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Planning

PLANNING CIVIL WORK PROJECTS UNDER THE ENVIRONMENTAL OPERATING PRINCIPLES

1. Purpose. The purpose of this Circular is to reaffirm the U.S. Army Corps of Engineers general policy and further describe the specific procedures for formulating and evaluating Civil Works projects consistent with environmental sustainability as defined in the Corps of Engineers Environmental Operating Principles and Implementation Guidance.

2. Applicability. This Circular applies to all HQUSACE elements, major subordinate commands and district commands having Civil Works responsibilities. It is applicable to all Corps of Engineers Civil Works feasibility studies and general reevaluation studies initiated after the publication of this Circular, where a new Congressional authorization is necessary. It is also applicable to projects developed under Section 205 of the Continuing Authorities Program.

3. References.

a. ER 1105-2-100, Planning Guidance Notebook (PGN)

b. U.S. Army Corps of Engineers Environmental Operating Principles and Implementation Guidance, 26 March 2002

c. Trade-Off Analysis Planning and Procedures Guidebook, Institute of Water Resources, April 2002, IWR Report 02-R-2

d. Planning Manual, Institute of Water Resources, November 1996, IWR Report 96-R-21

e. Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies (Principles and Guidelines), Water Resources Council, 10 March 1983

4. Background and Policy.

a. The Implementation Guidance for the Corps Environmental Operating Principles defines environmental sustainability 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." In accord with this definition, the Corps goal is to strive to achieve the appropriate balance between the economic and environmental benefits provided by a project. Currently, Corps projects can be developed to achieve this goal through the formulation of plans that produce both national economic development benefits and national ecosystem restoration benefits. Where practical and supportable, the plan formulation should incorporate the principles of avoiding or minimizing significant adverse impacts within the guiding principle of limiting damage to the natural ecosystem. Through the incorporation of these principles, plans will likely avoid or minimize damages and be less intrusive. Thus, avoidance of disrupted natural processes is preferable, where practical, to creating new resources.

b. Plans that are formulated to produce both economic and ecosystem restoration benefits are labeled as the Combined NED/NER Plan in the Planning Guidance Notebook (ER 1105-2-100). These plans are defined as plans that produce both types of benefits such that "no alternative plan or scale has a higher excess of NED plus NER benefits over total project costs." In addition, the Combined NED/NER Plan is a product of a planning process that requires first the identification of the NED Plan or NER Plan for the primary problem under consideration (i.e., flood damage reduction, navigation or ecosystem restoration). Alternative plans that address ecosystem restoration are then considered and compared to the optimal plan to identify the trade-offs and determine the recommended Combined NED/NER Plan. In many situations, maintenance or restoration of natural processes may be at the expense of net NED benefits and increases in NED benefits may be at the expense of NER outputs. The key is the identification of the best reasonable mix of benefits at a reasonable cost.

5. Principles. The underlying principles of economic development benefits and ecosystem restoration outputs are described in more detail in ER 1105-2-100. The key principle for economic development benefits is the potential increases in the national outputs of goods and services. The key principle for ecosystem restoration outputs is the restoration of significant ecosystems and resources. These principles are also applicable when formulating a Combined NED/NER Plan. In some instances, conflicts may arise from the implementation of plans that produce a given type of benefit (economic development or ecosystem restoration) or even multiple categories of the same type of benefit. The formulation and evaluation process for the Combined NED/NER Plan shall explicitly account for those conflicts and identify a balanced plan that addresses both types of benefits. The Combined NED/NER plan is not developed by adding "ornaments" to a NED or a NER plan. It is a different plan resulting from a formulation process that considers the opportunities for each purpose and the synergies between combined purposes. From here on, the Combined NED/NER Plan will be known simply as the Combined Plan. Project delivery teams (PDT's) should consider and take advantage of every opportunity to engage in the formulation of combined plans unless prohibited by study authority, the lack of financial capability or authority of the sponsors.

6. Primary Purpose. The formulation and evaluation process suggested in this regulation requires the identification of a primary purpose and a plan that optimizes benefits for that purpose (NED or NER Plan). In most instances, the primary purpose will be flood damage reduction, navigation or storm damage prevention and the formulation process will result in the identification of the NED Plan. In accordance with the formulation principles stated in the Principles and Guidelines (reference e), the NED Plan is a plan that reasonably maximizes economic development benefits consistent with protecting the environment. As stated in paragraph 4.a. of this regulation, the plan formulation for the primary purpose should also, where practical and supportable, incorporate the principles of avoiding or minimizing significant adverse impacts within the guiding principle of limiting damage to the natural ecosystem. Only after the incorporation of these principles, should mitigation be evaluated.

7. Specific Procedures for the Formulation and Evaluation of the Combined Plan.

a. Planning Process. The six-step planning process described in Section I of Appendix E of ER 1105-2-100 will be followed to formulate and evaluate the Combined Plan. The Planning Manual (IWR Report 96-R-21) provides a detailed description of the six-step planning process and specific suggestions applicable to various types of projects. In general, formulation of the Combined Plan requires compliance with the following principles: broad formulation of alternatives to meet opportunities; identification of cost-effective plans with multiple benefits; identification of the highest ranked plan based on trade-off analysis; and, the recommended Combined Plan must be justified. All policies stated in ER 1105-2-100 applicable to each project purpose are also applicable to the Combined Plan. The following paragraphs expand and clarify specific policies applicable to formulation and evaluation of the Combined Plan.

b. Step 1, Define Problems and Opportunities and Step 2, Inventory and Forecast. Under Step 1, PDT's must clearly define problems, opportunities, objectives and constraints for both economic development and ecosystem restoration. Efforts must be directed towards identifying the potential for addressing national economic development opportunities and for restoring significant ecosystems or resources. The significance of the ecosystems or resources to be restored shall be clearly documented in the planning document following the criteria and guidelines provided in ER 1105-2-100. The project delivery team must ensure that planning objectives are clearly defined in consistency with the procedures defined in ER 1105-2-100. The key product of Step 2 shall be a clear definition of the future without project condition.

c. Step 3, Plan Formulation. PDT's should identify all reasonable management measures that will contribute to achieve the objectives and avoid or meet the constraints identified for the study. The mix of management measures should include structural and non-structural measures. It should also include measures that could be added to the NED or NER only plans to take advantage of opportunities created by these plans, and measures that can jointly produce economic development and ecosystem restoration benefits. Consideration of all these types of measures is critical for the success of the formulation process. Normally, Corps studies are authorized to address a primary purpose. Consistent with current Corps authorities and the Principles and Guidelines, the formulation process shall be conducted in three distinct sub-steps. The first sub-step is to formulate plans that address the primary purpose of the study (flood damage reduction, navigation or ecosystem restoration). The second sub-step is to identify the NED or NER Plan. The third sub-step is to formulate plans that address other problems and opportunities as well as the primary problem under study. The emphasis of the formulation process will be on formulating alternatives that take advantage of the synergies created by the plans that address both the primary problem and the relevant secondary problems. If the primary problem is flood damage reduction, other plans will be formulated to address both flood damage reduction and ecosystem restoration opportunities. If the primary problem is ecosystem restoration, other plans will be formulated to address both ecosystem restoration and economic development opportunities.

d. Step 4, Evaluation. The evaluation framework for the Balanced Plan requires assessing benefits across different project purposes and, in some cases, performing tradeoffs between different types of benefits. This critical and complex planning step is divided into 5 sub-steps.

(1) Evaluation Sub-step 1, Decision Criteria. The decision criteria for the cost-effectiveness and trade-off analysis are total national benefits and total cost. Total national benefits are subdivided into two sub-criteria, national economic development benefits and national ecosystem restoration outputs. Consistent with existing formulation principles, incidental recreation benefits are not to be considered part of the economic development benefits for cost-effectiveness and trade-off analysis purposes, except where floodplains will be evacuated through acquisition and the relocation of its occupants. The national economic development benefits and the ecosystem restoration outputs can be subdivided into more specific criteria to represent the different types of benefits or outputs produced by the alternative plans under consideration if desirable. Criteria that do not enable planners to discriminate among plans can be safely eliminated from the analysis. An example of a non-discriminating criterion would be one for which all plans have exactly the same measured effect. The best criteria are quantitative and cardinal in their metric.

(2) Evaluation Sub-step 2, Identify Cost Effective Plans (not-dominated plans). Applying the decision criteria in sub-step 1, the total number of plans under consideration would be screened to identify a set of cost effective plans (plans that are not dominated by any other plan that has been formulated). A dominated plan is not cost effective in the sense that there is another plan that costs the same or less than this plan and accomplishes at least as much or more than the dominated plan. Non-cost effective plans (dominated plans) would never be chosen as a recommended plan and are eliminated as early in the process as possible. The result of this sub-step is a set of cost effective plans, none of which is dominated by any other plan. As no one plan is clearly best, a preferred plan can only emerge from this set as the result of a trade-off analysis.

(3) Evaluation Sub-step 3, Trade-off Analysis. There are various methods that can be used to assess and trade-off the cost-effective plans' effects to help identify the best Combined Plan to be further considered. No single trade-off method will be adequate or appropriate for all situations. A good trade-off procedure will be transparent, understandable, replicable, and will use valid data transformations and algorithms. Developing a valid trade-off approach can be both difficult and controversial, so PDT's are encouraged to seek specialized assistance in developing an approach, and must coordinate with their vertical team early in the planning process to assure that their approach will be accepted. Once a trade-off approach is selected, the most difficult issue to address related to the evaluation of a Combined Plan is the fact that the metrics for the benefits/outputs produced are not interchangeable. Until better techniques are available, a suggested approach is to use surrogates, such as indexes, and normalization procedures to conduct the trade-off analysis (reference 3.c). Trade-off analysis requires the implicit or explicit assignment of preferences (weights) to each decision criterion. Assignment of preferences is a subjective process that should reflect the relative importance assigned to each criterion by the PDT with inputs considered from all stakeholders. Various techniques are available to assist the PDT in determining preferences. The technique selected for determining and the resulting weights must be properly documented and supported in the feasibility report. Sensitivity analyses will be conducted to demonstrate the impact of using different sets of preferences (weights) in the final outcome of the analysis. Care must be exercised when assigning weights to ensure that the final set of weights reasonably reflects the relative importance of each purpose to the overall plan. It is important to avoid situations where the final plan selection could be driven by the production of a small quantity of benefits with a disproportionately large weight.

(4) Evaluation Sub-step 4, Rank of Plans. The final outcome of the trade-off analysis is a rank of plans. The highest ranked plan performs best relative to all the other plans formulated, the criteria identified and the determined set of preferences. The highest ranked plan is the Combined Plan.

(5) Evaluation Sub-step 5, Plan Justification. Next, it is necessary to determine if the highest ranked Combined Plan is justified. The justification requirement in this case is that the

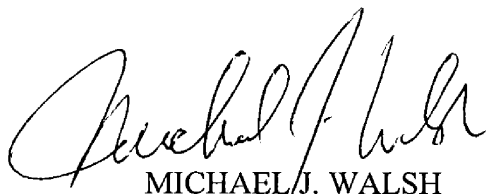
plan is justified if the benefits of each purpose included in the plan exceed the separable costs of the purpose plus the joint allocated costs. Procedures to calculate separable costs and allocate costs are provided in ER 1105-2-100, Appendix E, paragraph E-63. If the highest ranked plan is not justified for one or both purposes, the plan is eliminated from further consideration and the justification test is repeated for other plans in order of their rank. This step is repeated as necessary until the highest ranked justified plan is identified and carried to the next step. This plan is designated as the Combined Plan.

e. Steps 5 and 6, Comparison, Final Trade-off Analysis and Plan Selection. The NED or NER Plan is the benchmark for comparison to the Combined Plan. Benefits foregone, benefits gained and differences in total cost shall be quantified, displayed and documented. Other important decision making criteria may also be considered in support of the selection of the Combined Plan. Finally, the benefit to cost ratio for the Combined Plan must be reported. If no justified Combined Plan is identified as a result of the analysis, then the NED or NER Plan shall be recommended for implementation.

8. Cost Sharing Requirements. A Combined Plan shall be cost shared in accordance with the cost sharing requirements established for each purpose included in the plan. For projects that include measures that have joint costs, costs shall be allocated using the Separable Cost/Remaining Benefits method as described in ER 1105-2-100.

9. Implementation. This guidance is effective immediately. Districts and divisions should inform CECW-PG of any problems with the implementation of this guidance.

FOR THE COMMANDER:



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