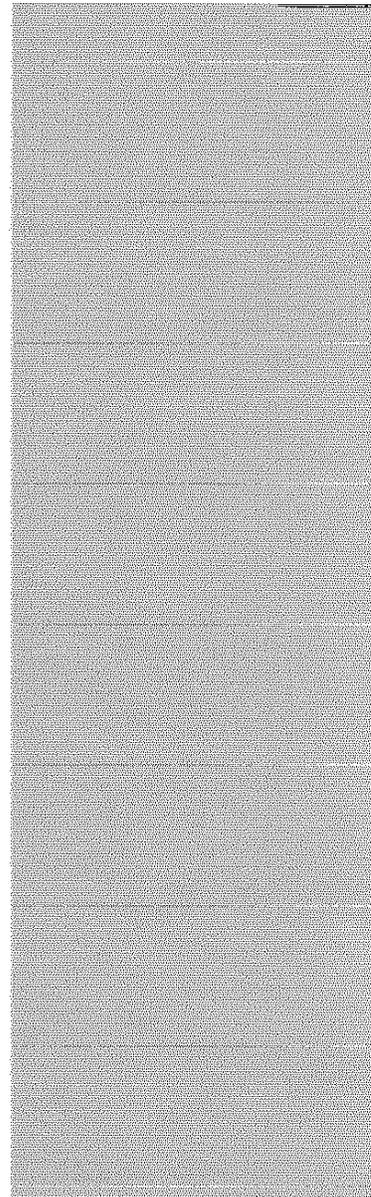
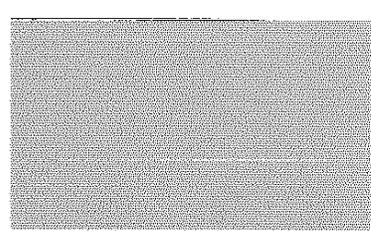


Section 103 Evaluation



**ENCLOSURE
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Section 103 Evaluation of Ocean Disposal

Savannah Harbor Deepening

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THE GEORGIA PORTS AUTHORITY

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SECTION 103 EVALUATION OF OCEAN DISPOSAL

SAVANNAH HARBOR DEEPENING PROJECT

PROJECT DESCRIPTION

Introduction

The Georgia Ports Authority (GPA) conducted studies to be used by the U.S. Army Corps of Engineers (USACE) to produce an Environmental Impact Statement (EIS) under Section 203 of the Water Resources Development Act (WRDA) of 1986. Among other concerns, the EIS assesses the potential environmental effects of deepening a portion of the existing Savannah Harbor to better serve the economic interests of the State of Georgia and federal interests in navigation. In order to qualify as a federal navigation project, the study must meet all applicable federal regulations. The EIS explores four (4) deepening alternatives and evaluates each of these according to appropriate environmental and economic criteria. The alternatives include deepening the existing channel by 2 feet, 4 feet, 6 feet, and 8 feet plus appropriate overdredge allowances and advanced maintenance.

A necessary component of the EIS is the evaluation of ocean disposal of dredged materials excavated from a portion of the Savannah Harbor project area proposed for deepening. Such evaluation is to be conducted in satisfaction of the requirements set forth by Section 103 of the Marine Protection, Research, and Sanctuaries Act of 1972 (MPRSA), Public Law 92-532. Regulatory agencies responsible for review and enforcement of the provisions of the MPRSA are the USACE and the U.S. Environmental Protection Agency (USEPA). The purpose of this Enclosure to the EIS is to provide the necessary Section 103 evaluation as it pertains to disposal of dredged material from the Savannah Harbor deepening project, as well as future operations and maintenance, into a designated ocean disposal area.

Project Location

Savannah Harbor is a deep-draft harbor located on the South Atlantic U.S. coast 75 statute miles south of Charleston Harbor, South Carolina and 120 statute miles north of Jacksonville Harbor, Florida (USACE, 1996). The Inner Harbor (IH) area proposed for deepening roughly corresponds to channel Stations 0+000 (near Fort Pulaski) to 103+000 (above the Kings Island Turning Basin) and comprises 103,000 river feet. The Bar Channel (BC), or ocean channel, proposed for deepening begins at Station 0+000 and extends to a maximum length¹ of approximately 85,000 feet (Station -85+000B) offshore. The maximum proposed project length which could potentially result in being deepened, considering both the IH and BC segments, is therefore approximately 36 miles. As previously indicated the Section 103 Evaluation addresses the dredging and disposal of sediments from the BC. The IH improvements are addressed separately in an enclosure to the EIS, which presents the Section 404(b)(1) Evaluation.

¹ Each incremental deepening alternative necessarily lengthens the seaward portion of the Bar Channel to the point where the seabed elevation matches the channel depth.

The information presented in this Enclosure generally follows the guidance provided in the Region IV USEPA and South Atlantic Division USACE Regional Implementation Manual (RIM). Where possible, the suggested outline formatting of Section 404(b)(1) of the Clean Water Act is incorporated into the 103 Evaluation for consistency.

General Description of Dredged Material

All material proposed for removal will originate from the channel bottom and side slope cuts necessary to achieve the desired dredge depth. Material excavation for the proposed Project will consist of sediments that reside within the maintenance, new work, overdredge, and advanced maintenance prisms associated with each of the 2 ft incremental deepening alternatives. The minimum control elevation to be achieved for the proposed BC (assuming a maximum 8 ft deepening) would be (-)54 ft MLW. The USACE has determined that approximately 15 million cubic yards of sediment would need to be dredged from the BC to achieve the maximum proposed deepening (plus overdredge and advanced maintenance) of (-)54 ft MLW.

A physical description of the sediments contained within the BC is provided in the Geotechnical Appendix to the report "Dredged Material Environmental Effects Evaluation: Savannah Harbor Deepening" (ATM, 1998). Physical characteristics of sampled sediments within the area of Savannah Harbor proposed for deepening include:

- geologic vibrocore logs;
- grain size analysis of samples;
- specific gravity of samples; and,
- composite sample grain size and specific gravity analyses.

A total of six stations were sampled within the boundaries designated as the Bar Channel. Two of these stations were located within Channel Wideners and the remaining four were obtained within the main channel footprint. Samples obtained and subjected to individual and compositing analyses were extracted from the cores at sediment depths indicative of either existing dredge operations (Operations and Maintenance) or at elevations not previously achieved by dredge operations (New Work). The physical composition of the samples obtained at the six stations revealed relatively variable quality material, ranging from well sorted sand with a 5.8% fines fraction in the seaward-most Operations and Maintenance sample to greenish clayey sand (6.3 to 35.1% fines) in the New Work 'sections' of the proposed channel targeted for deepening. The reader is referred to the Geotechnical Appendix for a complete treatment of the sampling protocols, testing procedures, and results.

Description of the Proposed Discharge Site

The EPA-approved unconfined offshore open water site, referred to as the Savannah Ocean Dredged Material Disposal Site (ODMDS), is located south of the entrance channel and approximately 3.7 nautical miles offshore of Little Tybee Island, Georgia. Ambient water depths surrounding the ODMDS vary between approximately 28 and 42 ft MLW. Maintenance dredge sediments and new work material are proposed to be spoiled to the 4.26 square nautical mile ODMDS, which is centered at 31° 56' 54" N and 80° 45' 34" W. The site is further described in 40 CFR Part 228.15(h)(6), and indicates the only material to be placed in the Savannah ODMDS is from the Savannah Harbor area.

Site storage capacity of the approximately 3,521-acre ODMDS far exceeds the current annual volumetric placement quantities derived from maintenance dredging activities. A bathymetric survey of the ODMDS

conducted in May/June 1994 revealed that prior disposal operations have generally occurred in the northeast quadrant of the site, resulting in a mound of deposited sediment at elevation (-)30 ft MLW.

Alternative placement sites (and especially beneficial uses) were investigated as part of the EIS. A sampling and analysis plan (SAP) was developed to provide representative, comparable, and complete information to evaluate the potential adverse effects of the management of the dredged material proposed for excavation (ATM, 1997). The plan was designed to be flexible (e.g., provide information for various disposal options and contaminant pathways) and cost effective.

Description of the Disposal Method

Material excavated from the BC has typically been removed through the use of self-propelled drag-head hopper dredges, with subsequent spoil placement in the ODMDS. A relatively short hopper dredging "window" designated principally for the protection of sea turtles, right whales and humpback whales limits the time during which dredging operations can be undertaken. Dredging by the use of hopper equipment is limited to November 1 through May 31, with no screening or monitoring required from December 1 through March 31.

Because of existing guidance documentation and the dredge window restrictions, the consideration of beneficial use alternatives to offshore disposal must be evaluated. Such beneficial uses primarily consist of utilizing hydraulic pipeline dredges to create nearshore sediment mounds, feeder berms, and beach nourishment projects. However, the potential contaminant-related environmental acceptability of open water beneficial use alternatives is regulated in accordance with Section 404(b)(1) of the Clean Water Act. Accordingly, an enclosure of this EIS addresses the Section 404 Evaluation. For the purposes of the Section 103 Evaluation, all sediments removed from the Bar Channel are considered solely for open water disposal.

The LTMS EIS indicated an interest in control of the discharge of dredged materials into the ODMDS such that further mounding of sediment does not result. This is particularly relevant in the northeast quadrant of the site. Strategic placement of dredged material may be necessary to limit excessive mounding of sediments within the ODMDS, particularly as such mounding could result in either potential adverse impacts to navigation or possible migration of sediment outside of the ODMDS boundaries.

Management of the ODMDS

The USACE and USEPA, together with representatives of the Georgia Department of Natural Resources and Chatham County, Georgia established an interagency Site Management and Monitoring Plan (SMMP) for the Savannah ODMDS (LTMS). The established plan is believed to be fully comprehensive in its scope and adequate to address future dredge spoil placement practices for the proposed new work as well as for future O&M activities in Savannah Harbor. Future modifications to the SMMP may be necessary, however, and would be dependent upon analysis of findings from the proposed monitoring to be performed at the site. A copy of the SMMP is provided as an Enclosure to the EIS.

Anticipated Schedule

The earliest anticipated date for the commencement of new work activities in Savannah Harbor is July 1999. This schedule is contingent upon inclusion of an approved EIS in the Water Resources Development Act (WRDA) of 1998, agency review and approval of proposed plans, and any necessary fiscal appropriations. The appropriate dredge windows associated with the use of hopper equipment further condition the Bar Channel commencement and completion dates.

Together with nearshore beneficial use alternatives, it is expected that the ODMDS will be utilized for future O&M dredging activities in the Bar Channel subsequent to the proposed deepening of Savannah Harbor. The exact frequency of future O&M activities is uncertain at this time and will in part be dependent on the maximum dredge depth authorized for the project.

SEDIMENT TESTING AND EVALUATION

Exclusionary Criteria

The sediments in the footprint of the existing Bar Channel meet the exclusionary criteria from further testing in accordance with Title 40 CFR Part 227.13(b)(1), which states: "...dredged material is composed predominantly of sand, gravel, rock, or any other naturally occurring bottom material with particle sizes larger than silt, and the material is found in areas of high current or wave energy such as streams with large bed loads or coastal areas with shifting bars and channels..." In addition, the USACE performed sediment testing as part of a Section 103 Evaluation completed in 1992, obtaining the EPA's concurrence on the suitability of the material for ocean placement (LTMS).

The LTMS included a review of the 1992 Section 103 evaluation. Tier II and Tier III testing was performed by Skidaway Institute of Oceanography for the USACE in support of the Section 103 (Windom, 1992). Six stations were established between Station 0+000 and Station 60+000, along with three control stations. Chemical and physical testing was conducted; contaminant levels were found to be low, at or near natural levels, or undetectable. Bioassay results were found to be compatible with sediment chemistry and revealed no adverse biological effects (Windom, 1992). The conclusions of the USACE review resulted in the EPA granting an "update" to the Savannah Harbor 103 Evaluation valid through March 23 1998. The information contained in the current Section 103 Evaluation (this supplement to the EIS) should serve to validate, as well as update, the existing evaluation.

Need for Testing Documentation

To confirm the suitability of principally the "new work" sediments for ocean disposal (and to a lesser degree to provide "confirmatory sampling" of O&M material), sediment samples were collected by Applied Technology and Management, Inc. (ATM) in October and November 1997. As previously discussed, vibracore samples were collected at six stations within the BC boundaries: four within the main channel and two in bend widenings. A complete description of the field and laboratory sampling procedures, core locations, core logs, grain size distribution and specific gravity calculations are provided in the report "Dredged Material Environmental Effects Evaluation: Savannah Harbor Deepening" (ATM, 1998).

Sediment Sampling Program Results

Results of the testing indicate that the sediment in the vicinity of the BC is predominantly sandy material (63.5 to 93.7% sand), with fines percentages ranging from a low of 5.8% in the O&M segment of the channel near the maintained offshore limit to a high of 35.1% fines in the new work material located within the first channel bend widener northeast of Tybee Island. Specific gravity of the sediment was calculated between 2.615 and 2.680.

WATER COLUMN TESTING AND EVALUATION (TIER II)

Background

Analysis of water chemistry was conducted concurrent with the sediment sampling, with a single system water sample obtained in the nearshore segment of the Bar Channel (STA -005+000B). The background water sample was analyzed for the same comprehensive suite of parameters as the elutriated sediment samples. Elutriate tests were conducted on three composite sediment samples from the Bar Channel segment of the Savannah Harbor project.

LIMITING PERMISSIBLE CONCENTRATION COMPLIANCE DETERMINATION

The Automated Dredging and Disposal Alternatives Modeling System (ADDAMS) simulation was applied to assist with determining the fate of disposing of dredged material in open water. The simulation: Short Term Fate of Disposal in Open Water (STFATE) was performed utilizing the required inputs from the sediment and water column tests as well as known parameters unique to the Savannah Harbor coastal system and the ODMDS.

For the Nearshore Reach, the constituent of concern requiring the greatest dilution to meet WQC was Total Ammonia. The Ammonia concentrations outside the ODMDS never rise above background, and the WQC for Ammonia is not exceeded within the ODMDS at the end of the 4hr mixing time. Because Total Ammonia was required to greatest dilution to meet WQC, all other constituents meet WQC within the required mixing period.

The Tier I analysis concluded that the Offshore Reach should be relatively free of potential contaminants of concern because of the distances from the anthropogenic sources, grain size, high dilutive capacity, and high wave energy. As expected, the physical analyses revealed a composite grain size of 15% fines in the cores taken from the Offshore Reach. Because contaminants are generally associated with finer-grained sediments, elutriate analyses were not conducted on the sediment samples collected in this reach.

Confirmatory bulk sediment chemistry was performed in the Offshore Reach. The seaward most station sampled contained elevated levels of some trace metals (Cd, Cr, Hg, Ni, and As) and Low Molecular Weight (LMW) PAH compounds. However, only Cd exceeded the applied probable effects level (ER-M). The allision of the container ship, Neptune Jade, with Savannah RACON/Light in November 1996 resulted in a spill of diesel fuel and a hazardous substance used as a lacquer in the vicinity of STA -075+000B. Despite cleanup efforts following the spill, the elevated contaminant levels in the sediments are almost certainly the result of this accident. Since the elevated contaminant concentrations are surficial and localized, these values were not used as typical of Offshore sediments constituent concentrations. Instead, the critical values were obtained from samples collected near STA -035+000B.

The USACE numerical model STFATE was utilized for the mixing zone analysis. Inputs to the model were identical to the Nearshore cases, except for the contaminant of concern. The model was executed in “screening mode” to allow input of the bulk sediment chemical results and applicable WQC for Zn. The Zn concentrations outside the ODMDS never rise above background, and the WQC for Zn is not exceeded within the ODMDS at the end of the 4hr mixing time. Therefore, offshore disposal of the Offshore Reach material is in compliance with §103 and Tier III analysis is not required.

Water Column Toxicity Evaluation

Laboratory testing of sediment and water samples revealed that marine water quality criteria will be met for all constituents of concern following initial mixing. This result substantiates compliance with Title 40 CFR Part 227.13(c)(2)(i). A comprehensive treatment of the selected sampling water chemistry results can be reviewed in the report “Dredged Material Environmental Effects Evaluation: Savannah Harbor Deepening” (ATM, 1998).

BENTHIC DETERMINATIONS (TIER II)

Tier II provides useful information and evaluation through existing screening tools. This tier is ultimately expected to reach conclusions through the use of reliable and rapid screens. The project SAP (ATM, 1997b) was specifically developed to provide as much useful information about the proposed dredged material as possible to complete this investigation in Tier II.

The Green Book recognizes that dredged material environmental effects evaluations is an evolving field that that new screening tools and approaches will be added to Tier II as they become available. With existing screening tools and values, it is particularly difficult to make certain statements about dredged material carries low levels of contaminants like the Savannah Harbor material. This evaluation employs several different techniques and screening values in order to aid in make factual determinations.

Secondly, the Tier II evaluation must make determinations concerning benthic effects benthic toxicity and benthic bioaccumulation. Like water column evaluations, many hope that sediment quality criteria (SQC) will be developed which will become the basis of State sediment quality standards (SQS) which can be used for the benthic toxicity evaluations. At the time of this writing, no such criteria exist. Several approaches are being studied, but none has been determined to be appropriate at this time. Instead, the most widely used approach to screening sediments at present are sediment quality assessment guidelines (SQAGs) developed by various researchers including Edward R. Long, Lee G. Morgan, and Donald D. MacDonald (Long and Morgan, 1990; MacDonald, 1994; Long et al., 1995; MacDonald et al., 1996). The development SQAGs uses a weight-of-the-evidence approach that provides two values (an effects range-low and an effects range-median) for several contaminants of concern. These two values provide three concentration ranges where based on a national or regional database effects were ① rarely, ② occasionally, or ③ frequently associated with this concentration. This procedure is useful as a rapid screening tool especially when contaminant concentrations in the dredged material are below the lower screening value (ER-L or TEL)². Problems with the approach include the lack of normalization to % fines or organic carbon and the lack of strict attention to the bioavailability of the contaminant.

² The ER-L (Long and Morgan, 1990; Long et al. 1995) and TEL (Threshold Effects Level) represent the level where effects are sometimes observed. Similarly, the ER-M and PEL (Probable Effects Level) represent the level where effects are often observed. The weight-of-the-evidence approach was used to generate both of these SQAG sets, but different source data was used.

Tier II benthic bioaccumulation is evaluated by calculating the theoretical bioaccumulation potential (TBP) of nonpolar organic compounds. This approach utilizes sediment organic carbon content, percent lipid content in the target organism, and accumulation factors associated with the target contaminant and organism. The approach is limited because it can only be conducted on nonpolar organic compounds (which exclude metals, metal compounds, organic acids and salts, and organometallic complexes such as Methyl Mercury and Tributyltin) and the database of available biota sediment accumulation factors (BSAFs) is small.

The environmental effects of dredged material management alternatives analysis did not reveal any potentially unacceptable adverse effects from the excavation, transportation, discharge, and management of the material proposed for excavation and disposal in the ODMDs. Additionally, surficial sediments from the vicinity of the destroyed Savannah RACON/Light should be removed and disposed of by approved methods by the shipping line responsible for the contaminating spill before construction of the Harbor deepening project. These sediments are contaminated with Cadmium above the probable effects level. If the concern is not addressed by the shipping line responsible or some third party prior to deepening, the area surface sediments should be resampled using approved techniques and an analysis conducted that will permit the most appropriate management option to be undertaken at that time.

OCEAN DISPOSAL CRITERIA COMPLIANCE EVALUATION

Environmental Impact

Subpart B of Title 40 CFR (Section 227.4) establishes specific criteria for the evaluation of environmental impact associated with the dumping of materials into ocean waters. Compliance with the applicable prohibitions, limits and conditions generally results in a USEPA determination that the proposed disposal will not unduly degrade or endanger the marine environment in the vicinity of the activity and that the ocean disposal will present no unacceptable adverse effects:

- on human health and no significant damage to marine environmental resources;
- on the marine ecosystem;
- due to the dumping of dredged materials; and
- on the ocean for other uses as a result of direct impact.

Each of the prohibited, limited, potentially hazardous and other applicable standards associated with the proposed disposal of New Work and Operations and Maintenance dredged sediments from the Savannah Harbor Bar Channel are addressed in this section of the 103 Evaluation. The volume of material anticipated for dredging associated with the proposed project (approximately 15 million cubic yards) will be disposed of in the 3,521-acre ODMDs, which has accepted dredged materials from prior improvements and maintenance to the BC since its establishment. No unacceptable adverse persistent or permanent effects due to the dumping of dredged materials in the ODMDs have been identified from prior use.

PROHIBITED MATERIALS

There are no high-level radioactive wastes, materials produced or used for radiological, chemical or biological warfare, persistent inert synthetic or natural materials which may float or remain in suspension, or other

materials which would be deemed prohibited in accordance with Title 40 CFR Section 227.5 known to reside within the boundaries and sediments which comprise the proposed dredge material. Limited sampling confirms that no such materials are found in the Bar Channel and vicinity.

PROHIBITED CONSTITUENTS

In accordance with Title 40 CFR (Section 227.6), ocean dumping of several metals and metal compounds is strictly regulated. These include Organohalogens, Mercury, and Cadmium. In addition, oil of any kind, as well as known carcinogens, mutagens or teratogens are similarly regulated and prohibited. Such materials, if known to occur above trace concentrations, cannot be disposed in the ocean unless it can be demonstrated that such constituents are ① present in the material only as chemical compounds or forms non-toxic to marine life and non-bioaccumulative in the marine environment upon disposal, or ② present in the material only as chemical compounds or forms which will be quickly rendered non-toxic and non-bioaccumulative to marine life at the time of the disposal and thereafter.

Trace metal concentrations in the BC sediments did not show significant anthropogenic enrichment and were below probable effects level concentrations. The exception to this is the Cadmium concentration discovered in the surficial sediments in the vicinity of the recently destroyed Savannah RACON/Light tower. The clean-up of these surficial sediments is the responsibility of the container ship line. Both the Tier I and confirmatory Tier II sampling indicate that other metal concentrations are only in naturally-occurring to slightly enriched amounts and are not expected to cause unacceptable adverse impacts on aquatic life.

LIMITS ESTABLISHED FOR SPECIFIC WASTES OR WASTE CONSTITUENTS

Subpart B, Title 40 CFR (Section 227.7) establishes specific additional limitations on waste constituents prior to acceptance for ocean disposal. Included in this provision are liquid waste constituents immiscible with or slightly soluble in sea water (e.g., benzene, xylene, carbon disulfide and toluene); radioactive materials: wastes containing living organisms that could endanger humans, fish, shellfish and wildlife; highly acidic or alkaline wastes; and, biodegradable or oxygen consuming constituents. Sediments from the Nearshore BC area were elutriated using the standard test and none of the listed constituents were found in other than trace amounts; therefore, the limitations of Section 227.7 are not applicable to the proposed project.

LIMITATIONS OF THE DISPOSAL RATES OF TOXIC WASTES

There are no wastes, either in the liquid or solid phase, which are contained within the sediments proposed for dredging that will exceed the Limiting Permissible Concentration as defined in Subpart B, Title 40 CFR (Section 227.27). None of the waste constituents governed by Section 227.8 are deemed containerized or insoluble.

LIMITATIONS ON QUANTITIES OF WASTE MATERIALS

The dredge spoil to be disposed in conjunction with the proposed deepening and maintenance of the Bar Channel is composed primarily of sand and fine-grained sediments. The physical and chemical properties of the dredge material are not toxic to the environment and will therefore not damage the ocean environment. Dredge volumes associated with the deepening, while substantial (15 million cubic yards), will be deposited in the properly sited and regulated ODMDS. Title 40 CFR Part 227.9 additionally references "serious reduction in

amenities...". Because of the location of the BC and ODMS relative to the shoreline, there are no such "amenities" which will be subjected to other than the short-term bottom sediment and localized water column disturbances associated with dredge material excavation and disposal.

HAZARDS TO FISHING, NAVIGATION, SHORELINES OR BEACHES

Dredged material proposed for removal from the Savannah Harbor BC will not present a serious obstacle to fishing or navigation interests. Hopper dredge operations in the BC and transportation of dredged material from the excavation area to the ODMS will necessarily inhibit fishing and navigation operations in the immediate vicinity of the dredge and disposal activity. This is a temporary interruption, however, and cannot be considered a hazard.

The ODMS is located 3.7 nautical miles offshore of Little Tybee Island. The dredge material to be excavated from the BC (sand and fine-grained sediments) will be deposited well offshore of the closest shoreline. Temporary suspension of fine-grained sediments will occur in the vicinity of excavation and disposal operations associated with the Savannah Harbor deepening. Such impacts will be localized to the work areas and will not present a hazard to the beaches or shorelines in the vicinity of the BC and ODMS.

CONTAINERIZED AND INSOLUBLE WASTES

There are no containerized or insoluble wastes as defined by Title 40 CFR 227.11 and 227.12 proposed for dredging or placement in the ODMS. Only O&M and New Work dredged sediments will be removed from the Bar Channel and placed in the approved ocean disposal site offshore of Little Tybee Island.

DREDGED MATERIAL

Subpart B of Title 40 CFR 227.13 provides specific guidance with respect to the ocean disposal of dredged materials. The proposed BC sediments to be dredged from the Savannah Harbor and placed in the ODMS generally comply with 227.13(b)(1), insofar as the material is composed predominantly of sand and is found in areas of high current or wave energy. Tier II testing of samples obtained in the BC and channel bend widenings indicates that the dredged material is in compliance with the requirements of 227.6 (constituents prohibited as other than trace contaminants). Complete results of the sediment testing and evaluation are provided in the report "Dredged Material Environmental Effects Evaluation: Savannah Harbor Deepening" (ATM, 1998). Based on the above and the results contained within the reference document, the sediments proposed to be dredged are found to be environmentally acceptable for ocean dumping in the Savannah ODMS.

Need for Disposal of Dredged Materials from the Bar Channel to the ODMS

The criteria for evaluating the need for ocean disposal of dredged material excavated from the Savannah Harbor BC are addressed in Subpart C, Title 40 CFR 227. Factors 227.15(a) and (b) are not applicable to this evaluation, as the material is not considered to be a waste associated with any industrial process. The only environmental risks, impact and comparative cost to ocean disposal which warrant discussion as detailed in 227.15(c) are:

- discharge of the material to an upland confined disposal facility (CDF);
- nearshore deposition of the dredged material in a feeder berm configuration;
- direct pumpout to a beach for the purposes of beach nourishment; and,
- no action (i.e., not undertaking the deepening project).

Alternate disposal of the BC sediments to a CDF is not a viable alternative due to increased haul distances from the outer reaches of the BC to currently designated CDFs (as compared to the ODMDS). Additionally, a large land area would be required to safely and properly contain the approximately 15 million cubic yards of sediment anticipated to be dredged from the Bar Channel. The existing CDFs are required for containment of the sediments to be dredged from the Inner Harbor reaches of the Savannah River project. Several of the existing CDFs cannot accept the anticipated volume of dredged sediment without additional modification (i.e., increasing dike elevations).

Beneficial use alternatives (feeder berm and beach nourishment) were investigated as a component of the EIS. The “Alternative Ocean Dredged Material Placement Study: Savannah Harbor Deepening” (ATM, 1997) provides a detailed assessment of the potential for construction of a feeder berm in the nearshore environment off Tybee Island, Georgia, and the placement of dredge material directly onto the beaches of either Tybee Island or Daufuskie Island, South Carolina. The study concluded that neither of these beneficial use alternatives are presently considered viable due to (1) overall sediment characteristics serving to elevate turbidity levels in the vicinity of the shoreline and (2) being undesirable for direct beach placement. There are, however, sediment samples acquired along segments of the Bar Channel that display grain size characteristics indicative of potential beach quality. Additional geotechnical investigation could be used to more accurately quantify the volume of material and to qualify the environmental constraints necessary to deem either of these beneficial uses viable.

Because the O&M material is subject to greater enrichment of both inorganic and organic compounds from human sources, the “no action” alternative or continued maintenance of the existing federal project without the proposed improvements, places higher concentrations of constituent compounds of concern in each maintenance interval than the deepening proposals which will dilute the constituents in the O&M overburden during for the construction interval under consideration.

Impact of the ODMDS on Aesthetic, Recreational and Economic Values

Subpart D of Title 40 CFR 227 requires the consideration of a basis for determination, the factors considered in the assessment of the disposal site, and an overall assessment of the impact of the proposed disposal. The following considerations are investigated as the basis for determination:

- 1) potential for affecting recreational uses and values of ocean waters, inshore waters, beaches or shorelines;
- 2) potential for affecting the recreational and commercial values of living marine resources;
- 3) responsible public concern for the consequences of the proposed dumping; and
- 4) the consequences of not authorizing the proposed dredge material disposal.

Impacts to recreational use of the ocean waters in the vicinity of the ODMDS will be temporarily affected by the presence of the dredge and turbidity plumes generated during material placement. Inshore waters, beaches and shorelines will not be adversely affected by the activity due to the distance of the ODMDS from the shoreline. No shellfish beds or fish spawning grounds are located in the ODMDS, and benthic community

impacts will be temporary (direct burial of benthic organisms in the ODMDS subjected to spoil disposal). Since the ODMDS has been previously used for the same purposes as the proposed deepening (dredged material disposal), public objection over the continued use of the ODMDS is not anticipated. Discontinuation of the ODMDS as a viable disposal site would require either beneficial use alternatives to be implemented or disposal in a CDF. These issues were addressed previously and were found to be unfeasible.

Specific factors to be considered in the assessment of aesthetic, recreational and economic value impacts are outlined in Title 40 CFR 227.18. The factors are repeated below, followed by an evaluation (assessment) of their respective impacts:

Nature and extent of present and potential recreational and commercial use of areas which might be affected by the proposed dumping.

Evaluation: the only impacts anticipated are those associated with ① the physical presence of dredge equipment in the ODMDS and ② temporary discharge plumes.

Existing water quality, and nature and extent of disposal activities, in the areas which might be affected by the proposed dumping.

Evaluation: water quality would be temporarily impacted in the vicinity of the direct discharge due to elevated turbidity and suspended solids levels in the ODMDS. Sediment settling and dispersion are expected to occur quickly due to the nature of the sediments to be dredged from the Bar Channel.

Applicable water quality standards.

Evaluation: the Savannah Harbor ODMDS is located in ocean waters (seaward of State of Georgia coastal waters). There are no applicable state water quality standards, but federal WQC apply.

Visible characteristics of the materials (e.g., color, suspended particulates) which result in an unacceptable aesthetic nuisance in recreational areas.

Evaluation: a discharge plume may be visible in the vicinity of the dredge discharge for a short period of time following each discharge due to the silt/clay fraction of some of the sediment to be dredged from the Bar Channel.

Presence in the material of pathogenic organisms which may cause a public health hazard either directly or through contamination of fisheries or shellfisheries.

Evaluation: there are no known pathogenic organisms in the sediments to be dredged and discharged to the ODMDS. The ODMDS is not a designated (nor is it proximate to a) shellfishery; therefore, no contamination is anticipated.

Presence in the material of toxic chemical constituents released in volumes which may affect humans directly.
Evaluation: sediment tests conducted and summarized in the report "Dredged Material Environmental Effects

Evaluation: Savannah Harbor Deepening" (ATM, 1998) did not reveal chemicals which are present in such quantities as to directly affect humans. The evaluation therefore focused on the potential impacts to aquatic organisms.

Presence in the material of chemical constituents which may be bioaccumulated or persistent and may have an adverse effect on humans directly or through food chain interactions.

Evaluation: The proposed dredged material is primarily composed of new work sediments which are relatively free of anthropogenically produced organic constituents that may bioaccumulate in aquatic life and eventually affect humans through ingestion of seafood. Naturally occurring metals and other constituents were not found at levels where current guidance indicates significant risk of adverse impacts. The O&M material does contain some compounds (particularly PAHs and Butyltins) which may potentially bioaccumulate in aquatic life. The concentrations of these compounds (particularly when mixed with the new work material) were not thought to be high enough to impact aquatic life in and around the disposal area. This being the case, dredged material constituents do not present a significant risk to humans feeding on aquatic organisms.

Presence in the material of any constituents which might significantly affect living marine resources of recreational or commercial value.

Evaluation: The dredged material environmental effects evaluation targeted aquatic organisms as the primary potentially impacted group. The evaluation did not find that constituents in the proposed sediments are in high enough concentrations or available to aquatic biota to the degree where unacceptable adverse impacts are likely to result from placement in the approved ODMDS.

IMPACT OF THE PROPOSED DISPOSAL ON OTHER USES OF THE OCEAN

The basis for determining impacts of Savannah Harbor dredged sediment disposal in the ODMDS on other uses of the ocean is governed by the provisions of Subpart E, Title 40 CFR 227. The following “other” uses of the ocean (other than for dredged material disposal) are:

- commercial fishing (open ocean, coastal area and estuarine area);
- recreational uses (open ocean, coastal, and estuarine area fishing; use of shoreline and beaches);
- navigation (commercial and recreational);
- cultural resources;
- endangered species;
- non-living resources; and
- scientific research and study.

The Savannah Harbor ODMDS is a previously designated and approved dredge disposal site which has realized the placement of frequent O&M dredged material associated with prior events. Estuarine areas will not be impacted by this activity due to the physical distance of both the dredge and disposal sites from the estuary and the settlement/dispersion of suspended sediments associated with the operation. Fishery impacts have been previously addressed and are not anticipated to result in anything other than temporary disruption in the

immediate area of the dredge and discharge plumes. Commercial and recreational navigational interests would be similarly affected on a temporary basis. Recreational use of the shoreline at Tybee and Little Tybee Island will not be adversely impacted due to the distance of the ODMDS from the shoreline.

There are no known cultural resources in the vicinity of the ODMDS. Endangered species impacts are separately addressed by regulatory authorization and time of year/equipment restrictions on dredging.

The only non-living resource affected by the activity is relocation of existing bottom sediments from the navigation channel (BC) to the ODMDS. Beneficial use alternatives of the BC sediments have not been definitively qualified or quantified at this time, rendering disposal to the ODMDS the best use of the dredged material. Scientific research and study associated with monitoring dredge material deposition and transport patterns following placement within the ODMDS may actually be enhanced. The document "Site Monitoring Plan for the Savannah Harbor ODMDS" (USACE, August 1996) provides a detailed scope of work for determining deposited material fate and assessment of impact through monitoring of changes in sediment characteristics and biological communities.

Requirements (Management Options) To Meet Ocean Disposal Criteria

An interagency Site Management and Monitoring Plan (SMMP) team has been established to review and comment on all Savannah Harbor ODMDS monitoring and management activities. Such activities are regulated by Title 40 CFR Part 228.3 of the Criteria for the Management of Disposal Sites for Ocean Dumping. Site management is presently governed by the "Site Management Plan: Savannah Harbor ODMDS" (USACE, August 1996). The scope and extent of this plan are comprehensive and should be adequate to address the management objectives of Title 40 CFR Part 228.

MPRSA Section 103 Conditions

The Marine Protection, Research and Sanctuaries Act of 1972, Section 103 provides the USACE with the authority to permit disposal of dredged material with review and concurrence by the USEPA. The USACE does not issue itself a permit for dredged material disposal; however, the USACE is responsible for meeting the same requirements and upholding the same pertinent regulations as a permittee. An evaluation of Title 40 CFR, Parts 220-228, as written in the 1991 Green Book is provided in this document.

Determination and Findings

Based on the above and referenced documentation, the dredged material in the Savannah Harbor Bar Channel is suitable for placement in the designated ODMDS and will not unduly degrade or endanger the marine environment. This determination is supported by the following findings:

The majority of the proposed dredge material is predominantly sand which meets the criteria of Part 227.13(b)(1).

Field sampling was conducted in the Bar Channel to confirm the physical and chemical properties of sediments located within the existing (O&M) segments of the channel as well as to obtain New Work (proposed deepening) cores and water column samples in the channel and bend wideners.

Tier I testing of sediment samples revealed some trace contaminants, but these data were deemed insufficient to make factual determinations concerning the potential effects of the proposed material. This is particularly

true for the bulk of the New Work material which is deeper than previous studies have investigated. Therefore, Tier II evaluations were deemed necessary.

A Tier II evaluation of water column impacts was performed, revealing compliance of the dredge material with federal marine water quality criteria outside the ODMDS and within the 4hr mixing time for the constituent of concern requiring the greatest dilution to meet WQC.

A Tier II evaluation of benthic impacts was performed by comparing sediment constituent concentrations to available benthic effects criteria and by calculating TBPs for non-polar organics. These analyses indicated that increased benthic effects on aquatic biota are unlikely from discharge of the proposed dredged material in the ODMDS.

Tier II results indicate that further tiered evaluation is not necessary to make determinations.

Compliance evaluations addressed and found minimal environmental impact associated with the excavation and disposal of dredged materials.

Management of the ODMDS is comprehensively addressed by an existing Management Plan executed by the USACE and USEPA.

No unacceptable adverse impacts to water quality, navigation, recreational uses, cultural resources, aesthetic, recreation or economic values are anticipated.