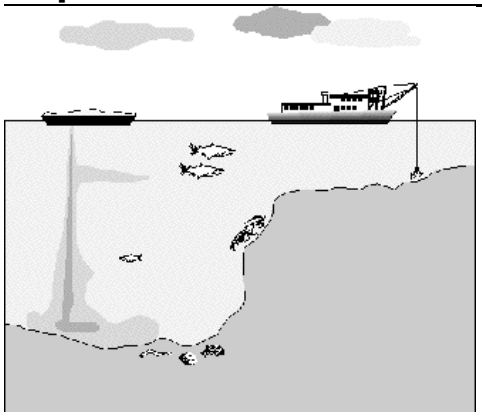
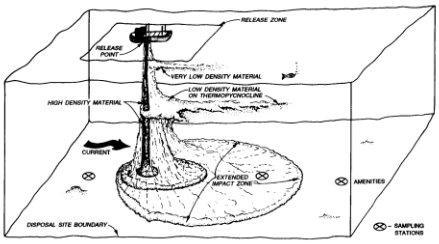
Gulfport West & East
OCEAN DREDGED MATERIAL DISPOSAL SITES

SITE MANAGEMENT AND MONITORING PLAN

September 2009





U.S. Army Corps of Engineers

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The following Site Management and Monitoring Plan (SMMP) for the Gulfport Ocean Dredged Material Disposal Sites (ODMDSs) has been developed and agreed to pursuant to the Water Resources Development Act Amendments of 1992 (WRDA 92) to the Marine Protection, Research, and Sanctuaries Act of 1972 (MPRSA) for the management and monitoring of ocean disposal activities, as resources allow, by the U.S. Environmental Protection Agency (EPA) and the U.S. Army Corps of Engineers (Corps).

30 oct '09

Byron G. Jorns Date
Colonel, District Commander
U.S. Army Corps of Engineers,
Mobile District
Mobile, Alabama

10/9/2009

A. Stanley Meiburg, Acting Date
Regional Administrator
U.S. Environmental Protection Agency
Region 4
Atlanta, Georgia

This plan is effective from the date of signature for a period not to exceed 10 years. The plan shall be reviewed and revised more frequently if site use and conditions at the sites indicate a need for revision.

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GULFPORT ODMDSs

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SITE MANAGEMENT AND MONITORING PLAN

1.0 INTRODUCTION.

It is the responsibility of the U.S Environmental Protection Agency (EPA) and the U.S. Army Corps of Engineers (COE) under the Marine Protection, Research, and Sanctuaries Act (MPRSA) of 1972 to manage and monitor each of the Ocean Dredged Material Disposal Sites (ODMDSs) designated by the EPA pursuant to Section 102 of MPRSA. The goal of this management is to ensure that ocean dredged material disposal activities will not unreasonably degrade the marine environment or endanger human health or economic potential. As part of this responsibility, a SMMP is being developed to specifically address the disposal of dredged material into the Gulfport ODMDSs. This plan will include past monitoring results and will comply with provisions of the Water Resources Development Act (WRDA) of 1992 and a Memorandum of Agreement (MOA) between EPA and Corps. Upon finalization of this SMMP, these SMMP provisions shall be requirements for all dredged material disposal activities at the Gulfport sites. **All Section 103 (MPRSA) ocean disposal permits or evaluations shall be conditioned as necessary to assure consistency with the SMMP.**

This SMMP has been prepared in accordance with the *Guidance Document for Development of Site Management Plans for Ocean Dredged Material Disposal Sites* (EPA and Corps 1996). This document provides a framework for the development of SMMPs required by MPRSA and WRDA 92. The SMMP may be modified if it is determined that such changes are warranted as a result of information obtained during the monitoring process. The SMMP will be reviewed and revised as needed or every ten years, whichever time period is shorter.

1.1 Site Management and Monitoring Plan Team. An interagency SMMP team has been established to assist EPA and the Corps in finalizing this SMMP. The team consists of the following agencies and their respective representatives:

Corps, Mobile District
Ms. Jenny Jacobson

EPA, Region 4
Mr. Doug Johnson

U.S. Coast Guard
District Commander
CAPT Steven D. Poulin

Mississippi State Port Authority
Mr. John Webb

Mississippi Department of Environmental Quality
Ms. Florance Watson

National Oceanic and Atmospheric Administration
Mr. Buck Sutter

Mississippi Department of Marine Resources
Mr. Jan Boyd

Secretary of State, Land Division
Ms. Margaret Bretz

Other agencies, such as the National Marine Fisheries Service (NMFS), the U.S. Fish and Wildlife Service (USFWS), and the Minerals Management Service (MMS) will be asked to participate where appropriate. The SMMP team will assist EPA and the Corps in evaluating existing monitoring data, the type of disposal (i.e., operations and maintenance (O&M) vs. new work), the type of material (i.e., sand vs. mud), location of placement within the ODMDSs, and quantity of material. The team will assist EPA and the Corps on deciding on appropriate monitoring techniques, the level of monitoring, the significance of results, and potential management options.

Specific responsibilities of EPA and the Corps, Mobile District are:

EPA: EPA is responsible for designating/de-designating MPRSA Section 102 ODMDSs, for evaluating environmental effects of disposal of dredged material at these sites, and for reviewing and concurring on dredged material suitability determinations.

Corps: The Corps is responsible for evaluating dredged material suitability, issuing MPRSA Section 103 permits, regulating site use, and developing and implementing disposal-monitoring programs.

2.0 SITE MANAGEMENT.

ODMDS management involves a broad range of activities including regulating the schedule of use, the quantity, and the physical/chemical characteristics of dredged materials disposed of at the sites. It also involves establishing disposal controls, conditions and requirements to avoid and minimize potential impacts to the marine environment. Finally, ODMDS management involves monitoring the site environs to verify that unanticipated or significant adverse effects are not occurring from past or continued use of the site and that permit conditions are met.

Section 228.3 of the Ocean Dumping Regulations (40 CFR 220 - 229) states that "management of a site consists of regulating times, rates, and methods of disposal and quantities and types of materials disposed of; developing and maintaining effective ambient monitoring programs for the site; conducting disposal site evaluation studies; and recommending modifications in site use and/or designation." The plan may be modified if it is determined that such changes are warranted as a result of information obtained during the monitoring process. MPRSA, as amended by WRDA 92, provides that the SMMP shall include but not be limited to:

- A baseline assessment of conditions at the site;
- A program for monitoring the site;
- Special management conditions or practices to be implemented at each site that are necessary for the protection of the environment;
- Consideration of the quantity and physical/chemical characteristics of dredged materials to be disposed of at the site;
- Consideration of the anticipated use of the site over the long-term; and
- A schedule for review and revision of the plan.

2.1 Disposal Site Characteristics. The Eastern and Western Gulfport ODMDSs encompass an area of 2.47 and 5.22 square nautical miles (nmi^2), respectively. The corner coordinates are as follows:

Eastern ODMDS Geographic		**Western ODMDS Geographic**	
30°11'10"N	88°58'24"W	30°12'00"N	89°00'30"W
30°11'12"N	88°57'30"W	30°12'00"N	88°59'30"W
30°07'36"N	88°54'24"W	30°11'00"N	89°00'00"W
30°07'24"N	88°54'48"W	30°07'00"N	88°56'30"W
		30°06'36"N	88°57'00"W
		30°10'30"N	89°00'36"W

Note that the northern portion of the Western ODMDS is no longer available for use. Depths at the northern portion of the Western ODMDS are less than 25 feet. Hopper dredges require a minimum depth of 25 feet to safely dispose of dredged material; therefore, the Corps no longer utilizes the northern portion of this site.

The Eastern and Western sites are approximately 12 and 14 nm from the main coastline of Mississippi, and are 0.7 and 1.2 nm from Ship Island, respectively. The sites range in depth from 20 feet to 31 feet (**Figure 1**). The sediment composition at these sites consists of silts and clays ranging from 22 to 91% and is comparable to the dredging site. Physical, chemical, and biological conditions at the ODMDSs are described in *Final EIS for the Pensacola, FL., Mobile, AL., and Gulfport Harbor, Ms. Dredged Material Disposal Site Designation* and in the *Draft Sediment Quality Characterization of the Gulfport Harbor Federal Navigation Channel, Gulfport, MS.*

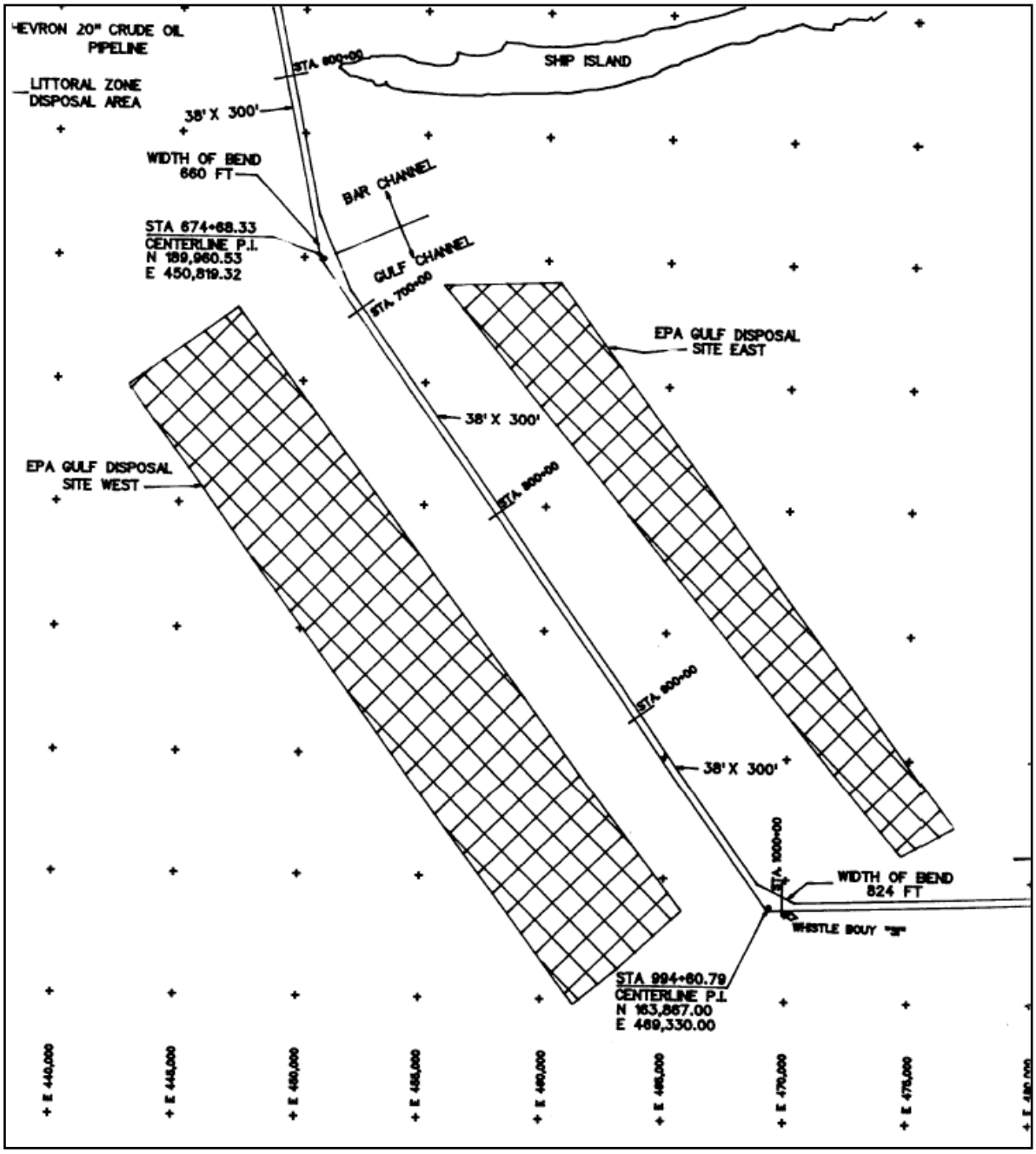


Figure 1: Gulfport ODMDSs Location Map and Operational Boundaries

2.2 Management Objectives. There are three primary objectives in the management of the Gulfport ODMDSs:

- Protection of the marine environment, living resources, and human health and welfare;
- Documentation of disposal activities at the ODMDSs and provision of information which is useful in managing the dredged material disposal activities; and
- Provide for beneficial use of dredged material whenever practical.

The objective of the SMMP is to provide guidelines in making management decisions necessary to fulfill mandated responsibilities to protect the marine environment as discussed previously. Risk-free decision-making is an impossible goal; however, an appropriate SMMP can narrow the uncertainty. The following sections provide the framework for meeting these objectives.

2.3 Dredged Material Volumes. It is intended that the Gulfport ODMDSs will be used for dredged material (both maintenance and construction or new work material) from the greater Gulfport, Mississippi vicinity. The two primary users of the Gulfport ODMDSs are:

- Corps for Civil Works
- Mississippi State Port Authority

The Gulfport ODMDSs have been used to dispose of material dredged from this area since the 1970s. Since 1977, approximately 26 million cubic yards of dredged material have been disposed of in the Gulfport ODMDSs (**Table 1**). Since 1990, approximately 17 million cubic yards of dredged materials have been disposed of in the Gulfport ODMDSs. Between 1977 and 1990, the average volume of dredged material disposed in the ocean was about 1.1 million cubic yards and between 1991 and 2008 the average annual disposal volume was about 1.3 million cubic yards.

Table1: Yearly Record of Ocean Dredged Material Disposal in the Gulfport ODMDSs (NW=New Work; O&M=Operations & Maintenance; cy=cubic yards)

Year	Action Type	Cubic Yards	Disposal Site	Composition
1977	O&M	2,924,400	East ODMDS	Silts & Clays
1979	O&M	728,300	East ODMDS	Silts & Clays
1981	O&M	1,801,000	East ODMDS	Silts & Clays
1982	O&M	101,200	West ODMDS	Silts & Clays
1984	O&M	996,900	West ODMDS	Silts & Clays
1985	O&M	885,500	East ODMDS	Silts & Clays
1987	O&M	909,000	East ODMDS	Silts & Clays
1989	O&M	469,700	West ODMDS	Silts & Clays
1992	NW & O&M	6,431,100	East ODMDS	Silts & Clays
1993	NW & O&M	3,518,900	West ODMDS	Silts & Clays
1996	O&M	623,000	East ODMDS	Silts & Clays
1997	O&M	1,067,000	West ODMDS	Silts & Clays
1998	O&M	1,300,000	West ODMDS	Silts & Clays
2002	O&M	943,000	West ODMDS	Silts & Clays
2003	O&M	542,800	West ODMDS	Silts & Clays
2004	O&M	1,391,000	West ODMDS	Silts & Clays
2005	NW	1,000,000	East ODMDS	Silts & Clays
2005	O&M	390,000	West ODMDS	Silts & Clays
2006	O&M	0	West ODMDS	Silts & Clays
2007	O&M	0	West ODMDS	Silts & Clays
2008	O&M	0	West ODMDS	Silts & Clays

Future volumes and rates of disposal, from both Federal and private applicants, are expected to be less than 1 million cubic yards per year. However, this estimate may increase if it is determined feasible to deepen and widen the Federal channel into Gulfport Harbor, requiring consideration of alternative disposal sites (e.g., designation of a new Gulfport ODMDS, or use of the existing Pascagoula ODMDS). Short-term (5-year) projected disposal volumes are shown

in **Table 2**. Civil works maintenance projects for Gulfport Harbor are anticipated to account for approximately 100% of the total volume of material to be disposed at the Western ODMDS.

Table 2: Projected Volume of Dredged Material Disposal in the Gulfport ODMDSs

Year	Action Type	Cubic Yards	Disposal Site	Composition
2009	O&M	400,000	West ODMDS	Silts & Clays
2010	O&M	0	West ODMDS	Silts & Clays
2011	O&M	400,000	West ODMDS	Silts & Clays
2012	O&M	0	West ODMDS	Silts & Clays
2013	O&M	400,000	West ODMDS	Silts & Clays
2014	O&M	0	West ODMDS	Silts & Clays

The Gulfport ODMDSs have been determined to be dispersive sites, particularly during hurricane season. However, the dispersiveness of the sites, and consequently the ultimate capacity of the ODMDSs, is subject to unpredictable variability. Previous capacity studies have indicated that the capacity of the ODMDSs should be restricted to 1 million cubic yards of dredged material per year for the West site. The East site will no longer be used due to extensive transport of the placed material back into the channel.

2.4 Material Suitability. Two basic sources of material are expected to be placed at the sites, new work material and maintenance dredged material. These materials will consist of mixtures of silts, clays, and sands in varying percentages. Sediments dredged from navigation in the Gulfport Harbor include mainly ocean and estuarine sources (sandy, littoral materials). Shoals occur where specific physical factors promote deposition or movement of sediments. These factors may vary spatially and temporally.

The disposition of any significant quantities of beach compatible sand from future projects will be determined on a project-by-project basis. Utilization of any significant quantities of beach compatible dredged material for beach nourishment is strongly encouraged and supported by EPA and the Corps. In fact, the Corps manages its dredged material under its Regional Sediment Management (RSM) initiative to be used beneficially. As a result, the Corps evaluates the whole coastal system when managing dredged material disposal rather than focusing on an individual project. Disposition of non-beach quality sand should be planned to allow the material to be placed so that it will be

within or accessible to the sand-sharing system, to the maximum extent practical, and following the provisions of the Clean Water Act.

The suitability of dredged material for ocean disposal must be verified by the Corps and agreed to (concur) by EPA prior to disposal. Verification will be valid for three years from the time last verified. Verification will involve: 1) a case-specific evaluation against the exclusion criteria (40 CFR 227.13(b)), 2) a determination of the necessity for testing including bioassay (toxicity and bioaccumulation) testing for non-excluded material based on the potential for contamination of the sediment since last tested, and 3) carrying out the testing (where needed) and determining that the non-excluded, tested material is suitable for ocean disposal.

Documentation of verification will be completed prior to use of the sites. Documentation will be in the form of a MPRSA Section 103 Evaluation. The Evaluation and any testing will follow the procedures outlined in the 1991 *EPA/Corps Dredged Material Testing Manual* and *2008 Southeast Regional Implementation Manual (SERIM)*. Only material determined to be suitable through the verification process by the Corps and EPA will be placed at the Gulfport ODMDSs.

2.5 Timing of Disposal. At present, no restrictions have been determined to be necessary for disposal related to seasonal variations in ocean current or biota activity. As monitoring results are compiled, should any such restriction appear necessary, disposal activities will be scheduled so as to avoid adverse impacts. Between April 1 and November 30 monitoring and precautions necessary to protect sea turtles and Gulf sturgeon, as described in the next paragraph, are required when using hopper dredges. Additionally, if new information indicates that endangered or threatened species are being adversely impacted, restrictions may be incurred.

2.6 Disposal Techniques. No specific disposal technique is required for this site. In order to protect sea turtles and Gulf sturgeon, the NMFS requires monitoring according guidance outlined in the *Regional Biological Opinion for Dredging of Gulf of Mexico Navigation Channels and Sand Mining ("Borrow") Areas Using Hopper Dredges by Corps Galveston, New Orleans, Mobile, and Jacksonville Districts* (NMFS, 2003). In addition, standard surveillance and evasive measures to protect sea turtles and marine mammals shall be employed during all disposal operations at the ODMDSs.

2.7 Disposal Location. Disposal shall occur no less than 330 feet (100 meters) inside the site boundaries to comply with 40 CFR §227.28. Placement methods that promote mounding are beneficial for creating relief on the ocean floor for habitat; however, the Corps will prevent mounded dredged material from becoming an unacceptable navigation hazard. Dredged material shall be placed so that at no point will depths less than -25 feet Mean Lower Low Water (MLLW) occur (i.e., a clearance of 25 feet above the bottom will be maintained).

To maximize ODMDSs capacity and promote mounding of material, disposal shall be within a specific area identified by the Corps in consultation with EPA, Region 4. Depths at the time of disposal will be monitored to detect if adjustments of disposal methods are needed to prevent unacceptable mounding (i.e. navigational hazards). The physical removal or leveling of material above -25 feet MLLW is a management alternative should mounds greater than those elevations occur.

2.8 Permit and Contract Conditions. The disposal monitoring and post-disposal monitoring requirements described under Site Monitoring will be included as permit conditions on all MPRSA Section 103 permits and will be incorporated in the contract language for all Federal projects. A summary of the management and monitoring requirements to be included are listed in **Table 3**.

Table 3. Summary of Permit and Contract Conditions

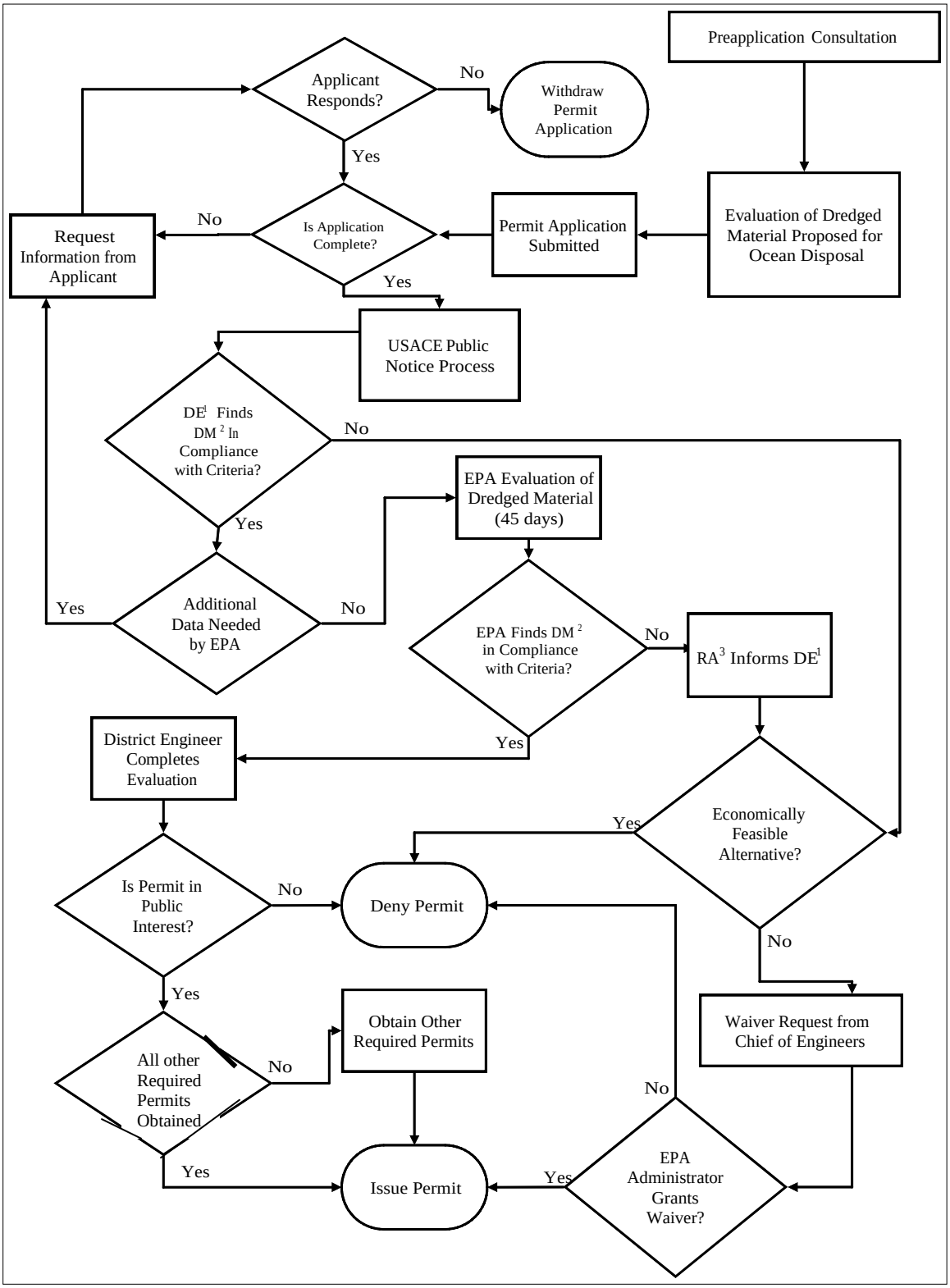
Condition	Reference
Dredged Material Suitability and Term of Verification	Gulfport ODMDS SMMP pages 7 & 8
Disposal within Appropriate Zones	Gulfport ODMDS SMMP pages 8 & 9
Post Bathymetric Surveys within 30 days of Project Completion	Gulfport ODMDS SMMP page 14
Disposal Monitoring and Recording of Disposal Locations	Gulfport ODMDS SMMP page 13
Reporting Requirements: Daily & Monthly Operations Reports and Disposal Summary Reports within 90 Days of Project Completion	Gulfport ODMDS SMMP page 17

2.9 Permit Process. The permit process is outlined in **Figure 2** and consists of 10 main steps:

- **Preapplication Consultation**: Includes discussion of alternatives and the qualitative and quantitative information required by the District Engineer for use in evaluating the proposed dredged material.
- **Evaluation of Dredged Material Proposed for Ocean Disposal**: Includes development, approval and implementation of sampling and analysis plan (see Section on Material Suitability). This step should include close coordination between EPA, Region 4, the Corps, and the applicant.
- **Permit Application**: According to 33 CFR 325.1, a permit application must include the following:
    - A complete description of the proposed activity, including necessary drawings, sketches, or plans.
    - The location, purpose, and need for the proposed activity; scheduling of the activity; names and addresses of adjoining

property owners; location and dimension of adjacent structures
    - A list of authorizations required by other Federal, interstate, State, or local agencies for the work, including all approvals received or denials already made
    - The source of the material; the purpose of the disposal, and a description of the type, composition, and quantity of the material (this includes information necessary to determine if the material is in compliance with the criteria); the method of transportation and disposal of the material; and the location of the disposal site.
- **Review of Application for Completeness**: Additional information is requested if the application is incomplete.
- **Public Notice**: Per 33 CFR 325.3, Public Notices issued by the Corps for dredged material disposal must include all of the information in 40 CFR 225.2(a) (see RIM). A supplemental, revised or corrected Public Notice will be issued if the District Engineer believes that the new information affects the review of the proposal.
- **EPA MPRSA Review**: Independent review of the information to determine whether the disposal activity complies with the criteria found in 40 CFR 227 and 228.
- **District Engineer Completes Evaluation**: The District Engineer addresses comments and holds public meeting if needed.
- **Corps Public Interest Review**: The Corps must consider all comments, suggestions, and concerns provided by all commenters and incorporate their comments into the administrative record of the application.
- **Permit Issued**: A decision to issue or deny a permit is discussed in either a Statement of Findings or Record of Decision.
- **Permit Public Notice**: A list of permit decisions is published and distributed to all interested parties each month.

Figure 2: Permit Application/Evaluation Procedure



1-District Engineer; 2-Dredged Material, 3-Regional Administrator

2.10 Information Management of Dredged Material Placement Activities.
As discussed in the following sections, a substantial amount of diverse data regarding use of the Gulfport ODMDSs and the effects of disposal is required from many sources (EPA, Corps, and Mississippi State Port Authority). If this information is readily available and in a useable format, it can be used to answer many questions typically asked about a disposal site:

- What is being dredged?
- How much is being dredged?
- Where did the dredged material come from?
- Where was the dredged material placed?
- Was dredged material dredged correctly placed correctly?
- What will happen to the environment at the disposal sites?

As part of site management, EPA and the Corps will investigate alternatives for appropriate data management. The Corps has an Ocean Disposal Database maintained by the Engineering Research and Development Center (ERDC). This database provides the quantities disposed of at the ODMDSs along with the chemical, physical, and biological information, and whether the project is from a civil work project or private entity.

3.0 SITE MONITORING.

The MPRSA establishes the need for including a monitoring program as part of the Site Management Plan. Site monitoring is conducted to ensure the environmental integrity of a disposal site and the areas surrounding the site and to verify compliance with the site designation criteria, any special management conditions, and with permit requirements. Monitoring programs should be flexible, cost effective, and based on scientifically sound procedures and methods to meet site-specific monitoring needs. A monitoring program should have the ability to detect environmental change as a result of disposal activities and assist in determining regulatory and permit compliance. The intent of the program is to provide the following:

(1) Information indicating whether the disposal activities are occurring in compliance with the permit and site restrictions; and/or

(2) Information concerning the short-term and long-term environmental impacts of the disposal; and/or

(3) Information indicating the short-term and long-term fate of materials disposed of in the marine environment.

The main purpose of a disposal site monitoring program is to determine whether dredged material site management practices, including disposal operations, at the site need to be changed to avoid significant adverse impacts.

3.1 Baseline Monitoring. Disposal has occurred at the present sites since the 1970s and predates any data gathering at the site. Therefore, no true baseline information has or can be collected. The results of investigations presented in the designation EIS and subsequent surveys listed in **Table 4** will serve as the main body of data for the monitoring of the impacts associated with the use of the Gulfport ODMDSs.

Table 4. Surveys and Studies Conducted at the Gulfport ODMDSs

Survey/Study Title	Conducted By:	Date	Purpose	Results
Analysis & Synthesis of Oceanic Conditions in the Mississippi Sound Offshore Region	Corps	March 1984	Determine the direction and amount of sediment transport from a dredged material disposal site.	Circulation patterns within the site are controlled by astronomical tides, winds, and freshwater discharges.
Field Survey of the Gulfport ODMDSs (*Analysis & Synthesis of Oceanic Conditions in the Mississippi Sound Offshore Region*)	Corps	March 1984	Video, Bathymetry, Hydrography, Water Quality, Sediment Benthic Survey, Tissue Analysis	-Baseline Survey
Sediment Mapping	UGA Center for Applied Isotopes for EPA	February 1995	Characterization of bottom sediments using gamma spectrometry	- Baseline Survey
Gulfport ODMDSs Benthic Communities Study	Corps	1986	Benthic community characterization	- Baseline analysis
Bathymetric Survey	Corp	Before and After Event	Monitor bathymetry changes	- Baseline analysis
Disposal Monitoring	Corps	During each Event	Compliance	- Database

3.2 Disposal Monitoring. For all disposal activities, an electronic tracking system (ETS) must be utilized. The ETS will provide surveillance of the transportation and disposal of dredged material. The ETS will be maintained and operated to continuously track in real-time the horizontal location and draft condition (nearest 0.1 foot) of the disposal vessel (i.e. hopper dredge or disposal scow) from the point of dredging to the disposal site, and return to the point of dredging. Data shall be collected at least every 500 feet during travel to and from the ODMDS and every minute or every 200 feet of travel, whichever is smaller, while approaching within 1,000 feet and within the ODMDS. The following information shall be electronically recorded for each disposal cycle:

a. Load Number
b. Disposal Vessel Name and Type (e.g. scow)
c. Tow Vessel Name (if applicable)
d. Captain of Disposal or Tow Vessel
e. Estimated volume of Load
f. Description of Material Disposed
g. Source of Dredged Material
h. Date, Time and Location at Start at Initiation and Completion of Disposal Event

It is expected that disposal monitoring will be conducted utilizing the Silent Inspector (SI) system for Civil Works projects [see http://si.usace.army.mil]. Disposal monitoring and ETS data will be reported to EPA Region 4 on a weekly basis utilizing the eXtensible Markup Language (XML) specification and protocol per Section 3.5. EPA Region 4 and the USACE District shall be notified within 24 hours if disposal occurs outside of the ODMDS or specified disposal zone or if excessive leakage occurs. Excessive leakage is any change in draft exceeding 1.5 feet from the point of departure from the dredging site to the disposal site.

3.3 Post Discharge Monitoring. The Corps or other site user will conduct a bathymetric survey within 30 days after disposal project completion. [Surveys will not be required for projects less than 50,000 cubic yards.] Surveys will conform to Class 2 specifications as described in the Corps' Engineering Manual, EM1110-2-1003, *Hydrographic Surveying*, dated January 1, 2002 and the Corps' Engineering Circular, EC1130-2-210, *Hydrographic Surveying*, dated 1 October 1998 to the extent practicable. The number and length of transects required will be sufficient to encompass the ODMDSs and a 500-foot wide area around the sites. The survey area may be reduced on a case-by-case basis if disposal zones are specified and adhered to. The surveys will be taken along lines spaced at 500-foot intervals or less with a depth recording density of 20 to 70 feet. Depth precision of the surveys will be +/- 0.1 feet. Horizontal location of the survey lines and depth sounding points will be determined by an automated positioning system utilizing either a microwave line of site system or differential global positioning system. The vertical datum will be referenced to prescribed NOAA Mean Lower Low Water (MLLW) datum, 1960-1978 epoch, as shown on the Tidal Benchmark sheet for Port Gulfport Entrance (872 1608). MLLW is 1.8 feet below NGVD 1929. The horizontal datum will be Mississippi State Plane (zone 0901 FL East) or Geographic (NAD 1983 or NAD 1927). Bathymetric surveys will be used to monitor the disposal mound to insure a navigation hazard is not produced, to assist in verification of material placement, to monitor bathymetric changes and trends, to aid in environmental effects monitoring, and to insure that the site capacity is not exceeded, i.e., the mound does not exceed the site boundaries. Copies of these surveys shall be provided to EPA, Region 4 when completed.

3.4 Material Tracking and Disposal Effects Monitoring. Surveys can be used to address possible changes in bathymetric, sedimentological, chemical, and

biological aspects of the ODMDSs and surrounding areas as a result of the disposal of dredged material at the sites.

3.4.1 Summary of Results of Past Monitoring Surveys. The surveys/studies listed in **Table 4** have indicated that the ODMDSs are dispersive sites for fine-grained material and as a result dredged material may extend beyond the designated site boundaries. Indicators of dredged material (from the sediment mapping and bathymetric surveys) appear within the ODMDS and to the northwest. Placement of dredged material in the northern portion of the Western ODMDS has resulted in this portion of the disposal site being too shallow for continued use. Placement of material in the Eastern ODMDS has resulted in dredged material being transported back into the channel.

3.4.2 Future Monitoring Surveys. Based on the type and volume of material disposed and impacts of concern, various monitoring surveys can be used to examine if and the direction the disposed dredged material is moving, and what environmental effect the material is having on the sites and adjacent areas.

Within 30 days of completion of a disposal event, detailed bathymetric surveys of the placement area will be completed. The interagency team will meet to review the results of these efforts and determine the need for additional information. This need will be based on observance of any anomalies or potential adverse impacts associated with a specific event. If the results of the bathymetric surveys do not indicate any anomalies or adverse impacts, no additional monitoring will be required for the disposal event. Reassessment of the site may be undertaken, possibly every 10 years. This reassessment may include benthic macrofaunal and sediment chemistry surveys. Additional surveys for water quality, sediment mapping, or the use of remote sensing equipment may also be required.

At the current time, no nearby biological resources have been identified that are of concern for potential impact. The Gulfport ODMDSs are at least one nautical mile from all known fish havens, artificial reefs, and fishing areas. The sites have been designated as dispersive. This means that it is expected that material will be moved outside the site boundaries. It is also expected that this material will not move in distinct mounds, but instead will blend with the surrounding environment causing a progressive transition to sediments containing a higher percentage of silt and clay. Changes in sediment composition will likely alter the benthic community structure. However, based on previous benthic studies, it is unlikely that permanent or long-term adverse impacts will result due to changes in sediment composition.

Future surveys as outlined in **Table 5** will focus on determining the rate and direction of disposed dredged material dispersal and the capacity of the ODMDSs. The management plan presented may require revision based on the outcome of any monitoring program.

Table 5. ODMDSs Monitoring Strategies and Thresholds for Action

Goal	Technique	Sponsor	Rationale	Frequency	Threshold for Action	Management Options	
						Threshold Not Exceeded	Threshold Exceeded
Monitor Bathymetric Trends	Bathymetry	Site User	Determine the extent of the disposal mound and major bathymetric changes	Post disposal	Disposal mound occurs outside ODMDS boundaries	Continue Monitoring	-Modify disposal method/placement -Restrict disposal volumes
Benthic Effects Monitoring	Sediment Mapping (Gamma/ CS^3)	EPA	Determine aerial influence of dredged material	Complete	Communities under the influence of dredged material outside the site have significant differences in diversity/ richness/biomass from those not under dredged material influence after one-year recovery period.	Discontinue monitoring unless disposal quantities, type of material or frequency of use significantly changes	-Limit quantity of dredged material to prevent impacts outside boundaries -Create berms to retard dredged material movement -Cease site use
	Benthic Survey	EPA	Determine impact of dredged material on benthic community	Complete			
Long-Term Fate	Modeling	Corps	Determine dispersiveness of site and aerial extent of impact	As resources allow	Aerial extent of impact reaches resources of concern and/or increases over time.	Continue to use site without restrictions	-Restrict disposal volumes -Create berms to retard dredged material transport -Cease site use / Designate new site
	Erosional Analysis	Corps					

Table 5. ODMDSs Monitoring Strategies and Thresholds for Action continued

Goal	Technique	Sponsor	Rationale	Frequency	Threshold for Action	Management Options	
						Threshold Not Exceeded	Threshold Exceeded
Site Capacity	Information from Long Term Fate	Corps/ EPA/ Site Users	Determine dispersiveness of site and long and short term capacity	-As resources allow -Prior to any project in excess of 1 million cubic yards	New work volumes exceed estimated capacity	Continue to use site without restrictions	-Enlarge site or designate additional site for new work
					Maintenance volumes exceed estimated capacity	Continue to use site without restrictions	-Enlarge site or designate additional site for new work
					New work volumes exceed estimated capacity	Continue to use site without restrictions	-Enlarge site or designate additional site for new work
Insure Safe Navigation Depth	Bathymetry	Site User	Determine height of mound and any excessive mounding	Post disposal	Mound height > -30 feet mean lower low water (MLLW)	Continue Monitoring	-Modify disposal method/placement -Restrict disposal volumes
					Mound height > -25 feet MLLW	Continue Monitoring	- Halt disposal - Physically level material
Compliance	Disposal Site Use Records	Site User	-Insure management requirements are being met -To assist in site monitoring	Daily during the project	Disposal records required by SMMP are not submitted or are incomplete	Continue Monitoring	-Restrict site use until requirements are met
					Review of records indicates a dump occurred outside ODMDS boundary	Continue Monitoring	-Notify EPA, Region 4/COE, and investigate why egregious dump(s) occurred. Take appropriate enforcement action.
					Review of records indicates a dump occurred in the ODMDS but not in target area	Continue Monitoring	-Direct placement to occur as specified.

3.5 Reporting and Data Formatting. Disposal monitoring data shall be provided to EPA Region electronically on a weekly basis. Data shall be provided per the EPA Region 4 XML format (USEPA, Region 4, 2007) and delivered as an attachment to an email to DisposalData.R4@epa.gov. The XML format is available from EPA Region 4.

Disposal summary reports shall be provided to EPA within 90 days after project completion. These reports should include: dates of disposal; dredging project; volume disposed, number of loads completed, type of material disposed; contractor conducting the work, permit and/or contract number; identification of any misplaced material; and dates of bathymetric surveys of the ODMDS. The disposal summary reports should be accompanied by the bathymetry survey results (paper plot and X, Y, Z ASCII data file), track plots for each disposal trip, a scatter plot of all dump locations, and a summary table of the information

required by Section 3.2. If all data is provided in the required XML format, track plots, scatter plots and summary tables will not be necessary.

The user will be required to prepare and submit to the Corps daily reports of operations and a monthly report of operations for each month or partial month's work. The user is also required to notify the Corps and the EPA within 24 hours (or next business day) if a violation of the permit and/or contract conditions occur during disposal operations. In the case of large new work projects where the material is expected to consist of stiff clays, it is recommended that mid-project bathymetric surveys be conducted of the disposal area to insure that mounding limits are not being exceeded.

4.0 ANTICIPATED SITE USE.

It is anticipated that there will be a need for use of the Gulfport West ODMDS for many years. The site will be utilized to dispose of less than 1 million cubic yards per year. This projection is based on 1970-2008 dredging records, currently available dredged material disposal options, and the Corps planning documents.

5.0 MODIFICATION OF THE GULFPORT ODMDSs SMMP.

If the results of the monitoring surveys or valid reports from other sources indicate that continued use of the ODMDS(s) would lead to unacceptable effects, then the ODMDS management will be modified to mitigate the effects. The SMMP will be reviewed and updated at least every 10 years. The SMMP will be reviewed and updated as necessary if site use changes significantly. For example, the SMMP will be reviewed if the quantity or type of dredged material placed at site changes significantly or if conditions at the site indicate a need for revision. The plan should be updated in conjunction with activities authorizing use of the site.

6.0 IMPLEMENTATION OF THE GULFPORT ODMDSs SMMP.

This plan is effective from the date of signature for a period not to exceed 10 year.

The plan shall be reviewed and revised more frequently if site use and conditions at the sites indicate a need for revision. The EPA and the Corps shall share responsibility for implementation of the SMMP. Site users may be required to undertake monitoring activities as a condition of their permit. The Corps will be responsible for implementation of the SMMP for Federal maintenance projects.

7.0 REFERENCES.

Center for Applied Isotope Studies, 1996. Postdisposal Areal Mapping of Sediment Chemistry at the Gulfport, Mississippi ODMDS. EPA Contract No. 68-C2-0134, April 8, 1996.

Fredette, Thomas J., Nelson, David A., Clausner, James E., and Anders, Fred J. 1990. *Guidelines for Physical and Biological Monitoring of Aquatic Dredged Material Disposal Sites*, Technical Report D-90-12, US Army Engineer Waterways Experiment Station, Vicksburg, MS.

NMFS. (2003). Regional Biological Opinion for Dredging of Gulf of Mexico Navigation Channels and Sand Mining ("Borrow") Areas Using Hopper Dredging by COE Galveston, New Orleans, Mobile, and Jacksonville Districts (Consultation Number F/SER/2000/01287), NOAA, NMFS, Southeast Regional Office, Protected Resources Division, St. Petersburg, FL, 121 pp.

Pequegnat, Willis E., Gallaway, Benny J., and Wright, Thomas D., 1990. *Revised Procedural Guide for Designation Surveys of Ocean Dredged Material Disposal Sites*, Technical Report D-90-8, US Army Engineer Waterways Experiment Station, Vicksburg, MS.

U.S. Army Corps of Engineers. 2006. Final Sediment Quality Characterization of the Gulfport Harbor Federal Navigation Channel, Gulfport, MS. U.S. Army of Corps of Engineers, Mobile District. Mobile, AL.

U.S. Army Corps of Engineers (COE). 2002. *Hydrographic Surveying*. Engineering Manual 1110-2-1003, Department of the Army, Washington D.C.

U.S. Environmental Protection Agency, Region 4, 2007. Dredged Material Ocean Disposal Verification System - Specifications for Data Submittal, revised October 30, 2007. Prepared by Wetlands and Marine Regulatory Section.

U.S. Environmental Protection Agency and U.S. Army Corps of Engineers, 1991. *Evaluation of Dredged Material Proposed for Ocean Disposal (Testing Manual)*, February 1991. Prepared by Environmental Protection Agency Office of Marine and Estuarine Protection and Department of Army United States Army Corps of Engineers under EPA Contract No. 68-C8-0105.

U.S. Environmental Protection Agency and U.S. Army Corps of Engineers, 1996. *Guidance Document for Development of Site Management Plans for Ocean Dredged Material Disposal Sites*, February 1996. Prepared by Environmental Protection Agency Office of Water and Department of Army United States Army Corps of Engineers.

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APPENDIX A

WATER COLUMN EVALUATIONS NUMERICAL MODEL (STFATE) INPUT PARAMETERS – EAST SITE

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Water Column Evaluations
Numerical Model (STFATE) Input Parameters
Gulfport East ODMDS

SITE DESCRIPTION

Parameter	Value	Units
Number of Grid Points (left to right)	45	
Number of Grid Points (top to bottom)	45	
Spacing Between Grid Points (left to right)	300	ft
Spacing Between Grid Points (top to bottom)	750	ft
Constant Water Depth	26	ft
Roughness Height at Bottom of Disposal Site	.005[1]	ft
Slope of Bottom in X-Direction	0	Deg.
Slope of Bottom in Z-Direction	0	Deg.
Number of Points in Ambient Density Profile Point	2	
Ambient Density at Depth = 6 ft	1.0175	g/cc
Ambient Density at Depth = 26 ft	1.0205	g/cc

AMBIENT VELOCITY DATA

Parameter	Value	Units
Profile	Depth Avg. Logarithmic	
X-Direction Velocity at Depth = 10 ft	0.422	ft/sec
Z-Direction Velocity at Depth = 10 ft	0.503	ft/sec
X-Direction Velocity at Depth = 20 ft	0.316	ft/sec
Z-Direction Velocity at Depth = 20 ft	0.377	ft/sec

DISPOSAL OPERATION DATA

Parameter	Value	Units
Location of Disposal Point from Top of Grid	14,100[2]	ft
Location of Disposal Point from Left Edge of Grid	2,100[2]	ft
Dumping Over Depression	0	

INPUT, EXECUTION AND OUTPUT

Parameter	Value	Units
Location of the Upper Left Corner of the Disposal Site - Distance from Top Edge	600	ft
Location of the Upper Left Corner of the Disposal Site - Distance from Left Edge	900	ft
Location of the Lower Right Corner of the Disposal Site - Distance from Top Edge	27,650	ft
Location of the Lower Right Corner of the Disposal Site - Distance from Left Edge	3,300	ft
Duration of Simulation	14,400	sec
Long Term Time Step	600	sec

COEFFICIENTS

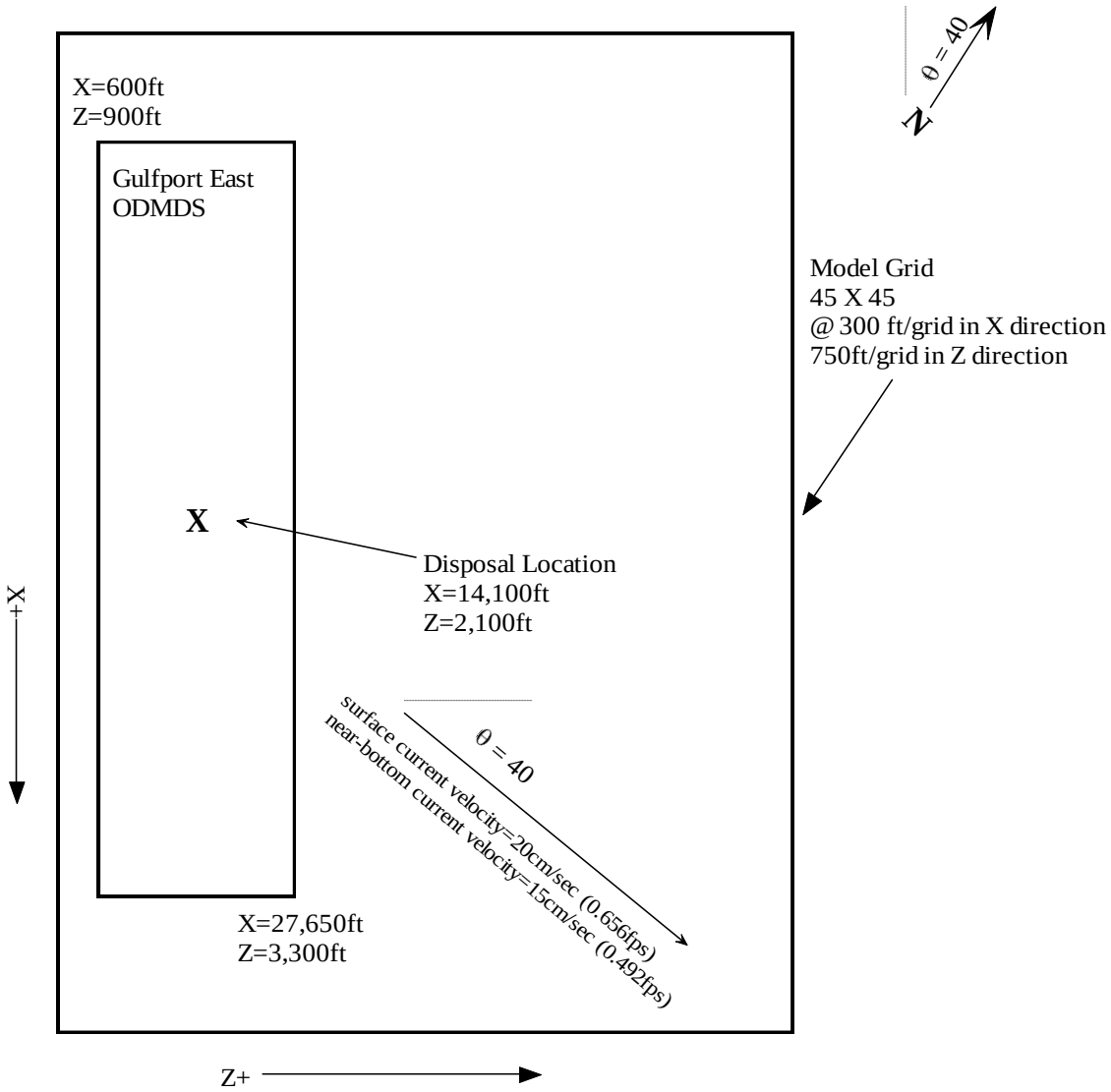
Parameter	Keyword	Value
Settling Coefficient	BETA	0.000[1]
Apparent Mass Coefficient	CM	1.000[1]
Drag Coefficient	CD	0.500[1]
Form Drag for Collapsing Cloud	CDRAG	1.000[1]
Skin Friction for Collapsing Cloud	CFRIC	0.010[1]
Drag for an Ellipsoidal Wedge	CD3	0.100[1]
Drag for a Plate	CD4	1.000[1]
Friction Between Cloud and Bottom	FRICTN	0.010[1]
4/3 Law Horizontal Diffusion Dissipation Factor	ALAMDA	0.001[1]
Unstratified Water Vertical Diffusion Coefficient	AKYO	Pritchard Expression
Cloud/Ambient Density Gradient Ratio	GAMA	0.250[1]
Turbulent Thermal Entrainment	ALPHAO	0.235[1]
Entrainment in Collapse	ALPHAC	0.100[1]
Stripping Factor	CSTRIP	0.003[1]

[1]Model default value

[2]Represents center of disposal site. Dredged material requiring disposal in another location in order to meet the dilution criteria must be brought to the attention of EPA and the COE.

Typical dilution achieved after 4 hours = 1,700:1
Typical dilution achieved at all times outside disposal site = 100:1

Gulfport East ODMDS STFATE Input Parameters



APPENDIX B

WATER COLUMN EVALUATIONS NUMERICAL MODEL (STFATE) INPUT PARAMETERS – WEST SITE

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Water Column Evaluations
Numerical Model (STFATE) Input Parameters
Gulfport West ODMDS

SITE DESCRIPTION

Parameter	Value	Units
Number of Grid Points (left to right)	45	
Number of Grid Points (top to bottom)	45	
Spacing Between Grid Points (left to right)	300	ft
Spacing Between Grid Points (top to bottom)	600	ft
Constant Water Depth	25	ft
Roughness Height at Bottom of Disposal Site	.005[1]	ft
Slope of Bottom in X-Direction	0	Deg.
Slope of Bottom in Z-Direction	0	Deg.
Number of Points in Ambient Density Profile Point	2	
Ambient Density at Depth = 6 ft	1.0175	g/cc
Ambient Density at Depth = 25 ft	1.0205	g/cc

AMBIENT VELOCITY DATA

Parameter	Value	Units
Profile	2- Point at constant depth	
X-Direction Velocity at Depth = 10 feet	0.303	ft/sec
Z-Direction Velocity at Depth = 10 feet	0.582	ft/sec
X-Direction Velocity at Depth = 19 feet	0.227	ft/sec
Z-Direction Velocity at Depth = 19 feet	0.436	ft/sec

DISPOSAL OPERATION DATA

Parameter	Value	Units
Location of Disposal Point from Top of Grid	13,800[2]	ft
Location of Disposal Point from Left Edge of Grid	2,700[2]	ft
Dumping Over Depression	0	

INPUT, EXECUTION AND OUTPUT

Parameter	Value	Units
Location of the Upper Left Corner of the Disposal Site - Distance from Top Edge	600	ft
Location of the Upper Left Corner of the Disposal Site - Distance from Left Edge	900	ft
Location of the Lower Right Corner of the Disposal Site - Distance from Top Edge	27,000	ft
Location of the Lower Right Corner of the Disposal Site - Distance from Left Edge	4,500	ft
Duration of Simulation	14,400	sec
Long Term Time Step	600	sec

COEFFICIENTS

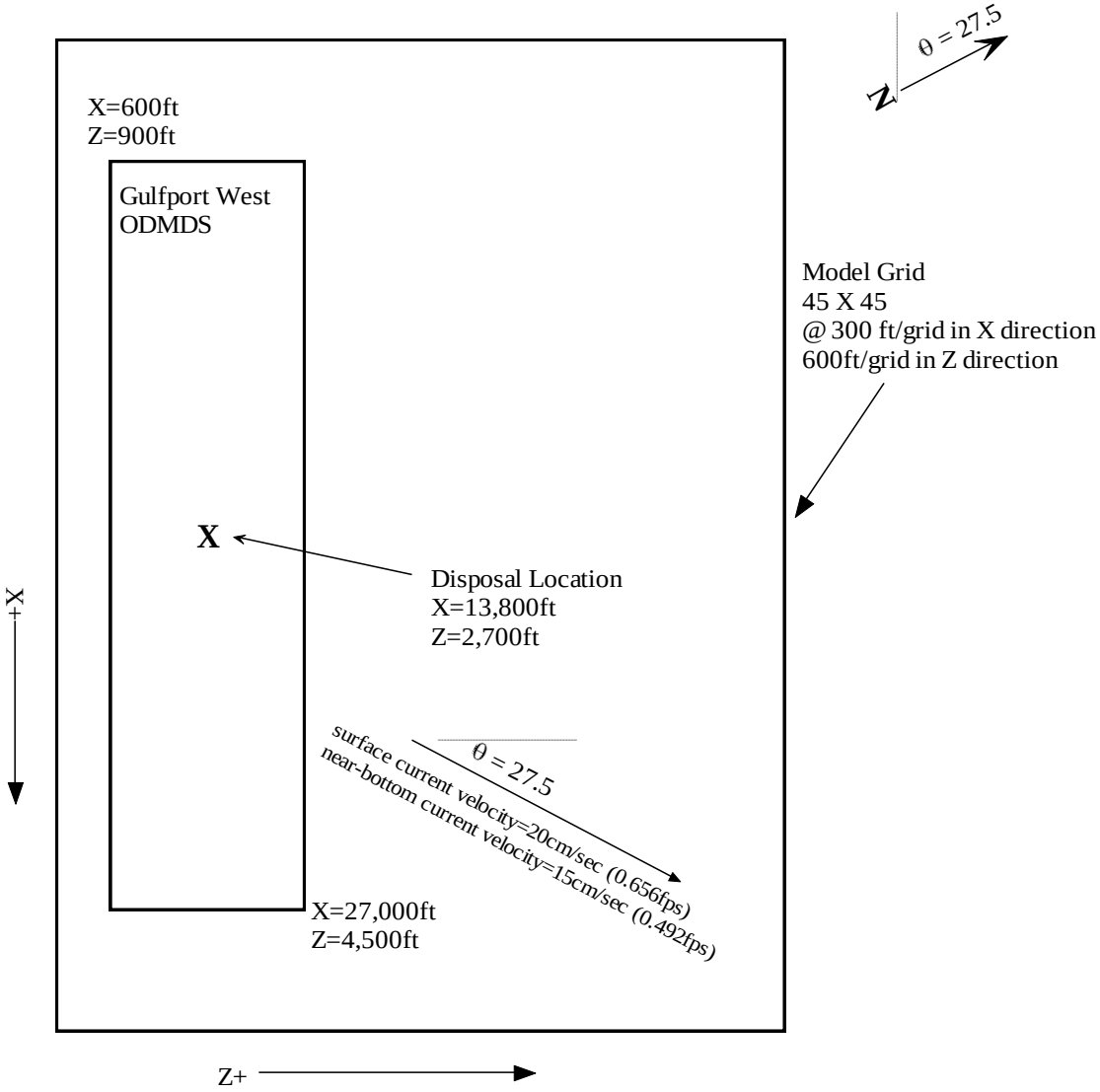
Parameter	Keyword	Value
Settling Coefficient	BETA	0.000[1]
Apparent Mass Coefficient	CM	1.000[1]
Drag Coefficient	CD	0.500[1]
Form Drag for Collapsing Cloud	CDRAG	1.000[1]
Skin Friction for Collapsing Cloud	CFRIC	0.010[1]
Drag for an Ellipsoidal Wedge	CD3	0.100[1]
Drag for a Plate	CD4	1.000[1]
Friction Between Cloud and Bottom	FRICTN	0.010[1]
4/3 Law Horizontal Diffusion Dissipation Factor	ALAMDA	0.001[1]
Unstratified Water Vertical Diffusion Coefficient	AKYO	Pritchard Expression
Cloud/Ambient Density Gradient Ratio	GAMA	0.250[1]
Turbulent Thermal Entrainment	ALPHAO	0.235[1]
Entrainment in Collapse	ALPHAC	0.100[1]
Stripping Factor	CSTRIP	0.003[1]

[1]Model default value

[2]Represents center of disposal site. Dredged material requiring disposal in another location in order to meet the dilution criteria must be brought to the attention of EPA and the COE.

Typical dilution achieved after 4 hours = 1,200:1
Typical dilution achieved at all times outside disposal site = 170:1

Gulfport West ODMDS STFATE Input Parameters



APPENDIX C

TEMPLATE
For
Generic Special Conditions
For
MPRSA Section 103 Permits

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TEMPLATE
GENERIC SPECIAL CONDITIONS
FOR MPRSA SECTION 103 PERMITS
Gulfport East & West, MS ODMDS

I. DISPOSAL OPERATIONS

A. For this permit, the term disposal operations shall mean: navigation of any vessel used in disposal of operations, transportation of dredged material from the dredging site to the Gulfport East & West ODMDS, proper disposal of dredged material at the disposal area within the Gulfport East & West ODMDS, and transportation of the hopper dredge or disposal barge or scow back to the dredging site.

B. The Gulfport East & West ODMDS is defined as the trapezoid with corner coordinates as follows:

Eastern ODMDS Geographic		**Western ODMDS Geographic**	
30°11'10"N	88°58'24"W	30°12'00"N	89°00'30"W
30°11'12"N	88°57'30"W	30°12'00"N	88°59'30"W
30°07'36"N	88°54'24"W	30°11'00"N	89°00'00"W
30°07'24"N	88°54'48"W	30°07'00"N	88°56'30"W
		30°06'36"N	88°57'00"W
		30°10'30"N	89°00'36"W

C. No more than [NUMBER] cubic yards of dredged material excavated at the location defined in [REFERENCE LOCATION IN PERMIT] are authorized for disposal at the Gulfport East & West ODMDS.

D. The permittee shall use an electronic positioning system to navigate to and from the Gulfport East & West ODMDS. For this section of the permit, the electronic positioning system is defined as: a differential global positioning system or a microwave line of site system. Use of LORAN-C alone is not an acceptable electronic positioning system for disposal operations at the Gulfport East & West ODMDS. If the electronic positioning system fails or navigation problems are detected, all disposal operations shall cease until the failure or navigation problems are corrected.

E. The permittee shall certify the accuracy of the electronic positioning system proposed for use during disposal operations at the Gulfport East & West ODMDS. The certification shall be accomplished by direct comparison of the electronic positioning system's accuracy with a known fixed point.

F. The permittee shall not allow any water or dredged material placed in a hopper dredge or disposal barge or scow to flow over the sides or leak from such vessels during transportation to the Gulfport East & West ODMDS.

G. A disposal operations inspector and/or captain of any tugboat, hopper dredge or other vessel used to transport dredged material to the Gulfport East & West, MS ODMDS shall insure compliance with disposal operation conditions defined in this permit.

1. If the disposal operations inspector or the captain detects a violation, he shall report the violation to the permittee immediately.

2. The permittee shall contact the U.S. Army Corps of Engineers, Mobile District's Regulatory Branch [TELEPHONE NUMBER] and EPA Region 4 at (404) 562-9386 to report the violation within twenty-four (24) hours after the violation occurs. A complete written explanation of any permit violation shall be included in the post-dredging report.

H. When dredged material is disposed, no portion of the hopper dredge or disposal barge or scow shall be outside of the boundaries of the Gulfport East & West ODMDS as defined in Special Condition B. Additionally, disposal shall occur within a specified disposal zone defined as [DEFINE COORDINATES AND SIZE OF DISPOSAL ZONE]. Disposal shall not occur closer than 1,500 feet to any oil and gas rigs that may be present within the site boundaries.

I. The permittee shall use an automated disposal verification system that will continuously track (1 to 5 minute intervals) the horizontal location and draft condition of the disposal vessel (hopper dredge or disposal barge or scow) to and from the Gulfport East & West ODMDS. This information shall be available in electronic format to the Mobile District Corps of Engineers and EPA Region 4 weekly basis utilizing SI specifications or approved (EPA and COE) requirements.

1. Required digitally recorded data are: date, time, vessel name, captain of vessel, beginning and ending coordinates of the dredging area for

each load, location at points of initiation and completion of disposal, description of material disposed (sand, clay or silt), volume of load, and disposal technique. This information will be available to the Mobile District Corps of Engineers on a daily basis.

2. The permittee shall use Mississippi State Plane or latitude and longitude coordinates (North American Datum 1983). State Plane coordinates shall be reported to the nearest 0.10 foot and latitude and longitude coordinates shall be reported as degrees and decimal minutes to the nearest 0.01 minutes.

J. The permittee shall conduct a bathymetric survey of the Gulfport East & West ODMDS within 30 days following project completion.

1. The number and length of the survey transects shall be sufficient to encompass the defined disposal zone within the Gulfport East & West ODMDS and a 500 foot wide area around the disposal zone. The transects shall be spaced at 500-foot intervals or less with a depth recording density of 20 to 70 feet.

2. Vertical accuracy of the survey shall be ±0.1 feet. Horizontal location of the survey lines and depth sounding points will be determined by an automated positioning system utilizing either microwave line of site system or differential global positioning system. The vertical datum will be referenced to prescribed NOAA Mean Lower Low Water (MLLW) datum. MLLW is 1.8 feet below NGVD 1929. The horizontal datum will be Mississippi State Plane (zone 2301 MS East) or Geographic (NAD 1983). State Plane coordinates shall be reported to the nearest 0.10 foot and latitude and longitude coordinates shall be reported as degrees and decimal minutes to the nearest 0.01 minutes.

K. The permittee has read and agrees to assure that they are in compliance with the requirements of the Gulfport East & West ODMDS Site Management and Monitoring Plan.

II. REPORTING REQUIREMENTS

A. The permittee shall send the U.S. Army Corps of Engineers, Mobile District's
Regulatory Branch and EPA Region 4' s Wetlands, Coastal and Oceans Branch (61 Forsyth Street, Atlanta, GA 30303) a notification of commencement of work at least fifteen (15) days before initiation of any dredging operations authorized by this permit.

B. The permittee shall submit to the U.S. Army Corps of Engineers weekly disposal monitoring reports. These reports shall contain the information described in Special Condition I.1.

C. The permittee shall develop and send one (1) copy of the disposal summary report to the Mobile District's Regulatory Branch and one (1) copy of the disposal summary report to EPA Region 4 documenting compliance with all general and special conditions defined in this permit. The disposal summary report shall be sent within 90 days after completion of the disposal operations authorized by this permit. The disposal summary report shall include the following information:

1. The report shall indicate whether all general and special permit conditions were met. Any violations of the permit shall be explained in detail.

2. The disposal summary report shall include the following information: Corps permit number, actual start date and completion date of dredging and disposal operations, total cubic yards disposed at the Gulfport East & West, MS ODMDS, locations of disposal events, and post disposal bathymetric survey results (in hard and electronic formats).

APPENDIX D

MOBILE DISTRICT CORPS OF ENGINEERS GENERIC CONTRACT SPECIFICATION LANGUAGE

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Mobile District Corps of Engineers Contract Specification Language

I. Offshore Disposal

A. Dredged material shall be place within designated ocean disposal areas or zones, as shown on contract drawings.

B. The use of bottom dump barges and dredges and hydraulic unloading barges and hopper dredges to dispose of dredged material in the offshore disposal area will be permitted. Water and excavated material shall not be permitted to overflow or spill out of barges, dump scows, or hopper dredges while in route to the disposal site. Failure to repair leaks or change the method of operation, which is resulting in overflow or spillage, will result in suspension of excavation operations and require prompt repair or change of operation to prevent overflow or spillage as a prerequisite to the resumption of excavation. Material shall be placed in the offshore disposal area below the –25 MLW level, and within [XX] feet of the center of the defined disposal area or zone.

II. Electronic Tracking System (ETS) for Ocean Disposal Vessels

The Contractor shall furnish an ETS for surveillance of the movement and disposition of dredged material during [excavation and ocean disposal] [excavation and disposal (nearshore and ocean)]. This ETS shall be established, operated and maintained by the Contractor to continuously track in real-time the horizontal location and draft condition of the disposal vessel for the entire dredging cycle, including dredging area and disposal area. The ETS shall be capable of displaying and recording in real-time the disposal vessel's draft and location.

A. ETS Standards

The Contractor shall provide automated (computer) system and components to perform in accordance with EM 1110-1-2909. A copy of the EM can be downloaded from the following website: http://www.usace.army.mil/inet/usace-docs'eng-manuals/em.htm. Horizontal location shall have accuracy equal to or better than a standard DGPS system, equal to or better than plus/minus 10 feet (horizontal repeatability). Vertical (draft) data shall have an accuracy of plus/minus 0.5 foot. Horizontal location and vertical data shall be collected in sets and each data set shall be referenced in real-time to date and local time (to nearest minute), and shall be referenced to the

same state plane coordinate system used for the survey(s) shown in the contract plans. The ETS shall be calibrated, as required, in the presence of the Contracting Officer's Representative (COR) at the work location before disposal operations have started, and at 30-day intervals while work is in progress. The COR shall have access to the ETS in order to observe its operation. Disposal operations will not commence until the ETS to be used by the Contractor is certified by the COR to be operational and within acceptable accuracy. It is the Contractor's responsibility to select a system that will operate properly at the work location. The complete system shall be subject to the COR's approval.

B. Data Requirements and Submissions

1. The ETS for each disposal vessel shall be in operation for all dredging and disposal activities and shall record the full round trip for each loading and disposal cycle. [Note: A dredging and disposal cycle constitutes the time from commencement of dredging to complete discharge of the material.] The COR shall be notified immediately in the event of ETS failure and all dredging operations for the vessel shall cease until the ETS is fully operational. Any delays resulting from ETS failure shall be at the contractor's expense.

2. All data shall be collected and stored on CD-ROM(s) in ASCII format using IBM compatible MS-DOS 5.0 or later version. Each dredging and disposal cycle will be a separate and distinct ASCII file, labeled by the trip number. More than one file may be stored on the CD-ROM(s).

3. Data shall be collected, during the dredging and disposal cycle, every 500 feet (at least) during travel to the disposal area, and every minute or every 200 feet, whichever is smaller, while approaching within 1,000 feet and within the disposal area.

4. The required digital data to be collected for each dredging and disposal cycle includes the following:

(1) Trip Number
(2) Date
(3) Time
(4) Vessel ID
(5) Vessel Captain
(6) State Plane X Coordinate - in accordance with c. above
(7) State Plane Y Coordinate - in accordance with c. above
(8) Vessel Draft
(9) Type of Disposal Vessel

(10) Exact State Plane X & Y coordinate at start of dump
(11) Volume of Material Disposed

5. Plot Reporting (2 types):

(a) Tracking Plot - For each disposal event, data collected while the disposal vessel is in the vicinity of the disposal area shall be plotted in chart form, in 200-foot intervals, to show the track and draft of the disposal vessel approaching and traversing the disposal area. Each plot will be attached to the corresponding ascii data table when submitted.

(b) Scatter Plot - Following completion of all disposal events, a single and separate plot will be prepared to show the exact disposal locations of all dumps. Every plotted location shall coincide with the beginning of the respective dump. Each dump will be labeled with the corresponding Trip Number and shall be at a small but readable scale. To accompany the Scatter Plot, a single and separate table will be prepared of the corresponding ETS data for every dump location. The volume of material disposed for each trip will be included in this table.

6. All digital ETS data shall be furnished to the COR within 24 hours of collection. The digital plot files should be in an easily readable format such as Adobe Acrobat PDF file, Microstation DGN file, JPEG, BMP, TIFF, or similar. The hardcopy of the ETS data and tracking plots shall be both maintained onboard the vessel and submitted to the COR on a weekly basis.