employed during the Expedited Reconnaissance Study, the detailed procedures for conducting economic and environmental analyses outlined in Principles and Guidelines (P&G), and in Corps regulations based on P&G, will not be required. However, the principles of P&G justification will be followed. Economic and environmental investigations should be limited to qualitative assessments of benefits and costs of a limited number of potential solutions in sufficient detail to indicate that a solution to the water resource problem will likely warrant Corps participation. The economic assessment should describe the existing conditions, and potential magnitude and types of benefits from proposed solutions. Likewise, the environmental evaluation should describe existing conditions, effects of potential measures, and the likely requirement for mitigation.

(6) To keep the Expedited Reconnaissance Study focused, cost low, and duration short, the following items should not be included for these studies: (1) development and formalized displays of detailed cost estimates (such as MCACES); (2) detailed engineering and design studies and data gathering; (3) detailed environmental resources evaluations; (4) optimization and benefit-cost analyses; (5) detailed real estate information; (6) report preparation; (7) formal coordination with other Federal and state agencies and; (8) other studies not directly needed to support the essential tasks. There is no need to quantify benefits and costs. Meaningful qualitative descriptions of likely benefits and costs are sufficient to support Federal interest in feasibility studies.

(7) As part of the Section 905(b) (WRDA of 1986) Analysis, the District will describe the major feasibility phase assumptions that will provide the basis for the study, discussion of alternatives that will be considered, and estimate of feasibility study cost and schedule. The Section 905(b) (WRDA of 1986) Analysis format enclosed in Exhibit G-2 provides the minimum requirements for MSC review and approval, and a sample set of assumptions.

(8) A Section 905(b) (WRDA of 1986) Analysis, as described above, is to be used as the basis for making the decision to proceed or to not proceed into the feasibility phase. The Section 905(b) (WRDA of 1986) Analysis should be submitted to HQUSACE for review and approval as early as possible in the reconnaissance phase. The PMP discussions with the non-Federal sponsor should be initiated at the start of the study phase and should be continuous throughout the study phase.

(9) MSCs have delegated authority to approve policy compliant 905(b) analysis. (Refer to Exhibit G-6 for determination of policy sensitive areas.) Section 905(b) analysis that are not in accordance with Corps policy will be coordinated with the respective Headquarters Regional Integration Team (RIT) prior to the MSC taking action on the report. A copy of the approval and report will be provided to the RIT. After approval of the 905(b) analysis and letter of intent and upon completion of PMP negotiation and approval by Headquarters of any requested deviations to the model FCSA, the District may execute the Feasibility Cost Sharing Agreement, which would then conclude the reconnaissance phase and initiate the feasibility phase.

(10) Cost Limits. The $100,000 expedited reconnaissance study is an important means to initiate quality feasibility studies more quickly and at less cost. However, the $100,000 expedited reconnaissance studies may not be the most effective means to initiate every feasibility study. Districts may request exceptions to the $100,000 cost limit of the Expedited Reconnaissance Study. The justifications for exceptions must be submitted with the request to the appropriate RIT for review and approval.

(11) The following language is required in correspondence from the District Commander to the study sponsor in transmitting the proposed FCSA prior to submission for certification.

"It is recognized and understood that upon completion of this feasibility study, extensive review is required at several levels in the Executive Branch of the Federal Government and may also be required at state and local levels. Consequently, the recommendations made in this report may be changed. The following paragraph is required in my recommendations. The recommendations contained herein reflect the policies governing formulation of individual projects and the information available at this time. They do not necessarily reflect program and budgeting priorities inherent in the local and state programs or the formulation of a national Civil Works construction program. Consequently, the recommendations may be modified at higher review levels within the Executive Branch before they are transmitted to the Congress as proposals for authorization and implementation funding. However, prior to transmittal to the Congress, the sponsor, the state(s), interested Federal agencies, and other parties will be advised of any modifications and will be afforded an opportunity to comment further."

d. Special Cases. Studies with large geographic areas, or having multiple objectives or sponsors, may present special management problems which require case-by-case guidance. In instances where there are several separable problem areas and several potential non-Federal sponsors, or where a study will address multiple purposes, and there are likely to be study components for which costs are not easily allocated to the separate areas or sponsors. In instances where the complexity of the study dictates significant revision of the model FCSA, the Division Commander should request an IRC with HQUSACE (RIT) and non-Federal sponsors to consider the appropriate way to proceed.

e. Study Conduct.

(1) A study team shall be organized as a multi-disciplinary group, consisting at least of the affected functional elements in the District. The potential non-Federal study sponsor should be invited and encouraged to participate at their expense. Given the increased emphasis in the planning phase on cost estimating, scheduling, real estate, ability to construct, and operation of proposed plans, the composition of the study team must ensure that these areas are addressed.

(2) District commanders will ensure that experienced and qualified personnel are assigned to the study team for the reconnaissance phase. Due to the short time available to conduct the study, many decisions will necessarily be based primarily upon professional judgment, without all the desirable information available.

(3) During the reconnaissance study, the study team will scope the problems, the planning setting, and the potential solutions. It will establish members' roles and interests, and

focus on the issues to be addressed. The team will recommend to the executive committee (defined in (4)) the tasks to be conducted and the extent of planning to be carried out in the feasibility study.

(4) When the reconnaissance study progresses sufficiently, an executive committee structure and participants will be identified. The potential executive committee participants will serve as the coordination points of contact for the remainder of the reconnaissance study, including development of the draft FCSA (see paragraph G-8). The executive committee membership normally includes the District Engineer, the District's chief planner (or designate), and a representative of the non-Federal sponsor(s) with commensurate decision making authority. The District Engineer and the non-Federal sponsor's counterpart will co-chair the committee.

f. Cost Estimating and Scheduling.

(1) During the reconnaissance study, a project management plan (PMP) will be developed in task detail to the first major decision point or IPR.

(2) Section 905(b) (WRDA of 1986) Preliminary Analysis should be submitted to HQUSACE for review and approval prior to completing the negotiation of the PMP. PMP discussions with the non-Federal sponsor should be initiated at the start of the study phase and should be continuous throughout the study phase.

g. Section 905(b) Analysis.

(1) The requirement for a traditional Reconnaissance Report is waived. A Section 905(b) (WRDA of 1986) Analysis is to be used. It will define the value of proceeding with a feasibility cost sharing agreement. The Section 905(b) Analysis shall address, as a minimum, the subject matter outline in Exhibit G-2.

(2) Additional information should be included in the analysis when needed for unusual situations. Generally the test for including such information is whether or not it is necessary for either the Federal or non-Federal decision maker to reach a conclusion on proceeding to the feasibility phase.

h. Fish and Wildlife Resources Considerations. Fish and wildlife resources considerations during the reconnaissance stage of planning shall be of sufficient scope and detail to:

(1) Identify the presence and general location of known fish and wildlife resources within the study area that should be approached with care;

(2) Make preliminary determinations of the likely impacts that potential alternative plans would have on these fish and wildlife resources;

(3) Briefly describe potential mitigation features that would address these impacts; and,

(4) Develop the scope of fish and wildlife resources surveys, studies and analyses to be conducted during the feasibility study stage.

| Exhibit G-2. Section 905(b) WRDA of 1986 Analysis Outline and Sample Assumptions for an Ecosystem Restoration Feasibility Study |
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| OUTLINE |
| 1. STUDY AUTHORITY. Include the full text of principle resolution(s) and/or other study authorities. Provide summary of study funding including budget and appropriation history. |
| 2. STUDY PURPOSE |
| 3. LOCATION OF PROJECT/CONGRESSIONAL DISTRICT |
| 4. DISCUSSION OF PRIOR STUDIES, REPORTS AND EXISTING WATER PROJECTS |
| 5. PLAN FORMULATION |
| a. Identified Problems. Provide assessment of water and related land resource problems and opportunities specific to the study area. The following information is required: (1) existing conditions; (2) expected future conditions; and, (3) concise statement of specific problems and opportunities with emphasis on problems warranting Federal participation in the feasibility study. |
| b. Alternative Plans. Description and discussion of the likely array of alternatives to be developed and the environmental impacts and outputs for each alternative analyzed. |
| c. Preliminary Evaluation of Alternatives. Description and discussion of the likely benefits, costs and environmental impacts and outputs for each alternative analyzed. |
| 6. FEDERAL INTEREST. Define the Federal interest, consistent with Army policies, based on a preliminary appraisal, costs, benefits and environmental impacts of identified potential project alternatives. |
| 7. PRELIMINARY FINANCIAL ANALYSIS. The 905(b) Analysis must be accompanied by a letter of intent from the non-Federal sponsor stating their willingness to pursue the feasibility study described in the PMP and to share in the costs of construction. |
| 8. SUMMARY OF FEASIBILITY STUDY ASSUMPTIONS. The summary will describe the normal assumptions used for the formulation, evaluation, coordination and reporting procedures described in this regulation, ER 200-2-2 and related planning phase guidance. The summary should highlight any anticipated deviations from the normal feasibility phase requirements. |
| 9. FEASIBILITY PHASE MILESTONES |

| Exhibit G-2. Section 905(b) WRDA of 1986 Analysis Outline and Sample Assumptions for an Ecosystem Restoration Feasibility Study |
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| 10. FEASIBILITY PHASE COST ESTIMATE |
| 11. RECOMMENDATIONS. Recommend whether to continue to a feasibility study or not, based on consistency with Army and budgetary policies and likelihood of a project meeting criteria for Federal participation in project implementation. |
| 12. POTENTIAL ISSUES EFFECTING INITIATION OF FEASIBILITY PHASE. Discuss any potential issues which may affect the initiation of the feasibility phase or project implementation. |
| 13. VIEWS OF OTHER RESOURCE AGENCIES (if known) |
| 14. PROJECT AREA MAP |
| *District Engineer Signature Block* |
| |
| SAMPLE ASSUMPTIONS FOR ECOSYSTEM RESTORATION STUDY |
| 1. The resulting document will be a combined EIS/EIR prepared by the local sponsor combined (but not integrated) with the Feasibility Report prepared by the Corps. The Feasibility Report will rely heavily on the NEPA/CEQA document as a reference.<br><br>2. The document will address the project as an independent project that does not rely on other projects (describe), but which could benefit from other projects through an accelerated realization of the anticipated environmental outputs.<br><br>3. The schedule assumes that ongoing activities (describe) will result in a clean enough site for R/E to assign a land value appropriate for some type of highest and best use in order to predict how the properties will ultimately be zoned.<br><br>4. The schedule assumes that the property will be available for wetland restoration (as scheduled) by January 2000.<br><br>5. The Feasibility Report will be based on a package of engineering information provided by the Local Sponsor. An Engineering Appendix will not be prepared by the Corps. The engineering information provided by the Local Sponsor will be reviewed by the relevant district sections. The schedule assumes that no additional engineering analysis will be necessary, and that no major revision to the engineering package will be needed.<br><br>6. A Draft Coordination Act Report may not be ready by August 1. The Fish and Wildlife Service may be able to prepare a Planning Aid Letter, in which F&W issues and concerns are identified, in time for circulation with the draft report. A HEP analysis will be conducted by FWS and the resulting Habitat Units will be used by the Corps to quantify the environmental |

Exhibit G-2. Section 905(b) WRDA of 1986 Analysis Outline and Sample Assumptions for an Ecosystem Restoration Feasibility Study

output of the proposed project.

7. An MCACES will be performed on the selected plan providing an analysis suitable for a feasibility level study.

8. An approved real estate gross appraisal will not be required for the draft feasibility report.

9. There will be only one conference before the AFB. Due to the need for expedited reviews. The AD FR/EIS/EIR will be provided to HQ before the District and sponsor completes their review of the documents. Issues from the conference will be provided to HQ before the AFB.
10. QC certification of the AFB package (AD FR/EIS/EIR) will not be provided prior to the AFB conference, but will be provided at the conference.

11. The FCSA will be signed after the Public Meeting.

12. There will be no AFB Decision Conference as the decision to have an AFB conference has already been made.

13. An incremental analysis of some sort will be performed by the Corps on information provided by the local sponsor in order to display cost vs. ecological output (benefits). The Feasibility Report will not contain a detailed economics analysis as there are no traditional economic outputs anticipated.

14. Four increments will be analyzed:
a. Wetland restoration without the use of dredged material.
b. Placement of dredged material to accelerate wetland restoration.
c. Wetland restoration at the project site and State Lands properties without the use of dredged material.
d. Placement of dredged material at the State Lands property using dredged material to accelerate wetland restoration.

15. All alternatives except the no action alternative will have a goal of creating a mix of 20 percent seasonal wetland and 80 percent tidal marsh. This ratio is a result of interagency input.

16. The report will assume that construction will last a maximum of ten years, after which the levee will be breached regardless of remaining capacity.

17. The report will not address the costs or impacts of the transportation of dredged material

Exhibit G-2. Section 905(b) WRDA of 1986 Analysis Outline and Sample Assumptions for an Ecosystem Restoration Feasibility Study

into
the site. Those costs will be addressed for specific dredging projects. Because the cost of transportation to the site (including unloading) will be less than the cost of ocean disposal, the transportation and unloading costs will be funded by the specific dredging projects. The report will address the site preparation, placement of material, and the levee breaching, as well as O&M and monitoring of the completed project.

18. The schedule assumes that the local sponsor is willing to go along with it and they do not have their own list of conditions that conflict with ours. Discussions on this issue are currently underway.
19. The schedule assumes that the FCSA will be signed prior to HQ approval of the PSP. HQ concurrence on this is needed ahead of time. The local sponsor is willing to sign the FCSA at this stage provided they agree with the conditions of the draft PSP. At this time we are requesting permission to proceed in this manner.

G-8. Feasibility Cost Sharing Agreement (FCSA).

a. Partnership. The FCSA (see www.hq.usace.army.mil/cecc/ccpca.htm for model agreement) is intended to promote a partnership for the conduct of the feasibility study. The Department of the Army remains responsible for representing the Federal interest by following Federal policies and budgetary priorities. Both parties will conduct planning within the framework established by the P&G and additional guidance provided in this regulation. The model FCSA shall be followed for all agreements, but minor adaptations may be made to accommodate individual study circumstances. The District Commander shall be satisfied that the non-Federal sponsor has authority to enter into the agreement and that the FCSA is legally sufficient.

b. Negotiations with Potential Non-Federal Sponsor.

(1) While developing the PMP, which will be incorporated in the FCSA, the District Commander must discuss with the prospective non-Federal sponsor(s) the objectives of the feasibility study, necessary level of detail, cost of studies, and scheduling of activities for the feasibility study. If desired and acceptable to the non-Federal sponsor, various project detail studies normally achieved after completion of the feasibility phase could be scheduled for the feasibility study to reduce uncertainties in areas such as design and cost.

(2) During negotiations, the prospective non-Federal sponsor must be informed that the level of accuracy of alternative plan evaluation and cost estimates to be developed in the

feasibility study will depend on the extent of uncertainties and the depth of investigations made during the feasibility study.

c. Project Management Plan (PMP).

(1) A PMP, negotiated between the Corps and the non-Federal sponsor, will ensure that the work required for the feasibility phase has been carefully developed and considered. The PMP forms the basis for estimating the total study cost and local share. It also is the basis for assigning tasks between the Corps and the sponsor and for establishing the value of in-kind services. The responsibility for the preparation of the PMP rests with the study manager, in coordination with the project manager. During the feasibility phase, significant changes to the PMP, may require a modification of the FCSA.

(2) The PMP will be completed during the Reconnaissance phase and will be revised and updated, as appropriate, based on discussions, resolution of issues and agreements on actions at the Feasibility Scoping Meeting.

(3) The determination of the dollar value of in-kind products or services will be negotiated, based on a detailed government estimate and sponsor proposal, between the Federal Government and the non-Federal sponsor as fixed fee items, applying applicable Federal regulations, including OMB Circular A-87. The dollar value of the in-kind effort will be established prior to the initiation of the in-kind effort. Acceptance of the product will be as called for in the PMP.

(4) The PMP should include the costs for the tasks which non-Federal sponsors have historically accomplished without charge, such as: supervision and administration; study management; attendance at meetings, both public and technical; and overhead and indirect costs which are directly related to the feasibility study. It is expected that detailed scopes of work may be needed for individual items in the PMP. Work items will also include those tasks typically necessary to support the review process from the signing of the report through the ASA(CW)'s request to OMB for the views of the Administration. These items could include answering comments, attending Washington level meetings (including the non-Federal sponsor), and report revisions as a result of review by higher authority.

(5) The PMP will guide the allocation of study funds among tasks to assure that all interests are given adequate attention. As a minimum, the PMP should address: work tasks, and their milestones and negotiated costs, and responsibility for their accomplishment; Corps and other professional criteria used to assess the adequacy of the completed work effort; procedures for reviewing and accepting the work of both parties, which can be audited; the schedule of performance; the coordination mechanism between the Corps and non-Federal sponsor; and

references to regulations and other guidance that will be followed in conducting the tasks.

(6) The PMP will address the appropriate level of engineering detail required for the feasibility phases. Engineering studies and analysis should be scoped to the minimum level needed to establish project features and elements that will form an adequate basis for the project construction schedules and cost estimate. Uncertainties should be reflected in contingencies which will be resolved during feasibility and/or PED.

(7) To ensure that the sponsor is afforded the opportunity to participate in any significant effort as a result of Washington level policy review, review support will be included as a work item in the PMP for District and non-Federal sponsor costs only. These costs, including any necessary travel, will be limited to those reasonable costs associated with the review and processing of the feasibility report. This item will be 5 percent of the total study cost or $50,000, whichever is less, and will be cost shared equally.

(8) During the feasibility phase, significant changes to the PMP may require a modification of the FCSA.

d. Feasibility Phase Cost.

(1) The total cost of the feasibility phase will be established through negotiations of the PMP. The cost estimate in appropriate Code of Accounts format will identify major costs by task and by type (i.e., labor, materials, equipment, indirect cost, etc.), and be fully supported and documented. Procedures will be established for tracking expenses and cost accounting, including the allocation of costs between the Federal government and non-Federal sponsor. These procedures will include the ability to review costs incurred during the study, and will provide the basis for the annual cost accounting and the final cost settlement. All parties to the FCSA must agree to the funding schedule established in the PMP.

(2) Should the review support costs exceed the limit of 5 percent of the total study cost or $50,000, whichever is less, the FCSA will be modified to provide for 50-50 sharing of those additional costs. Any costs relating to the feasibility report that are incurred following completion of the feasibility phase will be 100 percent Federal.

e. Disclosure of Lobbying Activities. The FCSA will be accompanied by a signed Certification Regarding Lobbying and, if applicable a completed Disclosure of Lobbying Activities. These forms must be thoroughly discussed with sponsors prior to their signature. Completed forms will be attached to the FCSA prior to its signature by the District Commander, and kept on file by the District for later submittal to HQUSACE, if requested.

G-9. Feasibility Studies**.**

a. Purpose. The purpose of the feasibility study is to identify, evaluate and recommend to decision makers an appropriate, coordinated, implementable solution to the identified water resources problems and opportunities. The resulting report should be a complete decision document, referred to as a feasibility report. It presents the results of both study phases. The report will:

(1) Provide a complete presentation of study results and findings, including those developed in the reconnaissance phase so that readers can reach independent conclusions regarding the reasonableness of recommendation;

(2) Indicate compliance with applicable statutes, executive orders and policies; and

(3) Provide a sound and documented basis for decision makers at all levels to judge the recommended solutions(s).

b. Cost Sharing.

(1) The cost of the feasibility phase will be shared equally between the Federal government and the non-Federal sponsors during the study. The non-Federal sponsor's share, 50 percent of the total feasibility phase cost, may be in-kind products and services.

(2) Section 105(a)(1) of WRDA of 1986 requires the sponsor to contribute 50 percent of the study costs during the period of such study. No credit may be given to the non-Federal sponsor for work prior to the start of the feasibility phase or after its completion.

(3) Cost sharing is not applicable to single purpose inland navigation studies on the Nation's inland waterways system. For studies where inland navigation is the primary purpose and there are other purposes being considered, request additional guidance from the appropriate RIT for feasibility phase cost sharing procedures.

c. No Implementable Plan. If the District Commander determines that a feasibility study should be terminated, but the non-Federal sponsor wishes to continue the feasibility study under the terms of the FCSA, continuation will be considered on a case-by-case basis. Normally, an exception to termination will not be granted. However, consideration will be given to those cases where there are compelling reasons to complete the feasibility report. Such situations might occur when the feasibility report is very near completion and there is a strong likelihood that non-Federal interest would implement one of the alternatives. Requests for an exception to termination shall be submitted to HQUSACE (RIT) for decision.

d. Monitoring and Tracking. The Division Commander shall establish a procedure for accomplishing an annual reconciliation of study costs between the Federal government and the non-Federal sponsor. No adjustments in the non-Federal contributions are required until the final accounting required in ARTICLE IV of the FCSA.

e. Project Cost Estimating and Scheduling.

(1) A baseline estimate will be developed for the selected plan and NED plan if it is not the selected plan, in accordance with ER 5-1-11.

(2) Two project cost estimates shall be displayed in the feasibility report; one based on constant dollars and one based on projected inflation rates. Inflation rates utilized shall be those published in Engineer Manual EM 1110-2-1304, Civil Works Construction Cost Index. The cost estimate based on constant dollars is the one used for authorization purposes.

f. Review Process. Feasibility reports must undergo both technical and policy compliance review. Technical review, which is the District's responsibility, is accomplished at the district level, in accordance with their quality management control regulations. Policy compliance review, which is Headquarters responsibility, unless it has been delegated, is intended to identify and resolve policy concerns that might otherwise delay or preclude approval of feasibility reports. The policy compliance review process provides for early Headquarters involvement and participation in the study process and in the review of the feasibility reports and other decision documents. General requirements for review and approval of decision documents and specific procedures for review of draft and final feasibility reports are described in Appendix H. Prior to preparation of the draft feasibility report, Headquarters policy compliance review is required at two points in the feasibility study - the Feasibility Scoping Meeting (FSM) and the Alternative Formulation Briefing (AFB). If there are additional requirements for Headquarters involvement in the study that are not met by the FSM and/or the AFB, an Issue Resolution Conference (IRC) or In-Progress Review (IPR) may be held. Additional information on the purposes and procedures for conducting FSMs, AFBs, and IRCs/IPRs is provided in Exhibit G-3 through G-6.

| Exhibit G- 3. Procedures for Conducting Feasibility Scoping Meetings, Alternative Formulation Briefings, and Issue Resolution Conferences/In-Progress Reviews for Feasibility and Post Authorization Studies and Reports |
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| Purpose. This exhibit describes procedures and requirements for conducting the Feasibility |

| Exhibit G- 3. Procedures for Conducting Feasibility Scoping Meetings, Alternative Formulation Briefings, and Issue Resolution Conferences/In-Progress Reviews for Feasibility and Post Authorization Studies and Reports |
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| Scoping Meeting (FSM), Alternative Formulation Briefing (AFB), and other Issue Resolution Conferences/ In-Progress Reviews (IRCs/ IPRs) in conjunction with feasibility and post authorization studies and reports generally covered in ER 1105-2-100. |
| Background. The primary objective of FSMs, AFBs, and IRCs/IPRs is to engage the USACE vertical team (i.e., District, Division, Headquarters) and ASA(CW), if needed, to identify, discuss and resolve policy issues to ensure the study progresses in an orderly manner and that preparation of a final report is not delayed. The FSM and the AFB are required to be held at the appropriate time during the conduct of the study. IRCs and IPRs can be held at any point in time during the study process to provide an update of study findings and progress (IPR) or to identify and resolve potential problems (technical/policy) that could delay study completion (IRC). The District should strongly encourage the non-Federal sponsor and resource agencies to participate in all FSMs, AFBs, and IRCs/IPRs. The end-product of all FSMs, AFBs, and IRCs/IPRs is a formal guidance memorandum from Headquarters that documents issues to be resolved by the district for incorporation in the draft report. |
| Feasibility Scoping Meeting (FSM).<br><br>The purpose of the FSM is to bring the USACE vertical team, the non-Federal sponsor, and resource agencies together to reach agreement on the problems and solutions to be investigated during the feasibility study and the scope of analysis required.<br><br>The FSM should be held upon completion of steps 1 and 2 of the planning process (i.e.; Step 1 - Identification of Problems and Opportunities; Step 2 – Inventory and Forecast Resource Conditions) and preliminary plan formulation and evaluation. The FSM is also related to the NEPA scoping process (see ER 200-2-2) which determines the scope of issues to be addressed and identifies the significant issues related to a proposed action. In general, the district should convene a FSM after the NEPA scooping process and the preliminary plan formulation and evaluation have been accomplished and the district is prepared to focus and tailor the feasibility study on key alternatives, to further define the depth of analysis required and to refine study/project constraints.<br><br>FSM documentation should include, as a minimum, a detailed description of identified problems and opportunities, statements of specific planning objectives and constraints, a detailed description of future without project conditions, a description of applicable management measures, the results of preliminary plan formulation and evaluation (i.e.; screening), and the results of preliminary coordination and public involvement. Issues that need to be resolved should be identified and fully documented and the district should present its analysis of options considered. FSM documentation will address the general evaluation |

Exhibit G- 3. Procedures for Conducting Feasibility Scoping Meetings, Alternative Formulation Briefings, and Issue Resolution Conferences/In-Progress Reviews for Feasibility and Post Authorization Studies and Reports

guidelines presented in Exhibit G-1 to the extent possible at this early stage of the study. Exhibit G-4 is an expanded outline of the information to be included in FSM documentation and addresses the level of detail required. Technical work products that support the FSM documentation (e.g.; surveying & mapping, hydraulics & hydrology, average annual damage computations, etc.) should have been subject to technical review (ITR). Although ITR issues may not have been fully resolved, a status report discussing significant ITR concerns and how these concerns will be resolved must be provided as part of the FSM material. The transmittal of the FSM material to Headquarters should include a document that explains what actions have been taken to address any issues identified by Headquarters in the reconnaissance guidance memorandum.

Upon completion of the process outlined in this exhibit, Headquarters will issue the FSM Guidance Memorandum. The guidance memorandum will identify any changes in the conduct of remaining feasibility study activities agreed to by the USACE vertical team and will be used to revise the PMP, if necessary.

Alternative Formulation Briefing (AFB).

The AFB was established to save time and costs in the preparation and review of feasibility and general reevalution reports, and to facilitate Headquarters participation in plan formulation. The purpose of the AFB is to confirm that the plan formulation and selection process, the tentatively selected plan, and the definition of Federal and non-Federal responsibilities are consistent with applicable laws, statutes, Executive Orders, regulations and current policy guidance. The goal is to identify and resolve any legal or policy concerns that would otherwise delay or preclude Washington-level approval of the draft report, and to allow the districts to release the draft report to the public concurrent with the Headquarters policy compliance review of the draft report.

An AFB should be held when the District is prepared to present the results of the alternative formulation, evaluation and comparison of plans and has identified a tentatively selected plan. The AFB is concerned with the adequacy of the formulation, evaluation and comparison of alternative plans (steps 3 through 5 of the planning process), the reasonableness of the costs, benefits, and impacts of the final array of plans, and the proper application of cost sharing and other legal and policy requirements in arriving at the tentatively selected plan. The AFB should also provide a current description of problems and opportunities, planning objectives and constraints, and the without-project condition (steps 1 and 2 of the planning

Exhibit G- 3. Procedures for Conducting Feasibility Scoping Meetings, Alternative Formulation Briefings, and Issue Resolution Conferences/In-Progress Reviews for Feasibility and Post Authorization Studies and Reports

process). Issues that need to be resolved should be identified and fully documented and the districts should present their analysis of options considered and its tentatively recommended solution.

AFB documentation should provide all information that is pertinent to the formulation, evaluation, comparison, and selection of the tentatively recommended plan. The AFB documentation will address the general evaluation guidelines presented in Exhibit G-1. Exhibit G-5 is an expanded outline of the information to be included in AFB documentation and addresses the level of detail required. Conceptually, AFB documentation would be comparable to a draft report that is about 75 percent complete. Although not required, if the draft report is available, that report may serve as the AFB documentation. Technical work products that support the AFB documentation (e.g.; surveying & mapping, hydraulics & hydrology, environmental/NEPA documentation, average annual damage and benefit computations, cost estimates, etc.) should have been subject to independent technical review (ITR). Although ITR issues may not have been fully resolved, a status report discussing significant ITR concerns and how these concerns will be resolved must be provided as part of the AFB material. The AFB material must also include a document stating how concerns identified in the Headquarters FSM guidance memorandum have been addressed.

Upon completion of the process outlined in this exhibit, Headquarters will issue the AFB Guidance Memorandum. The AFB Guidance Memorandum will be used by the District to complete all required detailed analyses and prepare the draft feasibility report/NEPA document. Subject to the district presenting its resolution of issues from the AFB Guidance Memorandum and Headquarters approval, the draft feasibility report/NEPA document will be distributed for the required 45-day public review concurrent with transmittal of the draft report to Headquarters for policy compliance review.

Issue Resolution Conferences / In-Progress Reviews (IRCs/ IPRs). The purpose of an IRC is to involve the USACE vertical team in the early identification and resolution of potential problems (technical/policy/legal) that could delay study progress. The purpose of an IPR is to provide the USACE vertical team and others, as needed, an update of study findings and progress. IRCs and IPRs can be held at any time during the study process at the request of any USACE vertical team member (i.e.; District, Division or Headquarters) or the ASA(CW). Documentation should be developed to provide the background and facts appropriate to the purpose and scope of the IRC/IPR. Issues that need to be resolved should be identified and fully documented and the District should present its analysis of options considered and its recommended solution. Prior to an IRC/IPR, the District should have completed and documented independent technical review

Exhibit G- 3. Procedures for Conducting Feasibility Scoping Meetings, Alternative Formulation Briefings, and Issue Resolution Conferences/In-Progress Reviews for Feasibility and Post Authorization Studies and Reports

appropriate to the stage of the study. Upon completion of the process outlined in this exhibit, Headquarters will provide guidance for the resolution of issues or future study activities in the form of an IRC/IPR Guidance Memorandum.

Procedures for Conducting FSMs, AFBs, and IRCs/IPRs.

Document Transmittal. The documentation required for an FSM, AFB, or IRC/IPR is defined in this exhibit and in Exhibits G-4 and G-5. The District will submit 10 copies of documentation to the respective Headquarters MSC Regional Integration Team and two copies to the MSC. The transmittal memorandum will identify and discuss any policy issues requiring resolution and/or significant or potential issues that the MSC/District believes could affect the outcome of the project. Copies of previous Headquarters guidance memoranda, the District's compliance memorandum, and appropriate ITR documentation should be enclosed.

Document Review and Discussion of Issues. Headquarters will review the FSM, AFB, or IRC/IPR documentation and produce policy compliance review comments (see Appendix H) appropriate to the situation. The target time for providing formal, written Headquarters policy review comments is 30 days after receipt of complete documentation. Policy review comments will be transmitted to the District and MSCs with required actions identified to achieve issue resolution. At a minimum, the District will be required to provide formal written responses to the Headquarters policy review comments stating how the issues will be resolved.

The next step in the process is for the USACE vertical team, the non-Federal sponsor, and others as necessary (e.g.; ASA(CW), resource agencies) to discuss the comments and responses and reach consensus on the appropriate actions that will be taken to resolve the issue. The form of this discussion may be a telephone conference, videoconference, or a face-to-face meeting as appropriate. The appropriate MSC RIT should be contacted to discuss the form of the discussion and a range of proposed dates for the discussion and will confirm the acceptability of the final date with other Washington level offices. When deciding the form of the discussion, consideration should be given to the need for a project site visit. A project site visit should be part of the AFB, unless there are extenuating circumstances. If a site visit would be useful but is not practical, slides and/or a video should be presented.

Discussions of policy issues will be chaired by the MSC and should be structured to

Exhibit G- 3. Procedures for Conducting Feasibility Scoping Meetings, Alternative Formulation Briefings, and Issue Resolution Conferences/In-Progress Reviews for Feasibility and Post Authorization Studies and Reports

encourage the surfacing and discussion of concerns and development of consensus on resolution of issues. The sponsor and appropriate Federal and State agencies should be encouraged to participate fully in all discussions. The District participants should be prepared to address the policy issues raised by Headquarters review. Discussions and required actions will be recorded and will be the basis of the draft guidance memorandum developed at the conference.

Headquarters Guidance Documentation. In coordination with the Office of Water Project Review and Headquarters Communities of Practice (CoPs), as appropriate, the respective MSC RIT will be responsible for finalizing the guidance memorandum. The final guidance memorandum will be transmitted to the MSC within 14 calendar days following the discussion of the issues. All subsequent documents submitted for Headquarters review shall be accompanied by a document indicating how compliance with previous Headquarters guidance has been achieved. The FSM Guidance Memorandum will be used to revise the PMP to incorporate the changes agreed to at the meeting. The revised PMP, as a result of the FSM or other IRCs/IPRs, will be followed during the conduct of the feasibility study and will be a primary tool for the review of subsequent products (AFB pre-conference documentation, draft or final report). Outstanding policy and ITR issues must be resolved before subsequent products are forwarded to HQUSACE.

| Exhibit G-4. Items to be Addressed in Feasibility Scoping Meeting (FSM) Documentation |
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| 1. Study Background.<br>a. Study Authority. Include the full text of the study resolution(s) or other authority.<br>b. Location. Include a map(s). |
| 2. Future Without Project Condition Problems, Opportunities, Goals, Objectives, and Constraints. Present the results of steps 1 and 2 of the planning process as generally described in Appendix E, paragraph E-3. Specifically identify any key assumptions regarding forecasted without-project conditions. For the project purpose(s) being studied, provide specific information to describe and quantify the problem in accordance with the applicable evaluation procedures presented in Appendix E. Following are references to the specific analyses and information required to describe the problem for several project purposes:<br><br>- Urban Flood Damage Reduction. Appendix E, paragraph E-18.<br>- Deep Draft Navigation. Appendix E, paragraph E-9.<br>- Ecosystem Restoration. Appendix E, paragraph E-32. |
| 3. Formulation and Evaluation of Preliminary Plans. The FSM documentation will present the results of initial plan formulation, step 3 of the planning process (Appendix E, paragraph E-3).<br><br>a. Identification of Management Measures. A management measure is a feature (a structural element that requires construction or assembly on-site) or an activity (a nonstructural action). Management measures are the building blocks of alternative plans. The FSM documentation will describe the full range of management measures that have been considered to address the identified problems and opportunities. Descriptions of management measure will include their purpose, location, composition (e.g., materials, methods), and physical properties (i.e.; scale/sizing) to the extent possible at this early stage of the study. All applicable measures should be considered, including those beyond the authority of the Corps to implement.<br><br>b. Evaluation of Management Measures. For each measure identified, discuss its potential to contribute to the planning objectives and its consistency with the planning constraints. Identify measures that will be eliminated from further consideration and document the reasons (e.g.; cost, effectiveness). Identify measures that can be combined to form alternative plans. Identify measures that must be combined due to dependency. Identify measures that are mutually exclusive. Assess the Federal interest in identified potential solutions to the problems based on consistency with Administration budget policy, specific USACE policies for each project purpose (see Appendix E), and Federal laws, regulations, and Executive Orders. Indicate who (i.e.; Corps, other Federal agency, non-Federal interests) has responsibility for addressing |

| Exhibit G-4. Items to be Addressed in Feasibility Scoping Meeting (FSM) Documentation |
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| each problem identified. |
| c. Plans To Be Studied Further. Identify the conceptual plans that will be studied further and describe the future work that will be accomplished to develop and evaluate preliminary plans. |
| 4. Policy issues or questions to include analysis of options and proposed recommendation(s). A list of sensitive policy areas which require vertical team coordination with MSCs/HQUSACE is enclosed as Exhibit G-6. |
| 5. Independent technical review documentation completed to date, including status of unresolved issues and how they will be resolved |
| 6. List of future study/project milestones and completion dates |
| 7. Proposed Changes to the PMP. Provide a narrative discussion of changes that need to be made to the PMP as a result of the findings of the study to date. Explain significant changes in the scope, schedule, or cost of specific tasks. |
| 8. Headquarters Guidance Memoranda from Reconnaissance Phase or most recent IRC/IPR. |
| 9. Compliance memorandum indicating how compliance with Reconnaissance or most recent IRC/IPR Guidance has been achieved. |
| The FSM documentation should include but is not limited to the above items. It should include other information pertinent to the project or specific issues. |

| Exhibit G-5. Items to be Addressed in Alternative Formulation Briefing (AFB) Documentation |
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| 1. Study Background.<br>a. Study Authority. Include the full text of the study resolution(s) or other authority.<br>b. Location. Include a map(s). |
| 2. Current Description of Future Without Project Condition Problems, Opportunities, Goals, Objectives, and Constraints. Present the current, updated results of steps 1 and 2 of the planning process as generally described in Appendix E, paragraph E-3. Specifically identify any key assumptions regarding forecasted without-project conditions. For the project purpose(s) being studied, provide specific information to describe and quantify the problem in accordance with the applicable evaluation procedures presented in Appendix E. Following are references to the specific analyses and information required to describe the problem for several project purposes:<br><br>- Urban Flood Damage Reduction. Appendix E, paragraph E-18.<br>- Deep Draft Navigation. Appendix E, paragraph E-9.<br>- Ecosystem Restoration. Appendix E, paragraph E-33. |
| 3. Formulation and Evaluation of Alternative Plans. The AFB documentation should confirm that all reasonable alternatives, including non-structural measures and measures beyond the authority of the Corps to implement, have been systematically formulated and evaluated in accordance with the P&G.<br>a. Plan Formulation, Evaluation, and Comparison. Summarize the screening of applicable management measures, development and evaluation of preliminary plans, and the iterations of plan formulation that led to the final array of detailed plans (steps 3, 4, and 5 of the planning process (Appendix E, paragraph E-3). Tell the plan formulation story.<br>b. For the final array of plans provide:<br>(1) Descriptions of the physical features and LERRD requirements. Include maps and sketches.<br>(2) Implementation costs in appropriate Code of Accounts format to include preconstruction engineering and design, LERRD requirements, construction, and operation, maintenance and repair costs. Implementation costs include mitigation. Identify contingencies. Identify economic cost (e.g.; interest during construction).<br>(3) Description of models and assumptions used to estimate benefits and costs.<br>(4) Environmental mitigation requirements including associated LERRD requirements. Document justification for mitigation measures (Appendix C, paragraph C-3)<br>(5) Discussion of major areas of risk and uncertainty, to include key assumptions regarding forecasted future with-project conditions. Address the sensitivity of project justification to key with- and without-project assumptions |

| Exhibit G-5. Items to be Addressed in Alternative Formulation Briefing (AFB) Documentation |
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| c. Identify the NED, NER or Combined plan<br>d. Identify the Tentatively Recommended Plan. Provide rationale and justification for selection of the plan if it is not the NED/NER/Combined Plan.<br>e. For the Tentatively Recommended Plan provide:<br>(1) Allocation of costs to project purposes<br>(2) Apportionment of Federal and non-Federal costs<br>(3) A description of Federal and non-Federal implementation responsibilities. |
| 4. Policy issues or questions to include analysis of options and proposed recommendation(s). A list of sensitive policy areas which require vertical team coordination with MSC/HQUSACE is enclosed as Exhibit G-6. |
| 5. Status of environmental compliance actions, coordination, and NEPA documentation. |
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| 6. Independent technical review documentation completed to date, including status of unresolved issues and how they will be resolved. |
| 7. Identification of any legal issues and status of legal review certification. |
| |
| 8. Status of engineering activities. In general, sufficient engineering analysis should be complete to have a reasonably certain estimate of project scope, benefits, and costs. Identify any incomplete items of work that could have a significant effect on project scope, benefits, or costs and an assessment of the likely effect. |
| 9. Identification of any LERRD issues and status of real estate activities. In general, the Real Estate Plan (ER 405-1-12, Chapter 12) should be sufficiently complete so as to have a reasonably certain estimate of project LERRD requirements and, for cost shared projects, a reasonably certain description of the nature and scope of the non-Federal sponsor's responsibilities and estimated LERRD credit amount. Identify any incomplete items of work that could have a significant effect on project scope, benefits, or costs and an assessment of the likely effect. |
| 10. Status of all applicable environmental compliance coordination activities and resource agency views, if known. |
| 11. List of future study/project milestones and completion dates. |
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| 12. Status of M-CACES cost estimate. |
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| 13. Headquarters Guidance Memoranda from FSM or most recent IRC/IPR. |
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| 14. Compliance memorandum indicating how compliance with FSM or most recent IRC/IPR |

| Exhibit G-5. Items to be Addressed in Alternative Formulation Briefing (AFB) Documentation |
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| guidance has been achieved. |
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| 15. Status of non-Federal sponsor support. |
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| Note: The AFB documentation should include but is not limited to items 1 to 15. It should include other information pertinent to the project or specific issues. |
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Exhibit G-6. Sensitive Policy Areas Which Require Vertical Team Coordination with MSC/HQUSACE

GENERAL PROJECT INFORMATION:

Project Name: State, County, River Basin/Waterbody under Study

Project Description: Need project description with general details, such as a fact sheet attached. For GRRs, if project is the same as authorization attach a summary, if different provide a description of what differs from original authorization, the authorizing language, and dimensions to give perspective of the change in scope and scale. If there was an authorizing report, state at what level it was approved (i.e., OMB, ASA(CW), HQUSACE). Include date of approval. If no prior reports, give a more detailed description.

Cost Sharing: Describe the cost sharing for the project to be constructed. Describe whether the cost sharing follows general law or if there is other special cost sharing for the project.

Has a NEPA document been completed? If no, coordination through vertical team required. Provide complete description of issues.

Will the NEPA Documentation be more than 5 years old at the time of PCA signing or construction initiation? If yes, coordination through vertical team required. Provide complete description of issues.

Will the ESA Findings be more than 3 years old at the time of PCA signing or construction initiation? [Note: Findings refers to Corps documentation and/or US Fish and Wildlife Service's opinions and recommendations]. If yes, coordination through vertical team required. Provide complete description of issues.

Is ESA coordination complete? If no, coordination through vertical team required. Provide complete description of issues.

If an EIS/EA was completed for the project, has the Record of Decision/Finding of No Significant Impact been signed? If no, coordination through vertical team required. Provide complete description of issues.

Is the proposed project consistent with the ROD/FONSI? If no, coordination through vertical team required. Provide complete description of issues.

| Exhibit G-6. Sensitive Policy Areas Which Require Vertical Team Coordination with MSC/HQUSACE |
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| Have there been any changes in Federal environmental laws or Administration or Corps policy since original project authorization that make updating necessary? [e.g., change to the Clean Air Act status for the project area…going from attainment to non-attainment] If yes, coordination through vertical team required. Provide complete description of issues.<br><br>Is there a mitigation plan for fish and wildlife, flood damage, cultural and historic preservation and/or recreation? If yes to any or all, coordination through vertical team required. Identify and describe what is being mitigated and cost shared. Describe the authority for the cost sharing.<br><br>Are the mitigation plan(s) that are now being proposed the same as the authorized plan? If no, coordination through vertical team required. Provide complete description of issues.<br><br>Is there an incremental analysis/cost effectiveness analysis of the fish and wildlife mitigation features based on an approved method and using an accepted model? If no, coordination through vertical team required. Provide complete description of issues.<br><br>Is it expected that the project's fully funded cost would exceed the cost limit of Section 902 of WRDA 1986? (Note: for hurricane and storm damage reduction projects there are two separate 902 limits, one for initial project construction and one for periodic renourishment.) If yes, coordination through vertical team required. Provide the authorized project cost, price level, and current and fully funded project cost estimates and price levels.<br><br>Does the project involve HTRW clean-up? If yes, coordination through vertical team required. Provide complete description of issues.<br><br>Does the work involve CERCLA covered materials? If yes, coordination through vertical team required. Provide complete description of issues.<br><br>Are the project purposes now being proposed different than the authorized project? (Note: different than specifically noted in authorization or noted in Chief's report and is it measured by project outputs.) If yes, coordination through vertical team required. Provide complete description of issues.<br><br>Are there any proposed scope changes to the authorized project? If yes, coordination through vertical team required. Describe the authority that would enable the project to proceed without additional Congressional modification. |

| Exhibit G-6. Sensitive Policy Areas Which Require Vertical Team Coordination with MSC/HQUSACE |
|---|
| Is Non-Federal work-in-kind included in the project? (Note: Credit to a non-Federal sponsor for work-in-kind must be based upon having an existing authority. Need to identify the authority and if not a general authority such as Sec 215, provide a copy of the authority.) If yes, coordination through vertical team required. Provide complete description of issues.<br><br>Does project have work-in-kind authority? (Note: If there is no existing authority, as determined in conjunction with District Counsel, the only other vehicle is to propose work-in-kind and rationale in the decision document and submit to HQUSACE for specific Congressional authorization.) If no, coordination through vertical team required. Provide complete description of issues.<br><br>Are there multiple credit authorities (e.g., Sec. 104 & 215) including LERRDS, Work-In-Kind and Ability to Pay? (Note: See App. B of ER 1165-2-131. Describe the authority for work-in-kind and if authority exists, the PM should submit a completed App. B through the vertical team.) If yes, coordination through vertical team required. Provide complete description of issues.<br><br>Is an Ability to Pay cost sharing reduction included in the proposed project? If yes, coordination through vertical team required. Fully describe the proposal, citing how this authority is applicable. Include a table showing the cost sharing by project purpose and expected Ability to Pay reductions.<br><br>Is the recommended plan different from the NED plan? If yes, coordination through vertical team required. State whether plan is less costly than NED plan, more costly with the same cost sharing the same as NED plan (exception), more costly with all costs exceeding the cost of the NED plan at 100% non-Federal cost, or if ASA(CW) has already granted an exception.<br><br>Was a standard accepted Corps methodology/model used to calculate NED benefits? If no, coordination through vertical team required. Provide complete description of methodology/model used and issues.<br><br>Are there non-standard benefit categories? [Reference ER 1105-2-100]. If yes, coordination through vertical team required. Provide complete description of non-standard benefit category and procedure/model used to estimate the benefits. |

Exhibit G-6. Sensitive Policy Areas Which Require Vertical Team Coordination with MSC/HQUSACE

NAVIGATION COMPONENT (INLAND OR HARBOR)

For projects with a navigation component, answering yes to any of the following questions will require coordination through the vertical team. A complete description of the issues will need to be provided in each case.

Is there land creation?

Is there a single owner and/or beneficiary which is not a public body? (Public body as defined by Section 221 of WRDA 1970)

For harbor projects, will removals or deep draft utility relocation be necessary?

Are there proposals for Federal cost sharing of Local Service Facilities (e.g., dredging of non-Federal berthing areas) work?

Is there sediment remediation proposed under Sec. 312 authority? (i.e., Section 312 of WRDA 1990 as amended by Section 205 of WRDA 1996)

Is there dredged material placement on beaches where the use is not the least costly environmentally acceptable plan?

Will the dredged material be used for ecosystem restoration where the recommended plan is not the least costly environmentally acceptable plan?

Does the project have recreation navigation benefits?

Does the project involve inland navigation harbor development?

Can the resale or lease of lands used for disposal of excavated material recover the cost of the improvements?

Will acquisition of land outside the navigation servitude be necessary for construction of the improvements (either the project or non-Federal facilities that will use or benefit from the project) and will this permit local entities to control access to the project. (The latter case is assumed to exist where the proposed improvement consists of a new channel cut into lands.)

FLOOD DAMAGE REDUCTION COMPONENT

Exhibit G-6. Sensitive Policy Areas Which Require Vertical Team Coordination with MSC/HQUSACE

For projects with a flood damage reduction component, answering yes to any of the following questions will require coordination through the vertical team. A complete description of the issues will need to be provided in each case.

Is the project for protection of a single property or beneficiary?

Is the project producing land development opportunities/benefits? (If land creation benefits are expected to occur, describe whether special cost sharing should apply.)

Is there any recommendation to cost share any interior drainage facilities?

Are there any windfall benefits that would accrue to the project sponsor or other parties? (If windfall benefits are expected to occur, describe whether special cost sharing should apply.)

Are there non-structural buyout or relocation recommendations? If yes list the authority and describe what is proposed.

Are the reallocation studies likely to change the existing allocated storage in lake projects?

HURRICANE AND STORM DAMAGE REDUCTION COMPONENT

For projects with a hurricane and storm damage reduction component, answering yes to any of the following questions will require coordination through the vertical team required. A complete description of the issues will need to be provided in each case.

Does the project provide for protection of privately owned shores?

Does the project provide for protection of undeveloped lands? Does the project provide for protection of Federally owned shoreline at Federal cost? (If yes, describe what is to be protected and who bears the federal cost

Does the project involve tidal or fluvial flooding, i.e.; is it clear what the project purpose is and has the project been formulated as a hurricane and storm damage reduction or flood damage reduction project?

Exhibit G-6. Sensitive Policy Areas Which Require Vertical Team Coordination with MSC/HQUSACE

Is there any recommendation to cost share any interior drainage facilities?

Is recreation > 50 percent of total project benefits needed to justify the project?

Are there any parking or public access issues (no public access or none provided within ½ mile increments)?

Are easements being provided to ensure public use and access?

Is there a Section 934 of WRDA 86 extension of the period of authorized Federal participation?

Are there any Section 111 of Rivers and Harbors Act of 1958, as amended, proposals?

ECOSYSTEM RESTORATION COMPONENT

For projects with an ecosystem restoration component, answering **no** to any of the following questions will require coordination through the vertical team. A complete description of the issues will need to be provided in each case.

Has the project been formulated using cost effectiveness and incremental analysis techniques?

Was "IWR Plan" used to do cost effectiveness/incremental analysis?

Are all the benefits aquatic?

Has the significance of the habitat been clearly identified? Describe the basis for determining the significance.

Are all the proposed recreation features in accord with ER 1105-2-100, Appendix E, Exhibit E-3?

Has the restoration project been formulated for biological/habitat values as opposed to, for example, water quality?

For projects with an ecosystem restoration component, answering **yes** to any of the following questions will require coordination through the vertical team. A complete description of the

Exhibit G-6. Sensitive Policy Areas Which Require Vertical Team Coordination with MSC/HQUSACE

issues will need to be provided in each case.

Is the project purpose for restoration of cultural or historic resources as opposed to ecosystem restoration?

Is there mitigation authorized or recommended?

Are there recommendations for other than restoring a degraded ecosystem ([e.g., creating new habitat where it has never been)?

Is the project on non-public lands?

Does the project involve land values > 25% of total project cost?

Are there recommendations to include water quality improvements?

Is the monitoring and adaptive management period proposal beyond 5 years after completion of construction?

Does the proposal involve land acquisition in other than fee title?

Are there recommendations for non-native species?

Does the project propose the use of navigation servitude?

RECREATION COMPONENT

For projects with a recreation component, answering yes to any of the following questions will require coordination through the vertical team. A complete description of the issues will need to be provided in each case.

Is the cost of proposed recreation development > 10 % of the Federal project cost without recreation, (except for nonstructural flood damage reduction and hurricane and storm damage projects)? Describe the proposal and whether ASA(CW) approval has been granted.

Does the proposal involve land acquisition in other than fee title?

Are there recreation features located on other than project lands?

| Exhibit G-6. Sensitive Policy Areas Which Require Vertical Team Coordination with MSC/HQUSACE |
|---|
| Does the project involve/provide for waterfront development?<br><br>Does the project involve the need to reallocate authorized storage (Sec III, App E, ER 1105-2-100)?<br><br>Does the project include non-standard recreation facilities? (refer to ER 1105-2-100, Appendix E, Exhibit E-2) |
| WATER SUPPLY COMPONENT<br>For projects with a water supply component, answering yes to any of the following questions will require coordination through the vertical team. A complete description of the issues will need to be provided in each case.<br><br>Does the project use non-standard pricing for reallocated storage?<br><br>Are there exceptions to model contract/agreement language? |

g. Feasibility Report

(1) Content

(a) Feasibility phase procedures and study results shall be documented in a feasibility report. Report requirements are generally the same regardless of whether or not Federal action is recommended. The following requirements are generally applicable to all reports. Requirements for NEPA are in Appendix C.

(b) The report will present the recommended plan and, if applicable, the degree of and rationale for departure from the NED Plan, the NER Plan, or the Combined NED/NER Plan and the sponsor's preference, if none of these are the recommended plan. Should the District Commander find that the NED Plan, the NER Plan or the Combined NED/NER Plan or a justifiable departure is not acceptable to the sponsor, a locally preferred plan may be considered for Federal participation. If there is no acceptable plan, the study should be terminated and guidance obtained from the appropriate RIT.

(c) As required by Section 904 of the WRDA of 1986, the report shall address the

following matters in the formulation and evaluation of alternative plans:

(1) Enhancing national economic development (including benefits to particular regions that are not transfers from other regions);

(2) Protecting and restoring the quality of the total environment;

(3) The well-being of the people of the United States;

(4) The prevention of loss of life; and

(5) The preservation of cultural and historical values.

(d) In accordance with Section 905 of the WRDA of 1986, the report will also describe, with reasonable certainty, the economic, environmental, social, and engineering (including hydrologic and geologic information) benefits and costs of the recommended and alternative plans. A nonstructural alternative to the recommended plan will be described, including Federal and non-Federal participation, when the recommended plan does not have significant non-structural features. The report will also describe the purposes, scope, scale, public acceptability, and Federal and non-Federal participation for the recommended plan. The report will document that the affected states, other non-Federal interests, and Federal agencies have been consulted in the development of the recommended plan. In accordance with the provisions of Section 905 of the WRDA of 1986, benefits to Indian tribes, if any, shall be considered in the analyses and documented in the report.

(e) In accordance with Section 928 of the WRDA of 1986, any report describing a project having recreation benefits will include a brief description of the competing facilities and their existing and expected future use with and without the proposed project. For clarity and ease of understanding a tabular display of the facilities with uses by categories may be desirable. The impact description should distinguish between them and describe the impacts on peak versus average use in the with and without proposed project conditions.

(f) The report will include, for the recommended plan, a discussion of the uncertainty associated with significant cost features and how this uncertainty is expected to be reduced during the future project development.

(g) A preliminary draft PCA is not to be included in the report.

(h) The report shall also include a discussion of PCA responsibilities. The discussion should demonstrate that all parties have a complete understanding of the ultimate requirements for

implementation of the plan. If the non-Federal sponsor is in basic agreement with the appropriate model PCA, so state. If the non-Federal sponsor has requested special conditions different than provisions in the model, and these conditions are agreed to by HQUSACE and ASA(CW) at the IRC or in the subsequent PGM, these conditions should be included in the report along with the reporting officers recommendation. A preliminary financing plan and statement of financial capability are also required to establish implementability as required by the P&G. ER 1165-2-131 contains guidance on the development of PCAs; Appendix D contains guidance on financial plans and statements.

(i) Provisions which address non-Federal responsibilities for hazardous substances in, on, or under project lands and encourage responsible management of hazardous substances by ensuring that Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) costs do not become a cost of constructing, operating, maintaining, repairing, replacing and rehabilitating Federal projects must be included in the report.

(j) For alternatives which include impoundment(s), the report shall address the requirements of Section 1202 of the WRDA of 1986 by including information on the consequences of failure, and geologic or design factors which could contribute to the possible failure of such facility.

(k) An ability to pay analysis shall be included for projects addressing flood control or agricultural water supply as required by Section 103 (m) of the WRDA of 1986 in accordance with ER 1165-2-121 and in the Federal Register (60 FR 5133, January 26, 1995). The 1995 rule maintains the two tests included in ER 1165-2-121 but adds a third test designed to provide a reduction for unusually high non-Federal per capita construction costs.

(l) The text of the report shall contain the major subject matter elements (not necessarily to be used as headings) presented in Exhibit G-7 (Feasibility Report Content).

(a) The report cover shall contain a concise title which shall be the official report title, and indicate: the type of report; whether the report contains an EA or an EIS; whether the report is a draft or final; the name of the District and Division; and the month and year.

(b) A title sheet on the District's letterhead stating the official report title shall be included as the first page inside the front cover.

(c) A syllabus shall be placed immediately after the title sheet when there is an EIS and a project is being recommended for authorization. A sentence shall be included as follows: "The requirements of Section 404(r) of Public Law 92-500, as amended, have been met."

(d) A table of contents including tables, figures, and any appendixes will be placed after

the syllabus.

(e) An EA or EIS will be included.

(f) Appendixes may be used when information must be a part of the report and cannot be relegated to supporting documentation. These appendixes may be bound in a separate volume but are an integral part of the report.

| Exhibit G-7. Feasibility Report Content |
|---|
| |
| 1. Study Authority. Include the full text principle resolution(s) or other authority. |
| 2. Study Purpose and Scope. State whether the report is an interim or final response to study authority. |
| 3. Concise Discussion of Prior Studies, Reports and Existing Water Projects. |
| 4. Plan Formulation. (Include the results of public involvement).<br>a. Assessment of water and related land resources problems and opportunities specific to the study area:<br>1. Existing conditions<br>2. Future without project conditions; and<br>3. Concise statement of specific problems and opportunities<br>b. Planning Constraints<br>c. Alternative plans<br>1. Measures that address identified problems and opportunities<br>2. Reasons for selecting and combining measures to formulate alternative plans that meet identified problems and opportunities<br>3. Screening of alternative plans; and,<br>4. Reformulation of alternative plans, as necessary.<br>d. Presentation and evaluation of final array of alternative plans<br>e. Trade-off analysis<br>f. Selection of the final plan, to include rationale for selection and a discussion of sensitivity analysis and risks and uncertainties. |
| 5. Description of Selected Plan<br>a. Plan components; including mitigation,<br>b. Design and construction considerations,<br>c. LERRD considerations,<br>d. Operation and maintenance considerations,<br>e. Plan accomplishments; and,<br>f. Summary of economic, environmental and other social effects. |
| 6. Plan Implementation<br>a. Institutional requirements; |

| Exhibit G-7. Feasibility Report Content |
|---|
| b. Division of plan responsibilities, cost sharing and other non-Federal responsibilities; and,<br>c. Views of non-Federal sponsor(s) and any other agencies having implementation responsibilities |
| 7. Summary of Coordination, Public Views and Comments |
| 8. Recommendations (including disclaimer). |

(g) Displays, such as maps, graphs, tables, drawings, photographs, and other graphics shall be used to facilitate the presentation of information.

h. Supporting Documentation. The following supporting documentation will be prepared and reproduced separately for technical review of feasibility studies, and shall contain the technical information prescribed by the Division Commander. This documentation is not an integral part of, and shall not duplicate descriptive material contained in the feasibility report or appendixes. However, it shall be provided in a logical readable format.

(1) Engineering design data will be provided to supplement the plan formulation and the plan selection process. The material shall contain, as applicable, a description of the existing and modified hydrology and hydraulics of the detailed plans; geotechnical and other technical data; designs; and the results of geologic investigations pertinent to plan implementation and related public safety. High-volume technical data, such as boring logs, and back-up data for alternatives that were eliminated during plan formulation is not to be included. If any of this work has been contracted out, it shall be so acknowledged.

(2) Description of formulation process showing justification of each separable project element and the scale of the project that maximizes net benefits.

(3) Detailed economic data and any derivations from that data to support plan formulation, forecasts, and detailed explanations of benefits should be provided. Describe the with and without project physical, biological and economic conditions of the study area and how each category of benefits was computed.

(4) Supplemental environmental material required by the applicable environmental protection statutes such as correspondence with other Federal agencies regarding actions taken to comply with the Fish and Wildlife Coordination Act, the Endangered Species Act and The National Historic Preservation Act.

(5) Any other specific subject matter of a complex, voluminous or unique nature necessary to support planning; e.g., cost estimates should be summarized as much as possible. A

few copies of the complete data package should be prepared for interested readers.

(6) The revised and updated Policy Compliance Checklist that was initiated with the 905 (b) report. This list should be a living document that is updated and completed more fully at each stage of the project, including both the draft and final report submittals.

i. Report Recommendations.

(1) When a project is authorized by Congress, the recommendations contained in the feasibility report become the basis for proceeding with the project as a Federal undertaking. Authorizing legislation normally references the "recommendations" of the Chief of Engineers, which are derived from the recommendations of the District Commander. The provisions of the recommendations thus provide a legislative basis that will not change unless modified by Congress through applicable general legislation or by specific legislative action for the particular authorization in question. Accordingly, the wording of recommendations, incorporated by reference in the authorizing act, has the force of law for the project, and therefore requires special attention.

(2) Federal laws and policies applicable to all plans recommended for implementation as a Federal project need not be cited in the recommendations section as a requirement of local cooperation or a requirement of the Federal Government. Exhibit G-8 lists the most commonly applicable laws and policies. In writing report recommendations care must be taken to ensure that a law, or section of law, is not erroneously made applicable to the entire project when in fact it is applicable to only a portion, or particular aspect or purpose of the project.

(3) The recommendation(s) shall be prefaced with an appropriate statement, in the first person, indicating that the District Commander has given consideration to all significant aspects in the overall public interest. Those aspects considered shall include environmental, social, and economic effects; engineering feasibility; and any other elements bearing on the decision.

(4) The recommendation(s), in first-person, active voice, shall contain the following, as applicable:

(a) A clear reference to the plan being recommended for implementation, including appropriate mitigation;

(b) A phrase stating that the plan is being recommended "with such modifications thereof as in the discretion of the Commander, HQUSACE, may be advisable";

(c) A listing of local cooperation requirements, which shall be prefaced by a statement

that the non-Federal sponsors shall, prior to implementation, agree to perform the required items of cooperation.

| Exhibit G-8. Federal Laws and Policies Applicable to all Recommended Plans | |
|---|---|
| **Title of Public Law** | **US CODE** |
| Abandoned Shipwreck Act of 1987 | 43 USC 2101 |
| American Indian Religious Freedom Act | 42 USC 1996 |
| Agriculture and Food Act (Farmland Protection Policy Act) of 1981 | 7 USC 4201 et seq. |
| American Folklife Preservation Act of 1976, As Amended | 20 USC 2101 |
| Anadromous Fish Conservation Act of 1965, As Amended | 16 USC 757 a et seq. |
| Antiquities Act of 1906, As Amended | 16 USC 431 |
| Archeological and Historic Preservation Act of 1974, As Amended | 16 USC 469 |
| Archeological Resources Protection Act of 1979, As Amended | 16 USC 470 |
| Bald Eagle Act of 1972 | 16 USC 668 |
| Buy American Act | 41 USC 102 |
| Civil Rights Act of 1964 (Public Law 88-352) | 6 USC 601 |
| Clean Air Act of 1972, As Amended | 42 USC 7401 et seq. |
| Clean Water Act of 1972, As Amended | 33 USC 1251 et seq. |
| Coastal Barrier Resources Act of 1982 | 16 USC 3501-3510 |
| Coastal Zone Management Act of 1972, As Amended | 16 USC 1451 et seq. |
| Comprehensive Environmental Response, Compensation and Liability Act of 1980 | 42 USC 9601 |
| Conservation of Forest Lands Act of 1960 | 16 USC 580 mn |
| Contract Work Hours | 40 USC 327 |
| Convict Labor | 18 USC 4082 |
| Copeland Anti-Kickback | 40 USC 276c |
| Davis Bacon Act | 40 USC 276 |
| Deepwater Port Act of 1974, As Amended | 33 USC 1501 |
| Emergency Flood Control Funds Act of 1955, As Amended | 33 USC 701m |
| Emergency Wetlands Resources Act | 16 USC 3901-3932 |
| Endangered Species Act of 1973 | 16 USC 1531 |
| Estuary Program Act of 1968 | 16 USC 1221 et seq. |
| Equal Opportunity | 42 USC 2000d |
| Farmland Protection Policy Act | 7 USC 4201 et seq. |
| Federal Environmental Pesticide Act of 1972 | 7 USC 136 et seq. |
| Federal Water Project Recreation Act of 1965, As Amended | 16 USC 4601 |
| Fish and Wildlife Coordination Act of 1958, As Amended | 16 USC 661 |
| Flood Control Act of 1944, As Amended, Section 4 | 16 USC 460b |

| Exhibit G-8. Federal Laws and Policies Applicable to all Recommended Plans | |
|---|---|
| **Title of Public Law** | **US CODE** |
| Food Security Act of 1985 (Swampbuster) | 16 USC 3811 et seq. |
| Hazardous Substance Response Revenue Act of 1980, As Amended | 26 USC 4611 |
| Historic and Archeological Data Preservation | 16 USC 469 |
| Historic Sites Act of 1935 | 16 USC 461 |
| Jones Act | 46 USC 292 |
| Land and Water Conservation Fund Act of 1965 | 46 USC 4601 |
| Magnuson Fishery Conservation and Management Act | 16 USC 1801 |
| Marine Mammal Protection Act of 1972, As Amended | 16 USC 1361 |
| Marine Protection, Research and Sanctuaries Act of 1972 | 33 USC 1401 |
| Migratory Bird Conservation Act of 1928, As Amended | 16 USC 715 |
| Migratory Bird Treaty Act of 1918, As Amended | 16 USC 703 |
| National Environmental Policy Act of 1969, As Amended | 42 USC 4321 et seq. |
| National Historic Preservation Act of 1966, As Amended | 16 USC 470 |
| National Historic Preservation Act Amendments of 1980 | 16 USC 469a |
| Native American Religious Freedom Act of 1978 | 42 USC 1996 |
| Native American Graves Protection and Repatriation Act | 25 USC 3001 |
| Native American Religious Freedom Act of 1978 | 16 USC 469a |
| National Trails System Act | 16 USC 1241 |
| Noise Control Act of 1972, As Amended | 42 USC 4901 et seq. |
| Rehabilitation Act (1973) | 29 USC 794 |
| Reservoir Salvage Act of 1960, As Amended | 16 USC 469 |
| Resource Conservation and Recovery Act of 1976 | 42 USC 6901-6987 |
| River and Harbor Act of 1888, Sect 11 | 33 USC 608 |
| River and Harbor Act of 1899, Sections 9, 10, 13 | 33 USC 401-413 |
| River and Harbor and Flood Control Act of 1962, Section 207 | 16 USC 460 |
| River and Harbor and Flood Control Act of 1970, Sections 122, 209 and 216 | 33 USC 426 et seq. |
| Safe Drinking Water Act of 1974, As Amended | 42 USC 300f |
| Shipping Act | 46 USC 883 |
| Submerged Lands Act of 1953 | 43 USC 1301 et seq. |
| Superfund Amendments and Reauthorization Act of 1986 | 42 USC 9601 |
| Surface Mining Control and Reclamation Act of 1977 | 30 USC 1201-1328 |
| Toxic Substances Control Act of 1976 | 15 USC 2601 |
| Uniform Relocation and Assistance and Real Property Acquisition Policies Act of 1970, As Amended | 43 USC 4601 et seq. |
| Utilization of Small Business | 15 USC 631, 644 |
| Vietnam Veterans | 38 USC 2012 |

| Exhibit G-8. Federal Laws and Policies Applicable to all Recommended Plans | |
|---|---|
| **Title of Public Law** | **US CODE** |
| Water Resources Development Act of 1974, As Amended | 88 Stat 12 |
| Water Resources Development Act of 1976, Section 150 | 90 Stat 2917 |
| Water Resources Development Act of 1986 | 33 USC 2201 et seq. |
| Water Resources Development Act of 1988 | 33 USC 3301 note |
| Water Resources Development Act of 1990 | 33 USC 3301 note |
| Water Resources Development Act of 1992 | 33 USC 3301 note |
| Water Resources Development Act of 1996 | 33 USC 3301 note |
| Watershed Protection and Flood Control Act of 1954, As Amended | 16 USC 1001 et seq. |
| Wild and Scenic Rivers Act of 1968, As Amended | 16 USC 1271 et seq. |
| Wilderness Act | 16 USC 1131 |
| Walsh-Healy | 41 USC 35 et seq. |
| | |
| **Executive Orders** | |
| 11593, Protection and Enhancement of the Cultural Environment, may 13, 1979 | 36 FR 8921; May 15, 1971 |
| 11988, Floodplain Management, May 24, 1977 | 42 FR 26951; May 25, 1977 |
| 11990, Protection of Wetlands | 42 FR 26961; May 25, 1977 |
| 11514, Protection and Enhancement of Environmental Quality, March 5, 1970, as amended by Executive Order 11991, May 24, 1977 | |
| 12088, Federal Compliance with Pollution Control Standards, October 13, 1978 | |
| 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations, February 11, 1994 | |
| | |
| | |
| **Other Federal Policies** | |
| Council on Environmental Quality Memorandum of August 11, 1980: Analysis of Impacts on Prime and Unique Agricultural Lands in Implementing the National Environmental Policy Act | |
| Council on Environmental Quality Memorandum of August 10, 1980: Interagency Consultation to Avoid or Mitigate Adverse Effects on Rivers in the Nationwide Inventory. | |
| Migratory Bird Treaties and other international agreements listed in | |

| Exhibit G-8. Federal Laws and Policies Applicable to all Recommended Plans | |
|---|---|
| **Title of Public Law** | **US CODE** |
| the Endangered Species Act of 1973, as amended, Section 2(a)(4) | |

j. Reporting for Fish and Wildlife.

(1) General. Feasibility reports shall describe specific considerations given to fish and wildlife conservation and other environmental resources during the study. All factors which the reporting officer considered as contributing to the justification of the expenditures recommended for mitigation, conservation and restoration features shall be explicitly described. Specifically, the report shall:

(a) Describe fish and wildlife resource features included in the recommended plan, including the basis for justification, consistent with guidance set forth in this section;

(b) Include appropriate letters and reports furnished by the FWS/NMFS and State agencies;

(c) Describe recommendations furnished by the FWS/NMFS and affected States in compliance with the FWCA and Section 7 of the ESA, discuss specifically how each recommendation was addressed in appropriate alternative plans, and provide reasons for adoption or non-adoption of each recommendation;

(d) Include, as appropriate, provisions for monitoring mitigation features included in the recommended plan;

(e) Describe consideration given to the protection and conservation of wetland resources, including the establishment of wetlands in connection with recommended plans that include the disposal of dredged material, as set forth in ER 1165-2-27;

(f) Include the necessary letters of intent from agencies and non-Federal sponsors participating in fish and wildlife mitigation features; and,

(g) Describe how such features will be operated, managed and funded.

(2) Mitigation. Reports seeking authorization or approval of any water resources development project shall contain either a determination that such project will have negligible adverse impacts on fish and wildlife; or, a recommendation with a specific plan to mitigate fish and wildlife resource losses created by such project.

(3) PCA Environmental Compliance Checklist. The checklist of environmental compliance (in www.hq.usace.army.mil/inet/functions/cw/cecwa/branches/guidance/chklst.htm) contains information which must be addressed in documentation accompanying Project Cooperation Agreements.

k. Disclaimer. Draft and final feasibility reports recommending authorization or implementation funding, accompanying public notice, correspondence which may be disseminated apart from those documents, and HQUSACE endorsements shall all include the following paragraph immediately following each reporting officer's recommendations:

> "The recommendations contained herein reflect the information available at this time and current Departmental policies governing formulation of individual projects. They do not reflect program and budgeting priorities inherent in the formulation of a national Civil Works construction program nor the perspective of higher review levels within the Executive Branch. Consequently, the recommendations may be modified before they are transmitted to the Congress as proposals for authorization and implementation funding." However, prior to transmittal to the Congress, the sponsor, the States, interested Federal agencies, and other parties will be advised of any modifications and will be afforded an opportunity to comment further.

l. Provision of Current Estimates of Project Benefits. Benefit-cost ratio computations, where required in support of funding requests, will be developed based on the benefits in the latest approved detailed economic analysis, annualized at the specified discount rates, if necessary. Appendix D provides the requirements and procedures to update project benefits.

m. Maintenance of Project Justification Documentation. Records documenting the data, conduct, analyses and results of Feasibility studies recommending project authorization, and similar information for any subsequent re-evaluations, shall be maintained in files until either project construction is completed or the project is deauthorized. Documentation will be in sufficient detail to support the basis used to compute benefits and costs.

n. Fact Sheets. The Division Commander shall submit a fact sheet in the Corps of Engineers word processing standard (currently Microsoft WORD) by e-mail to the appropriate RIT when the Division Commander's public notice is issued. The fact sheet format is furnished in Exhibit G-9. A map in electronic format showing the location and the recommended plan of improvement shall be included.

G-10. NEPA Documentation. The documents which must be prepared as documentation of the NEPA process are required at the same time that the feasibility report is prepared. The EA or EIS, as appropriate, may either be a self supporting document combined with and bound within the feasibility report or integrated with the report. The EIS should be integrated with the report

unless complex environmental impacts preclude this alternative. Detailed guidance on the organization and content of the EIS for each of the cases is in Appendix C, 40 CFR Parts 500-1508, and ER 200-2-2. The Division Commander is delegated the authority to determine the most appropriate presentation. This authority may be further delegated to District commanders.

Exhibit G-9. General Investigation Study Fact Sheet

(Date)_____
SUMMARY OF CORPS FEASIBILITY REPORT
(or SUMMARY OF CORPS POST AUTHORIZATION CHANGE REPORT)

1. Name of Report: (Complete Name)
   State(s): Congressional District(s):

2. Type of Report: (Name from budget category and class/interim or final)

3. Location of Study Area: (Brief narrative sentence with reference to nearest city)

4. Authority for Report: (Cite legislation or committee resolutions)

5. Dates of Corps Reports:

   a. Division Engineer's Report/Public Notice or Post Authorization Change Report
   b. Chief of Engineers' Report

6. Problems and Opportunities Identified in Study: (Brief narrative of those stemming from the study authority and those from the planning process and an indication of any recent events or conditions which highlight the problems or opportunities.)

7. Alternative Plans Considered. (Brief narrative description of the final array of alternative plans considered to alleviate the problems and take advantage of the opportunities in the planning area.)

8. Description of Recommended Plan. (Brief narrative in non-technical terms without detailed quantitative data.)

9. Physical Data on Project Features. (Brief description of each significant component and expected performance/outputs from those features.)

10. New Policy Directions Recommended

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11. Views of States, Non-Federal Interest and other Countries. (Discuss views and indicate responses to proposed CoE report and final EIS; give date and type of support from non-Federal interests for recommended cost sharing.)

12. Views of Federal and Regional Agencies. (Discuss any unresolved issues associated with the Reporting Officer's recommendations/proposed CoE report/ Final EIS; as applicable.)

13. Status of NEPA Document:

14. Estimated Implementation Costs: (Month/Year price level)

| Federal (Agency/Purpose) | Cost-sharing |
|---|---|
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| **Non-Federal (State/sponsors)** | |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |

Total_____

15. Desription of Non-Federal Implementation Costs: (Briefly describe the nature of non-Federal costs identified in item 14 and separately list any other significant non-Federal costs identified in the report.)

16. Estimated Annual O&M Costs: (month/year price level)

| Federal (Agency/Purpose) | Cost-sharing |
|---|---|
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| **Non-Federal (State/sponsors)** | |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |

Exhibit G-9. General Investigation Study Fact Sheet

Total_____

17. Description of non-Federal O&M Costs: (Briefly describe the nature of the non-Federal O&M costs.)

18. Estimated Effects:

| Account Effects | Average Annual Equivalent Beneficial Effects ($1000) | Average Annual Equivalent Adverse Effects ($1000) |
|---|---|---|
| NED (include employment and incidental) | _____ | _____ |
| Total | _____ | _____ |

Project economic life: (years)
Benefit-cost ratio: (Current discount rate)
NED plan recommended?: (Yes/No) (If no, describe NED plan and reasons why this plan was not selected.

19. Direct Beneficiaries: (Ientify major direct beneficiaries of the project. Use general terms unless there are definable, limited beneficiaries.)

(Items 20 and 21 are to be completed only if report is a modification of an authorized project, or requires authorization and/or construction of elements not included in the features being recommended.)

20. Relationship to Other Plans: (Brief narrative description of how recommended plan fits into related plans. Include status of other plans, e.g.. not authorized, completed, under construction, preconstruction planning and engineering.)

21. Cumulative Funds Expended to Date on Previous/Related Project(s): (Show Federal and non-Federal expenditures for each project identified.)

22. Current Status of Chief of Engineers Report: (To be completed by HQUSACE)

## SECTION III - Post-Authorization Changes

G-11. Purpose**.** This section provides guidance for making changes to uncompleted authorized projects.

G-12. Definitions**.**

a. Authorized Project. An authorized project means a project specifically authorized by Congress for construction, generally through language in an authorization or appropriation act, or a project authorized pursuant to Section 201, of the Flood Control Act of 1965.

b. Changes in Price Levels. For purposes here changes in price levels are changes in the general level of money prices in the economy, or in sectors of the economy. Changes in price levels may be measured by appropriate price indices, or by observation of changes in particular unit prices, as appropriate.

c. Changes in Scope. Changes in scope are increases or decreases in the outputs for the authorized purposes of a project. Outputs are the projects physical effects which (usually) have associated benefits (hence, project purpose). Change in the degree of reduction in flood stages is a change in a project outputs. It would be a change in scope if it resulted from formulation, or from design changes. Changes in the value of outputs (benefits) resulting from price level changes, or from other purely economic phenomena, are not considered changes in scope.

G-13. Approval Authorities**.**

a. Approval Authority Delegated to Division Commander. Division commanders may approve changes to authorized projects, or elements thereof, if such changes meet all of the criteria listed below. Such changes shall be reported to HQUSACE through the Project Review Board process. Division commanders should submit doubtful or controversial cases to HQUSACE (RIT) for a determination of the proper approval authority, reports, and report processing.

(1) For projects authorized by the WRDA of 1986, and subsequent legislation, an increase in total project cost no greater than increases in price level changes and cost of modifications required by subsequent legislation. For projects authorized prior to the WRDA of 1986, an increase in total baseline project cost estimate no greater than increases in price level changes and the cost of modifications required by subsequent legislation.

(2) Increase or decrease in scope no greater than 20 percent of the scope authorized by Congress. If the scope can be defined by several parameters, (for example, storage capacity, outputs, environmental impacts) and the change in any one parameter exceeds 20 percent, the change must be approved by the Commander USACE.

(3) Change in the location or the design of the project to the extent that the location and magnitude of the impacts of the change are determined to be insignificant compared to the impacts assessed for the authorized project.

(4) Change does not add or delete a project purpose, except deletion of water quality where the benefits attributed to water quality are less than fifteen percent of the total project benefits, pursuant to Section 65, of the WRDA of 1974.

b. Approval Authority Reserved by the Commander USACE. Any change to an authorized, uncompleted project that does not meet all of the criteria listed in paragraph G-13a and which does not require authorization by Congress pursuant to one or more of the criteria in paragraph G-13c shall be approved by the Director of Civil Works, HQUSACE, or specifically delegated by the Director to the Division Commander for approval.

c. Changes Requiring Authorization by Congress. The Chief of Engineers' discretionary authority to approve changes to authorized projects must not be abused. Changes in scope, including reduction in scope, beyond those listed in paragraph G-13a. should serve as an alert that the change may exceed the Chief of Engineers' discretionary authority. After review, the Commander USACE, in consultation with the ASA(CW), will determine whether the change can be made under discretionary authority or whether additional Congressional authorization is required. In addition, the following always require authorization by Congress:

(1) Addition or deletion of a project purpose, unless permitted under existing general authorities as discussed in paragraph G-14.

(2) Where Section 906(b) of WRDA 1986, as amended, is used as the authority to mitigate damages to fish and wildlife resulting from a water resources project:

(a) acquisition of lands, or interests therein, by condemnation for projects on which at least 10 percent of the physical construction of the project was complete as of 17 November 1986; and

(b) acquisition of water, or interests therein, by condemnation.

(3) Change in the local cooperation requirements specifically referenced in the

authorizing language, unless required by:

(a) Subsequent legislation; or,

(b) Addition of a project purpose within the general authority of the Chief of Engineers.

(4) Exceedence of the $10 million Federal cost, exclusive of price level changes, if the project was authorized under Section 201, prior to 22 October 1976; or $15 million Federal cost if authorized under Section 201, as amended by Section 131, of the WRDA of 1976, on or after 22 October 1976.

(5) Deepening of navigation channels.

(6) For projects authorized by WRDA '86 and subsequent authorizations, an increase in total project cost, exclusive of price level changes, of more than twenty percent of the total project cost stated in the authorizing legislation.

G-14. Authority and Procedures for Additional Project Purposes.

a. Water Supply.

(1) Legislative Authority. The Water Supply Act of 1958 allows the addition of water supply as a project purpose without the approval of Congress, if such modification does not seriously affect the purpose for which the project was authorized, surveyed, planned, or constructed, or which would not involve major structural or major operational changes

(2) Procedures for Implementation of Legislative Authority.

(a) The Chief of Engineers, in consultation with the ASA(CW), shall determine whether addition of water supply is within discretionary authority to approve or must be transmitted to Congress for authorization.

(b) A deletion of water supply specifically authorized by Congress as a project purpose requires authorization by Congress. The deletion of water supply added by the Chief of Engineers under the Water Supply Act of 1958 may be approved by the Chief of Engineers prior to the initiation of construction of the project.

b. Water Quality.

(1) Legislative Authorities. There is no general authority available for adding water

quality to an authorized project. Section 65 of the WRDA of 1974, provides a reporting process for the deletion or modification of water storage in reservoir projects for the regulation of stream flow to improve water quality. The provision applies to all authorized projects not funded for construction on the date of enactment of the act (7 March 1974).

(2) Procedures for Deletion or Modification of Reservoir Storage Under the Authority of Section 65. The purpose of Section 65, Public Law 93-251, is to delineate authorities and procedures for modifying projects not funded for construction which included authorized reservoir storage for water quality, when the Administrator, EPA, determines that such storage is no longer required, or is required in a reduced amount. Such determinations are made by the Administrator pursuant to Section 102(b), Public Law 92-500. The provisions of Section 65 are not applicable if the benefits allocated to water quality exceed 25 percent of the total project benefits. In such cases, deletion or modification of water quality storage will require authorization by Congress. Where water quality benefits are equal to or greater than fifteen percent, but less than 25 percent of the total project benefits, deletion or modification of water quality storage requires Congressional approval. ASA(CW) will obtain approval for such recommended changes by resolutions from the Senate Committee on Environment and Public Works, and the House Committee on Public Works and Transportation. If water quality benefits are less than 15 percent of the total project benefits, deletion or modification of water quality storage can be approved by the Division Commander for the Chief of Engineers.

(a) Required Field Coordination. Pursuant to Section 102(b), Public Law 92-500, reports recommending a project with reservoir storage allocated to stream flow regulation for water quality shall be coordinated with the appropriate regional office of EPA prior to submission to HQUSACE. Views of the EPA regional administrator will be included with report submission and be fully considered by the reporting officer in developing recommendations.

(b) Reallocation of Reservoir Storage for Water Quality. When a project is modified to delete or reduce the amount of reservoir storage allocated to water quality, the deleted or reduced amount may be reallocated to other authorized purposes of the project, as appropriate. Reallocation to a new purpose may require Congressional authorization.

(3) Procedures for Deletion or Modification of Reservoir Storage Not Subject to the Authority of Section 65. Completed projects and projects which were funded for construction on or before 7 March 1974, are not subject to the reporting requirements of Section 65 of Public Law 93-251. In these cases, when the Administrator, EPA, pursuant to Public Law 92-500, determines that water quality storage is no longer required, or is required in a reduced amount, the reporting requirements will follow those required by the purpose that will be utilizing the deleted water quality storage space. Should the project modification reducing water quality

storage involve more than one other purpose, a report to Congress under Section 216 or other outstanding study authority might be necessary, depending on whether the modification exceeds the Chief of Engineers' discretionary authority.

c. Recreation

(1) Legislative Authorities.

(a) Public Law 89-72, Federal Water Project Recreation Act, 9 July 1965, as amended.

(b) Section 4, Public Law 534, Flood Control Act of 1944, December 22, 1944, as amended by Section 207 of the River and Harbor and Flood Control Act of 1962, and Section 234 of the River and Harbor and Flood Control Act of 1970.

(c) Section 103(c)(4) and Section 926, WRDA of 1986.

(2) Procedures for Implementation of Legislative Authorities on Lake Projects. The following discussion provides guidance on procedures for processing of changes in recreation or features at lake projects.

(a) Recreation Not Authorized as a Project Purpose.

(1) Where joint costs are not to be allocated such change shall be approved by HQUSACE, in consultation with ASA(CW).

(2) If recreation was not specifically authorized by Congress for the project, and is added to the project, such change will require authorization by Congress if project joint costs are allocated to the added purpose. After initiation of construction, project joint costs are normally not allocated to recreation unless storage is added or reallocated to that purpose. Costs may not be reallocated without authorization by Congress.

(b) Recreation Authorized as a Project Purpose but No Local Assurances Provided at Time of Authorization.

(1) Projects authorized prior to the Federal Water Project Recreation Act-Uniform Policies, but not yet under construction, require cost sharing in accordance with that act, unless authorizing legislation specified other requirements.

(2) If the District Commander is unable to enter into an agreement for recreation prior to initiation of construction, only minimum facilities for public health and safety may be provided

where public use warrants. Provision for such minimum facilities should be included in post-authorization planning documents.

(3) If an agreement is entered into for development of recreation prior to initiation of construction, the scope shall be approved by HQUSACE.

(c) Recreation Authorized as a Project Purpose For Which Local Assurances Were Provided at the Time of Authorization. If the project is unjustified with the level of recreation benefits expected to be realized with provision of only minimum facilities, preconstruction planning should be terminated and HQUSACE notified.

(3) Procedures for Implementation of Legislative Authorities on Non-Lake Projects. The following discussion provides guidance on changes in recreation features at non-lake projects.

(a) Recreation Not Specifically Authorized as a Project Purpose. Division commanders shall process the addition of recreation as a change for HQUSACE approval.

(b) Fish and Wildlife Enhancement Not Specifically Authorized as a Project Purpose. District commanders shall consider the addition of fish and wildlife enhancement as a change for HQUSACE approval.

(c) Recreation or Fish and Wildlife Enhancement Specifically Authorized as Project Purpose. Deletion of recreation or fish and wildlife enhancement as project purposes shall be processed as a change for authorization by Congress if joint costs previously allocated to these purposes are to be reallocated to other purposes.

d. Low-flow Augmentation For Purposes Other Than Water Quality.

(1) Legislative Authority. Section 102(b), Public Law 92-500 Federal Water Pollution Control Act Amendments of 1972, 18 October 1972 (33 U.S.C. 1251).

(2) Procedures for Implementation of Legislative Authority.

(a) Low-flow augmentation storage for purposes other than water quality may be added as a project purpose if determined feasible by the Chief of Engineers. Recommended changes which include the addition of such storage shall be reported and processed in accordance with paragraph G-13.

(b) Reports recommending deletion of water storage for streamflow regulation for

project purposes other than water quality low-flow augmentation shall be processed to Congress for authorization.

e. Provision for Future Hydroelectric Power at Authorized Dams.

(1) Legislative Authority. Section 4 of the Flood Control Act of 1938, Public Law 75-761, as amended.

(2) Procedures for Implementation of Authority. To facilitate later installation of hydroelectric power at projects constructed by the Department of the Army, penstocks and other similar facilities (collectively, "minimum facilities") may be included in the initially constructed projects on the recommendations of the Chief of Engineers and the Federal Energy Regulatory Commission (FERC), and with the approval of the ASA(CW). Recommendations to include the addition of such facilities must be reported to HQUSACE for approval by the ASA(CW). Recommendations shall be coordinated with FERC at the field level, and a report must contain technical, and economic justification, analyses of environmental impacts, and an assessment of anticipated interest accruing on the investment to a projected power-on-line date. The additional costs of minimum facilities will be reimbursed to the Corps of Engineers. Army policy is for these costs to be reimbursed during construction. If future facilities are developed under a FERC license, the costs of minimum facilities will be reimbursed to the Corps of Engineers prior to the start of construction of the future facilities. The costs to be reimbursed shall be the costs incurred by the Federal government for installation of the minimum facilities, with interest.

f. Endangered Species.

(1) Legislative Authority.

(a) Endangered Species Act of 1973, Public Law 93-205, as amended.

(b) Fish and Wildlife Coordination Act of 1958, Public Law 85-624, as amended.

(c) Water Resources Development Act of 1986, Public Law 99-662, Section 906.

(2) Procedures for Implementation of Legislative Authority.

(a) Section 7 of the Endangered Species Act requires the Fish and Wildlife Service or the National Marine Fisheries Service to issue a biological opinion following consultation with the Corps of Engineers. The Chief of Engineers is authorized to acquire lands for the preservation and conservation of habitat for endangered and threatened species using the project

land acquisition authorities. The Act (Section 7(b)) states that Federal agencies shall not make any irreversible or irretrievable commitments of resources to the project which has the effect of foreclosing the formulation or implementation of any reasonable and prudent alternative measures defined in the biological opinion.

(b) The scope and extent of the land requirement will influence the decision of whether land acquisition for endangered and threatened species requires approval by ASA(CW).

(c) Factors to be considered are:

(1) Status of project.

(2) Amount of land required by the terms of the biological opinion.

(3) Authorization, acquisition, habitat comparability, and status of land that may be authorized for fish and wildlife mitigation.

(4) Completion of biological opinion features required by the Endangered Species Act.

(5) Alternatives.

(d) All cases involving land acquisition for endangered and threatened species will be coordinated early with HQUSACE and approved by the Chief of Engineers.

(e) Project modifications, exclusive of land acquisition, will be considered under the general guidance for changes.

g. Fish and Wildlife Mitigation.

(1) Legislative Authority. Section 906(b), Public Law 99-662, the Water Resources Development Act of 1986, 17 November 1986.

(2) Procedures for Implementation of Legislative Authority.

(a) After consultation with appropriate agencies, the Secretary is authorized to mitigate damages to fish and wildlife resulting from any water resources project under his jurisdiction. Mitigation may include acquisition of lands, except that acquisition may not be by condemnation in the case of projects completed or at least 10 percent completed on 17 November 1986. Further, acquisition of water, or interests therein, cannot be by condemnation under this authority.

(b) This authority does not apply to measures that cost more than $7,500,000 or 10 percent of the project cost, whichever is greater. No more than $30,000,000 may be obligated in any year under this authority.

(c) Costs for implementation and operation, maintenance, and rehabilitation for mitigation measures will be allocated among authorized project purposes and will be cost shared accordingly.

(d) Mitigation which requires condemnation of land for projects at least ten percent complete as of 17 November, 1986, or condemnation of water rights requires Congressional authorization.

h. Applicability of FWCA and ESA to Postauthorization Activities.

(1) FWCA Applicability. The FWCA applies to postauthorization activities if the activity meets the threshold test outlined in Section 2(a) of the FWCA, i.e., the authorized plan is modified or supplemented, and these changes relate to Federal construction which would divert, modify, impound, or otherwise control a waterway.

(2) Section 2(b) Report and Section 2(e) Funding. Sections 2(b) and (e) of the FWCA normally apply during post-authorization activities for Federal projects where the Section 2(a) threshold test has been met.

(a) Mandatory Compliance. Section 2(b) of the FWCA is mandatory when changes to the authorized plan meets the Section 2(a) threshold test and the proposed changes to the authorized plan or project require a report to Congress, or the approval of the Chief of Engineers, or above.

(b) Discretionary Compliance. In all other instances where Section 2(a) applies, compliance with Section 2(b) requirements would be discretionary. However, it is Corps policy to fund the FWS for it's FWCA Section 2(b) activities associated with Corps studies and projects, consistent with procedures set forth in the 1980 Transfer Funding Agreement, as amended effective 21 September 1982. The following criteria are considered appropriate for District commanders to use for determining when Section 2(b) and (e) of the FWCA applies to postauthorization project activities. First, the proposed activity must meet the Section 2(a) threshold test. Second, a project document must be under preparation that requires approval by at least the Division Commander, or above, and any of the following factors exist:

(1) The acknowledgment by the Corps in the feasibility report, or accompanying NEPA

document, that sufficient uncertainty exists concerning impacts the recommended plan could have on fish or wildlife resources to warrant further investigations and analysis during postauthorization planning, engineering and design activities;

(2) Modification or supplementation of the authorized plans require the development of a supplement to the FEIS;

(3) New information or factors are identified during postauthorization project activities that appreciably change the extent to which the authorized project would or could impact upon fish and wildlife resources beyond what was documented in the feasibility report;

(4) The authorized project contains major fish and wildlife mitigation or enhancement features, and the further planning, siting, designing and construction of such features would benefit from involving the FWS, NMFS or State resources agencies in these activities; or,

(5) District and Division professional staff determine that continued involvement of the FWS, NMFS or State resources agencies during postauthorization project activities would better assure public and agency acceptance of the water resources development project, including authorized fish and wildlife features included in the project.

(6) The new or supplemented Section 2(b) report, planning aid letter, etc., shall accompany the project document throughout the decision-making process.

(4) ESA Applicability. Section 7 of the ESA is applicable for any project, or unit thereof, regardless of when the project was authorized or completed.

G-15. Authorized Maximum Cost of Projects.

a. Determining the Section 902 Limit.

(1) The maximum project cost limit imposed by Section 902 is a numerical value specified by law which must be computed in a legally supportable manner. It is not an estimate of the current cost of the project. The limit on project cost must be computed including an allowance for inflation through the construction period. This limit will then be compared to the current project estimate including inflation through the construction period. For beach nourishment projects authorized with an initial cost and a cost for future nourishment, there are two limits. There is a limit on initial construction the same as other projects, and a limit on total cumulative cost of nourishment.

(2) The authorized cost may be increased from the price level in the authorizing

document to include inflation. The construction component of the authorized cost will be updated to account for historical inflation using the Civil Works Construction Cost Index System (EM 1110-2-1304). The real estate component of the authorized cost will be updated to account for historical inflation based on changes to the Consumer Price Index, specifically, the unadjusted percentage changes reflected under the "Rent, residential" expenditure category.

(3) The maximum project cost includes the authorized cost (adjusted for inflation), the current cost of any studies, modifications, and action authorized by WRDA '86 or any later law, and 20 percent of the authorized cost (without adjustment for inflation). The cost of modifications required by law is to be kept separate and added to the other allowable costs. These three components equal the maximum project cost allowed by Section 902.

(4) Exhibit G-10 provides a detailed discussion of the method used to compute the maximum project cost allowed by Section 902. The method outlined in Exhibit G-10 for escalating the authorized cost to current price levels is based on the currently estimated project schedule which includes actual obligations to date. The Project Cost Fact Sheet in Exhibit G-11 should be used to display the Section 902 maximum cost limit and to compare the current project cost estimate to the maximum project cost limit. For projects involving beach nourishment, there are two limits. A maximum cost for the first placement, as well as a maximum cost for future nourishment will be computed following the procedure in Exhibit G-10.

b. Procedures When Cost Exceeds Limit. Upon determination that project cost estimates will exceed the maximum cost limitation, as determined in accordance with Exhibit G-10, work on the phase of the project underway at that time should continue until notification otherwise by HQUSACE, unless continuation of work will result in obligation of funds exceeding the authorized limitation. The determination of when to continue work on the project will be based generally on the criteria given in the matrix in Exhibit G-10. In general, work may continue on a separable element or a single contract if that unit of work will not incur obligations over the legal limitation. The intent will be to honor current PCA's and current contracts where possible. The computation sheets and the Project Cost Increase Fact Sheet will be submitted within 30 days after it is determined that the project cost exceeds the cost limit. When a firm estimate of the cost to complete the project is available, a report will be prepared and submitted.

| Exhibit G-10. Maximum Cost of Projects |
| --- |
| Background.<br>Section 902 allows for increases due to modifications which do not materially alter the scope or function of a project. Project modifications may encompass further engineering and design refinements to project features that are identified in project authorizing documents, as |

Exhibit G-10. Maximum Cost of Projects

well as the construction of new project features that are not identified in authorizing documents. In most instances further engineering and design refinements will be necessary to construct project features that are only generally described in authorizing documents. In such cases the maximum cost of the project can be increased by up to 20 percent to pursue the engineering and design refinements. However, in those instances where no further engineering and design refinements are necessary to construct the improvements in the authorizing documents, the amount specified in the authorizing legislation will be the maximum cost of the project, except for other cost adjustments appropriate under the law.

The total project cost is the cost of all work associated with preconstruction engineering and design and construction, including real estate and appropriate credit provisions of Section 104 of the WRDA of 1986 and Section 215 of Public Law 90-483. The cost of the entire project as authorized will be the cost used for comparison. If, subsequent to authorization, it is determined that a separable increment of the project is no longer desired and will not be built, the cost of that separable element should be included as a part of the project cost when computing the maximum cost. If the authorization is for a modification to a project authorized prior to the WRDA of 1986, only the cost of the identified modification is subject to the limitation of Section 902.

Cost Increase Indexes. The construction component of the authorized cost will be updated to account for historical inflation using the Civil Works Construction Cost Index System (CWCCIS) in EM 1110-2-1304. The appropriate state index or average of two state indexes may be used. The same index method must be used for all subsequent adjustments to the authorized cost. The real estate component of the authorized cost will be updated to account for historical inflation based on changes to the Consumer Price Index as published monthly by the U.S. Department of Labor, Bureau of Labor Statistics, (BLS). Specifically, the unadjusted percentage changes reflected under the "Rent, residential" expenditure category from the tables containing the Consumer Price Index for All Urban Consumers: U.S. city average, will be used. For projects located in the metropolitan areas specifically identified in Table 17 of the BLS publication (Consumer Price Index for All Urban Consumers: Selected Areas), the percentage change reflected under the "Rent, residential" category will be the appropriate index. It is also permissible to use the index in Table 17 for a project proximate to, but not located in, a specifically identified area if, due to tangible market influences, it is more reasonable to do so. However, once a table is selected, it must be used for all subsequent adjustments to the authorized cost. Tables G-1 and G-2 provide worksheets for computing the historic cost increase indexes for both construction and real estate components of the authorized cost. Entries are needed from the date of the authorized cost to the current date. These tables will be added to each year as the current date becomes available. Use actual indexes from the referenced publications.

Project Cost Increase Computation. The steps to compute the maximum project cost are

Exhibit G-10. Maximum Cost of Projects

outlined below. The computation starts with the creation of a tabulation as in Table G-3. The table needs vertical columns for years starting with the year of the authorized estimate and continuing through the current year.

Maximum Cost Including Inflation Through Construction. Table G-4 would contain the computation of the maximum project cost, including inflation through the construction period.

Project Cost Limits for Beach Nourishment Projects. For all new project authorizations which include periodic nourishment as a part of project construction, the authorized cost will be given as an initial total cost, and an average annual cost for periodic beach nourishment over the life of the project. Projects thus authorized would be subject to two cost limits in accordance with Section 902. Projects authorized in P.L. 99-662 and in P.L. 100-676 are authorized at a single total cost. This cost, in most cases, includes an initial construction cost and the present worth of the cost of future nourishment. The present worth was computed at the appropriate Federal discount rate over a 50-year project life. For these projects, the cost number in the authorizing document will have to be examined to determine the amount which is for initial construction and the amount which is the present worth of future nourishment. These will then be used to compute two Section 902 limits.

1. The project first cost would be limited to the initial cost increased as allowable under Section 902. This would be a one time cost limitation like any other project, computed as discussed in the preceding paragraphs.
2. Total periodic nourishment cost would be limited by the total amount estimated for future nourishment, increased as allowable in accordance with this Appendix. The present worth amount for nourishment needs to be converted to a total cost over the life of the project. In general, the present worth computation is based on an average annual cost, which in turn is based on the estimated cost of each nourishment event divided by the years anticipated between events. The average annual cost (at the appropriate price level: Oct 97 or Oct 99) is to be multiplied by the years of project life. This cost is then used as the authorized cost of beach nourishment. It is the total cost to use in column f of Table G-3. In Table G-3, the current project cost would be the cost to date in the year it was expended, plus a current estimate of the nourishment required for the remainder of the project, at current price levels. The Section 902 limit would be computed using the procedure in the preceding paragraphs. The actual cost of each nourishment would be treated as a cost in the year in which it occurs. In this way, a cumulative record would be kept, and it would be readily apparent when total cost reaches the limit.

Project Cost Increase Fact Sheet. The Project Cost Increase Fact Sheet is a comparison of the project cost to the maximum project cost as limited by Section 902. The information in line 3 is from the computations described in the preceding paragraphs. The number in line 3e is the

Exhibit G-10. Maximum Cost of Projects

same as line 4 of Table G-4. Line 4 is the current total project cost estimate and must include all separable elements. This is the same as line 1b of Table G-4. It includes engineering and design, construction, supervision and administration, contract dispute settlements or awards, value of lands, easements and rights-of-way, utility and facility relocations, and dredged material disposal areas provided by the sponsor. This cost does not include costs for betterments, operation, repair, maintenance, replacement or rehabilitation. The current cost estimate may be the result of engineering and design studies, preparation of plans and specifications, or further adjustments to the project cost.

The Section 902 cost limit has been exceeded of the current estimate on line 4 exceeds the limit as shown on line 3e. The computation on line 5 allows a determination of the percentage of the current estimate increase over the authorized cost.

Cost Limitation Action Matrix. The matrix in Table G-5 will be used as a guide for determining what actions may be undertaken while waiting for new authorization for a project when the cost estimate exceeds the limit. The intent is to honor current PCAs and contracts to the extent possible.

Table G-1. CWCCIS Index(s)

| | | | | | | Total Allowed Inflation (g) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | *Yearly Inflat* | *Cumulative Inflation* | *Cumulative Rate to* | | *One Half Rate of Infl* | | *Total Allowed Inflation* | |
| | | *Index* | *Rate* | *Rate* | | *Begin FY* | | *for FY* | | *for FY* | |
| | *(b)* | *(c)* | *(d)* | *(e)* | *(f)* | *(h)* | | *(I)* | | *(j)* | |
| *Date of Price Level, Authorized Estimate:* | | | | | | | | | | | |
| *First Fiscal Year:* | | _____ | _____ | | | _____ | *x* | _____ | = | | |
| *1st Quarter, 2nd Yr:* | _____ | | | | | | | | | | |
| *Second Fiscal Year:* | | _____ | _____ | | | _____ | *x* | _____ | = | | |
| *1st Quarter, 3rd Yr:* | _____ | | | | | | | | | | |
| *Third Fiscal Year:* | | _____ | _____ | | | _____ | *x* | _____ | = | | |
| *1st Quarter, 4th Yr:* | _____ | | | | | | | | | | |
| *Fourth Fiscal Year:* | | _____ | _____ | | | _____ | *x* | _____ | = | | |
| *1st Quarter, 5th Yr:* | _____ | | | | | | | | | | |
| *Fifth Year:* | | | _____ | | _____ | | | _____ | *x* | _____ | = |

Notes:

b. Enter the date of the authorized cost and the beginning date of following fiscal years.
c. These entries are the fiscal years.

d. These are the index numbers from the referenced publications and must all be expressed with the same base year (base year price

equals 100).
e. This column equals the index at the beginning of the next year, divided by the index at the beginning of the year, minus one.
f. The cumulative inflation rate equals the index (column (d)) at the beginning of the year divided by the index of the first line of the table.
g. The allowed inflation rates equal the cumulative rate through the beginning of the FY (equals one for the first FY after project authorization) times one plus 1/2 of the rate of inflation for the FY. For the remaining balance, it equals the cumulative rate to the beginning of the next fiscal year.
h. These are the cumulative rates through the beginning of the FY. They are the amounts in column (f) one-half line above.
i. This is one plus 1/2 the rate of inflation during the fiscal year, 1+1/2x column (e).
j. The total inflation is the product of the last two entries.
k. The inflation rate for the remaining balance is the last entry in column (f).

Table G- 2 CPI Index(s)

| | | | | | | Total Allowed Inflation (g) | | |
|---|---|---|---|---|---|---|---|---|
| | (b) | (c) | Index (d) | Yearly Inflat Rate (e) | Cumulative Inflation Rate (f) | Cumulative Inflation Begin FY (h) | One Half Rate of Infla For FY (I) | Total Allowed Inflation For FY (j) |
| *Date of Price Level, Authorized Estimate:* | _____ | | _____ | | | | | |
| *First Fiscal Year:* | | _____ | | _____ | | _____ X | _____ = | |
| *1st Quarter, 2nd Yr:* | _____ | | _____ | | | | | |
| *Second Fiscal Year:* | | _____ | | _____ | | _____ X | _____ = | |
| *1st Quarter, 3rd Yr:* | _____ | | _____ | | | | | |
| *Third Fiscal Year:* | | _____ | | _____ | | _____ X | _____ = | |
| *1st Quarter, 4th Yr:* | _____ | | _____ | | | | | |
| *Fourth Fiscal Year:* | | _____ | | _____ | | _____ X | _____ = | |
| *1st Quarter, 5th Yr:* | _____ | | _____ | | | | | |
| *Fifth Year:* | | _____ | | _____ | | _____ X | _____ = | |

Notes:

b. Enter the date of the authorized cost and the beginning date of following fiscal years.
e. These entries are the fiscal years.
f. These are the index numbers from the referenced publications and must all be expressed with the same base year (base year price equals 100).
e. This column equals the index at the beginning of the next year, divided by the index at the beginning of the year, minus one.
f. The cumulative inflation rate equals the index (column (d)) at the beginning of the year divided by the index of the first line of the table.
g. The allowed inflation rates equal the cumulative rate through the beginning of the FY (equals one for the first FY after project authorization) times one plus 1/2 of the rate of inflation for the FY. For the remaining balance, it equals the cumulative rate to the beginning of the next fiscal year.
h. These are the cumulative rates through the beginning of the FY. They are the amounts in column (f) one-half line above.
i. This is one plus 1/2 the rate of inflation during the fiscal year, 1+1/2x column (e).
j. The total inflation is the product of the last two entries.
k. The inflation rate for the remaining balance is the last entry in column (f).

Table G- 3 Authorized Cost Increase Computation

| *FY* | *Current Project Cost (Price Level)* | | | *Current Schedule (%)* | | *Authorized Cost Schedule* | | *Auth. Cost Inflat.* | |
|---|---|---|---|---|---|---|---|---|---|
| | *Total* (a) | *Constr.* (b) | *R.E.* (c) | *Constr.* (d) | *R.E.* (e) | *Constr.* (f) | *R.E.* (g) | *Constr.* (h) | *R.E.* (I) |
| *99* | | | | | | | | | |
| *00* | | | | | | | | | |
| *01* | | | | | | | | | |
| *02* | | | | | | | | | |
| *03* | | | | | | | | | |
| *Balance to Complete* | | | | | | | | | |
| *Total* | | | | *100%* | *100%* | | | | |

*Notes:*

*a. The total of column (a) is the current working estimate of project cost at the current price level, less the cost of any modifications*

*required by law. The entries for all years from authorization to the current year are the actual obligations made that year. The balance to complete is the remaining cost at current price levels.*
*b. Column (b) is the construction component of the cost in column (a).*
*c. Column (c) is the real estate component of column (a). Column (b) plus column (c) must equal column (a).*
*d. Column (d) is the percent distribution of the construction cost in column (b). It must total 100 percent.*
*e. Column (e) is the percent distribution of the real estate cost in column (c). It must total 100 percent.*
*f. The total of column (f) is the construction component of the authorized cost, from the authorizing legislation. The yearly entries are the distribution of the total by the percentage distributions in column (d).*
*g. The total of column (g) is the real estate component of the authorized cost. The yearly entries are the distribution of the total by the percentage distributions in column (e). The total of column (f) and the total of column (g) must equal the cost in the authorizing legislation.*
*h. The entries in column (h) are the amounts in column (f) increased by the appropriate inflation factor which is derived from the Corps of Engineers CWCCIS index. Table G-1 would contain a computation of appropriate construction inflation factors .*
*i. The entries in column (i) are the amounts in column (g) increased by the appropriate real estate inflation factor, which is derived from the CPI index. Table G-2 would contain a computation of the appropriate real estate inflation factors.*

Table G- 4 Maximum Cost Including Inflation Through Construction

*Line 1:*

*a. Current project estimate at current price levels:*

*b. Current project cost estimate, inflated through construction:*

*c. Ratio: Line 1b / Line 1a*

*d. Authorized cost at current price levels:*
*Columns (h) plus (I) from Table G-8.3*

*e. Authorized cost, inflated through construction:*
*Line c x Line d*

*Line 2: Cost of modifications required by law:*

*Line 3: 20 percent of authorized cost:*
*.20 x (Table G-8.3, Columns (f) + (g))*

*Line 4: Maximum cost limited by Section 902:*
*Line 1e + Line 2 + Line 3*

*Notes:*
*a. Line 1a is the current project cost estimate.*

*b. Line 1b requires the current project cost estimate including inflation through the construction period. This is required each year by the annual budget guidance EC. This cost estimate will be developed by the appropriate cost engineering element. The ratio of this inflated project estimate to the current project estimate is used to inflate the totals of column (h) and (i) from Table G-1 to determine the authorized cost including inflation through the construction period.*
*c. Line 1c is the ratio of the current estimate including inflation through construction to the current estimate.*
*d. Line 1d is the authorized cost at current prices. It is the total of columns (h) and (i) from Table G-1.*
*e. Line 1e is the authorized cost including inflation through construction. It is computed as the authorized cost at current price levels times the ratio on line 1c.*
*f. Line 2 is the cost of any modifications required by law. This is the total cost and includes actual obligations and future obligations including inflation through construction.*
*g. Line 3 is 20 percent of the cost specified in the authorizing legislation. The authorized cost is the total of columns (f) and (g) in Table G-8.1.*
*h. Line 4 is the maximum project cost, including inflation through the construction period, allowed by Section 902. It is the total of lines 1e, 2, and 3.*

Exhibit G-11. Project Cost Increase Fact Sheet

*1. Name of Project*
*2. Section and Law That Authorized or Modified the Project:*
*3. Section 902 Limit on Project Cost:*
- *a. Authorized project cost:(W/Price level)*
- *b. Price level increases from date of authorized cost: **
- *c. Current cost of modifications required by law: ***
- *d. 20% of line 3a:*
- *e. Maximum project cost limited by Section 902:*

*4. Current Project Cost Including Inflation Through Construction: ****
*5. Computation of Percentage Increase:*
- *a. Current estimate: (Line 4)*
- *b. Less total of lines 3a, b, and c:*
- *c. Subtotal:*
- *d. Percent increase: (line 5c/3a)*

*6. Explain cost indexes used in 3b; whether national or regional for real estate, and single state or two state average for construction.*
*7. Explain increases in 3c; Legislation requiring the modification, and how accommodated.*
*8. Explain reasons for cost changes other than inflation.*
*9. Explain any changes in benefits and provide current BCR.*
*10. Provide detailed explanation of the status of the project.*

* *Line 1e from Table G-4, less the authorized cost.*

** *This includes cost of external credit under Section 104 of WRDA `86, for example. (Integral Section 104 credit is included in the authorized project cost on line 3a.) (See ER 1165-2-29).*

*** *Line 1b from Table G-4.*

Table G- 5 Section 902 Cost Limitation Action Matrix

*IMPLEMENTATION STATUS AT TIME ESTIMATED TOTAL COSTS EXCEED SEC 902 LIMIT*

| | *PRIOR TO EXECUTION OF THE PCA* | *PCA EXECUTED, BUT NO CONTRACTS AWARDED* | *ONE OR MORE CONTRACTS AWARDED, FUTURE CONTRACTS/FUTURE PCA's* | *UNDER CONSTRUCTION LAST CONTRACT* |
|---|---|---|---|---|
| *1. PROJECTS THAT HAVE ONE PCA, AND ONE CONTRACT* | *1/* | *1/* | *N.A.* | *3/* |
| *2. PROJECTS THAT HAVE ONE PCA, AND MULTIPLE CONTRACTS* | *1/* | *1/* | *2/* | *3/* |
| *3. PROJECTS THAT HAVE MULTIPLE PCAs AND MULTIPLE CONTRACTS* | *1/* | *1/* | *2/* | *3/* |

*1. Await new legislation before proceeding with executing the PCA or award of the first contract if a PCA has already been approved.*
*2. Continue implementation of the project until implementation of the next PCA increment (or award of the next contract when the last PCA increment is already under construction) would require funds in excess of the 902 limit. Submit legislation to permit the authorization committees to consider inclusion of the legislative proposal in a biennial WRDA in time to prevent a break in project implementation whenever possible.*
*3. If completion of the current contract(s) would require funds in excess of the 902 limit, conclude current contract activities in the most practical and cost effective manner consistent with public safety and to minimize any obligations that exceed the 902 limit.*

G-16. Processing Changes**.**

a. Post Authorization Change (PAC) Reports. Changes where an authority determination must be made by the Commander USACE, and changes where cost increases exceed the limit established by Section 902 of the WRDA of 1986, will be documented in a General Reevaluation Report, a Limited Reevaluation Report or an Engineering Documentation Report and submitted to HQUSACE (RIT). These reports will support the PCA and will be subsequently referred to as PAC reports. The PAC reports format below is a guide; the PAC reports will be reviewed by the RIT as a feasibility report seeking authorization. The reports will be reviewed by the ASA(CW) and coordinated with OMB as appropriate for submission to the Congress.

(1) Description of Authorized Project. Describe the authorized project, its location, functions, size, land requirements and local cooperation requirements.

(2) Authorization. Identify the authorization Act: section, public law, title, date and statute citation. Identify the House or Senate document number of the project document referenced in the authorization act.

(3) Funding Since Authorization. Provide a funding history, by fiscal year, indicating the category in which funds have been appropriated.

(4) Changes in Scope of Authorized Project. Give a description and rationale of any changes in project scope, using a subparagraph for each. Use tables for comparing authorized numbers with recommended numbers; and indicate percentage of change.

(5) Changes in Project Purpose. Describe and explain reasons for any changes in purposes from those authorized for the project.

(6) Changes in Local Cooperation Requirements. State and explain the reasons for any changes in the local cooperation requirements. Changes include any modification of the wording used in the recommendation language adopted by Congress in the authorization act, or in subsequent legislation applicable to the project, as may be modified by general legislation.

(7) Change in Location of Project. Briefly describe any changes in location of the project, or project elements, including the reasons for the changes. When the change in location requires additional land or change in estate to be acquired, the requirement should be addressed.

(8) Design Changes. Describe design changes and the reasons for the changes.

(9) Changes in Total Project First Costs. Provide a table showing a four column comparison of the estimated cost for the project being recommended, the project as authorized by Congress, the authorized project updated to current price levels, and the project last presented to Congress. In subparagraphs, itemize the reasons for the cost changes so that 100 percent of the cost increase since authorization is explained. Minor changes may be lumped in the table and in the narrative. The total increase due to changes in price levels may be shown under one subparagraph.

(10) Changes in Project Benefits. Provide a table showing a comparison of the benefits given in the project document, the benefits last reported to Congress, and the benefits based on reevaluations which have been done to support the recommended changes to the project. Summarize each type of benefit in a subparagraph, stating any changes in criteria or other factors such as use of current interest rate which resulted in significant changes in the benefit estimates. State the increase in benefits attributed to price level increases.

(11) Benefit-Cost Ratio. State the BCR for the recommended project and the authorized project at current price levels and the current interest rate. Also state the interest rate used in the authorizing document.

(12) Changes in Cost Allocation. Provide a table showing the allocation of cost among the project purposes for the authorized project and the recommended project. Give both the dollar amounts and percentages allocated to each purpose. Discuss any changes which are not the result of simply recomputing the cost allocation based on current benefit and cost estimates.

(13) Changes in Cost Apportionment. Provide a table showing the Federal and non-Federal costs of the authorized project and the recommended project, both at current price levels. Indicate Federal appropriations requirements and reimbursable costs.

(14) Environmental Considerations in Recommended Changes. Discuss any environmental effects of the recommended changes. State whether the EIS currently on file was determined to be adequate. Appropriate NEPA documentation will be included in the PAC or accompanying report.

(15) Public Involvement. Describe the public involvement and coordination effected in formulating the recommended changes to the project and discuss the impact of these activities on the recommendations.

(16) History of Project. Provide a history of the project since authorization including other studies accomplished, directions from Appropriations Committees, any litigation, relationship of project to basin plans and other pertinent information not found elsewhere in the report.

b. Reporting Changes in PB-3s and Justification Sheets. Changes in costs shall be reflected in PB-3s (Project Cost Estimates) and Budget Justification Sheets as soon as they have the concurrence of the Division Commander. New estimates of benefits, costs and project scope shall be footnoted until approved. For changes requiring authorization by Congress, the Budget Justification Sheets will also include information on the change in the "other information" paragraph. See the annual Budget EC for instructions on preparation of these documents.

G-17. Interest Rates for Changes. Interest rates used in formulating project changes through incremental analysis are as follows:

a. General Reevaluation Studies. For general reevaluation studies, use the current interest rate.

b. Limited Reevaluation Studies. For limited reevaluation studies, use the current interest rate.

c. Addition of mitigation. For the addition of mitigation, use of the rate applicable to the authorized project is permissible.

## SECTION IV - Study and Project Deauthorization

G-18. Purpose**.** This section provides guidance for the implementation of Section 710, Water Resources Development Act of 1986 (WRDA of 1986) (study deauthorization), Section 1001, WRDA of 1986 (project deauthorization) and Section 52, WRDA of 1988 (project deauthorization).

G-19. Study Deauthorization

a. Annual Submission. Section 710, WRDA of 1986 requires an annual submission to Congress of a list of authorized but incomplete water resources studies which have not had funds appropriated during the preceding five full fiscal years.

b. Approved Study Data Base. Each Division shall submit electronically to HQUSACE (CECW-I) the consolidated Division approved study database by 15 November each year. The database should be updated through September 30 of the current year.

c. HQUSACE Responsibilities. The RITs will review the overall Division lists (which include all studies), prepare a list of those that meet the criteria for submission to Congress, and submit the list to ASA(CW) for submission to Congress. Following the submission to Congress a copy of the list will be provided to each Division.

d. Appropriate Funds. The list is not a recommendation for deauthorization, but rather a list of studies meeting the legal criteria for deauthorization. Congress has 90 days, after the submission, to appropriate funds for the studies on the list. Studies that are not funded during the 90-day period are no longer authorized.

G-20. Project Deauthorization**.** Section 1001 of the WRDA of 1986, as amended, provides for the deauthorization of water resources projects on which Federal funds for planning, design or construction have not been obligated for 7 fiscal years. Every two years, the Secretary of the Army is required to submit to Congress a list of projects that meet this eligibility criteria. Affected congressional delegations must be notified of the projects in their districts or states. The projects remain on the list for 30 months, after which they are automatically deauthorized if Federal funds have not been obligated during the 30-month period. Section 1001(c) requires publication of the lists of deauthorized projects in the Federal Register. The project deauthorization process is managed at HQUSACE by CECW-I and that office should be contacted for further information.

## SECTION V - Flood Plain Management Services (FPMS)

G-21. The FPMS Program. The FPMS Program is authorized by Section 206 of the Flood Control Act of 1960.

G-22. Flood Plain Management Services. Flood plain management services cover the full range of information, technical services, and planning guidance and assistance on floods and flood plain issues within the broad umbrella of Flood Plain Management (FPM). They include:

a. General Technical Services. Flood and flood plain data are obtained and developed and interpreted.

b. General Planning Guidance. On a broader scale, assistance and guidance in the form of "Special Studies" are provided on all aspects of FPM planning, including the possible impacts of off-flood plain use changes on the physical, socioeconomic and environmental conditions of the flood plain.

c. Guides, Pamphlets and Supporting Studies.

(1) They are disseminated to states, local governments, Federal agencies, and private citizens to convey the nature of flood hazards and to foster public understanding of options for dealing with flood hazards.

(2) Supporting studies are conducted to improve methods and procedures for flood damage prevention, reduction, and abatement. Studies can also be undertaken to illustrate alternative ways of achieving FPM goals.

G-23. National Flood Insurance Program (NFIP) Support. The NFIP is administered by the Federal Emergency Management Agency (FEMA). The Corps provides technical support to the NFIP on a reimbursable basis.

a. Technical assistance and other support are provided for three components of the NFIP: the Flood Insurance Study (FIS) effort, the Limited Map Maintenance Program (LMMP), and the Community Assistance Program.

(1) The FIS and LMMP efforts require detailed hydrologic and hydraulic analyses to determine areas of flood hazards and the degree of flood risk. While FIS efforts are commu-

nity-wide or basin-wide studies, LMMP efforts generally are limited to analysis of a single stream or reach of stream.

(2) The Community Assistance Program assists local officials in the administration of the NFIP for their community. Program tasks include such activities as surveying elevation reference marks, performing community assessment visits, and conducting flood proofing workshops.

b. On a less frequent basis, special investigations are conducted. These investigations, which draw upon the Corps expertise in water resources planning and engineering, generally involve development or review of complex methodology, and are handled in a similar fashion as FIS efforts.

G-24. Management.

a. HQUSACE Role. The FPMS Program and related activities are managed in HQUSACE by CECW-I.

b. Division Commander. The Division Commander will provide guidance on the FPMS Program and related activities to their respective districts, monitor work, and initiate actions necessary to ensure proper implementation, coordination, and conduct of the Program. In addition, Division FPMS Program managers shall review and approve District's T&C estimates for Special Studies, collect and analyze Program data, provide consultation on Flood Plain Management methodology, and participate on FPMS Program related committees and task forces.

c. District Commander. The District Commander shall ensure appropriate organization and staffing to maintain contact with requesting agencies, and for timely, accurate and coordinated responses to requests for FPMS and for NFIP support. Multi-disciplinary expertise within the District shall be used.

G-25. FPMS Program Guidelines. As authorized by section 321 of the Water Resources Development Act of 1990 (PL 101-640), Technical Services and Planning Guidance are (1) provided to states and local governments without charge, and (2) offered to Federal agencies and private persons on a cost recovery basis.

a. Full Federal Cost. Within personnel and funding capabilities, requests for General Technical Services and Special Studies shall be honored from state, regional, or local governments or other non-Federal public agencies and from Indian tribes without charge. However, the requesting entity may provide voluntary contributions for the purpose of

expanding the scope of the requested services, as follows:

(1) The services or assistance must fall within the scope of the FPMS Program.

(2) A “Letter Agreement” similar to the agreements used for FPMS cost-recovery procedures must be executed with the requesting entity. Other types of agreement may be substituted for the “Letter Agreement” if both parties concur.

(3) Funds received as voluntary contributions must be handled in a similar fashion as those collected for FPMS cost-recovery purposes.

(4) Approval authority for the expanded services and the “Letter Agreement” is delegated to the MSC and may be further delegated to the District.

b. Cost Recovery. Requests for General Technical Services and Special Studies from Federal agencies and private persons shall be honored on a cost recovery basis within personnel capabilities.

(1) For cost recovery purposes, the term "private persons" is interpreted to mean all entities in the private sector, including but not limited to individuals, private institutions, sole proprietorships, partnerships, and corporations.

(2) Generally, services shall be provided on a first-come, first-served basis either after payment has been received or after arrangements have been made for reimbursement.

(a) Services shall be provided to private persons only after payment has been received.

(b) Services may be provided to Federal agencies on either a pay first or reimbursable basis.

c. Quick Reponses. Certain limited requests for services from Federal agencies and private persons may be honored without charge. Services provided to Federal agencies and private persons without charge shall be limited to "Quick Responses" to walk-in or telephone requests, each of which require only ten minutes or less of work by one person to provide. They may include providing general information; on-hand data, materials, and publications; and brief explanations and/or advice on FPM measures, NFIP standards, and EO 11988 requirements. They normally will not include obtaining, developing, or interpreting flood or flood plain data.

d. Program related information and/or available, existing data may be exchanged between the Corps and Federal agencies or Private Persons without charge when it is mutually beneficial

to the parties involved. Note that this is an exchange rather than a provision of services.

e. Services shall be provided only upon request, and generally to entities outside the Corps. Requests for services from within the Corps shall normally be paid from applicable project or study funds rather than FPMS funds. Written requests shall normally be required for responses that take one person more than one day to provide. Generally, responses shall be by letter or by short report.

f. Requests for services that are available under other programs shall be directed to the appropriate source for assistance.

g. Requesters will be encouraged to become involved in FPM activities and to help reduce costs by furnishing field survey data, maps, and historical flood information.

h. Available data shall be used whenever practical. Utilization of data from all sources is encouraged, including hydrologic and hydraulic information developed by not only different elements within the Corps but also other agencies. When non-Corps data are used, the source of the data shall be acknowledged.

i. In establishing priorities for providing services, special consideration shall be given to areas where development pressures are the most significant and where the information is most likely to be used to solve flood related problems.

j. Services normally shall not involve extensive and detailed mapping.

k. Large area, long reach delineation, and floodway studies normally shall be confined to the study of non-Federal public lands, Indian tribal lands, or to areas of counties not mapped in detail under the NFIP. On request, reanalysis of floodways previously studied by the Corps shall be made if local conditions warrant.

l. In cases where assistance on flood warning and preparedness (including flood emergency evacuation) planning may require extensive involvement in plan preparation, the requester shall be informed at the outset that Corps efforts are intended only to support preparation of the plan, and that the plan and its implementation are the responsibility of the requester. Efforts shall be closely coordinated with the National Weather Service.

m. Services relating to flood control works and other flood damage mitigation measures, shall be limited as follows:

(1) Work shall not duplicate efforts which should or are being accomplished under other

Corps authorizations.

(2) Detailed planning and design shall not be done.

(3) Work shall assess the likelihood of success and the identification of pros and cons of measures being considered, but shall not include detailed economic analysis.

n. In cases where the request for services may require a reconnaissance study or could result in a Federal project, the requester shall be advised that services will be terminated if either proves to be the case.

G-26. Program Guidelines for Support to the NFIP.

a. Unless otherwise directed by HQUSACE (CECW-I), reimbursable work in support of the NFIP shall be undertaken at the discretion of the field office performing the work.

b. At the request of FEMA, the field office shall prepare a Time and Cost (T&C) estimate only if there is an interest and capability to do the work. Once a T&C estimate is submitted to FEMA, the Corps has an obligation to perform according to the estimate. In deciding interest, special consideration should be given to locations where Corps studies are current or where studies are expected to be undertaken.

c. FIS and LMMP activities shall be performed based on the requirements described in FEMA's "Statement of Work" and "Guidelines and Specifications for Study Contractors," and the Corps "Instructions for Flood Insurance Studies." Community Assistance Program activities shall be accomplished using the guidance described in FEMA's "Community Assistance Program Manual". These documents are furnished to Division and District offices by HQUSACE (CECW-I). They are periodically reviewed and updated as Program requirements change. Program or study managers shall ensure that the latest guidance is followed during the execution of work.

d. Scopes of work. Scopes of work, time and cost estimates, completed studies, and other pertinent documents are normally coordinated by the performing districts with the requesting FEMA Regional offices. The respective Division offices have the option of conducting a final review and approval of these documents prior to their submission to FEMA.

e. When activities in support of the NFIP involve the study of areas where the Corps has ongoing or completed flood control studies, the appropriate (existing or proposed) levee, channel, and/or other capacities used in the flood control study should also be used in the technical analyses for FEMA.

f. Where the Corps has ongoing flood control studies or projects which could impact on existing NFIP flood maps, coordination is required with FEMA and with the local sponsor.

G-27. Funding.

a. Appropriations for Non-reimbursable FPMS Items. Funding for non-reimbursable FPMS items involves the justification of funds through the budgetary process, the establishment of work allowances for specific items, and the use of funds during the fiscal year.

(1) Divisions review and consolidate districts FPMS requirements and submit them to HQUSACE for review and incorporation as a line item under "Collection and Study of Basic Data" in the overall General Investigations (GI) Program.

(2) After appropriations have been made, Division commanders shall furnish to HQUSACE (CECW-I) a breakdown of FPMS funding requirements by item for each District.

(3) The FPMS item names and related Project Work Item (PWI) numbers to be used in the breakdown for work allowances are assigned below and shall be used by each District and Division.

| PWI Number | Item Name | Description |
|---|---|---|
| 082025 | NFPC | Lump-sum amount to fund travel and other activities of the Corps National Flood Proofing Committee members. |
| 082030 | FPMS Unit | Lump-sum amount to fund liaison and administrative support by District staff. |
| 082040 | Technical Services | Lump-sum amount to fund the provision of general technical services to state and local governments by District staff including general information, hazard reports on spot locations, and general FPM planning guidance. |
| 082045 | Quick Responses | Lump-sum amount to fund limited services to Federal agencies and private persons that take |

| | | |
|---|---|---|
| | | one person ten minutes or less to provide. |
| To be assigned by HQUSACE (CECW-I) | SS-(study name or name of significant work) | Individual amounts to fund significant work or special studies for state and local governments by district staff. Includes floodways, reach delineations, hurricane evacuation and flood warning and preparedness studies, and other significant or unique services. |

(4) Program Management. To ensure the most effective and economical application of available funds, division and district commanders are permitted to reallocate FPMS funds within limits during the fiscal year as set forth in Appendix A, ER 11-2-201. Generally, reallocations shall be accomplished through adjustments to work allowances. DD Form 448 (Military Interdepartmental Purchase Request) shall not be used for the internal reallocation of FPMS funds unless specifically authorized by HQUSACE (CECW-I).

b. Cost Recovery for Reimbursable FPMS. Three different procedures shall be used to recover the cost of Technical Services and Planning Guidance provided to Federal agencies and private persons. Two involve the use of negotiated agreements and one involves the use of a non-negotiated "Fee Schedule".

(1) The five levels of fees contained in the following "Fee Schedule" will be used by each District to charge for general information taking more than ten minutes and for site specific technical assistance and advice taking up to one day to provide.

Table G-6. “Fee Schedule” of Standard Corps-wide Charges

| Level | Description of Work | Fee |
|---|---|---|
| 1 | Basic information from readily available data that does not require technical evaluation or documentation and is transmitted by form letter. | $25 |
| 2 | Information from readily available data that requires minimal technical evaluation which is transmitted by form letter. | $55 |
| 3 | Information that requires some file search, brief technical evaluation, and documentation of results by a form letter or by a brief composed letter. | $105 |
| 4 | Information and assistance that requires moderate file search, brief technical evaluation, and documentation of results in a composed letter. | $125 |
| 5 | Information and assistance that require significant file search or retrieval of archived data, moderate technical evaluation, and documentation of results in a brief letter report. | $325 |

(2) Two types of negotiated agreements ("Letter Requests" and signed agreements) will be used to recover the cost of responses that take more than a day to provide.

(a) A "Letter Request" will be negotiated to recover the cost of each response taking more than a day and generally up to one week to provide. However, if requested by the customer, the "Letter Request" may cover work taking more than a week. This will involve providing a description of work and a time and cost estimate to the customer who, in turn, will be required to send in a letter requesting the work and providing payment in full before the work is started.

(b) Signed agreements generally will be used to recover the cost of responses taking more than a week, but may also be used for responses taking less than a week if requested by the customer. The agreements will be in the form of a "Letter of Agreement" with a private person

and either an "Interagency Agreement" or "Memorandum of Agreement" with a Federal agency. They will involve negotiating the time and cost estimate and developing a statement describing the work to be done, setting a completion date, and stipulating how payment will be made (either in advance or by reimbursement). Each agreement will be signed (1) by the FPMS Program manager or other appropriate staff designated by the Commander of the office performing the work and (2) by the requesting party.

(3) To facilitate maximum cost recovery, the office doing the work will charge in accord with its specific cost requirements. Approximately 100% of the total costs of doing business will be recovered, including direct costs, benefits, technical indirect costs, and administrative overhead.

(4) As requests are received, the staff of the office performing the work will determine the appropriate procedure for recovering costs. Payments shall be received prior to the provision of services to private persons and either prior to or after the provision of services to Federal agencies. Funds should be handled in accordance with appropriate procedures.

c. Reimbursements for Support to the NFIP. Funding for reimbursable activities in support of the NFIP is accomplished under the general authority of annual interagency agreements with FEMA.

(1) Specific funds and the schedule for each FIS are documented in Project Orders to each Agreement which are executed at the HQUSACE level with FEMA. Letters authorizing the work and establishing the funding arrangements are prepared by HQUSACE (CECW-I) and transmitted to the appropriate Division.

(2) Funds for each Division or District's level of effort under the LMMP and Community Assistance Program are allocated by Project Orders to the respective Agreements which are executed at the HQUSACE level with FEMA. Letters establishing lump-sum funding are prepared by HQUSACE (CECW-I) and transmitted to the appropriate Division. Specific costs and schedules for individual tasks under these programs are negotiated between the FEMA regional office and the responding Corps Division or District. Tasks are authorized by letters from the FEMA Regional office to the Corps office doing the work.

G-28. Recording and Reporting Requirements.

a. For the FPMS Program. Each District shall furnish, for information, one copy of all bound and covered FPMS reports through the appropriate Division office to HQUSACE (CECW-I) within one week of completion/publication of the report.

b. For NFIP Support.

(1) Quarterly status reports are required for each FIS underway, and quarterly Check Point Summary reports are required from each District having FIS underway. Reports Control Symbol, RCS CECW-P-14 has been established for this reporting requirement. Details for preparing the reports are in the Corps "Instructions for Flood Insurance Studies." The reports shall be forwarded to reach HQUSACE (CECW-I), with a copy to the appropriate Division, as follows:

| Period | Due Date |
|---|---|
| October-December | 10 January |
| January-March | 10 April |
| April-June | 10 July |
| July-September | 10 October |

(2) FEMA has developed a web-based reporting system, “Monitoring Information on Contracted Studies” (MICS) for documenting progress throughout the flood mapping life cycle. The MICS system is being phased in at this time. The MICS system will include upward reporting capability eliminating the need for the quarterly reports specified in paragraph G-27b(1). Each District having FIS underway should contact the appropriate FEMA Regional Office to request permission to access the MICS system.

G-29. Coordination**.**

a. Coordination with states shall be in accord with the assignments in Exhibit G-12. Coordination with regional and local governments, other non-Federal public agencies, and Indian tribes, shall be in accord with District and Division boundaries.

b. To ensure proper state coordination, the Division Commander shall designate a lead District to be responsible for coordinating with the assigned states and to cooperate with other districts for the provision of requested services. If appropriate and agreeable to all involved parties, the lead District may serve as the single point-of-contact with the assigned state, provided that each District having jurisdiction within the state is properly represented and is involved, as warranted, in the provision of services.

c. Coordination with state and local governments for the provision of FPMS shall be accomplished at least once a year and well in advance of budget submissions to ensure that their needs and priorities receive appropriate consideration in the budgetary process.

d. NFIP Support. NFIP support activities shall be coordinated with FEMA, other Federal agencies, and state and local officials as required by FEMA's "Statement of Work" and "Guidelines and Specifications for Study Contractors," and the Corps "Instructions for Flood Insurance Studies."

G- 30. Publications**.**

a. Dissemination. Each District shall disseminate or make available to Federal, state, area-wide, and local planning agencies, libraries, universities, clearing houses, and others as appropriate, copies of all FPMS publications including guides, pamphlets, supporting studies, and reports as well as non-Corps publications furnished by HQUSACE (CECW-I) for dissemination.

b. Information Copy. Each District shall furnish, for information, one copy of all bound and covered FPMS reports through the appropriate Division office to HQUSACE (CECW-I) and one copy to CEHEC-IM-LP within one week after completion/publication of the report.

Exhibit G- 12. Division Assignments

| | | | |
|---|---|---|---|
| ***CENAD*** - | *Connecticut* | ***CENWD*** - | *Idaho* |
| | *Delaware* | | *Kansas* |
| | *District of Columbia* | | *Missouri* |
| | *Maine* | | *Montana* |
| | *Maryland* | | *Nebraska* |
| | *Massachusetts* | | *Oregon* |
| | *New Hampshire* | | *South Dakota* |
| | *New Jersey* | | *Washington* |
| | *New York* | | *Wyoming* |
| | *Pennsylvania** | | |
| | *Rhode Island* | ***CESWD*** - | *Arkansas* |
| | *Vermont* | | *Oklahoma* |
| | *Virginia* | | *Texas* |
| ***CESAD*** - | *Alabama* | ***CESPD*** - | *Arizona* |
| | *Florida* | | *California* |
| | *Georgia* | | *Colorado* |
| | *North Carolina* | | *New Mexico* |
| | *Puerto Rico* | | *Nevada* |
| | *South Carolina* | | *Utah* |
| | *U.S. Virgin Islands* | | |
| | | ***CEPOD*** - | *Alaska* |
| ***CELRD*** - | *Indiana* | | *American Samoa* |
| | *Kentucky* | | *Guam* |
| | *Michigan* | | *Hawaii* |
| | *Ohio* | | *Commonwealth of Northern Mariana Islands* |
| | *Tennessee* | | |
| | *West Virginia* | | *Trust Territory Pacific Islands (Palau only)* |
| ***CEMVD*** - | *Illinois** | | |
| | *Iowa* | | |
| | *Louisiana* | | |
| | *Minnesota** | | |
| | *Mississippi** | | |
| | *North Dakota* | | |
| | *Wisconsin** | | |

** The following states are hereby reassigned for coordination and management when planning assistance is provided in support of the Coastal Zone Management (CZM) Act: Illinois, Minnesota, Wisconsin, and Pennsylvania to CELRD Mississippi to CESAD.*

G-31. Definitions**.**

a. Planning Assistance to States. The Planning Assistance to States (PAS) Program is also known as Section 22 Program.

b. Sponsor. Any non-Federal public body that agrees to cooperate with the Corps of Engineers on a planning study identified in the State Water Plan.

c. Drainage Basins. For the purposes of this Section, the term Drainage Basins includes coastal zones and lake shores, as well as riverine drainage areas or any portion thereof located within the boundaries of a state.

d. Planning Assistance. Any effort or service (rather than a grant) pertaining to the planning for water and related resources of a drainage basin or larger region of a state, for which the Corps of Engineers has expertise. The planning process can extend through the functional design process and the preparation of generic structural designs. However, in no case will the term planning assistance extend to the preparation of site-specific structural designs or construction specifications.

e. Lead Division. A Division assigned the primary responsibility for coordinating efforts, approving work requests and cost sharing agreements, and preparing budget data for a given state. Lead Division assignments are given in Exhibit G-11.

f. Coordinating District. A District with responsibility delegated from the Lead Division for detailed coordination with the single point-of-contact in a state government.

g. Performing District. A District that negotiates and executes an agreement with a local sponsor for a work request agreed to by the state single point-of-contact and the Coordinating District.

G-32. Guidelines for Corps Assistance**.**

a. Types of Agreements. Agreements for studies costing $100,000 or less should be kept as simple as possible, using less formal “Letters of Agreement.” More complicated studies and studies costing in excess of $100,000 may have to use a more formal “Cost Sharing Agreement.” In either case, every effort should be made to keep the negotiation and execution of agreements as simple as possible to conserve the limited Program funds.

b. Approval of Agreements. Once an Agreement has been negotiated, it should be

submitted to the PAS Program Manager in the Lead Division for approval. It is the Lead Division Program Manager's responsibility to ensure that the work requested meets the eligibility requirements and that the terms of the agreement comply with the provisions of this regulation.

c. General Guidance.

(1) Work items should be at least regional and comprehensive in scope or be a part of a regional, comprehensive study or effort being performed by the state.

(2) Planning assistance within one state may not be extended to areas of another state unless all of the involved states agree.

(3) The PAS Program will not be used to supplement efforts under other ongoing or pending Corps programs, such as feasibility studies.

(4) If a study under this Program identifies a potential construction project with Federal interest, the study should be immediately transferred to the appropriate GI study program, unless the state intends to pursue the project solely as a state project.

(5) Planning assistance may be funded under this program and provided to assist states in support of the Coastal Zone Management Act or in flood plain management activities when the primary purpose of the assistance is to supplement basin-wide or regional state planning for the coastal zone or flood plains.

(6) Planning assistance may include, among other activities, review and update of information previously developed by authorized studies that are not currently funded, provided that the assistance is required for preparation of the state water plan.

(7) Planning assistance may include the collection of new data, but only as an integral part of conducting a legitimate planning study. This should not be interpreted as authorizing the use of the PAS Program to conduct large data collection programs.

(8) Planning assistance may not be used to offset any required State contributions to Federal grants programs. Likewise, sponsors may not use any Federal grant funds as their share of a cost sharing agreement, except where the legislation authorizing the Federal grant program allows such use.

(9) Although the primary purpose of the PAS Program is to make Corps expertise available to the states, work may be contracted out under the following conditions: (a) when a

particular task is normally contracted out by the District for cost-effectiveness reasons, or (b) when a District has lost capability in order to respond to an emergency situation and contracting is necessary to meet the agreed-to schedule, or (c) when contracting out is necessary to meet predetermined District contracting goals.

(10) Because the PAS Program was established to provide Corps planning expertise to states, in-kind services will not be accepted for any portion of the sponsor's share of a cost sharing agreement.

(11) Because some work items may require several years effort or because limited funding may force work to be divided among two or more fiscal years, Performing districts and sponsors may write multi-year/multi-phase agreements. However, each phase should be accomplished within one year of the date the agreement for that phase was signed.

G-33. Program Coordination and Budget Development**.**

a. Budget Guidance. In March of each year, HQUSACE issues budget guidance to divisions and districts for the upcoming Budget Year (BY). Included in that guidance is a revised breakdown of funds for each Division for BY-1 and an initial breakdown for BY.

b. Invitation for Work Requests. In April of each year, Coordinating districts issue an invitation for work requests to state single points-of-contact for final priorities for BY-1, for specific requests for BY, and an initial estimate of potential work in BY+1.

c. Provide the Requested Budget Information. In May of each year, state single points-of-contact provide the requested budget information and an evaluation of work completed in BY-3.

d. Evaluations. In June of each year, Coordinating districts provide copies of work requests and prior year's evaluations from the states and the annual budget submittal for each state to the Lead Division. The budget submittal includes:

(1) historical summary of work for BY-3,

(2) summary of ongoing work in BY-2,

(3) final priority listing of work requests for BY-1,

(4) the budget request for BY, and

(5) an initial estimate of work likely in BY+1.

e. Budget Submittals. In July of each year, Lead divisions provide copies of the Coordinating District's budget submittals for each state and a prioritization of work within the Division's states for BY-1 and BY to HQUSACE (CECW-PB).

f. Budget Justification Sheets. HQUSACE (CECW-PB) uses the information submitted to prepare Budget Justification Sheets for OMB and Congress, and input for budget testimony of the Director of Civil Works. The PAS Program is included as a separate line item in the line item entitled "Cooperation with Other Federal Agencies, States, and Non-Federal Interests" under the General Investigations Appropriation.

G-34. Budget Execution and Program Accomplishment.

a. After appropriations have been made, Division coordinators shall furnish to HQUSACE (CECW-PB) a prioritized breakdown of PAS funding requirements by item for each District. .

b. Negotiating Agreements. Throughout the fiscal year, the Performing districts negotiate agreements for the current year and the upcoming fiscal year. As agreements are finalized, they are forwarded through the Coordinating District to the PAS Program Manager in the Lead Division.

c. CEFMS Work Item Numbers. CEFMS Work Item numbers (PWI numbers) are assigned by HQUSACE (CECW-PB) for each study when funds are allotted.

d. Monitor Progress. The PAS Program Manager in the Lead Division continues to monitor progress on each agreement and report any problems, excess funds, or need for additional funds, to HQUSACE as necessary.

## SECTION VII - Other Planning Assistance

G-35. Purpose and Scope**.** This section provides information on various authorities by which the Corps may provide planning assistance to Federal agencies, states, Indian tribes and local units of government.

G-36. Authorities**.**

- Section 219, Flood Control Act of 1965, Public Law 89-298 - See paragraph G-37 for a description of this authority.

- Title III, Intergovernmental Cooperation Act of 1968, Public Law 90-577 – See paragraph G-37 for a description of this authority.

- Technical and Engineering Assistance on Shore and Streambank Erosion, Section 55, Water Resources Development Act of 1974, Public Law 93-251 – See paragraph G-39 for a description of this authority.

- Water Resources Management Planning Service for the Hudson River Basin, Section 49; and Technical Resource Service, Red River Basin, Minnesota and North Dakota, Section 50, Water Resource Development Act of 1988, Public Law 100-676 – See paragraph G-40 for a description of this authority.

G-37. General Reimbursable Work**.** The intent of the legislation authorizing reimbursable work for others is threefold: to encourage intra- and intergovernmental cooperation and coordination in the conduct of specialized or technical service; to avoid overlapping or duplication of special service functions among Federal agencies, states and local governments; and to make available specialized or technical services in areas of agency expertise. Planning assistance may be provided on a reimbursable basis for Federal agencies and for states and local units of government as set forth in ER 1140-1-211.

G-38. Coastal Zone Management**.** The Coastal Zone Management Act establishes a national policy to preserve, protect, develop, and where possible, restore or enhance the resources of the U.S. coastal zone. It requires Federal agencies to cooperate and actively participate with states and local governments and regional agencies towards achieving integrated policy and action proposals for managing the coastal zone. Planning assistance may be provided to assist states in coastal management activities in several ways.

a. Available Data. Available data or other information collected in the course of ongoing research, surveys, or studies or regulatory activities should be furnished without cost to the state.

b. Special Data. Special data, information, or studies requested by the state which require significant additional effort in collection, compilation, interpretation, or analysis, including specific research projects, should be furnished by the Corps on a fully reimbursable basis. The state should be informed that requested data or studies will require reimbursement.

c. Special Coastal Zone Related Studies. Special coastal zone related studies may be conducted under the authority provided by Section 22 of Public Law 93-251 ( See "Planning Assistance to States", Section VI) when the primary purpose is to complement comprehensive State planning for effective management of its coastal zone.

G-39. Technical and Engineering Assistance on Shore and Streambank Erosion. The purpose of this program is to provide technical and engineering assistance to non-Federal public interests in the development of structural and nonstructural methods for preventing damages attributable to shore and streambank erosion. For information on the provision of planning assistance under this program contact HQUSACE (CECW-CE).

G-40. River Basin Planning Assistance Programs**.** The Water Resources Development Act of 1988 established two separate planning assistance programs, Section 49 for the Hudson River Basin in New York and New Jersey, and Section 50 for the Red River of the North Basin, Minnesota and North Dakota. The purpose of these programs is to provide a full range of technical services for the development and implementation of state and local water and related land resources initiatives within those river basins within available funds.

G-41. Tribal Partnership Program.

a. Section 203 of WRDA 2000, Public Law 106-541, authorizes the Secretary of the Army, in cooperation with Indian tribes and the heads of other Federal agencies, to study and determine the feasibility of carrying out projects that will substantially benefit Indian tribes. The projects would be undertaken at sites primarily within Indian country, as defined in 18 U.S.C. 1151, or in proximity to Alaska Native villages. Section 203, titled the Tribal Partnership Program (TPP), also establishes cost sharing provisions, defines cooperation and consultation requirements, and authorizes appropriations.

b. Matters to be Studied. The statutory language for the TPP defines the matters to be studied to include flood damage reduction, environmental restoration and protection,

preservation of natural and cultural resources, and, "such other projects as the Secretary, in cooperation with Indian tribes and the heads of other Federal agencies, determines to be appropriate." The TPP provides an opportunity to assist with water resources projects that address economic, environmental and cultural resources needs.

c. Federal funds may be used to prepare a reconnaissance study in accordance with guidance above. If it is determined that the outputs are not consistent with Army/Corps implementation and budgetary policy, no further studies should be undertaken and a recommendation as to an appropriate course of action should be made to the tribal interests. If it is determined that the outputs are consistent with Army/Corps implementation and budgetary policy, a cost sharing partner must be identified, the scope of the feasibility study would be defined and a Feasibility Cost Sharing Agreement (FCSA) would be negotiated.

d. Section 203 feasibility studies will be cost shared 50/50 and all the sponsor's share may be provided as in-kind services. The use of other Federal agency funds for the non-Federal share of the feasibility study costs shall be guided by Article II.F. of the model FCSA, which requires approval of the use of those funds by the contributing agency.

e. Section 203 states that any cost sharing agreement for a study under this provision shall be subject to the ability of the non-Federal entity to pay. A draft Ability to Pay rule is currently being developed for coordination with the Office of the Assistant Secretary of the Army (Civil Works) and the Office of Management and Budget. When finalized, this rule will apply to section 203 studies. Until such time as the rule is final, reductions under the section 203 Ability to Pay provision cannot be applied.

f. In accordance with Section 203 (c), all activities undertaken under this authority must be coordinated with the Department of the Interior (DOI) to avoid conflicts and to consider the authorities and programs of DOI as well as other Federal agencies.

## SECTION VIII - Flood Mitigation and Riverine Restoration

G-42. Authority**.** Section 212 of the WRDA of 1999 provides authority for the Secretary of the Army to implement projects that reduce flood hazards and restore the natural function and values of rivers and that meet other specific criteria without seeking individual authorization for each project. The U.S. Army Corps of Engineers sought this authority and referred to the proposal as Challenge 21. The Corps does not currently have appropriations to implement this program. However, the Corps is conducting studies using other authorities and may seek authorization for projects that meet the goals of this program.

G-43. Types of Improvements**.** As authorized the Flood Mitigation and Riverine Restoration program emphasizes the use of nonstructural approaches to preventing or reducing flood damages and coordination with FEMA and other Federal, State, and local agencies, and Native American (Indian) Nations. Projects carried out under this authority may have structural elements. In accordance with subparagraph (d) of Section 219 of the WRDA of 1999, projects must significantly reduce potential flood damages, improve the quality of the environment and be justified considering all costs and beneficial outputs.

G-44. Cost Sharing Requirements. Each project will require a non-Federal sponsor willing to provide 50 percent of the cost of a study and a minimum of 35 percent of the cost of implementation. The non-Federal interest will provide all land, easements, rights-of-way, dredged material disposal areas, and relocations necessary for the project, the value of which will be credited toward the non-Federal sponsor's share of the project cost. The non-Federal sponsor will also be responsible for all costs associated with the operation and maintenance of the project.

G-45. Funding Limits**.** Federal spending on an individual project is limited to $30,000,000. The House and Senate Committees must be notified of each project proposed for implementation and must approve by resolution any project for which the Federal cost for construction exceeds $15,000,000. Appropriation authority is limited to $20,000,000 for FY 2001, $30,000,000 for 2002, and $50,000,000 for FYs 2003-2005. All projects must be fully funded within these limits.

This amendment was approved by William R. Dawson, CECW-P, (202)761-0115.

DEPARTMENT OF THE ARMY
U. S. Army Corps of Engineers
CECW-CP Washington, DC 20314-1000

Regulation 20 November 2007
ER 1105-2-100

# APPENDIX H

# POLICY COMPLIANCE REVIEW AND APPROVAL OF DECISION DOCUMENTS

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Note: The HQUSACE, Civil Works Policy and Policy Compliance Division web site http://www.usace.army.mil/cw/cecw-p/index.html and the EKO web site should be consulted as needed for updated exhibits and other guidance.

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# APPENDIX H

## Policy Compliance Review and Approval of Decision Documents

H-1. Purpose. This appendix prescribes policy compliance review and approval procedures for the following decision documents: section 905(b) analyses, feasibility reports, limited and general reevaluation reports, post authorization change reports, and other reports supporting project authorization or budget decisions. This appendix applies to specifically authorized projects and programs, but does not supersede any requirements contained in the authorizing language for those projects and programs. Appendix F addresses requirements for the Continuing Authorities Program (CAP) projects. Separate guidance addresses the peer review requirements for the various decision documents and their supporting analyses (the phrase "peer review" in this appendix includes both Independent Technical Review and External Peer Review). ER 1165-2-502 addresses requirements for decision documents with review and approval authority delegated to the Major Subordinate Commands (MSCs).

H-2. General Requirements. Decision documents are prepared to document project evaluations and facilitate acceptance of the study conclusions and recommendations by the sponsor, public, state and local agencies, and the Federal government. Peer, policy, and legal compliance reviews are an integral part of the process for defining a justified and acceptable project and developing the appropriate and necessary decision and implementation documents. Approvals or decisions to forward recommendations to higher authorities occur only after peer, policy, and legal compliance reviews determine that the proposed study or project complies with existing professional practices, Administration policy, and Federal law.

a. Objective. The objective of policy compliance review is to: (1) confirm that the appropriate water resource problems and opportunities have been addressed; (2) confirm that the recommended solution warrants Corps participation, is in accord with current policies, can be implemented in accordance with environmental laws and statutes, and has a sponsor willing and able to fulfill the non-Federal responsibilities; and (3) appropriately represents the views of the Corps of Engineers, the Army, and the President. This review process is critical to achieve corporate agreement at all levels in the Corps of Engineers on the recommended project and to assure the non-Federal sponsor that the study will lead to District recommendations that HQUSACE will support and ASA (CW) and OMB will likely support. The review process is integrated with the report development process to avoid and minimize rework and delays that would likely occur if reviews were deferred to the tail end of the study phase.

b. Scope. Policy compliance review (1) determines the acceptability of the recommended plan and the supporting analyses, including the decision factors, criteria, assumptions, and methods used to select and define the recommended plan, the extent and nature of Federal interest, project implementation responsibilities, and related issues; (2) ensures a uniform application of policy and procedures nationwide; (3) identifies policy issues that must be resolved in the absence of established guidance or where judgment plays a substantial role; and

(4) ensures that the proposed action is consistent with the overall goals and objectives of the Civil Works program. Although policy compliance reviews do not routinely delve deeply into technical analyses, they may when necessary to determine the sources of apparent inconsistencies or counterintuitive results, or to simply confirm sensitive issues were handled appropriately.

c. Focus. Policy compliance review focuses primarily on the plan formulation, economic, environmental, social, cost sharing, legal, and real estate aspects of proposed solutions and significant alternatives. Engineering and life safety aspects are considered as well as other aspects known to be important to the decision-making process of the Chief of Engineers and the ASA(CW). The reviews consider the views expressed by interested parties at or in response to public reviews, meetings, and workshops. Reviews may also address the application of budget criteria and the appropriate approval of project implementation documents.

d. Roles and Responsibilities. Final policy and legal compliance reviews are performed by HQUSACE, unless this responsibility has been delegated. Policy and legal compliance are also critical parts of the District and Major Subordinate Command (MSC) QA/QC responsibilities. Each reporting officer is responsible for assuring that his/her decision document complies with all applicable statutory and policy guidance prior to forwarding the document to higher authority. General roles during the decision document review and approval process are described in the following paragraphs:

(1) Vertical Team. A key for success is early and continuous involvement by the entire vertical team, which includes key personnel from HQUSACE, MSC, District PDT, non-Federal sponsor, and ASA(CW). The District and MSC are encouraged to seek additional vertical team assistance or reviews whenever needed. Open, proactive, and positive communication enables early identification and resolution of concerns so delays may be avoided or minimized. Vertical teams are encouraged to communicate frequently with short and well-focused meetings, preferably face-to-face. Team members are encouraged to continually improve communication methods, such as more effective use of the internet, consistent with the needs and capabilities of the participating offices. The HQUSACE Planning Community of Practice (CoP) will develop and maintain the Planners Web Site to share key information, documents, and tools, such as the Civil Works Review Board (CWRB) schedule, CWRB After Action Report (AAR), and links to completed planning documents.

(2) Legal Review. District and Division Counsel are responsible for ensuring the legal sufficiency of each decision document. Legal review involves a critical examination of the decision document to ensure compliance with applicable laws, policies, and regulations. Legal review should begin early in the study process so that issues are identified and addressed promptly, with elevation to higher authority as appropriate. Legal certification is required prior to release of the draft decision document for public review, and legal review must continue as the final report is developed, with specific focus on changes in the decision document.

(3) Districts. Districts must ensure that their decision documents have been fully read by the project manager to ensure an integrated product wherein the main report is consistent with

the appendices. Districts review their products during product (report) development and engage independent and/or external reviews at key points to ensure technical, policy and legal compliance based on prior published guidance. The PDT is responsible for project success and for delivering a quality product in accordance with ER 5-1-11. District Engineers are responsible for ensuring the quality of their decision documents and fully documenting the quality control and quality assurance (QA/QC) actions, including technical, policy and legal compliance. Districts are responsible for developing documents in accordance with the procedures and policies set forth in all USACE engineering regulations and circulars. Districts are responsible for identifying policy-sensitive issues to the MSC for vertical team action as early as possible and, when warranted, will request waivers from policy and guidance through the MSC, Regional Integration Team (RIT) and ASA(CW) (see paragraph H-2g below). The leader of the District Planning CoP is responsible for certifying the policy compliance of each decision document by signing the peer review certification. District Counsel is responsible for the legal review of each decision document and signing a certification of legal sufficiency. Once the District submits a report to higher authority for review and approval, the District is responsible for providing briefings and supplemental information as needed to assist the review and approval process.

(4) Major Subordinate Commands (MSCs). MSCs (also referred to as Divisions) perform quality assurance and are responsible for vertical and horizontal coordination in accordance with ER 5-1-11. They provide on-going technical, policy and legal compliance support to their districts. Each MSC will establish a quality assurance program that ensures quality decision documents in accordance with technical, policy and legal requirements. Quality assurance is to be achieved through early, continuous involvement in the process. The MSCs will identify and refer policy-sensitive reports to the RIT and coordinate/facilitate the vertical team resolution of issues arising during the study, particularly in policy review actions. The MSCs generally host Feasibility Scoping Meetings (FSMs), Alternative Formulation Briefings (AFBs), other issue resolution conferences (IRCs) and in-progress reviews (IPRs). The MSC Planning Chiefs are responsible for documenting quality assurance for all planning phase products and for ensuring the resolution of all technical, policy, and legal issues. Division Engineers are responsible for ensuring policy and legal compliance, and documenting technical, policy and legal compliance for decision documents that have been delegated to MSCs for review and approval in accordance with ER 1165-2-502. MSC Counsel will support the District efforts to ensure the legal sufficiency of decision documents and help facilitate the early-on vertical team resolution of legal issues.

(5) HQUSACE. HQUSACE reviews products at various points in the planning phase to confirm policy and legal compliance, and ensure nationwide consistency. The HQUSACE team assists the MSC and PDT throughout the project delivery process. HQUSACE is responsible for establishing technical, policy, and legal compliance requirements for specific projects, and providing final compliance documentation for Washington-level decision makers, generally the Chief of Engineers, ASA(CW), OMB, and Congress. The HQUSACE team is responsible for confirming the policy and legal compliance planning products; supporting the resolution of issues requiring HQUSACE, ASA (CW) or OMB decisions; continuously evaluating the overall project development process, including the peer review and policy compliance processes

(including responsibilities delegated to MSCs); and recommending appropriate changes when warranted. Key HQUSACE roles include:

(a) Regional Integration Teams (RITs), Civil Works and Military Programs Directorates, HQUSACE. RITs, as project execution team leaders, serve as the designated point of contact for all civil works activities, represent the MSC and District in Washington, and receive all official correspondence. Each RIT is responsible for the various planning management actions necessary to process decision documents to the appropriate and ultimate decision maker, usually the Chief of Engineers, the ASA(CW), or the Congress. This includes facilitating timely Washington-level processing of decision documents, advising the field on Washington-level processes and the status of actions in Washington, leading the resolution of policy and planning issues, consulting with the field, coordinating ASA(CW) participation in issue resolution conferences, checking District and MSC submittals for completeness, and issuing project guidance memoranda.

(b) Office of Water Project Review (OWPR), Policy and Policy Compliance Division, HQUSACE. OWPR (aka CECW-PC) performs HQUSACE policy compliance reviews for decision documents for projects requiring new authorization or modification of existing authorizations, and other decision documents that MSCs can not approve under delegated authority (see ER 1165-2-502). OWPR assists vertical teams throughout the study process to identify and resolve issues early so that final reports can be approved or cleared in a timely manner by HQUSACE, ASA(CW), and OMB as needed. OWPR participates with the RITs in IRCs, IPRs and other efforts to resolve outstanding issues. OWPR is also responsible for documenting and/or ensuring that the Districts document the resolution of peer review issues. OWPR, with the RIT planner, also schedules and arranges the District Engineer presentations of final reports to the CWRB. HQUSACE policy compliance review teams include members from the HQUSACE Office of Counsel and the Real Estate, Engineering and Construction, and other CoPs as needed. The Policy Branch (CECW-PB) and the Planning CoP assist as needed to help resolve issues, clarify existing policies and procedures, and to adapt or develop policies and procedures when warranted. OWPR will appoint a review manager for each arriving decision document to lead the review team and serve as the team's point of contact. The review team's coordination with the vertical team will generally be conducted through the RIT planning manager.

(6) Office of the Assistant Secretary of the Army (Civil Works). ASA(CW) has oversight responsibility for assuring that the authorization, implementation, and budgeting of projects is consistent with applicable laws and policies. As appropriate, ASA(CW) will be involved in resolving policy issues and approving exceptions to or waivers of policy. For certain proposals ASA(CW) may be directly involved in the policy compliance review and may choose to participate in IRCs and IPRs.

e. Review, IRC and IPR Procedures. General procedures and requirements for HQUSACE policy/legal compliance reviews, IRCs and IPRs are presented in Exhibit H-1. Further requirements for FSM, AFB, and draft and final report reviews are addressed below.

f. Issue Papers. District planning elements are expected to be knowledgeable of water resources policies and procedures and to apply that knowledge, including basic research of USACE guidance, before elevating issues to higher authority. When a District or MSC identifies a policy or procedural issue or uncertainty during the planning phase that warrants HQUSACE assistance, the District will prepare an issue paper that concisely describes the issue, the desired outcome, and any pertinent background information; identifies applicable guidance, interprets the guidance; and recommends a solution or course of action, if possible, for HQUSACE review. Issue papers involving legal concerns should be supported by a legal opinion signed by District Counsel. The issue paper and any supporting legal opinion should be provided to the MSC and forwarded to the RIT to coordinate the issue resolution. Depending on the nature of the issue, the RIT, vertical team, OWPR, and HQUSACE Planning CoP will determine whether additional information, coordination, ASA(CW) involvement, or an IRC (see Exhibit H-1) is necessary to resolve an issue.

g. Policy Waivers. A District may request an exception to policy, preferably after informal vertical team coordination, in a memorandum to the MSC and RIT supported by an issue paper (see above) that explains the need and rationale for the exception. The RIT will coordinate the HQUSACE review of the request and, if warranted, forward the request to ASA(CW) to approve or disapprove. The District and/or MSC may be asked to brief HQUSACE and ASA(CW) staff regarding the request.

h. Compliance Memorandum. Each submittal for HQUSACE policy compliance review will include a memorandum that summarizes how the District complied with previous guidance issued by the MSC or HQUSACE specifically for the current project. The memorandum will reference the previous guidance memoranda, reference each required action, briefly describe the changes in the analyses and/or presentation to fulfill each required action, and state the location (paragraph and page number) within the submittal materials for each action taken. A useful compliance memorandum will allow reviewers and interested decision-makers to quickly find and confirm that appropriate actions were taken to resolve the concerns. It also provides key portions of the Documentation of Review Findings that OWPR forwards with the final Report of the Chief of Engineers.

H-3. Reconnaissance Phase. Certification of the reconnaissance phase signifies that the proposed feasibility study would likely comply with current policies, the scope and nature of the water resource problem(s) warrant Federal participation in a feasibility study, and a non-Federal entity has the appropriate interest, authority and capabilities to fulfill non-Federal responsibilities for the feasibility, design, and construction phases. The Feasibility Cost Sharing Agreement (FCSA) may not be executed until the reconnaissance phase is certified and any requirements specified in a contingent certification are met. Reconnaissance phase certification should occur within six to twelve months of initiating the reconnaissance phase. FCSA execution concludes the reconnaissance phase. For reconnaissance studies recommending no further Federal action, see paragraph H-7.

a. Reconnaissance Study Schedule and Cost Changes. The MSCs are authorized to

approve study schedule and cost changes. Section 905(b) of WRDA 1986 states the duration of the reconnaissance study should normally be no more than twelve months, and in all cases limited to eighteen months.

b. Reconnaissance Phase Certification. Within six months, but no more than twelve months, of initiating the reconnaissance phase, the District Engineer will sign the Section 905(b) Analysis and provide it with the sponsor's letter of intent (LOI) to the MSC. MSCs are encouraged, but not required, to accept submittal materials informally and electronically, and should advise the Districts on acceptable methods of transmittal. The LOI should state that the sponsor is ready, willing, and able to execute the FCSA. The MSC will review the analysis and supporting materials to assess policy and legal compliance, and provide comments and/or guidance, as warranted, via e-mail to the district within thirty days of receiving the 905(b) analysis and LOI. The MSC will coordinate any aspect that does not clearly comply with law and/or policy with the RIT prior to certification. If warranted by the scope or impact of the issues, the MSC may request HQUSACE participation in an IRC to resolve those issues and establish any requirements that would allow certification (see the IRC procedures in Exhibit H-1). If the MSC determines that policy compliance can not be achieved, it must disapprove the analysis, defer certification, or, if warranted, seek an exception from policy from HQUSACE and ASA(CW). Once the MSC determines that the analysis and LOI are policy compliant, it may certify the reconnaissance phase. Certification may be contingent upon specific requirements. The MSC must forward the certification memorandum and analysis to the RIT, and release the analysis to the public or delegate the release to the District Engineer.

c. Project Management Plans (PMPs). The MSC will encourage the PDT to request PCX involvement early in the development of the PMP and subsequent PCX review of the PMP before FCSA negotiations are completed. The MSC, assisted by the PCX as needed, will ensure that the PMP is consistent with current guidance on policies and procedures for decision documents before the PMP is approved. The PMP does not need to be forwarded to HQUSACE unless specifically requested or as needed to assist the MSC and/or District. Following initial approval, each PMP should be posted on the District's website for access by the public or higher authority.

d. Feasibility Cost Sharing Agreement (FCSA). The authority to approve a FCSA, including any deviations thereto and the authority to execute such agreement, will follow the authorities and procedures outlined in the implementation memo for the model FCSA. The FCSA may not be executed until the reconnaissance phase is certified or the requirements specified in the contingent certification are met. A model FCSA is displayed on the CECW-P web page under the link titled, "Project Cooperation Agreement Models."

H-4. Feasibility Phase through the Draft Report Stage.

a. Feasibility Study Schedule and Cost Changes. The MSCs are authorized to approve study schedule and cost changes.

b. Project Study Issue Checklist. The Project Study Issue Checklist in Exhibit H-2

includes many of the more frequent and sensitive policy areas encountered in studies.

The checklist was created to emphasize the District's responsibility for achieving policy compliance and to facilitate the early identification and resolution of technical, policy and legal issues via the vertical team. The District will prepare a draft checklist early in the feasibility phase, preferably within the first three months of initiation and always prior to the FSM. The District will include an updated checklist in each submittal of study documents for policy compliance review (the FSM, AFB, draft report and final report) to help identify potential issues for resolution. When the District identifies an issue as sensitive, it should immediately engage the vertical team to resolve the concern. If an issue can not be resolved by simple coordination, the resolution effort should be supported with an issue paper in accordance with paragraph H-2.f.

c. Feasibility Scoping Meeting (FSM). The purpose of the FSM is to bring the vertical team, the non-Federal sponsor, and resource agencies together to agree on the problems and solutions to be investigated and the scope of analyses required. An FSM will address the problems, opportunities, and needs; refine study constraints; identify the key alternatives; and further define the scope, depth, and methods of analyses required. The FSM will use the IRC procedures outlined in Exhibit H-1. An FSM should normally occur upon completion of steps 1 and 2 of the planning process (see paragraphs 2-3a and 2-3b, ER 1105-2-100); after preliminary plan formulation, evaluation and screening (i.e., identification of the alternatives to be analyzed in detail); and after the NEPA scoping meeting (see ER 200-2-2). The FSM pre-conference submittal requirements are listed in Exhibit H-3. For overall study efficiency, PDTs are encouraged to begin writing their draft feasibility reports prior to the FSM, rather than creating separate documents for the FSM and AFB.

d. Alternative Formulation Briefing (AFB). The purpose of the AFB is to confirm that the plan formulation and selection process, the tentatively selected plan, and the definition of Federal and non-Federal responsibilities are consistent with applicable laws, statutes, Executive Orders, regulations and current policy guidance. The goal is to obtain a HQUSACE endorsement of the tentatively selected plan, to identify and resolve any legal or policy concerns that would otherwise delay or preclude Washington-level approval of the draft report, and to obtain HQUSACE approval to release the draft report and NEPA document to the public concurrent with the HQUSACE policy compliance review of the draft report. An AFB should be held when the District is prepared to present the formulation, evaluation and comparison of alternative plans (steps 3 through 5 of the planning process); the costs, benefits, and impacts of the final array of plans; the plan selection rationale; the tentatively selected plan; the cost apportionment; and any known significant issues. The AFB will use the IRC procedures outlined in Exhibit H-1. The AFB pre-conference submittal requirements are listed in Exhibit H-4. If an adequate draft report is available for review, the draft report review requirements below may be fulfilled in the AFB. The AFB and the resulting AFB PGM will address the policy compliance and public reviews of the draft report and NEPA document. The District will use the AFB PGM as a supplement to existing guidance to further complete the decision document.

e. Draft Report Submittal. HQUSACE policy compliance review and approval of the draft report and supporting materials is required prior to public release of the draft report and NEPA document unless a prior AFB PGM or other HQUSACE guidance approved concurrent

HQUSACE and public reviews, or deferred further compliance reviews to the final report. Review and approval prior to public release are necessary to ensure that resulting sponsor and public expectations regarding Federal support can be reasonably fulfilled. See Exhibit H-5 for the submittal requirements. The review and issue resolution process will use the procedures outlined in Exhibit H-1. The resulting PGM will specify the requirements for releasing the documents for public review if public release is still pending and completing the final report.

f. Draft Environmental Impact Statement (EIS) Filing. Following HQUSACE approval to release the draft report and supporting materials to the public, the District Engineer will circulate the draft report and preliminary draft EIS or draft Environmental Assessment (EA) and draft Finding of No Significant Impact ( FONSI), as appropriate, to agencies, organizations and members of the public known to have an interest in the study. If an EIS is appropriate, five copies of the preliminary draft EIS and report will be mailed to Director, Office of Federal Activities (A-104), Environmental Protection Agency, 401 M Street, SW, Washington, DC 20460 for filing after distribution has been accomplished. Review comments should be accepted from the public, agencies and others for a minimum of 45 days (for EIS, or 30 days for EA) after the Notice of Availability (NOA) is published in the Federal Register. Public hearings should generally be held during the public review to solicit the views of key stakeholders and others in areas likely to be impacted by the tentatively selected plan. The District Engineer should provide written responses to significant comments received in writing during the review. All significant comments and the Districts responses should be documented in the feasibility report. Since the NOA is generally published in the Federal Register on the Friday of the week after EPA receives the preliminary draft EIS, District schedules should allow two weeks for filing the draft EIS.

H-5. Feasibility Phase Final Report Stage. The Division Engineer's submittal of the final report initiates a series of Washington-level actions that would ideally culminate in the authorization of the recommended project. Requirements for the major actions are summarized in the paragraphs that follow. Key milestones with typical dates relative to the arrival of the MSC submittal in the RIT are listed in Exhibit H-12.

a. Submittal of Final Reports Requiring Authorization. Final decision documents recommending the authorization of new projects and/or modification of existing projects must be transmitted to HQUSACE for review and approval prior to the execution of design agreements or project cooperation agreements (PCAs), and the subsequent obligation and expenditure of funds for design or construction. The procedures below apply to the submittal of all final Corps of Engineers Civil Works feasibility reports and post authorization reports that require new authorization or the modification of existing authorization by the United States Congress. See paragraphs H-6 and H-7 for the processes for other types of reports.

(1) District Transmittal. Once the District Engineer signs the recommendations in the final decision document, the District should forward the final report, final NEPA document, and related materials (see Exhibit H-7) to the MSC. The District Engineer's signature is for the recommendation and does not constitute the project decision in accordance with ER 2-2-200. Therefore, the ROD or FONSI should not be signed at or before this time. The District should

retain between 12 and 50 copies of the report and NEPA documentation for the State and Agency (S&A) Review discussed in later paragraphs. The number of report copies will vary depending upon the project's purpose, features and location. Contact the RIT planner or CECW-PC to determine the number of copies that will be required. Note, although the EIS is identified as "final" at this stage of processing, it should be made clear to all those requesting a copy that it is an "*Interim Document under Agency Review - Subject to Revision*" and will become the agency's final EIS when it is filed after OWPR review.

(2) Final Report Submittal Package. The Division Engineer's Transmittal Letter will provide the submittal package to HQUSACE for review as described in paragraph 3 of Exhibit H-1 and will enclose the items listed in Exhibit H-7. A Division Engineer's Public Notice announcing the completion of the final feasibility report is no longer required, but may be used at the MSC's discretion. Model text for both the transmittal letter and notice are presented in Exhibit H-6. Note that models for the draft ROD and the draft Report of the Chief of Engineers are presented in Exhibits H-8 and H-9, respectively.

(3) Supporting Information. The Report Summary and briefing slides required in Exhibit H-7 should be updated annually and forwarded to the RIT by November 30 to reflect the October, current year, price level and other changes. The initial and updated versions are necessary to support various briefings, decision-related meetings, and hearings both within HQUSACE and with or before ASA (CW), OMB, other agencies, Congressional staff, and Congressional committees during the authorization process. The updates should continue until the project is authorized or is no longer pursued at the Washington-level. The report summary and slides should be provided and maintained in the current Corps of Engineers standard for electronic files, currently Microsoft Word and PowerPoint. Supporting maps, artwork, and photos can be provided in industry standard format (jpg or gif).

(a) Report Summary. The Report Summary will follow the standard outline in Exhibit H-11. The Report Summary will concisely and comprehensively summarize the feasibility study, the NEPA document, and the recommended plan. As such, the Report Summary should not exceed ten pages. It will provide insights to the key problems and opportunities, risks and uncertainties, assumptions and other important considerations that underlie the recommendation. The standard format will result in consistent reporting across studies, making cross-comparisons more possible. The Report Summary also replaces the Project Fact sheet, and serves as the basis for the District Engineer Briefing (below).

(b) ASA(CW)/OMB Briefing Slides. The District Engineer will e-mail a file of electronic (Microsoft PowerPoint) slides listed in Exhibit H-10 for feasibility-level reports which recommend Federal action to the HQUSACE RIT concurrent with the Division Engineer's transmittal of the final report to HQUSACE, and provide updated slides to the RIT when requested. The HQUSACE RIT will use the file primarily to brief ASA(CW) and OMB staffs as needed during the Washington-level processing of the final report, particularly for briefing OMB. The file will be a summary version of the District Engineer's Civil Works Review Board (CWRB) briefing slides with generally no more than a dozen slides.

b. Civil Works Review Board (CWRB). The MSC and District Engineers will present the final results and recommendations for all Civil Works feasibility and post authorization reports that recommend new or additional Congressional authorization to the CWRB in HQUSACE. The CWRB briefing is the corporate checkpoint for determining that the final decision and NEPA documents, and the proposed Report of the Chief of Engineers are ready to release for State and Agency (S&A) Review as required by the Flood Control Act of 1944, as amended (33 U.S.C. 701-1).

(1) Scheduling. Approximately six months before the final report package is submitted to HQUSACE, the District Engineer shall notify the MSC and RIT to schedule a briefing of the CWRB. The briefing will be held no less than 21 calendar days after HQUSACE receives the Division Engineer's Transmittal Letter and prior to issuance of the Final Report of the Chief of Engineers. The briefing will be held before the S&A Review process is initiated. For expediency, exceptions regarding the timing of the S&A Review process may be considered in cases where there are no outstanding review concerns and no known controversies associated with the project. To obtain such an exception, the District Engineer must submit a request through the MSC Division Engineer to the Director of Civil Works (DCW) for action.

(2) Members. The Deputy Commander will chair the CWRB. This level of involvement emphasizes to the Corps and the public the importance placed on the vertical team process in developing water resources projects. For each briefing, the CWRB will consist of five voting members. Three Board members will serve permanently on every panel: the CWRB Chair, the DCW, and the Leader of the Planning Community of Practice (CoP). Two additional Board members will be drawn specifically for each panel: one RIT leader (not from the presenting MSC); and one additional CoP leader from Engineering, Operations, Real Estate or another area as appropriate. The Office of the Chief Counsel will serve in an advisory role for all reports.

(3) Attendance. The appropriate HQUSACE, MSC, and District staff will attend. The project sponsor should attend and present its views on the project. The peer review team leaders (Independent Technical Review and External Peer Review) and other key stakeholders should be invited. Representatives from OWPR, the policy compliance review team, the RIT, and other HQUSACE offices will attend, as appropriate. Representatives from ASA (CW) and the Office of Management and Budget (OMB) will be invited. If travel is not practical, the MSC and/or District should contact OWPR regarding participation via video-teleconference.

(4) Agenda. Following presentations by the District Engineer, Division Engineer, OWPR, the non-Federal sponsor, and other guests, the CWRB will determine whether the report should be issued for S&A Review, and whether other instructions are warranted. A sample agenda is presented in Exhibit H-13.

(a) District Engineer Briefing. The District Engineer will address the report recommendations, the rationale for plan selection, the benefits and costs, NEPA compliance, cost sharing, and how all peer and policy review comments were addressed and resolved. The District Engineer will address the systems perspective and how risk and uncertainty were considered in the study. The District Engineer will also provide an overview of the public

involvement process, including any peer review, the major concerns expressed and how they were resolved. The District Engineer shall cover the topics listed in Exhibit H-14.

(b) Division Engineer Briefing. The Division Engineer will present the rationale for issuing the Division Engineer's Transmittal Letter, certification of legal and policy compliance, the expected response to the draft Report of the Chief of Engineers, and any MSC Quality Assurance or other observations. The Division Engineer and/or the HQUSACE RIT leader will summarize the QA/QC efforts, specifically the certifications of technical, legal and policy compliance. They should discuss the peer review process and results, including the involvement of the Planning Centers of Expertise, and any significant and/or unresolved technical, legal or policy compliance concerns.

(c) OWPR Briefing. Upon receiving the MSC submittal materials, the OWPR policy compliance review team will briefly assess the compliance of the materials with previous guidance (PGMs) to identify any obvious concerns that may warrant delaying the S&A Review. The OWPR review team manager will summarize these and any other significant policy and legal concerns to the CWRB, including their significance and the steps needed to resolve each one. The review manager will recommend whether or not the report and the proposed Chief's Report should be released for S&A Review. As indicated below, the full policy compliance review of the final report will continue concurrently with the S&A Review.

(5) CWRB Decision. If the CWRB decision is not a simple approval to release the final report for S&A Review and file the FEIS with EPA, OPWR will record the decision and, if necessary, the RIT will issue a guidance memorandum to the MSC and District. OWPR will include the CWRB decision and instructions, if any, in the Documentation of Review Findings.

(6) After Action Reports (AARs). To facilitate lessons learned, the District will prepare a brief AAR of the CWRB meeting on outcomes and decisions reached, and any follow-on actions required. The AAR will be furnished to the Division Engineer, the RIT, and OWPR within 30 calendar days of the CWRB briefing. CECW-PC will place the AAR in the Planners Web Site with a link to the presentations made at the briefing.

c. State and Agency Review. The S&A Review by pertinent agencies is required by Executive Order 12372, Public Law 78-534, as amended, and Public Law 85-624. HQUSACE shall administer the S&A Review with the assistance of the District. OWPR will provide a coordination package to the District to initiate the S&A Review as soon as possible after the CWRB briefing, consistent with the CWRB decisions. OWPR will provide a mailing list, signed transmittal letters, and the proposed Report of the Chief of Engineers to the District with instructions for mailing copies of the report to the State and Federal agencies for S&A Review. The District will date and mail the transmittal letters and enclosures according to the written HQUSACE instructions. (Keep copies to verify the dates.) The transmittal letters will explain the current status of the report and FEIS and direct any comments to the DCW. OWPR will contact any agencies or governor's offices that do not respond by the end of the review period. OWPR will identify any State or Agency comments that warrant a response and the RIT planner will coordinate with the MSC and District to draft response letters for signature by the Chief,

Planning and Policy Division at HQUSACE, CECW-P.

d. EIS Filing. Following CWRB approval, OWPR will provide signed transmittal letters for the District to circulate the final report, FEIS, and the proposed Report of the Chief of Engineers to interested parties for public review and to file these documents with EPA pursuant to regulations of the President's Council on Environmental Quality (CEQ) for implementing NEPA (see ER 200-2-2, paragraph 17, and 40 CFR Parts 1500-1508). (District should make copies of the transmittal letters before mailing.) The letter to interested parties explains the current status of the report and FEIS, directs comments to CECW-P, and states the official closing date for the receipt of comments is 30 days from the date that the notice of availability of the FEIS appears in the Federal Register, which may be somewhat later than 30 days from the date of the letter. The review period may be extended upon request (see paragraph 19a, ER 200-2-2). Concurrent with mailing the documents for S&A Review, the District will date the letter to interested parties with the day it is postmarked and distribute the documents to groups and individuals known to have an interest in the study or who provided comments on the draft EIS but were not included on the S&A Review mailing list. The report appendices circulated with the draft report and EIS need not be circulated with the final report and final EIS. After allowing adequate time for delivery to the interested parties, the District will date the second transmittal letter and file the documents with EPA. EPA generally publishes a notice of availability of the FEIS in the Federal Register on the Friday of the week following EPA's receipt of the FEIS. Due to the timing of the notice of availability in the Federal Register, the review of the FEIS generally ends a couple weeks after the S&A Review. The Division Engineer will issue any needed responses to comments received from interested parties.

e. Final Report Policy Compliance Certification.

(1) OWPR Review. The S&A review and filing of the FEIS, as appropriate, with the EPA shall be concurrent with OWPR's final policy compliance review. This review will confirm compliance and provide a basis for advising the Chief of Engineers about forwarding the recommendations to ASA(CW), OMB, and ultimately Congress. This will be a final checkpoint on the need for an ASA(CW) policy exception, and if needed an exception would be concurrently coordinated by OWPR. The final Chief's Report would not be signed until the exception is approved by ASA(CW). This review will concentrate on the compliance of the final report with the latest PGM and any changes in the documents since the previous OWPR review. Should policy issues be identified, OWPR will work with the RIT and reporting officers to resolve these issues to finalize the report. If the final decision document is not in compliance, an IRC may be requested to resolve remaining issues related to the project or supporting documentation. If, after an IRC or other discussions, compliance cannot be agreed upon, OWPR may advise the DCW to return the report with corrective guidance to the reporting officer. OWPR will issue the Documentation of Review Findings and certify policy compliance, when the final document adequately complies with policy. The Documentation of Review Findings will include a summary of the S&A and NEPA reviews.

(2) Final Report and FEIS Revisions. If the CWRB action or OWPR review requires minor revisions (with insignificant impacts) to the plan as recommended by the Division and

District Engineers, these changes and impacts shall be noted in the final feasibility report. If major revisions are necessary to the recommended plan and revisions are variants of the plan or are within the range of alternatives considered and discussed in the draft EIS, an addendum to the final report and FEIS will be prepared by the District, as required. It will be identified as an "*Addendum to the Final Feasibility Report and Final EIS - Environmental Consequences of the Modifications Recommended by the Headquarters, U.S. Army Corps of Engineers – (project name)*." The format shall include an abstract on the cover page; recommended changes to the Division/District Engineer's proposed plan; rationale for the recommended changes; environmental consequences of the recommended changes; and the name, expertise/discipline, experience, and role of the principal preparer(s) of the addendum. If the CWRB or OWPR requires a major revision or a new alternative to the recommended plan with significant impacts which were not discussed in the draft EIS, a supplement to the draft EIS will be required. After consultation with the RIT, OWPR, and the Division Engineer, the District Engineer will prepare and circulate the supplement to the draft EIS in accordance with CEQ implementing guidance (40 CFR 1502.9). The supplement together with incoming letters of comment and Corps responses to substantive issues shall be incorporated into the existing final report and EIS with a minimum of page changes or revisions to reflect the modified or new proposed plan. OWPR will review its proposed action in light of the comments received prior to taking final action on the report and EIS.

f. Final Report Recommendation Package. After the S&A review, FEIS review, and the final feasibility report policy compliance certification have been completed, the HQUSACE RIT will prepare a recommendation package for processing to obtain signature of the Report of the Chief of Engineers. The recommendation package will include the items listed in Exhibit H-15. OWPR will finalize the Chief of Engineers Report for the Chief's signature and the ROD for signature by the ASA (CW). The RIT will forward the package and schedule briefings for the Director of Civil Works and/or the Chief of Engineers, as needed. The RIT will notify the MSC and District of any briefings so that they have the opportunity to participate.

g. Chief of Engineers Approval. Once the Chief of Engineers signs the report signifying approval of the project recommendation, the Chief of Staff signs the notification letters forwarding the Report of the Chief of Engineers (Chief’s Report) to the chairpersons of the Senate Committee on Environment and Public Works, and the House of Representatives Committee on Transportation and Infrastructure. The signed Chief’s Report is then returned to the RIT. The RIT submits a copy of each of the following to ASA (CW): the Chief’s Report, the final feasibility report and FEIS, the body of draft letters transmitting the report to OMB and Congress under the ASA(CW) signature, the unsigned draft ROD, all State and Agency review letters and any CECW responses to those letters, ASA(CW)/OMB briefing slides, Report Summary, and Documentation of Review Findings. In addition, the RIT will e-mail ASA(CW) staff the electronic versions (scanned signed documents and text files for unsigned letters) of each of these documents, except the final feasibility report and FEIS.

h. ASA(CW) Approval. The ASA(CW) will review the documents provided by the RIT to determine the level of administration support for the Chief of Engineers recommendation. The ASA(CW) will formally submit at least one copy of the report to OMB per Executive Order

12322, 17 September 1981. The submittal will include the report, NEPA documentation, draft ROD (if a final EIS has been filed), appendices, Documentation of Review Findings, and the draft transmittal letters to Congress. The submittal to OMB should normally occur within 180 calendar days of the Division Engineer's transmittal letter to HQUSACE. OMB will review the recommendation to determine its relationship to the program of the President. OMB will then provide a letter to ASA(CW) either clearing the release of the report to Congress subject to whatever changes OMB deems necessary or objecting to the release. If there are no OMB objections, the ASA(CW) will then provide guidance on necessary revisions and direct the DCW to prepare the report for transmittal to Congress. In accordance with OMB instructions, ASA(CW) will provide the DCW with guidance on necessary actions which could range from revising the recommendation, revising the final report, redoing part of the study, to terminating the study outright. The ASA(CW) and OMB may request briefings to aid their decision-making. The RIT normally provides these briefings and any other supplemental information that ASA(CW) or OMB may need, assisted as needed by the vertical team. If the needed information is not readily available in HQUSACE, the District may be asked to provide it. Note that paragraph G-8c.(9) of Appendix G, “Planning Reports and Programs,” requires that the District retain adequate funding to support the Washington-level review activities.

i. Review of Changes to Report Recommendations. Depending on the extent of changes in the recommendations it may be necessary to provide an opportunity for the sponsor, state(s), interested Federal agencies, and other parties to review and comment on the changes prior to transmitting the report to Congress and signing the ROD. Changes involving significant environmental impacts may require additional NEPA documentation in accordance with 33 CFR 230. In such circumstances, HQUSACE or ASA(CW) may allow additional time for further comment before finalizing their respective recommendations. Notification and scheduling requirements will be determined on a case-by-case basis since the need for coordination will vary with the degree of change.

j. Transmittal to Congress. After OMB provides its views on the relation of the recommended project with the programs of the President, the ASA(CW) will sign the ROD if the project has not yet been authorized and will transmit with any modifications that may be needed the Report of the Chief of Engineers, the state and agency review letters, the ROD, and the final feasibility report/EIS to Congress. The District will then notify the sponsor, state(s), and interested agencies and other parties of the Report of the Chief of Engineers and the ROD. When Congress has authorized construction prior to receiving the ASA(CW) recommendations, the Director of Civil Works will sign the ROD and forward a copy to ASA(CW) to include in the transmittal to Congress. In this case the ROD should only address the project as authorized by the Congress and not attempt to provide any additional justification of the Congressional action.

H-6. Post-Authorization Decision Documents.

a. Modification of Existing Authorizations. Decision documents that recommend the modification of existing project authorizations, other than raising the cost limit established by Section 902 of WRDA 1986, or that lack delegated approval authority will utilize the review and approval process described above for feasibility reports. PAC reports recommending an increase

in a cost limit established by Section 902 of WRDA 1986 will follow the review and approval procedures outlined in ER 1165-2-502. The MSC will forward the final report, with the peer review and legal review certifications, to the RIT for submittal to ASA(CW) for review and coordination with OMB as appropriate for submission to Congress.

b. Projects Authorized without a Report. The requirements described above in paragraphs H-1 through H-5 apply to reports for projects or project modifications authorized without the benefit of a Secretary-approved feasibility-level report and without contingent actions, except that a Chief of Engineers Report and the S&A Review will generally not be necessary. The MSC submittal requirements in Exhibit H-7 will apply, except for the report mailing list and the Draft Proposed Report of the Chief of Engineers.

c. Projects Authorized Contingent upon Completion of a Chief of Engineers Report. The requirements described above in paragraphs H-1 through H-5 apply to reports for projects or project modifications authorized subject to the completion of a Chief of Engineers Report, except that the transmittal letters, Report Summary, Chief of Engineers Report and briefing slides will describe the contingent authorization language. The MSC submittal requirements in Exhibit H-7 will apply.

d. Projects Authorized Subject to a Determination by the Secretary of the Army. The requirements previously described in paragraphs H-1 through H-5 apply to reports for projects or project modifications authorized subject to a determination by the Secretary, except that a Chief of Engineers Report and S&A Review will generally not be necessary. A Report of the Director of Civil Works will recommend and forward the final report to the ASA(CW). The MSC submittal requirements in Exhibit H-7 will apply, except for the report mailing list and the Draft Proposed Report of the Chief of Engineers.

e. Delegated Post-Authorization Decision Document Approval Authorities. ER 1165-2-502 provides guidance on the delegated review and approval of post-authorization decision documents. The submittal of MSC approved documents to the RIT for budget clearance should comply with the annual budget guidance and include a copy of the Decision Document Checklist described in ER 1165-2-502. Submittal requirements to support PCA actions are addressed in ER 1165-2-131.

H-7. Reports Recommending No Further Federal Action.

a. The MSC or District, if delegated by the MSC, will release a public notice to all interested parties, including the Congressional delegation(s), the MSC, and the RIT, that the reconnaissance or feasibility-level study report recommends no further Federal action.

b. The public notice will include language stating, “If this study receives no additional funding for a period of five years, the Secretary will include it on the list of incomplete studies provided to Congress in accordance with Section 710 of WRDA 1986. Each study in the list will no longer be authorized if it is not funded within 90 days after the list is provided to the

Congress."

c. Within 15 working days of receipt of the District Engineer's appraisal or report recommending no Federal action, the MSC will notify the RIT in writing of the intent to publish a public notice. This written notification will also include an evaluation of the reconnaissance report and recommendation(s) by the MSC and two copies of the 905(b) analysis or report for information.

d. In those cases where an IRC is held, the resulting guidance memorandum will address, if warranted, any additional specific report processing requirements.

e. HQUSACE will prepare an annual report for transmittal to Congress summarizing all reconnaissance and feasibility reports recommending no further Federal action for that year.

H-8. Decision Documents Prepared by Sponsors. For a decision document prepared by a non-Federal interest, such as under the authority of Section 211 of WRDA 1996, the District should encourage the non-Federal interest to utilize the review and approval processes described in this appendix in order to receive timely input on the adequacy of their report and maximize the opportunity for approval by the Secretary. If the non-Federal interest chooses some other path, the District should expect to conduct peer, policy and legal reviews of the final decision document, or possibly some interim product, and to provide the results of their reviews to the MSC and RIT along with advice on whether the report should be approved. The MSC will endorse the District's findings with its own views on approval and advise the RIT regarding the adequacy of the District's reviews. The RIT will engage an OWPR policy and legal compliance review, and forward the results to ASA(CW) with summary advice regarding the consistency of the document with technical, policy and legal requirements, and a recommendation to approve or not approve the report. The District will retain responsibility for fulfilling the NEPA requirements, including any necessary scoping meetings, public reviews, filings with EPA, executing a FONSI, and/or providing the draft ROD for HQUSACE or ASA(CW) signature, as appropriate. A report prepared by non-Federal interests may still require a Chief's Report (i.e., Section 203 reports), so a CWRB and follow-on procedures may be necessary.

This amendment was approved by Mr. Raleigh H. Leef, CECW-P, (202)761-1380.

Exhibit H-1
Issue Resolution Conference Procedures

1. Exhibit Purpose. This exhibit describes procedures and requirements for conducting In-Progress Reviews (IPRs) and Issue Resolution Conferences (IRCs) in conjunction with feasibility and post-authorization studies generally covered in ER 1105-2-100. IRCs include the Reconnaissance Review Conference (RRC), Feasibility Scoping Meeting (FSM), the Alternative Formulation Briefing (AFB), and Feasibility Review Conference (FRC).

2. General.

a. IRC/IPR Purpose. The primary purpose of an IRC is to involve the vertical team (non-Federal sponsor, District, MSC, HQUSACE and, when needed, ASA(CW)) to identify, discuss and resolve issues to ensure an orderly completion of the study and Washington-level acceptance of the final report recommendations. Issues can involve existing and potential technical, policy, legal, and procedural concerns. The purpose of an IPR is to update the vertical team and others on study findings and progress.

b. Participation. The District, Division, and HQUSACE will participate in all IRCs and many IPRs. HQUSACE may invite ASA(CW). The District should invite the peer review team leader. The District should strongly encourage the non-Federal sponsor, resource agencies, and major stakeholders to participate in all IRCs and IPRs.

c. Timing/Scheduling.

(1) Meetings. IRCs and IPRs can be held at any time during the study process at the request of any vertical team member. The FSM and AFB are held at particular times in the study process as described in subparagraphs H-4.c and H-4.d. An RRC or FRC will only be held when there are extraordinary concerns with the reconnaissance appraisal or draft feasibility report, respectively. Upon submittal of read-ahead or review materials for an IRC or IPR, the MSC will coordinate with the District and the HQUSACE RIT to select the appropriate forum and propose potential dates. The RIT will coordinate within HQUSACE and with ASA(CW) as needed to confirm the date, forum, and Washington-level participation. The date will be contingent upon complete submittals, timely review, and timely responses to review concerns. Review and other pre-conference materials should generally be provided to HQUSACE a minimum of about six weeks before the conference (see paragraph 4 below).

(2) HQUSACE Reviews. Policy compliance review actions at HQUSACE should generally be scheduled for a minimum of 30 days, unless an alternate period is specifically approved by the RIT and OWPR. The 30-day period begins when OWPR receives the appropriate number (see below) of complete reports and accompanying document copies, and ends when OWPR presents the policy review concerns in a memorandum to the RIT. About a week should be allowed for the PDT to receive the comment memorandum, prepare responses to

the comments, and provide those responses to the RIT. About three to five days should be allowed for the HQUSACE review team to assess the responses prior to the issue resolution conference (IRC).

d. Forum. The forum of the IRC or IPR may be a telephone conference, videoconference, or a face-to-face meeting as appropriate. The forum selection should, consider the need for a project site visit. A project site visit should normally occur with the FSM or AFB. If a site visit would be useful but is not practical, slides and/or a video of the site should be presented.

3. Pre-Conference Submittals. Prior to each conference, the District will simultaneously provide the MSC and RIT with a memorandum that identifies the conference objectives, notes any concerns that warrant special attention, and lists and encloses the required pre-conference submittal materials. To ensure a focused, productive and conclusive meeting, the pre-conference materials will include the background and facts appropriate to the purpose and scope of the requested IRC or IPR. The vertical team will use the information to identify the staff that should participate and to help set the agenda.

a. Review and Report Submittal Memorandum. The transmittal memorandum forwarding pre-conference materials and decision documents for HQUSACE policy compliance support or review shall be addressed as shown below and shall cite the six-digit Project Work Item (PWI) number assigned by the financial management system. Copies of supporting materials will be cited in and copies enclosed with the transmittal memorandum. The District will furnish a copy of the transmittal memorandum and all enclosures concurrently to the MSC. The PDT should coordinate with the MSC District Support Team lead to determine the MSC submittal requirements. Mail report submittals for HQUSACE to:

Director of Civil Works
ATTN: CECW-xxD (or CEMP-xxD) (identify the appropriate RIT)
US Army Corps of Engineers
441 G. Street, N.W.
Washington, D.C. 20314-1000

To avoid the radiation requirement for all incoming mail to the HQUSACE office building and for a quicker delivery, use the mailing location below:

7701 Telegraph Road
Alexandria, Virginia 22315-3860

b. Submittal Materials. See paragraph H-4.c and the exhibits referenced therein for the required submittal materials for FSMs, AFBs, and draft report reviews. The MSC should coordinate the submittal content for other IRCs with the HQUSACE RIT. The content will depend on the scope and nature of the issues to be resolved. For any issue warranting MSC or HQUSACE involvement, the District should analyze and document the issue and proposed solution in an issue paper in accordance with paragraph H-2.f. Materials prepared specifically for an IRC should be concise and focused on the items requiring discussion and/or agreement.

c. IPR Submittal Materials. Pre-conference IPR documentation should include background information on the study; the status of major study activities, including peer, policy and legal reviews; and issue papers on any significant policy, process, or other issues that could affect the outcome of the study.

d. Peer Review of Submittal Materials. Peer review appropriate to the stage of the study should be completed and documented prior to an IRC. Technical work products that support the submitted documentation (e.g.; surveying & mapping, hydraulics & hydrology, average annual damage computations, etc.) should have been subject to peer review to confirm technical/analytical adequacy and compliance with policy. Early in the study phase, all peer review issues may not have been fully resolved. In this situation, a status report discussing significant peer review concerns and how these concerns have been or will likely be resolved must be submitted. Later in the study when Washington-level acceptance of the selected plan or draft report, the peer review activities should be generally completed for all supporting technical work products, including the documentation of those investigations and analyses. All peer review activities should be fully completed before a final report is submitted. District certification of peer review should include the certification of internal supervisory review of the report (i.e., branch chief signatures of technical and policy compliance) as well as the review team certification of technical and policy compliance.

4. HQUSACE Policy Compliance Review. OWPR will provide the HQUSACE policy compliance review, unless approval authority has been delegated to an MSC. MSCs will generally not conduct substantive policy compliance review of documents submitted for OWPR review, unless there is a need to address unusual and significant QA/QC issues. Following receipt of the District's complete submittal package for review, OWPR will assign a review manager and team. OWPR may assign the review manager role to an MSC when appropriate, but would retain responsibility for issuing review documents. The team may include subject matter experts from a District (usually outside the home District), MSC, or Planning Centers of Expertise, subject to need and availability. An incomplete submittal package will generally delay the initiation of review until all required items are provided by the District. (The RIT planner will check the submittal for completeness and facilitate follow on actions at HQUSACE.) OWPR will issue a comment memorandum within 30 calendar days to the RIT, which will transmit the review comments simultaneously to the District and MSC along with any additional instructions for achieving issue resolution. The District will provide a written response for each comment stating how the issue will be resolved. The District will forward the responses simultaneously to the MSC and the RIT, generally within a week, and no less than

three working days before the conference. The review team will immediately assess the responses in order to identify: (1) concerns that require further consultation within HQUSACE prior to the conference; (2) issues that must be included in the conference agenda for discussion and/or resolution; and (3) reviewers who should attend the conference. FSM procedures will differ slightly in that the comments and responses will be exchanged informally.

5. Conference. The next step is to convene the IRC to address and resolve any concerns remaining after OWPR's assessments of the responses. The MSC will normally host and chair IRCs and IPRs. The meetings should encourage a full discussion and understanding of the various concerns and their eventual resolution. The sponsor and appropriate Federal and State agencies should be encouraged to participate fully. The District participants should be prepared to address the policy issues raised by the HQUSACE review. The MSC will designate someone to record major discussion points and all required actions during the conference as electronic text, summarize all required actions before the end of the conference, and e-mail the text to the HQUSACE and MSC participants immediately after the conference. If possible, a draft PGM or MFR should be provided to participants before they leave the meeting in order to ensure a common understanding of the required actions and facilitate the timely completion of the conference PGM or MFR. FSM procedures will differ somewhat in that the FSM will generally follow a site visit and consist of a PDT briefing with issues addressed in a workshop format.

6. Post-Conference Guidance. The final product of an IRC and IPR will be a project guidance memorandum (PGM) from the HQUSACE RIT or a memorandum for the record (MFR) from the MSC. PGMs generally approve advancing the study, subject to specific District actions and sometimes further determinations by the MSCs. PGMs may deny or defer approval until adequate information is provided to resolve specific issues. In general, the HQUSACE RIT will issue a PGM for an AFB, FRC, or other IRC with significant policy or procedural issues. The MSC, subject to HQUSACE concurrence, will generally issue an MFR for a FSM, IPR, or IRC with less significant issues. The PGM or MFR should be issued within two weeks of the IRC or IPR, and will document the review comments and issues, significant discussion points, actions required to resolve the issues, and other decisions. The District will forward the PGM or MFR to the peer review team and will revise the PMP as needed to incorporate changes resulting from actions required in the PGM or MFR. In general, actions required in the PGM or MFR should be completed before subsequent products are forwarded to HQUSACE.

During the final report review and approval process, OWPR will compile all PGMs and the final report policy compliance assessment results into the Documentation of Review Findings that will be forwarded to ASA(CW) with the final report. The Documentation of Review Findings will demonstrate that the decision document has received policy and legal compliance review and that the document complies with all legal and policy requirements. Documentation of Review Findings will normally not include the FSM or IPR MFRs.

Exhibit H-2 - Project Study Issue Checklist

This list includes sensitive policy areas that require vertical team coordination – preferably, early in the study process. The list should be filled out based on knowledge available at the time about the selected or most likely selected plan. Any items that will not be known or addressed until later in the study should be marked as "Pending." For items that are not applicable, such as questions about existing project aspects when there is no existing Federal project, enter "NA" for not applicable. Any non-pending response with an asterisk (*) requires coordination and issue resolution through the vertical team using an issue paper as outlined in paragraph H-2.f. All issues need to be resolved before requesting approval of the decision document.

(Insert Name of Study or Project)

1. Will the report clearly articulate how the selected plan will be consistent with each of the Chief of Engineers Actions for Change for Applying Lessons Learned during Hurricanes Katrina and Rita issued 24 August 2006? YES____ NO___*.

2. Will the report clearly articulate how the selected plan will be consistent with each of the USACE Environmental Operating Principles? YES____ NO___*.

3. Has a NEPA document been completed? YES____ NO___*.

4. Will the NEPA Documentation be more than 5 years old at the time of PCA signing or construction initiation? YES___* NO____.

5. Will the ESA Findings be more than 3 years old at the time of PCA signing or construction initiation? [Note: Findings refers to Corps documentation and/or US Fish and Wildlife Service's opinions and recommendations] YES___* NO____.

6. Is ESA coordination complete? YES____ NO___*.

7. If an EIS/EA was completed for the selected plan, will anything prevent signing the Record of Decision (ROD) or Finding of No Significant Impact (FONSI)? YES___* NO____.

8. Is the selected plan consistent with the ROD/FONSI? YES____ NO___*.

9. Have there been any changes in Federal environmental laws or Administration or Corps policy since original project authorization that make updating necessary; e.g., change to the Clean Air Act status for the project area…going from attainment to non-attainment? YES___* NO____.

10. Are the feasibility-level planning, selection and justification of mitigation plans for fish and wildlife, induced flood damages, cultural or historic preservation, or recreation incomplete or deferred to the PED Phase? YES___* NO____.
[Issue papers must describe what is being mitigated, the likely mitigation plan, the likely cost of mitigation, and why the analyses are being deferred.]

11. For reevaluations that conclude further authorization is unnecessary, are the proposed mitigation plan(s) for fish and wildlife, induced flood damages, cultural or historic preservation, or recreation the same as the previously authorized plan? YES____ NO___*

12. Is there an incremental analysis/cost effectiveness analysis of proposed fish and wildlife mitigation features based on an approved method and using an accepted model? YES____ NO___*.

13. Were cost risk analysis methods applied to develop contingencies for the estimated total project costs (see Engineering and Construction Bulletin issued 10Sep07)? YES____ NO___*

14. Was the peer (technical) review of the cost estimates duly coordinated with the cost estimate center of expertise and addressed in the review documentation and certification? YES____ NO___*

15. Would the selected plan cause the previously authorized project's fully funded cost to exceed the cost limit of Section 902 of WRDA 1986? [Note: for coastal storm damage reduction projects there are two separate 902 limits, one for initial project construction and one for periodic renourishment] YES___* NO____ [Issue paper must provide the authorized project cost, price level, and current and fully funded project cost estimates and price levels].

16. Does the selected plan involve HTRW clean-up? YES___* NO____.

17. Does the selected plan involve CERCLA covered materials? YES___* NO____.

18. Are the proposed project purposes different than the previously authorized project? [Note: different than specifically noted in authorization or noted in Chief's report and is it measured by project outputs] YES___* NO____.

19. Are there any scope changes proposed for the previously authorized project? YES___* NO ____. [Issue paper must describe the authority that would enable the project to proceed without additional Congressional modification].

20. If the selected plan includes crediting a non-Federal entity for in-kind services provided either before or after authorization, has a request for a Secretary determination of credit eligibility been forwarded to HQUSACE? [Note: In order to credit a non-Federal sponsor for in-kind services, the credit must be based upon a particular Congressional authority and ASA(CW) must approve a credit eligibility request before the services are provided. The issue paper must describe the scope of the in-kind services, the schedule for providing the services, the authority for providing credit, the status of the request for ASA(CW) approval, and the resulting elements of the non-Federal cost-share (LERRD, cash and credit). If the credit is based on an existing authority, the issue paper must include a copy of the authority if it is not a general authority such as Sec 215. If there is no existing authority to credit the in-kind services, as determined by Counsel, the issue paper should present the rationale for recommending such credit in the decision document for specific Congressional authorization.] YES____ NO *.

21. Would the project cost sharing involve reimbursement to the sponsor? [Note: The issue paper must identify the circumstances and authority for recommending reimbursement.] YES___*_ NO___.

22. Is an Ability to Pay cost sharing reduction included in the selected plan? [If yes, fully describe the proposal in the issue paper, citing how this authority is applicable. Include a table showing the cost sharing by project purpose and expected Ability to Pay reductions.] YES___* NO____.

23. Is a Locally Preferred Plan recommended without an exception granted by ASA(CW) to recommend plan different from the NED, NER or NED/NER Plan prior to the release of the draft decision document for public review? [Note: if this answer is yes, then a series of questions arise that will need to be addressed in the issue paper…is plan less costly than NED plan, is the plan more costly with the same cost sharing the same as NED plan (exception), is plan more costly with all costs exceeding the cost of the NED plan at 100% non-Federal cost, or has ASA(CW) already granted an exception] YES___* NO____. Remarks:

24. Was a standard accepted Corps methodology/model used to calculate NED benefits? YES____ NO___*.

25. Are non-standard benefit categories used to select or justify the recommended plan? YES___* NO___.

26. Was the planning effort conducted in a systems/watershed context and was this reflected in the presentation of the without-project conditions, problem and opportunity statements, and the plan formulation, evaluation and selection? YES____ NO___*.

27. Were the alternatives formulated, evaluated, and selected using the four P&G evaluation accounts – NED, EQ, RED, and Other Social Effects? YES____ NO___*.

28. Did the planning effort collaborate with other Federal, state, Tribal, and local entities to develop solutions that integrate expertise, policies, programs, and projects across public entities? YES____ NO___*.

29. Were the types and degrees of risk and uncertainty clearly characterized for the selected plan and were the various adjustments included in the selected plan to reduce risk and uncertainty also described clearly? YES____ NO___*.

**Navigation Component (Inland or Harbor)**

30. Is there a navigation component (inland or harbor) in the selected plan? YES____ NO____. If Yes, answer each of the following questions for the selected plan:

31. Is there land creation? YES___* NO____.

32. Is there a single owner and/or beneficiary which are not a public body? [Public body as defined by Section 221 of WRDA 1970] YES___* NO____.

33. Are there proposals for Federal cost sharing of Local Service Facilities [e.g., dredging of non-Federal berthing areas] work? YES___* NO____.

34. Is there sediment remediation proposed under Sec. 312 authority? [i.e., Section 312 of WRDA 1990 as amended by Section 205 of WRDA 1996] YES___* NO____.

35. Is there dredged material placement on beaches where the use is not the least costly environmentally acceptable plan? YES___* NO____.

36. Will the dredged material be used for ecosystem restoration where the recommended plan is not the least costly environmentally acceptable plan? YES___* NO____.

37. Are there recreation navigation benefits? YES___* NO____.

38. Does the selected plan involve inland navigation harbor development? YES___* NO____.

39. Can the resale or lease of lands used for disposal of excavated material recover the cost of the selected improvements? YES___* NO____.

40. Will acquisition of land outside the navigation servitude be necessary for construction of the proposed improvements (either the project or non-Federal facilities that will use or benefit from the project) and will this permit local entities to control access to the project? [The latter case is assumed to exist where the proposed improvement consists of a new channel cut into lands.] YES___* NO____.

**Flood Damage Reduction Component**

41. Is there a flood damage reduction component in the selected plan? YES____ NO____. If Yes, answer each of the following questions for the selected plan:

42. Is the selected plan for protection of a single property or beneficiary? YES___* NO____.

43. Would the selected plan produce land development opportunities/benefits? [Issue paper must describe whether special cost sharing should apply.] YES___* NO____.

44. Is there any recommendation to cost share any interior drainage facilities? YES___* NO____.

45. Are there any windfall benefits that would accrue to the project sponsor or other parties? [Issue paper must describe whether special cost sharing should apply.] YES___* NO____.

46. Are there non-structural buyout or relocation recommendations? YES___* NO____.

47. Is the selected plan likely to change the existing allocated storage in lake projects? YES___* NO____.

48. Do the proposed changes to the project include any significant risks to public safety related to uncontrolled flooding? YES___* NO____.

49. Have all the public safety issues related to uncontrolled flooding been fully resolved with the district/MSC Dam Safety Officers? YES____ NO___*.

50. Have all the changes in residual public safety risks related to uncontrolled flooding been communicated to the public and incorporated into their emergency response plan? YES____ NO___*.

**Coastal Storm Damage Reduction Component**

51. Is there a coastal storm damage reduction component in the selected plan? YES____ NO____. If Yes, answer each of the following questions for the selected plan:

52. Does the selected plan protect privately owned shores? YES___* NO____.

53. Does the selected plan protect undeveloped lands? YES___* NO____.

54. Does the selected plan protect Federally owned shoreline at Federal cost? [If yes, describe what is to be protected and who bears the Federal cost.] YES___* NO____.

55. Does the selected plan involve tidal or fluvial flooding; i.e., is it clear what the project purpose is and has the project been formulated as a coastal storm damage reduction project or flood damage reduction project? YES___* NO____.

56. Is there any recommendation to cost share any interior drainage facilities? YES___* NO___.

57. Is recreation more than 50% of total project benefits needed to justify the project? YES___* NO___.

58. Are there any parking or public access issues [no public access or none provided within 1/2 mile increments]? YES___* NO___.

57. Are easements being provided to ensure public use and access? YES___ NO___*.

59. Is there a Sec. 934 of WRDA 1986 extension of the period of authorized Federal participation? YES___* NO___.

60. Are there any Sec. 111 of Rivers and Harbors Act of 1958, as amended proposals? YES___* NO___.

61. Do the proposed changes to the project include any significant risks to public safety related to uncontrolled flooding? YES___* NO___.

62. Have all the public safety issues related to uncontrolled flooding been fully resolved with the district/MSC Dam Safety Officers? YES___ NO___*.

63. Have all the changes in residual public safety risks related to uncontrolled flooding been communicated to the public and incorporated into their emergency response plan? YES___ NO___*.

**Aquatic Ecosystem Restoration Component**

64. Is there an aquatic ecosystem restoration component of the selected plan? YES___ NO___. If Yes, answer each of the following questions for the selected plan:

65. Has the selected plan been formulated using cost effectiveness and incremental analysis techniques? YES___ NO___*.

66. Was "IWR Plan" used to do cost effectiveness/incremental analysis? YES___ NO___*.

67. Are the restoration features justified by aquatic habitat restoration benefits (exclude preservation and enhancement benefits, and terrestrial habitat benefits)? YES___ NO___*.

68. Is the project purpose for restoration of cultural or historic resources as opposed to ecosystem restoration? YES___* NO___.

69. Is mitigation authorized or recommended? YES___* NO___.

70. Are there recommendations for other than restoring a degraded aquatic ecosystem [e.g., creating new habitat where it has never been]? YES___* NO___.

71. Is the significance of the habitat clearly identified using the categories and criteria defined in Section 3.4.3 of Principles and Guidelines and in paragraph 16.b of EP 1165-2-502? YES___ NO___*.

72. Has the restoration project been formulated for biological/habitat values as opposed to, for example, water quality? YES___ NO___*.

73. Is the selected plan on non-public lands? YES___* NO____.

74. Does the selected plan involve land acquisition where the value exceeds 25% of total project cost? YES___* NO____.

75. Are all the proposed recreation features in accord with ER 1105-2-100, Appendix E, Exhibit E-3? YES____ NO____*.

76. Are there recommendations to include water quality improvement? YES___* NO____.

77. Is the monitoring & adaptive management period proposal beyond 5 years after completion of construction? YES___* NO____.

78. Does the selected plan involve land acquisition in other than fee title? YES___* NO____.

74. Are there recommendations for non-native species? YES___* NO____.

79. Does the selected plan propose the use of navigation servitude? YES___* NO____.

80. Does the recommendation include monitoring costs greater than 1% of the total first cost of aquatic ecosystem restoration? YES___* NO____.

81. Does the recommendation include adaptive management costs greater than 3% of the total first cost of aquatic ecosystem restoration, excluding monitoring costs? YES___* NO____.

**Recreation Component**

82. Is there a recreation component of the selected plan? YES____ NO____. If Yes, answer each of the following questions for the selected plan:

83. Is the cost of proposed recreation development more than 10 % of the Federal project cost without recreation [except for nonstructural flood damage reduction and coastal storm damage projects]? YES___* NO____. [Issue paper must describe the proposal and whether ASA(CW) approval has been granted.]

84. Are there recreation features located on other than project lands? YES___* NO____.

85. Does the selected plan involve/provide for waterfront development? YES___* NO____.

86. Does the selected plan involve the need to reallocate authorized storage (see Section III, Appendix E, ER 1105-2-100]? YES___* NO____.

87. Does the selected plan include non-standard recreation facilities (refer to ER 1105-2-100, Appendix E, Exhibit E-2)? YES___* NO____.

**Water Supply Component**

88. Is there a water supply component of the selected plan? YES____ NO____. If Yes, answer each of the following questions for the selected plan:

89. Does the component include features other than Corps reservoir storage space for M&I water supply? YES___* NO____.

90. Do the outputs meet other needs other than M&I water supply, such as agricultural water supply? YES___* NO____.

91. Does the selected plan use non-standard pricing for reallocated storage? YES___* NO____.

92. Are there exceptions to model contract/agreement language? YES___* NO___.

**Concurrences**

| | | |
|---|---|---|
| Project Manager | _____ | Date:_____ |
| District Planning and Policy CoP leader | _____ | Date:_____ |
| District Counsel | _____ | Date:_____ |
| DDE (PM) | _____ | Date:_____ |
| MSC Planning and Policy CoP Leader | _____ | Date:_____ |
| MSC Counsel | _____ | Date:_____ |

Exhibit H-3. Feasibility Scoping Meeting Pre-Conference Submittals

The FSM submittal materials should include the following:

1. Report Text. Present a complete outline of the anticipated decision document (see Appendix G, Exhibit G-4, Feasibility Report Content). Include preliminary drafts of report text for all items in the outline from item 1 through item 5.d.(4) in Exhibit G-4. The analyses for items 5.d.(2), (3), and (4) should be complete through the preliminary screening of alternatives, i.e.; a tentative identification of the plans for more detailed analysis. The District should describe the future work that will be accomplished to develop and evaluate preliminary plans. In addition, the District should include draft text for item 8 that covers the results of the NEPA Scoping Meeting and the results of other preliminary coordination and public involvement efforts. Additional report outline topics may be presented depending on the availability of information. Identify any information gaps in the above items and note the status of pending analyses and results. The draft document sections should address the respective general evaluation guidelines presented in Appendix G, Exhibit G-1 to the extent possible at this stage of the study.

2. Documentation. The following documentation should be concise and focus on issues requiring HQUSACE buy-in:

a. Policy and Procedure Issues. The District will complete and include the Project Study Issue Checklist shown in Exhibit H-2. The submittal will identify checklist and other issues that need to be resolved, and present an analysis of options and proposed solutions in an issue paper (see paragraph H-2.g.). The District may include issue papers to address any other concerns related to the study or project implementation.

b. Peer Review. Describe the status of peer review activities and present the peer review documentation completed to date, including the status of unresolved issues and the most likely resolution.

c. Schedule. List the future study/project milestones and completion dates.

d. Project Guidance Memoranda. Provide a copy of the most recent PGM issued by the MSC or HQUSACE, even if it is from the Reconnaissance Phase or an IPR.

e. Compliance Memorandum. Include the reconnaissance approval or guidance memorandum, and a memorandum documenting the District's compliance with any PGMs resulting thus far from feasibility phase IRCs (see paragraph H-2.f).

f. Other Information. Include other information pertinent to understanding the topics above or other issues that may affect the project.

3. Copies. Provide eight (8) hard copies of the draft report text (item 1 above) and one (1) hard copy of each of the other items listed above to the HQUSACE RIT. Contact the DST for MSC submittal requirements.

Exhibit H-4. Alternative Formulation Briefing Pre-Conference Submittals

The AFB submittal materials should provide all information that is pertinent to the formulation, evaluation, comparison, and selection of the tentatively recommended plan. The AFB documentation will address the general evaluation guidelines presented in Appendix G, Exhibit G-1. Conceptually, AFB documentation would be comparable to a draft report that is about 75 percent complete. Specifically, the submittal materials should include the following:

1. Report Text. Present a complete outline of the anticipated decision document (see Appendix G, Exhibit G-4, Feasibility Report Content). Include drafts of report text for outline items 1 through 5.g, 7.b, 7.c, and 8 in Exhibit G-4. Except for items 7.c and 8, the supporting analyses should be complete. The sponsor and agencies views will be preliminary, pending the upcoming public review. The draft text for item 8 would cover the results of the NEPA Scoping Meeting and the results of other coordination and public involvement efforts to date. Additional report outline items may be presented if available. The outline should identify any information gaps in the above items and note the status and expected results of any pending analyses. The full draft report, if available, it should be submitted in lieu of the outline and text listed above.

2. Documentation. The following documentation should be concise and focus on issues requiring HQUSACE buy-in:

a. Policy and Procedure Issues. The District will complete and include the Project Study Issue Checklist shown in Exhibit H-2. The submittal will identify checklist and other issues that need to be resolved, and present an analysis of options and proposed solutions in an issue paper (see paragraph H-2.f.). The District should include issue papers to address any other concerns related to the study or project implementation.

b. Environmental Compliance. Present the status of environmental compliance actions, coordination, and any NEPA or other documentation that has been drafted (see Exhibit G-8).

c. Peer Review. Describe the status of peer review activities and present the review documentation completed to date, including the status of unresolved issues and the most likely resolution. Technical work products that support the submittal materials (e.g.; surveying & mapping, hydraulics & hydrology, environmental/NEPA documentation, average annual damage and benefit computations, cost estimates, etc.) should have been subjected to peer review. The documentation should address the PCX and Cost Engineering Directory of Expertise (DX) coordination and the application of the Cost Engineering DX technical review checklist. It should also address the heightened review of real estate costs.

d. Legal Review. Identify any legal issues and status of legal review certification.

e. Status of Engineering Activities. In general, sufficient engineering analysis should be complete to have a reasonably certain estimate of project scope, benefits, and costs. Identify any incomplete items of work that could cause significant risks/uncertainties for the project scope, benefits, or costs, and assess the likely consequences. Describe the status of the M-CACES cost

estimates, cost risk analysis, and project risk management plan.

f. Status of Real Estate. Identify any LERRD issues and the status of real estate activities, and include a copy of the draft Real Estate Plan (REP), even if it is incomplete. In general, the REP (ER 405-1-12, Chapter 12) should be sufficiently complete so as to have a reasonably certain estimate of project LERRD requirements and, for cost shared projects, a reasonably certain description of the nature and scope of the non-Federal sponsor's responsibilities and estimated LERRD credit amount. Identify any incomplete items of work that could cause significant risks/uncertainties for the project scope, benefits, or costs, and assess the likely consequences.

g. Schedule. List the future study/project milestones and completion dates.

h. Project Guidance Memoranda. Provide a copy of pertinent PGMs or MFRs.

i. Compliance Memorandum. Include the FSM MFR and a memorandum documenting the District's compliance with any PGMs resulting from feasibility phase IRCs or IPRs (see paragraph H-2.f). If no FSM was held, provide the reconnaissance approval or guidance memorandum.

j. Other Information. Include other information pertinent to understanding the topics above or other issues that may affect the project.

3. Copies. Provide eight (8) hard copies of the draft report text (item 1 above) and one (1) hard copy of each of the other items listed above to the HQUSACE RIT. Contact the DST for MSC submittal requirements.

Exhibit H-5. Draft Report Policy Compliance Review Submittals

The draft report submittal materials should include the draft decision document and preliminary draft NEPA document. Specifically, the submittal materials should include the following:

1. Draft Decision Document and Preliminary Draft NEPA Document. Provide the draft decision document and the preliminary draft NEPA document. Both documents and the appendices should be essentially complete, except for the results of the pending public review. The report will address the general evaluation guidelines presented in Exhibit G-1. The sponsor and agencies views will be preliminary, pending the upcoming public review. The report text for public and agency involvement should cover the results of the NEPA Scoping Meeting and the results of other coordination and public involvement efforts to date. Supporting analyses should be complete.

2. Documentation. The following documentation should be concise and focused on issues requiring HQUSACE buy-in:

a. Policy and Procedure Issues. The District will complete and include the Project Study Issue Checklist shown in Exhibit H-2. The submittal will identify checklist and other issues that need to be resolved, and present an analysis of options and proposed solutions in an issue paper (see paragraph H-2.f.). The District should include issue papers to address any other concerns related to the study or project implementation.

b. Environmental Compliance. Present the status of environmental compliance actions and related coordination (see Appendix G, Exhibit G-8).

c. Peer Review. Provide the peer review certification(s) and the review documentation for the draft decision document, preliminary draft NEPA document, and the supporting analyses. Peer review should be complete for all supporting technical work products. Identify any unresolved review issues and the expected path to resolve these issues. The documentation should address the PCX and Cost Engineering Directory of Expertise (DX) coordination and the application of the Cost Engineering DX technical review checklist. It should also address the heightened review of real estate costs.

d. Legal Review. Provide the District counsel's legal review certification. Identify any unresolved legal issues.

e. Engineering Activities. Provide the engineering documentation, including the M-CACES cost estimate, cost risk analysis, and project risk management plan.

f. Schedule. List the future study/project milestones and completion dates.

g. Project Guidance Memoranda. Provide a copy of pertinent PGMs or MFRs.

h. Compliance Memorandum. Include a memorandum documenting the District's compliance with the AFB PGM and/or subsequent PGMs resulting from feasibility phase IRCs or IPRs (see paragraph H-2.h).

i. Other Information. Include other information pertinent to understanding the topics above or other issues that may affect the project.

3. Copies. Provide eight (8) copies of the draft decision document and preliminary draft NEPA document to HQUSACE. Provide one (1) copy of each of the other items listed above to HQUSACE. Contact the DST for MSC submittal requirements.

## Exhibit H-6. Model Division Engineer's Transmittal Letter and Notice

### Text for Division Engineer's Transmittal Letter

(Salutation)

I hereby submit the (subject report, specify) and concur with the findings and recommendations of the District Engineer (specify name). In addition, I confirm that the report complies with all applicable policy and laws in place at the time of its completion.

Division Engineer Signature Block

Attachments

Subject Report (15 copies)
Report Summary
Documentation and certification of Peer Review
Certification of legal review
PGM compliance document
(Any other pertinent supplemental documentation)

### Text for Division Engineer's Notice

The text below is suggested for the body of a Division Engineers Notice to interested parties announcing the completion of a final feasibility report. Note that such notices are optional. The notice should not indicate that the public will be notified prior to final action, should HQUSACE materially modify the recommendation contained in the report.

The _____ District Engineer has completed the _____ feasibility report. I find the District Engineer's conclusions and recommendations to be in accord with current policy. I have submitted the District Engineer's report for Washington-level review. Comments on the report may be submitted during the next 30 days to the Director of Civil Works, 441 G Street, N.W., Washington D.C. 20314-1000. The report and the final NEPA document will soon be made available to the public.

Exhibit H-7. MSC Final Report Submittal Package

The MSC's final report submittal package will include one hard copy of each of the following items unless otherwise noted:

- Division Engineer's Transmittal Letter
- Division Engineer's Notice (if applicable)
- Final report with EIS or EA and appendices (15 copies)
- Draft ROD or draft FONSI (see Exhibit H-8) [1]
- Report mailing list
- Project Study Issue Checklist [1]
- Documentation and certification of peer review and, if applicable, EPR (10 copies) [2]
- Legal review certification
- Value Engineer (VE) Statement (see ER 11-1-321)
- Sponsor's signed letter indicating support for the recommended plan
- Non-Federal Sponsor's Self-Certification of Financial Capability for Agreements
- Draft Proposed Report of the Chief of Engineers (see Exhibit H-9) [1]
- PGM Compliance Memorandum [1]
- Report Summary (see Exhibit H-11) [1]
- M-CACES cost estimate summary, cost risk analysis, and project risk management plan
- Project map (3 copies)
- ASA(CW)/OMB Briefing Slides (see Exhibit H-10) [1]

[1] E-mail electronic versions (Microsoft © WORD or POWERPOINT compatible) to the HQUSACE RIT when the paper copies are mailed.

[2] The documentation should address the PCX and Cost Engineering Directory of Expertise (DX) coordination and the application of the Cost Engineering DX technical review checklist. It should also address the heightened review of real estate costs.

Exhibit H-8. Model Record of Decision

**RECORD OF DECISION**

**WETWATER RIVER AT BIG CITY, STATE[1]**
**FLOOD DAMAGE REDUCTION AND ECOSYSTEM RESTORATION[2]**

The final feasibility report and final Environmental Impact Statement (EIS), dated April 20XX, for the Wetwater River, Flood Damage Reduction and Ecosystem Restoration Feasibility Study addresses flood damage reduction and restoration opportunities in Big City, State. Based on the report, the reviews of other Federal, State, and local agencies, input from the public, and the review by my staff, I find that the plan recommended by the Chief of Engineers to be technically feasible, economically and environmentally justified, cost effective, in accordance with environmental statutes, and in the public interest[3,4].

The Final Feasibility Report and FEIS evaluated various structural and non-structural alternatives to address the flood damage reduction and ecosystem restoration needs of the Big City, State area. The recommended plan is the National Economic Development/National Ecosystem Restoration (NED/NER) plan and consists of a levee system and aquatic habitat with adaptive management. Specific flood damage reduction features include:

- Construction of 7.2 miles of raised and new levees;
- Construction of new discharge pipes for six existing pump stations; and,
- Construction of 12 sets of 6-foot by 6-foot concrete box culverts through the levees;

Ecosystem Restoration features include:

- Creation of 10 acres of aquatic habitat; and,
- Adaptive management of the aquatic habitat for a period of ten years to ensure outputs, as needed.

Mitigation features include:

- Creation of 10 acres of wetlands; and,
- Monitoring mitigation performance and impacts to wetlands for corrective action, if needed[5].

In addition to a "no action" plan, six structural and two non-structural alternatives[6] for flood damage reduction and six alternatives for ecosystem restoration are identified and discussed in the Corps of Engineers reports[7]. The flood damage reduction structural alternatives included levees of various heights and alignments with water control structures of various sizes. Nonstructural alternatives included relocation of structures and raising structures. The ecosystem restoration alternatives include three sizes of aquatic habitat at two sites. The North Levee alternative to protect against a flood event with a 0.02 percent chance of exceedence with 95 percent reliability with the restoration of 10 acres of aquatic habitat along the Wetwater River

is the NED/NER plan and is identified as the environmentally preferable alternative[8].

The Draft Feasibility Report and DEIS were circulated for public review for 45 days on September 13, 20XX. A meeting was held October 6, 20XX to address agency comments. All comments submitted were responded to in the FEIS dated March 20XX. Additional comment letters were received on the FEIS. No objections to the project were expressed.

The Corps modified the FEIS to satisfy four of five Essential Fish Habitat conservation recommendations provided by National Marine Fisheries Service. The Corps did not concur with the recommendation to mitigate adverse impacts to freshwater marsh by creating at least two acres of new marsh for each acre destroyed. The selected plan will mitigate impacts by providing an equal or greater habitat value of damaged marshes, rather than trying to achieve a fixed ratio of acreages.

Consistent with reducing flood damages in an environmentally sustainable manner, the project will be designed, constructed and operated to avoid impacts to anadromous fish by limiting work in the Wetwater River to non-migratory periods and through the installation of screens on water control discharge facilities. The specific designs and operating plans will be formulated in consultation with an interagency fishery resource evaluation team. All practicable means to avoid or minimize adverse environmental effects have been incorporated into the recommended plan[9].

Technical and economic criteria used in the formulation of alternative plans were those specified in the Water Resource Council's Principles and Guidelines. All applicable laws, executive orders, regulations and local government plans were considered in the evaluation of alternatives[10]. Based on review of these evaluations, I find that the (monetary and non-monetary) benefits outweigh the costs and any adverse effects. This Record of Decision completes the National Environmental Policy Act process.

_____ _____

Date

John Paul Woodley, Jr.
Assistant Secretary of the Army
(Civil Works)

_____

Model ROD Instructions. Each ROD should include the minimal amount of information necessary to comply with 40 CFR Section 1505.2. Notes for the model include:

[1] The Final Feasibility Report, FEIS, Report of the Chief of Engineers, and the ROD should all use the identical project title

[2] Include all project purposes cited in the Report of the Chief of Engineers

[3] The ROD must have a clear approval statement

[4] The ROD must state what the decision is

_____

(Footnotes continued from previous page)

[5] If the selected plan includes monitoring, the ROD should state it; if it is required for mitigation, the ROD must state it
[6] The ROD must identify all of the alternatives considered
[7] The ROD should reference the decision document that discusses the alternatives in greater detail.
[8] The ROD must identify the environmentally preferable alternative
[9] The ROD must state whether all practicable means to avoid or minimize environmental harm have or have not been adopted, and if not, why
[10] The ROD must state the considerations addressed in arriving at the decision

Exhibit H-9. Model Proposed Report of the Chief of Engineers

Proposed Report[1]

CECW-PC (1105-2-10a)

SUBJECT: Wetwater River at Big City, State[2]

THE SECRETARY OF THE ARMY

1. I submit for transmission to Congress my report on flood damage reduction and ecosystem restoration along the Wetwater River in the vicinity of Big City, State[3]. It is accompanied by the report of the XXX District Engineer and the Northwestern Division Engineer. These reports are in final response to a resolution by the Committee on Transportation and Infrastructure of the House of Representatives, adopted 19 May 2003[4]. The resolution requested a review of "the report of the Chief of Engineers on the Wetwater River, State and other pertinent reports, with a view to determining whether modifications of the recommendations contained therein are advisable in the interest of flood control, fish and wildlife conservation and restoration, and other related water resources purposes in the vicinity of Big City, State[5]." The Big City Levee, Wetwater River project was authorized by the Flood Control Act of 1936. Project construction of the Big City Levee was completed in 1968[6]. Preconstruction engineering and design activities, if funded, would be continued under the authority provided by the resolution cited above.

2. The reporting officers recommend authorizing a plan to reduce flood damages by increasing the height of the Big City Levee and restore the ecosystem by improving habitat for fish, wildlife and waterfowl in the vicinity of Big City, State. The recommended plan for reducing flood damages includes increasing the height of approximately 9,140 linear feet of levee about 5 feet, replacing stoplog structures, modifying drainage structures, replacing or modifying 3 pump stations, and relocating 4 utility crossing relocations. Unavoidable environmental impacts would be fully compensated for by the creation of approximately 1.2-acres of emergent wetland[7]. This mitigation feature would be monitored for up to five years to ensure its performance[8]. The recommended plan to restore the ecosystem consists of dredging 55 acres to create aquatic habitat and using the dredged material to create an island with 21 acres of riparian habitat in the Wetwater River above Memorial Bridge[9]. The recommended plan also includes post-construction monitoring and adaptive management for a period of ten years to ensure project performance[8]. Since the recommended plan would not have any significant adverse effects, no mitigation measures (beyond management practices and avoidance) or compensation measures would be required[7]. The recommended plan is the national economic development and national ecosystem restoration plan[10]. All features are located in State.

3. The Big City Flood Control District is the non-Federal cost-sharing sponsor for all features. Based on October 2006 price levels, the estimated total first cost of the plan is $52,900,000, including $32,900,000 for flood damage reduction and $20,000,000 for ecosystem restoration[11,12]. The Federal share of the total project cost would be about $34,400,000 (65 percent) and the non-Federal share would be about $18,500,000 (35 percent).

a. In accordance with the cost sharing provisions of Section 103 of the Water Resources Development Act (WRDA) of 1986, as amended by Section 202 of WRDA 1996, the Federal share of the first costs of the flood damage reduction features would be about $21,400,000 (65 percent) and the non-Federal share would be about $11,500,000 (35 percent). The cost of lands, easements, rights-of-way, relocations, and dredged or excavated material disposal areas is estimated at $3,100,000. The total cost includes $1,200,000 for environmental mitigation, $200,000 for environmental monitoring, and $1,000,000 for adaptive management[13]. Big City would be responsible for the operation, maintenance, repair, replacement, and rehabilitation (OMRR&R) of the project after construction, a cost currently estimated at about $190,000 per year. The OMRR&R estimate includes $15,000 for monitoring and adaptive management beyond the construction phase[14]. In addition to the above, Big City would be fully responsible for performing the investigation, cleanup and response of hazardous materials on the project site. The cost of hazardous material work is estimated at approximately $900,000 and is a non-Federal responsibility[15]. Also in addition to the above, Big City would be fully responsible for removing and relocating utilities and discharge pipelines on the project site that are non-compensable, at a cost estimated at approximately $1,900,000.

b. In accordance with the cost sharing provisions of WRDA 1986, as amended by Section 210 of WRDA 1996, the Federal share of the first costs of the ecosystem restoration features would be about $13,000,000 (65 percent) and the non-Federal share would be about $7,000,000 (35 percent). The cost of lands, easements, rights-of-way, relocations, and dredged or excavated material disposal areas is estimated at $1,100,000. The total cost includes $300,000 for environmental monitoring, and $900,000 for adaptive management. Big City would be responsible for the operation, maintenance, repair, replacement, and rehabilitation (OMRR&R) of the project after construction, a cost currently estimated at about $140,000 per year. The OMRR&R estimate includes $60,000 for monitoring and adaptive management beyond the construction phase.

4. Based on a 4.875-percent discount rate and a 50-year period of analysis, the total equivalent average annual costs of the project are estimated to be $3,170,000, including OMRR&R[16].

a. The total equivalent average annual flood damage reduction costs are estimated to be $1,960,000, including OMRR&R. The selected plan is estimated to be 99 percent reliable in protecting portions of Big City, State from a flood which has a one percent chance of occurrence in any year (100-year flood). The selected plan would reduce average annual flood damages by about 81 percent and would leave average annual residual damages estimated at $3,500,000. The
equivalent average annual benefits are estimated to be $18,200,000 with net average annual benefits of $14,700,000. The benefit-cost ratio is approximately 7.5 to 1[17].

b. The total equivalent average annual aquatic ecosystem restoration costs are estimated to be $1,210,000, including OMRR&R. Cost effectiveness and incremental cost analysis techniques were used to evaluate the alternative plans to ensure that an efficient ecosystem restoration plan was recommended. The cost of the recommended aquatic ecosystem restoration features is justified by restoring 380 average annual habitat units on 55 acres of aquatic habitat and 120 average annual habitat units on 21 acres of riparian habitat. The plan would restore the habitats in the most cost-effective manner. The restored aquatic habitat would increase the habitat for the fall chinook salmon listed as endangered under the Endangered Species Act and would improve the aquatic habitat for other species in the Wetwater River for several miles downstream. The restored riparian habitat would increase scarce resting, nesting, feeding, and rearing habitat for migratory waterfowl, shorebirds, and neotropical migrant birds using the internationally significant Western Flyway[18].

5. I concur in the findings, conclusions, and recommendations of the reporting officers. Accordingly, I recommend that the plan to reduce flood damages and restore the ecosystem for the Wetwater River at Big City, State be authorized in accordance with the reporting officers' recommended plan at an estimated cost of $52,900,000 with such modifications as in the discretion of the Chief of Engineers may be advisable. My recommendation is subject to cost sharing, financing, and other applicable requirements of Federal and State laws and policies, including Section 103 of WRDA 1986, as amended by Section 202 of WRDA 1996, and WRDA 1986, as amended by Section 210 of WRDA 1996. The non-Federal sponsor would provide the non-Federal cost share and all LERRD. Further, the non-Federal sponsor would be responsible for all OMRR&R. This recommendation is subject to the non-Federal sponsors agreeing to comply with all applicable Federal laws and policies.

6. The recommendation contained herein reflects the information available at this time and current departmental policies governing formulation of individual projects[19]. It does not reflect program and budgeting priorities inherent in the formulation of a national civil works construction program or the perspective of higher review levels within the executive branch. Consequently, the recommendation may be modified before it is transmitted to the Congress as a proposal for authorization and implementation funding. However, prior to transmittal to Congress, the sponsor, the State, interested Federal agencies, and other parties will be advised of any significant modifications and will be afforded an opportunity to comment further.

ROBERT L. VAN ANTWERP
Lieutenant General, U.S. Army
Chief of Engineers

Instructions. The order, structure, content, and level of detail of each sentence in the model serves a specific purpose and should be replicated to the extent possible. Other instructions are noted in the footnotes below.

---

[1] "Proposed Report" only appears on unsigned copies circulated for S&A Review and in conjunction with filing the final report and FEIS with EPA
[2] The Final Feasibility Report, FEIS, Report of the Chief of Engineers, and the ROD should all use the identical project title
[3] State each recommended project purpose and the general project or study area
[4] State whether the reports are an interim or final response to the study authorization, and identify the study resolution or section and act and its date that authorized the study
[5] Quote the purpose and scope stated in the study authorization, unless it is a general authority; e.g., These reports were prepared under the authority of Section 216 of the 1970 Flood Control Act, which authorizes the Secretary of the Army to review the operation of projects constructed by the Corps of Engineers when found advisable due to significantly changed physical, economic or environmental conditions.
[6] If the recommendation involves modifying an authorized project, state the project authorization, including modifications, and the status of implementation.
[7] If mitigation is required, state the mitigation plan with a simple measure of scale of each significant feature; if mitigation is not required, state that mitigation is not required; the typical language is presented here even though mitigation normally would not be part of an NED/NER Plan.
[8] All monitoring and adaptive management measures should be presented as feature and state the purpose and duration.
[9] Summarize the features for each project purpose separately; also summarize features separately for work recommended under different authorities (such as design deficiency corrections under existing authority).
[10] State whether the recommended plan is the NED, NER, NED/NER or Locally Preferred Plan.
[11] Present the total first costs and, if multipurpose, the first cost for each purpose.
[12] Present more than 2 or 3 significant digits for any first or annual cost/benefit estimate. Round all estimates under $1 million to at least the nearest $1,000, estimates under $10 million to the nearest $10,000; under $100 million to the nearest $100,000; under $1 billion to the nearest $1 million, etc.
[13] Present the estimated costs for any construction phase mitigation, monitoring and adaptive management.
[14] Present the rounded estimated costs for any OMRR&R monitoring and adaptive management.
[15] Present any associated costs that are not included in the cost shared amount.
[16] Paragraphs 3 and 4 are usually combined for single purpose projects.
[17] Present the BCR to the nearest hundredth if it is between 0.90 and 1.10, otherwise only to the nearest tenth.
[18] Present the significance of non-monetary outputs used to justify the recommended plan.
[19] Following the completion of the policy, S&A and NEPA Reviews, and the resolution of all review issues, OWPR will edit this document as needed, add a paragraph addressing the reviews, and add the items of local cooperation.

Note: Paragraphs regarding the results of the Washington-level review (including environmental compliance) and the items of local cooperation are not included until after the completion of the final NEPA and State and Agency reviews.

Exhibit H-10. OMB Briefing Slides

The OMB Briefing slide file should include separate slides depicting:

- Study Title - Include the full project name and state. If the report recommends more than one project, furnish a project title slide and a set of the following slides (only one on the legislative authority is needed) for each project.
- Legislative Authority - Identify the study authority. If report is an interim, so state.
- Project Purpose
- Non-Federal Sponsor – Identify the sponsor.
- State Map and Project Location - State boundaries, state capital, and the location of project and major water features should be conspicuous. Nearby major population centers should also be indicated.
- Problem - An illustration, preferably a photograph, should depict the major water resources problems to be solved by the report recommendation. A list or graphical representation of significant problem and/or opportunity statements is acceptable if a photo is not available.
- Alternatives Considered. Include a word slide that lists structural and non-structural alternatives considered.
- Project Map - Provide a simple, multicolor map of the entire project. Schematics are acceptable, even preferable if done well.
- Recommended Plan Features - One or more slides of the significant project features (conceptual level) if they can not be illustrated on the Project Map.
- Economic Summary - Include total project cost, average annual costs, average annual benefits and the BCR (if applicable). Round all costs and benefits to the nearest $1,000, and the BCR to one decimal place unless between 1.0 and 1.05. Show the price level and discount rate.
- Cost Apportionment – A simple table using the same format in the project summary.
- Deviation from NED Plan – If an LPP is recommended, show the incremental costs, benefits, and impacts.
- Environmental Compliance – Show whether an EA or EIS was prepared, the date of the FONSI or ROD if signed, and any significant environmental compliance issues.
- Public Involvement – Summarize the extent of public involvement and note any major public controversies or issues.
- Artist's Rendition - Annotate a photo to show the project design or an artist's rendition of completed project (optional).
- Project Implementation – List the remaining milestones such as the month and year for the design agreement execution, PCA execution, contract award, and construction completion.
- CWRB – Show the date, summarize the decision, and list any OMB attendees.

The project name and date should appear on each slide.

Exhibit H-11. Model Report Summary

REPORT SUMMARY
(Specify Study Name)

| | |
|---|---|
| Feasibility Scoping Meeting: | DD MMM YYYY |
| Alternative Formulation Briefing: | DD MMM YYYY |
| AFB Guidance Memorandum: | DD MMM YYYY |
| Draft Report Guidance Memorandum: | DD MMM YYYY |
| Division Engineer Transmittal: | DD MMM YYYY |
| Received at CECW-PC: | DD MMM YYYY |
| CWRB Briefing: | DD MMM YYYY |
| 30-Day S&A Review start: | DD MMM YYYY |
| 30-Day S&A Review end: | DD MMM YYYY |
| FEIS filed with EPA: | DD MMM YYYY |

**STUDY INFORMATION**

**Study Authority.** Include the full text of principal resolutions(s) or other authority.

**Study Sponsor.** Include the name(s) of the study sponsor(s).

**Study Purpose and Scope.** State whether the report is an interim or final response to the study authority. Succinctly identify the study purpose and scope.

**Project Location/Congressional District.** Include a concise description of the study area and project location (including clear maps with all key features identified) and identify the Congressional District(s).

**Prior Reports and Existing Water Projects.** Include a concise discussion of relevant prior studies, reports, NEPA documents and Endangered Species Surveys, existing water projects, and other key related activities. Also include relevant documents and projects undertaken by entities other than the Corps.

**Federal Interest.** Define the Federal interest, consistent with Army policies, based on an appraisal of the costs, benefits and environmental impacts of the recommended project alternative.

**STUDY OBJECTIVES**

**Problems and Opportunities.** Specify the key problems being addressed and the opportunities for alleviating them.

**Planning Objectives.** Statement of the intended purposes of the planning process; what alternatives are intended to achieve.

**Planning Constraints.** Restrictions that limit the extent of the planning process.

## ALTERNATIVES

**Plan Formulation Rationale.** Strategies and approaches used to develop alternative plans.

**Management Measures and Alternative Plans.** Discussion of the measures, scales, and combinations used to develop alternative plans, and reformulation to refine the performance of alternatives (Tabular presentations to supplement discussion may be appropriate).

**Final Array of Alternatives.** Describe the plans that qualified for the final comparison, including the NED, NER or Combined Plan, and any Locally Preferred Plan. Discuss the rationale for eliminating alternative plans.

**Comparison of Alternatives.** Describe how the plans in the final array of alternatives compare in meeting the planning objectives and constraints. Cite key risks and uncertainties associated with the plans, and explain how these factors have been treated. Identify key tradeoffs among the alternatives (could be among outputs and effects, or against risks and uncertainties).

**Key Assumptions.** Identify key assumptions that underlie the analysis. Consider hydrologic, environmental, economic, and other assumptions key to the formulation and recommendation, including those related to analytic models used in the study.

**Recommended Plan.** Identify the selected plan, and describe the rationale supporting the selection. List the significant features with one or two measures of scale for each one.

**Systems / Watershed Context.** Describe how the Recommended Plan is integrated with other watershed purposes. Discuss agency partnerships and cooperation. Include which other agencies were invited to be formal Cooperating Agencies and those which accepted, and identify the responsible lead agency.

**Environmental Operating Principles.** Describe how the recommendation supports the USACE Environmental Operating Principles.

**Peer Review.** Describe how the plan and associated analyses were reviewed for quality, as well as any substantive peer review comments and their resolution.

## EXPECTED PROJECT PERFORMANCE

**Project Costs.** Present all project costs by category (including construction elements by project purpose, LERRD, PED, construction management (E&D and S&A), deferred (periodic nourishment), associated non-Federal costs, and any other as applicable), and detail any cost allocation as applicable. Specify price level and discount rate applied. Follow the sample Table 1 format and level of detail. Separate “elements” should be presented for each project purpose.

Table 1 (Sample)

Cost Summary
"Subject Study"
(October 200x Price Levels)

| Construction Item | Cost |
|---|---|
| Lands & Damages | $ 900,000 |
| Elements | |
| Relocations | $ 6,600,000 |
| Locks | 163,100,000 |
| Fish & Wildlife Mitigation | 5,100,000 |
| Channel Improvements | 10,100,000 |
| Cultural Resources Preservation | 100,000 |
| Monitoring | 200,000 |
| Buildings, Grounds, & Utilities | 5,200,000 |
| Permanent Operating Equipment | 2,500,000 |
| Subtotal | $ 192,900,000 |
| Preconstruction Engineering & Design (PED) | 34,800,000 |
| Construction Management (E&D, S&A) | 10,700,000 |
| Total First Cost | $ 239,300,000 |
| HTRW Remedial Action* | $ 500,000 |

* Associated financial costs that are not part of the recommended Federal project but are a necessary non-Federal responsibility.

**Equivalent Annual Costs and Benefits.** List all project costs and benefits computed to an annual equivalent basis, including results of risk and uncertainty analyses. Distinguish between major categories of benefits (both within and between the four accounts, as appropriate: NED, RED, EQ, OSE), monetary and non-monetary benefits, and primary versus incidental benefits. Present net benefits and benefit/cost ratios where applicable. (Include benefit/cost ratio evaluated at a 7 percent discount rate per Executive Order 12893.) Follow the sample Table 2A and B formats to the extent possible. Benefits from Ecosystem Restoration studies do not require monetization, and should be displayed in the units used in the evaluation. Benefit/cost ratios are not required for NER projects. Combined Plans should list both NED and NER benefits and costs associated with the recommended plan:

Table 2A (sample NED)

Equivalent Annual Benefits and Costs
"Subject Study"
(October 200x Price Level, 50-Year Period of Analysis, 4.875 Percent Discount Rate)

| | |
|---|---|
| Investment Costs | |
| Total Project Construction Costs | $ 239,400,000 |
| Interest During Construction | 36,600,000 |
| Total Investment Cost | $ 276,000,000 |
| | |
| Average Annual Costs | |
| Interest and Amortization of Initial Investment | $ 17,800,000 |
| (*additional annual costs, if applicable*) | 1,600,000 |
| OMRR&R | 2,600,000 |
| Total Average Annual Costs | $ 22,000,000 |
| | |
| Average Annual Benefits | $ 35,600,000 |
| Net Annual Benefits | $ 13,600,000 |
| Benefit-Cost Ratio | 1.6 to 1 |
| Benefit-Cost Ratio (computed at 7%)[1] | 1.3 to 1 |

[1] Per Executive Order 12893

| Table 2B (Sample Combined Plan)<br>"Subject Study"<br>Economic Costs And Benefits Of Recommended Plan[1] ($1,000) | | | | | | |
|---|---|---|---|---|---|---|
| **Item** | **FDR** | | **Ecosystem** | | **Total Costs** | |
| | **Allocated Costs** | **Benefits** | **Allocated Costs** | **Benefits** | **Allocated Costs** | **Benefits** |
| Investment Cost | | | | | | |
| First Cost | 4,260 | | 40,446 | | 44,706 | |
| Interest During Construction | 271[3] | | 3,066[4] | | 3,337[4] | |
| Total | 4,531 | | 43,512 | | 48,043 | |
| Annual Cost | | | | | | |
| Interest and Amortization | 272 | | 2,615 | | 2,887 | |
| OMRR&R[2] | 47 | | 8 | | 55 | |
| Subtotal | 319 | | 2,623 | | 2,942 | |
| Annual Benefits | | | | | | |
| Monetary (FDR) | | 577 | | | | 577 |
| Non-monetary (Ecosystem) | | | | 888 AAHU's | | 888 AAHU's |
| | | | | | | |
| Net Annual FDR Benefits | | 258 | | | | 258 |
| FDR Benefit-Cost Ratio | | | | | | 1.8 to 1 |
| FDR Benefit-Cost Ratio (at 7%)[5] | | x.x to 1 | | | | x.x to 1 |

[1]Based on October 200x price levels, 5 5/8 percent rate of interest, and a 50-year period of analysis.
[2]Operation, Maintenance, Repair, Replacement, and Rehabilitation
[3] Two year period of construction assumed for J levee removal and construction of setback levee
[4] Three year period construction assumed for overall project
[5] Per Executive Order 12893

**Cost Sharing.** Show the apportionment of the first costs, including associated costs, between the Federal government and the non-Federal sponsor(s) using the format displayed in Table 3. Present all financial costs of the Project and describe how such costs will be shared with the non-Federal sponsor, including in-kind services, LERRDs, other credits, and any other applicable considerations.

| Table 3<br>(Project Name) - Cost Sharing<br>(October 200x Price Level) | | | |
|---|---|---|---|
| Item | Federal Cost | Non-Federal Cost | Total Cost |
| Ecosystem Restoration (ER) | | | |
| PED[1] | $ xx,xxx,000 (65) | $ x,xxx,000 (35) | $ xx,xxx,000 |
| LERR&D | $ 0 | $ xx,xxx,000 | $ xx,xxx,000 |
| Ecosystem Restoration | xx,xxx,000 | xx,xxx,000 | xxx,xxx,000 |
| Subtotal | $ xxx,xxx,000 (65) | $ xxx,xxx,000 (35) | $ xxx,xxx,000 |
| ER Subtotal | $ xxx,xxx,000 (65) | $ xxx,xxx,000 (35) | $ xxx,xxx,000 |
| Flood Damage Reduction (FDR) | | | |
| PED | $ x,xxx,000 (65) | $ x,xxx,000 (35) | $ x,xxx,000 |
| LERR&D | $ 0 | $ x,xxx,000 | $ x,xxx,000 |
| Flood Damage Reduction[2,3] | xx,xxx,000 | x,xxx,000 | xx,xxx,000 |
| Section xxx Credit | x,xxx,000 | (x,xxx,000) | |
| Subtotal | $ xx,xxx,000 (65) | $ x,xxx,000 (35) | $ xx,xxx,000 |
| FDR Subtotal | $ xx,xxx,000 (65) | $ xx,xxx,000 (35) | $ xx,xxx,000 |
| Associated Costs[4] | | $ x,xxx,000 | |
| Recreation | | | |
| PED | $ x,xxx,000 (50) | $ x,xxx,000 (50) | $ x,xxx,000 |
| LERR&D | $ 0 | $ xx,xxx,000 | $ xx,xxx,000 |
| Recreation | xx,xxx,000 | -xx,xxx,000 | xx,xxx,000 |
| Subtotal | $ xx,xxx,000 (50) | $ xx,xxx,000 (50) | $ xx,xxx,000 |
| Recreation Subtotal | $ xx,xxx,000 (50) | $ xx,xxx,000 (50) | $ xx,xxx,000 |
| Total Project | $ xxx,xxx,000 (xx) | $ xx,xx,000 (xx) | $ xxx,xxx,000 |
| Associated Costs | $ 0 (0) | $ x,xxx,000 | $ x,xxx,000 |
| Total with Associated Costs | $ xxx,xxx,000 (xx) | $ xx,xx,000 (xx) | $ xxx,xxx,000 |

[1]Sponsor contributes 25% during the design phase and the remaining 10% the construction phase

[2]Non-Federal amount must be 5 percent or more in accordance with Section 103 of WRDA 1986

[3]If the Sponsor constructs a portion of the project under Section 104 of WRDA 1986, show separate lines for the completed Section 104 work and for the remaining work

[4]Non-creditable reolcation, HTRW cleanup, or other costs

**Project Implementation.** Identify the non-Federal sponsor(s) for project implementation. Briefly state the institutional arrangements, the responsibilities of the various partners, and other information pertinent to implementation. Include plans for adaptive management and resource monitoring if applicable.

**Operation, Maintenance, Repair, Rehabilitation, and Replacement (OMRR&R)**. Present summary of OMRR&R actions, costs, and responsibilities.

**Key Social and Environmental Factors.** Identify key social and environmental factors and consequences associated with the plan, and the influence these key factors had on the formulation of the alternatives and on the selection process. Describe cumulative effects where appropriate. Describe any mitigation actions associated with the plan, efforts taken to avoid/minimize adverse impacts, and commitments related to monitoring and management of mitigation actions.

**Stakeholder Perspectives and Differences.** Describe public involvement, review and consultation actions; describe key perspectives and differences among stakeholders based on comments received on the draft report and responses to those comments. Describe the views of Resource agencies and how concerns were addressed. Note actions that have been taken to resolve issues, and actions proposed to address any unresolved issues.

**Environmental Compliance.** Identify whether the NEPA document is an EA or EIS. State the status of the NEPA document and the FONSI or ROD. Identify any other significant, non-routine compliance controversies and the final resolution. Summarize the significant responses to the filing of the FEIS, if applicable, and the final resolution of issues. (The District should include a draft statement initially and provide a final version for HQUSACE to insert after the public/agency review of the FEIS is completed.)

**State and Agency Review.** Identify the dates S&A review began and ended. Identify the states and agencies that responded, identify any objections or issues that they expressed, and summarize the final resolution of any objections or issues. (To be inserted by HQUSACE after the S&A Review ends.)

**Certification of Peer and Legal Review.** State the dates of the certifications of the technical and legal adequacy of the final feasibility report. Summarize the involvement of the Cost Engineering DX in the approval of the total project cost estimate and similar efforts in the approval of the real estate cost estimates.

**Policy Compliance Review.** Summarize the final results of the HQUSACE policy compliance review process. (To be inserted by HQUSACE when the Documentation of Review Findings are completed.)

Exhibit H-12 . Washington-Level Milestones

| Action | Date* |
|---|---|
| OWPR Preliminary Assessment | 1 week |
| CWRB District Engineers Briefing | 2 weeks |
| S&A Review, Interested Party, & EIS filing letters signed and sent to District | 2.5 weeks |
| District sends letters/reports to State/agencies & files EIS | 3 weeks |
| Notice of availability appears in Federal Register** | 5 weeks |
| OWPR policy assessment | 4 weeks |
| District responses to policy assessment concerns | 5 weeks |
| IRC, if necessary (telephone or video) | 6 weeks |
| S&A Review period ends (30 days) | 7 weeks |
| NEPA review period ends (30 days) | 9 weeks |
| District provides RIT draft responses to significant S&A Review comments | 10 weeks |
| RIT issues response letters for significant S&A Review comments | 10.5 weeks |
| MSC issues response letters for significant NEPA review comments | 10.5 weeks |
| OWPR completes Documentation of Review Findings | 11 weeks |
| OWPR provides final report package to RIT | 11 weeks |
| RIT forwards final report package to DCW and Chief of Engineers | 12 weeks |
| Chief signs Report of the Chief of Engineers | 13-15 weeks |
| RIT forwards Report of the Chief of Engineers to ASA(CW) | 14-16 weeks |

* Typical cumulative durations relative to OWPR receipt of a complete final report package.

** The notice of availability is published in the Federal Register no earlier than the Friday of the week after EPA receives the FEIS, final report and proposed Report of the Chief of Engineers. The notice is the official start of the NEPA review of the FEIS.

Exhibit H-13. Sample Agenda for District Engineer's Briefing

- Welcome (RIT leader representing the presenting district)
- Introductions
- Project Briefing: District Engineer
- Division Engineer Briefing
  - Rationale for project support (transmittal letter)
  - Expected response to draft Report of Chief of Engineers
  - Other observations
- QA Briefing: Division Engineer / RIT SES
  - Certifications of technical, legal and policy compliance
  - Significant and/or unresolved technical, legal and policy compliance concerns
- Sponsor support: Local sponsor
- Policy Review Assessment: OWPR
- Summary of Project Briefing: District Engineer
- Lessons Learned / After Action Report: District Engineer
  - What was supposed to happen?
  - What did happen?
  - Why did it happen that way?
  - How will we improve next time?
- Lessons Learned (others, as applicable): MSC, OWPR, Local Sponsor, others
- Action: Director of Civil Works
- Close: CWRB Chair

Exhibit H-14. District Engineer's Briefing

- An overview of the report including the rationale for plan selection and the recommended plan (and the NED, NER or combined NED/NER plan if different);
- Description of how the plan is integrated with other watershed purposes;
- Description of how the recommendation supports the Environmental Operating Principles;
- How the Actions for Change for applying the lessons learned from Hurricanes Katrina and Rita were incorporated, particularly those dealing with robust design, risk and reliability;
- The district's compliance actions from the PGMs;
- The highlights and results of the District-level peer, legal and policy compliance reviews, including:
    - The substantive comments and responses and their resolution; and
    - The cost engineering and real estate cost estimate reviews;
- Substantive OWPR policy compliance review comments and responses and their resolution;
- An overview and the general outcome of the Public Involvement process, including any independent outside review, the major concerns that came about, and how they were resolved;
- Public and agency comments and responses on the draft NEPA documents;
- An assessment of the project delivery process, including:
    - The PDT membership and performance;
    - Type and frequency of meetings;
    - Lessons learned from the PDT and vertical team;
    - Recommended improvements and what will be done differently in the future; and,
- What would you do differently? (Anywhere in the process).

Exhibit H-15. Report of the Chief of Engineers Signature Package

The package recommending signature of the Report of the Chief of Engineers will include the following items:

- Report Summary
- OWPR Documentation of Review Findings
- Project map.
- Peer and legal review certifications
- Summary of agency and public comments
- Letter signed by the sponsor indicating support for the recommended plan
- Correspondence received from S&A Review and related CECW-P responses
- Mailing list-for the S&A Review
- Feasibility report, FEIS or EA/FONSI, appendices, and/or supporting documentation (addendums)
- Signature-ready Report of the Chief of Engineers
- Unsigned letters to the Chairman, Committee on Environment and Public Works, U. S. Senate, and the Chairman, Committee on Transportation and Infrastructure, U. S. House of Representatives, enclosing a copy of the Report of the Chief of Engineers in response to their requests for advance information for examination by their respective committees (to be signed by the Chief of Staff)