



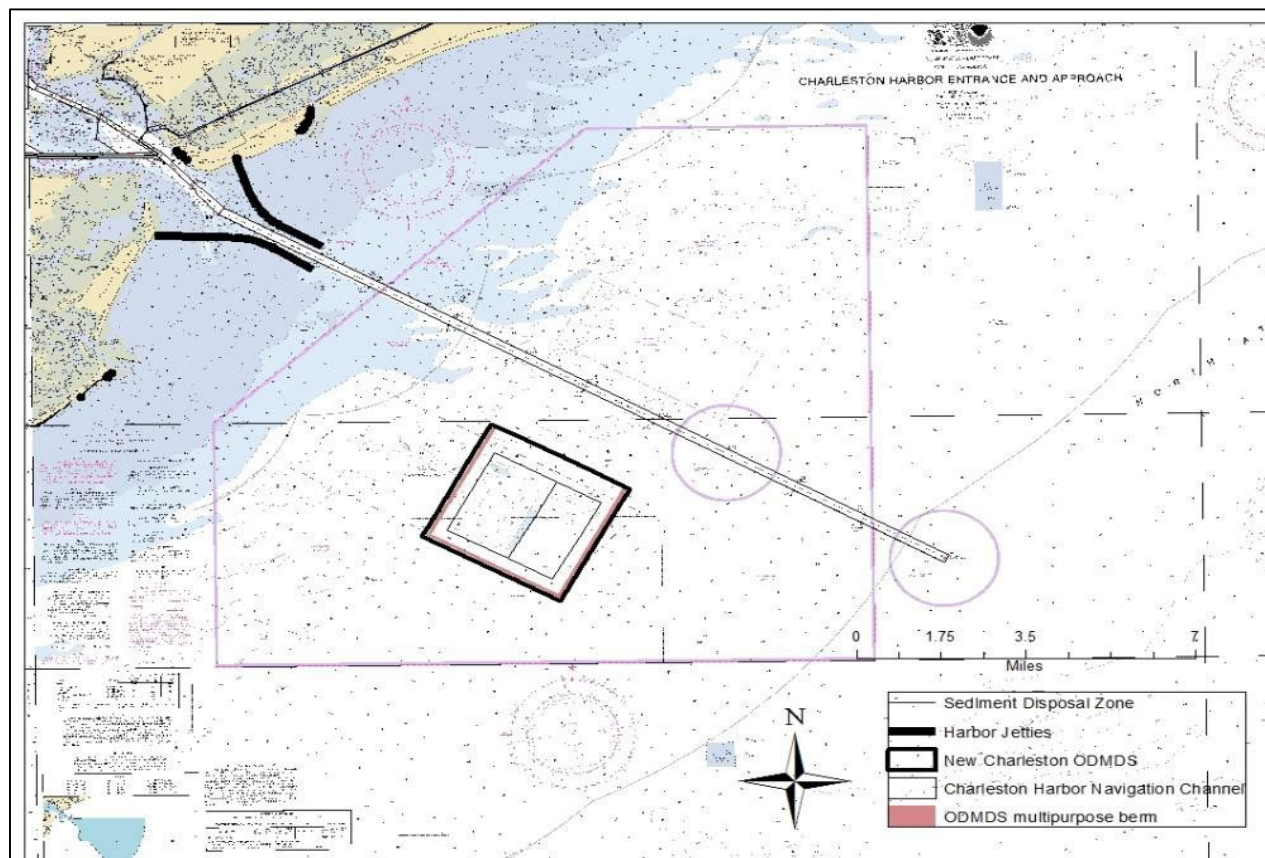
CHARLESTON OCEAN DREDGED MATERIAL DISPOSAL SITE

FINAL SITE MANAGEMENT AND MONITORING PLAN



**US Army Corps
of Engineers®**

September 2026



The following Site Management and Monitoring Plan (SMMP) for the Charleston Ocean Dredged Material Disposal Site (ODMDS) has been reviewed and revised to comply with Section 102(c)(3) of the Marine Protection, Research, and Sanctuaries Act (MPRSA) of 1972, as amended (33 U.S.C. Section 1412(c)(3) and has been approved by the following officials of the U.S. Environmental Protection Agency (EPA) Region 4 and the U.S. Army Corps of Engineers (USACE), Charleston District. This SMMP supersedes all prior Charleston ODMDS SMMP's.

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This plan is effective from the date of the last signature for a ten-year period. The plan shall be reviewed and revised more frequently if site use and conditions at the site indicate a need for revision.

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1 INTRODUCTION

The Marine Protection, Research, and Sanctuaries Act (MPRSA), also referred to as the “Ocean Dumping Act”, regulates the transportation and dumping of any material into ocean waters. The MPRSA applies to all ocean waters that are seaward of the baseline from which the territorial sea is measured. Under MPRSA, no permit may be issued for ocean dumping where such dumping will unreasonably degrade or endanger human health, welfare, or amenities, or the marine environment, ecological systems or economic potentialities. Most material dumped in the ocean today is dredged material (i.e., sediments) removed from the bottom of water bodies to maintain navigation.

In the case of dredged material, the U.S. Army Corps of Engineers (USACE) is responsible for issuing ocean dumping permits and authorizing or conducting federal projects involving ocean disposal of dredged material (33 U.S.C. Section 1413, MPRSA Section 103). The USACE applies the U.S. Environmental Protection Agency (EPA) marine protection criteria established pursuant to Section 102 of the MPRSA when evaluating permit applications or authorization requests for (and implementing federal projects involving) the transportation of dredged material for the purpose of disposal into ocean waters. MPRSA permits and federal projects involving the ocean dumping of dredged material are subject to the EPA review and written concurrence. The EPA may concur with or without conditions or decline to concur (i.e., non-concur) on the permit or federal project authorization. If the EPA concurs with conditions, the final permit or the terms of the federal project authorization must include those conditions. If the EPA declines to concur on an ocean dumping permit or federal project, the USACE cannot issue the permit or authorize or conduct the transportation to and dumping of dredged material in the ocean associated with the federal project. According to USACE regulations at 33 C.F.R. 325.6, MPRSA permits for and federal projects involving the transportation of dredged material for the purpose of dumping it in ocean waters may not exceed three years.

Under MPRSA Section 102, the EPA is responsible for the designation of all ocean disposal sites and the management of such designated sites. The EPA's MPRSA regulations at 40 C.F.R. Part 228 establish procedures for the designation and management of ocean disposal sites. Management of a site consists of regulating times, rates, and methods of disposal; regulating quantities and types of materials disposed; developing and maintaining effective ambient monitoring programs for the site; conducting disposal site evaluation studies; and recommending modifications in site use and/or designation (40 C.F.R. 228.3(a)).

The EPA shares the responsibilities of conducting management and monitoring activities at the EPA-designated Ocean Dredged Material Disposal Sites (ODMDs) with the USACE. Under MPRSA Section 102(c), the EPA, in conjunction with the USACE, is responsible for developing a Site Management and Monitoring Plan (SMMP) for each designated ODMD. The objective of each SMMP is to ensure that dredged material ocean disposal activities will not unreasonably degrade the marine environment or

endanger human health or economic potentialities or other uses of the ocean. The SMMP provisions are an integral part of managing all disposal activities at an ODMDS. Preparation of this SMMP has been informed by the Guidance Document for Development of Site Management Plans for Ocean Dredged Material Disposal Sites (EPA and USACE, 1996).

This SMMP may be modified during its term if the EPA in conjunction with the USACE determines that such changes are warranted, including as a result of information obtained from monitoring or due to other factors. This SMMP will be reviewed and revised as needed, or at least every 10 years, whichever is sooner. The MPRSA provides that the SMMP shall include, but is not 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 of the material to be disposed of at the site and the presence, nature, and bioavailability of contaminants in the material;
- Consideration of the anticipated long-term use of the site including the anticipated closure of the site, if applicable, and any need for continued management after closure of the site; and
- A schedule for review and revision of the plan (which shall be reviewed and revised at least every 10 years).

The provisions in this SMMP apply for all dredged material disposal activities at the Charleston ODMDS, including monitoring and management activities by the Federal agencies. This SMMP also includes water quality modeling input parameters for dumping (Appendix A), template provisions for the USACE to include in future permits issued for disposal at this site (Appendix B), as well as the USACE template contract conditions (Appendix C). References in this SMMP to conditions that “should be required” refer to implementation in a subsequent proceeding to authorize dumping of dredged material, whether in a permit, in a contract or other federal project specification for the transportation and dumping of dredged material, or by the USACE directly. Other than the regulatory text copied below, this SMMP does not itself impose binding requirements or obligations, though terms and conditions from the SMMP will be incorporated into other documents (e.g., permits and federal project documents that authorize transportation and dumping of dredged material at the ODMDS) that will then impose binding rights and obligations on persons responsible for the authorized transportation and dumping.

Conditions that “should be required” are implemented through application of the template language included in Appendices B and C, though the language may vary from the terms of the Appendices as necessary and appropriate. If the project specific conditions proposed by the USACE warrants further clarification, EPA can ensure implementation of the template provisions in Appendix B and C as necessary by including project specific conditions in their concurrence letter.

1.1 DEFINITIONS

For the purposes of this document the following definitions apply:

- *“Authorization document”* means any permit issued pursuant to MPRSA and/or authorizations from the USACE for the transportation and/or ocean disposal of dredged material including but not limited to transportation-related or disposal-related conditions in the permit, contract documents and/or specifications.
- *“Site user”* as used here means a person utilizing a permit issued by USACE under section 103 of MPRSA and any person operating any federal dredging and ocean disposal projects reviewed under section 103(e) of MPRSA or under a Dredged Material Permit as defined below.
- *“Disposal vessel”* is any barge, scow, or self-propelled vessel (such as a hopper dredge) that carries dredged material during transit and from which the dredged material is discharged, typically by opening doors in the bottom of the hull or by splitting the hull.
- *“Disposal Release Zone”* is the area identified within the ODMDs in which dumping of dredged material must occur in order for it to stay within the boundaries of the site, within which the disposal vessel must discharge all of the dredged material.
- *“Dredged Material Permit”* means a permit issued by the USACE under section 103 of MPRSA and any federal projects reviewed under section 103(e) of the Act (see 40 C.F.R. 220.2(h)).
- *“Towing vessel”* is any self-propelled tug or other marine vessel used to transport (tow or push) the “disposal vessel” for any portion of the transit to the ODMDs.

1.2 ROLES AND RESPONSIBILITIES

An interagency SMMP team was established to assist the EPA and the USACE in developing a Charleston ODMDs SMMP in 1993. In addition to EPA Region 4 and the USACE, Charleston District, the team consisted of the following agencies and their respective representatives:

- South Carolina Department of Natural Resources (SCDNR)
- National Marine Fisheries Service (NMFS)
- South Carolina State Ports Authority (SCSPA)

Other agencies such as the South Atlantic Fisheries Management Council and the South Carolina Department of Health and Environmental Control (now Department of Environmental Services) were asked to participate as appropriate.

The EPA and the USACE will continue to consult with these South Carolina and federal agencies, as appropriate, on future revisions to the Charleston ODMDs SMMP. The other SMMP agencies have, in the past, provided technical input that has informed the EPA and the USACE with decision-making about appropriate dumping practices, monitoring techniques, the level of monitoring, the significance

of results, and potential management options.

The EPA and the USACE work together to implement the site management and monitoring program for the Charleston ODMDs. Specific responsibilities of the EPA and the USACE are as follows:

EPA: The EPA is responsible for designating, modifying, and de-designating/cancelling ODMDs under MPRSA Section 102, managing these sites by regulating site use, developing and implementing site monitoring programs (including compliance monitoring), evaluating environmental effects of disposal of dredged material at the sites, reviewing for concurrence on dredged material suitability determinations, and reviewing for compliance with the MPRSA criteria, conditions, and restrictions for MPRSA Section 103 permits or federal projects authorizing the ocean dumping of dredged material.

Under MPRSA Sections 101 and 105, the EPA has broad authority to assess civil penalties and seek injunctive remedies for unauthorized transport of material for the purpose of dumping it into ocean waters, including deviations from transportation-related and disposal-related conditions required by a regulation establishing the ODMDs or deviations from transportation-related and disposal-related conduct required or authorized by the USACE in a Dredged Material Permit or construction contract. All activities associated with MPRSA Section 102 and Section 103 for the Charleston ODMDs are handled by the EPA Region 4 in consultation with the EPA Headquarters.

USACE: Under Section 103 of the MPRSA (33 U.S.C. Section 1413), the USACE is responsible for the issuance of permits and federal project authorizations for the transportation of dredged material for the purpose of dumping it into ocean waters. This includes evaluating dredged material suitability and compliance with the MPRSA marine protection criteria, conditions, and restrictions, and, in conjunction with the EPA, regulating site use and developing and implementing site monitoring programs (including compliance monitoring) through development and use of the SMMP. The USACE also has a contract remedy process to enforce conditions related to ocean dumping with a contractor for a federal project. The USACE contract remedies are separate and distinct from statutory remedies under the MPRSA.

The SMMP provisions apply to all dredged material transportation and dumping at the site, including monitoring and management activities by the federal agencies. In addition to the SMMP provisions, the SMMP also includes template provisions for the USACE to include in subsequently issued permits or in the transportation and disposal requirements for a federal project (see Appendix B). The EPA can ensure implementation of the template provisions as necessary through their inclusion as conditions in the EPA's Section 103 concurrence actions. The agencies may adjust the template provisions to individual projects, as necessary. All MPRSA Section 103 permits or contract specifications for ocean dumping of dredged material shall ensure compliance with the conditions of this SMMP.

2 SITE DESCRIPTION

The following Sections 2.1 through 2.5 are a summary of site-specific information used in the development of this SMMP.

2.1 SITE HISTORY AND DESIGNATION

The Charleston ODMDS is one of the most frequently used sites in the South Atlantic Bight (part of EPA's Region 4 area of responsibility). The general area has been in use since 1896 for disposal activities.

A Final Environmental Impact Statement (FEIS) was prepared for the original Charleston ODMDS designation offshore of Charleston, South Carolina, and was published in October 1983. Based on the evaluation in the FEIS, two ODMDS's were designated in 1987. One was a 12-square mile (mi²) site for deepening material, and the second site, for maintenance material, was 3- mi² in size and placed within the 12- mi² site.

During the 1980s, additional benthic and sediment studies were conducted by the South Carolina Department of Natural Resources (SCDNR). In 1987, live bottoms were identified in the western portion of the 12- mi²ODMDS. Concerns regarding impacts on these live bottoms encouraged EPA to place a restriction on the use of the 12- mi² site. The final rule regarding this restriction was published in the *Federal Register* on March 5, 1991, stating, "Disposal shall be limited to dredged material from the Charleston Harbor area. All dredged material, except entrance channel material, shall be limited to that part of the site east of the line between coordinates 32°39'04"N, 79°44'25"W and 32°37'24"N, 79°45'30"W unless the material can be shown by sufficient testing to contain 10% or less of fine material (grain size of less than 0.074 mm) by weight and shown to be suitable for ocean disposal." This bisecting line was an immediate effort by EPA to protect live-bottom resources initially reported by fishermen. The line was set with limited knowledge of the exact location and extent of those resources and was set in a location that was believed to be as protective as possible at that time.

In 1993, the active disposal release zone was relocated to avoid impacting sensitive, live bottom habitat. This location was 4-mi² in size and agreed upon by all agencies. The creation of this 4-mi² disposal release zone within the larger ODMDS required the development of a Management Plan which included a comprehensive Monitoring Plan for the site. The monitoring plan was regarded as a flexible strategy with the various tasks and techniques applied as appropriate and as dictated by disposal activities (Charleston ODMDS Site Management Plan, 1993). Based on the Site Management Plan, the USACE began building an L-shaped berm on the western side of the 4-mi²four-square mile disposal release zone using material from the 42-ft deepening project. The berm was to be constructed of consolidated material and was designed to serve as a barrier, with finer, unconsolidated materials to be placed to the east of the barrier. At that time, the bisecting line should have been moved, but due to an oversight, it was not.

In 1995, the smaller ODMDS was officially de-designated in the Federal Register due to the presence of live bottom habitat in the area. The language describing the larger ODMDS was

modified such that the site could be used for all dredged materials permitted for offshore disposal, which meant that the site was no longer limited for the disposal of deepening materials and the site was promulgated for “continued use.”

On June 6, 2002, a final rule was published in the Federal Register to modify the site name and restriction of use. The action was (1) to define the 4-mi² box as the only area in which disposal can continue, (2) to shorten the official name of the site from the Charleston Harbor Deepening Project ODMDS to the Charleston ODMDS and (3) to remove the line that restricts the disposal of fine-grained material.

In 2016, the Charleston ODMDS was modified again to expand the site to 9.8- mi² (7.4 square nautical miles (nmi²))) with a disposal release zone of 5.1-mi² (3.9-nmi²), effective October 7th, 2016. This expansion was required to accommodate additional material from the Post 45 Project, which widened and deepened the federal navigation channel. Additionally, a U-shaped berm along the east, south, and west side of the modified ODMDS was constructed using consolidated material from the deepening.

2.1.1 Final Rule Text from 40 CFR 228.15(h)(5)

The official Charleston ODMDS designation is published at 40 CFR 228.15(h)(5).

Charleston, SC, Ocean Dredged Material Disposal Site.

- (i) Location: 32° 36.280' N, 79° 43.662' W; 32°37.646' N, 79° 46.576' W; 32°39.943' N, 79° 45.068' W; 32°38.579' N, 79° 42.152' W.
- (ii) Size: Approximately 7.4 square nautical miles in size.
- (iii) Depth: Ranges from approximately 30 to 45 feet (9 to 13.5 meters).
- (iv) Restrictions: (A) Disposal shall be limited to dredged material from the Charleston, South Carolina area; (B) Disposal shall be limited to dredged material determined to be suitable for ocean disposal according to 40 CFR 227.13; (C) Disposal shall be managed by the restrictions and requirements contained in the currently-approved Site Management and Monitoring Plan (SMMP); (D) Monitoring, as specified in the SMMP, is required.

2.2 SITE LOCATION

The site is located approximately six nautical miles (nm) offshore of Charleston, South Carolina (Figure 1). The site covers a 7.4 nmi² area, with a bottom elevation ranging from -27 to -53 feet mean lower low water (MLLW). Corner coordinates as both latitude/longitude and state plane coordinates are provided in Table 1.

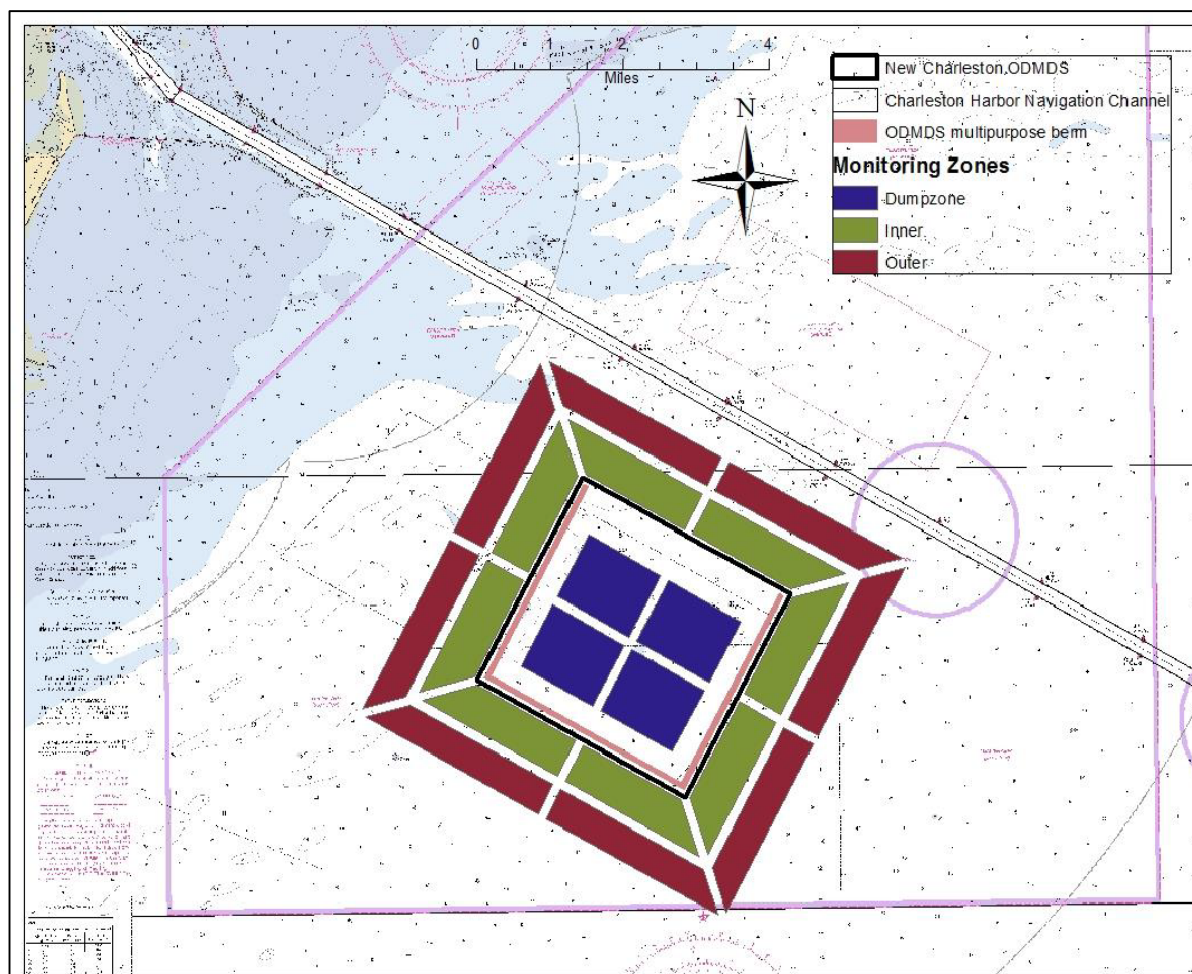


Figure 1. Layout of the current Charleston ODMDS and monitoring zones.

Table 1. Coordinates of the Charleston ODMDS.

Site		Geographic (NAD83, Decimal Degrees)		State Plane (South Carolina US Survey Feet)		Area (nmi ²)	Area (mi ²)
		Latitude	Longitude	N	E		
Charleston ODMDS	Center	32.63522	-79.73939	294137.61	2388059.58	7.4	9.8
	SE	32.60467	-79.72770	283067.786	2391795.475		
	SW	32.62744	-79.77627	291170.826	2376741.168		
	NW	32.66571	-79.75113	305185.821	2384312.304		
	NE	32.64299	-79.70253	297104.717	2399371.043		

Note – NAD 83.

2.3 SITE USE

It is intended that the Charleston ODMDS will be used for dredged material from the greater Charleston, South Carolina vicinity. The two primary users of the Charleston ODMDS have been and are expected to be:

- USACE for Civil Works
- South Carolina State Ports Authority

From 1987 until 2025, approximately 100 million cubic yards (cy) of dredged material have been disposed of at the Charleston ODMDS. Approximately 48 million cy of dredged material disposed of at the Charleston ODMDS is from 2016 through 2025. Of which, roughly 29 million cy were associated with the Post 45 deepening project. The 2016 modified disposal release zone is estimated to have approximately 75 million cy capacity. Appendix E includes the documented disposal history from 1991 through 2025.

2.4 PAST MONITORING ACTIVITIES

The Charleston ODMDS is one of the most extensively monitored ODMDSs due to its high-use and long history. Monitoring efforts have included bathymetric surveys, examination of sediment characteristics and contamination, gamma isotope mapping of bottom sediments, assessment of benthic infaunal invertebrate communities, and fish assemblage assessments. Bathymetric surveys are typically conducted before and after each disposal event and are used to inform future monitoring activities and site disposal activity.

The following table summarizes some of the major monitoring efforts.

Table 2. History of Monitoring at the Charleston ODMDS.

Date	Survey Type	Conducted by	Purpose	Findings
1972-present	Bathymetry	USACE, Charleston District	Monitor bathymetry changes within the active disposal release zone and 100-meter buffer zone over time.	The most recent survey (2025) indicated that the U-shaped berm continues to remain stable and intact.
1978	Sediment (contaminants)	SCWMRD (now SCDNR) (SCWMRD 1979)	Site characterization	Slightly elevated levels of mercury and cadmium.
1978	Benthic assemblages	SCWMRD (now SCDNR) (Van Dolah et al., 1983)	Site characterization	Findings did not indicate any differences in the benthic communities present that could be attributed to previous disposal operations.
1979	Benthic assemblages	Interstate Electronics Corp (under contract to EPA/HQ) (USEPA 1983)	Site characterization	Findings did not indicate any differences in the benthic communities present that could be attributed to previous disposal operations.
1983	Sediment (contaminants)	Interstate Electronics Corp (under contract to EPA/HQ) (USEPA 1983)	site designation studies	No elevated levels of contaminants.
1987	Benthic assemblages	SCWMRD (now SCDNR) (Winn et al., 1989)	Site characterization and trends assessment.	The survey detected minor changes in benthic community structure related to a disposal operation completed in 1986, and some movement of the material was detected away from the disposal site (Winn et. al., 1989). However, this movement did not appear to significantly alter benthic communities outside the smaller ODMDS.
1989	Sediment (contaminants)	SCWMRD (now SCDNR) (Winn et al. 1989)	Site characterization and assessment of disposal impacts.	No contaminant levels above ranges observed in 1978. Minor changes in sediment characteristics were detected, with some movement of material away from the disposal release site.

1993-1994	Sediment (contaminants and physical)	SCDNR (Van Dolah et al., 1996,1997)	Site characterization and assessment of disposal impacts.	Bottom sediments in the area were comprised primarily of medium to fine-grained sands, with variable concentrations of silt/clay and shell hash. Metal contaminants were detected in several strata, but concentrations were generally below known bioeffects levels.
1993 and 1994	Benthic assemblages	SCDNR (Van Dolah et al., 1997)	Baseline monitoring prior to harbor deepening project	Species composition, faunal density, and number of species varied among zones and strata. The density of some general taxonomic groups was found to be related to sediment type, a finding which suggests that future disposal operations could lead to disposal-related changes in the benthic communities.
1988, 1990, 1991, 1993, 1994	Sediment mapping	UGA/Center for Applied Isotope Studies (Noakes 1995)	To assess material placement and migration.	Survey results indicated the seafloor was relatively homogeneous. Each of these surveys was successful in tracking and documenting the dispersion of the dredged material deposited at the disposal site. The construction of the L-shaped berm was clearly indicated.
1994-1995	Currents	NOAA/NOS (Williams et al., 1997)	In-situ conditions	The results of this study found that the currents in the vicinity of the Charleston ODMDS consist of tidal, wind-driven, and density-driven currents. The currents flowing toward the southwest or west could potentially transport dredged material to the benthic communities in the southwest corner of the larger ODMDS.
2000	Benthic assemblages	SCDNR (Zimmerman et al., 2002)	Post harbor deepening assessment	Subtle changes in the benthic taxa that were observed as a result of the disposal of fine-grained material.
2000	Sediment Contaminants	SCDNR (Zimmerman et al., 2003)	Post harbor deepening assessment.	Trace metal, PAH, PCB, and pesticide concentrations were found above the detection limit but below published bioeffects guidelines. Contaminants were limited to the disposal release zone.

2000	Geophysical Characterization (Hardbottom)	Coastal Carolina University (Gayes 2001)	Post harbor deepening assessment of the sea floor and habitats near the ODMDS.	Sonar and underwater video cameras documented existing hard bottom habitat at six sites around the ODMDS.
2002	Sediment contaminants Benthic assemblages	SCDNR (Jutte et al., 2005)	Post harbor deepening monitoring assessment	Trace metal, PAH, PCB, and pesticide concentrations were below published bioeffects guidelines, with the exception of cadmium levels in one stratum within the disposal area. These findings suggest that the presence of contaminated sediments was low and limited to the designated disposal release zone. Temporal comparisons of benthic assemblages from the baseline assessment (1993-1994), interim assessment (2000), and post-disposal assessment (2002) indicate significant effects on benthic community structure related to disposal operations completed as part of the 1999-2002 Charleston Harbor Deepening Project.
2001-2005	Hard bottom reef assessments	SCDNR (Crowe et al., 2006)	Post assessment monitoring after 1996 deepening	Hardbottom reef areas monitored showed no evidence of substantial degradation from possible sediment movement from the ODMDS.
2012-2013	Hardbottom and Cultural Resources	ANAMAR on behalf of USACE (Gayes et al., 2013)	Baseline studies for a proposed modification to the ODMDS	40 anomalies were identified during the cultural resources survey. However, none of them were determined to be historically significant. Approximately 17.3 acres of hardbottom and/or probable hardbottom were identified within or near the proposed ODMDS expansion area.

2014	Charleston Harbor ODMDS Current and Wave Measurements	EPA/Region 4 (USEPA 2014)	Baseline studies for a proposed modification to the existing ODMDS	Currents in the vicinity of the Charleston ODMDS tend to have a significant tidal component with predominant currents in the cross-shore direction. Waves in the vicinity of the Charleston ODMDS are out the east-southeast and are of sufficient length to influence bottom velocities and resuspension of dredged material.
2017-2018	Fish Assemblages	SCDNR (Arendt et al. 2020)	Routine monitoring	Two benthic foragers (Atlantic sturgeon, Cobia) and three large sharks (White, Tiger, Blacktip) were the most frequently detected species in the ODMDS. The occurrence of these species in the ODMDS throughout the study demonstrates the lack of extended avoidance concurrent with dredge spoil material placement in the immediate vicinity.
2018	Sediment Analysis	SCDNR (Johnson et al. 2020)	Baseline studies for the Post 45 project	Sand was the dominant component and benthic community analysis showed that the previously active disposal strata and the boundary strata in the western portion of the study area had benthic community characteristics more similar to each other than to the strata to the east. Overall, polychaetes were the most abundant taxonomic group.
2021	Sediment contaminants	EPA/ Region 4	Post-dredging studies for the Post 45 project	Elevated levels were found, however, it was concluded that disposal activities at the ODMDS did not result in the elevated levels. One outlier was identified that was presumably a misdump.

2.5 SITE CHARACTERIZATION

2.5.1 Physical Characterization

The Charleston ODMDs consists of fine to coarse sand and shell hash and less than 10% silt with an average water depth of 40 feet. To reduce dispersion and possible associated adverse impacts the original L-shaped berm was expanded to be a U-shaped berm constructed from the consolidated material from the Post 45 deepening project. The following is the original design information for the berm:

- Dimensions 15,000 feet x 16,000 feet x 15,000 x 400 feet for the western, southern, eastern sides and width;
- Roughly a 3:1 slope;
- Height of 10 feet greater than the ocean floor and no higher than 25 feet MLLW.

Based on the July 2025 single beam condition survey, the berm has remained stable and has maintained the 10-foot height, with slightly less relief on the western arm due to variations in the existing seafloor.

2.5.2 Chemical Characterization

In the most recent survey of the ODMDs and surrounding area, chemical analyses of sediments resulted in exceedances of arsenic, chromium, lead, and nickel at one 'outlier' station (EPA 2021). This station was also dramatically different in grain size from every other sample collected during the survey, therefore, this seems to be a misdump as the rest of the samples were at or below the minimum reporting limit for metals, PCBs, semi-volatile organics, and pesticides.

2.5.3 Biological Characterization

A 2018 survey established baseline assessment of sediment characteristics and associated benthic infaunal communities in areas adjacent to the ODMDs prior to the Post 45 deepening project (Johnson et al., 2020). Data from this survey showed the sediments to be predominantly sand. In the 140 benthic macroinvertebrate infauna samples collected in 2018, more than 17,900 organisms representing 249 distinct taxa were collected and identified. Polychaetes, mollusks, and amphipods were the most numerous groups present. Sediment characteristics and benthic communities in the boundary areas continue to be similar to those inside the disposal release zone.

From 2017-2019 additional surveys were conducted by SCDNR to characterize the habitat and associated epifaunal organisms and fish assemblages at natural hard bottom sites adjacent to the ODMDs (Arendt et al., 2020). These surveys were conducted both before and during placement activities associated with the Post 45 deepening. Fish assemblage surveys documented 15 large marine species. Two benthic foragers (Atlantic sturgeon, Cobia) and three large sharks (White, Tiger, Blacktip) were the most frequently detected species in the ODMDs. The occurrence of these species in the ODMDs throughout the study demonstrates the lack of extended avoidance concurrent with dredged material placement in the immediate vicinity. Seasonal detection patterns resembled other locations monitored in the South Carolina coastal plain, suggesting minimal impact on the anticipated occurrence of mobile species in the ODMDs area.

The post-assessment of the Charleston Harbor Post 45 Deepening Project is currently underway by SCDNR and will enable an evaluation of changes to the benthic habitat and infaunal community in the disposal release zone as a result of dredged material placement, as well as detection of changes to inner or outer boundary strata as a result of potential natural drift of dredged material out of the ODMDS.

2.5.4 Discussion of Critical Amenities

Hard bottom reef habitats have a patchy distribution within 2.5 miles of the Charleston ODMDS. As mentioned in Table 2 above, a 5-year study was conducted to document any changes in sedimentation movement, sponge/coral density and condition, finfish assemblages, and areal extent of the hardbottom reef areas. The study showed no evidence of substantial degradation resulting from continued use of the ODMDS (Crowe et al., 2006). Several, mobile threatened and endangered species are known to occur in the Atlantic Ocean and may be present within or near the ODMDS during disposal events. All disposal activities will adhere to the most recent USACE South Atlantic Division Endangered Species Act Section 7 Consultation Regional Biological Opinion for Dredging of Material and Placement Activities in the Southeast United States (SARBO).

A survey was conducted in 2012-2013 to identify possible cultural resources within the ODMDS project area. The purpose of the survey was to discover and document sonar and/or magnetic anomalies that might represent cultural resources, such as shipwrecks or other submerged historic resources. Based on survey findings, no cultural targets of significance were found in the survey area (Gayes et al., 2013). However, approximately 17.3 acres of hardbottom and probably hardbottom were identified within or near the ODMDS expansion area.

3 SITE MANAGEMENT

Appropriate management of an ODMDS assures that disposal activities do not unreasonably degrade or endanger human health, welfare, the marine environment, or economic potentialities as directed under MPRSA Sections 102 and 103(a). The primary objectives for management of an ODMDS include, but are not limited to:

- Protecting the marine environment, such that:
 - No unacceptable physical, chemical, or biological impacts occur inside or outside the disposal site; and
 - Adequate site monitoring is conducted to detect environmental impacts.
- Ensuring that disposed material (1) meets the suitability requirements of the ocean dumping regulations (40 C.F.R. Parts 220 through 228) and (2) is consistent with national and regional guidance for the evaluation of dredged material proposed for ocean dumping.
 - Under MPRSA Section 103, evaluation of any proposed disposal of dredged material into ocean waters must apply the EPA marine protection criteria established pursuant to Section 102 of the MPRSA. To apply the criteria, the Ocean Testing Manual, sometimes

referred to as the Green Book (EPA and USACE, 1991), and the Southeast Regional Implementation Manual (SERIM, EPA, 2008) provide guidance for sampling, testing, and analysis of water, sediment, and biological tissue to evaluate the environmental acceptability of dredged material proposed for ocean disposal. The criteria prohibit the ocean dumping of uncharacterized materials (40 C.F.R. 227.5(c)).

- Identifying management conditions to be implemented by the EPA and the USACE, as well as conditions that should be required in permits and documents establishing the terms of a Federal project applicable to transportation and disposal in ocean waters.
 - For federal projects, the EPA should specify in the MPRSA concurrence letters that the EPA concurrence itself is conditioned on incorporation of the EPA concurrence conditions into any USACE federal contract documents.
- Maintaining a long-term disposal alternative for dredged material, while encouraging beneficial use of dredged material where practicable.
- Identifying a schedule or condition triggering a review or renewal of this SMMP.

SMMP Sections 3.1 through 3.4 summarize the disposal operation conditions that will be considered for management of the Charleston ODMDS as described in 40 C.F.R. 228.15(h)(5). Enforceable conditions for dredged material disposal operations at the Charleston ODMDS are drawn from the USACE-issued permits and transportation and disposal authorization documents for federal projects. The conditions intended to be enforceable are identified in this SMMP as necessary under MPRSA Section 103(a) or 103(e) and should be included as conditions in the EPA's concurrence if the permit or authorization documents do not already require such conditions.

Water quality compliance determinations will be made using a numerical model, such as the Short-Term FATE (STFATE) model, for evaluation of mixing. The general goal of the model is to increase the accuracy, reliability, and cost-effectiveness of dredged-material management activities in a timely manner (EPA and USACE, 1991). The STFATE model input parameters listed in Appendix A are specific to the Charleston ODMDS. This model is used to predict the movement of dredged material disposed of in open waters and may result in increasing or lessening operational restrictions or the need for confined disposal release zones to protect the environment and ensure regulatory compliance. Water-column bioassays will also be used to account for contaminants without water quality criteria, and to assess synergistic effects. Only material determined to be suitable and in compliance with the marine protection criteria established pursuant to Section 102 of the MPRSA (33 U.S.C. 1412) and 40 C.F.R. Part 227 through the Marine Protection Criteria Compliance Process (Section 3.1) by the USACE and the EPA Region 4 is appropriate for transportation and disposal in the ODMDS.

The template language in Appendix B is intended to be applicable to dredging projects permitted by the USACE (federal and non-federal) as well as to the USACE-authorized federal dredging projects, regardless of whether government owned and operated dredging equipment or contracted equipment is used. Appendix C provides example language that the USACE will use in development of contract

specifications for use of the site in federal projects, and the EPA's concurrence should be conditioned on use of these specifications. The EPA may also specify or confirm additional project-specific conditions in its concurrence.

Conditions and reporting requirements become enforceable when and as included in the disposal site designation regulation, in MPRSA Section 103 permits, and in transportation and disposal-related authorizations for federal projects, including the USACE federal contract documents or other federal project specification documents.

Violations of the MPRSA by a permittee or dredging contractor, including violations of conditions established in an MPRSA permit or federal project authorization—are subject to compliance action including suspension of disposal operations or possible assessment of substantial administrative, civil, or criminal penalties, or other injunctive remedies, as appropriate.

3.1 MARINE PROTECTION CRITERIA COMPLIANCE PROCESS

The USACE uses the marine protection criteria established pursuant to Section 102 of the MPRSA when evaluating permit requests for applications and when implementing federal projects involving the transportation of dredged material for the purpose of disposing it into ocean waters. Disposal of dredged material in the ocean must comply with the criteria, and the EPA reviews the demonstrations of compliance when reviewing permits and projects for written concurrence, which may include conditions that must be incorporated into the permit or project authorization documents.

In the case of federal navigation projects, the USACE implements the same substantive MPRSA requirements directly in the USACE projects involving transportation and ocean disposal of dredged materials, including through the USACE contractors. Federal projects, though not required to have a permit, must adhere to the same criteria, factors to be evaluated, procedures, and requirements that apply to permits, including the process for evaluation of the project. Federal projects must receive EPA's concurrence prior to authorization of transportation and disposal of dredged materials, and authorizing documents must contain any conditions included in the EPA's concurrence. EPA and the USACE will coordinate early in the contracting process so the USACE can incorporate any of the EPA concurrence conditions into project authorization documents.

Ocean disposal of dredged materials from non-federal projects requires an ocean dumping permit issued by the USACE pursuant to MPRSA section 103. A summary of the permitting process can be found at: <https://www.epa.gov/marine-protection-permitting/marine-protection-research-and-sanctuaries-act-permits>.

3.2 DREDGED MATERIAL CHARACTERIZATION

Prior to any disposal of dredged material at the Charleston ODMDS, the EPA and the USACE must evaluate the project applying the marine protection criteria established pursuant to Section 102 of the MPRSA and 40 C.F.R. Part 227, and the USACE must specifically authorize the dumping under MPRSA Section 103. The EPA reviews and approves the sampling and analysis plan for each project *prior* to any

sampling of proposed dredged material. This includes how dredging projects will be subdivided into project segments for sampling and analysis. Guidance for a process to determine the suitability of dredged material proposed for disposal at the Charleston ODMDS is described in the Ocean Testing Manual and the Southeast Regional Implementation Manual (EPA and USACE, 1991; EPA and USACE, 2008).

Procedural steps, in order of operation, include:

- Case-specific evaluation of proposed material against the exclusion criteria (40 C.F.R. 227.13(b));
- Determination of the need to test non-excluded material, taking into consideration the time since previous testing and the potential of sediment contamination since last verification;
- Conducting required testing to determine the suitability of the material for ocean disposal; and
- Review and evaluation of testing data results by the USACE and the EPA to determine suitability.

Additional reviews by stakeholders including the public, states, tribes, and other federal agencies would also be conducted through the USACE permitting or authorization processes.

Only material which the USACE and the EPA have determined to be suitable and in compliance with the Ocean Dumping Criteria (40 C.F.R. Part 227) may be considered for transportation and dumping in the Charleston ODMDS. Documentation will be in the form of a MPRSA Section 103 Evaluation, as outlined in Appendix C of the SERIM. Water quality compliance determinations will be made using the STFATE (ADDAMS) model and the input parameters provided in Appendix A of this SMMP. No disposal activities may occur at the site until the EPA reviews the testing data results and transmits its written concurrence that the material is acceptable for disposal at the ODMDS.

3.3 DREDGED MATERIAL TRANSPORTATION AND DISPOSAL

3.3.1 Transportation of Dredged Material

A transportation route to and from the Charleston ODMDS is specified to minimize possible interference with nearby fishing grounds and commercial navigation. To avoid impacts to nearby hardbottom habitat, equipment used to transport dredged material (loaded or unloaded) shall remain north of the line shown in Figure 2 that extends from the northwest corner of the ODMDS to the seaward tip of the south jetty. Minor departures from the navigation channel to avoid traffic or facilitate safe vessel passage are acceptable. The electronic tracking system discussed below, provides verification that the approved route was taken (Figure 2).

In a situation where the towed scow fails to open once triggered inside the disposal release zone, the disposal vessel will remain inside the disposal zone while efforts are made to affect the disposal. Should the scow remain closed after a reasonable attempt has been made to dispose the material within, the disposal vessel will make its return transit directly to the entrance channel by way of the approved route. This will allow for the least amount of exposure of hardbottom habitat

in the event of leaking material. Habitat in this area is limited, patchy, and ephemeral in nature; therefore, the shortest route will minimize exposure.

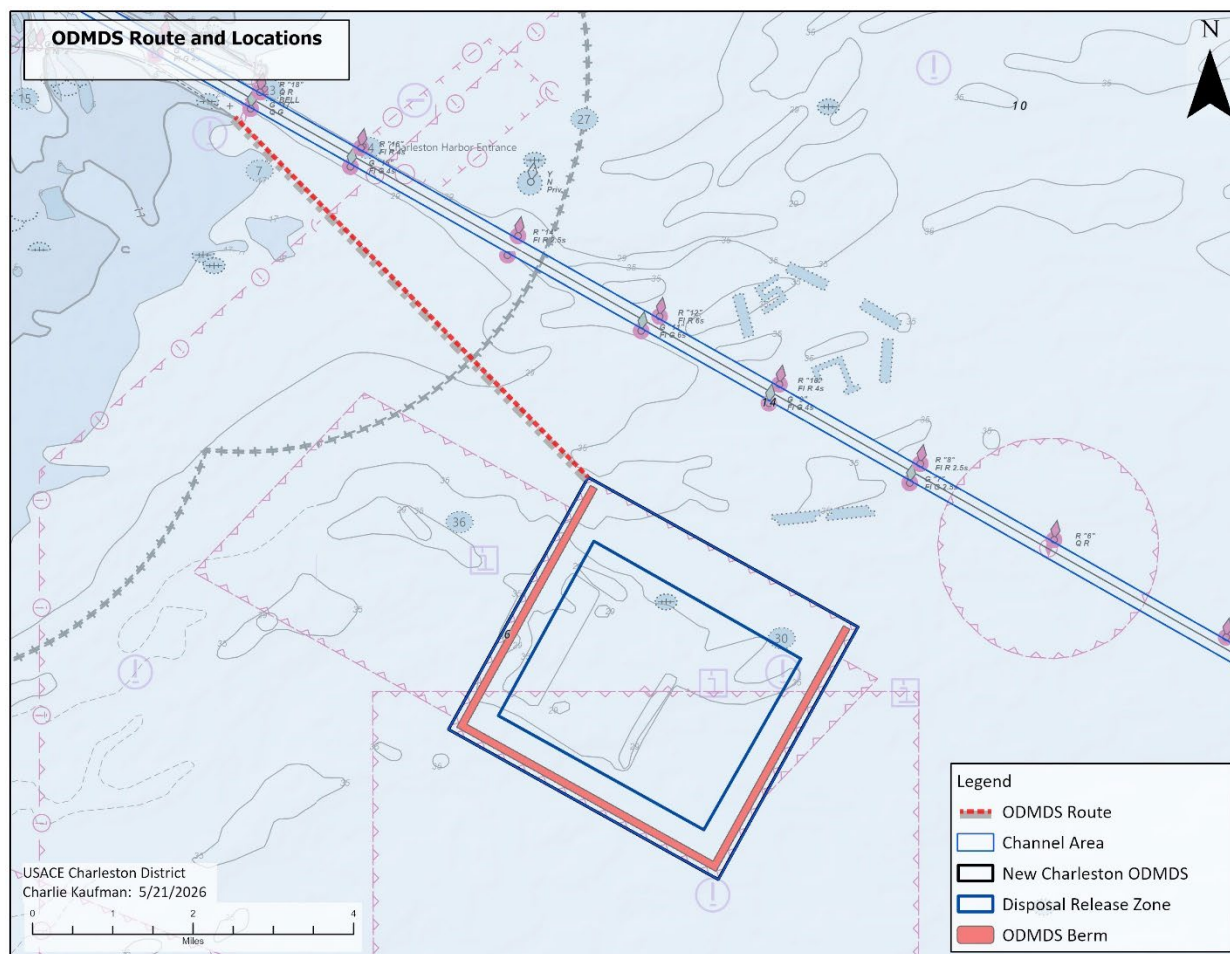


Figure 2. Disposal route to the ODMDS.

3.3.2 Disposal Locations

The regulation at 40 C.F.R. 227.28 defines the “release zone” relative to the vessel. To ensure all dredged material is disposed of within the “release zone,” dredged material placement into the ODMDS must occur at least 330 feet (100 meters) inside the ODMDS boundaries, creating a buffer zone. Implementation of the release zone requirements (and the resulting buffer zone) ensures that the dredged material is deposited within the site boundaries and increases the likelihood that no material will leave the site as it falls to the seabed.

The EPA and the USACE may establish release zones within the site to maintain compliance with the ocean dumping criteria in 40 C.F.R. 227.28. Disposal authorization documents (e.g., a permit or federal project contract term) require that disposal be initiated within the applicable release zone boundary and completed (i.e., doors closed) prior to leaving the release zone boundary.

Placement methods to prevent mounding of dredged materials from becoming an unacceptable navigation hazard will be used. Dredged material shall be placed so that at no point will depths be less

than -25 feet MLLW occur (i.e., a clearance of 25 feet above the bottom will be maintained) to help ensure continued safe navigation for placement activities associated with dredging.

To manage site use, maximize site capacity, reduce multiple user conflicts, simplify monitoring and management, and reduce potential adverse impacts to the marine environment, the USACE, Charleston District in consultation with the EPA Region 4, has established a disposal zone within the ODMDS for dredged materials from ocean dumping activities (Figure 3).

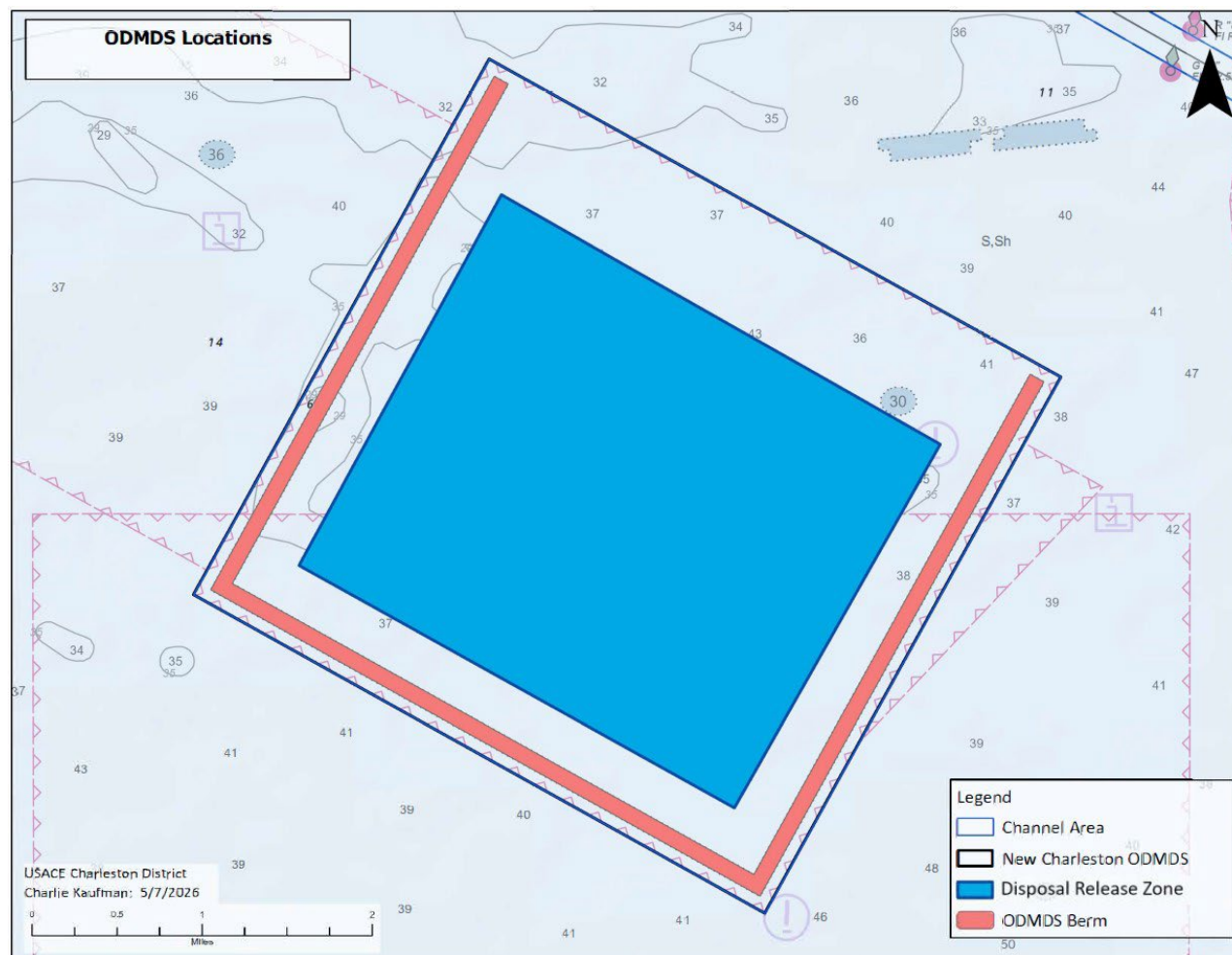


Figure 3. Current ODMDS with berm and disposal zone.

3.3.3 Disposal Methods

Dredged material shall not be leaked or spilled from disposal vessels during any portion of the transit to the ODMDS. This is tracked and monitored through the Dredge Quality Management (DQM) system, described below. Transit to the ODMDS begins as soon as the disposal vessel begins moving to the ODMDS, therefore all requirements as outlined in the SMMP apply as soon as transit begins to the ODMDS. All appropriate measures to avoid spillage during transit must be taken. Appropriate measures may include but are not limited to the following: up-to-date U.S. Coast Guard and/or American Bureau of Shipping certification of all disposal-related vessels; maintenance (inspection

and/or replacement) of gaskets on barge doors, minimization of excess free liquids in barge loads, pre-transit testing of barge door hydraulics, and pre-transport verification of appropriate weather and sea state conditions.

No specific disposal technique is required for this site. As discussed in Section 2.5.4, all projects will adhere to the 2020 South Atlantic Regional Biological Opinion (SARBO), which requires monitoring for sea turtles, Shortnose and Atlantic sturgeon, and North Atlantic right whales (National Marine Fisheries Service, 2020). To protect North Atlantic right whales, disposal vessel (either hopper dredge, support vessel, or tug and scow) speed and operation will be restricted in accordance with the SARBO). In addition, the disposal vessel's captain should be aware of the vessel approach restrictions in 50 CFR 224.103 which at the time of this SMMP prohibits approach within 500 yards of a right whale by vessel, aircraft, or any other means. Standard surveillance and evasive measures to protect sea turtles and marine mammals shall also be employed during all disposal operations at the ODMS.

For enforcement and compliance assurance purposes, the permit or authorization documents should specify a requirement for "closed doors," on disposal vessels, requiring both physically closed doors and a properly functioning hull status monitor indicating that the doors are closed. The monitoring plan and disposal authorization documents should also specify methods to prevent mounding of dredged materials which could create an unacceptable navigation hazard.

3.3.4 Disposal Times

Timing of disposal operations will be in accordance with the most recent SARBO. As monitoring results are compiled, should any such restriction appear necessary, disposal activities will be scheduled so as to avoid adverse impacts. Additionally, if new information indicates that endangered or threatened species are being adversely impacted, restrictions may be imposed.

Transportation of dredged material shall only be allowed when weather and sea state conditions, and scow loading level, will not interfere with safe transportation and will not create risk of spillage, leak or other loss of dredged material during transit. No disposal trips shall be initiated when the National Weather Service has issued a gale warning for local waters during the time period necessary to complete disposal operations.

3.3.5 Disposal Vessel Tracking

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 0.25 nautical miles or every four minutes during travel to and from the ODMS and every 12 seconds or every 30 feet of travel, whichever is smaller, while the hull status is open within the ODMS. In addition to the continuous tracking data, the following information shall be electronically recorded for each disposal cycle:

- Load Number
- Disposal Vessel Name and Type (e.g., scow)
- Estimated Volume of Load
- Description of Material Disposed
- Source of Dredged Material
- Date, Time, and Location at Start at Initiation and Completion of Disposal Event

It is expected that disposal monitoring will be conducted utilizing the Dredging Quality Management (DQM) system for Civil Works projects [see <http://dgm.usace.army.mil>], although other systems are acceptable. Disposal monitoring and ETS data will be reported to the EPA Region 4 on a weekly basis utilizing the eXtensible Markup Language (XML) specification and protocol per Section 3.4 and delivered as an attachment to an email (DisposalData.R4@epa.gov).

The EPA Region 4 and the USACE, Charleston District shall be notified within 24 hours if disposal occurs outside of the ODMDS or specified disposal zone or if any apparent leaking or spilling of dredged material occurs as indicated by a loss of disposal vessel draft. Excessive leakage is defined in Section 3.4.4.

3.4 DISPOSAL PERMITTING & REPORTING

3.4.1 Permitting Process

All transportation to and disposal of dredged material in the ocean, except for federal civil works projects, requires an ocean dumping permit issued by the USACE pursuant to Section 103 of the MPRSA. Additional information about the permitting process can be found on both the EPA (<https://www.epa.gov/marine-protection-permitting/mprsa-dredged-material-permits>) and the USACE websites (<https://www.sac.usace.army.mil/Missions/Regulatory/>).

3.4.2 Information Management of Dredged Material Disposal Activities

As discussed in the following sections, a substantial amount of diverse data regarding use of the Charleston ODMDS and effects of disposal are required from many sources. When this information is readily available and in a useable format it can be used to answer many questions typically asked about a disposal site including:

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

3.4.3 Post Disposal Summary Reports

A Post Disposal Summary Report shall be provided to the EPA within 60 days at the conclusion of dredging and disposal operations for each project.

Necessary report elements include the following: dredging project title; permit number and expiration date (if applicable); contract number; name of contractor(s) conducting the work, name and type of vessel(s) disposing material in the ODMDS; disposal time from each vessel; volume disposed at the ODMDS (as paid *in situ* volume, total paid and un paid *in situ* volume, and gross volume reported by dredging contractor), number of loads to ODMDS, type of material disposed at the ODMDS; identification by load number of any misplaced material; dates of pre and post disposal bathymetric surveys of the ODMDS and a narrative discussing any violation(s) of the 103 concurrence and/or permit (if applicable).

The narrative should include a description of any violation(s), indicate the time the violation(s) occurred and when the violation was reported to the EPA and the USACE, a discussion of the circumstances surrounding the violation(s), and identification and description of specific measures taken to prevent reoccurrence.

The Post Disposal Summary Report must be accompanied by the bathymetry survey results (plot and X, Y, Z ASCII data file, optionally a GIS shapefile), a summary scatter plot of all disposal start locations, and a summary table of the trip information required by Section 3.3.5 with the exception of the disposal completion data.

3.4.4 Project Initiation and Violation Reporting Requirements

The USACE or other site users shall notify the EPA 15 days prior to the beginning of a dredging cycle or project disposal.

The EPA Region 4 and the USACE, Charleston District require notification by the contractor within 24 hours if disposal occurs outside of the specified disposal release zone, if excessive leakage occurs, if hull open status occurs outside the ODMDS, or other violation of the conditions in the authorization documents and/or Dredged Material Permit (Department of the Army permit) occurs. Excessive leakage is defined as more than 1.5 feet of draft loss during transit to the ODMDS averaged between forward and aft sensors. Documentation will be required to explain how the issue was addressed, pertinent dates, and corrective actions to be implemented to prevent repetition in the future.

4 SITE MONITORING

Site monitoring is conducted to ensure the environmental integrity of a disposal site and the areas surrounding the site as well as to verify compliance with the site designation criteria; any special management conditions; and permit, contract, or Federal project authorization document requirements. Monitoring programs should be flexible, cost effective, and based on scientifically sound procedures and methods to meet site-specific monitoring needs. Tiered approaches to monitoring

should be used where specific management actions or additional monitoring activities may be triggered when unacceptable environmental conditions are recorded.

Specific goals of the monitoring program are to provide the following:

- Information indicating whether the disposal activities are occurring in compliance with the permit (or Federal project authorization documents) and site restrictions;
- Information on the short-term and long-term fate of materials disposed of in the marine environment; and,
- Information concerning the short-term and long-term environmental impacts of disposal activities.

The site monitoring program describes the monitoring actions that should be taken if issues are found during routine trend assessment monitoring or any other means. A tiered strategy for a monitoring program is used to ensure that more advanced monitoring activities are used only when necessary. With a tiered approach, an unacceptable environmental condition may trigger further and often more complex monitoring and/or changes to the management of the site. Data collected during site monitoring should be used to adjust site management and/or revise the SMMP.

A monitoring program should be structured to address specific questions (i.e., hypotheses) and measure key indicators and endpoints, particularly those defined during site designation or specific project-related issues that arise. Multi-year trend analyses are outlined in the MPRSA Regulations at 40 C.F.R. 228.13; these analyses should be used to determine whether there are consistent changes from previous site conditions or baseline conditions. At a minimum, a Trend Assessment Study should be conducted at least once every ten years and should be used to revise the SMMP. Results from these surveys should be used to assess the need for additional targeted or more complex studies.

The monitoring program for the Charleston ODMDS is designed to address the following questions:

What are the short- and long-term fates of the material disposed at the site?

This would include considerations such as:

- Does disposed dredged material remain within the site boundaries or leave the site?
- If any disposed material leaves the site, where does it go? Does it move toward sensitive areas such as marine sanctuaries or productive fisheries?
- Does disposed material create mounds within the site or result in a dispersed layer on the sea bottom?
- Is there a potential for interference with navigation due to mounding of disposed material?
- Was any material dumped outside of the site boundaries?

What are the short- and long-term environmental impacts of the disposal of material at the site?

This would include considerations such as:

- Has the benthic community structure changed due to disposal activities?
- Is there an absence of pollution-sensitive biota at the site?
- Are there progressive, non-seasonal changes in water quality, sediment composition, or numbers of pelagic, demersal, or benthic biota at or near the disposal site?
- Has there been an increase in contaminant levels in the sediments or biota at or near the site?
- Are there any other impacts detected inside or outside the site boundaries?

Sections 4.1 and 4.2 below describe the monitoring strategy at the site to address these and other questions and also summarize the management actions that should be considered by the EPA, in coordination with the USACE, if thresholds are exceeded.

4.1 MONITORING THE TRANSPORTATION, DISPOSAL, AND FATE OF DISPOSED MATERIALS

Monitoring the transportation and disposal process is necessary to confirm that disposal activities comply with all permit conditions and site restrictions. Monitoring the location and movement of disposed material at the site should be used to ensure that disposed material disperses as expected to determine that any accumulation of disposed material does not pose a navigational hazard in the area, and to confirm that future site use will not exceed the site's capacity. The monitoring activities used to achieve each of these management goals are summarized in Table 3 below.

Table 3. Monitoring Strategies and Thresholds for Action

Goal ¹	Technique	Sponsor	Rationale	Frequency	Threshold for Action	Management Options When Threshold:	
						Not Exceeded	Exceeded
Short & Long-term Fate of Disposed Dredged Material	Sediment Profile Imaging, Sediment Mapping, or Bathymetry	Site User/ EPA	Confirm: (A) Aerial extent of disposal mound and benthic impact and (B) Not impacting benthic communities outside of the ODMDS	Following any major new work project	The disposal mound footprint occurs outside ODMDS boundaries (> 5cm thick)	Continue to use site without further restrictions	(A) Restrict disposal volumes (B) Modify disposal zones (C) Institute environmental effects monitoring
Monitor Bathymetric Trends	Bathymetry	Site User	Determine the extent of the disposal mound and major bathymetric changes	Pre and post disposal (>50,000 cys or > 5 years)	Disposal mound occurs outside ODMDS boundary (> 5cm thick)	Continue Monitoring	(A) Modify disposal method/ placement (B) Restrict disposal volume
Ensure Safe Navigation Depth	Bathymetry	Site User	Determine height of mound and any excessive mounding	Post disposal for significant projects (> 50,000cy)	Mound height > -25 feet MLLW	Continue Monitoring	(A) Modify disposal method/ placement (B) Direct disposal operators to avoid areas shallower than 25 feet. (C) Physically level material shallower than 25 feet (D) Notify mariners of mound location and depth (E) Further restrict disposal volumes
Trend Assessment	Water and Sediment Quality, Benthic Community Analysis (40C.F.R.228.13)	EPA	Periodically evaluate the impact of disposal on the marine environment (40C.F.R. 228.9)	Approximately every 10 years.	(A) Absence from the site of pollution sensitive biota (B) Progressive non-seasonal changes in water or sediment quality	Continue Monitoring	(A) Conduct Environmental Effects Monitoring or Advanced Environmental Effects Monitoring (B) Review dredged material evaluation procedures

¹ Goals are not presented in a sequential order of preference; all are applicable.

Goal ¹	Technique	Sponsor	Rationale	Frequency	Threshold for Action	Management Options When Threshold:	
						Not Exceeded	Exceeded
Environmental Effects Monitoring	(A) Chemical Monitoring (B) Benthic Monitoring	EPA/ USACE	Determine: (A) if chemical contaminants are significantly elevated ² within and outside of site boundaries (B) whether there are adverse changes in the benthic populations outside of the site and evaluate recovery rates	Implement if disposal footprint extends beyond the ODMDS boundaries (> 5cm thick) or if Trend Assessment results warrant.	(A) Contaminants are found to be elevated ² (B) Adverse changes observed outside of the ODMDS that may endanger the marine environment	Discontinue monitoring.	(A) Institute Advanced Environmental Effects Monitoring (B) Implement case specific management options (i.e. Remediation, limits on quantities or types of material). (C) Consider isolating dredged material
Advanced Environmental Effects Monitoring	(A) Tissue Chemical Analysis and/or bioaccumulation modeling (B) Benthic Monitoring	EPA/ USACE	Determine if the ODMDS is a source of adverse: (a) bioaccumulation (b) sub-lethal ³ changes in benthic organisms which may endanger the marine environment.	Implement if Environmental Effects Monitoring warrants.	(A) Benthic body burdens and risk assessment models indicate potential for food chain impacts. (B) Sub-lethal effects are unacceptable.	Discontinue monitoring	(A) Discontinue site use (B) Implement case specific management options (i.e., Remediation, limits on quantities or types of material).

² Significantly elevated: Concentrations above the range of contaminant levels in dredged sediments that the Regional Administrator and the District Engineer found to be suitable for disposal at the ODMDS.

³ Examples of sub-lethal effects include without limitation the development of lesions, tumors, development abnormality, and/or decreased fecundity.

Goal ¹	Technique	Sponsor	Rationale	Frequency	Threshold for Action	Management Options When Threshold:	
						Not Exceeded	Exceeded
Compliance	Disposal Site Use Records in EPA R4's XML format	Site User	(A) Ensure management requirements are being met (B) To assist in site monitoring	Weekly during the project	Disposal records required by SMMP are not submitted or are incomplete	Continue Monitoring	Restrict site use until requirements are met

4.2 MONITORING ENVIRONMENTAL EFFECTS OF DISPOSED MATERIAL

Monitoring of impacts to the physical, chemical, and biological environment is necessary to ensure that the transport and disposal of dredged material does not result in unreasonable degradation to the marine environment or endanger human health, welfare, or economic potentialities.

The environmental effects monitoring plan for the Charleston ODMDs summarized in Table 3 above is structured as a tiered monitoring approach; unacceptable conditions discovered during a lower tier assessment should trigger additional testing or other management action.

The USACE and the EPA periodically assess environmental conditions of the entire site and surrounding area and consider other environmental data that may have been collected by other entities in the area; this information is then used to assess overall site conditions and to conduct trend assessments.

Enhanced environmental effects monitoring should be triggered if disposed material is found to have unexpectedly left the site or is observed in unexpected locations during the transportation, disposal, and fate monitoring activities described in section 4.1. Any monitoring at the site that identifies an issue of potential concern should trigger additional monitoring or management actions.

4.3 PRE- AND POST-DISPOSAL BATHYMETRIC MONITORING REQUIREMENTS

Pre-disposal monitoring: A baseline bathymetric survey will be conducted prior to the first use of each project specific disposal release zone.

- Surveys will conform to the minimum performance standards for USACE Hydrographic Surveys as described in the USACE Engineering Manual, EM1110-2-1003, Hydrographic Surveying dated November 30, 2013
[http://www.publications.usace.army.mil/Portals/76/Publications/EngineerManuals/EM_1110-2-1003.pdf] or updates.
- The number and length of transects required will be sufficient to encompass the disposal release zone and a 500-foot-wide area around it.
- The surveys will be taken along lines spaced at 200-foot intervals or less for single beam surveys and 500 feet or less for multibeam surveys unless a lesser spacing provides 100% coverage.

The minimum performance standards in Hydrographic Surveying shall be followed. Horizontal location of the survey lines and depth sounding points will be determined by an automated positioning system utilizing a differential global positioning system. The vertical datum will be referenced to prescribed NOAA MLLW datum. The horizontal datum should be referenced to the local State Plane Coordinate System (SPCS) for that area or in Geographical Coordinates (latitude-longitude). The horizontal reference datum should be the North American Datum of 1983 (NAD 83).

Post-disposal monitoring: The USACE 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 cys. The number and aerial extent of transects required will be the same as in the baseline survey. Bathymetric survey results will be used to ensure that unacceptable mounding is not occurring and to aid in environmental effects monitoring.

Data collection methods are described in Engineer Manual EM 1110-2-1003. Results from post- and pre-dredge bathymetry should be provided to the EPA Region 4 when completed as part of the summary report.

(https://www.publications.usace.army.mil/Portals/76/Publications/EngineerManuals/EM_1110-2-1003.pdf).

5 MODIFICATION OF THIS SMMP

This plan is effective and available for implementation from the date of the last signature. The regulations designating ODMDs require site users to comply with specific minimum restrictions and requirements identified in the SMMP and incorporated into the site designations. The MPRSA Section 102(c)(3) directs the EPA, in conjunction with the USACE, to review and revise this SMMP at least every ten years or sooner if site conditions indicate a need for revision. The EPA and the USACE share responsibility for implementation of the SMMP. Site users may be required to undertake monitoring activities as a condition of their permit. The USACE and any USACE contractor remain responsible for implementation of the SMMP for federal new work and maintenance projects. Conditions for updating this SMMP may include but are not limited to:

- Significant changes in disposal site use (change in frequency, site expansion, de-designation, new dredged material source location, etc.);
- Discovery of significant impacts to the physical, chemical, or biological environment during monitoring activities; and
- Any other conditions or changes at the site or area surrounding the site that may necessitate a review or update to the SMMP.

6 REFERENCES

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7 APPENDIX A – NUMERICAL MODEL (STFATE) INPUT PARAMETERS

Water Column Evaluations – Charleston ODMDS STFATE Input Parameters

Charleston ODMDS

STFATE (Short-Term FATE of dredged material disposal in open water) models the discharge of a single load of dredged material from a scow or hopper. STFATE computes a prediction of the deposition and water quality effects of dredged materials disposed of in open water. This numerical model is used for required evaluations of initial mixing and water column effects. STFATE is an outgrowth of the first comprehensive model for predicting the fate of dredged material developed by Koh and Chang (1993). STFATE models three disposal phases, convective descent, dynamic collapse, and passive transport dispersion. STFATE models conventional displacement (bottom dumping) where the vast majority of the dredged material released from a barge or hopper dredge descends rapidly to the bottom in a high density jet known as the convective descent phase. The dynamic collapse phase begins when the jet impacts the bottom. The more dense material immediately deposits, while the less dense particles are spread outward as a density flow when the vertical energy is transferred into horizontal momentum. Over time the less dense material also settles.

Input data for the model includes information regarding the following:

- Disposal operation
- Disposal site
- Dredged material
- Model coefficients
- Input/output/execution controls

The STFATE input parameters are to be used in future evaluations of disposal operations. These parameters are based on information obtained during site designation studies as presented in the Charleston ODMDS FEA, previous applications of the disposal models, and default parameters. Additional project and site-specific information should be used in future STFATE applications to improve the predictive capability of the model.

The STFATE model input parameters include site description, ambient velocity data, disposal operation information, and coefficients. A 103 by 98 grid was chosen to provide the highest resolution. The grid spacing in the north/south and east/west directions was selected at 200 feet to keep the disposal plume within the grid during the model execution. An average depth of 36 feet is used and a two-point density profile is used. A depth averaged logarithmic velocity profile was selected using median values to the East. Disposal operation and execution parameters include disposal site boundaries and disposal location and model time step and duration. The duration is set to 14,400 seconds (4 hours) to meet the 4-hour dilution requirement. Project specific disposal operations data (i.e., vessel speed, dimensions and draft) will depend on the

individual projects. Likewise, dredged material characteristics may vary based on specific sediment testing information. Model default values are specified where appropriate.

STFATE Model Input Parameters

Section 103 Regulatory Analysis for Ocean Water, Tier III, Short-Term Fate of Dredged Material from Split Hull Barge or Hopper/Toxicity Run Average sediment characteristics of recent sediment 103 evaluations were used to calculate the Volumetric Fractions. STFATE model input parameters utilized in the module were as follows:

Water Column Evaluations

Numerical Model (STFATE) Input Parameters Modified
Charleston ODMDS (17,000 X 16,000)

SITE DESCRIPTION

Parameter	Value	Units
Number of Grid Points (left to right)	103	
Number of Grid Points (top to bottom)	98	
Spacing Between Grid Points (left to right)	200	ft
Spacing Between Grid Points (top to bottom)	200	ft
Constant Water Depth	36	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 = 0 ft	1.0215	g/cc
Ambient Density at Depth = 36 ft	1.0220	g/cc

AMBIENT VELOCITY DATA

Parameter	Value	Units
Water Depth	36	ft
Profile	Logarithmic	
Vertically Averaged X-Direction Velocity	0.0	ft/sec
Vertically Averaged Z-Direction Velocity	0.33	ft/sec

DISPOSAL OPERATION DATA

Parameter	Value	Units
Location of Disposal Point from Top of Grid	10,300	ft
Location of Disposal Point from Left Edge of Grid	9,800	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	1,800	ft
Location of the Upper Left Corner of the Disposal Site - Distance from Left Edge	1,800	ft
Location of the Lower Right Corner of the Disposal Site - Distance from Top Edge	18,800	ft
Location of the Lower Right Corner of the Disposal Site - Distance from Left Edge	17,800	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	0.0225 ²

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

¹Model Default Value

²Calculated from NOAA Field Work at Fort Pierce (1994)

8 APPENDIX B – TEMPLATE FOR GENERIC SPECIAL CONDITIONS

Template Language for Generic Special Conditions for MPRSA Section 103 Permits

1. REGULATORY REQUIREMENTS

- A. Per 33 C.F.R. § 325.6(e) maintenance dredging permits may not exceed ten years from the date of issuance. Therefore, new work and/or maintenance dredging as defined in Department of the Army (DA) Permit SAC-[YEAR-NUMBER] is authorized for a period of 10 years and will expire on [DATE]. Per 33 C.F.R. § 325.6 (c), permits for the transport of dredged material for the purpose of disposing of it in ocean waters will not exceed 3 years, therefore the time limit for completing work authorized under the MPRSA ends 3 years from the date of issuance of this permit.
- B. Coordination with the Charleston District's Navigation Branch is required for each dredging event to obtain permission to use the Charleston ODMDS and the coordinates of the project specific disposal release zone and the endpoints of the specific disposal lines where dredged material must be placed within the Charleston ODMDS.
- C. Prior to each dredging and ocean disposal event, the permittee must submit a dredging operations plan to both the Corps and EPA for review and approval at least 30 days prior to conducting any work in waters of the U.S. The plan must include: 1) a recent bathymetric survey of the area that will be dredged (less than 30 days old) prepared and signed by a registered land surveyor, 2) an estimate of the volume of maintenance material, 3) a description of the dredging method, 4) detailed information about the equipment that will be used to transport dredged material to the Charleston ODMDS, and 5) and a recent pre-disposal bathymetric survey (less than 30 days old) of the project specific disposal release zone within the Charleston ODMDS. All surveys must be referenced to "Mean Lower Low Water."
- D. The permittee and their dredging contractor must schedule and participate in a pre-dredging conference with the Charleston District's Regulatory Division. The purpose of this meeting is to review the dredging operations plan and to verify that the proposed plan is sufficient to comply with the requirements of the above-referenced DA permit and the associated EPA concurrence letter.

2. 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 Charleston ODMDS, proper disposal of dredged material within the disposal release zone, and transportation of the hopper dredge or disposal barge or scow back to the dredging site.
- B. The Charleston ODMDS is defined by the following coordinates:

Site		Geographic (NAD83, Decimal Degrees)		State Plane (South Carolina US Survey Feet)		Area (nmi ²)	Area (mi ²)
		Latitude	Longitude	N	E		
	Center	32.63522	-79.73939	294137.61	2388059.58		

Charleston ODMDS	SE	32.60467	-79.72770	283067.786	2391795.475	7.4	9.8
	SW	32.62744	-79.77627	291170.826	2376741.168		
	NW	32.66571	-79.75113	305185.821	2384312.304		
	NE	32.64299	-79.70253	297104.717	2399371.043		

The disposal release zone within the Charleston ODMDS has the following coordinates:

Site		Geographic (NAD83, Decimal Degrees)		State Plane (South Carolina US Survey Feet)		Area (nmi ²)	Area (mi ²)
		Latitude	Longitude	N	E		
Disposal Release Zone	SE	32.62953	-79.76731	291963.450	2379495.145	3.9	5.1
	SW	32.61220	-79.73030	285797.391	2390966.182		
	NW	32.63817	-79.71280	295312.397	2396237.184		
	NE	32.65600	-79.75011	301659.432	2384675.135		

- 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 Charleston ODMDS.
- D. The permittee shall use an electronic positioning, such as the Corps' Dredge Quality Management (DQM), system to navigate to and from the Charleston 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 Charleston 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 Charleston ODMDS. The certification shall be accomplished by direct comparison of the electronic positioning system's accuracy with a known fixed point.
- F. Before any disposal vessel departs for the *Charleston ODMDS*, a dedicated quality control inspector shall certify in writing that the disposal vessel is not overloaded, and complete a Scow Certification Checklist (or Vessel Certification Checklist) that documents all of the substantive elements found in the example in Appendix D. If an alternate version of this checklist is utilized, the EPA and the USACE must approve the checklist prior to the commencement of ocean disposal operations.
- G. 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 Charleston ODMDS. Excessive leakage/spillage or other loss of material means an apparent loss of dredged material greater than limits established Section 103 Concurrence, and/or Section 103 permit or a change in draft greater than 1.5 feet averaged between the

forward and stern sensors during transit to the ODMDS. Transportation of dredged material to the ODMDS may not begin or continue when weather and sea state conditions interfere with safe transportation and create risk of spillage, leaks, or other loss of dredged material during transit. Disposal vessels cannot be loaded beyond a level at which dredged material would be expected to be spilled in transit under anticipated sea state conditions.

- H. A disposal operations inspector and/or captain of any tugboat, hopper dredge or other vessel used to transport dredged material to the Charleston ODMDS shall ensure 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 Charleston District's Regulatory Division via email at sac.rd.charleston@usace.army.mil or via phone at 843-329-8044 and EPA Region 4 via email at OceandumpingR4@epa.gov or via phone at [TELEPHONE NUMBER] 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 disposal summary report.
- I. When dredged material is disposed, no portion of the hopper dredge or disposal barge or scow shall be outside of the boundaries of the Charleston ODMDS Disposal Release Zone as defined in Special Condition 2B. Additionally, disposal shall be initiated within the project specific disposal release zone in Special Condition 1B.:
- J. For all disposal activities, permittees must use an electronic positioning, tracking, and/or remote monitoring and documentation system, such as the Dredge Quality Management (DQM) system. Dredges and scows that have the necessary sensors should be inspected and certified by the DQM Support Center annually. The remote monitoring system must document the horizontal location and draft condition (accuracy ± 0.1 foot) of the disposal vessel (i.e., hopper dredge or disposal scow) from the point of dredging to the disposal site and during its return to the point of dredging. Data shall be collected at least every 0.25 nautical mile or every 4 minutes during travel to and from the ODMDS and every twelve seconds or every 30 feet of travel within the ODMDS and while hull status is open.
- K. The permittee shall complete a Scow Certification Checklist (or Vessel Certification Checklist) for each load of dredged material that is transported to the Charleston ODMDS for the purpose of ocean disposal. No ocean disposal trip may be initiated until both the towing vessel captain and the quality control inspector have reviewed and signed all relevant entries on the checklist. The inspector shall provide a summary of any discrepancies or inaccuracies on the checklist in the disposal summary report that is submitted to the EPA and the USACE.
- L. In addition to the pre-dredging and pre-disposal bathymetric surveys described in Special Condition 1C, the permittee shall conduct post-dredging and post-disposal bathymetric surveys of the area that was dredged and the project specific disposal release zone within 30 days following project completion.
 - 1. The number and length of the survey transects shall be sufficient to encompass the disposal release zone and a 500-foot-wide buffer around the disposal release zone. The transects shall be spaced at 200-foot intervals or less for single beam survey and

500-foot intervals or less for multibeam surveys unless a lesser spacing provides 100% coverage.

2. Vertical accuracy of the survey shall be ± 0.5 feet. Horizontal location of the survey lines and depth sounding points will be determined by an automated positioning system utilizing either microwave line of sight system or differential global positioning system. The vertical datum shall be mean lower low water (MLLW) and the horizontal datum shall use South Carolina 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 decimal degrees to 6 decimal points.

3. REPORTING REQUIREMENTS

- A. All reports, documentation and correspondence required by the conditions of this permit shall be submitted to the following addresses: U.S. Army Corps of Engineers, Charleston District Regulatory Division, via email at sac.rd.charleston@usace.army.mil or via hardcopy at 69A Hagood Avenue, Charleston, South Carolina 29403 and Environmental Protection Agency Region 4's Oceans and Estuarine Management Section via email at OceandumpingR4@epa.gov or via hardcopy at 61 Forsyth Street, Atlanta, GA 30303. The Permittee shall reference the DA permit SAC-[YEAR-NUMBER] on all submittals.
- B. In addition to the dredging operations plan described in Special Condition 1C at least 15 days before initiating any dredging and disposal operations authorized by this permit, the Permittee shall provide to the Corps and the EPA a written notification of the date of commencement of work authorized by this permit.
- C. Electronic data required by Special Condition J shall be provided to EPA Region 4 on a daily basis. Data shall be submitted as an eXtensible Markup Language (XML) document via Internet e-mail to DisposalData.R4@epa.gov. XML data file format specifications are available from EPA Region 4.
- D. The permittee shall send one (1) copy of the following reports to the Charleston District's Regulatory Division and EPA Region 4 documenting compliance with all general and special conditions defined in this permit. These reports shall be submitted within 60 days after completion of the disposal operations authorized by this permit.
 1. The disposal summary report shall include the following information: dredging project title; dates of disposal; permit number and expiration date; name of contractor(s) conducting the work, name and type of vessel(s) disposing material in the ODMDS; disposal timeframes for each vessel; volume disposed at the ODMDS (as paid *in situ* volume, total paid and unpaid *in situ* volume, and gross volume reported by dredging contractor), number of loads to ODMDS, type of material disposed at the ODMDS; identification of any misplaced material (outside the project specific disposal release zone and/or the ODMDS dump zone boundaries); dates of pre- and post-disposal bathymetric surveys of the project specific disposal release zone and a narrative discussing any violation(s) of the 103 permit.
 2. The Material Discharge Report shall include: a spreadsheet of all discharges in the

Charleston ODMDs, in Microsoft Excel format with the load number, scow name, tow vessel name, captain of tow vessel, estimated volume of load, description of material disposed, source of dredged material, date, time, and location at start of initiation and completion of each disposal event, EPS data for the specific load.

3. The Summary Scatter Plot report shall include: the boundary of the Charleston ODMDs, the coordinates of the project specific disposal release zone (within the ODMDs), the center lines of the project specific disposal lanes, and the coordinates where each discharge was initiated. No more than 50 discharges (loads) should be shown on each scatter plot and each load number must be identified in Adobe Acrobat PDF format.
4. The Bathymetric Survey Report shall include pre-dredging and post-dredging bathymetric surveys of the existing berth, and pre-disposal and post-disposal bathymetric surveys of the project specific disposal release zone within the Charleston ODMDs. Bathymetric surveys must be prepared and signed by a registered land surveyor and submitted to both the Corps and EPA for review and approval within 30 days of completing each dredging event and the associated disposal activities.

9 APPENDIX C – TEMPLATE CONTRACT LANGUAGE

TYPICAL CONTRACT LANGUAGE FOR IMPEMENTING SMMP REQUIREMENTS FOR THE DISPOSAL OF DREDGED MATERIAL

A. General

All material dredged shall be transported to and deposited in the disposal area(s) designated on the drawings. The approximate maximum and average distance to which the material will have to be transported are as follows:

Disposal Area	Maximum Distance Statute Miles	Average Distance Statute Miles
Charleston ODMDS		
[INSERT DISPOSAL ZONES AREA 2]	[XX miles]	[XX miles]

[IF MATERIAL FROM DIFFERENT PROJECT AREAS GO TO DIFFERENT DISPOSAL AREAS, IT SHOULD BE SPECIFIED HERE]

B. Ocean Disposal Notification

The Corps or the contractor shall notify EPA Region 4 's Oceans, Wetlands, and Stream Protection Branch (61 Forsyth Street, Atlanta, GA 30303) and via email at OceandumpingR4@epa.gov at least 15 calendar days and the local Coast Guard Captain of the Port at least 5 calendar days prior to the first ocean disposal. The notification will be by certified mail with a copy to the Contracting Officer. The following information shall be included in the notification:

- Project designation; Corps of Engineers' Contracting Officer's name and contract number; and, the Contractor's name, address, and telephone number.
- Port of departure.
- Location of disposal zone(s) within the ODMDS.
- Schedule for ocean disposal, giving date and time proposed for first ocean disposal.

C. Ocean Dredged Material Disposal Sites (ODMDS)

The material excavated shall be transported to and deposited in the Charleston ODMDS as shown on the drawings. When dredged material is disposed, no portion of the hopper dredge or disposal barge or scow shall be outside of the boundaries of the Charleston ODMDS. Additionally, disposal shall be initiated within the disposal release zone(s) defined by the following coordinates:

Table C1. Charleston ODMDS Disposal Maintenance Material Release Zone

Site		Geographic (NAD83, Decimal Degrees)		State Plane (South Carolina US Survey Feet)	
		Latitude	Longitude	N	E
Charleston ODMDS	Center	32.63522	-79.73939	294137.61	2388059.58
	SE	32.60467	-79.72770	283067.786	2391795.475
	SW	32.62744	-79.77627	291170.826	2376741.168
	NW	32.66571	-79.75113	305185.821	2384312.304
	NE	32.64299	-79.70253	297104.717	2399371.043

During transit to and from the Charleston ODMDS, equipment used to transport dredged material (loaded or unloaded) shall remain north of the line shown in Figure 2 that extends from the northwest corner of the ODMDS to the seaward tip of the south jetty. Minor departures from the navigation channel to avoid traffic or facilitate safe vessel passage are acceptable.

Logs

The Contractor shall keep a log for each load placed in the Charleston ODMDS. The log entry for each load shall include:

- Load Number
- Disposal Vessel or Scow Name
- Tow-Vessel Name (if used)
- Captain of Vessel
- Estimated Volume of Load
- Description of Material Disposed
- Source of Dredged Material
- Date, Time, and Location at State of Initiation of Disposal and Completion of Disposal Event
- The ETS data required by Special Condition I

At the completion of dredging and at any time upon request, the log(s) shall be submitted in paper and electronic formats to the Contracting Officer for forwarding to the appropriate agencies.

D. Scow Checklist

Before any disposal vessel departs for the Charleston ODMDS, a dedicated quality control inspector shall certify in writing that the disposal vessel is not overloaded, and otherwise meets the conditions and requirements of a Scow Certification Checklist that contains all of the substantive elements found in the example provided in this SMMP in Appendix D. If an alternate version of the Scow Certification Checklist (Appendix D) is utilized, the EPA and the USACE must

approve the proposed Scow Certification Checklist prior to the commencement of ocean disposal operations. No ocean disposal trip may be initiated until both the towing vessel captain and the quality control inspector have signed all relevant entries on the Scow Certification Checklist. The inspector shall provide a summary of any discrepancies or inaccuracies on the Checklist in the site user's report to the EPA and the USACE.

E. Overflow, Spills, and Leaks

The permittee shall not allow any water or dredged material placed in a disposal vessel (i.e., a hopper dredge, disposal barge or scow) to flow over the sides or leak from such vessels during transportation to the Charleston ODMDS. Excessive leakage/spillage or other loss of material means an apparent loss of dredged material greater than limits established in the most current Section 103 Concurrence, Section 103 permit, and/or described within the USACE contract specifications. In any event, loss of dredged material during transit to ODMDS (in open water) is not to exceed 1.5 feet.

Transportation of dredged material to the ODMDS may not begin or continue when weather and sea state conditions interfere with safe transportation and create risk of spillage, leaks, or other loss of dredged material during transit. Disposal vessels cannot be loaded beyond a level at which dredged material would be expected to be spilled in transit under anticipated sea state conditions.

F. 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 dredging and ocean disposal. This ETS shall be established,

operated, and maintained by the Contractor to continuously track in real-time the horizontal location and draft condition (accuracy $\pm$ 0.1 foot) of the disposal vessel (hopper dredge or disposal scow) from the point of dredging to the disposal site and return to the point of dredging. The ETS shall be capable of displaying and recording, in real-time, the disposal vessel's draft, speed, and location. Data shall be collected at least every 0.25 nm or every 4 minutes during travel to and from the ODMDS and every twelve seconds or every 30 feet of travel within the ODMDS and while hull status is open.

----- [USE LANGUAGE BELOW FOR NON DQM PROJECTS]

G. ETS Standards

The Contractor shall provide automated (computer) system and components to perform in accordance with COE EM 1110-1-2909. A copy of the EM can be downloaded from the following web site: <http://www.usace.army.mil/inet/usace-docs/eng-manuals/em.htm>. Horizontal location and draft condition shall have an accuracy of $\pm$ 0.1 foot.

Data shall be collected at least every 0.25 nm or every 4 minutes during travel to and from the ODMDS and every twelve seconds or every 30 feet of travel within the ODMDS and while hull

status is open. In addition to the continuous tracking data, the following trip information shall be electronically recorded for each disposal cycle:

- Load Number
- Disposal Vessel Name and Type (e.g. scow)
- Estimated volume of Load
- Description of Material Disposed
- Source of Dredged Material
- Date, Time and Location at Initiation and Completion of Disposal Event

The ETS shall be calibrated, as required, in the presence of the Contracting Officer at the work location before disposal operations have started, and at 30-day intervals while work is in progress. The Contracting Officer 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 Contracting Officer 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 Contracting Officer's approval.

ETS 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 from the point of dredging to the disposal site and return to the point of dredging.

The Contracting Officer 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. Data shall be collected, during the dredging and disposal cycle (NOTE: A dredging and disposal cycle constitutes the time from commencement of dredging to complete discharge of the material), at least every 0.25 nm or every 4 minutes during travel to and from the ODMDs and every twelve seconds or every 30 feet of travel within the ODMDs and while hull status is open.
3. 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. The plot shall identify the exact position at which the dump commenced.
 - 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 shall be labeled with the corresponding Trip Number and shall be at a small but readable scale.

- c. Summary Table – A spreadsheet which contains all of the information in the log(s) above shall be prepared and shall correspond to the exact dump locations represented on the Scatter Plot.
4. ETS data and log data required by Section 3.3.5 shall be provided to EPA Region 4 on a weekly or more frequent basis (within one week of disposal). Data shall be submitted to EPA Region 4 as an eXtensible Markup Language (XML) document via Internet e-mail to DisposalData.R4@epa.gov. XML data file format specifications are available from EPA Region 4. EPA Region 4 and the USACE District require notification by email within 24 hours if disposal occurs outside of the specified disposal release zone, if excessive leakage occurs, if hull open status occurs outside the ODMDS, or other violation of the conditions in this SMMP occur. Excessive leakage is defined as more than 1.5 feet of draft loss during transit to the ODMDS averaged between forward and aft sensors. Correspondence will be required to explain how the issue was addressed, pertinent dates, and corrective actions to be implemented to prevent repetition in the future. All digital ETS data shall be furnished to the Contracting Officer 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 hard copy of the ETS data and tracking plots shall be both maintained onboard the vessel and submitted to the Contracting Officer on a weekly basis.

-----[FOR DQM PROJECTS]

See: <http://dqm.usace.army.mil/Specifications/Index.aspx>

For scows, the monitoring profile, TDS profile or Ullage profile shall be used.

I. Misplaced Materials

For civil works projects, materials deposited outside of the disposal release zone specified in 3.3.2 will be classified as misplaced material and will result in a suspension of dredging operations. Redredging of such materials will be required, where applicable, as a prerequisite to the resumption of dredging unless the Contracting Officer, at his discretion, determines that redredging of such material is not practical. If redredging of such material is not required, then the quantity of such misplaced material may be deducted from the Contractor's pay quantity. If the quantity for each misplaced load to be deducted cannot initially be agreed to by both the Contractor and Contracting Officer, then an average hopper/scow load quantity for the entire contract will be used in the determination. Both regulatory and civil works projects misplaced loads may be subject to penalty under the Marine Protection, Research and Sanctuaries Act. Materials deposited above the maximum indicated elevation or outside of the disposal area template shown will require the redredging, relocation, or removal of such materials. In addition, the Contractor must notify the USACE Contracting Officer and the Environmental Protection Agency Region 4 's Oceans and Estuarine Management Section (61 Forsyth Street, Atlanta, GA 30303) within 24 hours of a misplaced dump or any other violation of the Site Management and

Monitoring Plan for the Charleston ODMDS. Corrective actions must be implemented prior to the next dump and the Contracting Officer must be informed of actions taken.

10 APPENDIX D—EXAMPLE SCOW CERTIFICATION TEMPLATE

SCOW CERTIFICATION CHECKLIST		USACE PERMIT or CONTRACT #		4/17/2015	
[PROJECT NAME]		DATE:			
CHECKLIST ITEM	RECORD DATA	INITIALS			
	TO BE FILLED OUT AND SIGNED WITHIN 1 HOUR PRIOR TO DEPARTURE TIME IN NO. 3	CONTRACTOR	Permittee or Authorized Representative		
1. OCEAN DISPOSAL TRIP NUMBER					
2. DEPARTURE DATE TO ODMDs					
3. DEPARTURE TIME TO ODMDs					
4. DEPARTURE LOCATION (dredge, berth, etc.)					
5. SCOW NAME					
6. SCOW CAPACITY (CY)					
7. TUG NAME					
8. TUG CAPTAIN'S NAME					
9. DREDGED MATERIAL SOURCE (area, reach, berth, etc.)					
10. CUBIC YARDS HAULED					
11. SCOW FORE DRAFT / AFT DRAFT / AVG AND TIME					
12. SCOW FORE DRAFT / AFT DRAFT / AVG AND TIME (must be at least one hour prior to time in No. 11)					
13. DRAFT CHANGE (No 12 - No. 11)					
14. FREE BOARD OF MATERIAL AND/OR WATER SURFACE					
15. NWS COASTAL MARINE FORECAST (out to 20 nm)	DATE / TIME OF REPORT				
Detail	WAVE HEIGHT				
WRITE-IN APPROPRIATE FORECAST PERIODS (ie, TODAY, TONIGHT, TOMORROW)	WIND SPEED (KTS)				
	PERIOD (SEC)				
	COMMENTS:				
16. SCOW TRACKING SYSTEM FUNCTIONING?	☐ YES ☐ NO				
17. HELMSMAN DISPLAY FUNCTIONING ON TUG?	☐ YES ☐ NO				
18. GPS FUNCTIONING ON TUG?	☐ YES ☐ NO				
19. COMMENTS					
20. CONTRACTOR'S SIGNATURE	PRINT NAME:		TIME / DATE:		
21. PERMITTEE/REPRESENTATIVE'S SIGNATURE	PRINT NAME:		TIME / DATE:		
22. THE DECISION TO PROCEED TO THE OCEAN DISPOSAL SITE, BASED UPON ALL AVAILABLE DATA INCLUDING THE RECORDING AND CALCULATIONS ON THIS FORM, IS ALSO SUBJECT TO THE PROFESSIONAL JUDGEMENT OF THE TUG CAPTAIN AS TO THE SAFETY OF THE CREW AND VESSEL.					
TUG CAPTAIN'S SIGNATURE:	PRINT NAME:		TIME / DATE:		
DATE/TIME OF DUMP:					
BARGE X OR LONGITUDE:					
BARGE Y OR LATITUDE:					
TUG X OR LONGITUDE:					
TUG Y OR LATITUDE:					
DATE/TIME OF DISPOSAL VESSEL CLOSURE:					
BARGE X OR LONGITUDE:					
BARGE Y OR LATITUDE:					
TUG X OR LONGITUDE:					
TUG Y OR LATITUDE:					
ADDITIONAL COMMENTS, PROBLEM DESCRIPTIONS, ETC.					

11 APPENDIX E – HISTORY OF DISPOSAL AT THE CHARLESTON ODMDS

Table E1. Historical Use of the Charleston ODMDS.

YEAR	Port Authority Quantity (cys)	Federal Quantity (cys)	Annual Total (cys)
1991	68,093		68,093
1992	1,315,091		1,315,091
1995	37,363	1,735,000	1,772,363
1997		775,000	775,000
1999		1,563,000	1,563,000
2000	281,474	2,061,000	2,342,474
2002	54,273	708,000	762,273
2003	69,889	1,927,000	1,996,889
2004		2,191,000	2,191,000
2006		1,179,000	1,179,000
2007		1,452,000	1,452,000
2008		2,161,000	2,161,000
2009		862,000	862,000
2010		1,291,000	1,291,000
2011		1,233,000	1,233,000
2012		2,406,000	2,406,000
2013		628,000	628,000
2014		485,000	485,000
2015	-	1,235,122	1,235,122
2016	-	524,728	524,728
2017	-	2,631,025	2,631,025
2018	-	2,055,877	2,055,877
2019	204,634	2,211,535	2,416,169
2020	-	11,227,814	11,227,814
2021	1,535,052	14,959,009	16,494,061
2022	266,077	5,971,911	6,237,988
2023	-	2,083,498	2,083,498
2024	-	3,323,632	3,323,632
2025	-	1,171,241	1,171,241