GUIDELINES FOR PREPERATION OF ANALYSIS OF SECTION 404 PERMIT APPLICATIONS PERSUANT TO THE SECTION 404(B)(1) GUIDELINES OF THE CLEAN WATER ACT (40 CFR, SECTION 230)

PART I
INTRODUCTION

This appendix evaluates compliance with the Section 404(b)(1) Guidelines of the Clean Water Act (Guidelines). The goal of the Guidelines is "to restore and maintain, the chemical, physical, and biological integrity of waters of the United States (waters of the US) through the control of discharges of dredged or fill material." The regulations set forth in 40 CFR Section 230 are the substantive criteria issued by the US Environment Protection Agency (USEPA), used in evaluating discharges of dredged of fill material in to waters of the US. The Guidelines provide regulations outlining measures to avoid, minimize and compensate for impacts. For any permit to be issued under Section 404 of the Clean Water Act, the proposed action must address all relevant portions of the Guidelines.

A. **Proposed Project.** Describe the proposed project. The description should include, but is not limited to, a brief description of facilities and work, particularly those that would impact waters of the US. Describe the size and location of the proposed project site; the acres and type(s) of jurisdictional wetlands proposed to be impacted; the linear feet and type of jurisdictional stream(s) proposed to be impacted; the amount and type(s) of any other jurisdictional and/or non-jurisdictional waters proposed to be impacted; and the applicant's proposed mitigation plan.

B. **Applicant's Purpose and Need Statement**. The applicant will provide a project purpose and need statement. This statement will be used by the US Army Corps of Engineers (USACE) to determine the "basic" and "overall" project purposes. The following are citations from regulations that concern project purpose and need:

1. 40 CFR Section 1502.13, Purpose and Need. "The statement shall briefly specify the underlying purpose and need to which the agency is responding in proposing the alternatives including the proposed action."

2. 33 CFR, Part 325, Appendix B, 9b(4), Purpose and Need. "If the scope of analysis for the NEPA document (see paragraph 7b) covers only the proposed specific activity requiring a Department of the Army (DA) permit, then the underlying purpose and need for that specific activity should be stated. (For example, "The purpose and need for the pipe is to obtain cooling water from the river for the electric generating plant.") If the scope of analysis covers a more extensive project, only part of which may require a DA permit, then the underlying purpose and need for the entire project should be stated. (For example, "The purpose and need for the electric generating plant is to provide increased supplies of electricity to the (named) geographic area.") Normally, the applicant should be encouraged to provide a statement of his proposed activity's purpose and need from his perspective (for example, "to construct an electric generating plant"). However, whenever the NEPA document's scope of analysis renders it appropriate, the Corps also should consider and express that activity's underlying purpose and need from a public

interest perspective (to use that same example, “to meet the public's need for electric energy”). Also, while generally focusing on the applicant's statement, the Corps, will in all cases, exercise independent judgment in defining the purpose and need for the project from both the applicant's and the public's perspective.”

3. 33 CFR, Part 320.4(q), Economics. “When private enterprise makes application for a permit, it will generally be assumed that appropriate economic evaluations have been completed, the proposal is economically viable, and is needed in the market place. However, the district engineer in appropriate cases, may make an independent review of the need for the project from the perspective of the overall public interest.”

C. **Basic Project Purpose.** Based on information provided by the applicant, the USACE will determine the basic purpose of the project. The basic project purpose is typically general in scope and is primarily used to determine whether a project is water dependent. For example, the purpose of a residential development is to provide housing for people. Houses do not have to be located in a special aquatic site to fulfill the basic purpose of the project, i.e., providing shelter. Therefore, a residential development is not water dependent. If a project is not water dependent, alternatives, which do not involve impacts to special aquatic sites, are presumed to be available to the applicant. Examples of water dependent projects may include, but are not limited to certain boat launching facilities, mooring facilities and docks. The basic purpose of these projects is to provide access to the water. Although the basic purpose of a project may be water dependent, a vigorous evaluation of alternatives under the National Environmental Policy Act (NEPA) and the 404 (b)(1) Guidelines will often be necessary, due to expected impacts to the aquatic environment.

D. **Water Dependency.** Depending on the basic project purpose, the USACE will determine whether a proposed project is water dependent. Provide a brief discussion of why or why not the project would or would not be considered water dependent. Please note that most projects are not considered water dependant by the USACE. The following is a citation from regulation that concerns water dependency, which is referred to as the “rebuttable presumption,” concerning non-water-dependant projects.

40 CFR Section 230.10(a)(3). “Where the activity associated with a discharge which is proposed for a special aquatic site (as defined in subpart E of the Guidelines) does not require access or proximity to or sighting within the special aquatic site in question to fulfill its basic purpose (i.e., is not "water dependent"), practicable alternatives that do not involve special aquatic sites are presumed to be available, unless clearly demonstrated otherwise. In addition, where a discharge is proposed for a special aquatic site, all practicable alternatives to the proposed discharge, which do not involve a discharge into a special aquatic site are presumed to have less adverse impact on the aquatic ecosystem, unless clearly demonstrated otherwise.”

E. **Overall Project Purpose**. The overall project purpose is more specific than the basic project purpose. The overall project purpose is used in the alternative site identification process and for the evaluation of identified practicable alternative sites under the Section 404(b)(1) Guidelines. The overall project purpose must be specific enough to define the applicant’s needs and the geographic area of consideration for the proposed project, but not so restrictive as to preclude all

discussion of off-site alternatives. Defining the overall project purpose is the responsibility of the USACE; however, the applicant's needs must be considered in the context of the desired geographic area of the development, and the type of project being proposed. Defining the overall purpose of a project is critical in its evaluation, and should be carefully considered.

For example, if the only impact to waters of the US involved a proposed road through wetlands or across a stream to provide access to an upland residential development, the overall project purpose would be "construction of road access to an upland development site." Based on this overall project purpose, the USACE would evaluate other potential access alternatives to the residential development. However, the USACE would not consider alternatives in any way for the residential community or otherwise "regulate" the upland housing.

However, if a proposed residential development would involve impacts to waters of the US for construction of an access road, as-well-as internal roads, utilities, lots, a community park, etc., then the overall project purpose would likely be to "construct a residential subdivision." In this case, an analysis of alternatives with regard to a residential subdivision would be required.

F. **Geographic Area of Review for Alternative Project Sites**. The applicant must identify the geographic area that was considered for potential project sites. Based on the applicant's need and propose statement, and on the applicant's identified site selection screen criteria (below), the identified geographic area could include the southeastern United States, the State of Georgia, a region of Georgia, a specific county in Georgia, a specific city in Georgia, or a specified distance from the intersection of two highways or other defined point. Using the USACE determined overall project purpose as a guide; the USACE will determine whether the applicant identified an appropriate geographic area of review for alternative project sites.

G. **Selection of Alternative Project Sites**. The applicant must determine appropriate project specific site selection screening criteria based on the need and purpose of the project. The applicant must provide a list of the project specific site selection criteria that were used to screen potential sites within this identified geographic area, and an explanation of why the criteria were selected. The applicant must provide a list of all potential alternative project locations that were investigated, and an explanation of how the project specific criteria were used to screen these sites. Any alternative site that was considered, but eliminated from further consideration, should be documented as not being a practicable project site, and why. Sites that do not meet all site selection criteria would not be considered in the off-site alternatives analysis in Part II, below. Alternative sites that meet all site selection screening criteria would be considered practicable, and would be further evaluated in Part II, below. Please note that the applicant's basic project purpose cannot be so specific that there would be no practicable alternative sites. Therefore, the applicant's preferred site and a minimum of two practicable alternative sites must be identified and evaluated in Part II, below. The USACE will review the applicant's analysis of potential off-site alternatives for consistency with the USACE-determined overall project purpose.

1. Example Site Selection Screening Criteria. The following are examples of possible site selection screening criteria and a brief discussion of how they might be used by the applicant to screen potential project sites for practicability. These and other site screening criteria identified by the applicant must be pass/fail. A potential project site that meets all identified criteria would

be considered a practicable alternative site. A site that fails one or more criteria would not be considered practicable. The below listed site selection screening criteria are for example purposes only and should not be used by an applicant unless they are relevant to their proposal.

a. Project size. Identify the minimum and/or maximum acreage necessary for construction of the proposed project. If a minimum 10-acre tract is needed for a project, a tract of less than 10 acres would not be considered a practicable alternative. Similarly, a 20-acre tract might be too large for a project requiring 10 acres. The applicant must define the minimum and/or maximum project site size necessary for construction of the proposed project, and why.

b. Proximity to target market. Identify the targeted market for the project. For certain commercial developments, proximity of the site to high traffic roads or high density residential areas might be important. For certain residential developments, proximity of the site to a city center or other area where services are available might be important. For use of this factor, the applicant would define the target market and the minimum or maximum distance that a project site could be located from that market to be considered practicable.

c. Proximity to river, stream or other waterway. The applicant must explain why a proposed project would need to be located in, on, adjacent to or near a river, stream or other waterway. As discussed above at Section I.D, most projects are not water dependant; therefore, the explanation should focus on the benefits of locating the project in or near a waterway. Potential project sites would be screened by the applicant for whether or not they meet this project specific site selection criterion, and why.

d. Proximity to an airport, rail or major highway. For certain commercial projects, close proximity to an airport, rail or major highway may be important for the purposes of incoming and outgoing materials and/or for import and export purposes. Potential project sites would be screened by the applicant for whether or not they meet this project specific site selection criterion, and why.

e. Proximity to electric transmission line, potable water or sewer main. For residential projects, proximity to utilities is typically important. Potential project sites would be screened by the applicant for whether or not they meet this project specific site selection criterion, and why.

f. Zoning. Whether or not a potential site is zoned properly would be important for most projects. Potential project sites would be screened by the applicant for whether or not they are zoned property, and if not, whether a site could be re-zoned.

g. Cost. Overall cost of project construction can be used as a site selection screening criteria. However, the fact that an applicant already owns a site, and would be required to purchase any other alternative project site, cannot be used to render alternative sites as cost prohibitive and impracticable. If cost is used as a criterion, the value of the site already owned by the applicant (or what it would cost to purchase the site) would have to be considered as part of the overall project construction cost for the preferred alternative. The overall cost of constructing the project must be discussed for the preferred site and all alternative sites; including, but not limited to the property cost, construction cost and mitigation cost. If cost is

used as a criterion, the USACE may also require the application to prepare an estimated "return on capital investment" for the preferred project site and alternative sites. Potential project sites would be screened by the applicant for whether or not they meet this project specific site selection criterion, and why.

2. Example Summary Alternative Sites Screened for Practicability. The example project is a residential subdivision proposed for construction in a rapid growth area of a large city in Georgia. The applicant identified a geographic area for review that encompasses a five mile radius from the intersection of two major highways on the northern side of the city. The applicant also needs a tract of at least 75 acres and no more than 100 acres to meet the stated need and purpose. The applicant provided an analysis of projected return on capital investment to compare cost of construction on sites considered. The following is an example summary of the applicant's site screening criteria for this proposed project.

a. The applicant's preferred 85-acre project site is located within the identified geographic area of review and is zoned for residential development. Existing utilities (electrical, water and sewer) are located within close proximity of the proposed site, and would adequate and available to service the proposed residential development. Based on an analysis of return on capital investment, construction of the project would be economically viable on this site.

b. Alternative Site 1 is 80-acres in size, is located within the identified geographic area of review and is zoned for residential development. Existing utilities (electrical, water and sewer) are located within close proximity of the proposed site, and would adequate and available to service the proposed residential development. Based on an analysis of return on capital investment, construction of the project would be economically viable on this site.

c. Alternative Site 2 is 90-acres in size, is located within the identified geographic area of review and is zoned for residential development. Existing utilities (electrical, water and sewer) are located within close proximity of the proposed site, and would adequate and available to service the proposed residential development. Based on an analysis of return on capital investment, construction of the project would be economically viable on this site.

d. Alternative Site 3 is 100-acres in size, is located within the identified geographic area of review and is zoned for residential development. Existing utilities (electrical, water and sewer) are located within close proximity of the proposed site, and would adequate and available to service the proposed residential development. However, based on an analysis of return on capital investment, construction of the project would not be economically viable on this site.

e. Alternative Site 4 is 80-acres in size, is located within the identified geographic area of review and is zoned for residential development. There are no existing utilities (electrical, water and sewer) located within close proximity of the proposed site. Utility corridor easements would need to be identified, purchased and constructed. Based on an analysis of return on capital investment, construction of the project would not be economically viable on this site.

f. Alternative Site 5 is 85-acres in size, is located within the identified geographic area of review and is zoned for residential development. Existing utilities (electrical, water and sewer)

are located within close proximity of the proposed site, and would adequate and available to service the proposed residential development. Based on an analysis of return on capital investment, construction of the project would be economically viable on this site.

e. Alternative Site 6 is 70-acres in size, is located within the identified geographic area of review and is zoned for residential development. There are no existing utilities (electrical, water and sewer) located within close proximity of the proposed site. Utility corridor easements would need to be identified, purchased and constructed. Based on an analysis of return on capital investment, construction of the project would not be economically viable on this site.

Attached at Exhibit ** is a map depicting the location of all of all sites considered.

Table 1. Example Summary Table for Site Screening Selection Criteria

Site Screening Selection Criteria	Applicant's Preferred	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6
Size	Yes	Yes	Yes	Yes	Yes	Yes	No
Utilities	Yes	Yes	Yes	Yes	No	Yes	No
Zoning	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cost	Yes	Yes	Yes	No	No	Yes	No
Practicable Site	Yes	Yes	Yes	No	No	Yes	No

G. **Regulatory Guidance Letter (RGL) 93-02**. The purpose of RGL 93-02 is to clarify the appropriate level of analysis required for evaluating compliance with Guidelines requirements for consideration of alternatives. Specifically, this memorandum describes the flexibility afforded by the Guidelines to make regulatory decisions based on the relative severity of the environmental impact of proposed discharges of dredged or fill material into waters of the US. For projects that would involve expansion of facilities on an existing project site, or for very minimal impact projects, the applicant should provide an explanation of why the project should be reviewed under RGL 93-02.

PART II
PROPOSED ACTION and ALTERNATIVES
[40 CFR SECTION 230.10(a)]

In this section, the proposed action, along with different alternatives, are presented and analyzed to identify the least environmentally damaging practicable alternative pursuant to 40 CFR 230.7(b)(1). The purpose of the below analysis is to ensure that "no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem."

A. Factors Used to Analyze Practicable Alternatives:

1. Environmental Factors. The applicant must evaluate the potential environmental impacts that would result from construction of the proposed project on the preferred project site, and on at least two practicable alternative project sites. This analysis will be conducted using environmental factors identified by the applicant. First and foremost, aquatic impact factors

must be defined to identify potential impacts to wetlands and streams. Potential impacts to other environmental factors must also be identified and defined. The following are examples of factors that might be used to analyze the potential environmental impacts associated with construction of the proposed project on the preferred project site and on alternative sites.

a. Stream Impacts (quantitative). Describe the type(s) of stream impacts that would result from construction of the project and the linear feet of stream that would be impacted.

b. Stream Function (qualitative). Describe the quality of the stream(s) that would be impacted and the assessment method used to determine stream quality. For the purposes of this assessment, overall loss in stream function that would result from construction of the project on each site is evaluated and rated as high, medium or low. The functional loss rating is to be based on the linear feet of stream(s) that would be impacted and the quality of the stream(s) impacted. The rationale for the stream function loss rating given to each site must be discussed.

c. Wetland Impacts (quantitative). Describe the type(s) of wetland impacts that would result from construction of the project and the acres of wetland that would be impacted.

d. Wetland Function (qualitative). Describe the quality of the wetland(s) that would be impacted and the assessment method used to determine wetland quality. For the purposes of this assessment, overall loss in wetland function that would result from construction of the project on each site is evaluated and rated as high, medium or low. The functional loss rating is to be based on the acres of wetland(s) that would be impacted and the quality of the wetland(s) impacted. The rationale for the wetland function loss rating given to each site must be discussed.

e. Impacts to Other Waters (quantitative). Describe the type(s) of ditch, open water, etc., impacts that would result from construction of the project and the quantity of other waters that would be impacted.

f. Other Waters Function (qualitative). Describe the quality of the waters that would be impacted and the assessment method used to determine quality. For the purposes of this assessment, overall loss in aquatic function that would result from construction of the project on each site is evaluated and rated as high, medium or low. The functional loss rating is to be based on the quantity of waters that would be impacted and the quality of the waters impacted. The rational for the aquatic function loss rating given to each site must be discussed.

g. Federally listed Threatened or Endangered Species. If federally listed species are within the proposed project's geographic area for review (Section 1.F, above), each alternative site must be reviewed for the potential for threatened or endangered species to be present, or for the presence of suitable habitat for the listed species.

h. Cultural Resources. If sites listed as eligible or potentially eligible for listing in the National Register of Historic Places within the proposed project's geographic area for review (Section 1.F above), each alternative site must be reviewed for cultural resources.

2. Other Factors. The applicant may also identify additional qualitative factors that may be necessary to evaluate the relative suitability of alternative sites for meeting the basic project purpose. The applicant must provide a discussion of why and how any additional factors are being used. These factors are not to be used to determine whether an alternative site would be considered practicable. Any site being evaluated in this section has already been determined to meet site selection screening criteria, and therefore to be a practicable alternative. These factors would be used by the applicant to rate each alternative site as high, medium or low; on a scale of 1 to 5; yes or no; or in some other qualitative manner. The following are examples of qualitative factors that might be used to rate the relative suitability of the applicant's preferred site and alternative sites in meeting the basic project purpose for a retail commercial development:

a. Major Highway Visibility. A site would be rated high if it is located directly adjacent to a major highway, where passing motorists would have an unobstructed view of the project once completed. Sites not located directly adjacent to a major highway and/or where passing motorists would have an obstructed view of the project would be rated medium or low.

b. Proximity to Residential Areas. A site would be rated high if it is within a defined distance of existing housing areas with a defined minimum residential density necessary to provide the desired customer base. Sites located further from existing housing area or where minimum residential density is not met would be rated medium or low.

c. Site Size and/or Configuration. The applicant determined that the optimal site for the proposed commercial development is 15 acres in a square or nearly square configuration; but the project could be constructed on a 10 acre site in a rectangular configuration. A 15 acre, square site would be rated high, with smaller or oddly shaped sites rated medium or low. Likewise, a 20 acre site might be rated as medium or low due to excessive acreage.

The above factors are for example purposes only and may not be relevant to any given proposal.

B. **Proposed Action or Applicant's Preferred Alternative**. In this section, the proposed project is evaluated under each of the factors specified in Section II.A, above. The discussion must be objective and include information about how each factor was used to rate/rank the site. **There shall be no discussion about how the preferred site compares with the other off-site alternatives**; the preferred site and off-site alternatives are compared to the no-action alternative at Section II.F, below.

C. **No Action Alternative**. In this section, discuss whether the no-action would meet the applicant's project need and basic purpose.

D. **Off-Site Alternatives**. In this section, evaluate each off-site alternative under each of the factors specified in Section II.A, above. The discussion must be objective and include information about how each factor was used to rate/rank each off-site alternative. **There shall be no discussion about how alternative sites compare with the applicant's preferred site in this section**; the no action, preferred site and off-site alternatives are compared at Section II.F, below.

E. **Summary of Alternatives Analysis.**

1. Compare the no-action alternative, which would result in no environmental impacts, with the applicant's preferred alternative and all other evaluated off-site alternatives. The conclusion of this section should be the following statement, "Therefore, the USACE has determined that the applicant's preferred alternative is the least environmentally damaging practicable alternative (LEDPA) that would meet the overall project purpose."

2. Example Summary Table of the Above Alternatives Analysis

FACTORS **Environmental Factors**	**No Action Alternative**	**Applicant's Preferred**	**Alternative 1**	**Alternative 2**
Stream Impacts (Linear Feet)	None	350	300	400
Loss in Stream Function	None	Low	High	Medium
Wetland Impacts (Acres)	None	2.0	2.5	4.0
Loss in Wetland Function	None	Low	High	Medium
Federal Endangered Species	N/A	No	Yes	No
Cultural Resources	N/A	No	Yes	No
Other Factors				
Highway Visibility	N/A	High	Low	Medium
Proximity to Customers	N/A	High	Low	Medium
Property Size	N/A	High	Low	Medium
LEDPA	No	Yes	No	No

PART III
AVOIDANCE, MINIMIZATION AND COMPENSATORY MITIGATION

A. **Measures Considered to Avoid Unnecessary Aquatic Impacts**.

1. Total Avoidance of Impacts to Waters of the US. Discuss whether construction of the proposed project on the applicant's preferred project site would be practicable if all on-site waters were avoided.

2. Original Site Development Plan. Discuss the applicant's original site development plan and why this plan was not the least environmentally damaging practicable plan. Identify how many acres of wetlands and/or linear feet of stream would be impacted under this plan. For the purposes of documenting avoidance of on-site impacts to aquatic resources, the applicant's original site development plan is compared to the final plan, to determine how many acres of wetland and/or linear feet of steam were avoided.

3. Alternative Site Development Plan. If multiple revisions were made to the applicant's original site development plan, discuss each alternative revised plan and the impacts to aquatic resources that would have resulted from each of the plans. Also discuss why each revision to the plan was not considered the least environmentally damaging plan. For the purposes of documenting avoidance of on-site impacts to aquatic resources, the compare each revised plan to the final plan, to determine how many acres of wetland and/or linear feet of steam were avoided.

4. Final Site Development Plan. Discuss the applicant's final site development plan and why this plan is the least environmentally damaging practicable plan. Identify how many acres of wetlands and/or linear feet of stream would be impacted under this plan. For the purposes of documenting avoidance of on-site impacts to aquatic resources, the applicant's original site development plan is compared to the final plan, to determine how many acres of wetland and/or linear feet of steam were avoided.

B. **Aquatic Impact Minimization Measures**.

1. Site Specific Minimization Measures. Once all practicable measures have been taken to avoid unnecessary impacts to waters of the US, as discussed above, the applicant will implement all practicable measures to minimize adverse impacts to aquatic resource that would result from unavoidable impacts. List any minimization measures here, if applicable. Many minimization measures are included in the special permit conditions that would be added to draft permits; these are listed below at III.C.2. If there are no additional minimization measures, Section III.B.1 may be omitted.

2. Minimization Special Permit Conditions. For any permit issued for the proposed project, the below listed special conditions would be added. The intent of these conditions would be to further minimize unavoidable direct and indirect impacts to wetlands, and other waters of the US, and thereby, reduce potential project related losses in aquatic function. List aquatic impact minimization special permit conditions. [Note: Only those applicable special permit conditions listed in the case document are to be listed here. Not all permit conditions are designed to further minimize unavoidable direct and indirect impacts to wetlands, and other waters of the US.]

C. **Compensatory Mitigation.**

1. Applicant's Proposed Mitigation Plan. Summarize the applicants proposed mitigation plan.

2. Mitigation Requirement. Based on Savannah District's Standard Operating Procedure (SOP), for calculating compensatory mitigation requirements, *** wetland credits and/or *** stream credits would be required to adequately offset losses in aquatic function that would result from unavoidable impacts to wetlands and other waters of the US associated with the proposed project.

3. Available Mitigation Credits. The applicant provided an assessment of approved compensatory mitigation banks that could service the proposed project site. Based on this information, the proposed project site is within the primary service area of the ********** Mitigation Bank, the bank has aquatic resources similar in function to those at the proposed project site, and the bank has wetland mitigation credits available.

4. Conclusions. The applicant's proposed compensatory wetland mitigation plan is to purchase *** wetland and/or *** stream mitigation credits from the ********* Mitigation Bank. This mitigation plan would provide appropriate and adequate compensatory mitigation necessary to offset unavoidable losses in aquatic function that would result from impacts to waters of the US associated with construction of the proposed project.

5. Special Conditions. For any permit issued for the proposed project, the below listed special conditions would be added. The intent of these conditions would be to provide compensatory mitigation necessary to offset the loss in aquatic function that would result from unavoidable project related impacts waters of the US. List mitigation special permit conditions.

PART IV
ENVIRONMENTAL SETTING/EXISTING CONDITIONS

The description of environmental setting and existing condition for this section should be identical to the description of environmental setting and existing condition contained in the case document at Part III.A. This description should include a discussion of the proposed project site to include: rural or urban; piedmont or coastal plain; ecoregion; soil type(s); terrain; land cover type(s); typical vegetation; wildlife; wetland type(s); stream classification(s); etc.

PART V
PROHIBITIONS AND SIGNIFICANT DEGRADATION

Activities permitted under Section 404 of the Clean Water Act must not result in violations of other environmental laws and must not result in significant degradation (40 CFR Section 230.10(b) and (c)). The activity must not result in significant degradation that would result in significant adverse effects on the aquatic system or human environment. According to 40 CFR Sections 230.10(c) and 230.11, findings of significant degradation rely on factual determinations, evaluations, and tests required by Subparts B and G, and after consideration of Subparts C through F and H of the Guidelines.

A. **Subpart C - Potential Effects on Physical and Chemical Characteristics of the Aquatic Ecosystem**. [Note: The effects described in this subpart should be considered in making the factual determinations and the findings of compliance or non-compliance in subpart B of the Guidelines.] For each of the below listed evaluation criterion, discuss the potential impact as well as any minimization measures that would be used to reduce the level of impact. For the findings section, identify resultant impact level.

1. Substrate [40 CFR Section 230.20].

a. Substrate. The substrate of the aquatic ecosystem underlies open waters of the United States and constitutes 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.

b. 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. Discharges which alter substrate elevation or contours can result in changes in water circulation, depth, current pattern, water fluctuation and water temperature. Discharges may adversely affect bottom-dwelling organisms at the site by

smothering immobile forms or forcing mobile forms to migrate. Benthic forms present prior to a discharge are unlikely to recolonize on the discharged material if it is very dissimilar from that of the discharge site. Erosion, slumping, or lateral displacement of surrounding bottom of such deposits can adversely affect areas of the substrate outside the perimeters of the disposal site by changing or destroying habitat. The bulk and composition of the discharged material and the location, method, and timing of discharges may all influence the degree of impact on the substrate.

c. Discussion: Discuss probable impacts to this factor that would likely result from the proposed discharge and provide a rational for the determination of effect listed below.

FINDINGS: __ No Effect __ Negligible __ Major (Significant)
__ Short Term Minor __ Long Term Minor

2. Suspended Particulates/Turbidity (40 CFR Section 230.21).

a. Suspended particulates. Suspended particulates in the aquatic ecosystem consist of fine-grained mineral particles, usually smaller than medium sands, and organic particles. Suspended particulates may enter water bodies as a result of surface runoff, flooding, vegetative and planktonic breakdown, resuspension of streambed sediments, and man's activities including dredging and filling. Particulates may remain suspended in the water column for variable periods of time as a result of such factors as water velocity, turbulent agitation of the water mass, particle shape, specific gravity, and diameter, and physical and chemical properties of particle surfaces.

b. Possible loss of environmental characteristics and values. The discharge of dredged or fill material can result in greatly elevated levels of suspended particulates in the water column for varying lengths of time. These new levels may reduce light penetration and lower the rate of photosynthesis and the primary productivity of an aquatic area if they last long enough. Sight-dependent species may suffer reduced feeding ability leading to limited growth and lowered resistance to disease if high levels of suspended particulates persist. The biological and the chemical content of the suspended material may react with the dissolved oxygen in the water, which can result in oxygen depletion. Toxic metals and organics, pathogens, and viruses absorbed or adsorbed to fine-grained particulates in the material may become biologically available to organisms either in the water column or on the substrate. Significant increases in suspended particulate levels create turbid plumes which are highly visible and aesthetically displeasing. The extent and persistence of these adverse impacts caused by discharges depend upon the relative increase in suspended particulates above the amount occurring naturally, the duration of the higher levels, the current patterns, water level, and fluctuations present when such discharges occur, the volume, rate, and duration of the discharge, particulate deposition, and the seasonal timing of the discharge.

c. Discussion. Discuss probable impacts to this factor that would likely result from the proposed discharge and provide a rational for the determination of effect listed below.

FINDINGS: __ No Effect __ Negligible __ Major (Significant)
__ Short Term Minor __ Long Term Minor

3. Water (40 CFR Section 230.22).

a. Water. Water is the part of the aquatic ecosystem in which organic and inorganic constituents are dissolved and suspended. It constitutes part of the liquid phase and is contained by the substrate. Water forms part of a dynamic aquatic life-supporting system. Water clarity, nutrients and chemical content, physical and biological content, dissolved gas levels, pH, and temperature contribute to its life-sustaining capabilities.

b. Possible loss of environmental characteristics and values. The discharge of dredged or fill material can change the physical, chemical, and biological characteristics of the receiving water at a disposal site through the introduction of chemical constituents in suspended or dissolved form. Changes in the clarity, color, odor, and taste of water and the addition of contaminants can reduce or eliminate the suitability of water bodies for populations of aquatic organisms, and for human consumption, recreation, and aesthetics. The introduction of nutrients or organic material to the water column as a result of the discharge can lead to a high biochemical oxygen demand (BOD), which in turn can lead to reduced dissolved oxygen, thereby potentially affecting the survival of many aquatic organisms. Increases in nutrients can favor one group of organisms such as algae to the detriment of other more desirable types such as submerged aquatic vegetation, potentially causing adverse health effects, objectionable tastes and odors, and other problems.

c. Discussion: Discuss probable impacts to this factor that would likely result from the proposed discharge and provide a rational for the determination of effect listed below.

FINDINGS: __ No Effect __ Negligible __ Major (Significant)
__ Short Term Minor __ Long Term Minor

4. Currents Patterns & Water Circulation (40 CFR Section 230.23).

a. Current patterns and water circulation. Current patterns and water circulation are the physical movements of water in the aquatic ecosystem. Currents and circulation respond to natural forces as modified by basin shape and cover, physical and chemical characteristics of water strata and masses, and energy dissipating factors.

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, changing the direction or velocity of water flow and circulation, or otherwise changing the dimensions 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 rates; the deposition of suspended particulates; the rate and extent of mixing of dissolved and suspended components of the water body; and water stratification.

c. Discussion. Discuss probable impacts to this factor that would likely result from the proposed discharge and provide a rational for the determination of effect listed below.

FINDINGS: __ No Effect __ Negligible __ Major (Significant)
__ Short Term Minor __ Long Term Minor

5. Normal Water Fluctuations (40 CFR Section 230.24).

a. Normal water fluctuations. Normal water fluctuations in a natural aquatic system consist of daily, seasonal, and annual tidal and flood fluctuations in water level. Biological and physical components of such a system are either attuned to or characterized by these periodic water fluctuations.

b. Possible loss of environmental characteristics and values. The discharge of dredged or fill material can alter the normal water-level fluctuation pattern of an area, resulting in prolonged periods of inundation, exaggerated extremes of high and low water, or a static, nonfluctuating water level. Such water level modifications may change salinity patterns, alter erosion or sedimentation rates, 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 populations of nuisance organisms, modify habitat, reduce food supplies, restrict movement of aquatic fauna, destroy spawning areas, and change adjacent, upstream, and downstream areas.

c. Discussion. Discuss probable impacts to this factor that would likely result from the proposed discharge and provide a rational for the determination of effect listed below.

FINDINGS: __ No Effect __ Negligible __ Major (Significant)
__ Short Term Minor __ Long Term Minor

6. Salinity Gradients (40 CFR Section 230.25).

a. Salinity gradients. Salinity gradients form where salt water from the ocean meets and mixes with fresh water from land.

b. Possible loss of environmental characteristics and values. Obstructions which divert or restrict flow of either fresh or salt water may change existing salinity gradients. For example, partial blocking of the entrance to an estuary or river mouth that significantly restricts the movement of the salt water into and out of that area can effectively lower the volume of salt water available for mixing within that estuary. The downstream migration of the salinity gradient can occur, displacing the maximum sedimentation zone and requiring salinity-dependent aquatic biota to adjust to the new conditions, move to new locations if possible, or perish. In the freshwater zone, discharge operations in the upstream regions can have equally adverse impacts. A significant reduction in the volume of fresh water moving into an estuary below that which is considered normal can affect the location and type of mixing thereby changing the characteristic salinity patterns.

The resulting changed circulation pattern can cause the upstream migration of the salinity gradient displacing the maximum sedimentation zone. This migration may affect organisms adapted to freshwater environments. It may also affect municipal water supplies.

c. Discussion: Discuss probable impacts to this factor that would likely result from the proposed discharge and provide a rational for the determination of effect listed below.

FINDINGS: __ No Effect __ Negligible __ Major (Significant)
__ Short Term Minor __ Long Term Minor

B. **Subpart D - Potential Effects on Biological Characteristics of the Aquatic Ecosystem.**

1. Threatened or Endangered Species [40 CFR Section 230.30].

a. Endangered Species. An endangered species is a plant or animal in danger of extinction throughout all or a significant portion of its range. A threatened species is one in danger of becoming an endangered species in the foreseeable future throughout all or a significant portion of its range. Listings of threatened and endangered species as well as critical habitats are maintained by some individual States and by the U.S. Fish and Wildlife Service of the Department of the Interior (codified annually at 50 CFR 17.11). The Department of Commerce has authority over some threatened and endangered marine mammals, fish and reptiles.

b. Possible loss of values. The major potential impacts on threatened or endangered species from the discharge of dredged or fill material include: (1) covering or otherwise directly killing species; (2) impairment or destruction of habitat to which these species are limited. Elements of the aquatic habitat which are particularly crucial to the continued survival of some threatened or endangered species include adequate good quality water, spawning and maturation areas, nesting areas, protective cover, adequate and reliable food supply, and resting areas for migratory species. Each of these elements can be adversely affected by changes in either the normal water conditions for clarity, chemical content, nutrient balance, dissolved oxygen, pH, temperature, salinity, current patterns, circulation and fluctuation, or the physical removal of habitat; and (3) Facilitating incompatible activities.

c. Discussion. Discuss probable impacts to this factor that would likely result from the proposed discharge and provide a rational for the determination of effect listed below.

FINDINGS: __ No Effect __ May Effect Not Likely to Adversely Effect
__ Adverse Effect __ Jeopardy

2. Fish, Crustaceans, Mollusks, and Other Aquatic Organisms in Food Web (40 CFR Section 230.31).

a. Aquatic Organisms. Aquatic organisms in the food web include, but are not limited to, finfish, crustaceans, mollusks, insects, annelids, planktonic organisms, and the plants and animals on which they feed and depend upon for their needs. All forms and life stages of an organism, throughout its geographic range, are included in this category.

b. Possible loss of values. The discharge of dredged or fill material can variously affect populations of fish, crustaceans, mollusks and other food web organisms through the release of contaminants which adversely affect adults, juveniles, larvae, or eggs, or result in the

establishment or proliferation of an undesirable competitive species of plant or animal at the expense of the desired resident species. Suspended particulates settling on attached or buried eggs can smother the eggs by limiting or sealing off their exposure to oxygenated water. Discharge of dredged and fill material may result in the debilitation or death of sedentary organisms 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 due primarily to their limited mobility. They can be rendered unfit for human consumption by tainting, by production and accumulation of toxins, or by ingestion and retention of pathogenic organisms, viruses, heavy metals or persistent synthetic organic chemicals. The discharge of dredged or fill material can redirect, delay, or stop the reproductive and feeding movements of some species of fish and crustacea, thus preventing their aggregation in accustomed places such as spawning or nursery grounds and potentially leading to reduced populations. Reduction of detrital feeding species or other representatives of lower trophic levels 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. Discussion. Discuss probable impacts to this factor that would likely result from the proposed discharge and provide a rational for the determination of effect listed below.

FINDINGS: __ No Effect __ Negligible __ Major (Significant)
__ Short Term Minor __ Long Term Minor

3. Other Wildlife (40 CFR Section 230.32).

a. Wildlife. Wildlife associated with aquatic ecosystems are resident and transient mammals, birds, reptiles, and amphibians.

b. Possible loss of values. The discharge of dredged or fill material can result in the loss or change of breeding and nesting areas, escape cover, travel corridors, 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 certain aquatic wildlife and food chain organisms. The availability of contaminants from the discharge of dredged or fill material may lead to the bioaccumulation of such contaminants in 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. In some aquatic environments lowering plant and animal species diversity may disrupt the normal functions of the ecosystem and lead to reductions in overall biological productivity.

c. Discussion. Discuss probable impacts to this factor that would likely result from the proposed discharge and provide a rational for the determination of effect listed below.

FINDINGS: **__ No Effect** **__ Negligible** **__ Major (Significant)**
__ Short Term Minor __ Long Term Minor

C. Subpart E - Potential Effects on Special Aquatic Sites.

1. Sanctuaries and Refuges (40 CFR Section 230.40).

a. Sanctuaries and refuges. Sanctuaries and refuges consist of areas designated under State and Federal laws or local ordinances to be managed principally for the preservation and use of fish and wildlife resources.

b. Possible loss of values. Sanctuaries and refuges may be affected by discharges of dredged or fill material.

c. Discussion. Discuss probable impacts to this factor that would likely result from the proposed discharge and provide a rational for the determination of effect listed below.

FINDINGS: **__ No Effect** **__ Negligible** **__ Major (Significant)**
__ Short Term Minor **__ Long Term Minor**

2. Wetlands (40 CFR Section 230.41).

a. 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. Where wetlands are adjacent to open water, they generally 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, headwaters, rainwater catch basins, and 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 saturated 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 soil conditions and their competitors cannot. In addition to plant populations and communities, 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.

b. Possible loss of values. The discharge of dredged or fill material in wetlands is likely to damage or destroy habitat and adversely affect the biological productivity of wetlands ecosystems by smothering, by dewatering, by permanently flooding, or by altering substrate elevation or periodicity of water movement. The addition of dredged or fill material may destroy wetland vegetation or result in advancement of succession to dry land species. It may reduce or eliminate nutrient exchange by a reduction of the system's productivity, or by altering current patterns and velocities. Disruption or elimination of the wetland system can degrade water

quality by obstructing circulation patterns that flush large expanses of wetland systems, by interfering with the filtration function of wetlands, or by changing the aquifer recharge capability of a wetland. Discharges can also change the wetland habitat value for fish and wildlife as discussed in subpart D of the Guidelines. When disruptions in flow and circulation patterns occur, apparently minor loss of wetland acreage may result in major losses through secondary impacts. 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 wave actions, storm damage and erosion.

c. Discussion. Discuss probable impacts to this factor that would likely result from the proposed discharge and provide a rational for the determination of effect listed below.

FINDINGS: __ No Effect __ Negligible __ Major (Significant)
__ Short Term Minor __ Long Term Minor

3. Mud Flats (40 CFR Section 230.42).

a. Mud Flats. Mud flats are broad flat areas along the sea coast and in coastal rivers to the head of tidal influence and in inland lakes, ponds, and riverine systems. When mud flats are inundated, wind and wave action may resuspend bottom sediments. 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 vegetated only by algal mats.

b. Possible loss of values. The discharge of dredged or fill material can cause changes in water circulation patterns which may permanently flood or dewater the mud flat or disrupt periodic inundation, resulting in an increase in the rate of erosion or accretion. Such changes can deplete or eliminate mud flat biota, foraging areas, and nursery areas. Changes in inundation patterns can affect the chemical and biological exchange and decomposition process 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. Discussion: Discuss probable impacts to this factor that would likely result from the proposed discharge and provide a rational for the determination of effect listed below.

FINDINGS: __ No Effect __ Negligible __ Major (Significant)
__ Short Term Minor __ Long Term Minor

4. Vegetated Shallows (40 CFR Section 230.43).

a. Vegetated shallows. Vegetated shallows are permanently inundated areas that under normal circumstances support communities of rooted aquatic vegetation, such as turtle grass and eelgrass in estuarine or marine systems and a number of freshwater species in rivers and lakes.

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: (1) Changing water circulation patterns; (2) releasing nutrients that increase

undesirable algal populations; (3) releasing chemicals that adversely affect plants and animals; (4) increasing turbidity levels, thereby reducing light penetration and hence photosynthesis; and (5) changing the capacity of a vegetated shallow to stabilize bottom materials and decrease channel shoaling. The discharge of dredged or fill material may reduce the value of vegetated shallows as nesting, spawning, nursery, cover, and forage areas, as well as their value in protecting shorelines from erosion and wave actions. It may also encourage the growth of nuisance vegetation.

c. Discussion: Discuss probable impacts to this factor that would likely result from the proposed discharge and provide a rational for the determination of effect listed below.

FINDINGS: __ No Effect __ Negligible __ Major (Significant)
__ Short Term Minor __ Long Term Minor

5. Coral Reefs (40 CFR Section 230.44).

a. Coral reefs. Coral reefs consist of the skeletal deposit, usually of calcareous or silicaceous materials, produced by the vital activities of anthozoan polyps or other invertebrate organisms present in growing portions of the reef.

b. Possible loss of values. The discharge of dredged or fill material can adversely affect colonies of reef building organisms by burying them, by releasing contaminants such as hydrocarbons into the water column, by reducing light penetration through the water, and by increasing the level of 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 in turn provide habitat for many species of highly specialized aquatic organisms.

c. Discussion: Discuss probable impacts to this factor that would likely result from the proposed discharge and provide a rational for the determination of effect listed below.

FINDINGS: __ No Effect __ Negligible __ Major (Significant)
__ Short Term Minor __ Long Term Minor

6. Riffle and Pool Complexes (40 CFR Section 230.45).

a. Riffle and Pools: Steep gradient sections of streams are sometimes characterized by riffle and pool complexes. Such stream sections are recognizable by their hydraulic characteristics. The rapid movement of water over a coarse substrate in riffles results in a rough flow, a turbulent surface, and high dissolved oxygen levels in the water. Pools are deeper areas associated with riffles. Pools are characterized by a slower stream velocity, a steaming flow, a smooth surface, and a finer substrate. Riffle and pool complexes are particularly valuable habitat for fish and wildlife.

b. Possible loss of values: 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 and especially riffle/pool ratios, may reduce the aeration and filtration capabilities at the discharge site and downstream, may reduce stream habitat diversity, and may retard repopulation of the disposal site and downstream waters through sedimentation and the creation of unsuitable habitat. 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 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 hydraulic modification.

c. Discussion: Discuss probable impacts to this factor that would likely result from the proposed discharge and provide a rational for the determination of effect listed below.

FINDINGS: __ No Effect __ Negligible __ Major (Significant)
__ Short Term Minor __ Long Term Minor

D. **Subpart F - Potential Effects on Human Use Characteristics**.

1. Municipal and Private Water Supplies (40 CFR Section 230.50).

a. Water supplies: Municipal and private water supplies consist of surface water or ground water which is directed to the intake of a municipal or private water supply system.

b. Possible loss of values: Discharges can affect the quality of water supplies with respect to color, taste, and odor, chemical content and suspended particulate concentration, in such a way as to reduce the fitness of the water for consumption. Water can be rendered unpalatable or unhealthy by the addition of suspended particulates, viruses and pathogenic organisms, and dissolved materials. The expense of removing such substances before the water is delivered for consumption can be high. Discharges may also affect the quantity of water available for municipal and private water supplies. In addition, certain commonly used water treatment chemicals have the potential for combining with some suspended or dissolved substances from dredged or fill material to form other products that can have a toxic effect on consumers.

c. Discussion: Discuss probable impacts to this factor that would likely result from the proposed discharge and provide a rational for the determination of effect listed below.

FINDINGS: __ No Effect __ Negligible __ Major (Significant)
__ Short Term Minor __ Long Term Minor

2. Recreational and Commercial Fisheries (40 CFR Section 230.51).

a. Fisheries: Recreational and commercial fisheries consist of harvestable fish, crustaceans, shellfish, and other aquatic organisms used by man.

b. Possible loss of values: The discharge of dredged or fill materials can affect the suitability of recreational and commercial fishing grounds as habitat for populations of consumable aquatic organisms. Discharges can result in the chemical contamination of recreational or commercial fisheries. They may also interfere with the reproductive success of recreational and commercially important aquatic species through disruption of migration and spawning areas. The introduction of pollutants at critical times in their life cycle may directly reduce populations of commercially important aquatic organisms or indirectly reduce them by reducing organisms upon which they depend for food. 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. Discussion: Discuss probable impacts to this factor that would likely result from the proposed discharge and provide a rational for the determination of effect listed below.

FINDINGS: __ No Effect __ Negligible __ Major (Significant)
__ Short Term Minor __ Long Term Minor

3. Water-related Recreation (40 CFR Section 230.52).

a. Water-related recreation: Water-related recreation encompasses activities undertaken for amusement and relaxation. Activities encompass two broad categories of use: consumptive, e.g., harvesting resources by hunting and fishing; and non-comsumptive, e.g. canoeing and sight-seeing.

b. Possible loss of values: One of the more important direct impacts of dredged or fill disposal is to impair or destroy the resources which support recreation activities. The disposal of dredged or fill material may adversely modify or destroy water use for recreation by changing turbidity, suspended particulates, temperature, dissolved oxygen, dissolved materials, toxic materials, pathogenic organisms, quality of habitat, and the aesthetic qualities of sight, taste, odor, and color.

c. Discussion: Discuss probable impacts to this factor that would likely result from the proposed discharge and provide a rational for the determination of effect listed below.

FINDINGS: __ No Effect __ Negligible __ Major (Significant)
__ Short Term Minor __ Long Term Minor

4. Aesthetics (40 CFR Section 230.53).

a. Aesthetics: Aesthetics associated with the aquatic ecosystem 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 and property owners.

b. Possible loss of values: The discharge of dredged or fill material can mar the beauty of natural aquatic ecosystems by degrading water quality, creating distracting disposal sites, inducing inappropriate development, encouraging unplanned and incompatible human access, and by destroying vital elements that contribute to the compositional harmony or unity, visual distinctiveness, or diversity of an area. The discharge of dredged or fill material can adversely affect the particular features, traits, or characteristics of an aquatic area which make it valuable to property owners. Activities which degrade water quality, disrupt natural substrate and vegetational characteristics, deny access to or visibility of the resource, or result in changes in odor, air quality, or noise levels may reduce the value of an aquatic area to private property owners.

c. Discussion: Discuss probable impacts to this factor that would likely result from the proposed discharge and provide a rational for the determination of effect listed below.

FINDINGS: __ No Effect __ Negligible __ Major (Significant)
__ Short Term Minor __ Long Term Minor

5. Parks, National and Historical Monuments, National Seashores, Wilderness Areas, Research Sites and Similar Preserves (40 CFR Section 230.54).

a. Preserves: These preserves consist of areas designated under Federal and State laws or local ordinances to be managed for their aesthetic, educational, historical, recreational, or scientific value.

b. Possible loss of values: The discharge of dredged or fill material into such areas may 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. Discussion: Discuss probable impacts to this factor that would likely result from the proposed discharge and provide a rational for the determination of effect listed below.

FINDINGS: __ No Effect __ Negligible __ Major (Significant)
__ Short Term Minor __ Long Term Minor

For Cultural Resources Subject to Section 106 of the National Historic Preservation Act:

FINDINGS: __ No Effect __ No Adverse Effect __ Adverse Effect

E. **Subpart G - Evaluation and Testing.** The purpose of these evaluation procedures and the chemical and biological testing sequence outlined in 40 CFR Section 230.61 is to provide information to reach the determinations required by 40 CFR Section 230.11. Where the results of prior evaluations, chemical and biological tests, scientific research, and experience can provide information helpful in making a determination, these should be used. Such prior results may make new testing unnecessary. The information used shall be documented. Where the same information applies to more than one determination, it may be documented once and referenced in later determinations.

1. General Evaluation of Dredged or Fill Material (40 CFR Section 230.60).

a. General: If the evaluation under paragraph b below indicates the dredged or fill material is not a carrier of contaminants, then the required determinations pertaining to the presence and effects of contaminants can be made without testing. Dredged or fill material is most likely to be free from chemical, biological, or other pollutants where it is composed primarily of sand, gravel, or other naturally occurring inert material. 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 contaminants may be present, further inquiry should be made.

b. Factors: 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 include but are not limited to: (1) Potential routes of contaminants or contaminated sediments to the extraction site, based on hydrographic or other maps, aerial photography, or other materials 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. 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 persistent pesticides from land runoff or percolation; (4) Any records of spills or disposal of petroleum products or substances designated as hazardous under section 311 of the Clean Water Act (See 40 CFR Section 116); (5) Information in Federal, State and local records indicating significant introduction of pollutants from industries, municipalities, or other sources, 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 in harmful quantities by man-induced discharge activities.

c. Determinations: To reach the determinations in 40 CFR Section 230.11 involving potential effects of the discharge on the characteristics of the disposal site, the narrative guidance in Subparts C through F of the Guidelines shall be used along with the general evaluation procedure in 40 CFR Section 230.60 and, if necessary, the chemical and biological testing sequence in 40 CFR Section 230.61. Where the discharge site is adjacent to the extraction site and subject to the same sources of contaminants, and materials at the two sites are substantially similar, the fact that the material to be discharged may be a carrier of contaminants is not likely to result in degradation of the disposal site. In such circumstances, when dissolved material and suspended particulates can be controlled to prevent carrying pollutants to less contaminated areas, testing will not be required.

d. Constraints: Even if the 40 CFR Section 230.60(b) evaluation (previous tests, the presence of polluting industries and information about their discharge or runoff into waters of the

US, bioinventories, etc.) leads to the conclusion that there is a high probability that the material proposed for discharge is a carrier of contaminants, testing may not be necessary if constraints are available to reduce contamination 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 the Regional Administrator, and if the potential discharger is willing and able to implement such constraints. However, even if tests are not performed, the permitting authority must still determine the probable impact of the operation on the receiving aquatic ecosystem. Any decision not to test must be explained in the determinations made under 40 CFR Section 230.11.

e. Discussion: Discuss whether the dredged or fill material to be used on the project site would likely contain contaminants, and why.

2. Chemical, Biological, and Physical Evaluation and Testing (40 CFR Section 230.61).

a. Evaluation and Testing: No single test or approach can be applied in all cases to evaluate the effects of proposed discharges of dredged or fill materials. This section provides some guidance in determining which test and/or evaluation procedures are appropriate in a given case. Interim guidance to applicants concerning the applicability of specific approaches or procedures will be furnished by the permitting authority.

b. Chemical-biological interactive effects: The principal concerns of discharge of dredged or fill material that contain contaminants are the potential effects on the water column and on communities of aquatic organisms.

(1) Evaluation of chemical-biological interactive effects: Dredged or fill material may be excluded from the evaluation procedures specified in paragraphs E.1. (b) (2) and (3) above if it is determined, on the basis of the evaluation in 40 CFR Section 230.60, that the likelihood of contamination by contaminants is acceptably low, unless the permitting authority, after evaluating and considering any comments received from the Regional Administrator, determines that these 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 analyses will be of value in evaluating potential environmental effects. If the General Evaluation indicates the presence of a sufficiently large number of chemicals to render impractical the identification of all contaminants by chemical testing, information may be obtained from bioassays in lieu of chemical tests.

(2) Water column effects: Sediments normally contain constituents that exist in various chemical forms and in various concentrations in several locations within the sediment. An elutriate test may be used to predict the effect on water quality due to release of contaminants from the sediment to the water column. However, in the case of fill material originating on land which may be a carrier of contaminants, a water leachate test is appropriate.

Major constituents to be analyzed in the elutriate are those deemed critical by the permitting authority, after evaluating and considering any comments received from the Regional Administrator, and considering results of the evaluation in 40 CFR Section 230.60. Elutriate

concentrations should be compared to concentrations of the same constituents in water from the disposal site. Results should be evaluated in light of the volume and rate of the intended discharge, the type of discharge, the hydrodynamic regime at the disposal site, and other information relevant to the impact on water quality. The permitting authority should consider the mixing zone in evaluating water column effects. The permitting authority may specify bioassays when such procedures will be of value.

(3) Effects on benthos: The permitting authority may use an appropriate benthic bioassay (including bioaccumulation tests) when such procedures will be of value in assessing ecological effects and in establishing discharge conditions.

c. Procedure for comparison of sites.

(1) Sediment analysis: When an inventory of the total concentration of contaminants would be of value in comparing sediment at the dredging site with sediment at the disposal site, the permitting authority may require a sediment chemical analysis. Markedly different concentrations of contaminants between the excavation and disposal sites may aid in making an environmental assessment of the proposed disposal operation. Such differences should be interpreted in terms of the potential for harm as supported by any pertinent scientific literature.

(2) Biological analysis: 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 permitting authority. 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 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. Physical tests and evaluation: The effect of a discharge of dredged or fill material on physical substrate characteristics at the disposal site, as well as on the water circulation, fluctuation, salinity, and suspended particulates content there, is important in making factual determinations in 40 CFR Section 230.11. Where information on such effects is not otherwise available to make these factual determinations, the permitting authority shall require appropriate physical tests and evaluations as are justified and deemed necessary. Such tests may include sieve tests, settleability tests, compaction tests, mixing zone and suspended particulate plume determinations, and site assessments of water flow, circulation, and salinity characteristics.

e. Discussion: Similar to Section V.E.1, discuss whether the dredged or fill material to be used on the project site would likely contain contaminants, and why. Based on the potential presence of contaminants, discuss whether contaminant testing would be necessary, and why.

PART VI
SUBPART H - ACTIONS TO MINIMIZE ADVERSE EFFECTS

Note: There are many actions which can be undertaken in response to 40 CFR Section 203.10(d) to minimize the adverse effects of discharges of dredged or fill material. Some of these, grouped by type of activity, are listed in this subpart. Additional criteria for compensation measures are provided in subpart J of the Guidelines.

A. **Actions concerning the location of the discharge (40 CFR Section 230.70):** The effects of the discharge can be minimized by the choice of the disposal site. Some of the ways to accomplish this are by: (a) Locating and confining the discharge to minimize smothering of organisms; (b) Designing the discharge to avoid a disruption of periodic water inundation patterns; (c) Selecting a disposal site that has been used previously for dredged material discharge; (d) 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; (e) Selecting the disposal site, the discharge point, and the method of discharge to minimize the extent of any plume; (f) Designing the discharge of dredged or fill material to minimize or prevent the creation of standing bodies of water in areas of normally fluctuating water levels, and minimize or prevent the drainage of areas subject to such fluctuations.

B. **Actions concerning the material to be discharged (40 CFR Section 230.71):** The effects of a discharge can be minimized by treatment of, or limitations on the material itself, such as: (a) Disposal of dredged material in such a manner that physiochemical conditions are maintained and the potency and availability of pollutants are reduced; (b) Limiting the solid, liquid, and gaseous components of material to be discharged at a particular site; (c) Adding treatment substances to the discharge material; (d) Utilizing chemical flocculants to enhance the deposition of suspended particulates in diked disposal areas.

C. **Actions controlling the material after discharge (40 CFR Section 230.72):** The effects of the dredged or fill material after discharge may be controlled by: (a) 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 sites or methods include, but are not limited to: (1) Using containment levees, sediment basins, and cover crops to reduce erosion; (2) Using lined containment areas to reduce leaching where leaching of chemical constituents from the discharged material is expected to be a problem; (b) Capping in-place contaminated material with clean material or selectively discharging the most contaminated material first to be capped with the remaining material; (c) Maintaining and containing discharged material properly to prevent point and nonpoint sources of pollution; (d) Timing the discharge to minimize impact, for instance during periods of unusual high water flows, wind, wave, and tidal actions.

D. **Actions affecting the method of dispersion (40 CFR Section 230.73):** The effects of a discharge can be minimized by the manner in which it is dispersed, such as: (a) Where environmentally desirable, distributing the dredged material widely in a thin layer at the disposal site to maintain natural substrate contours and elevation; (b) Orienting a dredged or fill material

mound to minimize undesirable obstruction to the water current or circulation pattern, and utilizing natural bottom contours to minimize the size of the mound; (c) Using silt screens or other appropriate methods to confine suspended particulate/turbidity to a small area where settling or removal can occur; (d) Making use of currents and circulation patterns to mix, disperse and dilute the discharge; (e) Minimizing water column turbidity by using a submerged diffuser system. A similar effect can be accomplished by submerging pipeline discharges or otherwise releasing materials near the bottom; (f) Selecting sites or managing discharges to confine and minimize the release of suspended particulates to give decreased turbidity levels and to maintain light penetration for organisms; (g) Setting limitations on the amount of material to be discharged per unit of time or volume of receiving water.

E. **Actions related to technology (40 CFR Section 230.74):** 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: (a) Using appropriate equipment or machinery, including protective devices, and the use of such equipment or machinery in activities related to the discharge of dredged or fill material; (b) Employing appropriate maintenance and operation on equipment or machinery, including adequate training, staffing, and working procedures; (c) Using machinery and techniques that are especially designed to reduce damage to wetlands. This may include machines equipped with devices that scatter rather than mound excavated materials, machines with specially designed wheels or tracks, and the use of mats under heavy machines to reduce wetland surface compaction and rutting; (d) Designing access roads and channel spanning structures using culverts, open channels, and diversions that will pass both low and high water flows, accommodate fluctuating water levels, and maintain circulation and faunal movement; (e) Employing appropriate machinery and methods of transport of the material for discharge.

F. **Actions affecting plant and animal populations (40 CFR Section 230.75):** Minimization of adverse effects on populations of plants and animals can be achieved by: (a) Avoiding changes in water current and circulation patterns which would interfere with the movement of animals; (b) Selecting sites or managing discharges to prevent or avoid creating habitat conducive to the development of undesirable predators or species which have a competitive edge ecologically over indigenous plants or animals; (c) Avoiding sites having unique habitat or other value, including habitat of threatened or endangered species; (d) Using planning and construction practices to institute habitat development and restoration to produce a new or modified environmental state of higher ecological value by displacement of some or all of the existing environmental characteristics. Habitat development and restoration techniques can be used to minimize adverse impacts and to compensate for destroyed habitat. Additional criteria for compensation measures are provided in subpart J of the Guidelines. Use techniques that have been demonstrated to be effective in circumstances similar to those under consideration wherever possible. Where proposed development and restoration techniques have not yet advanced to the pilot demonstration stage, initiate their use on a small scale to allow corrective action if unanticipated adverse impacts occur; (e) Timing discharge to avoid spawning or migration seasons and other biologically critical time periods; (f) Avoiding the destruction of remnant natural sites within areas already affected by development.

G. **Actions affecting human use (40 CFR Section 230.76):** Minimization of adverse effects on human use potential may be achieved by: (a) Selecting discharge sites and following discharge procedures to prevent or minimize any potential damage to the aesthetically pleasing features of the aquatic site (e.g. viewscapes), particularly with respect to water quality; (b) Selecting disposal sites which are not valuable as natural aquatic areas; (c) Timing the discharge to avoid the seasons or periods when human recreational activity associated with the aquatic site is most important; (d) Following discharge procedures which avoid or minimize the disturbance of aesthetic features of an aquatic site or ecosystem; (e) Selecting sites that will not be detrimental or increase incompatible human activity, or require the need for frequent dredge or fill maintenance activity in remote fish and wildlife areas; (f) Locating the disposal site outside of the vicinity of a public water supply intake.

H. **Other actions (40 CFR Section 230.77):** (a) In the case of fills, controlling runoff and other discharges from activities to be conducted on the fill; (b) In the case of dams, designing water releases to accommodate the needs of fish and wildlife; (c) In dredging projects funded by Federal agencies other than the Corps of Engineers, maintain desired water quality of the return discharge through agreement with the Federal funding authority on scientifically defensible pollutant concentration levels in addition to any applicable water quality standards; (d) 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.

I. **Discussion:** Any draft permit issued for this project would include numerous general and special permit conditions addressing specific actions necessary to insure minimization of adverse project related impacts to the categories discussed in this part. See Part III.A of this document for a list of special permit conditions designed to minimize unavoidable impacts to aquatic resources and thereby, reduce potential project related losses in aquatic function. See Part III.B of this document for special permit conditions designed to insure that the permittee completes the compensatory mitigation necessary to offset the loss in aquatic function that would result from unavoidable project related impacts. A listing of all proposed special permit conditions is located at Part V, D of the Case Document and Environmental Assessment.

PART VII
DETERMINATION OF CUMULATIVE EFFECTS ON THE AQUATIC ECOSYSTEM
[40 CFR Section 230.11(g)]

According to Title 40 Code of Federal Regulation Parts 1508.7, cumulative impacts are the impacts on the environment that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions. Based on an analysis of all available information, the USACE has determined that the proposed project would not result in a significant impact on the environment; considering the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions. A detailed cumulative impacts assessment for this action is located at Part IV.E of the Case Document and Environmental Assessment.

PART VIII
DETERMINATION OF SECONDARY EFFECTS ON THE AQUATIC ECOSYSTEM
[40 CFR Section 230.11(h)]

The project was reviewed for potential secondary/indirect impacts such as those associated with utility relocation, satellite development and new infrastructure needs, etc. There would be the need for construction of a new power line from the project site, to the nearby existing Georgia Integrated Transmission System. Construction of this utility line may require impacts to waters of the US. Based on the information available, such impacts would include vegetation change, wildlife change, and a change to water quality; with such impact being negligible. No other known secondary/indirect impacts exist other than what is documented as a direct or cumulative impact in Part III. F of the Case Document and Environmental Assessment.

PART IX
FINDINGS

A. **Status of other authorizations and legal requirements.**

1. Water Quality Certification: The Georgia Department of Natural Resources, Environmental Protection Division completed their review of the proposed project pursuant to Section 401 of the Clean Water Act, and issued Water Quality Certification on ********.

2. Coastal Zone Management Consistency Determination: (Pick One)

a. The Georgia Department of Natural Resources, Coastal Resource Division issued Georgia Coastal Management Program consistency certification on **********.

b. This proposed project is not located in the coastal zone.

3. Compliance with Section 106 of the National Historic Preservation Act: The USACE has completed coordination and consultation pursuant to Section 106 of the National Historic Preservation Act. Discuss Memorandum of Agreement, if applicable.

4. Compliance with the Endangered Species Act: Pursuant to Section 7 of the Endangered Species Act, the USACE determined … discuss effect determination.

5. Compliance with Clean Air Act: Discuss whether this act is applicable, and what actions have been taken for compliance, if any.

6. Other State and/or local authorizations: Discuss any other known state or local authorizations that have been issued (e.g., stream buffer variance).

B. **Evaluation of Compliance with 404(b)(1) guidelines (restrictions on discharge, 40 CFR 230.10). (A check in a block denoted by an asterisk indicates that the project does not comply with the guidelines).**

1. Alternatives test:

___ Yes ___ No — (a) Based on the discussion in Part II, are there available, practicable alternatives having less adverse impact on the aquatic ecosystem and without other significant adverse environmental consequences that do not involve discharges into "waters of the US" or at other locations within these waters?

___ Yes ___ No — (b) Based on the discussion in Part II, if the project is in a special aquatic site and is not water-dependent, has the applicant clearly demonstrated that there are no practicable alternative sites available?

2. Special restrictions: Will the discharge:

___ Yes ___ No — (a) Violate state water quality standards? [Note: Section 401 Water Quality Certification has been issued by Georgia EPD.]

___ Yes ___ No — (b) Violate toxic effluent standards (under Section 307 of the Act)?

___ Yes ___ No — (c) Jeopardize endangered or threatened species or their critical habitat?

___ Yes ___ No — (d) Violate standards set by the Department of Commerce to protect marine sanctuaries?

___ Yes ___ No — (e) Evaluation of the information in Parts III – VIII indicates that the proposed discharge material meets testing exclusion criteria for the following reason(s).

( ) based on the above information, the material is not a carrier of contaminants

( ) the levels of contamination are substantially similar at the extraction and disposal sites and the discharge is not likely to result in degradation of the disposal site and pollutants will not be transported to less contaminated areas

( ) acceptable constraints are available and will be implemented to reduce contamination to acceptable levels within the disposal site and prevent contaminants from being transported beyond the boundaries of the disposal site

3. Other restrictions: Will the discharge contribute to significant degradation of "waters of the US" through adverse impacts to:

___ ___ Yes No — (a) Human health or welfare, through pollution of municipal water supplies, fish, shellfish, wildlife and special aquatic sites?

___ ___ Yes No — (b) Life states of aquatic life and other wildlife?

___ ___ Yes No — (c) Diversity, productivity and stability of the aquatic ecosystem, such as the loss of fish or wildlife habitat, or loss of the capacity of wetland to assimilate nutrients, purify water or reduce wave energy?

___ ___ Yes No — (d) Recreational, aesthetic and economic values?

4. Actions to minimize potential adverse impacts (mitigation): Will all appropriate and practicable steps (40 CFR 23.70-77) be taken to minimize the potential adverse impacts of the discharge on the aquatic ecosystem? If yes, measures are in Part III.

___ ___
Yes No

D. **Findings of Compliance or Non-compliance with the Restrictions on Discharge (40 CFR Section 230.12)**

( ) The discharge complies with the guidelines. The proposed project is the least environmentally damaging practicable alternative (LEDPA).

( ) All of the appropriate and practicable conditions are listed in Parts III.A and B to mitigate pollution or adverse effects to the affected ecosystem. These conditions have been included as part of the proposed action or will be required by special conditions of the permit. This revised and/or conditioned project is the LEDPA.

( ) The discharge fails to comply with the requirements of these guidelines because:

( ) There is a practicable alternative to the proposed discharge that would have less adverse effect on the aquatic ecosystem and that alternative does not have other significant adverse environmental consequences.

( ) The proposed discharge will result in significant degradation of the aquatic ecosystem under 40 CFR 230.10(b) or (c).

( ) The discharge does not include all appropriate and practicable measures to minimize potential harm to the aquatic ecosystem, namely...

( ) There is not sufficient information to make a reasonable judgment as to whether the proposed discharge will comply with the guidelines.

PART X
SUMMARY AND CONCLUSION

A. The discharge represents the least environmentally damaging, practicable alternative. In addition, adverse impacts on the aquatic environment (including wetland functions and values) by this project would be compensated for by the proposed mitigation.

B. The discharge does not cause or contribute to violation of any applicable state water quality standard, does not violate any applicable toxic effluent standard, does not impact any endangered or threatened species or marine sanctuary.

C. The discharge does not cause or contribute to significant degradation of the waters of the US.

D. All appropriate and practicable steps have been taken to minimize potential adverse impacts of the discharge on the aquatic ecosystem.

E. The proposed discharge, with the standard conditions placed on Department of the Army permits and other special conditions [found at Part V.D of the case document] would comply with the guidelines promulgated by the Administrator of the USEPA pursuant to Section 404(b) of the Clean Water Act.

PART XI
EVALUATION RESPONSIBILITY

PREPARED BY:

REVIEWD BY:

APPROVED BY: