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Part III

Environmental Protection Agency

Guidelines for Specification of Disposal Sites for Dredged or Fill Material

ENVIRONMENTAL PROTECTION AGENCY

[40 CFR Part 230]

[FRL 1241-3]

Guidelines for Specification of Disposal Sites for Dredged or Fill Material

AGENCY: Environmental Protection Agency.

ACTION: Proposed regulation.

SUMMARY: These Guidelines revise and clarify the September 5, 1975 interim final Guidelines regarding discharge of dredged or fill material into waters of the U.S. in order to:

(1) reflect the 1977 Amendments of section 404 of the Clean Water Act;

(2) correct inadequacies in the interim final Guidelines by filling gaps in explanations of unacceptable adverse impacts on aquatic and wetland ecosystems and by requiring documentation of compliance with the Guidelines; and

(3) produce a final rulemaking document.

The existing interim final Guidelines will remain in effect until the effective date of these revised Guidelines.

DATES: All comments received on or before November 19, 1979 will be considered.

ADDRESS: Send written comments to: Kenneth Mackenthun, Criteria and Standards Division, Office of Water and Waste Management, (WH-558), U.S. Environmental Protection Agency, 401 M Street, SW., Washington, D.C. 20460. Each person submitting a comment should include his or her name and address and give reasons for any recommendations. A copy of all public comments will be available for inspection and copying at the EPA Public Information Reference Unit, Room 2922 (EPA Library), 401 M Street, SW., Washington, D.C. 20460.

FOR FURTHER INFORMATION CONTACT: Kenneth Mackenthun, 202-755-0100.

Supplementary Information

Background

The Federal Water Pollution Control Act (FWPCA) Amendments of 1972 established a new permit program for the discharge of dredged or fill material in navigable waters. Under section 404 of the FWPCA, the Corps of Engineers (COE) specifies disposal sites based on application of Guidelines developed by the Administrator of EPA in conjunction with the Secretary of the Army acting through the Chief of Engineers. (Hereinafter, "404(b)(1) Guidelines" or "Guidelines"). In any case where such Guidelines alone would prohibit the specification of a disposal site, the Corps may still specify a site through the additional application of the economic impact of the site on navigation and anchorage. The Administrator may deny or restrict the specification or use of any disposal when he determines, after the opportunity for hearing and consultation with the COE, that a discharge will have unacceptable adverse effect on municipal water supplies, shellfish beds and fishery areas (including spawning and breeding areas) wildlife, or recreational areas.

The interim final Guidelines recognized that all aspects of aquatic ecosystems, including wetlands, may be affected by the discharge of dredged or fill material. The concept of critically important components of sites of the aquatic environment was set forth in the Guidelines and nine such components were identified. The Guidelines emphasized the importance of wetlands as a component of the aquatic environment. They identified the values associated with wetlands and specified methods of preventing or minimizing impacts of the discharge of dredged or fill material on wetlands. The interim final Guidelines also set out procedures for testing material proposed for discharge in order to predict unacceptable impact on aquatic organisms.

The COE regulations were revised, extensively reorganized, and repromulgated on July 19, 1977. The regulations established certain "Nationwide" permits in accordance with the concept of General or categorical permits in § 230.6 of the interim final guidelines. In enacting section 404(e) of the 1977 Clean Water Act Amendments, Congress also approved the use of general permits, including nationwide permits, to minimize administrative involvement in activities that have minimal individual or cumulative adverse impact on the aquatic and wetlands ecosystems. Greater use of General Permits is expected in the future.

Section 404 became the focus of considerable debate in the 95th Congress. In December 1977, the FWPCA was amended and substantial changes were made in section 404. The amendments specified several additional applications of the Guidelines: (1) General permits shall be based on 404(b)(1) Guidelines; (2) a State desiring to administer permit program in certain waters must use and assure compliance with the 404(b)(1) Guidelines; (3) the Administrator of EPA can withdraw a State program or prevent a State from issuing a permit if the State fails to comply with the 404(b)(1) Guidelines; (4) in order for the construction of a Federal project to be exempted under section 404(r), its EIS must include consideration of the 404(b)(1) Guidelines, and (5) best management practices prepared under a 208(b)(4) (B) and (C) statewide regulatory program must comply with the 404(b)(1) Guidelines.

Although the Clean Water Act uses the term "Guidelines" in section 404(b)(1), the requirements placed on their use in the Amendments demonstrate that they are regulatory in nature.

The interim final guidelines incorporated by reference the definition for "discharge or fill material" among other definitions from 33 CFR 209.120(d). Sanitary landfills were included among the examples of discharges of fill material into navigable waters. Current COE regulations (33 CFR 320) require a section 404 permit for fill material discharged into waters of the U.S. to construct a levee or dike for the rentention of solid waste. The discharge of solid waste within such retention structures is currently subject to regulation under section 402 of the Clean Water Act. Sanitary landfills in waters of the U.S. are now the subject of policy discussions among organizational units of EPA and the Corps of Engineers, with a view to the possibility of consolidating the regulation of such activities under a single regulatory authority.

Purpose and Content of the Guidelines

The purpose of the section 404(b)(1) Guidelines is to carry out the objective of the Act: to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. To accomplish that objective, it is necessary to control degradation of waters of the U.S. attributable to the discharge of dredged or fill material. The Guidelines are concerned with aquatic ecosystems because all parts of the systems are related and disruption of one part can cause changes in other parts. In many cases, such changes are foreseeable.

Waters of the U.S. vary greatly with respect to biogeographical characteristics. In addition, the use of those waters varies around the Nation as do the methods of discharging dredged or fill material. These and other variations make it unrealistic at this time to arrive at numerical criteria or standards for toxic or hazardous substances to be applied on a nationwide basis. The susceptibility of

wetlands to destruction by purely physical placement of dredged or fill material and the wide national variation in amount and quality of wetlands further complicate the problem of arriving at nationwide standards. As a result, the Guidelines concentrate on specifying the tools to be used in evaluating and testing the impact of dredged or fill material discharges on waters of the U.S.

The Guidelines also explain the appropriate use of these tools in particular circumstances to ensure that the objectives of the Act are met without unnecessary burden. Comments interspersed in the text provide further explanations and examples as appropriate.

Guideline Organization

The Guidelines are organized into nine Subparts, each of which is subdivided into numbered sections. After presenting general material such as policy and definitions, the Subparts deal with compliance; general physical, chemical and biological evaluations and tests and determinations; physical and chemical components of the aquatic and wetlands environment; special aquatic and wetlands sites; communities and populations of organisms dependent on water quality; human use characteristics; habitat development and restoration of water bodies; and general provisions, including consideration of cumulative and secondary impacts on the aquatic ecosystem. Factors that must be considered for every permit application are grouped into Subparts A through D. Factors that are important, but are not pertinent for every site for which a permit application is made, are grouped in Subparts E through G. Subpart H treats special processes and procedures. Material in Subparts D through G (chemical, physical, and biological characteristics of special aquatic environments and their human uses) has been organized in terms of values, possible loss of values due to discharge of dredged or fill material, methods of avoiding loss of values, and determinations that should be made in arriving at a finding of compliance with the Guidelines.

Documentation of Guideline Application and Compliance

Specific documentation is important to the permit applicant, the permitting authority, and any reviewing authority to ensure an understanding of the basis for each decision to allow, condition, or prohibit a discharge through application of the Guidelines. Documentation of information is required for: (1) facts and data gathered in the evaluation and testing of the extraction site, the material to be discharged, and the disposal site; (2) factual determinations regarding changes that can be expected at the disposal site if the discharge is made as proposed; and (3) findings regarding compliance with regulatory conditions involving mandatory standards, prevention of adverse impacts, and minimization of adverse impacts where practicable.

Documentation provides a record of actions taken that can be evaluated for adequacy and accuracy and ensures consideration of all important impacts in the evaluation of a permit application. The specific requirements for documentation in any given case depend on the level of investigation necessary to provide sufficient information about the extraction site, the material to be discharged, and the disposal site to provide a basis for a reasonable understanding of the impact on the aquatic and wetlands ecosystems.

Major Issues

Several important areas of the Guidelines involve important questions of policy which give rise to possible alternative treatments. This Preamble identifies for each issue the approach that has been selected and incorporated into the Guidelines and explains why this approach was selected. However, it should be noted that there remains an opportunity to alter these positions prior to final publication based upon analysis of informed public comment.

Issue Number 1. What are the requirements and limitations for the evaluation and consideration of practicable alternatives? [230.10(a)]

a. Is it necessary to consider additional alternatives where an initial evaluation under 404(b)(1) Guidelines shows that there would be adverse impacts from the initially proposed alternative but that those impacts could be judged "acceptable" within the context of 404(b)(1) Guidelines?

Approach Used in the Guidelines: The proposed revisions to the Guidelines take the position that even where the initial 404(b)(1) Guidelines evaluation shows that impacts fall within an "acceptable" range, it remains necessary to examine and consider practicable alternatives with even less damaging environmental impacts.

Reasons for Selecting This Approach: The 403(c) criteria (on which the Guidelines are statutorily required to be based) include "other possible locations and methods of disposal or recycling of pollutants including land-based alternatives." A national goal of the Clean Water Act is "that the discharge of pollutants into the navigable waters be eliminated by 1985." Moreover, the National Environmental Policy Act (NEPA) also imposes an obligation upon Federal agencies to interpret and administer regulations in accordance with the policies of NEPA. The courts have held repeatedly that the consideration of alternatives is the "linchpin" of NEPA. If impacts on wetlands or other special aquatic resources are to be prevented or minimized, then it is essential to identify least damaging practicable alternatives for the permitting authority's consideration in determining whether, and on what terms, the permit should be issued.

Further, in connection with wetlands, EPA Administrator's Statement Number 4, Protecing Our Nation's Wetlands, states that it is the Agency's policy in its decision process to preserve and protect wetlands from damaging misuses. Implementation of this policy requires that alternatives be evaluated and that the least damaging alternative be selected where practicable. Executive Order 11990, Protection of Wetlands, provides an additional foundation for requiring a broad consideration of alternatives in programs intended to protect wetlands through its directive for Federal agencies to take action to minimize the destruction, loss, (or) degradation of wetlands, and to preserve and enhance the natural and beneficial value of wetlands in carrying out programs affecting land use, including but not limited to water and related land resource planning and regulating and licensing activities.

Although the Executive Order does not apply to individual permit actions by private parties in non-Federal wetlands, it does apply to regulations which affect wetlands, such as the 404(b) guidelines.

b. What range of alternatives must be considered?

Approach Used in the Guidelines: The proposed revision requires that the evaluation of practicable alternatives must take into account *all* alternatives which meet the criteria of practicability, which as used here includes consideration of economic, technical, and logistical feasibility. The spectrum of alternatives considered should include both so-called "internal" alternatives (modifications to the activity within the scope of the application itself such as timing of discharge, alternate locations at the same general site, mitigating measures, etc.) and "external" alternatives (such as major modifications in the nature of the proposed activity or change in site *outside* the site proposed in the permit application.

Reasons for Selecting This Approach: External alternatives are not practicable if they fail to achieve the fundamental purpose of the proposed activity.

Consideration of "internal" alternatives needs little justification beyond the application of common sense. If the applicant has within his immediate capability an alteration in the project which will lessen the environmental impact, yet remain practicable, he should certainly implement it. Moreover, it is entirely possible that such an evaluation might even result in a *lower* cost project when such a broader evaluation is carried out. This is particularly plausible when considering the problems of erosion, flood damage, materials decomposition, etc., which are often of concern with construction in or near the water.

Support for the proposition that alternatives should also include "external" factors comes from: (1) section 403 of the Act; (2) NEPA; and (3) past practice. Section 403(c)(1)(F) specifically refers to other possible locations and methods of disposal, without limitations. Also, cases under NEPA and CEQ regulations, which are relevant by analogy, have held that even alternatives which are outside the existing authority of the agency must be considered. In addition, several 404 cases have involved consideration of alternatives sites not owned by the applicant. Discharges into the waters of the U.S. are allowed only through a permit process under which the applicant's interest in conducting a discharge is subject to the national interest in maintaining the integrity of the Nation's waters. However, it should be noted that the intent here is not to require consideration of the extreme or the absurd, but only those alternatives which are truly practicable. It is expected that the "Rule of Reason" shall be applied in the context of this alternatives test. The size of the activity and its impact will certainly be major factors in determining how far the search for alternatives should go.

c. Must the least damaging practicable alternative be selected, and can any alternative be accepted so long as it does not have "unacceptable" impacts?

Approach Used in the Guidelines: Generally the least damaging, yet practicable, alternative should be selected. In the case of discharges of *fill* material into *wetlands,* water dependency for the proposed activity should be considered a mandatory condition of compliance except upon the finding that other siting or construction alternatives are not practicable and the proposed fill will not cause a permanent adverse disruption to beneficial water quality uses of the system.

Reasons for Selecting This Approach: Support for the proposition that the least damaging alternative should be selected can be found in part in the statement of goals of the Clean Water Act. Section 101 provides that it is the goal of the Act to Maintain the chemical, physical, and biological integrity of the Nation's waters and to eliminate the discharge of pollutants (including dredge material, rock, and sand as defined in section 502) into the navigable waters. A selection of a more damaging practicable alternative over a less damaging one would be inconsistent with those goals particularly when the less damaging alternative is obvious and easily identified. Moreover, the mere requirement that alternatives be considered implies that where practicable, the less harmful choice will be made. Otherwise, the consideration of alternatives would be a mere formality.

d. Is identification of a least damaging practicable alternative on the basis of the section 404(b)(1) evaluation decision as to the outcome of the NEPA and/or Public Interest Review (PIR) alternatives evaluation?

Approach used in the Guidelines: The alternatives evaluation within the section 404(b)(1) Guidelines is separate and distinct from the NEPA and PIR alternatives evaluation. If the § 404(b)(1) review leads to a finding in favor of specification of a proposed site, that finding does not obviate the requirement for further alternatives evaluation of the proposed work via the requirements of NEPA and the PIR.

Reason for Selecting this Alternative: The requirements of NEPA and PIR take into account a broader range of environmental and other factors (e.g. air quality impacts, esthetics, of extent of public need for the proposed project) than those required to be considered by the Guidelines. Accordingly, in cases where the Guidelines themselves do not preclude the specification of a proposed disposal site, the more comprehensive requirements of NEPA and PIR may nevertheless lead to a decision to deny the requested permit.

Issue Number 2. Are water quality standards violation and violations of 307(a) standards the only grounds for findings of unacceptable adverse impacts within the context of 404(b)(1) Guidelines or can such findings be based upon a broader consideration of effects on the aquatic ecosystem?

Approach Used in the Guidelines: Any finding of acceptability of impact within the context of 404(b)(1) Guidelines (i.e., specification or non-specification of the site) *must* be made on the basis of *all* of the conditions of compliance under these 404(b)(1) Guidelines. That is, it must be based upon determinations of impact on the aquatic ecosystem, including such factors as wildlife habitat, commercial fisheries, and modifications of currents, as well as water quality and toxic pollutant standards.

Reasons for Selecting This Approach: The language of section 404(b)(1) itself supports a broad view of the impacts to be addressed in the Guidelines. That section says that the Guidelines shall be based on criteria "comparable" to the criteria in section 403(c). Thus, the section 404(b)(1) Guidelines are intended to be as broad in scope as the section 403 criteria. The section 403 criteria clearly include ecological concerns above and beyond the baseline numercial parameters of water quality (See Section 403(c)(1)(B), (C), and (G)). Moverover, section 404(b)(1) says that the Guidelines are to be based on criteria *comparable* to those of section 403. Thus, Congress recognized that the material to be disposed of under section 404 might be different from materials typically disposed of at sea and that section 404 waters might be affected somewhat differently than the seas. Finally, the wording of section 404(b) makes it clear that a site may be prohibited on the basis of such Guidelines "alone," implying that the broader considerations of ecological effect were to be dealt with in the context of the 404(b) decisions.

The fact that section 404(c) [1] goes beyond strict water quality consideration also supports the scope of the (b)(1) Guidelines. On its face, 404(c) is not limited to considerations of water quality since it refers to "unacceptable adverse effect on municipal water supplies, shellfish beds and fishery areas (including spawning and breeding areas), wildlife or recreational areas." In addition, since section 404(c) can be used before there is an application for a permit, it clearly contemplates consideration of the ecological characteristics of the site alone, wholly apart from the contaminants in a particular discharge.

The breadth of section 404(c) is relevant because of relationship between section 404(b) and (c). Senator Muskie's opening statement of the 1972 Conference Report explains that EPA has two opportunities for imput, apart from 309 authority; first, EPA develops

[1] Section 404(c) allows the Administrator to veto a site if a discharge of dredged or fill material will have an "unaceptable adverse effect" on enumerated resources.

the section 404(b)(1) Guidelines which serve as a general, advance guidance for the 404 program; second, EPA has an opportunity to police the application of those Guidelines by evaluating the ecologic implications of a particular permit under 404(C) (Legislative History of the Federal Water Pollution Control Act prepared by the Congressional Research Service of the Library of Congress. Vol. 1, page 177). If, on the other hand, the section 404(b)(1) Guidelines were narrower in scope than section 404(c), the permitting authority would continually be issuing permits which, although admittedly in compliance with EPA's Guidelines, would be subject to veto by the Administrator. It seems improbable that Congress intended the program to operate in such a manner.

Another indication that the section 404(b)(1) Guidelines were expected to include environmental effects generally can be found in section 404(e). That section allows the Corps to issue general permits when it determines that the separate and cumulative impacts of a category of activities will have minimal adverse "environmental" effects. Where the seprate of cumulative "environmental" effects are more than minimal, the Corps must apply the section 404(b)(1) Guidelines to each discharge individually instead of to the categroy. If the Guidelines were limited to water quality and toxics, there would be no reason to consider "environmental" impacts in deciding whether it would be appropriate to forego section 404(b)(1) scrutiny of individual projects.

Issue Number 3: How should the requirements for testing be structured?

Approach Used in the Guidelines: The proposed regulation includes procedures for physical, chemical, and biological testing of dredged or fill material proposed to be discharged into the waters of the United States. These proposed procedures are essentially identical to the testing procedures of the interim final guidelines of September 5, 1975 (40 CFR 230, Section 4–1). Within 30 days of the date of this proposal, detailed information will be provided in the **Federal Register** concerning possible approaches to revision of section 404(b)(1) testing procedures soliciting broad public comment on this aspect of the section 404(b)(1) evaluation process.

Reason for Selecting this Approach: Since publication of the interim final guidelines, experience in their implementation and the results of ongoing research have indicated the need to revise the testing procedures to improve both their operational efficiency and technical quality. Several approaches to modification of the current procedures have been considered and alternative approaches to the testing issue have been developed in considerable detail. These are still being prepared for public review. In order for this important issue to receive the most thorough focus and broadest comment, the testing issue will be prepared as a separate item for public comment within 30 days. Following a consideration of comments from this special publication, the modified testing approach will be proposed for inclusion in the Guidelines.

Issue Number 4. What is the relationship between sections 404 and 311?

Approach Used in the Guidelines: Section 311 of the Clean Water Act imposes reporting requirements, cleanup liabilities, and civil penalties in the event of spills of oil or hazardous substances in amounts which may be harmful. Both the identity of the hazardous substances and the amounts which may be harmful are specified in regulations. To date, 299 substances have been designated as hazardous. The section 404(b)(1) Guidelines have been drafted with these requirements in mind. However, because of the difficulty in measuring the exact amount of particular hazardous substances in dredged or fill material and because the amount which may actually be harmful may be vastly different from a spill of concentrated material when the substance is contained in dredged or fill material, we did not simply incorporate quantities in the section 311 regulations. The approach described below is taken to ensure the protection of the waters.

Reasons for Selecting This Approach: Section 230.10(c) provides that no discharge of dredged or fill material will be permitted if it will have an unacceptable adverse impact on the waters of the United States. Subsequent sections ensure that the impact of any discharge will be fully understood before any decision is made to permit the discharge. For example, under § 230.23(f), the permitting authority is required to make a determination of the "potential for acute or chronic effects on aquatic and wetland organisms, including bioaccumulation, as a result of the biological availability of pollutants in the solid, liquid, or suspended particulate phases."

Before making that determination, the permitting authority, pursuant to § 230.22, must consider the likelihood that the dredged or fill material in question is a carrier of pollutants. If this inquiry indicates that pollutants, such as 311 hazardous substances, are likely to be present, then the permitting authority is required to undertake specified tests as provided in § 230.23 to determine the effect of the proposed discharge at the proposed disposal site. The Guidelines state explicitly that one circumstance to be considered in assessing the need for testing is any history of spills of petroleum products or substances designated as hazardous under section 311. Thus, under the section 404(b)(1) Guidelines, a discharge of dredged or fill material containing more than the designated quantity of hazardous substances could be permitted *only* where there is prevailing evidence that the discharge will in fact not be harmful.

Public Participation

On September 7, 1978, the Office of Water Planning and Standards distributed for limited review a draft of the section 404(b)(1) Guidelines. More than 300 copies were distributed to Federal, State and local agencies, environmental/conservation groups, trade associations, civic groups and other interested parties and individuals. Thirty-two responses were received on the Guidelines and the following synthesis is representative of the comments received.

1. *Comment:* Several commenters stated that the Guidelines do not distinguish between regulatory and background materials, and recommended that the Guidelines should be divided into two sections, namely background on the effects of discharges on aquatic biota, wetlands, water quality, etc., and the specific regulatory procedures to evaluate those effects.

Answer: The Guidelines generally are physically divided into a procedural assessment part and an ecosystems guidance part, but it is not possible conceptually to divorce one from the other, since the two sections must be used in conjunction to properly evaluate a section 404 permit. To separate the two parts in a manner which subordinates the ecosystems guidance part would imply that the latter is not important or meaningful in the section 404 (b)(1) evaluation. This would be contrary to the purpose for which the ecosystems guidance is provided, namely to ensure that an adequately rigorous evaluation is carried out. This guidance also helps to ensure consistency of the evaluation process by providing a structured format for consideration of each of the special systems treated.

2. *Comment:* One commenter stated that activities authorized under General Permits should not require individual review and approval by regulatory agencies.

Answer: This comment may reflect confusion over the operational effect of the Guidelines. The Guidelines do not require review under the Guidelines when an individual proposes to undertake an activity covered by a General Permit. However, the establishment of a General Permit itself must be based on an assessment under the Guidelines of the activities to be covered.

3. *Comment:* Several commenters suggested that the Guidelines failed to adequately protect wetlands, and that EPA should do more to prevent the destruction of wetlands in the U.S.

Answer: The section 404 program in general and the Guidelines in particular are designed specifically to control the discharge of dredged or fill material into waters of the U.S., including wetlands. In this sense, section 404 and the Guidelines do not constitute a full-scale "wetlands protection law." However, the Guidelines do recognize wetlands as a particularly important component of the waters of the United States. This revision is designed to maintain that emphasis, but also to emphasize other aquatic areas that have values deserving special consideration.

4. *Comment:* One commenter strongly objected to the presumption that toxic pollutants are present in dredged material unless demonstrated otherwise by detailed testing procedures of the Guidelines.

Answer: Testing procedures for toxic substances have been incorporated into the Guidelines to ensure a healthy human environment and to prevent damage to the aquatic ecosystem and the organisms which occupy it. However, this testing is not required for every discharge. Indeed, it will be the exception, not the rule. The Guidelines have been structured in such a way as to provide for the elimination from chemical testing for those discharges where the probability of contamination is reasonably believed to be low. This "general evaluation" of § 230.22 is based upon such factors as proximity of the extraction site to known sources of pollution, potential routes of pollutant entry to the extraction site, and similarity of the material to be discharged to that comprising the substrate at the discharge site.

5. *Comment:* The "water dependency test" of § 230.10(e) is too weak as currently drafted. Although the requirement exists that the "* * * activity associated with the fill must have direct access or proximity to, or be located in, the water resource in question to fulfill its basic purpose * * *", it provides the applicant an easy escape if * * * "other site or construction alternatives are not practicable." Such a wording provides no regulatory controls beyond those already embodied in § 230.10(a)–(d).

Answer: EPA essentially agrees that the above-quoted draft language provided little specific regulatory authority except to highlight the presumption that fills into wetlands and other special areas are less likely to be found "acceptable". Accordingly, we have revised § 230.10(e) to clearly establish upon applicants a requirement to demonstrate a need for the basic purpose of proposed fill activities in wetlands or other special aquatic areas. This test is in addition to other evaluation requirements (e.g. alternatives, mitigation) of the Guidelines. The effect of this change is to complement and strengthen the overall precept of the Guidelines that adverse impacts upon valuable wetland areas should be minimized while avoiding the imposition of an unduly stringent generic restriction against all activities (e.g., primary residence housing in large geographical areas dominated by wetlands) involving filling within such areas.

Regulatory Analysis

Since these proposed Guidelines serve principally to revise the existing interim final Guidelines and since the operating regulations for the 404 Program are the Corps regulations, the basic costs and impacts of the Federal dredge and fill regulatory program derive from regulations already promulgated and in effect. However, it may be anticipated that some *incremental* costs and impacts may derive from these proposed Guidelines since their application will result in some changes in the manner in which proposed discharges are evaluated and perhaps in the ultimate specification decision. It is difficult or impossible to predict the net direction and magnitude of such incremental costs and impacts, since there may be either increases or decreases depending upon the specific case. On the one hand, these proposed Guidelines may require more costly documentation and/or lead to more permit denials or restrictive conditions. On the other hand, however, the more clearly drawn general evaluation procedures (which will excuse most small discharges from chemical testing) may reduce permit-processing costs and lead to fewer denials on the basis of purely speculative fears of potentially large environmental impact. In addition, the more carefully designed evaluation process should reduce the chance of "mistakes" requiring costly cleanup.

The overall economic effect of these regulations will depend upon such site-specific factors as the size and complexity of the project, the degree and nature of public interest, the general state of environmental quality, and the operating mode of the local regulatory authority. Only after several years of experience in operating the permit program under these Guidelines can we attempt to meaningfully assess the incremental difference. In conclusion, we have no reason to believe at present that the proposed Guidelines are significant regulations within the meaning of Executive Order 12044, and thus no Regulatory Analysis is required.

Subpart A—General

Sec.

Subpart B—Compliance With the Guidelines

Subpart C—General Physical, Chemical, and Biological Evaluations, Tests, and Determinations

Subpart D—Physical and Chemical Components of the Aquatic Ecosystem, including Wetlands

Subpart E—Special Aquatic Sites

Subpart F—Communities and Populations of Organisms Dependent on Water Quality

Subpart G—Human Use Characteristics

Subpart A—General

§ 230.1 Purpose and policy.

(a) The purpose of these Guidelines is to restore and maintain the chemical, physical, and biological integrity of the waters of the U.S. through the control of discharges of dredged and fill material.

(b) Congress has expressed a number of policies in the Clean Water Act. These Guidelines are intended to be consistent with and to implement those policies. While the guidelines have been written to stand by themselves, the user of the Guidelines is encouraged to keep the policies expressed in the Clean Water Act in mind to ensure the reasonable application of the Guidelines. The attention of the user is particularly directed to the policies expressed in the following sections of the Act: Section 101 (declaration of goals and policy), section 208 (area-wide management), section 301 (effluent limitations,), section 303 (water quality standards), section 307(a) (toxics), section 311 (hazardous substances), section 401 (certification), section 402 (National Pollution Discharge Elimination System), section 403 (ocean discharge criteria), section 404 (permits for dredged and fill material), and the definitions contained in section 502.

(c) Fundamental to the use of these Guidelines is the precept that dredged or fill material should not be discharged into the aquatic ecosystem, including wetlands, unless it can be demonstrated that such a discharge is necessary and will not have an unacceptable adverse impact either individually or in combination with known and/or probable impacts of other activities affecting the ecosystems of concern (See § 230.72). This precept places the burden of proof on the discharger to demonstrate that a proposed discharge should be permitted.

(d) From a national perspective, the degradation or destruction of aquatic resources by filling operations in wetlands is considered to be among the most severe environmental impacts covered by these guidelines. The guiding principle should be that destruction of highly productive wetlands may represent and irreversible loss of a valuable aquatic resource.

§ 230.2 Applicability.

(a) The Guidelines have been developed by the Administrator of the Environmental Protection Agency in conjunction with the Secretary of the Army acting through the Chief of Engineers under section 404(b)(1) of the Clean Water Act (33 U.S.C. 1344). The Guidelines are applicable to the specification of disposal sites for discharges of dredged or fill material into waters of the United States, and include:

(1) The regulatory program of the U.S. Army Corps of Engineers under sections 404 (a) and (e) of the Act (see 33 CFR 320, 323, 325);

(2) Permit programs of States approved by the Administrator of the Environmental Protection Agency in accordance with sections 404 (g) and (h) of the Act (see 40 CFR 122, 123 and 124);

(3) The civil works program of the U.S. Army Corps of Engineers to which the permit procedures of the regulatory program in (1) do not apply (see 33 CFR 209.145 and section 150 of Pub. L. 94–587, Water Resources Development Act of 1976);

(4) Activities controlled by best management practices implemented by approved Statewide dredged or fill material regulatory programs under section 208(b)(4) (B) and (C) of the Act (see 40 CFR 35.1560);

(5) The planning and evaluation of those Federal construction projects specifically authorized by Congress which meet criteria specified in section 404(r) of the Act.

(b) These Guidelines will be applied in the review of proposed discharges of dredged or fill material into navigable waters which lie inside the baseline from which the territorial sea is measured and the discharge of *fill* material into the territorial sea pursuant to the procedures specified in 33 CFR 320 and 33 CFR 209.145. The discharge of *dredged* material into the territorial sea is governed by the Marine Protection, Research, and Sanctuaries Act of 1972, Pub. L. 92–532, and regulations and criteria issued pursuant thereto (40 CFR 227, "Ocean Dumping Final Regulations and Criteria", and the International Convention for Prevention of Marine Pollution by Dumping of Wastes and Other Matter (London Convention) and to which the United States is one of the contracting parties).

(c) Guidance interpreting these Guidelines may be prepared jointly by EPA and the Corps at the National or regional level from time to time. No modifications to the basic application, meaning, or intent of these Guidelines will be made without rulemaking by the Administrator under the Administrative Procedure Act: (5 U.S.C. 551 *et seq.*)

§ 230.3 Definitions.

For purposes of this Part, the following terms shall have the meanings indicated:

(a) The term "Act" means the Clean Water Act (also known as the Federal Water Pollution Control Act–FWPCA) Pub. L. 92–500, as amended by Pub. L. 95–217, 33 U.S.C. 1251, et seq.

(b) The term "disposal site" means a unit of the waters of the U.S. enclosed within specific boundaries consisting of a water surface area (when present), a volume of water (when present), and a substrate area. In the case of wetlands on which water is not present at the time at which the disposal is contemplated, the disposal site consists of the wetland surface area.

(c) The term "discharge point" means the point within the disposal site at which the dredged or fill material is released.

(d) The term "dilution and dispersion zone" means the volume of water where discharged material and water mix.

Comment: The term "mixing zone" has been used in a number of different ways during the implementation of the Act and other Acts and in discussions concerning Section 404. To avoid confusion, the term "dilution and dispersion zone" is used in these Guidelines. This term refers to the purely physical and chemical processes of mixing the dissolved and suspended particulate components of discharged material with receiving water. The boundary of this zone is the point at which dissolved material and suspended particulates have been sufficiently diluted or dispersed so as to exhibit physical and chemical characteristics substantially the same as those of the receiving water. Therefore, this term differs from the concept of "mixing zone" which has been used elsewhere to mean the volume of the water mass in which discharged material is *allowed* to exceed acceptable levels (such as appropriate water quality standards). In these guidelines, the water mass in which discharged material is allowed to exceed acceptable levels while initial dilution and dispersion take place is described by use of the term "disposal site."

(e) The term "desposition zone" means the space on the substrate where discharged material accumulates.

(f) The term "constituents" means the chemical or radiological substances, solids, and organisms associated with dredged or fill material.

(g) The term "pollution" means the man-made or man-induced alteration of the chemical, physical, biological, or radiological integrity of the water.

(h) The term "toxic pollutant" means any substance on the list of toxic pollutants promulgated on January 31, 1978 (43 FR 4109) or on any subsequent list promulgated pursuant to section 307(a)(1) of the Act.

(i) The term "carrier of contaminant" means dredged or fill material that is contaminated by chemical, biological, or radiological substances in a form that can be incorporated into or ingested by and harm or otherwise contaminate aquatic organisms, consumers of aquatic organisms, or users of the aquatic environment.

(j) The term "solid phase" means the portion of dredged or fill material that, when discharged into water, retains its solid form and settles on the substrate in solid form.

(k) The term "liquid phase" means the portion of dredged or fill material that, when discharged into water, is dissolved and remains in solution as it passes through the water column.

(1) The term "suspended particulate phase" means the portion of dredged or fill material that, when discharged into water, disperses in the water column as suspended particles, usually the size of silt (63 microns or one-sixteenth of a millimeter) or smaller.

(m) The term "acute toxicity" means a short-term effect of a toxic pollutant that typically results in death of the exposed organisms. Acute toxicity can be expressed as the lethal concentration for a stated percentage of organisms tested, or the reciprocal, which is the tolerance limit of a percentage of surviving organisms. (Acute toxicity for aquatic organisms generally has been expressed for 24- to 96-hour exposures).

(n) The term "chronic toxicity" means the effect of toxic pollutants upon organisms through an extended time period. Chronic toxicity may be expressed in terms of an observation period equal to the lifetime of an organism or to the time span of more than one generation. Some chronic effects may be reversible, but most are not. Chronic effects often occur in the species population rather than in the individual.

(o) The terms "aquatic environment" and "aquatic ecosystem, including wetlands" mean waters of the U.S. that serve as habitat for interrelated and interacting communities and populations of plants and animals.

(p) The term "practicable" means feasible after taking into consideration economics, technology, and logistical factors.

(q) The term "pollutant" means dredged spoil, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial, municipal, and agricultural waste discharged into water.

Comment: The legislative history of the Act reflects that "radioactive materials" as included within the definition of "pollutant" in section 502 of the Act means only radioactive materials which are not encompassed in the definition of source, byproduct, or special nuclear materials as defined by the Atomic Energy Act of 1954, as amended, and regulated under the Atomic Energy Act. Examples of radioactive materials not covered by the Atomic Energy Act and, therefore, included within the term "pollutant", are radium and accelerator produced isotopes. See *Train* v. *Colorado Public Interest Research Group, Inc.*, 426 U.S. 1 (1976).

(r) The term "wetlands" means those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

(s) "Navigable waters" is defined in section 502(7) of the Act to mean "waters of the United States, including the territorial seas." This term includes but is not limited to:

(1) All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;

(2) Interstate waters, including wetlands;

(3) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, and wetlands; the use, degradation or destruction of which could affect interstate commerce including any such waters:

(i) Which are or could be used by interstate travelers for recreational or other purposes; and

(ii) From which fish or shellfish are or could be taken and sold in interstate commerce; and

(iii) Which are used or could be used for industrial purposes by industries in interstate commerce.

(4) All impoundments of waters of the United States otherwise defined as navigable waters under this paragraph.

(5) Tributaries of waters identified in paragraphs (1)–(4) of this section.

(6) Wetlands adjacent to waters identified in paragraphs (1)–(5) of this section, provided that treatment ponds or lagoons designed to meet the requirements of the Clean Water Act (other than cooling ponds meeting the criteria of this paragraph) are not waters of the United States.

Comment: For purposes of clarity, the term "waters of the United States" is used throughout the regulations rather than "navigable waters." In defining the jurisdiction of the FWCA as the "waters of the United States", Congress, as demonstrated in the legislative history to the Act, specified that the term "be given the broadest, consitutional interpretation unencumbered by Agency determinations which would have been made or may be made for administive purposes." While the words of this definition and those of the Corps of Engineers in 33 CFR 323.2(a) for "waters of the United States" differ to comply with intra-agency requirements both definitions describe the same waters.

(t) The term "adjacent" means bordering, contiguous, or neighboring. Wetlands separated from other waters of the United States by man-made dikes or barriers, natural river berms beach dunes and the like are "adjacent wetlands."

(u) The term "impoundment" means a standing body of open water created by artificially blocking or restricting the flow of a river, stream, or tidal area.

(v) The term "dredged material" means material that is excavated or dredged from waters of the United States.

(w) The term "discharge of dredged material" means any addition of dredged material into the waters of the United States. The term includes, without limitation, the addition of dredged material into waters of the United States and the runoff or overflow from a contained land or water disposal area. Discharges of pollutants into waters of the United States resulting from the onshore subsequent processing of dredged material that is extracted for any commerical use (other than fill) are not included within this term and are subject to section 402 of the Clean Water Act even though the extraction and deposit of such material may

require a permit from the Corps of Engineers.

(x) The term "fill material" means any material used for the primary purpose of replacing an aquatic area with dry land or of changing the bottom elevation of a waterbody. The term does not include any pollutant discharged into the water primarily to dispose of waste, as that activity is regulated under section 402 of the Clean Water Act Amendments of 1977.

(y) The term "discharge of fill material" means the addition of fill material into waters of the United States. The term generally includes, without limitation, the following activities: Placement of fill that is necessary to the construction of any structure in a water of the United States; the building of any structure or impoundment requiring rock, sand, dirt, or other material for its construction; site-development fills for recreational, industrial, commercial, residential, and other uses; causeways or road fills; dams and dikes; artificial islands; property protection and/or reclamation devices such as rip-rap, groins, seawalls, breakwaters, and revetments; beach nourishment; levees; fill for structures such as sewage treatment facilities; intake and outfall pipes associated with power plants and subaqueous utility lines; and artificial reefs.

§ 230.4 Organization, use, adaptability of the Guidelines.

(a) *Organization.* The Guidelines are divided into nine subparts. Subpart A presents those provisions of general applicability, such as purpose and definitions. Subpart B establishes the four general conditions which must be satisfied in order to make a finding that a proposed discharge of dredged or fill material complies with the Guidelines. Subpart C sets forth factual determinations which are to be considered in determining whether or not a proposed discharge satisfies the Subpart B conditions of compliance. In addition, Subpart C prescribes a number of physical, chemical, and biological evaluations and testing procedures to be used in reaching the required factual determinations. Subpart D describes the physical and chemical components of a site and provides guidance as to how proposed discharges of dredged or fill material may affect these components. Subparts E–G detail the special characteristics of particular aquatic and wetland ecosystems in terms of their values, the possible loss of these values due to discharges of dredged or fill material, and the means to prevent these losses from occurring.

Comment: The extent of use of Subparts E–G depends upon whether the resources discussed in these categories are present at the discharge site. For example, if it is determined that no sanctuaries or refuges are sufficiently close to the discharge site to be affected by the discharge, than no further consideration of § 230.4 is necessary. It is unlikely that a large number of the categories in Subparts E–G will be used in any given discharge consideration.

Subpart H recognizes that in certain circumstances, the discharge of dredged or fill material can benefit the environment. Subpart I treats General permits and preselection of disposal sites.

(b) *Use.* In evaluating whether a particular discharge site may be specified, the permitting authority should use these Guidelines in the following sequence (see also Flow Chart I):

(1) In order to obtain an overview of the principal regulatory provisions of the Guidelines, review the *conditions of compliance* of § 230.10(b) and (c), the *measures to minimize adverse impact*—or "permit conditions"—of § 230.10(d) and the required *factual determinations* of § 230.20.

(2) Examine *practical alternatives* to discharge into waters of the U.S.—that is, *not* discharging into the waters—or discharging into alternative aquatic site with potentially less damaging consequences (see § 230.10(a)).

(3) Evaluate the material to be discharged to determine the possibility of *chemical (toxic) contamination or physical incompatibility of the material* to be discharged (230.22 and 230.21(b)).

(4) If chemical contamination is reasonably believed to be probable, conduct the appropriate *tests* according to the section on Evaluation and Testing (§ 230.23).

(5) *Identify a candidate disposal site* based upon the criteria and evaluations of § 230.23(f).

(6) *Evaluate the candidate disposal* site with respect to the various *physical and chemical components* which characterize the non-living environment of the site—the substrate and the water including its dynamic characteristics (Subpart D).

(7) At the candidate disposal site, *identify and evaluate any special or critical characteristics* of the site related to its living communities or human uses (Subparts E, F, and G).

(8) Make appropriate and practical changes to the project plan to *minimize the environmental impact* of the discharge, based upon both the specialized Guidelines to Minimize Impacts of each paragraph (c) in Subparts D through G and the general measures to minimize impact in § 230.10(d).

(9) *Make and document Special Determinations* of appropriate paragraphs (d) in Subparts E through G.

(10) *Make and document General Determinations* in § 230.20 based upon the evaluations and tests of Subparts C and D.

(11) *Make and document Findings of Compliance* by comparing the General and Special Determinations with the Conditions of Compliance of § 230.10.

This outline of the steps to follow in using the Guidelines is simplified for purposes of illustration. The permitting authority must address all of the relevant provisions of the Guidelines in reaching a Finding of Compliance in an individual case.

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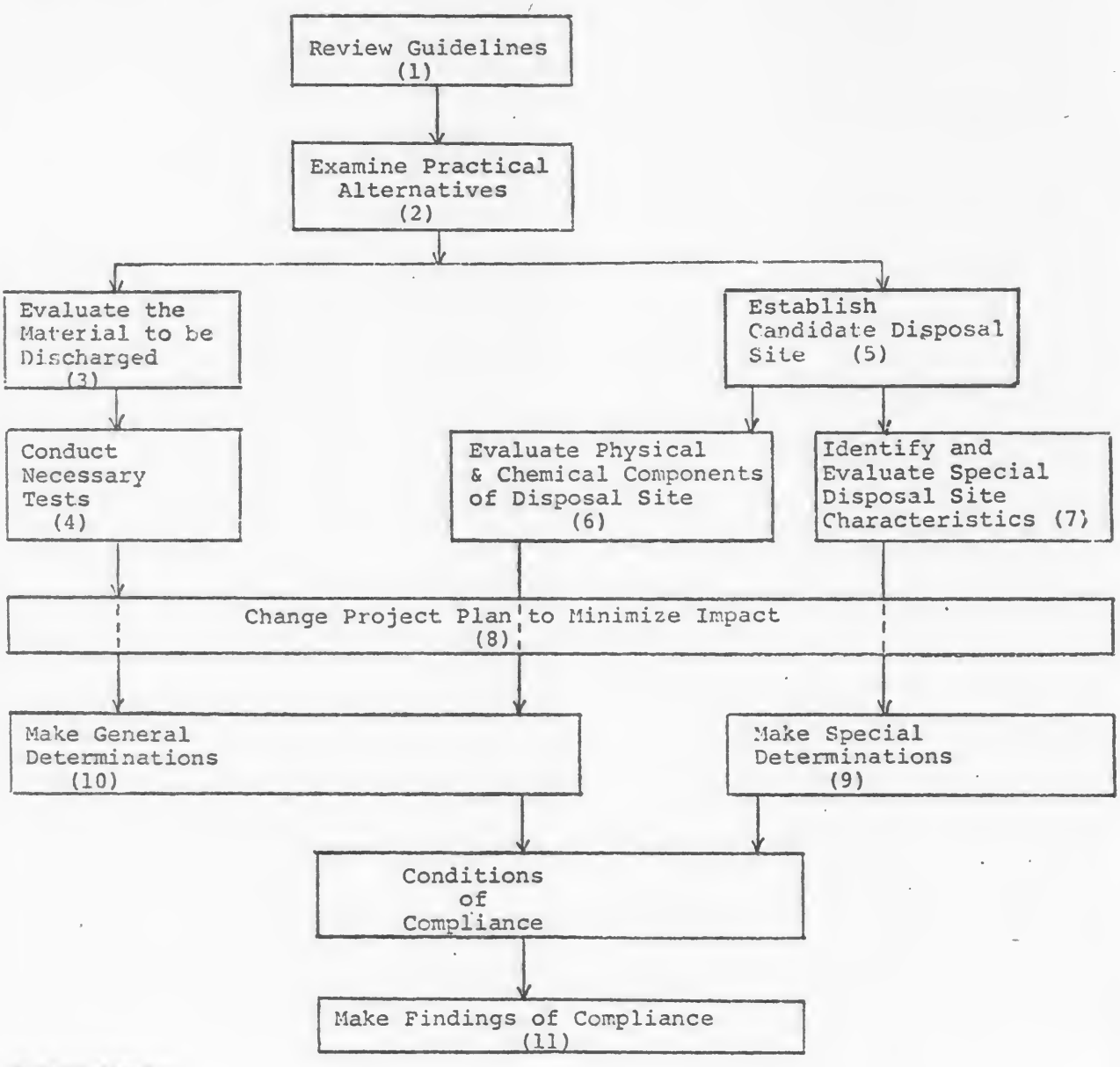
FLOW CHART I



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(c) *Adaptability to particular types of activities.* (1) The manner in which these Guidelines are used depends on the nature of the extraction site, the material to be discharged, and the candidate disposal site, including important environmental components. Documentation to demonstrate knowledge about the extraction site, materials to be extracted, and candidate disposal site is an essential component of guideline application. These Guidelines are broad enough to allow appropriate evaluation and documentation for a variety of activities, ranging from those with the potential for large, complex impacts on the aquatic environment and wetlands, to those for which the impact is likely to be innocuous. However, it is unlikely that the Guidelines will apply in their entirety to any one activity, no matter how complex. It is anticipated that substantial numbers of permit applications will be for minor routine activities that have little, if any, potential for noticeable environmental impacts. Although there may be exceptional cases, and while in certain situations the cumulative impact of a number of such discharges could in fact be significant, it generally is not intended or expected that extensive testing, evaluation or analysis will be needed to make findings of compliance in such routine cases.

The Guidelines user, including the agency or agencies responsible for implementing the Guidelines, must recognize the different levels of effort that should be associated with varying degrees of impact and require or prepare commensurate documentation. The level of documentation should reflect the significance and complexity of the discharge activity.

An essential part of the evaluation process involves making initial and intermediate determinations as to the relevance of any factor or portion(s) of the Guidelines and conducting further evaluation only as needed. However, where portions of the Guidelines review procedure are to be abbreviated, (i.e., "short form" evaluation) there still must be sufficient information including consideration of both individual and cumulative impacts (See § 230.72), to support the decision of whether to specify the site for disposal of dredged or fill material and to support the decision to curtail or abbreviate the evaluation process. The presumption against the discharge in 230.1 applies to this decision making.

Comment: Activities may be stratified with respect to their probable impact on the aquatic ecosystem, including wetlands. Examples of criteria for stratifying such impacts are:

(1) The history of extraction and use of the proposed disposal site; for instance, where discharges from maintenance dredging of a navigation channel have been authorized under Section 404 over a period of years, it may only be necessary to document that the impacts (including cumulative impacts) of future discharges would not differ from past impacts.

(2) The availability of approved areawide plans such as Coastal Zone Management plans and 208 plans which include treatment of disposal sites for the discharge of dredged or fill material. Supplementary documentation may be required for specific activity involving discharges to complement the broad documentation already contained in the plan.

(3) Availability of relevant information in the files of Federal, State, or local authorities. Supplementary documentation may be required to ensure that all applicable aspects of these Guidelines are considered in arriving at the Section 404 permit decision.

(4) Size and complexity of project.

(5) Likelihood of secondary and cumulative impacts.

(6) Similarity to previously reviewed projects.

In the case of activities covered by General Permits, the documentation required by the Guidelines is for General Permit promulgation and not for activities subject to General Permit control. These Guidelines do not require reporting or formal written communication at the time individual activities are initiated under a General Permit. However, a particular General Permit may require appropriate reporting.

Subpart B.—Compliance With the Guidelines

§ 230.10 Conditions of compliance.

Although all conditions of compliance in the § 230.10 must be met, the compliance evaluation procedures will vary to reflect the seriousness of potential for adverse impact on the aquatic ecosystems including wetlands, posed by specific dredged or fill material discharge activities. (§ 230.4(c)).

(a) The discharge of dredged or fill material does not comply with the Guidelines if there is a practicable alternative to the proposed discharge that is environmentally preferable and will have less adverse impact on the aquatic ecosystem (see Flow Chart II).

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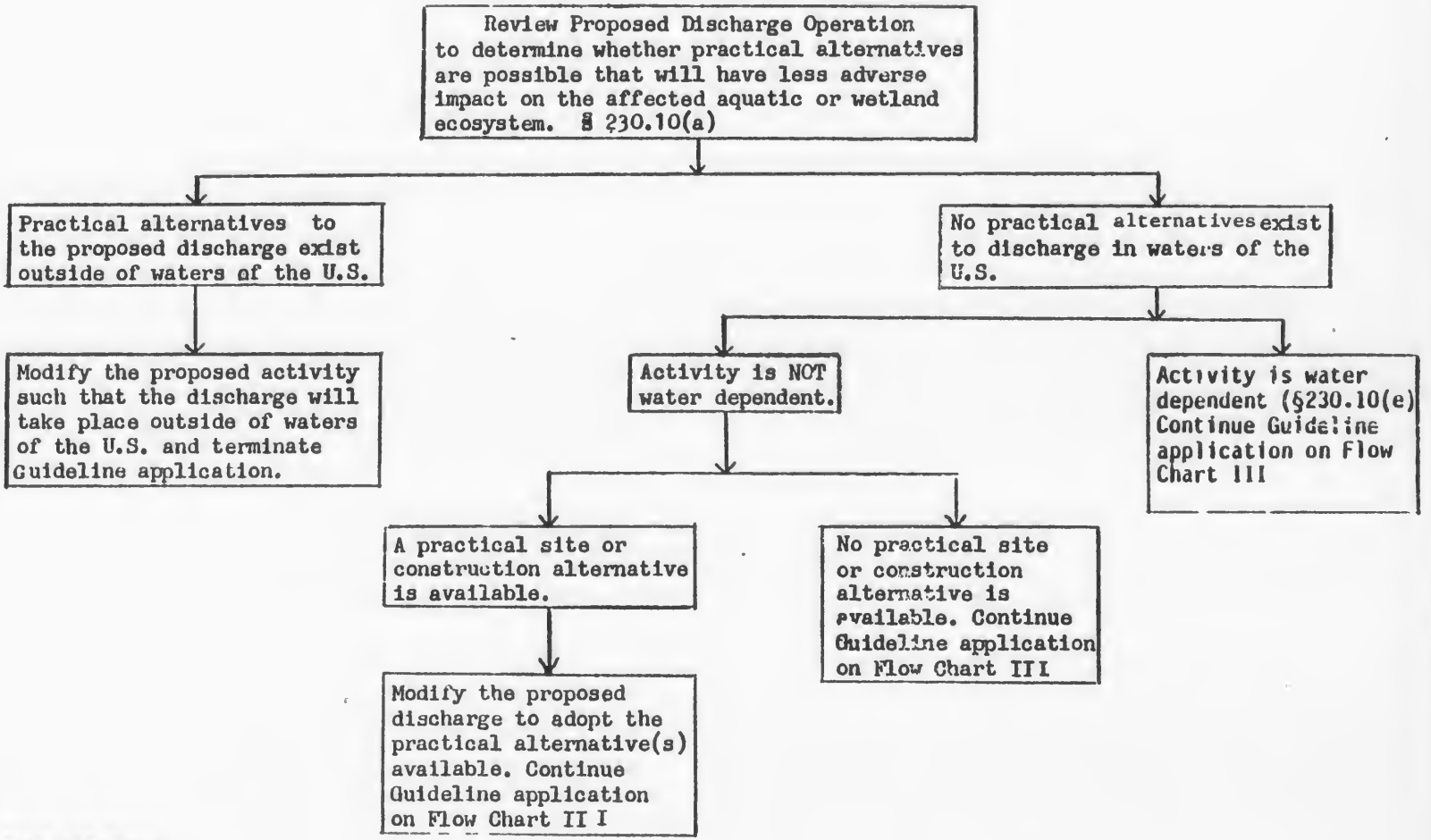
Flow Chart II



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(1) For the purpose of making this finding, practicable alternatives include, but are not limited to:

(i) Activities which do not involve a discharge of dredged or fill material into the waters of the United States or ocean waters;

(ii) Discharges of dredged or fill material at other locations in waters of the United States or ocean waters.

Comment: Areas not presently owned by the applicant which could reasonably be obtained, utilized, expanded or managed for project purposes may be considered as practicable alternatives.

(iii) Discharges of other particular volumes and concentrations of pollutants at other specific rates.

(2) In determining whether an alternative is practicable, consideration may be given to economic, technical, and logistical factors.

(3) (i) If all practicable alternatives to a proposed discharge (including the "no action" alternative), have been identified and evaluated through the NEPA process or other planning and evaluation process, further development of the alternatives may not be necessary under this paragraph, provided that the original development of alternatives complies with the requirements identified in this section and elsewhere in the Guidelines. References to such an evaluation shall be made in the written determination of findings, required by § 230.11(b).

(ii) Similarly, if an evaluation of all practicable alternative disposal sites has been conducted in a comprehensive planning process, such as a coastal zone management program or a 208 program, and if this evaluation is comparable in scope to the alternatives evaluation described in this section, it may serve as the basis for that part of the alternatives finding described in paragraph (a) above. However, because such a planning process may not be project-specific, it may be necessary to supplement the alternatives findings in paragraphs (g) (3) (i) and (3)(ii) through consideration of additional detailed information at the time a particular discharge is proposed or when further review of a class or category of activities is undertaken (General Permits or Best Management Practices).

Comment: When Federal planners and permit evaluators and state regulatory agencies conduct alternative studies under other authorities, they should consider the requirements of the Guidelines to ensure the usefulness of such studies for regulatory purposes under section 404.

(b) The discharge of dredged or fill material does not comply with the Guidelines if the discharge will:

(1) After consideration of dilution and dispersion at the disposal site, cause or contribute to ambient water quality which violates any applicable State water quality standard, approved or promulgated by EPA under section 303 of the Act, or any applicable water quality criteria promulgated by EPA;

(2) Violate any applicable toxic effluent standards or prohibitions under section 307 of the Act;

(3) Result in the introduction outside the disposal site of toxic substances in amounts which cause destruction of organisms through acute or chronic toxicity or through physiological disturbance or which will result in potential adverse effects in a consumer organism through bioaccumulation of the substance in the aquatic organism;

(4) Jeopardize the continued existence of an endangered or threatened species or result in the destruction or adverse modification of a habitat which is determined by the Secretaries of Interior or Commerce, as appropriate, to be a critical habitat under the Endangered Species Act of 1973 unless an exemption has been granted by the Endangered Species Committee;

Comment: The reference to the Endangered Species Committee is included in recognition of the possibility of exemption from the prohibition of the Endangered Species Act. However, such an exemption is not available where there are other grounds for denying a permit. Therefore, the permitting authority should complete review of the discharge under these Guidelines even where the discharge will not comply with (4).

(5) Disrupt conditions and terms of marine sanctuaries designated by the Secretary of Commerce under Title III of the Marine Protection, Research, and Sanctuaries Act of 1972.

(c) The discharge of dredged or fill material does not comply with these Guidelines if it is determined, after a consideration of § 230.26 where appropriate, that the discharge will have an unacceptable adverse impact on the waters of the United States. The finding of unacceptable adverse impact shall, as a minimum, be based upon appropriate determinations, evaluations, and tests required by Subpart C and any special determinations required by Subparts D through G with special emphasis on the persistence and permanence of such impacts.

(1) It shall be an objective of these Guidelines that the following adverse effects, individually or collectively, be prevented:

(i) Significantly adverse effects of discharge of pollutants on human health or welfare, including but not limited to effects on plankton, fish, shellfish, wildlife, and special areas such as shorelines, beaches, wetlands.

Comment: Fish and wildlife sanctuaries and refuges, parks, national and historical monuments, national seashores, wilderness areas, research sites or similar preserves are examples of other critical areas that should be protected;

(ii) Significantly adverse effects of discharge of pollutants on aquatic life and other wildlife, dependent on aquatic ecosystems, including the transfer, concentration, and dispersal of pollutants or their byproducts through biological, physical, and chemical processes.

(iii) Significantly adverse effects of discharge of pollutants on aquatic ecosystem diversity, productivity, and stability. Such effects may include, but are not limited to, loss of fish and wildlife habitat or loss of the capacity of a wetland to assimilate nutrients or reduce wave energy.

(iv) Significantly adverse effects of discharge of pollutants on aesthetic, recreation, and economic values.

(2) It shall be the additional objective of these Guidelines to prevent the chemical, physical or biological degradation of waters of the U.S. by the discharge of dredged or fill material through management of the number, location, size, and configuration of disposal sites as well as the rate, volume, and concentrations of pollutants in the material discharged. Chemical or physical alteration of a body of water or wetland should be avoided or minimized where possible. Use of waters of the U.S. for discharge of dredged of fill material is presumed to unacceptable unless it can be demonstrated that such a discharge is necessary and will not have an unacceptable adverse impact on the aquatic ecosystem including wetlands, either individually or cumulatively. Where a previously degraded aquatic ecosystem is involved, consideration should be given to the use of dredged or fill material to improve or restore the ecosystem.

Comment: It is the intent of these Guidelines to control and if necessary limit or prohibit discharges of dredged or fill material into the aquatic environment including wetlands. It is of primary importance that movement of material from one place to another not degrade the chemical and physical characteristics of the substrate. Chemical degradation is not likely to occur if the concentration of available chemical components of the material to be discharged is equal to or less than those of the same components at the

disposal site. Degradation can occur as a result of changing characteristics of the aquatic ecosystem, such as altering water level or circulation patterns and littering the environment with piles of discharged material. Restoration of degraded aquatic areas by discharge of dredged or fill material may provide not only disposal sites but also environmental benefits. However, improvements (such as creation of new wetlands) of undisturbed natural areas should be embarked upon only after extensive and careful evaluation of impacts and benefits.

(d) The discharge of dredged or fill material does not comply with these Guidelines if the manner of discharge fails to sufficiently minimize where practicable any potential adverse impact to the aquatic ecosystem including wetlands.

Comment: Discharge technology should be adapted to the needs of each site. In determining whether the discharge operation sufficiently minimizes adverse environmental impacts, the applicant should consider for example:

(1) The type of equipment or machinery, including protective devices, used in activities ancillary to the discharge of dredged or fill material;

(2) The operation and maintenance of such equipment or machinery including adequate operation, staffing, and training;

(3) The method of transportation of the material for discharge;

(4) Limitations on the solid, liquid, and gaseous components of material to be discharged;

(5) The addition of treatment substances such as oxygen to material to be discharged;

(6) Limitations on the amount of material to be discharged per unit of time or volume of receiving water;

(7) The timing of the discharge to minimize impact (e.g., to avoid spawing or migration seasons and periods of undesirable wave, wind, and tidal action);

(8) Proper maintenance and containment of material discharged to prevent erosion, leaching, slumping and other nonpoint sources of pollution;

(9) The method of dispersion of the material;

(10) The location of actual release of material with respect to the substrate and other factors;

(11) The location of the disposal outside of the vicinity of a public water supply intake;

(12) Delay in extraction or exposure of dredged material to different levels of oxygen, pH, temperature, or other particular conditions that will reduce the potency of non-persistent pollutants;

(13) Other measures identified in Subpart D through G of these Guidelines.

(e) In the case of a discharge of fill material into special aquatic or wetland areas (Subpart E), where the activity associated with the fill does not require direct access or proximity to or siting within, the water resource in question to fulfill its basic purpose, the discharge may be allowed only if, in addition to the other requirements of these Guidelines (alternatives, impacts, mitigation), there is a showing that the activity associated with the fill is necessary.

Comment: This subsection requires that an additional test be met by a "non-water dependent" activity before it can be located in a wetland or special aquatic area. This test is intended to prevent the destruction or adverse alteration of wetlands and special aquatic areas by non-water dependent activities except in cases where the applicant can show that the basic purpose of the activity is one for which the local community has a demonstrable need. In assessing the basic purpose of an activity, one must look at the basic service or product it provides. For example, the basic purpose of a housing development located in a wetland site to provide homesite waterfront dockage is still housing. Thus, to meet this test, the applicant would have to show a need for housing, *per se,* not merely a demand for *waterfront* housing.

§ 230.11 Findings of compliance.

(a) On the basis of these Guidelines the proposed disposal sites for the discharge of dredged or fill material must be:

(1) Specified as complying with these Guidelines; or

(2) Specified as complying with these Guidelines with the inclusion of appropriate discharge conditions to minimize pollution or adverse impacts to the affected aquatic ecosystems including wetlands; or

(3) Specified as failing to comply with the requirements of these Guidelines where: (i) There are practicable alternatives to the proposed discharge that will have a less adverse impact on the aquatic ecosystem (§ 230.10(a)) and are environmentally preferable; or (ii) the proposed discharge will result in unacceptable pollution to the aquatic ecosystem (§ 230.10 (b) and (c)); or (iii) the proposed discharge does not include all practicable measures to minimize potential harm to the aquatic ecosystem (§ 230.10(d)); or (iv) there does not exist sufficient information to make a reasonable judgment as to whether the proposed discharge will comply with these Guidelines.

(b) Findings under this section shall be set forth in writing by the District Engineer or, where appropriate, the Director (i.e., the chief administrative officer of a State agency administering a permit program approved by EPA under § 404(g) and § 404(h)) or his delegated representative, for each proposed discharge. These findings shall include the factual determinations required by § 230.20, findings under § 230.10, and a brief explanation of any adaptation of these Guidelines to the activity under consideration. In the case of a General Permit, such findings shall be prepared for that permit rather than for each subsequent discharge under the authority of that permit.

Subpart C—General Physical, Chemical, and Biological Evaluations, Tests, and Determinations

§ 230.20 Factual determinations.

Evaluation and testing procedures described in this subpart shall be applied as required to all proposed discharges of dredged or fill material in order to determine their potential short term or long term effect on the physical and chemical components of the aquatic environment, including wetlands, as described in Subpart D. These determinations, as well as any special factual determinations required by Subparts E through G, must be documented, must describe the scope, methods, and results of examinations used to reach them, and must be considered in making all findings of compliance required by § 230.11. Factual determinations required for each proposed discharge include the following:

(a) *Physical substrate determinations.* A determination shall be made of the nature and degree of effect that the proposed discharge will have on the characteristics of the substrate at the proposed disposal site. Consideration shall be given to the similarity in particle size, shape and degree of compaction of the material proposed for discharge and the material constituting the substrate at the disposal site, and any potential changes in substrate elevation and bottom contours (including changes outside of the disposal site which may occur as a result of erosion, slumpage, or other movement of the discharged material). The environmental characteristics and values, their potential loss, and the Guidelines to minimize impact, as detailed in § 230.30, shall additionally be considered in making these

determinations. Potential changes in substrate elevation and bottom contours shall be predicted on the basis of the proposed method, volume, location, and rate of discharge, as well as on the individual and combined effects of current patterns, water circulation, wind and wave action, and other physical factors that may affect the movement of the discharged material.

(b) *Water circulation, fluctuation, and salinity determinations.* A determination shall be made of the nature and degree of effect that the proposed discharge will have on current patterns, water circulation including downstream flows, normal water fluctuation, and salinity. Consideration shall be given to the potential diversion or obstruction of flow, alterations of bottom contours, or other changes in the hydrologic regime. Additional consideration of the environmental characteristics and values, their possible loss, and the Guidelines to minimize impacts, as detailed in § 230.33–230.35, shall be used in making these determinations. Potential effects on the current patterns, water circulation, normal water fluctuation and salinity shall be evaluated on the basis of the proposed method, volume, location, and rate of discharge.

(c) *Suspended particulates determinations.* A determination shall be made of the nature and degree of effect that the proposed discharge will have in terms of potential changes in the kinds and concentrations of suspended particulates in the vicinity. Consideration shall be given to the grain size of the material proposed for discharge, the shape and size of the plume of suspended particulates, and whether or not the potential changes in the kinds and concentrations of suspended particulates (suspended solids) will cause violations of applicable water quality standards. In making this determination, consideration should also be given to the environmental characteristics and values, to their possible loss, and to the Guidelines for minimizing impact in § 230.31 (Suspended Particulates). Consideration shall include the proposed method, volume, location, and rate of discharge, as well as the individual and combined effects of current patterns, water circulation and fluctuations, wind and wave action, and other physical factors on the movement of suspended particulates. Suspended particulate bioassay testing, as described in § 230.23, may be required to determine the impact of increased suspended particulate levels on filter-feeding and other vulnerable aquatic organisms.

(d) *Wetland and other aquatic biota determinations.* A determination shall be made of the nature and degree of effect that the proposed discharge will have (both individually and cumulatively) on the structure, function and habitat of wetland and other aquatic biota. Consideration shall be given to potential changes in substrate characteristics and elevation, water or substrate chemistry, and water currents, circulation, fluctuation, or salinity that would significantly affect the recolonization of the proposed disposal site by indigenous fish, wildlife, and aquatic communities. The environmental characteristics and values, their possible loss, and the Guidelines to minimize impacts, as detailed in §§ 230.30–230.35, and the appropriate section of Subparts D–F shall additionally be considered in making these determinations. Biological tests including inventories, bioassays, and bioaccumulation tests as described in § 230.23 may be required to provide information on both the physical and chemical suitability of the discharge material to support the communities or populations of organisms existing at the proposed disposal site.

(e) *Toxic pollutant determinations.* A determination shall be made of the degree to which the material proposed for discharge will introduce, relocate, or increase the amount of toxic pollutants listed under section 307(a)(1) of the Act. This determination shall consider the solid, liquid and/or suspended particulate phase of the material discharged, and the aquatic environment at the proposed disposal site. Such pollutants are presumed to be present unless demonstrated otherwise by the procedure outlined in § 230.22, or the tests outlined in § 230.23.

Comment: Under section 307(a)(1) of the Act, the Administrator must establish a list of toxic pollutants. Effluent guidelines will be developed for industries discharging listed substances and effluent standards will be established as appropriate. In addition, under section 307(a)(5) of the Act, the Administrator, after consultation with the Secretary of the Army, may designate dredged material as a category subject to effluent standards or prohibitions established under § 307(a)(2). Notwithstanding the current absence of effluent limitations for toxic substances in dredged material, substances listed under section 307(a) of the Act are a primary concern in the evaluation of the effects of proposed discharges of dredged or fill material under section 404 of the Act.

(f) *Biological availability determinations.* A determination shall be made of the potential for acute or chronic effects on aquatic organisms, including bioaccumulation, as a result of the biological availability of pollutants in the solid, liquid, or suspended particulate phases. Such effects will be presumed to occur where toxic pollutants listed under section 307(a)(1) of the Act have not been demonstrated to be absent by the procedure outlined in § 230.22 or by the tests outlined in § 230.23.

(g) *Proposed disposal site appearance determinations.* A determination shall be made of the appearance of the proposed disposal site and appropriate parts of the surrounding environment prior to the initiation of a discharge activity. Photographic determinations are preferable to narrative descriptions, provided they are accompanied by pertinent data such as exact location of photographer and direction of exposure, time of year and day and weather conditions affecting film exposure, the kind of camera, lens, etc. used, and the photograph clearly depicts those aspects of the aquatic environment and wetlands that will be impacted or modified by the discharge activity.

Comment: The appearance of the proposed disposal site and its surroundings prior to any discharge activity is relevant to the findings required in §§ 230.10 and 230.11. Sufficiently detailed information concerning the appearance of the disposal site before discharge occurs will aid in predicting the impact of the discharge, assessing the adequacy of measures to minimize impacts, monitoring compliance with the permit, and restoring the site where appropriate.

(h) *Special determinations.* A determination shall be made of whether the material to be discharged will disrupt any special disposal site characteristics, taking into consideration the resource values, possible loss of these resources, and these Guidelines, as well as special determinations described in Subparts E through G of the proposed disposal site.

§ 230.21 Purpose and use of evaluation and testing.

(a) The purpose of the evaluation procedure in § 230.22 and the chemical and biological testing sequence outlined in § 230.23 is to provide information to reach the determinations required by § 230.20. Where the results of prior evaluations, chemical and biological tests, scientific research, and experience can provide information helpful in reaching a determination, these should be used. Such prior results may make

new testing unnecessary. The information used to reach each determination shall be documented, except that where the same information is applicable to more than one determination, it may be documented in one instance and referenced in later determinations.

(b) To reach the determinations related to the potential effects of the discharge on physical characteristics of the disposal site (i.e., determinations on physical substrate characteristics, water circulation, fluctuation, salinity, and suspended particulates), the narrative guidance provided in Subpart D may be applied along with appropriate physical tests and evaluations.

Comment: Such tests may include sieve tests, settleability tests, and compaction tests, dilution and dispersion zone and suspended particulate plume determinations, and site assessments of water flow, circulation, and salinity characteristics.

(c) To reach the determinations involving potential effects of the discharge on the chemical characteristics of the disposal site (i.e., determinations on suspended particulates, aquatic and wetland organisms and vegetation, toxic pollutants, biological availability, and water quality standards), the narrative guidance in Subparts D–F shall be used along with the general evaluation procedure in §230.22, and the chemical and biological testing sequence in § 230.22, and the chemical and biological testing sequence in § 230.23 and prediction of dilution and dispersion in § 230.23(e) to examine the solid, liquid, and suspended particulate phases of the dredged or fill material proposed for discharge.

(d) The general evaluation procedure described in § 230.22 can be used to eliminate the need for further chemical and biological testing to determine the presence or absence of toxic pollutants in proposed discharges of dredged or fill material, where the material can be shown to be sufficiently removed from surces of pollution. Where the results of the evaluation do not provide the necessary information to reach the required determinations in § 230.20(c)–(g), the chemical and biological testing sequence outlined in § 230.23 and prediction of dilution and dispersion in § 230.23(e) for the solid, liquid, and suspended particulate phases shall be followed.

(e) In applying the chemical and biological evaluations and tests required by these Guidelines, the differences between dredged material (including dredged material used as fill) and fill material must be considered.

(f) In addition to the evaluation and chemical and biological testing procedures in Subpart C and the narrative guidance on the physical and chemical components of the aquatic wetland environment in Subpart D, the information provided in Subparts E–G (describing resource values, possible loss of resources, and guidelines to protect special characteristics of the aquatic and wetland environment) must be examined to reach the special determinations required by § 230.20(i).

§ 230.22 General evaluation of dredged or fill material.

(a) If dredged or fill material is evaluated under § 230.22(b) and determined not to be a carrier of contaminants, then the determinations required in § 230.20 can be made without testing under § 230.23.

Comments: Under § 230.20(e), toxic pollutants on the 307(a)(1) list are presumed to be present unless eliminated from consideration by the § 230.22(b) evaluation or further testing under § 230.23. Other contaminants must be tested under § 230.23 if the evaluation under § 230.22(b) or other information suggests that they may be present. The purpose of the tests in § 230.23 is to demonstrate the probable impact of a discharge of the material on the aquatic community, human uses of the environment, and any other aspect of the ecosystem susceptible to degradation.

Adaptation of the evaluation and testing process in these Guidelines by permitting authorities under § 230.4 may lead to presentation of different testing protocols. However, such protocols cannot be used to change the intent or requirements of these Guidelines.

(b) The extraction site shall be examined in order to assess whether it is sufficiently removed from sources of pollution to provide reasonable assurance that the proposed discharge material is not a carrier of contaminants. Factors to be considered in demonstrating reasonable assurance of the absence of such pollution include but are not limited to:

(1) Potential routes of pollution or polluted sediments to the extraction site, based on hydrographic or other maps, aerial photography, or other graphic methods that show watercourses, surface relief, proximity to tidal movement, private and public roads, location of buildings, municipal and industrial areas, and agricultural or forest lands;

(2) Pertinent results from tests previously carried out on the material at the extraction site, or carried out on similar material for other permitted projects in the vicinity (such results may be available as public information in the files of government agencies, universities, and elsewhere). The results of tests carried out on material similar to the material proposed for discharge may be relevant. Materials shall be considered similar if the sources of contamination, the physical configuration of the sites and the sediment composition of the materials are comparable, in light of water circulation and stratification, sediment accumulation and general sediment characteristics. Tests from other sites may be relied on only if no changes have occurred at the extraction sites to render the results irrelevant.

(3) Any potential for significant introduction of pesticides from land runoff;

(4) Any records of spills of petroleum products or substances designated as hazardous under Section 311 of the Clean Water Act (see 40 CFR 116–119);

(5) Information in Federal, State and local records indicating significant introduction of pollutants from industries, including types and amounts of waste materials discharged along the potential routes of contaminants to the extraction site; and

(6) Any possibility of the presence of substantial natural deposits of minerals or other substances which could be released to the aquatic environment or wetlands by man-induced discharge activities.

Comment: Dredged or fill material is most likely to be free from chemical, biological, radiological or other pollutants where it is composed primarily of sand, gravel, or other naturally occurring inert material with particle sizes larger than silt (63 microns or one-sixteenth of a millimeter). Dredged material so composed is generally found in areas of high current or wave energy such as streams with large bed loads or coastal areas with shifting bars and channels. However, when such material is discolored or contains other indications that polluted materials may be present, further inquiry should be made.

(c) Where the discharge site is adjacent to the extraction site and subject to the same sources of pollution, and materials at the two sites are substantially similar, the fact that the material to be discharged technically may be a carrier of pollution is not likely to result in degradation of the substrate at the disposal site upon its discharge. In such circumstances, when dissolved material and suspended particulates can be controlled to prevent carrying pollutants to uncontaminated areas,

testing under § 230.23 may not be required.

(d) Where the § 230.22(b) evaluation leads to the conclusion that there is a high probability that the material proposed for discharge is a carrier of pollutants, testing may not be necessary if constraints are available to reduce conditions to acceptable levels within the disposal site and to prevent contaminants from being transported beyond the boundaries of the disposal site, if such constraints are acceptable to the permitting authority, and if the potential discharger accepts and has the capability to implement such constraints.

Comment: An example of such a constraint might be a properly designed and operated contained disposal site.

(e) The presumption that toxic pollutants on the 307(a)(1) toxics list are present in sediments may be accepted following application of the examination specified in § 230.22(b) without conducting a sediment chemical analysis. However, acceptance of such a presumption does not preclude the requirement to supply information about the probable impact of discharge of sediment so contaminated on receiving aquatic ecosystems, including wetlands.

Comment: If a severely polluted sediment condition is established during this General Evaluation (§ 230.22) which will lead to requirement of bioassays, and a sufficiently large number of chemicals are present to render impractical the identification of all chemical pollutants by testing, chemical testing information reasonably may be obtained from bioassays. Severely polluted sediment conditions can be established during this General Evaluation (§ 230.22) by: previous tests (although the results of such tests may not be adequate for other uses in these Guidelines), the presence of polluting industries and information about their discharge or runoff into waters of the U.S., bioinventories, etc.

(f) The information justifying any decision not to test must be documented in § 230.20 Factual Determinations for use in § 230.11 Findings of Compliance.

§ 230.23 Evaluation and testing.

(a) No single test or approach can be applied in all cases to evaluate the effects of proposed discharges of dredged or fill materials. The chemical changes in water quality may best be simulated by use of an elutriate test. To the extent permitted by the state of the art, expected effects such as toxicity, stimulation, inhibition or bioaccumulation may best be estimated by appropriate bioassays. In determining which tests and/or evaluation procedures are necessary in a given case, the permitting authority shall refer to §230.4(c), Adaptability to Particular Types of Activities. EPA in conjunction with the Corps of Engineers will publish a procedures manual that will cover summary and description of tests, definitions, sample collection and preservation, procedures, calculations, and references. Interim guidance to applicants concerning the applicability of specific approaches or procedures will be furnished by the District Engineer.

(b) *Chemical-biological interactive effects.* Ecological perturbation caused by chemical-biological interactive effects resulting from discharges of dredged or fill material is very difficult to predict. Research performed to date has not clearly demonstrated the extent of chemical-biological interactive effects resulting from contaminants present in the dredged or fill material. The principal concerns of open water discharge of dredged or fill material that contain chemical contaminants are the potential effects on the water column or on benthic communities.

(1) *Evaluation of chemical-biological interactive effects.* Dredged or fill material may be excluded from the evaluation procedures specified in paragraphs (b)(2) and (3) of this section if it is determined on the basis of the evaluation in § 230.22 that the likelihood of contamination by toxic pollutants is acceptably low, unless the District Engineer, after evaluating and considering any comments received from the Regional Administrator, determines that these approaches and procedures are necessary. The Regional Administrator may require, on a case-by-case basis, testing approaches and procedures by stating what additional information is needed through further analyses and how the results of the analysis will be of value in evaluating potential environmental effects.

(2) *Water column effects.* Sediments normally contain constituents that exist in different chemical forms and are found in various concentrations in several locations within the sediment. The potentially bioavailable fraction of a sediment is dissolved in the sediment interstitial water or in a loosely bound form that is present in the sediment. In order to predict the effect on water quality due to release of contaminants from the sediment to the water column, an elutriate test may be used. The elutriate is the supernatant resulting from the vigorous 30-minute shaking of one part bottom sediment from the dredging site with four parts water (vol./vol.) collected from the dredging site followed by one-hour settling time and appropriate centrifugation and a 0.45μ filtration. Major constituents to be analyzed in the elutriate are those deemed critical by the District Engineer, after evaluating and considering any comments received from the Regional Administrator, and considering results of the evaluation in § 230.22. Elutriate concentrations observed should be evaluated with regard to with the same constituents in disposal site water and other data which describe the Volume and rate of the intended discharge, the type of discharge, the hydrodynamic regime at the disposal site, and other available information that aids in the evaluation of impact on water quality (including bioaccumulation tests). The District Engineer may specify bioassays when he determines that such procedures will be of value. In reaching this determination, dilution and dispersion effects subsequent to the discharge at the disposal site will be considered.

(3) Suspended particulate effects. Suspended particulate phase bioassay testing shall be required to make the determination in § 230.20(c), (e) and (f) where such determinations cannot be made based upon the general evaluation in § 230.22 or any other previously run currently valid tests. The suspended particulate bioassay may be necessary to determine the effect of uncontaminated suspended particulates on filter-feeding organisms or other vulnerable aquatic species, as well as to determine the bioavailability of toxics in the suspended particulate phase. Where suspended particulate testing of dredged material is required, (suspended particulate phase procedures do not apply to fill material), a bioassay test shall be conducted.

(4) *Effects on benthos.* Evaluation of the significance of chemical-biological interactive effects on benthic organisms resulting from the discharge of dredged or fill material is extremely complex and demands procedures which are at the forefront of the current state of the art. Although research has shown that benthic species can ingest contaminated sediment particles, it has not been determined to what degree the contaminants are dissociated from the sediment and incorporated into benthic body tissues thereby gaining entry to the food web. The District Engineer may use an appropriate benthic bioassay (including bioaccumulation tests) when such procedures will be of value in assessing ecological effect and in establishing discharge conditions.

(c) *Procedure for comparison of sites.* (1) When an inventory of the total

concentration of chemical constituents deemed critical by the District Engineer would be of value in comparing sediment at the dredging site with sediment at the disposal site, he may require a sediment chemical analysis. Markedly different concentrations of critical constituents between the excavation and disposal sites may aid in making an environmental assessment of the proposed disposal operation. Such analyses should be interpreted in terms of the potential for harm as supported by any pertinent scientific literature or as interpreted in criteria such as the Quality Criteria for Water.

(2) When an analysis of biological community structure will be of value to assess the potential for adverse environmental impact at the proposed disposal site, a comparison of the biological characteristics between the excavation and disposal sites may be required by the District Engineer. Biological indicator species may be useful in evaluating the existing degree of stress at both sites. Sensitive species representing community components colonizing various substrate types within the sites should be identified as possible bioassay organisms if tests for toxicity are required. Community structure studies are expensive and time consuming, and therefore should be performed only when they will be of value in determining discharge conditions. This is particularly applicable to large quantities of dredged material known to contain adverse quantities of toxic materials. Community studies should include benthic organisms such as microbiota and harvestable shellfish and finfish. Abundance, diversity, and distribution should be documented and correlated with substrate type and other appropriate physical and chemical environmental characteristics.

(d) *Size of disposal site.* The specified disposal site shall be confined to the smallest practicable area consistent with the type of dispersion determined to be appropriate by the application of these guidelines. In a few special cases under unique environmental conditions, the discharged material may be intended to be spread naturally in a very thin layer over a large area of the substrate rather than be contained within the disposal site. Where there is adequate justification to show that wide-spread dispersion by natural means will result in no significantly adverse environmental effects the discharge is not subject to the normal constraints on size of disposal site in this paragraph. Although the impact of the particular discharge may constitute a minor change, the cumulative effect of numerous such piecemeal changes often results in a major impairment of the water resources and interferes with the productivity and water quality processes of existing environmental systems. Thus, the particular disposal site will be evaluated with the recognition that it is part of a complete and interrelated ecosystem. The District Engineer may undertake reviews of particular areas in response to new applications, and in consultation with the appropriate Regional Director of the Fish and Wildlife Service, the Regional Director of the National Marine Fisheries Service of the National Oceanic and Atmospheric Administration, the Regional Administrator of the Environmental Protection Agency, the State Conservationist of the Soil Conservation Service of the Department of Agriculture, and the head of the appropriate State agencies, including the State Director of an approved Coastal Zone Management Program, to assess the cumulative effect of activities in such areas.

(e) *Fill material testing procedures.* Fill material means any pollutant including dredged materials, used to create fill in the traditional sense of replacing an aquatic or wetland area with dry land or changing the bottom elevation of a water body for any purpose. In order to serve that function, fill material must remain in place and generally be capable of bearing weight. This often requires confinement of fill material, which raises the possibility of percolation through or run-off or displacement of the fill by cataclysmic events of nature.

There is little or no sorting of material in a fill. Fill material originating on land may be inert as is the case of granite blocks used for rip rap, or it may consist of soil which could be clean or be contaminated from nearby pollution sources or by waste discharges. If the evaluation under § 230.22 indicates the need for testing, the procedures below should be followed.

(1) *Water Leachate Test.* Where toxic pollutants have not been eliminated through the procedures in § 230.22, water leachate tests for fill material may be conducted to make the determinations required by section 230.20.

(2) *Biological tests.* Biological tests of fill material proposed for discharge, adapted from those described in § 230.23, may be used to determine the acute or chronic effects of polluted fill material upon aquatic and wetland organisms.

(f) *Mixing zone determination.* The dilution and dispersion zone shall be the smallest practicable zone within each specified disposal site, consistent with the objectives of these guidelines, in which desired concentrations of constituents must be achieved.

The District Engineer and the Regional Administrator shall consider the following factors in determining the acceptability of a proposed dilution and dispersion zone:

(i) Depth of water at the disposal site;

(ii) Current velocity, direction, and variability at the disposal site;

(iii) Degree of turbulence;

(iv) Stratification attributable to causes such as obstructions, salinity or density profiles at the disposal sites;

(v) Discharge vessel speed and direction, if appropriate;

(vi) Rate of discharge;

(vii) Ambient concentration of constituents of interest;

(viii) Dredged material characteristics, particularly concentrations of constitutents, amount of material, types of material (sand, silt, clay, etc.) and settling velocities;

(ix) Number of discharge actions per unit of time;

(x) Other factors of the disposal site that affect the rates and patterns of mixing.

Subpart D—Physical and Chemical Components of the Aquatic Ecosystem, Including Wetlands

§ 230.30 Substrate.

The substrate is the solid phase of the aquatic ecosystem, including wetlands, underlying open and adjacent waters of the U.S. and constituting the surface of wetlands. It consists of organic and inorganic solid materials and includes water and other liquids or gases that fill the spaces between solid particles.

(a) *Environmental characteristics and values.* Natural substrates furnish habitat for aquatic plants and animals. These plants and animals often exhibit a variety of structural and behavioral specializations that adapt them to specific types of substrate environments. Substrates vary with respect to particle size and shape, chemical composition, and degree of compaction. The elevation and contours of substrates, molded in part by activity of overlying water, exert a pronounced underwater damming and directional influence on the manner in which water circulates. The chemical processes carried on in the substrate include the absorption and adsorption of materials introduced into the aquatic ecosystem, the production and exchange of gaseous substances, and decomposition and

cycling of inorganic and organic matter by the action of microbes and chemical processes. New material can accumulate naturally on substrates from the water column in the form of settling suspended particulates.

(b)(1) *Possible loss of environmental characteristics and values.* The discharge of dredged or fill material can result in varying degrees of change in the complex physical, chemical, and biological characteristics of the substrate. These changes can adversely affect the substrate environment and are often reflected throughout the entire aquatic ecosystem. The discharge of sufficient amounts of dredged or fill material to alter substrate elevation or contours can result in water circulation, current pattern, water fluctuation and water temperature changes. Erosion or slumpage of such deposits can adversely affect areas of the substrate outside the perimeters of the disposal site by changing or destroying habitat. Bottom-dwelling organisms at the site might be smothered or forced to migrate as a result of a discharge, but similar forms may recolonize on the discharged material. However, when discharged material is very dissimilar from that of the discharge site, recolonization by similar organisms at the site is unlikely. Adverse changes in the substrate can result from the bulk, composition, location, method, and timing of discharges.

(2) Adverse impacts can be compounded by the presence of contaminants in the dredged or fill material. Such effects may be immediate or long-term, localized or broadly dispersed through the aquatic ecosystem. Generally sediments extracted from heavily industrialized or settled areas can be expected to be contaminated with materials known to be discharged in the waters of such an area. The impact of contaminants contained in dredged and fill material is dependent upon the interaction among a wide range of poorly understood variables that affect their release into the immediate aquatic ecosystem.

(c) *Guidelines to minimize impacts.* In addition to the consideration of alternatives in § 230.10(a), the Guidelines to minimize impacts as described in § 230.10(d), and water dependency in § 230.10(e), specific measures to minimize impacts on the substrate include, but are not limited to:

(1) Confining the discharge to the smallest practicable deposition zone where mounding of material on the substrate at the disposal site will protect the characteristics and values of the surrounding substrate.

(2) Spreading or scattering discharge material where maximizing the size of the deposition zone will minimize the thickness of the layer of material or the substrate and prevent loss of characteristics and values attributable to mounding.

(3) Selecting discharge methods and disposal sites where the potential for erosion, slumping or leaching of materials into the surrounding aquatic ecosystem will be reduced. These methods or sites include, but are not limited to:

(i) Using containment levees, sediment basins, and cover crops to reduce erosion;

(ii) Using lined containment areas to reduce leaching where leaching of chemical constituents from the discharged material is expected to be a problem; and

(iii) Using contained areas and avoiding discharges near steep slopes of channels in unsuitable areas to reduce slumpage.

(4) Selecting a disposal site that has been used previously for dredged material discharge.

(5) Selecting an upland disposal site where available and where determined to be an environmentally satisfactory alternative (See § 230.10(a)).

(6) Selecting a disposal site at which the substrate is composed of material similar to that being discharged such as discharging sand on sand or mud on mud.

(7) Discharging material at a location and by methods which minimize changes in substrate elevation, thereby preventing modification of water mass movement leading to erosion or other adverse impacts.

(8) Considering the use of habitat development or restoration measures, where appropriate.

(9) Discharging at times of the year which will minimize adverse effects on the aquatic ecosystem.

(10) Capping in-place contaminated material with clean material or selectively discharging the most contaminated material first so it can be capped with the remaining material as appropriate.

§ 230.31 Suspended particulates.

Suspended particulates in the aquatic ecosystem, including wetlands, consist of fine-grained mineral particles usually smaller than silt, and organic particles. Suspended particulates may enter water bodies as a result of runoff from land, flooding uplands, flushing wetlands, debris from planktonic organisms and higher vegetation, resuspension of bottom sediments, and man's activities. Particulates may remain suspended in the water column for variable periods of time as a result of such factors as agitation of the water mass, particulate specific gravity, particle shape, and physical and chemical properties of particle surfaces.

(a) *Environmental characteristics and values.* Suspended particulates nourish plants by releasing nutrients in both inorganic and organic form to the water column. Suspended organic particles supply food for detritus feeding organisms. Suspended particulates also absorb and adsorb chemicals including pollutants from the water column, adding such materials to the substrate as they settle to the bottom. Suspended particulates settle and reconstitute the substrate when water currents or velocities decrease. Thus, they are present in the water column in greatest amounts at times of high flow or high water levels, but usually for relatively short periods. Large streams, carrying huge sediment loads like the Mississippi River, contain large amounts of suspended particulates much of the time. Other water bodies, like some springs and creeks in stable watersheds of well-forested mountains, only occasionally bear large amounts of suspended particulates. Organisms inhabiting both extremes exhibit marked specializations which adapt them for the environment in which they are found.

(b) *Possible loss of enviromental characteristics and values.* The discharge of dredged or fill material can result in greatly elevated levels of suspended particulates in the water column. High turbidity reduces light penetration which lowers the rate of photosynthesis and the primary productivity of an aquatic area. Sight-dependent species are impacted through reduced feeding ability, leading to more limited growth and lower resistance to disease. Both the biological and the chemical content of the suspended material will react with the dissolved oxygen in the water, which may result in oxygen depletion. Toxic metals and organics, pathogens and viruses absorbed or adsorbed to fine-grained particulates in the material proposed for discharge may be biologically available to organisms in the water column or upon settling to the substrate. When suspended particulate levels are raised significantly above background levels by discharges, they create turbid plumes which are highly visible and aesthetically displeasing. The adverse impacts caused by such discharges depend upon the relative increase in suspended particulates above the amount occurring naturally, the current patterns, water levels and fluctuations

present when such discharges occur, the volume and rate of the discharge, and the seasonal timing of the discharge.

(c) *Guidelines to minimize impacts.* In addition to the consideration of alternatives in § 230.10(a), the Guidelines to minimize impacts as described in § 230.10(d), and water dependency in § 230.10(e), specific measures to minimize the impacts of suspended particulates include, but are not limited to:

(1) Using silt screens or other appropriate filtration methods to confine suspended particulates to a small area where settling or removal can occur.

(2) Making use of currents and circulation patterns to mix, disperse and dilute the discharge in order to expedite reduction in the level of suspended particulates. Configuration of the pipeline at the discharge site can minimize turbidity levels.

(3) Minimizing water column turbidity by using a submerged diffuser system. The same effect can be accomplished to some extent by submerging pipeline discharges.

(4) Utilizing chemical flocculants to enhance the deposition of suspended particulates in diked disposal areas.

(5) Discharging at times of the year which will minimize adverse effects on the aquatic ecosystem.

(6) Adjusting the volume and rate of discharge to minimize the adverse effects of suspended particulates.

§ 230.32 Water.

Water is the liquid phase of the aquatic ecosystem, including wetlands, in which organic and inorganic constituents are dissolved or suspended. It is contained by the substrate to form a dynamic life-supporting system. Water clarity, nutrient and chemical content, color, odor, taste, dissolved gas levels, pH, and temperature contribute to its life-sustaining capabilities.

(a) *Environmental characteristics and values.* Physical and chemical characteristics of the water vary among water bodies and among strata in a single water mass. Vertical stratification from surface to substrate, and lateral stratification between shorelines or banks are also characteristic of certain water bodies. Aquatic organisms and communities are closely adapted both to certain ranges in the physical and chemical properties of water, and to the stratification patterns of the water body. Environmental values of water include its importance as a life-supporting system for communities of aquatic organisms, such as in a drinking water supply, an agricultural and manufacturing water supply, a transportation medium, a place for recreation, education, aesthetics, and food supply, derived from fish, shellfish, and wildlife.

(b) *Possible loss of characteristics and values.* The discharge of dredged or fill material can change the water chemistry and the physical characteristics of the water body at the disposal site through the introduction of chemical constituents in suspended or dissolved form that do not occur there naturally. Changes in the clarity, color, odor, and taste of water and the toxic or hazardous pollutants contained in it can reduce or eliminate the suitability of water bodies for communities and populations of aquatic organisms, and for human consumption, recreation, aesthetics, and amenities. The introduction of nutrients to the water column as a result of the discharge can create a high biochemical oxygen demand (BOD). The dissolved oxygen concentration is reduced as a result of BOD, affecting the survival of many aquatic organisms. Increases in nutrients can favor one group of organisms to the detriment of other more desirable types, resulting in bad health effects, objectionable tastes and odors, and other nuisances.

(c) *Guidelines to minimize impacts.* In addition to the consideration of alternatives in § 230.10(a), the Guidelines to minimize impacts described in § 230.10(d), and water dependency in § 230.10(e), specific measures to minimize the impacts of suspended particulates include, but are not limited to:

(1) Using upland disposal sites and retaining or treating runoff to remove dissolved pollutants before they reach waters of the U.S. when determined to be necessary to protect the aquatic ecosystem.

(2) Using lined or impervious containment areas in waters of the U.S. to prevent release of the discharged material to the receiving water column.

(3) Using a submerged diffuser system or other subsurface disposal method to minimize release of discharged material to the receiving water column.

(4) Adding treatment substances to the discharged material. For instance, the oxygen loss from the water column associated with biological and chemical oxygen demand can be reduced by addition of oxygen to the discharged material.

§ 230.33 Current patterns and water circulation.

Current patterns and water circulation are the physical movements of water in the aquatic ecosystem, including wetlands. Currents and circulation are in response to celestial, gravitational, atmospheric and geologic forces as modified by basin shape and cover, physical and chemical characteristics of water strata and masses, and energy dissipating factors.

(a) *Environmental characteristics and values.* Current patterns and water circulation act to transport, mix, and dilute dissolved and suspended chemical constituents in the aquatic ecosystem. They transport accumulated detritus and food organisms, dissolved nutrients and gases, eggs, sperm, and progeny of animals, seeds and plant fragments, larvae, and young upon which communities and individual populations of organisms depend. Current patterns and water circulation also furnish directional orientation for migratory species, moderate temperature extemes and otherwise influence temperature, and directly or indirectly affect navigation and recreation in the waters of the U.S.

(b) *Possible loss of environmental characteristics and values.* The discharge of dredged or fill material can modify current patterns and water circulation by obstructing flow, changing the direction or velocity of water flow and circulation, or otherwise reducing the reach of a water body. As a result, adverse changes can occur in location, structure, and dynamics of aquatic communities; shoreline and substrate erosion and deposition; the deposition of suspended particulates; the rate of mixing of dissolved and suspended components of the water body; and water stratification.

(c) *Guidelines to minimize impacts.* In addition to the consideration of alternatives in § 230.10(a), the Guidelines to minimize impacts in § 230.10(d), and water dependency in § 230.10(e), specific measures to minimize impacts on current patterns and water circulation include, but are not limited to:

(1) Distributing discharge material widely and in a thin layer at the disposal site to maintain natural substrate contours and elevation.

(2) Where mounding is an acceptable alternative engineering the shape and orientation of the mound to minimize the surface that constitutes a cross sectional barrier to the current and the vertical portion of the water column occupied by the mound. The manipulation of natural bottom contours should be considered in minimizing the size of the mound.

(3) Ensuring water circulation by use of properly designed culverts, pilings, suspension bridges, etc., for structures; and discontinuous mounds for open water discharge. (See Section 230.46 Riffles and Pools for discussion of channelization).

(4) Selection of the sites of impoundments associated with dams to minimize distortion of unique characteristics of riverine ecosystems caused by the inevitable drastic modification of current patterns and water circulation.

§ 230.34 Normal water fluctuations.

Normal water fluctuations in a natural system consist of daily tidal fluctuations, seasonal fluctuations, and annual fluctuations in water level. Biological and physical components of these systems are attuned to periodic water fluctuations.

(a) *Environmental characteristics and values.* Natural water fluctuations affect the water depth, water quality, and salinity conditions to which plants and animals in an aquatic area are closely adapted. They often play an important role during periods of spawning, juvenile development, nesting and feeding. Water fluctuations provide nutrients and water to aquatic biota and transport detritus and seeds, especially to wetlands flushed by tides. Periodic inundation excludes upland plant invasion and thus perpetuates wetland plant communities, which may help to minimize erosion, retard high water runoff (as from floods and storm surges) and promote accretion of the substrate.

(b) *Possible loss of environmental characteristics and values.* Discharge of dredged or fill material can alter the normal water-level fluctuation pattern of an area resulting in prolonged periods of high or low water, exaggerated extremes of high and low water, or a static, nonfluctuating water level. Depending on the condition created by the disposal activity, such water level modifications can change salinity patterns, increase erosion or sedimentation, aggravate water temperature extremes, and upset the nutrient and dissolved oxygen balance of the aquatic ecosystem. In addition, these modifications can alter or destroy communities and populations of aquatic animals and vegetation, induce replacement by nuisance growth, modify habitat, reduce food supplies, restrict movement of aquatic fauna, destroy spawning areas, and change adjacent or downstream areas.

(c) *Guidelines to minimize impacts.* In addition to the consideration of alternatives in § 230.10(a), the Guidelines to minimize impacts in § 230.10(d), and water dependency in § 230.10(e), specific measures to minimize impacts on current patterns and water circulation include, but are not limited to:

(1) Designing access roads and channel spanning structures using culverts, open channels, and diversions that will pass both the high and low stages of fluctuating water flows and maintain circulation and faunal movement.

(2) Designing the discharge of dredged or fill material to minimize or prevent the creation of standing bodies of water in areas of fluctuating water levels, or the drainage of areas previously subject to such fluctuations. (See § 230.46 Riffles and Pools for discussion of channelization).

§ 230.35 Salinity.

Salinity gradients form where salt water from the ocean meets and mixes with fresh water from land. These gradients exist in response to the natural forces that create and move masses of water.

(a) *Environmental characteristics and values.* The distribution of many aquatic species is associated with the salinity gradient of an aquatic area. Plant and animal communities adapted to particular salinity gradients form specialized communities within the larger aquatic ecosystem. Species, such as brown and white shrimp, spawn in the ocean, then migrate to nursery and maturation areas in the low-salinity waters of the bays, estuaries, and coastal marshes; their spawning and migratory behavior being closely adapted to the salinity gradient in certain aquatic areas. The manner in which fresh and salt water mix in estuarine areas is an important factor contributing to the role estuaries play as sediment traps. This is determined by the relative magnitude of the river flow and the tidal flow. In a river-dominated estuary, a salt-wedge develops and salt water flows upstream along the bottom while fresh water flows seaward in the upper levels. The upstream edge of this salt-wedge marks the point of maximum sedimentation. This upstream edge will migrate up and down the estuary yearly and seasonally in response to changes in the volume of river flow. In an estuary dominated by tidal flow, the salt wedge is destroyed and more thorough mixing occurs. There is a salinity gradient from the upstream to the downstream portion of the estuary, as well as vertically from surface to substrate, which is characteristic of the estuary.

(b)(1) *Possible loss of environmental characteristics and values.* Adverse impacts from dredged or fill material are principally caused by obstructions that divert or restrict the flow of either the fresh or salt water. These diversions and restrictions can effect permanent changes in the local areas by causing a shift in the salinity patterns.

(2) Partial blocking of the entrance to an estuary or river mouth will restrict the movement of the salt water into and out of that area. This can effectively lower the volume of salt water available for mixing that estuary. The circulation pattern will be altered, the salinity gradient will move downstream, sedimentation is displaced, and the associated aquatic biota must adjust to the new conditions.

(3) In the freshwater zone, disposal operations in the upstream regions can have equally adverse impacts. Any reduction in the volume of fresh water moving into the estuary will affect the location and type of mixing, changing the characteristic salinity pattern. The circulation pattern is altered, the salinity gradient and/or salt-wedge moves upstream, municipal water supplies can be affected, sedimentation areas are displaced, and the biota must move to new locations to find the portion of the salinity gradient to which they are adapted.

(c) *Guidelines to minimize impacts.* Adherence to the Guidelines for the protection of current patterns and water circulation and normal water fluctuations, §§ 230.33 and 230.34 will protect salinity patterns and the environmental values they support.

Subpart E—Special Aquatic Sites

§ 230.40 Sanctuaries and refuges.

Sanctuaries and refuges consist of areas designated and managed principally for the preservation of fish and wildlife.

(a) *Values.* Sanctuaries and refuges maintain and enhance the habitat for resident and transient fish and wildlife populations. They serve the functions of providing food resources and protective cover, and provide areas for reproduction and nursery grounds. Sanctuaries and refuges are managed to control predator populations and provide protection from interferences by man.

(b) *Possible loss of values.* The discharge of dredged or fill material can reduce suitable habitats either temporarily or permanently, interfere with spawning, migratory or other life stage activities and by contamination, concealment or destruction, reduce the availability of food for fish and wildlife. Discharges of dredged and fill material may increase incompatible human presence by providing persons ready access to remote areas or by requiring frequent maintenance activity. Modification of the environment by dredge and fill operations may provide a habitat for predators or competitively exploitive species of plants and animals.

(c) *Guidelines to Miminize Impacts.* In addition to the consideration of

alternatives in § 230.10(a), the Guidelines to minimize impacts as described in § 230.10(d), and water dependency in § 230.10(e), specific Guidelines to minimize adverse effects on sanctuaries and refuges include, but are not limited to:

(1) Selecting sites that will not result in long-term changes in valuable fish and wildlife habitat.

(2) Selecting sites that will not increase incompatible human activity causing significant impacts on fish and wildlife, or require the need for frequent maintenance activity in remote fish and wildlife areas.

(3) Selecting sites or managing discharges in a way to prevent or to control the creation of habitat for undesirable predators or competitive species of plants or animals.

(4) Not discharging at times during the breeding, migratory and other critical life stages of resident of transient fish, wildlife and other aquatic organisms.

(5) Enhancing habitat characteristics of the area, in a manner consistent with management practices.

(6) The specific Guidelines related to other special aquatic sites which exist within a sanctuary or refuge should also be examined.

(d) *Special determinations.* In addition to the determinations required by § 230.20 and § 230.30, special determinations where sanctuaries and refuges may be affected by discharges of dredged or fill material include whether the discharge will:

(1) Disrupt the breeding, spawning, migratory or other critical life states of resident or transient fish and wildlife;

(2) Create ready human access to remote aquatic areas;

(3) Create the need for frequent maintenance activity;

(4) Result in the establishment of undesirable competitive species of plants and animals;

(5) Modify the sanctuary or refuge management practices by changing the balance of water and land areas needed to provide cover, food, and other fish and wildlife habitat requirements;

(6) Be acceptable to sanctuary or refuge managers or supporters of the refuge or sanctuary;

(7) Allow for subsequent modification for restoration or habitat development of existing habitat.

§ 230.41 Parks, national and historical monuments, national seashores, wilderness areas, research sites, and similar preserves.

These nature preserves consist of areas designated and managed for their aesthetic, educational, historical, recreational, or scientific value.

(a) *Values.* Managed use of these natural areas is designed to preserve them in their natural states. The management of these areas ensures the general public continued access to sites of historical, educational, recreational and scientific importance while protecting them from overuse. The restriction of certain activities in areas valuable for scientific research preserves those sites in their natural states for the collection of scientific information.

(b) *Possible loss of values.* The discharge of dredged or fill material into such areas could modify the aesthetic, educational, historical, recreational and/or scientific qualities thereby reducing or eliminating the uses for which such sites are set aside and managed.

(c) *Guidelines to minimize impacts.* In addition to the consideration of alternatives in § 230.10(a), the Guidelines to minimize impacts described in § 230.10(d), and water dependency in § 230.10(e), specific Guidelines to minimize adverse effects on these designated natural areas include but are not limited to:

(1) Selecting a disposal site that will not result in a significant or irreversible loss in the specific values for which an area is being managed and protected.

(2) Specific Guidelines for other aquatic sites which exist within a preserve should also be examined.

(d) *Special determinations.* In addition to the determinations required by § 230.20 and § 230.30, special determinations, where these designated natural areas may be affected by discharges of dredged or fill material, include whether the discharge will:

(1) Modify management practices for the park, National or historical monument, National seashore, wilderness area, or research site under consideration for discharge.

(2) Be acceptable to users and managers of such areas.

(3) Allow for subsequent modification for restoration or habitat development of existing areas.

§ 230.42 Wetlands.

Wetlands consist of areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

Comment: Wetlands are the subject of Federal Executive Order No. 11990, Federal programs, and State law and programs in addition to section 404 of the Act. As a result, a number of wetland definitions have been codified or otherwise formally published and information is being collected and organized into wetland classification systems. The definition and classification systems differ in at least some particulars to accomodate or emphasize specialized needs. In these Guidelines, wetlands (§ 230.42) are distinguished from mud flats (§ 230.43) and vegetated and unvegetated shallows (§ 230.44) although by some classification systems all of these systems would be classified as wetlands. In addition, in particular circumstances, portions of sloughs, prairie potholes, wet meadows, river bottomlands, and other areas may be wetlands under section 404. Permanently inundated areas such as vegetated and unvegetated shallows (§ 230.44) and riffles and pools (§ 230.46) are considered to be open water. Where open water exists, wetlands, mud flats, sand flats, beaches, etc., constitute the transition to upland. The margin between wetland and open water can best be established by specialists familiar with the local environment, particularly where emergent vegetation merges with submerged vegetation over a broad area in such places as the lateral margins of open water, in headwaters, in rainwater catch basins, and at groundwater seeps. The landward margin of wetlands also can best be identified by specialists familiar with the local environment when vegetation from the two regions merges over a broad area. Wetland vegetation consists of plants that require wet soils to survive (obligate wetland plants) as well as plants, including certain trees, that gain a competitive advantage over others because they can tolerate prolonged wet soils conditions and their competitors cannot. In addition to plant populations and communities, vegetated wetlands are delimited by hydrological and physical characteristics of the environment. These characteristics should be considered when information about them is needed to supplement information available about vegetation, or where wetland vegetation has been removed or is dormant.

(a) *Values.* Wetlands serve important natural biological functions. They can support high biological productivity, especially in estuarine systems. Some wetlands may exchange nurtients through water circulation patterns thereby affecting adjacent ecosystems. Wetlands provide habitat for resident aquatic and terrestial species. Many nonresident species depend on wetlands

for food and as habitat at certain stages in their life cycle. For example, wetlands function as spawning and nursery areas for many fish species, and resting areas for migratory waterfowl. Functioning as a buffer zone, wetlands shield upland areas from wave action, erosion, and storm damage. Some wetlands also serve as storage areas for storm and flood waters. Wetlands may also have beneficial effects on water quality. Pollutants in runoff from surrounding upland areas or in water flushing wetlands may be retained or converted to innocuous forms protecting water quality in receiving waters. Wetlands influence natural drainage characteristics, water circulation, and sedimentation patterns. Wetlands may serve as aquifer recharge areas.

(b) *Possible loss of values.* The discharge of dredged or fill material in wetlands is likely to damage or destroy habitat or adversely affect the biological productivity of wetland eocsystems by smothering, dewatering, permanently flooding, or altering periodicity of water movement. Wetland vegetation is extremely sensitive to changes in substrate elevation. The addition of dredged or fill material may destroy wetland vegetation or result in advancement of succession to dry land species. Dredged or fill activities may reduce or eliminate nutrient exchange by a reduction of the system's productivity, or altering current patterns and changing velocities. Disruption of the wetland system can result in degradation of water quality. Discharging fill material in wetlands as part of municipal, industrial or recreational development may modify the capacity of wetlands to retain and store floodwaters and to serve as a buffer zone shielding upland areas from storm damage and erosion. The discharge of dredge and fill material in wetlands can obstruct sheet flow or circulation patterns that flush large expanses of adjacent wetland systems. When disruptions in flow and circulation patterns occur, apparent minor loss of wetland acreage may result in major losses through secondly impacts.

(c) *Guidelines to minimize impacts.* In addition to the consideration of alternatives in § 230.10(a), Guidelines in minimize impacts described in § 230.10(d), and water dependency in § 230.10(e), special Guidelines to minimize adverse effects on wetlands include, but are not limited to:

(1) Restoring the elevation, substrate type, and circulation patterns as soon as possible following the completion of any necessary construction or other discharge activity in a wetland to provide conditions for natural restoration of vegetation in disturbed areas.

(2) Restoring or developing habitat in disrupted wetlands by revegetation with the native wetland species removed by the activity.

(3) Establishing new wetlands with the disposal material where suitable sites and conditions exist and other components of the ecosystem such as vegetated shallow water areas will not be disrupted.

(4) Using machinery and techniques that are especially designed to reduce damage to wetlands. This may include machinery with specially designed wheels or tracks, machines equipped with devices that scatter rather than mound excavated materials, and the use of mats under heavy equipment to reduce wetland surface compaction and rutting.

(5) Limiting the number and extent of construction access roads and temporary fills in wetlands that may be required for the dredge or fill activity.

(6) Implementing habitat development which is compatible with other parts of the ecosystem. These measures may include but are not limited to:

(i) Establishing fish or wildlife habitat or food crop vegetation at the disposal site;

(ii) High mounding the discharged material in confined sites to create wildlife habitat.

(7) Discharging at times of the year which will minimize adverse effects on the wetlands ecosystem.

(d) *Special Determinations.* In addition to the determinations required by § 230.20 and § 230.30, special determinations where wetlands may be affected by discharges of dredged or fill material include whether the discharge will individually or cumulatively:

(1) Significantly change or affect the productivity or the nutrient exchange capability of a wetland area.

(2) Significantly change the capacity of a specific wetland type for protecting other areas from wave actions, erosion, or storm damage.

(3) Significantly change the capacity of a wetland to store storm and flood waters.

(4) Significantly change the aquifer recharge capability of a wetland.

(5) Significantly change the wetland as habitat for fish and wildlife.

§ 230.43 Mud flats.

Mud flats are located along the sea coast and in coastal rivers to the head of tidal influence and in inland lakes, ponds, and riverine systems.They are broad, flat areas, which when inundated are subject to the resuspension of bottom sediments by wind induced wave action. Coastal mud flats are exposed at extremely low tides and inundated at high tides with the water table at or near the surface of the substrate. The substrate of mud flats contains organic material and particles smaller in size than sand. They are either unvegetated or vegated only by algal mats.

(a) *Values.* Mud flats serve as habitats for shellfish and other invertebrates. They serve as nursery, spawning, and foraging areas for many fish, other aquatic species, birds, and other animals. Primary productivity in mud flats is centered in algal mats and diatoms. The decomposition of organic material in mud flats by chemical and biological processes contributes nutrients to the water column. Mud flats delay and thereby reduce the adverse effects of storm surge and runoff from surrounding uplands.

(b) *Possible loss of values.* The discharge of dredged or fill material can cause changes in water circulation pattern which may disrupt periodic inundation or permanently flood or dewater the mud flat. Such changes can deplete or eliminate mud flat biota, foraging areas, and nursery areas. Changes in inundation patterns also can affect the chemical and biological decomposition processes occurring on the mud flat and change the deposition of suspended material affecting the productivity of the area. Changes may reduce the mud flat's capacity to dissipate storm surge runoff.

(c) *Guidelines to minimize impacts.* In addition to the consideration of alternatives in § 230.10(a), the guidelines to minimize impacts described in § 230.10(d), and water dependency in § 230.10(e), special Guidelines to minimize adverse effects on mud flats include, but are not limited to:

(1) Designing the discharge to avoid a disruption of the periodic inundation patterns.

(d) *Special determinations.* In addition to the determinations required by § 230.20 and § 230.30, special determinations where coastal mud flats may be affected by discharges of dredged or fill material include whether the discharge will:

(1) Significantly change the periodic inundation patterns, resulting in an increase in the rate of erosion or accretion.

(2) Significantly change the periodic inundation patterns, resulting in adverse modifications of the mud flat as fish, shellfish and wild life habitat.

(3) Significantly change the periodic inundation patterns, resulting in

modification of the chemical and biological decomposition process of the mud flat.

(4) Significantly change the periodic inundation patterns, resulting in a reduction of the storm surge dissipating capacity of the mud flat.

§ 230.44 Vegetated and unvegetated shallows.

Vegetated shallows are permanently inundated areas that under normal circumstances support rooted aquatic vegetation such as turtle grass and eelgrass as well as a number of freshwater species. Unvegetated shallows are permanently inundated near shore areas.

(a) *Values.* Vegetated shallows are highly productive areas where the productivity is centered in the vegetation. Such vegetated beds provide food, cover, spawning, nursery, and forage areas for many aquatic organisms as well as wildlife. Harvestable aquatic organisms are concentrated in and around such beds. These vegetated shallows stabilize bottom materials and decrease turbidity and channel shoaling. Unvegetated shallows furnish benefits of food, spawning and nursery areas, and forage for many aquatic organisms, as well as wildlife. Both types of shallows constitute a buffer to protect shorelines from erosion and wave action.

Comment: Vegetation in shallow water does not always constitute an integral component of a productive, balanced ecosystem in a special aquatic site. Rooted vascular vegetation may erupt in response to excessive nutrients introduced by man directly and indirectly, because it is an exotic species with inadequate natural controls, or for other reasons. In extreme cases, when ponds or navigation channels are completely weed-choked by vascular vegetation, the nuisance factor is clear and the values of vegetated shallows are largely negated. The ecology of shallow water vegetation is complex and deserves professional consideration to prevent damage to productive natural systems while allowing control of nuisance growths.

(b) *Possible loss of values.* The discharge of dredged or fill material can smother vegetation and benthic organisms. It may also create unsuitable conditions for their continued vigor by changing water circulation patterns, releasing nutrients that increase algal populations, releasing chemicals that adversely affect plants and animals, increasing turbidity levels, or by reducing light penetration. The discharge of dredged or fill material may reduce the value of vegetated and unvegetated shallows as nesting, spawning, nursery, cover, and forage areas, as well as their value in protecting shorelines from erosion and wave actions.

(c) *Guidelines to minimize impacts.* In addition to the consideration of alternatives in § 230.10(a), the Guidelines to minimize impacts in § 230.10(d), and water dependency in § 230.10(e), specific Guidelines to minimize adverse impacts in vegetated and unvegetated shallows include but are not limited to:

(1) Locating and confining the discharge to avoid smothering productive beds of vegetation and concentrations of benthic life.

(2) Determining the point of discharge, the discharge site, and the method of discharge into the water column which will minimize the extent of any plume and the deposition zone where the discharge would adversely affect the vegetation, aquatic organisms, and other wildlife in a vegetated or unvegetated shallow.

(3) Locating and otherwise designing the discharge to avoid significant changes in water circulation patterns which are essential to the productivity of the shallow area.

(4) Timing the discharge to avoid interferences with the spawning, nursery, and nesting activities of aquatic organisms and associated wildlife.

(5) Restoring or transplanting vegetated beds where beneficial and where conditions at the site permit.

(d) *Special determinations.* In addition to the determinations required by § 230.20 and § 230.30, special determinations where vegetated and unvegetated shallows may be affected by discharges of dredged or fill material include whether the discharge will:

(1) Smother vegatated beds or benthic organisms.

(2) Significantly change or affect the species present or the productivity of the vegetation or the benthic organisms associated with a shallow area.

(3) Significantly change the capacity of a vegetated shallow for stabilizing bottom materials and for decreasing turbidity and channel shoaling.

(4) Significantly change the capacity of vegetated or unvegetated shallows to protect shorelines from erosion and wave action.

(5) Significantly change the capacity of the area to exchange organic matter and nutrients.

§ 230.45 Coral reefs.

Coral reefs consist of the skeletal deposit, largely of calcareous or silicaceous materials, produced by the vital activities of anthozoan polyps or other invertebrate orgamisms and include the colonies of organisms present in growing portions of the reef.

(a) *Values.* Coral reefs are highly productive areas where the productivity is centered in the reef building organisms. Coral reefs provide food, cover, spawning, nursery, and forage areas for many species of highly specialized aquatic organisms. They constitute a unique environment in which many rare forms or brilliantly colored fish and other organisms are concentrated. They serve as a site at which such organisms can be observed under natural conditions by scientists and others.

(b) *Possible loss of values.* The discharge of dredged or fill material can adversely affect colonies of reef building organisms by releasing contaminants such as hydrocarbons into the water column, by burying them, by reducing light penetration through the water, and by increasing the level or suspended particulates. Coral organisms are extremely sensitive to even slight reductions in light penetration or increases in suspended particulates. These adverse effects will cause a loss of productive colonies which provides habitat for many species of highly specialized aquatic organisms.

(c) *Guidelines to minimize impacts.* In addition to the consideration of alternatives in § 230.10(a), the Guidelines to minimize impacts in § 230.10(d), and water dependency in § 230.10(e), specific Guidelines to minimize adverse impacts on coral reefs include, but are not limited to:

(1) Selecting sites or managing discharges to confine and minimize the release of suspended particulates which would result in reductions in light penetration or increase in turbidity levels in the proximity of a coral reef. Water current and circulation patterns which may transport material into or across a coral reef must be considered.

(d) *Special determiniations.* In addition to the determinations required by § 230.20 and § 230.30. special determinations where coral reefs may be affected by discharges of dredged or fill material include whether the proposed discharge will:

(1) Smother colonies of reef building organisms.

(2) Significantly change or affect the productivity of reef building colonies by reducing light penetration or increasing water turbidity.

(3) Result in significant reductions in light penetration or increases in water turbidity due to the transportation of suspended particulates by current and circulation patterns onto or across a coral reef.

§ 230.46 Riffles and pools.

Upland and steep gradient streams generally have alternating segments of riffles and pools. Riffles are well oxygenated shallow areas with coarse substrates. Pools are areas between riffles where water generally is deeper and stream velocity is slower, allowing for the settling of particulates to the substrate.

(a) *Values.* (1) Riffles and pools are vital habitats for fresh water aquatic life. The abundance of riffles and pools and the ratio of riffles to pools are important factors in the kinds and amounts of habitat available to stream communities. Riffles aid in the oxygenation and filtration of streams. They are valuable spawning areas for fish requiring well-oxygenated areas for egg maturation. In addition, riffles support complex and productive habitats inhabited by algae, worms, snails, crustacea, aquatic insects, and fish. These organisms are vital links in the aquatic food chain. Drift of riffle-related invertebrates and organic matter aids in repopulating downstream areas.

(2) Pools, characterized by low stream velocity and greater depth, act as stream sedimentation basins and provide shelter and feeding habitat for mature fish. Pools and meanders act to control stream velocity and water discharge rates.

(b) *Possible loss of values.* (1) Discharge of dredged or fill material can eliminate riffle and pool areas by displacement, hydrologic modification, or sedimentation. Activities which affect riffle and pool areas or riffle/pool ratios reduce the aeration and filtration capabilities at the discharge site and downstream, and may retard any repopulation of downstream waters.

(2) The discharge of dredged or fill material which alters stream hydrology may cause scouring or sedimentation of riffles and pools. Sedimentation induced through hydrological modification or as a direct result of the deposition of unconsolidated dredged or fill material may clog riffle and pool areas, destroy habitats, and create anaerobic conditions. Eliminating pools and meanders by the discharge of dredged or fill material through channelization or otherwise can reduce water holding capacity of streams and cause rapid runoff from a watershed. Rapid runoff can deliver large quantities of flood water in a short time to downstream areas resulting in the destruction of natural habitat, high property loss, and the need for further hydrological modification.

(c) *Guidelines to minimize impacts.* In addition to the considerations of alternatives in § 230.10(a), the Guidelines to minimize impacts as described in § 230.10(d), and water dependency in § 230.10(e), specific Guidelines to minimize adverse impacts on riffles and pools include, but are not limited to:

(1) Selecting an upland disposal site where available and where determined to be an environmentally satisfactory alternative (§ 230.10(a)).

(2) Locating and containing unconsolidated dredged or fill material to prevent its deposition in riffle and pools areas.

(3) Minimizing or preventing changes in stream hydrology which would cause significant increases in scouring or sedimentation of riffles and pools.

(d) *Special determinations.* In addition to determinations required by § 230.20 and § 230.30, special determinations where riffle and pools may be affected by discharges of dredged or fill material include whether the discharge will:

(1) Result in the alteration or elimination of riffle and pools areas and their value as aeration and filtration zones.

(2) Modify stream hydrology causing increased scouring or sedimentation of riffles and pools.

(3) Increases sedimentation in pool areas.

(4) Reduce the water holding capacity of streams.

(5) Result in the deposition of unconsolidated material on coarse substrates, reducing the value of riffle areas as aeration and filtration zones and as habitat for specially adapted stream communities.

Subpart F—Communities and Populations of Organisms Dependent on Water Quality

§ 230.50 Mollusks.

Mollusks consist of oysters, clams, scallops, and other members of the Order Mollusca.

(a) *Values.* Mollusks serve as an important link in the food chain for many species of fish, birds and mammals. Some species rely on mollusks as their primary food source. Like most aquatic and wetland biota, mollusks are valued as contributors to the ecological diversity of the aquatic and wetland environment. In addition, they contribute directly to the economy and diet of persons in the form of food, agricultural supplies, and manufactured items.

(b) *Possible loss of values.* Discharge of dredged and fill material may result in the debilitation or death of mollusks by smothering, exposure to chemical contaminants in dissolved or suspended form, exposure to high levels of suspended particulates, reduction in food supply, or alteration of the substrate upon which they are dependent. Mollusks are particularly sensitive to the discharge of material during periods of reproduction and growth and development. Mollusks can be rendered unfit for human consumption by tainting, by ingestion and retention of pathogenic organisms, viruses, heavy metals or persistent synthetic organic chemicals, or through the stimulation of toxin production.

(c) *Guidelines to minimize impacts.* In addition to the considerations of alternatives in § 230.10(a), the Guidelines to minimize impacts in § 230.10(d), and water dependency in § 230.10(e), specific Guidelines to minimize adverse impacts on mollusks include, but are not limited to:

(1) Selecting discharge sites removed from areas of concentrated mollusk populations.

(2) Containing the discharge to prevent or minimize the release of contaminated material and suspended particulates in the proximity of mollusk populations (see measures described in § 230.10(d)).

(3) Timing the discharge to minimize or prevent interference with the reproductive success of mollusks or the growth and development of juvenile forms.

(d) *Special determinations.* In addition to the determinations required by § 230.20 and § 230.30, special determinations where mollusk populations may be affected by the discharge of dredged or fill material include whether the discharge will:

(1) Smother concentrated mollusk populations.

(2) significantly change or affect the suitability of the substrate as habitat for mollusk populations.

(3) Result in the chemical contamination of mollusk populations, reducing their value as a recreational or commercial food source.

(4) Significantly impair the filter-feeding capacities of mollusk populations due to increased levels of suspended particulates.

(5) Significantly interfere with the reproductive success of mollusk populations or the growth and development of juvenile forms through exposure to chemical contaminants or suspended particulates, or by other means.

§ 230.51 Fish, crustacea, and food chain organisms.

Aquatic food chain organisms include, but are not limited to, finfish, crustacea,

annelids, mollusks, planktonic organisms, and the plants and animals on which they feed. All forms and life stages of an organism, as well as its geographic range, are included in this category.

(a) *Values.* Fish, crustacea, and aquatic food chain organisms exhibit diverse adaptation to the aquatic ecosystem, and perform specific functions in the food web of these ecosystems. These organisms provide vital links in the transfer of energy from primary productivity to higher trophic levels. These links ensure the continued overall productivity of the ecosystem. The production of the aquatic food chains support recreational and commercial fisheries, thereby linking man as the ultimate consumer.

(b) *Possible loss of values.* The discharge of dredged or fill material can reduce populations of fish, crustacea, and other food chain organisms directly through the release of contaminants which adversely affect adults, juveniles, larvae and eggs. Suspended particulates settling on adhesive or buried eggs can smother the eggs. The movement of fish and crustacea can be redirected or stopped, thus preventing the aggregation of organisms in accustomed places such as spawning grounds. Reduction of detrital feeding species can impair the flow of energy from primary consumers to higher trophic levels. The reduction or potential elimination of food chain organism populations decreases the overall productivity and nutrient export capability of the ecosystem.

(c) *Guidelines to minimize impacts.* In addition to the consideration of alternatives in § 230.10(a), the Guidelines to minimize impacts as described in § 230.10(d), and water dependency in § 230.10(e), specific measures to minimize impacts on fish, crustacea, and other food chain organisms include, but are not limited to:

(1) Following procedures to minimize or reduce the amount of suspended particulates in the water column as described in § 230.31(c)(1), (2) and (3).

(2) Discharging dredged or fill material that contains contaminants which are potentially bioaccumulative in the tissues of food chain organisms away from areas of food chain productivity.

(3) Selecting discharge methods and disposal sites to minimize or prevent interference with the movement of fish, crustacea, and other food chain organisms, or reductions in the value of aquatic habitat due to changes in patterns of water flow and circulation. Discharge material may be spread or scattered on the disposal site to reduce the effects of mounting or changing elevation. Current patterns may be used to mix, disperse, and dilute the discharge.

(4) Not discharging during periods of breeding, migration and other critical life stages of resident or transient aquatic food chain organisms, nor during spawning cycles of finfish.

(5) Restoring aquatic food chain organism habitat conditions following the completion of the discharge or construction.

(6) Enhancing aquatic food chain organism habitat where site conditions are feasible.

(7) Selecting sites or managing discharges in a way to prevent or control the creation of habitat for undesirable predators or competitive species of plants and animals.

(d) *Special determinations.* In addition to the determinations required by § 230.20 and § 230.30 special determinations where fish, crustacea and other food chain organisms may be affected by discharges of dredged or fill material include whether or not the discharge will:

(1) Disrupt the breeding, spawning, migratory or other critical life stages of aquatic food chain organisms.

(2) Result in the establishment or proliferation of undesirable competitive species of plants and animals, at the expense of resident species.

(3) Change or affect the productivity or the nutrient export capability of an area.

§ 230.52 Wildlife.

Wildlife associated with aquatic ecosystems, including wetlands, are resident and transient mammals, birds, reptiles, and amphibians, among others.

(a) *Values.* (1) All species of wildlife are valuable members of the particular aquatic ecosystem to which they belong. The interactions of a species with the vegetation and other members of the community are integral to the continued functioning of the ecosystem.

(2) Wildlife species and communities are of special scientific, educational, recreational, and aesthetic value to the human population, providing opportunities for nature study, research, bird-watching, photography and hunting. Wildlife species additionally serve as sensitive indicators of changes in air and water quality. Some species of wildlife are of economic value, as in the trapping of furbearers, and the hunting of waterfowl.

(b) *Possible loss of values.* The discharge of dredged or fill material can result in the loss of breeding and nesting areas, escape cover, and preferred food sources for resident and transient wildlife species associated with the aquatic ecosystem. These adverse impacts upon wildlife habitat may result from changes in water levels, water flow and circulation, salinity, chemical content, and substrate characteristics and elevation. Increased water turbidity can adversely affect wildlife species which rely upon sight to feed, and disrupt the respiration and feeding of aquatic wildlife and food chain organisms. The availability of contaminants in the discharge of dredged or fill material may lead to the bioaccumulation of such contaminants in aquatic wildlife. Changes in such physical and chemical factors of the environment may favor the introduction of undesirable plant and animal species at the expense of resident species and communities. Losses in plant and animal species diversity may disrupt the normal functioning of the aquatic ecosystem, leading to reductions in biological productivity.

(c) *Guidelines to minimize impacts.* In addition to the consideration of alternatives in § 230.10(a), the Guidelines to minimize impacts as described in § 230.10(d), and water dependency in § 230.10(e), specific Guidelines to minimize adverse effects on wildlife include, but are not limited to:

(1) Selecting discharge methods and disposal sites to minimize or prevent interference with the movement of wildlife, or reductions in the value of aquatic or wetland habitat due to changes in patterns of water flow and circulation.

(2) Selecting a discharge site that will not result in increased human access, or require the need for frequent maintenance activity in remote or highly productive wildlife habitat.

(3) Not discharging during periods of breeding, migration, and other critical life stages of resident or transient wildlife species, or during the spawning cycles of fish, upon which some wildlife depend for food.

(4) Restoring aquatic wildlife habitat conditions following the completion of the discharge or construction activity.

(5) Developing or restoring aquatic wildlife habitat where site conditions are feasible.

(d) *Special determinations.* In addition to the determinations required by § 230.20 and § 230.30, special determinations where wildlife may be affected by discharges of dredged or fill material include whether the discharge will:

(1) Significantly change or affect breeding and nesting grounds, resting areas and escape cover, and preferred food sources for wildlife.

(2) Result in the introduction of undesirable plant or animal species that significantly affect resident species and communities.

(3) Result in significant changes in wildlife populations including abundance and diversity.

(4) Significantly affect the scientific, educational, aesthetic, and recreational values associated with wildlife communities at the disposal site.

§ 230.53 Threatened and endangered species.

An endangered species in any species which is in danger of extinction throughout all or a significant portion of its range. A threatened species is one which is in danger of becoming an endangered species in the foreseeable future throughout all or a significant portion of its range. The continued existence of any such species may be threatened by: (1) the present or threatened destruction, modification, or curtailment of its habitat or range; (2) over-utilization for commercial, sporting, scientific, or educational purposes; (3) disease or predation; (4) the inadequacy of existing regulatory mechanisms; or (5) other natural or man-made factors affecting its survival. Listings of threatened and endangered species and their critical habitats is maintained by the U.S. Fish and Wildlife Service of the Department of the Interior. The Department of Commerce has authority over some marine mammals, fish and reptiles.

(a) *Values.* Threatened and endangered species, by the fact of their scarceness and vulnerability to extinction, are of major importance in terms of historical, educational, and scientific interest. The extinction of an endangered species represents an irretrievable loss of potentially valuable scientific knowledge.

(b) *Possible loss of values.* The major impact from the discharge of dredged or fill material on threatened or endangered species is through the impairment or destruction of habitat to which these species are specially adapted. Elements of the aquatic habitat which are particularly crucial to threatened or endangered species include good quality water, spawning and maturation areas, nesting areas, protective cover, adequate and reliable food supply, and resting areas for migratory species. These elements can be adversely affected by changes in normal conditions like water clarity, chemical content, nutrient balance, dissolved oxygen, pH, temperature, salinity, current patterns and water circulation, and water fluctuation, or the physical removal of habitat.

(c) *Guidelines to minimize impacts.* In addition to the consideration of alternatives in § 230.10(a), the Guidelines to minimize impacts as described in § 230.10(d), and water dependency in § 230.10(e), the Guidelines for the protection of fish, wildlife, and other organisms (§ 230.51) should be followed, with special attention to the fact that an endangered species may be less able to withstand adverse impacts and usually is not capable of reestablishing itself. Attention should also be given to legislation which protects threatened or endangered species and their habitats.

(d) *Special determinations.* In addition to the determinations required by § 230.20 and § 230.30, special determinations where endangered and threatened populations may be affected by the discharge of dredged or fill material include whether the discharge will significantly change or affect the aquatic or wetland habitat which supports any threatened or endangered plant of animal species.

Subpart G—Human Use Characteristics

§ 230.60 Municipal and private water supplies.

Municipal and private water supplies consist of that portion of natural or open bodies of water or groundwater which is directed to an intake of a municipal or private water supply system.

(a) *Values.* The quality and quantity of water for human consumption is of paramount importance to the quality of life and social well-being.

(2) *Possible loss of values.* Water can be rendered unpalatable or unhealthy by the addition of suspended particulates, viruses and pathogenic organisms, and dissolved materials. The expense if removing such substances before delivery for consumption can be high. In addition, certain currently standard water treatment chemicals have the potential for combining with some suspended or dissolved substances to form other products that can have a toxic impact on consumers.

(b) *Guidelines to minimize impacts.* In addition to the consideration of alternatives in § 230.10(a), the Guidelines to minimize impacts as described in § 230.10(d), and water dependency in § 230.10(e), specific measures to minimize impacts on municipal and private water supplies include, but are not limited to:

(1) Selecting a disposal site removed from the vicinity of municipal and private water supply intake zones, recognizing the potential for transportation of the dredged material in the liquid or suspended particulate phases into the vicinity of a water supply intake zone. (Also, see impact minimizing measures described in § 230.31(c) and § 230.32(c)).

(2) Preventing or minimizing the dispersion of dissolved and suspended particulates released into the water column where the discharge of dredged or fill material in the proximity of a water supply intake is essential to maintaining or improving such supplies. (See measures described in § 230.31(c) and § 230.32(c).)

(c) *Special determinations.* In addition to the determinations required by § 230.20 and § 230.30, special determinations where municipal and private water supplies may be affected by discharge of dredged or fill material include whether the discharge will:

(1) Affect the quality of water supplies with respect to color, taste, odor, chemical content and suspended particulate concentration, in such a way as to reduce the fitness of the water for consumption.

(2) Affect the quantity of water available for municipal and private water supplies.

(3) Affect the cost of water treatment and purification.

§ 230.61 Recreational and commercial fisheries.

Recreational and commercial fisheries consist of harvestable fish, crustacea, shellfish, and other aquatic organisms for use by man.

(a) *Values.* Recreational and commercial fisheries make major contributions to local, state, and national economies. Recreational fishing provides opportunities for a large number of participants, each removing a small fraction of the catch. Commercial fisheries represent an important source of food and raw materials for use by man. In addition, commercial fisheries support important processing and distribution services. Both commercial and recreational fisheries support specialized equipment manufacturers and service industries. The value of recreational and commercial fisheries is reflected in the significant management and enforcement efforts which currently exist at the national and state levels.

(b) *Possible loss of values.* The discharge of dredged or fill materials can modify the characteristics of the aquatic environment, reducing the productivity of accustomed fishing grounds and dispersing certain species. The introduction of contaminants may impart undesirable taste or contaminate edible parts of the organism with pathogens or viruses, resulting in closures of fishing grounds. In addition,

populations of commercially important aquatic organisms or organisms upon which they depend for food may be reduced by the introduction of pollutants at critical stages in their life cycle that affects them directly or destroys necessary habitat. Any of these impacts can be of short duration or prolonged, depending upon the physical and chemical impacts of the discharge and the biological availability of contaminants to aquatic organisms.

(c) *Guidelines to minimize impacts.* In addition to the consideration of alternatives in § 230.10(a), Guidelines to minimize impacts as described in § 230.10(d), water dependency in § 230.10(e), and the specific measures described in § 230.51(c), specific measures to minimize impacts on recreational and commercial fisheries include, but are not limited to:

(1) Selecting discharge sites that are not recognized fishing grounds or areas upon which life-history stages of such species are not dependent.

(2) Containing the discharge to prevent or minimize the release of contaminants, such as hydrocarbons, capable of imparting undesirable tastes or odors to the flesh of edible aquatic organisms.

(3) Timing the discharge to avoid interference with critical periods in the life cycles of important harvestable aquatic organisms, and with peak seasons of commercial or recreational fishing activity.

(4) Preventing significant physical alteration of bottom profile so as not to preclude the efficient use of existing commercial fishery equipment.

(d) *Special determinations.* In addition to the determinations required by § 230.20 and the special determinations required by § 230.51(d), special determinations where recreational and commercial fisheries may be affected by the discharge of dredged or fill material include whether the discharge will:

(1) Change or affect the suitability of recreational and commercial fishing grounds as habitat for populations of edible aquatic organisms.

(2) Result in the chemical contamination of recreational or commercial fisheries.

(3) Interfere with the reproductive success of recreational and commercially important aquatic species through disruption of spawning or migration areas.

§ 230.62′ Recreation.

Recreation encompasses activities undertaken for amusement and relaxation. Water related outdoor recreation requires the use, but not necessarily the consumptive use, of natural aquatic sites and resources, including wetlands.

(a) *Values.* Much of our outdoor recreation is water-dependent. A host of activities, including fishing, swimming, boating, water-skiing, racing, claming, camping, beachcombing, picknicking, waterfowl hunting, wildlife photography, bird watching and scenic enjoyment, take place on, in, or adjacent to, the water. In many parts of the country, space and resources for aquatic recreation are in great demand. Water quality is a vital factor in determining the capacity of an area to support the various water oriented outdoor recreation activities.

(b) *Possible loss of values.* One of the more important direct impacts of dredged or fill disposal is on aesthetics; more serious impacts impair or destroy the resources which support recreation activities. Among the water quality parameters of importance to recreation that can be impacted by the disposal of dredged or fill material are turbidity, suspended particulates, temperature, dissolved oxygen, dissolved materials, toxic materials, pathogenic organisms, degradation of habitat, and the aesthetic qualities of sight, taste, odor, and color. Changes in the levels of these parameters can adversely modity or destroy water use for serveral or all of the recreation activities enjoyed in any given area.

(c) *Guidelines to minimize impacts.* In addition to the consideration of alternatives in § 230.10(a), Guidelines to minimize impacts as described in § 230.10(d), and water dependency in § 230.10(e), and the specific measures described in Subparts E and F, where appropriate, specific measures to minimize impacts on recreational resources include, but are not limited to:

(1) Selecting discharge sites removed from areas of recognized recreational value.

(2) Selecting time periods of discharge that do not coincide with seasons or periods of high recreational use.

(3) Use of procedures and methods as described in § 230.31(c) and § 230.32(c) to minimize and contain the amounts of suspended particulates and dissolved contaminants, including nutrients, pathogens, and other contaminants released to the water column.

(d) *Special determinations.* In addition to the determinations required by § 230.20, and the special determinations required by Subparts E and F, where appropriate, special determinations where recreational areas may be affected by the discharge of dredged or fill material include whether the discharge will:

(1) Change or affect the suitability of an area of high recreational value to provide recreational opportunities.

§ 230.63 Aesthetics.

Aesthetics, associated with the aquatic ecosystem, including wetlands, consist of the perception of beauty by one or a combination of the senses of sight, hearing, touch, and smell. Aesthetics of aquatic ecosystems apply to the quality of life enjoyed by the general public as distinct from the value of property realized by owners as a result of access to such systems (see § 230.64).

(a) *Values.* The aesthetic values of aquatic areas are usually the enjoyment and appreciation derived from the natural characteristics of a particular area. Aesthetic values may include such parameters as the visual distinctiveness of the elements present, which may result from prominence, contrasts due to irregularity in form, line, color, and pattern; the diversity of elements present including topographic expression, shoreline complexity, landmarks, vegetative pattern diversity, waterform expression, and wildlife visability; and the compositional harmony or unity of the overall area..

(b) *Possible loss of values.* The discharge of dredged or fill material can mar the beauty of natural aquatic ecosystems by degrading the water quality, creating distracting disposal sites, inducing nonconforming development, encouraging human access, and by destroying vital elements that contribute to the compositional harmony or unity, visual distinctiveness, or diversity of an area.

(c) *Guidelines to minimize impacts.* In addition to the consideration of alternatives in § 230.10(a), Guidelines to minimize impacts as described in § 230.10(d), water dependency in § 230.10(e), and specific measures described in Subparts D, E, and F, where appropriate, specific measures to minimize impacts on aesthetic values include, but are not limited to:

(1) Selecting discharge sites and following discharge procedures that will prevent or minimize any potential damage to the aesthetically pleasing features of the aquatic site, particularly with respect to water quality.

(2) Following procedures that will restore the disturbed area to its natural condition.

(d) *Special determination.* In addition to the determinations required by § 230.20 and the special determinations required by Subparts E and F, where appropriate, special determinations where aesthetic values in aquatic areas may be affected by the discharge of

dredged or fill material include whether the discharge will change or affect the elements of an aquatic or wetland area which contribute to its aesthetic appeal.

§ 230.64 Amenities.

Amenities derived from a natural aquatic ecosystem, including wetlands, include any environmental feature, trait, or character that contributes to the attractiveness of real estate, or to the successful operation of a business serving the public on its premises. Aquatic resources which are unowned or publicly owned may provide amenities to privately owned property in the vicinity.

(a) *Values.* Persons or institutions claiming amenities of the unowned or publicly owned aquatic ecosystem have monetary investments in property, a portion of which can be realized only because of the existence of unowned but accessible aquatic amenities. The added property value attributable to natural amenities varies with the quality, use, and accessibility of aquatic and wetland areas.

(b) *Possible loss of values.* The discharge of dredged or fill material can adversely affect the particular features, traits, or characters of an aquatic area which make it valuable as an amenity to property owners. Dredge or fill activities which degrade water quality, disrupt natural substrate and vegetational characteristics, deny access to the amenities, or result in changes in odor, air quality, or noise levels may reduce the value of an aquatic area as an amenity to private property.

(c) *Guidelines to minimize impacts.* In addition to the consideration of alternatives in § 230.10(a), the Guidelines to minimize impacts as described in § 230.10(d), water dependency in § 230.10(e), and specific measures described in Subparts E and F, where appropriate, specific measures to minimize impacts on amenities include, but are not limited to:

(1) Selecting discharge sites which are of lesser value to nearby property owners as natural aquatic or wetland amenities.

(2) Timing the discharge to avoid interference during seasons or periods when the availability and accessibility of aquatic or wetland amenities are most important.

(3) Following discharge procedures that do not disturb features of the aquatic ecosystem which contribute to the value of an aquatic amenity.

(d) *Special determination.* In addition to the determinations required by § 230.20 and the special determinations required by Subparts E and F, where appropriate, special determinations where aquatic amenities may be affected by discharges of dredged or fill material include whether the discharge will change or affect any feature of an aquatic area which contributes to its value as an amenity to property owners.

Subpart H—Habitat Development and Restoration of Water Bodies

§ 230.65 Habitat development and restoration of water bodies.

Habitat development and restoration involves changes in open water and wetlands that minimize adverse effects of proposed changes or that neutralize or reverse the effects of past changes on the ecosystem. Development may produce a new or modified ecological state by displacement of some or all of the existing environmental characteristics. Restoration has the potential to return degraded environments to their former ecological state.

(a) *Values.* Habitat development and restoration can contribute to the maintenance and enhancement of a viable aquatic ecosystem at the discharge site. From an environmental point of view, a project involving discharge of dredged and fill material should be designed and managed to emulate a natural ecosystem. Research, demonstration projects, and full scale implementation have been done in many categories of development and restoration. The U.S. Fish and Wildlife Service has programs to develop and restore habitat. The U.S. Army Engineer Waterways Experiment Station has published guidelines for using dredged material to develop wetland habitat, for establishing marsh vegetation, and for building islands that attract colonies of nesting birds. The EPA has a Clean Lakes program which supplies funds to States and localities to enhance or restore degraded lakes. This may involve dredging nutrient-laden sediments from a lake and ensuring that nutrient inflows to the lake are controlled. Restoration and habitat development techniques can be used to minimize adverse impacts and compensate for destroyed habitat. Restoration and habitat development may also provide secondary benefits such as improved opportunities for outdoor recreation and positive use for dredged materials.

Comment: The development and restoration of viable habitats in water bodies requires planning and construction practices that integrate the new or improved habitat into the existing environment. Planning requires a model or standard constituting a target, the achievement of which is attempted by manipulating design and implementation of the activity. Characteristics of a natural ecosystem in the vicinity of a proposed activity is specified as the model or standard to be used in developing or restoring habitat. Such use of a natural ecosystem is expected to prevent competition among individuals or groups with preconceived ideas of what constitutes acceptable habitat, and ensures that the developed or restored area will be nourished and maintained physically, chemically and biologically by natural processes once established. Some examples of natural ecosystems include, but are not limited to the following: salt marsh, cattail marsh, turtle grass bed, small island, etc.

(b) *Possible loss of values.* Habitat development and restoration, by definition, have environmental enhancement as their initial purpose. Where such projects are not founded on the objectives of maintaining ecosystem function and integrity, some values may be favored to the detriment or loss of others. Human uses of the environmental may not necessarily be considered part of development or restoraton although they may benefit directly from it. The ecosystem affected must be considered in order to achieve the desired result of development and restoration. In the final analysis, selection of the ecosystem to be emulated is of critical importance and a loss of value can occur if the wrong model or an incomplete model is selected. Of equal importance is the planning and management of habitat development and restoration on a case-by-case basis.

(c) *Guidelines to minimize impacts.* In addition to the consideration of alternatives in § 230.10(a) and the guidelines to minimize impact described in § 230.10(d), specific measures to minimize impacts on the aquatic ecosystem by enhancement and restoration projects include but are not limited to:

(1) Selecting the nearest similar natural ecosystem as the model in the implementation of the activity.

Comment: Obviously degraded or significantly less productive habitats may be considered prime candidates for habitat restoration. One viable habitat should not be sacrificed in an attempt to create another, i.e., a productive vegetated shallow water area should not be destroyed in an attempt to create a vegetated wetland in its place.

(2) Using development and restoration techniques that have been demonstrated to be effective in circumstances similar to those under consideration wherever possible.

(3) Where development and restoration techniques proposed for use have not yet advanced to the pilot demonstration or implementation stage, initiate their use on a small scale to allow corrective action if unanticipated adverse impacts occur.

(4) Where Federal funds are spent to clean up waters of the U.S. through dredging, scientifically defensible levels of concentration of pollutants in the return discharge shall be agreed upon with the funding authority in addition to any applicable water quality standards in order to maintain the desired improved water quality.

(5) When a significant ecological change in the aquatic environment is proposed by the discharge of dredged or fill material, the permitting authority should consider the ecosystem that will be lost as well as the environmental benefits of the new system.

Subpart I—General Processes and Procedures

§ 230.70 Advanced identification of dredged material disposal areas.

(a) Consistent with these guidelines and after consultation with EPA, permitting authorities may identify areas which will be considered as:

(1) Possible future disposal sites, including existing disposal sites and non-sensitive areas.

(2) Areas which will not be available for disposal site specification.

(3) Subject to emergency action to limit activities that could cause adverse cumulative or secondary effects to the aquatic ecosystem (see § 230.72).

(b) The identification of any area as a possible future disposal site shall not be deemed to constitute a permit for the discharge of dredged or fill material within such an area or a specification of discharge site, but may be used in evaluating individual or general permit applications.

(c) The appropriate public shall be notified of proposed identification of such areas. A record of areas so identified shall be maintained.

(d) To provide the basis for advanced identification of disposal areas, areas not available for disposal, and areas subject to emergency action, water bodies should be assessed to determine those areas which are of critical ecological concern, those which are of environmental concern those in which cumulative or secondary impacts are predictable, and non-sensitive areas. Those in which cumulative or secondary impacts are predictable, and nonsensitive areas. To facilitate this analysis, water resources management data should be assembled including such data as may be available form the public, other Federal and State agencies, and information from approved Coastal Zone Management Programs and River Basin Plans.

(e) The permitting authority shall maintain a record of the identified areas and a written statement of the basis for identification.

§ 230.71 General or categorical permits.

(a) *Conditions for the issuance of general permits.* General permits for a category of activities involving the discharge of dredged or fill material comply with the guidelines if it is determined by the permitting authority, after evaluation through the process outlined in the Guidelines, that:

(1) The activities in such category are similar in nature and similar in their impact upon water quality and the aquatic and wetland environment;

(2) The activities in such category will have only minimal adverse effects when performed separately; and

(3) The activities in such category will have only minimal cumulative adverse effects on water quality and the aquatic and wetland environment.

(b) *Evaluation process.* To reach the determinations required in paragraph (a) of this section, the permitting authority shall set forth in writing an evaluation of the potential individual and cumulative impacts of the category of activities to be regulated under the general permit.

(1) This evaluation shall be based upon consideration of the prohibitions listed in § 230.10(b) and the factors listed in § 230.10(c), and shall include documented information supporting each factual determination in § 230.20 of the Guidelines;

Comment: General permits are an important means of protecting the open water and wetland environments. Therefore, insofar as possible, general permits should be subjected to a rigorous development and review concerning impact on open water and wetland environments as individual permits. When a general permit is issued, the Guidelines will have been considered in depth, and measures to protect the environment already will have been incorporated. Therefore, when the users of a general permit comply with the conditions in that permit they reasonably can expect to have complied with the pertinent aspects of these Guidelines.

(2) The evaluation shall include a precise description of the activities to be permitted under the general permit, explaining why they are sufficiently similar in nature and in environmental impact to warrant regulation under a single general permit based on Subparts D–G of the Guidelines. Allowable differences between activities which will be regulated under the same general permit shall be specified. In addition, activities otherwise similar in nature may differ in environmental impact due to their location in or near ecologically sensitive areas, areas with unique chemical or physical characteristics or concerns (e.g., areas containing concentrations of toxic substances), and areas regulated for specific human uses or by specific land or water management plans (e.g., areas regulated under an approved Coastal Zone Management Plan). For these reasons, if there are specific geographic areas and water bodies within the purview of a proposed general permit, which are more appropriately regulated by individual permit due to the consideration cited in this paragraph, they shall be clearly delineated in the assessment and identified in the permit;

(3) To predict cumulative effects, the assessment shall include the number of individual discharge activities likely to be regulated under a general permit until its expiration, including repetitions of individual discharge activities.

§ 230.72 Cumulative and secondary impacts on the aquatic ecosystem.

(a) Cumulative impacts are changes in an aquatic ecosystem that are attributable to the collective effect of a number of individual discharges of dredged or fill material. Secondary impacts are changes in the aquatic ecosystem that are attributable to the purpose of the discharge of a dredged material disposal site or a fill, and not to the actual placement or dredged or fill material. Some examples of secondary impacts on aquatic ecosystem are fluctuating water levels in an impoundment and downstream associated with operation of a dam, septic tank leaching and surface runoff from residential or commercial developments on fill, leachate and runoff from a sanitary landfill located in waters of the U.S., and development of real estate improvements on a dredged material disposal site in a wetland in a manner that results in pollution of adjacent wetlands or other waters through runoff or other effects.

(b) Both cumulative and secondary impacts on the aquatic ecosystem which could not occur without the discharge of dredged or fill material in waters of the U.S., can have adverse effect on the chemical, phyiscal, and biological integrity of the Nation's waters. Cumulative and secondary effects attributable to the discharge of dredged or fill material in waters of the U.S.

should be predicted to a reasonable and practical extent.

(c) Information about cumulative effects on aquatic ecosystems shall be taken into consideration by section 404 permitting authorities. Information about secondary impacts on aquatic ecosystems shall be considered prior to the time final section 404 action is taken by permitting authorities, and when actions under any other section of the Act such as 301, 302, or under any other Acts are taken that involve section 404. Activities on fast land created by the discharged of dredged or fill material in waters of the U.S. are considered to be in waters of the U.S. for purposes of these Guidelines.

(d) The permitting authority or other responsible Federal or State authority shall collect information and solicit information from other sources about cumulative and secondary impacts on the aquatic ecosystem. This information shall be considered and documented at the time of inter- and intra-agency reviews leading to a decision concerning a section 404 activity, section 404 Public Notices and Public Hearings, and EIS preparation involving section 404 considerations.

Dated: September 5, 1979.

Douglas M. Costle,

Administrator.

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