Site Management and Monitoring Plan For the Pensacola Offshore Ocean Dredged Material Disposal Site Pensacola, Florida and Gulf of Mexico

September 2015

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

John J. Chytka Date	Heather McTeer Toney Date
Colonel, Corps of Engineers	Regional Administrator
District Commander	U.S. Environmental Protection Agency
P.O. Box 2288	Region 4
Mobile, Alabama	Atlanta, Georgia

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

PENSACOLA OFFSHORE ODMDS

SMMP

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1.0 INTRODUCTION.

It is the responsibility of the EPA and USACE under the MPRSA of 1972 to manage and monitor ODMDSs designated by EPA pursuant to Section 102 of the MPRSA. The goal of this management is to ensure ocean dredged material disposal activities will not unreasonably degrade the marine environment or endanger human health or economic potential. As part of this responsibility, a SMMP was originally developed as part of the ODMDS designation process and was published in September 1988 as part of the *Final Environmental Impact Statement (FEIS) for Designation of a New Ocean Dredged Material Disposal Site, Pensacola, Florida* to specifically address disposal of dredged material into the Pensacola Offshore ODMDS. This plan will include past monitoring results and will comply with provisions in WRDA of 1992 and a 2007 Memorandum of Understanding (MOU) between EPA, Region 4 and USACE, South Atlantic Division (SAD). Upon finalization of this SMMP, these provisions shall be requirements for all dredged material disposal activities at the Pensacola Offshore ODMDS. **All Section 103 (MPRSA) ocean disposal permits and concurrences shall be conditioned as necessary to assure consistency with the SMMP.**

This SMMP has been prepared in accordance with the *Guidance Document for Development of Site Management Plans for Ocean Dredged Material Disposal Sites* (EPA & USACE, 1996). This document provides a framework for the development of SMMPs required by MPRSA and WRDA of 1992. The SMMP may be modified if it is determined that such changes are warranted as a result of information obtained during the monitoring process. The SMMP will be reviewed and revised as needed or every 10 years, whichever time period is shorter.

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

USACE, Mobile District
Ms. Jennifer Jacobson
Mr. Matthew Lang
Mr. Larry Parson

Port of Pensacola
Ms. Amy Miller

USACE, Jacksonville District Regulatory
Mr. Clif Payne

EPA Region 4
Mr. Gary Collins

Florida Department of Environmental Protection
Ms. Elizabeth Orr

National Oceanic and Atmospheric Administration
Fisheries
Mr. Roy Crabtree
Mr. David Bernhart

U.S. Coast Guard
District Commander
Eighth District

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

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

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

USACE: The USACE is responsible for evaluating dredged material suitability, issuing MPRSA Section 103 permits, regulating site use, selecting MPRSA Section 103(b) ocean disposal sites if no suitable EPA designated site is available, and developing and implementing disposal monitoring programs. All of the above activities, with the exception of issuing MPRSA Section 103 permits, are handled by the Mobile District. Permitting activities for this part of Florida are handled by the Jacksonville District.

2.0 SITE MANAGEMENT.

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

Section 228.3 of the Ocean Dumping Regulations (40 CFR §220 - 229) states "management of a site consists of regulating times, rates, and methods of disposal and quantities and types of materials disposed of; developing and maintaining effective ambient monitoring programs for the site; conducting disposal site evaluation studies; and recommending modifications in site use and/or designation". The plan may be modified if it is determined that such changes are warranted as a result of information obtained through the monitoring process. MPRSA, as amended by WRDA of 1992, provides SMMPs shall include but not be limited to:

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

- A schedule for review and revision of the plan.

2.1 <u>Disposal Site Characteristics</u>. The Pensacola Offshore ODMDS was designated by EPA, Region 4 in September 1988 for fine-grained material dredged from the Pensacola area (**Figure 1**) that meets Ocean Dumping Regulations (40 CFR §220-229), but is not suitable for beach nourishment. Boundary coordinates of the Pensacola Offshore ODMDS are shown in **Table 1**, North American Datum (NAD) 27:

Table 1: Pensacola Offshore ODMDS Corner Coordinates

Latitude 30°08'50" N	Longitude 87°19'30" W
Latitude 30°08'50" N	Longitude 87°16'30" W
Latitude 30°07'05" N	Longitude 87°16'30" W
Latitude 30°07'05" N	Longitude 87°19'30" W
State Plane 0903 (Florida North)	
Northing 428347.51	Easting 1075701.81
Northing 427959.37	Easting 1091501.16
Northing 417355.53	Easting 1091243.06
Northing 417743.77	Easting 1075439.07

The Pensacola Offshore ODMDS is located in the Gulf of Mexico approximately 11 miles south of Pensacola Pass (**Figure 2**). The site covers an approximately 6-square mile rectangular area, with a bottom surface that generally declines in an easterly/southeasterly direction at elevations ranging from -63 to -93 feet mean lower low water (MLLW).

Future disposal of sediments will be within a bermed area created during the site's initial use in 1988-89 as illustrated in **Figure 3**. This area is in the shape of a horseshoe, with berms on the south, east, and north sides of the disposal site. The bottom elevation within the bermed area varies from -68 to -83 feet MLLW. The distance between crests of the north and south berms is approximately 6,050 feet. The east-west extent of the area from the crest of the east berm to high ground varies from 6,000 to 11,000 feet. The following is the original design information for the bermed area:

- Crest elevation -70 feet MLLW;
- East berm alignment along longitude 87˚ 17' 00" W from latitude 30˚ 07' 28" N to 30˚ 08' 13" N; and
- South and North berm alignments 30˚ 07' 28" N to 30˚ 08' 13" N, respectively.

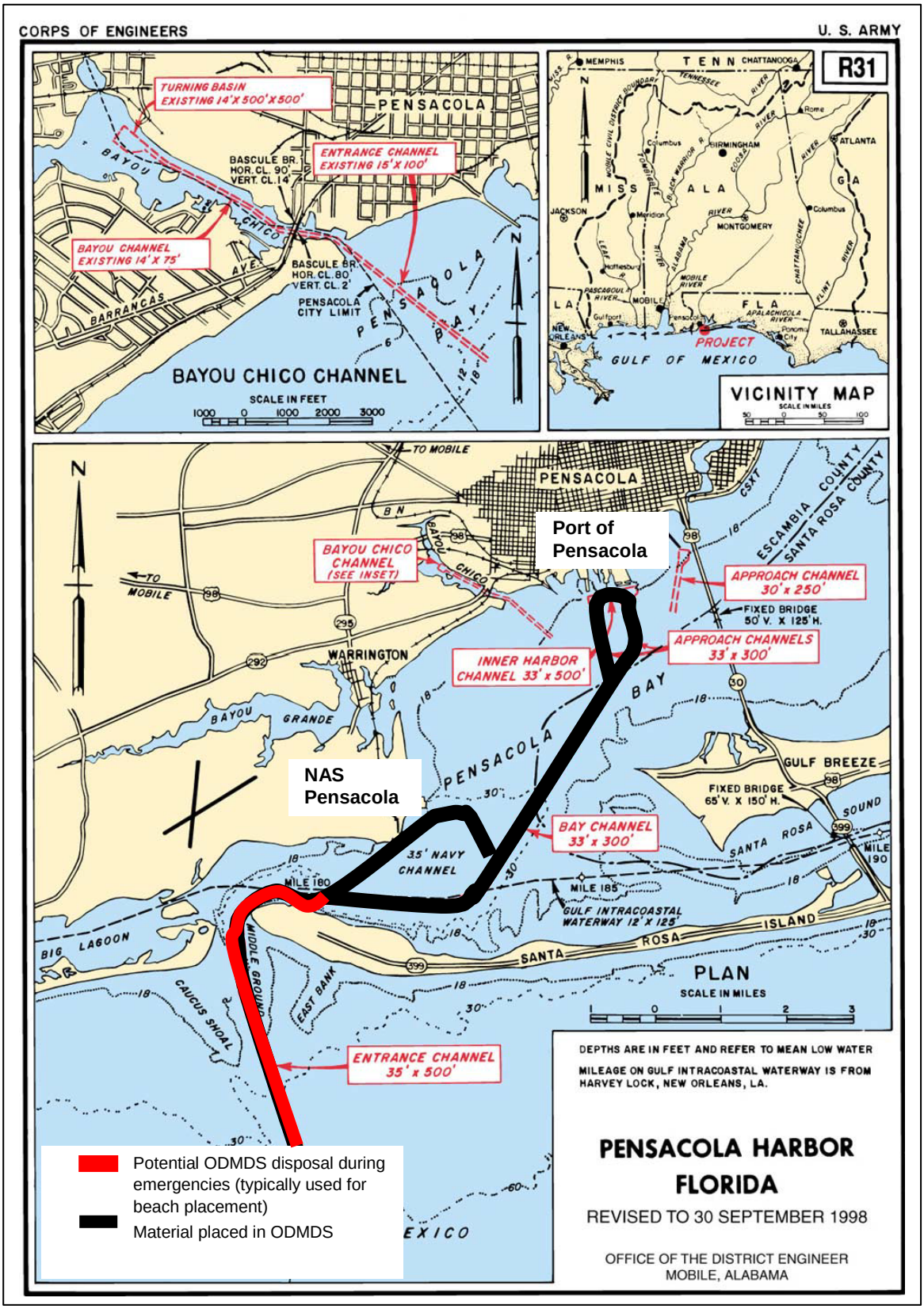


Figure 1: Pensacola Harbor Project Map.

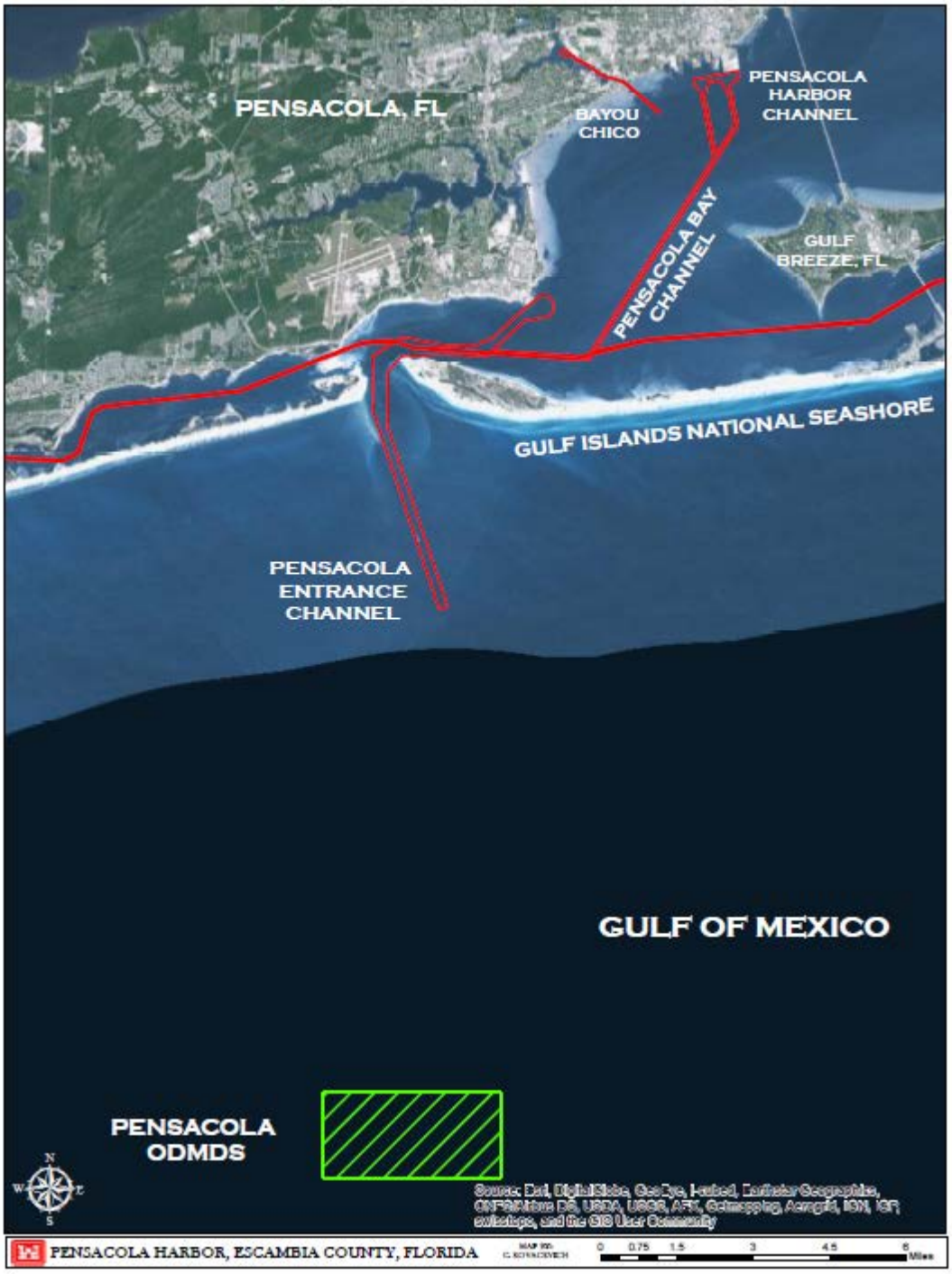


Figure 2: Location of the Pensacola Offshore ODMDS

Hydrographic surveys were conducted of the northern and southern berms in February 2001 and of the eastern berm in August 2003. The crest of the berms varied in elevation from -77 to -72 feet MLLW and deviated from the intended alignment by up to 200 feet. Likewise, the berm heights varied up to 8 feet and base widths varied up to 800 feet (**Figure 3**). Side slopes near the toes and crests were generally rounded, with side slopes at approximately 1-foot vertical to 40 feet horizontal or flatter. Surveys

conducted in May 2014 (**Figures 4 & 5**) show the berm is distinguishable and intact. Although there is some variation from the original berm design, the existing configuration will continue to provide sufficient capacity over more than the 25-year project life.

Management goals expected to be gained with this plan were restriction of movement of fine-grained materials in the northerly or easterly direction. Subsequent surveys confirm sediments were confined, as expected, and did not show any evidence contrary to expected results. Additionally, the area has experienced numerous storm events over the past 30 years. Storm events occurring in the vicinity of the Pensacola Offshore ODMDS since 2004 are listed in **Table 2**.

Table 2: Storm Activity in the Vicinity of the Pensacola Offshore ODMDS

Storm	Year
Ivan[1]	2004
Arlene[2]	2005
Cindy[2]	2005
Dennis[1]	2005
Katrina[1]	2005
Tammy[2]	2005
Alberto[2]	2006
Fay[2]	2008
Claudette[2]	2009
Ida[1]	2009
Bonnie[2]	2010
Isaac[1]	2012
Andrea[2]	2013

[1]Hurricane, [2]Tropical Storm

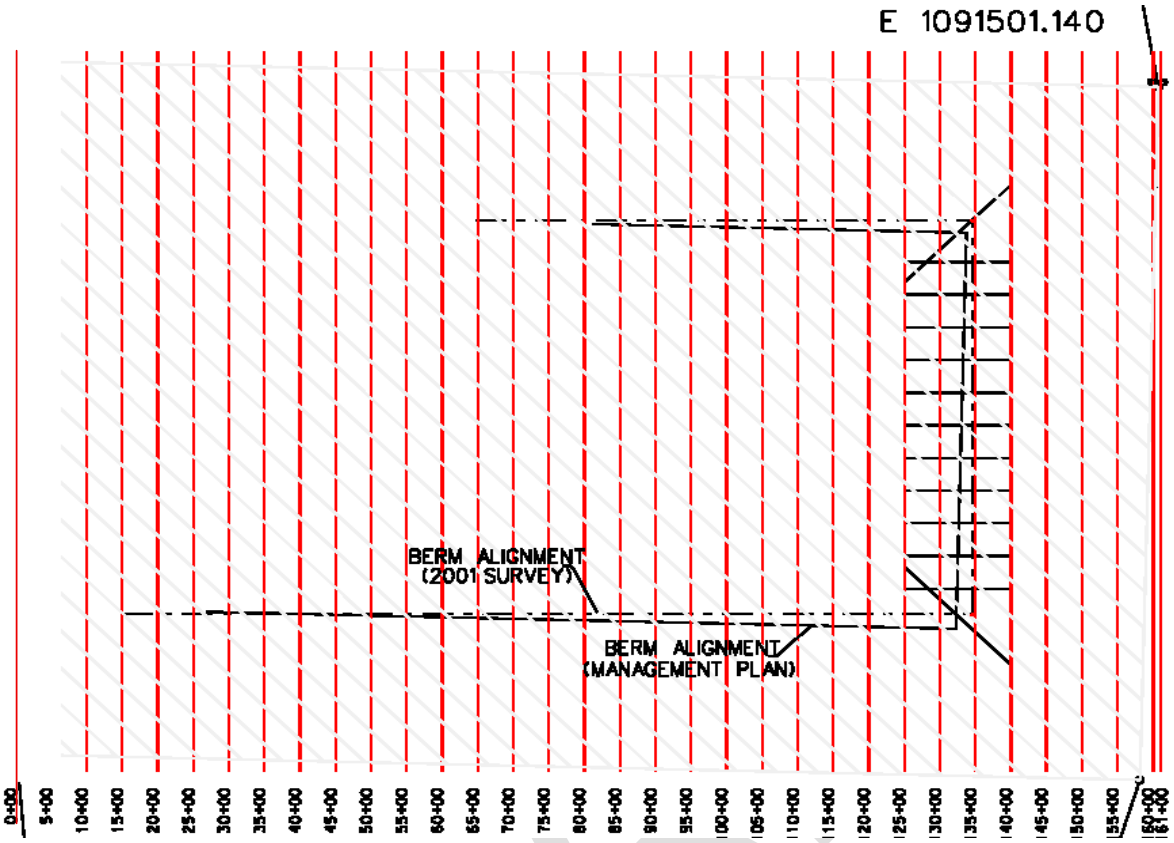


Figure 3: Berm alignment within the Pensacola Offshore ODMDS based on 2001 and 2003 surveys.

Upon completion of the berm construction, the Pensacola Offshore ODMDS was used for disposal of dredged material from the Navy Homeport of Pensacola between 1989 and 1990. The Pensacola Offshore ODMDS is also available for disposal from the Pensacola Harbor Federal navigation channel and private dredging activities (permitted regulatory actions). The USACE and the U.S. Navy were cooperating agencies of the September 1988 FEIS for site designation. Baseline physical and biological conditions at the Pensacola Offshore ODMDS were described in the 1988 FEIS. Physical, chemical, and biological conditions of dredged material to be placed at the Pensacola Offshore ODMDS are more recently described in the *Final Evaluation of Dredged Material-Pensacola Harbor Navigation Channel Project-Pensacola, Escambia County, Florida* (May 2013).

Future use of the Pensacola Offshore ODMDS is projected to occur from dredging the federally authorized Pensacola Harbor channels, and private users such as the Port of Pensacola or Pensacola Naval Air Station (NAS). Other than projected quantities in *Section 2.3*, additional uses may occur by private entities and therefore the exact nature and quantity of material, time of disposal, and type of equipment to be used are unknown for those permitted regulatory actions.

2.2 <u>Management Objectives</u>. Appropriate management of an ODMDS is aimed at assuring disposal activities will not unreasonably degrade or endanger human health, welfare, the marine environment or economic potentialities (MPRSA §103(a)). There are three primary objectives in managing the Pensacola Offshore ODMDS:

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

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

2.3 Disposal History and Dredged Material Volumes. It is intended that the Pensacola Offshore ODMDS will be used for dredged material (both maintenance and new work material) from the greater Pensacola Bay, Escambia County, Florida vicinity. The primary users of the Pensacola Offshore ODMDS are:

- USACE Mobile District
- Private Applicants (i.e. Regulatory Actions)

Disposal history can be found at the Ocean Disposal Database maintained by the Engineer Research and Development Center (ERDC) (http://el.erdc.usace.army.mil/odd/). The Navy conducted dredging activities in 1989 through 1990 from the Gulf of Mexico thru Pensacola Pass to the turning basin located adjacent to Pensacola NAS. This dredging was conducted as part of the Navy Gulf Coast Strategic Homeporting. Four different disposal areas were used during this dredging including approximately 3.77 million cys (from the Navy turning basin) in the Pensacola Offshore ODMDS. In addition to the dredging conducted for the Navy, emergency dredging of the eastern leg of the Pensacola inner harbor channel was conducted in August 2004. Approximately 30,000 cys of material was dredged and placed in the Pensacola Offshore ODMDS. Prior to this dredging event, the inner harbor and bay portions of the Pensacola Harbor navigation channel had not been maintained since 1973. In 2005, another 337,328 cys of maintenance material from the rest of the Pensacola Harbor navigation channel was placed in the site. The most recent disposals of maintenance material from the navigation channel occurred in 2013 and 2014 (313,872 cys and 261,194 cys, respectively). Disposal events associated with the Pensacola Offshore ODMDS are summarized in **Table 3**. Future volumes and rates of disposal, from both Federal and private applicants, are expected to range on the order of approximately 350,000 cys per dredging and disposal event on a 2 to 3 year cycle.

Table 3: Dredged material disposal at the Pensacola Offshore ODMDS

Year	Volume (cys)	Material Type	Project
1989-90	3,778,300	NW: Sandy Mud/Silt	Navy Homeport
2004	30,000	Mud/Silt	Pensacola Harbor Emergency
2005	337,328	Sandy Mud/Silt	Pensacola O&M
2013	313,872	Sandy Mud/Silt	Pensacola O&M
2014	261,194	Sandy Mud/Silt	Pensacola O&M

Notes: cubic yards = CY; new work = NW, * Pre-site designation

The Pensacola Offshore ODMDS consists of medium to coarse sand substrate. Currents within the site range from 0.722 feet/sec at a depth of -30 feet MLLW and 0.525 feet/sec at a depth of -56 feet MLLW (Appendix A). These currents are not sufficient to move the medium sands in the Pensacola Offshore ODMDS, however during hurricanes or extreme storm events the likelihood increases. Dredged material placed, or projected for disposal, is less dense and could be dispersed more readily. Hydrographic surveys of the Pensacola Offshore ODMDS conducted in 2014 (**Figures 4 & 5**) show the area has remained relatively stable and intact since its last use in 2013. Given the site's demonstrated stability through these events, including major storms such as Hurricanes Opal (1995), Ivan (2004), Dennis and Katrina (2005), and lesser hurricanes Ida (2009) and Isaac (2012), it is unlikely that significant sediment movement would have resulted from these events. In the event that a pre-disposal survey indicates a deterioration of the submerged berm, appropriate materials from the next disposal action will be used to restore the berm to acceptable dimensions.

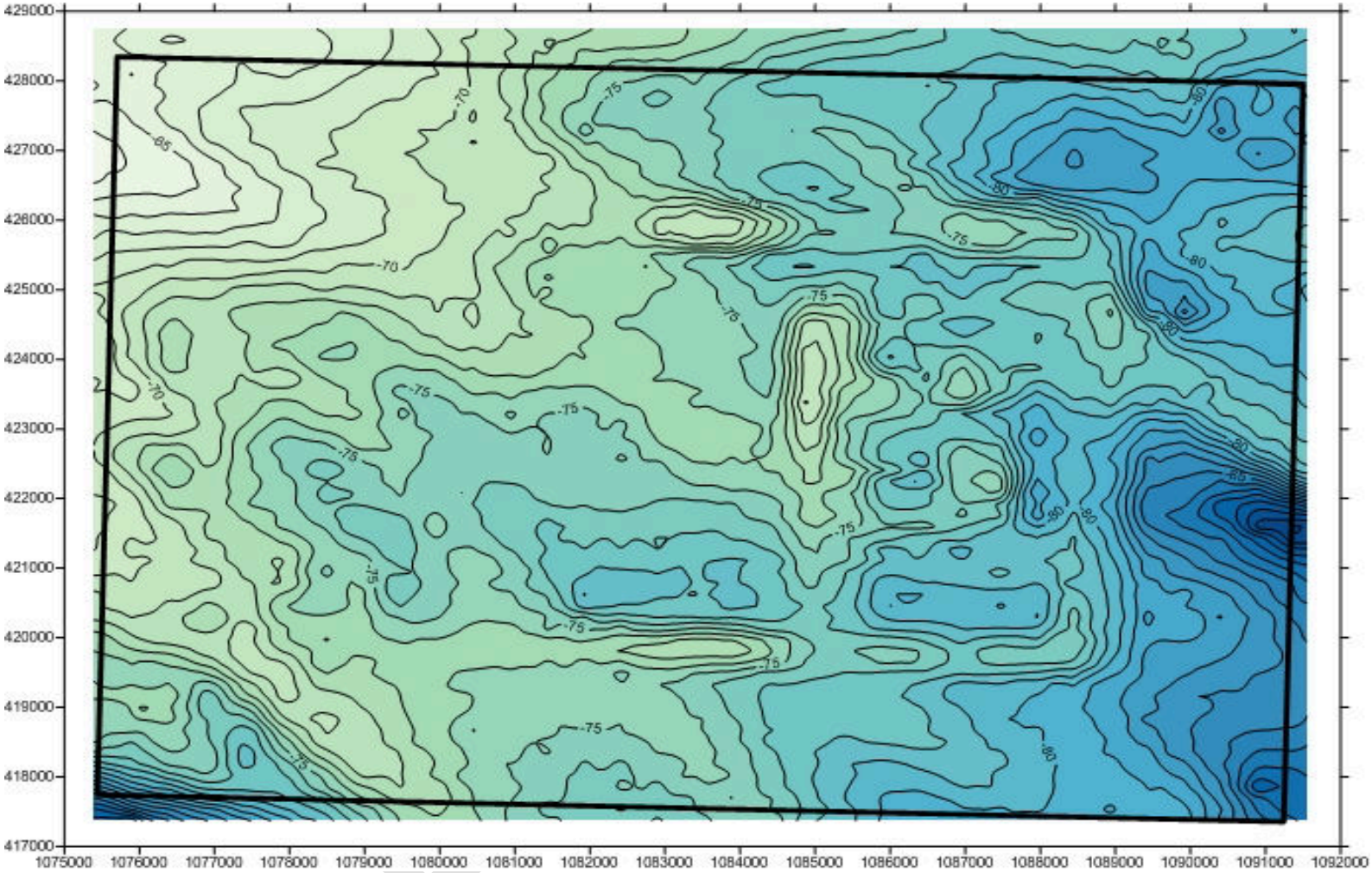


Figure 4: Hydrographic survey of Pensacola Offshore ODMDS, 2014

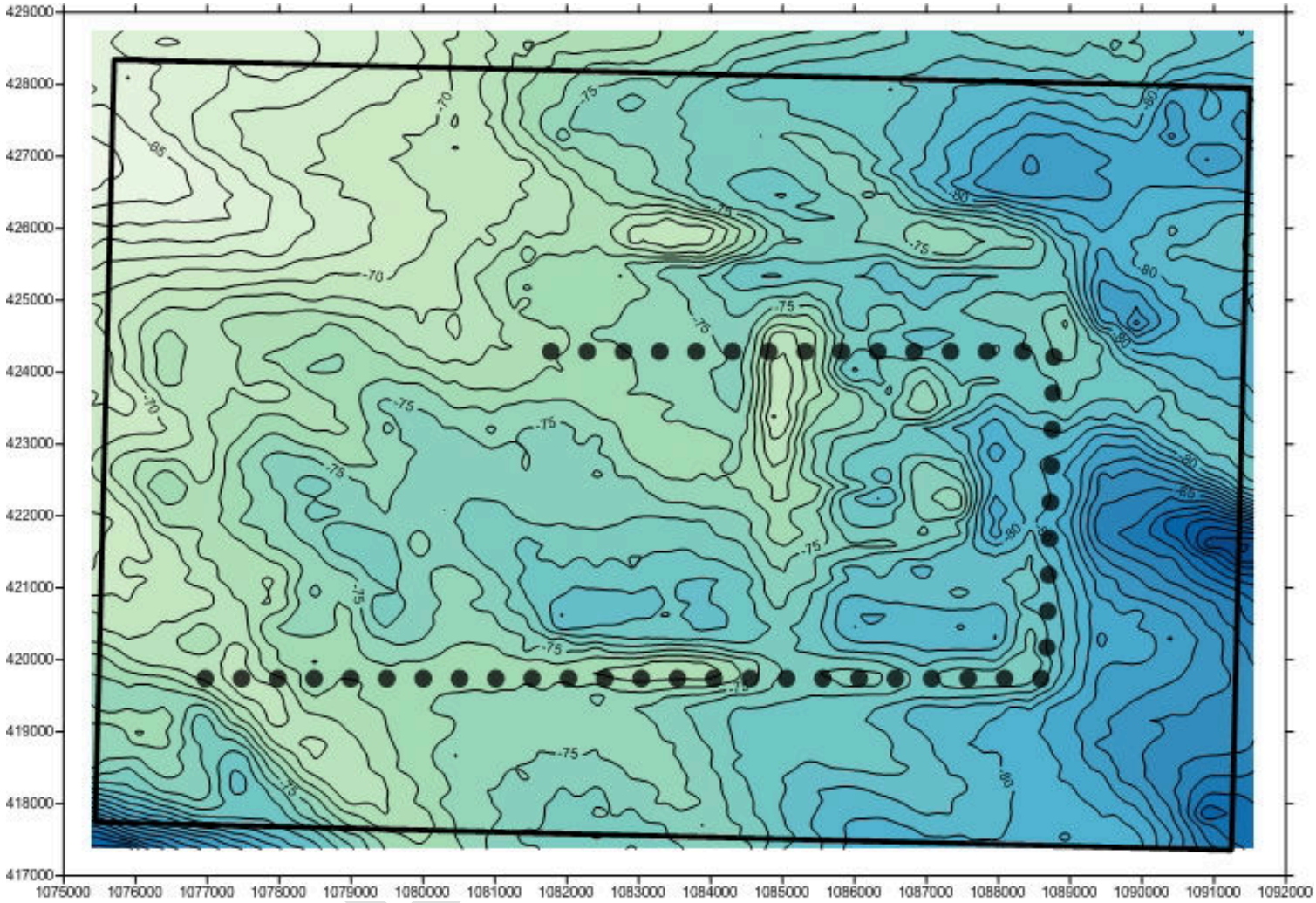


Figure 5: Hydrographic survey of Pensacola Offshore ODMDS, 2014 Including Berm Alignment

2.4 Material Suitability. USACE Beneficial Use of Dredged Material Engineer Manual (EM) 1110-2-5026 requires dredged material be maximized within the coastal system. Dredged materials that qualify for beach or near-shore disposal per applicable State of Florida standards shall be beneficially placed in such locations, to the maximum extent practicable, and the State of Florida will exercise its authority and responsibility during any future permitting activities. Beneficial use of compatible dredged material for beach nourishment is strongly encouraged and supported by EPA. All sandy material from the lower portion of the Federal Pensacola navigation project, including the entrance channel, is typically placed on Escambia County, Florida beaches for nourishment instead of ocean disposal. In fact, the USACE manages its dredged material under its Regional Sediment Management (RSM) initiative to be used beneficially and remain within the natural sediment budget. As a result, the USACE evaluates the whole coastal system when managing dredged material placement rather than focusing on an individual project. Disposition of beach quality sand should be planned to allow material to be placed so that it will be within or accessible to the sand-sharing system, to the maximum extent practicable, and following provisions of the Clean Water Act (CWA).

Two potential sources of material are expected to be placed at the site, new work and maintenance dredged material. These materials will consist of mixtures of silts, clays, and sands in varying percentages. Sediments dredged for navigational purposes in the Pensacola Harbor and NAS Pensacola Channels include an ocean source (sandy, littoral materials), river source (fine-grained sands, silts, and clays derived from easily eroded soils from the upper Escambia River basin), and mixtures of both. Shoals occur where specific physical factors promote deposition or movement of sediments.

The suitability of dredged material for ocean disposal must be verified by the USACE and concurred with by EPA prior to disposal. Verification will be valid for three years from the most current verification. Verification will involve:

1) a case-specific evaluation against exclusionary criteria (40 CFR 227.13(b)),
2) a determination of the necessity for testing including bioassay (toxicity and bioaccumulation) testing for non-excluded material based on the potential for contamination of the sediment since last tested, and
3) carrying out the testing (where needed) and determining that the non-excluded, tested material is suitable for ocean disposal.

Verification documentation for suitability will be completed prior to use of the ODMDS. Documentation will be in the form of a MPRSA Section 103 Evaluation. Potential testing and Evaluation will follow procedures outlined in the 1991 EPA/USACE Dredged Material Testing Manual (Green Book) and 2008 Southeast Regional Implementation Manual (SERIM) or appropriate updated versions. This includes how dredging projects will be subdivided into project segments for sampling and analysis. The MPRSA Section 103 Evaluation will be in the form outlined in Appendix C of the SERIM. Water Quality Compliance determinations will be made using the short-term fate of dredged material (STFATE-ADDAMS) model. Only material determined to be suitable and in compliance with the Ocean Dumping Criteria (40 CFR §227) through the verification process by the USACE and EPA, Region 4 can be disposed in the ODMDS. In addition, the site has been restricted to predominantly fine-grained material that is not suitable for beach nourishment or that does not have a median grain size of > 0.125 mm and a composition of < 10 % fines.

2.5 Timing of Disposal. At present, no restrictions have been determined to be necessary for disposal related to seasonal variations in ocean current or biotic activity. As monitoring results are compiled, should any such restrictions appear necessary, disposal activities will be scheduled so as to avoid adverse impacts. Monitoring and precautions necessary to protect sea turtles and Gulf sturgeon, as described in *Section 2.6*, are required when using hopper dredges. Additionally, if new information indicates that endangered or threatened species are being adversely impacted, restrictions may be implemented.

2.6 Disposal Techniques. No specific disposal technique is required for this site. In order to protect sea turtles and Gulf sturgeon, the NMFS requires monitoring according to guidance outlined in the *Regional Biological Opinion for Dredging of Gulf of Mexico Navigation Channels and Sand Mining ("Borrow") Areas Using Hopper Dredges by USACE Galveston, New Orleans, Mobile, and Jacksonville Districts* (NMFS, 2003, amended 2005 & 2007) with all standard surveillance and evasive measures to protect sea turtles employed during all placement operations at the Pensacola Offshore ODMDS. "Standard manatee conditions: issued by the USFWS would be followed to minimize adverse impacts to marine mammals within the project area.

2.7 Disposal Location. Disposal shall occur no less than 330 feet (100 meters) inside the site boundaries to comply with 40 CFR §227.28. Disposal methods to prevent mounding of dredged material from becoming an unacceptable navigation hazard will be used. Dredged material shall be placed so that at no point will depths be less than -55 feet MLLW. To maximize Pensacola Offshore ODMDS capacity and minimize mounding of material, disposal events shall be scattered throughout specified disposal zones through consultation with USACE and EPA, Region 4 staff. Depths will be monitored to detect if adjustments to disposal methods are needed to prevent unacceptable mounding. While control of disposal to minimize mounding is preferred, the physical removal or leveling of material above -55 feet MLLW is a management alternative should mounds greater than those elevations occur.

2.8 Permit and Contract Conditions. Pre and post-disposal monitoring requirements described under *Section 3.0 Site Monitoring* will be included as conditions on all MPRSA Section 103 permits and will be incorporated in the contract language for all Federal projects. A summary of the management and monitoring requirements to be included are listed in **Table 4**.

Table 4: Summary of Permit and Contract Conditions

Condition	Reference
Dredged Material Suitability and Term of Verification	Pensacola Offshore ODMDS SMMP page 12
Disposal within Appropriate Zones	Pensacola Offshore ODMDS SMMP page 13
Post Bathymetric Surveys within 30 days of Project Completion	Pensacola Offshore ODMDS SMMP page 18
Disposal Monitoring and Recording of Disposal Locations	Pensacola Offshore ODMDS SMMP page 17&18
Reporting Requirements: Daily & Monthly Operations Reports and Disposal Summary Reports within 90 Days of Project Completion	Pensacola Offshore ODMDS SMMP page 21&22

2.9 Permit Process. All ocean disposal of dredged material, with exception of Federal Civil Works projects, requires an ocean dumping permit issued by the USACE pursuant to Section 103 of the MPRSA. A summary of the permitting process can be found in 33 CFR Parts 320-325.

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

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

As part of site management, EPA and the USACE will investigate alternatives for appropriate data management. The USACE has an Ocean Disposal Database maintained by ERDC. This database provides quantities placed at the Pensacola Offshore ODMDS along with chemical, physical, and biological information, and whether the project is civil works or a privately permitted action.

The Mobile District Spatial Data Branch (CESAM-OP-J) has created an online Sediment Sampling Mapping Module that has capacity to organize and access all data relating to core borings and sediment testing activity. This application will allow users to retrieve detailed sediment sample properties (e.g. X, Y locations, harbor bottom elevations, top of rock elevation, or material characteristics) correlating with all relevant sediment testing (chemical, biological, or physical) results, and link related documents such as core borings, gradation curves or sediment testing reports.

In an attempt to streamline data sharing, EPA Region 4 and USACE, SAD has agreed on an eXtensible Markup Language (XML) standard for sharing of disposal monitoring data (see also *Section 3.5*).

3.0 SITE MONITORING.

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

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

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

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

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

Table 5 lists surveys and studies conducted at, or in the vicinity of, the Pensacola Offshore ODMDS dating back to 1986.

Table 5: Surveys and Studies Conducted at or in the vicinity of the Pensacola Offshore ODMDS

Survey/Study Title	Conducted By:	Date	Purpose	Results
Summary of Currents off Pensacola, FL	Physical Oceanography Division, Naval Ocean Research & Development Activity	July 1998	Document currents in the potential dredged material disposal site as part of Navy homeport project	Currents were non-tidal, wind driven, westward and parallel to the coast
Water Quality and Sediment Data	EPA	Nov 1986, Apr 1987, and July 1987	Determine water quality and sediment characteristics at the Pensacola Offshore ODMDS	Predominantly medium and coarse sands at the ODMDS. Sediments analyzed for metals, nutrients, oil and grease, pesticides and PCBs were either below MDLs or in very low concentrations. Salinity, temp, DO, and %light transmission were normal for water quality parameters

Pensacola Offshore ODMDS Benthic Communities Study		Nov 86 & Apr 87	Benthic community characterization	Infaunal communities characteristic of medium and coarse grain sediments of the northern Gulf of Mexico; dominated by polychaetes.
Characteristics of Dredged Material Proposed for Disposal	Dredged Materials Research Team, EPA	Aug 1988	Determine effects of dredged material on representative marine organisms	Proposed dredge material were not acutely toxic nor were chemicals in them bio-available for accumulation to concentrations of concern.
Video, Still Photography and Side Scan Sonar		1989		No live/hard bottoms detected
Bathymetric Survey	USACE	1989	Monitor bathymetry changes	Depths at the ODMDS range from -60 to -95 feet with an average of -76 feet MLLW.
Disposal Monitoring	Navy	1989-90	Compliance	Insured dredged material was placed within the ODMDS in specified area.
Post Disposal Bathymetric Survey	USACE	1990	Monitor bathymetry changes	Dredged material was placed within designated area and berm was verified.
Post Disposal Sediment Mapping	EPA	Apr & Oct 90; Oct 93	Map sediment distribution patterns	Dredged material was distinguishable from bottom sediment; migration was as predicted
Post Disposal Benthic Communities assessment	EPA	Oct 90 & 93	Evaluate benthic community parameters within and outside of dredged material influences	No adverse impacts to benthic communities as a result of dredged material disposal
Bathymetric Survey	EPA	2/2001	Monitor bathymetry changes	Berm still distinguishable. Disposed material within ODMDS.
Evaluation of Dredged Material from Pensacola Harbor, Escambia County, Florida	USACE	5/2002	Evaluate suitability of proposed dredged material for ocean disposal	Proposed dredged material is primarily silts and clays. Bulk sediment analysis; elutriate testing, water column bioassays, whole sediment bioassays, and bioaccumulation studies resulted in acceptable levels for ocean disposal.
Bathymetric Survey	USACE	9/2003	Monitor bathymetry changes	Berm still distinguishable. Disposed material within ODMDS. Collect bathymetric data to evaluate site for determining future disposal areas within ODMDS.

Bathymetric Survey	USACE	8/2004	Post-disposal surveys. Emergency dredging of Pensacola Harbor.	Material from emergency dredging of Pensacola Harbor placed within ODMDS. Site features remain distinguishable.
Bathymetric Survey	USACE	11/2004	Post-disposal surveys. O&M dredging of Pensacola Harbor.	Material from emergency dredging of Pensacola Harbor placed within ODMDS. Site features remain distinguishable.
Evaluation of Dredged Material from Lower Pensacola Harbor Post Deepwater Horizon Oil Spill	USACE	3/2012	Evaluate suitability of proposed dredged material for ocean disposal post oil spill.	Results of PAH and TPH testing of surface sediments showed no discernible evidence that sediment quality had been impacted by the Deepwater Horizon Oil spill.
Evaluation of Dredged Material from Pensacola Harbor, Escambia County, Florida	USACE	5/2013	Evaluate suitability of proposed dredged material for ocean disposal.	Proposed dredged material is primarily silts and clays. Bulk sediment analysis; elutriate testing, water column bioassays, whole sediment bioassays, and bioaccumulation studies resulted in acceptable levels for ocean disposal.
Status and Trends Assessment (40 CFR §228.13)	EPA	9/2013	To determine the physical, chemical, geological, and biological structure of the ODMDS	Benthic community is viable and healthy and in recovery with no adverse effects of disposal of dredged material.
Bathymetric Survey	USACE	11/2014	Pre-disposal surveys. O&M dredging of Pensacola Harbor.	Material from O&M dredging of Pensacola Harbor placed within ODMDS. Site features remain distinguishable.

3.1 <u>Baseline Monitoring</u>. Disposal has occurred at the site since the late 1980's for Pensacola Navy channel dredging operations, emergency dredging of the Pensacola inner harbor in 2004, and O&M dredging of the Pensacola Federal navigation channel in 2013 and 2014. Prior to 1990, and as part of the *Final Environmental Impact Statement for Designation of a New Ocean Dredged Material Disposal Site, Pensacola, Florida* dated 1988, numerous surveys and studies have been conducted at the Pensacola Offshore ODMDS in relation to disposal activities. Detailed results of these studies provide a baseline and are presented in the aforementioned designation FEIS. Those studies and subsequent surveys listed in **Table 5** serve as the main body of data for monitoring impacts associated with the use of the Pensacola Offshore ODMDS. Both pre and post-disposal surveys will be conducted associated with future dredging and disposal activities.

3.2 <u>Disposal Monitoring</u>. 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 the horizontal location and draft condition (accuracy± 0.1 foot) of the disposal vessel (i.e. hopper or 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 mile or every 4 minutes

during travel to and from the Pensacola Offshore ODMDS and twelve seconds or every 30 feet of travel, while the hull status is open within the Pensacola Offshore ODMDS. In addition to the continuous tracking data, the following trip information shall be electronically recorded for each dredging and disposal cycle:

a. Load Number
b. Disposal Vessel Name and Type (e.g. hopper, scow)
c. Estimated volume of Load
d. Description of Material Placed
e. Source of Dredged Material
f. Date, Time and Location 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://dqm.usace.army.mil/Specifications/Index.aspx], although other systems are acceptable. Disposal monitoring and ETS data will be reported to EPA Region 4 on a weekly basis (within 1 week of disposal) utilizing the eXtensible Markup Language (XML) specification and protocol per *Section 3.5*. EPA Region 4 and USACE, Mobile District shall be notified within 24 hours if disposal occurs outside of the Pensacola Offshore ODMDS or specified disposal zone, or if excessive leakage occurs.

3.3 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 cubic yards]. Surveys will conform to the minimum performance standards for Corps of Engineers 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. Surveys will be taken along lines spaced at 500-foot intervals or less. The minimum performance standards from Table 3-1 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 Mean Lower Low Water (MLLW) datum. The horizontal datum should be referenced to the local State Plane Coordinate System (SPCS) for the Pensacola area (Florida North – 0903) or in Geographical Coordinates (latitude-longitude). The horizontal reference datum should be the North American Datum of 1983 (NAD 83).

The number and length of transects required will be sufficient to encompass the Pensacola Offshore ODMDS and a 500-foot wide area around the disposal zone. The survey area may be reduced on a case-by-case basis if disposal zones are specified and adhered to.

3.4 Material Tracking and Disposal Effects Monitoring. Surveys can be used to address possible changes in bathymetric, sedimentological, chemical, and biological aspects of the Pensacola Offshore ODMDS and surrounding area as a result of the disposal of dredged material at the site.

3.4.1 Summary of Results of Past Monitoring Surveys. **Table 5** lists past surveys at the Pensacola Offshore ODMDS. In general, the surface of the site is covered by sand waves dominated by coarse and medium sand with varying amounts of shell fragments. Bottom current data within the Pensacola Offshore ODMDS indicates that fine-grained dredged material has the potential to be dispersed beyond the

designated site boundaries. The original purpose for the creation and design of the berm structure was to restrict the dredged material migration to only a generally southwest direction. The seafloor has a natural depression along that orientation that leads to deeper waters. USACE bathymetric surveys indicate the submerged berm structure was stable and acted to manage dispersion of finer grained dredged material.

The most recent monitoring of the Pensacola Offshore ODMDS was completed in September 2013 (USEPA, 2014). Results of this survey indicate that the benthic community is viable and the only discernable differences seen were at two sample locations that had been recently disposed on (less than 8 weeks prior to survey). The physical nature of the dredged material in those locations is believed to account for the slow recovery seen at that time.

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

Within 30 days of completion of a disposal event, detailed bathymetric surveys of the disposal area will be completed. The interagency team will meet, if necessary, to review the results of these efforts and determine the need for additional information. This need will be based on observance of any anomalies (i.e. potential cultural resources) or potential adverse impacts associated with a specific event. If the results of the bathymetric surveys do not indicate any anomalies or adverse impacts, no additional monitoring will be required for the disposal event. Reassessment of the site will be undertaken in accordance with 40 CFR §228.13 approximately every 10 years. Status and trend assessments include characterization of water quality, benthic communities, and sediment size/chemistry allowing for identification and interpretation of changes in community structure. Additional surveys for water quality, sediment mapping, or the use of remote sensing equipment may also be required.

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

Future surveys as outlined in **Table 6** will focus on determining the rate and direction of placed dredge material dispersal and the capacity of the Pensacola Offshore ODMDS. The management plan presented may require revision based on the outcome of any monitoring program.

Table 6: Pensacola Offshore ODMDS Monitoring Strategies and Thresholds for Action

Goal	Technique	Sponsor	Rationale	Frequency	Threshold for Action	Management Options	
						Threshold Not Exceeded	Threshold Exceeded
Monitor Bathymetric Trends	Bathymetry	Site User	Determine the extent of the disposal mound and major bathymetric changes	Post Disposal for projects greater than 50,000 cy	Disposal mound occurs outside ODMDS boundaries	Continue Monitoring	-Modify disposal method/disposal -Restrict disposal volumes
Benthic Effects Monitoring & Trend Assessment (40 CFR 228.13)	Water and Sediment Quality, Benthic Community Analysis	EPA	Periodically evaluate the impact of disposal on the marine environment (40CFR 228.9)	Approximately every 10 years	-Absence from the site of pollution sensitive biota -Progressive non-seasonal changes in water or sediment quality	Continue Monitoring on prescribed schedule	-Conduct Environmental Effects Monitoring or Advanced Environmental Effects Monitoring -Review dredged material evaluation
Environmental Effects Monitoring	Chemical Monitoring Benthic Monitoring	EPA/ USACE	Determine if chemical contaminants are significantly elevated[1] within and outside of site boundaries Determine whether there are adverse changes in the benthic populations outside of the site and evaluate recovery rates	Implement if disposal footprint extends beyond the site boundaries or if Trend Assessment results warrant. . .	Contaminants are found to be elevated[1] Adverse changes observed outside of the site that may endanger the marine environment	Discontinue monitoring.	- Institute Advanced Environmental Effects Monitoring - Implement case specific management options (ie. Remediation, limits on quantities or types of material). -Consider isolating dredged material (capping)
Advanced Environmental Effects Monitoring	Tissue Chemical Analysis Benthic Monitoring	EPA/ USACE	Determine if the site is a source of adverse bioaccumulation which may endanger the marine environment Determine if the site is a source of adverse sub-lethal[2] changes in benthic organisms which may endanger the marine environment	Implement if Environmental Effects Monitoring warrants	Benthic body burdens and risk assessment models indicate potential for food chain impacts. Sub-lethal effects are unacceptable.	Discontinue monitoring	-Discontinue site use - Implement case specific management options (i.e. Remediation, limits on quantities or types of material).

Site Capacity	MPFATE/ Long Term Fate	USACE/ Site Users	Determine dispersiveness of site and long and short term capacity	As resources allow	New work volumes exceed estimated capacity	Continue to use site without restrictions	- Enlarge site or designate additional site for new work
Long-term Fate	Modeling	EPA/USACE	Determine dispersiveness of site and aerial extent of impact	As resources allow	Aerial extent of impact reaches resources of concern and/or increases over time	Continue to use site without restrictions	-Restrict disposal volumes -Create berms to decrease dredged material transport -Cease site use / designate new site
	Current Meter & Wave Gauge	EPA/USACE/Site User					
	Precision Bathymetry	EPA/USACE					
Insure Safe Navigation Depth	Bathymetry	Site User	Determine height of mound and any excessive mounding	Post Disposal for projects greater than 50,000 cy	Mound height > -55 feet MLLW	Continue Monitoring	-Modify disposal method -Restrict disposal volumes
					Mound height > -50 feet MLLW	Continue Monitoring	- Halt disposal - Physically level material
Compliance	Disposal Site Use Records	Site User	-Ensure management requirements are being met -To assist in site monitoring	Daily during the project	Disposal records required by SMMP are not submitted or are incomplete	Continue Monitoring	-Restrict site use until requirements are met
					Review of records indicates a dump occurred outside ODMDS boundary	Continue Monitoring	-Notify EPA, Region 4/USACE, and investigate why egregious dump(s) occurred. Take appropriate enforcement action.
					Review of records indicates a dump occurred in the ODMDS but not in target area	Continue Monitoring	-Direct disposal to occur as specified.

[1] 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.

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

3.5 <u>Reporting and Data Formatting</u>. Disposal monitoring data shall be provided electronically by the USACE Project Manager to EPA Region 4. Disposal monitoring data shall be provided to EPA Region 4 electronically on a weekly basis (within one week of disposal event). Data shall be provided per the EPA Region 4 XML format and delivered as an attachment to an email to DisposalData.R4@epa.gov. The XML format is available from EPA Region 4.

Disposal summary reports shall be provided to EPA within 90 days after project completion. These reports should include: vessel name, disposal start and end dates and times; dredging project; volume disposed, number of loads completed, type of material disposed; contractor conducting the work, permit and/or contract number; identification of any misplaced material; and dates of bathymetric surveys of the Pensacola Offshore ODMDS. The disposal summary reports should be accompanied by the bathymetry survey results (contour plot and X, Y, Z ASCII data file). These reports can be accessed by USACE personnel at the DQM Website http://dqm-portal.usace.army.mil.

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

4.0 ANTICIPATED SITE USE.

It is anticipated that there will be a need for use of the Pensacola Offshore ODMDS for many years. The anticipated site is projected for dredged material disposal of approximately 350,000 cys of dredged material on a 2 to 3 year basis. This projection is based on shoaling rates, past dredging records, currently available dredged material disposal options, and USACE planning documents.

5.0 MODIFICATION OF THE PENSACOLA OFFSHORE ODMDS SMMP.

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

6.0 IMPLEMENTATION OF THE PENSACOLA OFFSHORE ODMDS SMMP.

This plan shall be effective from date of signature for a period not to exceed 10 years. The plan shall be reviewed and revised more frequently if site use and conditions at the site indicates a need for revision. The EPA and USACE shall share responsibility for implementation of the SMMP. Site users may be required to undertake monitoring activities as a condition of their permit. The USACE will be responsible for implementation of the SMMP for Federal new work and maintenance projects.

7.0 REFERENCES.

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

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

U.S. Army Corps of Engineers (USACE). 1994. *Hydrographic Surveying*. Engineering Manual 1110-2-1003, Department of the Army, Washington D.C.

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

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

U.S. Environmental Protection Agency Region 4 and U.S. Army Corps of Engineers South Atlantic Division, 2008. *Southeast Regional Implementation Manual (SERIM) Requirements and Procedures for Evaluation of the Ocean Disposal of Dredged Material in Southeastern U.S. Atlantic and Gulf Coastal Waters*, August 2008.

U.S. Environmental Protection Agency (USEPA). 1988. *Final Environmental Impact Statement for Designation of a New Ocean Dredged Material Disposal Site, Pensacola, Florida*.

U.S. Environmental Protection Agency (USEPA). 2014. *Pensacola Offshore ODMDS Status and Trends, September 2013.* June 2014. Prepared by Environmental Protection Agency, Region 4, Water Protection Division, Coastal & Ocean Protection Section

APPENDIX A

WATER COLUMN EVALUATIONS NUMERICAL MODEL (STFATE) INPUT PARAMETERS

Water Column Evaluations Numerical Model
(STFATE) Input Parameters Pensacola
Offshore ODMDS

SITE DESCRIPTION

Parameter	Value	Units
Number of Grid Points (left to right)	45	
Number of Grid Points (top to bottom)	45	
Spacing Between Grid Points (left to right)	750	ft
Spacing Between Grid Points (top to bottom)	500	ft
Constant Water Depth	75	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	3	
Ambient Density at Depth = 1 ft	1.0248	g/cc
Ambient Density at Depth = 36 ft	1.0267	g/cc
Ambient Density at Depth = 75 ft	1.0271	g/cc

AMBIENT VELOCITY DATA

Parameter	Value	Units
Profile	2-Point at constant depth	
X-Direction Velocity at Depth = 30 ft	0.0	ft/sec
Z-Direction Velocity at Depth = 30 ft	-0.722	ft/sec
X-Direction Velocity at Depth = 56 ft	0.0	ft/sec
Z-Direction Velocity at Depth = 56 ft	-0.525	ft/sec

DISPOSAL OPERATION DATA

Parameter	Value	Units
Location of Disposal Point from Top of Grid	11,250[2]	ft
Location of Disposal Point from Left Edge of Grid	16,875[2]	ft
Dumping Over Depression	0	

INPUT, EXECUTION AND OUTPUT

Parameter	Value	Units

Location of the Upper Left Corner of the Disposal Site - Distance from Top Edge	6,000	ft
Location of the Upper Left Corner of the Disposal Site - Distance from Left Edge	6,375	ft
Location of the Lower Right Corner of the Disposal Site - Distance from Top Edge	16,500	ft
Location of the Lower Right Corner of the Disposal Site - Distance from Left Edge	27,375	ft
Duration of Simulation	14,400	sec
Long Term Time Step	600	sec

COEFFICIENTS

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

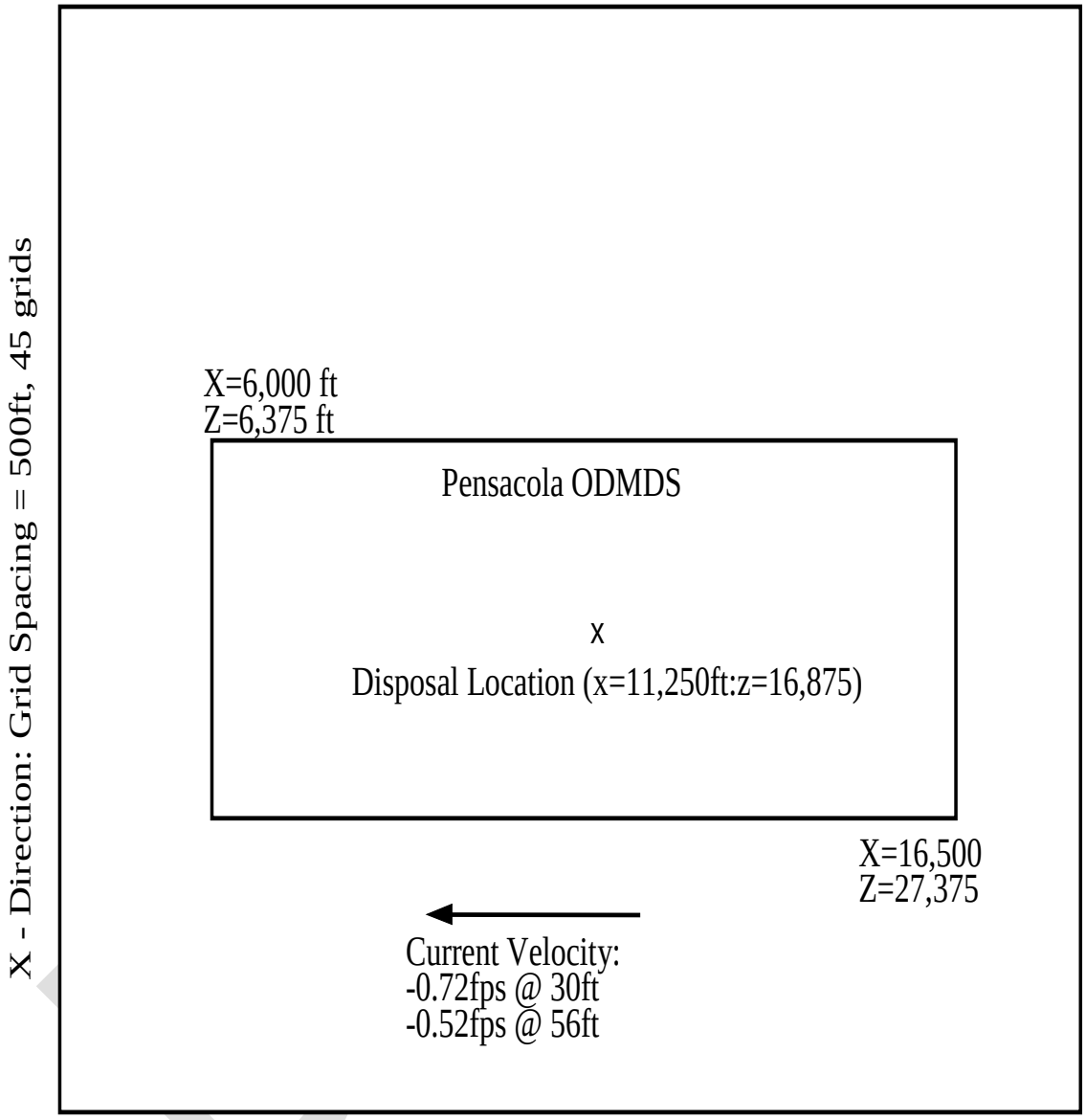
[1]Model default value

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

Pensacola Offshore ODMDS Background Water Concentrations

Chemicals of concern	Background Concentrations (ug/L)
Arsenic	1.14
Cadmium	0.004[1]
Chromium	0.21
Copper	0.229
Lead	0.041
Mercury	0.1[1]
Nickel	0.64
Selenium	0.5[1]
Silver	0.01[1]
Zinc	0.59
Tributyltin (TBT)	0.025[1]
Aldrin	0.001[1]
Chlordane	0.001[1]
DDT	0.0025[1]
Dieldrin	0.001[1]
alpha-Endosulfan	0.001[1]
beta-Endosulfam	0.002[1]
Endrin	0.002[1]
gamma-BHC (Lindane)	0.0005[1]
Heptachlor	0.00075[1]
Heptachlor epoxide	0.001[1]
Toxaphene	0.1[1]
Pentachlorophenol	5.33[1]

Values derived from Pensacola Offshore ODMDS Trend Assessment Study (2013)
[1] Analyte not detected. Value based on one half the reporting limit.


X - Direction: Grid Spacing = 500ft, 45 grids
X=6,000 ft
Z=6,375 ft
Pensacola ODMDS
x
Disposal Location (x=11,250ft:z=16,875)
X=16,500
Z=27,375
Current Velocity:
-0.72fps @ 30ft
-0.52fps @ 56ft
Z - Direction: Grid Spacing =750ft, 45 grids

APPENDIX B

GENERIC SPECIAL CONDITIONS FOR MPRSA SECTION 103 PERMITS PENSACOLA OFFSHORE ODMDS

I. DISPOSAL OPERATIONS

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

B. The boundary coordinates of the Pensacola Offshore ODMDS is defined as the rectangle delineated by the following latitude/longitude and State Plane Coordinate system (zone 0903 Florida North) NAD 83 coordinates:

Latitude 30°08'50" N	Longitude 87°19'30" W
Latitude 30°08'50" N	Longitude 87°16'30" W
Latitude 30°07'05" N	Longitude 87°16'30" W
Latitude 30°07'05" N	Longitude 87°19'30" W

State Plane 0903 (Florida North)

Northing 428347.51	Easting 1075701.81
Northing 427959.37	Easting 1091501.16
Northing 417355.53	Easting 1091243.06
Northing 417743.77	Easting 1075439.07

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 Pensacola Offshore ODMDS. The permittee agrees and understands that all dredged material will be placed in such a manner that its highest point will not exceed –55 feet MLLW.

D. The permittee shall use an electronic positioning system to navigate to and from the Pensacola Offshore ODMDS. For this section of the permit, the electronic positioning system will be as per the DQM specifications. 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 Pensacola Offshore ODMDS. The certification shall be accomplished by providing current certification documentation from the National DQM Program for scow and hopper dredge instrumentation systems. The National DQM certification is valid for one year from the date of certification.

F. The permittee shall not allow any water or dredged material placed in a hopper

dredge or disposal barge or scow to flow over the sides or leak from such vessels during transportation to the Pensacola Offshore ODMDS. In addition, the permittee understands that no debris is to be placed in the Pensacola Offshore ODMDS.

G. A disposal operations inspector and/or captain of any tug boat, hopper dredge or other vessel used to transport dredged material to the Pensacola Offshore ODMDS shall insure compliance with disposal operation conditions defined in this permit.

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

2. The permittee shall contact the U.S. Army Corps of Engineers (USACE), Mobile District's Regulatory Branch at (251) 690-2658 and EPA Region 4 at (404) 562-9395 to report the violation within twenty-four (24) hours after the violation occurs. A complete written explanation of any permit violation shall be included in the post-dredging report.

H. When dredged material is placed at the ODMDS, no portion of the hopper dredge, disposal barge, or scow shall be outside the boundaries of the Pensacola Offshore ODMDS as defined in Special Condition B. Additionally, disposal shall occur within a specified disposal zone defined as [DEFINE COORDINATES AND SIZE OF DISPOSAL ZONE].

I. The permittee shall use an automated disposal verification system that is certified by the National DQM program to continuously track the horizontal location and draft condition of the disposal vessel (hopper dredge or disposal barge or scow) to and from the Pensacola Offshore ODMDS. This real-time information is available on-line to the Mobile District and will be provided to the EPA Region 4 via an FTP site on a weekly basis.

J. The permittee shall conduct a bathymetric survey of the Pensacola Offshore ODMDS within two months prior to project disposal and within 30 days following project completion.

1. The number and length of the survey transects shall be sufficient to encompass the Pensacola Offshore ODMDS and a 1500-foot wide area around the site. Transects shall be spaced at 500-foot intervals or less.

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 site system or differential global positioning system. The vertical datum shall be mean lower low water (mllw) and the horizontal datum shall use Florida State Plane or latitude and longitude coordinates (North American Datum 1983). State Plane coordinates shall be reported to the nearest 0.10- foot and latitude and longitude coordinates shall be reported as degrees and decimal minutes to the nearest 0.01 minutes.

K. The permittee has read and agrees to assure that they are in compliance with the requirements of the Pensacola Offshore ODMDS Site Management and Monitoring Plan (SMMP).

II. REPORTING REQUIREMENTS

A. The permittee shall send USACE, Mobile District's Coastal Environment Team and EPA Region 4's Oceans, Wetlands and Streams Protection Branch (61 Forsyth Street, Atlanta, GA 30303) a notification of commencement of work at least thirty (30) days before initiation of any dredging operations authorized by this permit and referenced by the permit number. In addition, the permittee agrees to contact the U.S. Coast Guard (Marine Safety Office) at 251-441-5674 prior to disposing of any material in the ocean disposal site.

B. The permittee shall submit to USACE weekly disposal monitoring reports. These reports shall contain the information described in Special Condition I.1.

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

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

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

III. PERMIT LIABILITY

A. The permittee shall be responsible for ensuring compliance with all conditions of this permit.

B. The permittee and all contractors or other third parties who perform an activity authorized by this permit on behalf of the permittee shall be separately liable for a civil penalty of up to $50,000 for each violation of any term of this permit thy commit alone or in concert with the permittee or other parties. This liability shall be individual, rather than joint and several, and shall not be reduced in any fashion to reflect the liability assigned to and civil penalty assessed against the permittee or any other third party as defined in 33 U.S.C. Section 1415(a).

C. If the permittee or any contractor or other third party knowingly violates any term of this permit (either alone or in concert), the permittee, contractor or other party shall be individually liable for the criminal penalties set forth in 33 U.S.C. Section 1415(b).

APPENDIX C

GENERIC CONTRACT LANGUAGE FOR USE OF THE PENSACOLA OFFSHORE ODMDS

SECTION 35 20 23.23

NATIONAL DREDGING QUALITY MANAGEMENT PROGRAM
HOPPER DREDGE
6/21/2010

PART 1 GENERAL

1.1 DESCRIPTION

The work under this contract requires use of the National Dredging Quality Management Program (DQM), formerly known as Silent Inspector (SI), to monitor the dredge's status at all times during the contract, and to track load number, time-position history, instrument readings, vessel state, compute tons dry solids, report data, and manage data history.

This performance-based specification section identifies the minimum required output and precision and instrumentation requirements. The requirements may be satisfied using equipment and technical procedures selected by the Contractor. For purposes of this document, Contracting Officers Representative (COR) shall include the DQM Support Team personnel when on site.

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office responsible for review of the submittal for the Government. The following shall be submitted in accordance with Section 01 33 00, "SUBMITTAL PROCEDURES":

SD-01, Preconstruction Submittals

Dredge Plant Instrumentation Plan Revisions or Addendum; G, SAM-OP-J

Contract Quality Control Plan, section 3.2.5; G, XXX-XX-X *(enter local district)*

SD-06, Test Reports

Data Appropriately Archived e-mail, section 3.2.11; G, XXX-XX-X *(enter local district)*

SD-07, Certificates

Letter of National Dredging Quality Management Program Certification; G, XXX-XX-X *(enter local district)*

1.3 PAYMENT

No separate payment shall be made for installation, operation and maintenance of the DQM certified system as specified herein for the duration of the dredging operations; all costs in connection therewith shall be considered a subsidiary obligation of the Contractor and covered under the contract unit prices for dredging in the bidding schedule.

1.4 NATIONAL DREDGING QUALITY MANAGEMENT PROGRAM CERTIFICATION

The Contractor is required to have a current certification from the National Dredging Quality Management Program for the hopper dredge instrumentation system to be used under this contract. Criteria for certification shall be based on the most recent specification posted on the National Dredging Quality Management Program website (https://si.usace.army.mil/specifications.aspx). Compliance with these criteria shall be verified by on-site plant inspections conducted by DQM Support Center Inspection Team personnel, and by periodic review of the transmitted data. A National Dredging Quality Management Program Certification is valid for one year from the date of the annual inspection. Certification is contingent upon the system's ability to continuously meet the performance requirements as outlined in sections 3.3 and 3.5. If issues with data quality are not corrected within 48 hours, the system certification shall be revoked and recertification may be necessary.

An Annual Inspection Shall Include:

- A series of quality assurance checks as described in section 3.4 "Compliance Inspection and Quality Assurance Checks"
- Verification of data acquisition and transfer (Section 3.3)
- Review of the Dredge Plant Instrumentation Plan (DPIP) as described in Section 1.5

The dredging contractor shall have personnel who are familiar with the system instrumentation and who have the ability to recalibrate the sensors on site during the inspection. The dredging contractor must provide transportation from the shore to any platform with a DQM certified system for the Contracting Officers Representative in a timely manner. As a general rule, inspection teams will come with PPE consisting of hardhats, steel toe boots, and life jackets. If additional safety equipment is needed, such as eye protection, safety harnesses, work gloves or personal location beacons, these items shall be provided to the team while on site.

The owner or operator of the dredge shall contact the DQM Support Center Inspection Team at dqmsi@usace.army.mil on an annual basis, or at least three weeks prior to the proposed beginning of dredging, to schedule an inspection. This notification is meant to make the inspection team aware of a target date. At least one week prior to start of dredging, the dredging contractor shall contact the inspection team and verbally coordinate a specific inspection date and location. The contractor shall then follow-up this conversation with a written e-mail confirmation. The owner operator shall coordinate the inspection with all local authorities, including but not limited to, the local USACE contracting officer.

Re-inspection is required for any yard work which produces modification to displacement (i.e. change in dredge lines, repositioning or repainting hull marks), modification to bin volume (change in bin dimensions or addition or subtraction of structure) or changes in sensor type or location; these changes shall be reported in the sensor log section of the DPIP. A system does not have to be transmitting data between jobs, however it may not be turned off, disconnected or removed from the dredge in order to retain its certification during this period.

1.5 DREDGE PLANT INSTRUMENTATION PLAN (DPIP)

The Contractor shall have a digital copy of the DPIP on file with the National DQM Support Center. The Contractor shall also maintain a copy of the DPIP on the dredge which is easily accessible to government personnel at all times. This document shall describe how sensor data will be collected, how quality control on the data will be performed, and how sensors/data reporting equipment will be calibrated and repaired if they fail. A description of computed dredge specific data and how the sensor data will be transmitted to the DQM Database will also be included. The Contractor shall submit to the DQM Support Center any addendum or modifications made to the plan, subsequent to its original submission, prior to start of work.

The DPIP shall include the following as a minimum:
(DPIP must have table of contents in the following order)

1. Dredging Company
   a. Dredge Point of Contact
   b. Telephone Number
   c. Email address
2. Dredge Monitoring System Provider
   a. Dredge Monitoring System Point of Contact
   b. Telephone Number
   c. Email address
3. Dredge Name
4. Sensor data collection method
   a. Any averaging

b. Route from sensor to DQM computer
5. DQM Computer Hardware & Components
   a. Brand names and specifications
   b. User guides and owner manuals
6. Sensor repair, replacement, installation, modification or calibration methods
7. Dimensioned Drawings of the Dredge
   a. A typical plan and profile view of the dredge showing:
      i. Hopper dredge cross section
      ii. Locations of required sensors referenced to:
         (1) Fore and aft perpendicular
         (2) Hopper dredge length, depth, width, zero reference
         (3) External hull draft markings (latitudinal, longitudinal, keel)
         (4) Each other
      iii. Overall dredge dimensions
      iv. Dimensions of draghead
         (1) Length
         (2) Pipe inside diameter at sensor locations
         (3) Offset to positioning system antenna
8. Criteria and method used to increment load number
9. Description of how the UTC date/time stamp is collected
10. Positioning system
    a. Brand name and specifications
    b. Dredge heading instrumentation brand name and specifications
    c. Instrument used to calculate Coarse Over Ground (COG)
    d. Any calculation done external to the instrumentation
    e. Certificates of calibration and/or manufacturer certificates of compliance
    f. Description of how dredge speed is determined
11. Tide
    a. Description of how tidal information is entered into the data string.
12. Hull status
    a. Instrumentation brand name and specifications
    b. Certificates of calibration and/or manufacturer certificates of compliance
    c. Any calculation done external to the instrumentation
13. Drafts:
    a. Instrumentation brand name and specifications
    b. Certificates of calibration and/or manufacturer certificates of compliance
    c. Any calculation done external to the instrumentation
14. Displacement:
    a. Method used by Contractor to calculate displacement based on fore and aft draft
    b. Method used by Contractor to calculate lightship displacement
    c. Hydrostatic curves
    d. Tables listing (fresh and salt water) displacement as a function of draft certified by a licensed marine surveyor/ naval architect independent of the Contractor (feet and tenths of feet)

e. These methods and tables shall be an accurate reflection of the current configuration and displacement

15. Hopper Ullage:
    a. Sensor brand name and specifications
    b. Certificates of calibration and/or manufacturer certificates of compliance
    c. Any calculation done external to the instrumentation
16. Hopper Volume:
    a. Method used by Contractor to calculate hopper dredge volume based on fore and aft hopper dredge ullage
    b. Table listing the hopper dredge volume as a function of hopper dredge ullage, certified by a licensed marine surveyor/ naval architect independent of the Contractor (feet and tenths of feet).
    c. These methods and tables shall be an accurate reflection of the current configuration and volume
17. Draghead
    a. Draghead Depth
        i. Sensor brand name and specifications
        ii. Certificates of calibration and/or manufacturer certificates of compliance
        iii. Any calculation done external to the instrumentation
    b. Draghead Depth Check
        i. Method used
        ii. If applicable, sensor brand name and specifications
        iii. If applicable, certificates of calibration and/or manufacturer certificates of compliance
        iv. If applicable, any calculation done external to the instrumentation
    c. Drag Head Position
        i. Sensor brand name and specifications
        ii. Any calculation done external to the instrumentation
        iii. Certificates of calibration and/or manufacturer certificates of compliance
18. Slurry Density and Velocity Sensors:
    a. Sensor brand name and specifications
    b. Any calculation done external to the instrumentation
    c. Certificates of calibration and/or manufacturer certificates of compliance
19. Pump RPM
    a. Sensor brand name and specifications
    b. Any calculation done external to the instrumentation
    c. Certificates of calibration and/or manufacturer certificates of compliance
    d. Description of the pump for which the RPM is reported
20. Criteria used to determine
    a. Minimum pump effort
    b. Pumping water
    c. Material recovery
    d. Pumpout
21. Refractometer:

a. Brand
b. Resolution and accuracy
c. Method of calibration

22. Criteria used to determine open/closed status of hopper dredge
23. Documentation of :
    a. Test methods used by the Contractor to provide quality control of data
    b. Verification that the reported values are applicable for the sensor and application
24. Remote log in information
    a. Static IP address (Host)
    b. Incoming and outgoing port settings (Host)
    c. Username and password (Host)
25. Log of sensor performance and modifications
26. Log of Contractor data backup as per Section 3.3.7
27. Quality Control Plan as per section 3.5
    a. Name of Quality Control Systems Manager
    b. Procedures for checking collected data against know values
    c. Procedures for verifying telemetry is functioning
    d. Procedures for verifying DQM computer is on
    e. Procedures for verifying DQMOBS is running

Any changes to the computation methods shall be approved by the National Dredging Quality Management Program Support Center prior to their implementation.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 REQUIREMENTS FOR REPORTED DATA

The Contractor shall provide, operate and maintain all hardware and software to meet these specifications. The Contractor shall be responsible for replacement, repair and calibration of sensors and other necessary data acquisition equipment needed to supply the required data.

Repairs shall be completed within 48 hours of any sensor failure. Upon completion of a repair, replacement, installation, modification or calibration the Contractor shall notify the Contracting Office's Representative. The Contracting Office's Representative may request re-calibration of sensors or other hardware components at any time during the contract as deemed necessary.

The Contractor shall keep a log of sensor repair, replacement, installation, modification and calibration in the dredge's onboard copy of the DPIP. The log shall contain a three-year history of sensor maintenance to include: the time of sensor failures (and subsequent repairs), the time and results of sensor

calibrations, the time of sensor replacements, and the time that backup sensor systems are initiated to provide required data. It shall also contain the name of the person responsible for the sensor work.

3.1.1 Date and Time

The date and time shall be reported to the nearest second and referenced to UTC time based on a 24 hour format; mm/dd/yyyy hh:mm:ss

3.1.2 Load Number

A load number shall document the end of a disposal event. Load numbering will begin at number 1 at the start of the contract, and will be incremented by 1 at the completion of each disposal event or emptying of the hopper. Whenever possible, the load number shall be calculated off of the sensors aboard the dredge, and shall be a mathematically repeatable routine. Efforts shall be made to include logic that avoids false load number increments while also not allowing the routine to miss any disposal event. If manual incrementing of the load number is in place, extra attention shall be paid to this value in the contractor's quality control process (section 3.5).

3.1.3 Vessel Horizontal Positioning

Horizontal positioning of the antenna location shall be obtained using a Positioning System operating with a minimum accuracy level of 1 to 3 meters horizontal Circular Error Probable (CEP). Positions shall be reported as Latitude/Longitude WGS 84 in decimal degrees. West Longitude and South Latitude values are reported as negative.

3.1.4 Draghead Horizontal Positioning

Horizontal positioning of the dragheads shall be obtained using a Positioning System operating with a minimum accuracy level of 1 to 3 meters horizontal Circular Error Probable (CEP). Positions shall be reported as Latitude/Longitude WGS 84 in decimal degrees. West Longitude and South Latitude values are reported as negative.

3.1.5 Hull status

Open/closed status of the hopper dredge, corresponding to the split/non-split condition of a split hull hopper dredge shall be monitored. For dredges with hopper doors, the status of a single door that is the first opened during normal disposal operations may be monitored. An "OPEN" value shall indicate the hopper door is open, or in the case of split hull dredges, the hull is split. A "CLOSED" value indicates the hopper doors are closed, or in the case of split hull

dredges, the hull is not split. *For this contract, hull status shall register closed prior to leaving the disposal area.*

3.1.6 Dredge Course

Dredge course-over-ground (COG) shall be provided using industry standard equipment. The Contractor shall provide dredge course over ground to the nearest whole degree with values from 000 (true north) to 359 degrees referenced to a clockwise positive direction convention.

3.1.7 Dredge Speed

Dredge speed-over-ground shall be provided in knots using industry standard equipment with a minimum accuracy of 1 knot and resolution to the nearest 0.1 knot.

3.1.8 Dredge Heading

Dredge heading shall be provided using industry standard equipment. The dredge heading shall be accurate to within 5 degrees and reported to the nearest whole degree, with values from 000 (true north) to 359 degrees referenced to a clockwise positive direction convention.

3.1.9 Tide

Tide data shall be obtained using appropriate equipment to give the water level with an accuracy of $\pm$ 0.1 feet and a resolution of 0.01 feet. Tide values above project datum described in the dredging specification shall be entered with a positive sign, those below with a negative sign.

3.1.10 Draft

Draft measurements shall be made in feet with an accuracy of $\pm$0.1 foot, and reported with a resolution to the nearest 0.01 foot relative to the fore and aft draft marks. Industry standard pressure sensors, or an equivalent system, may be used. Two draft sensors, one fore and one aft, are required. At the discretion of the DQM Support Center, a system may use other means of measuring drafts if accuracies and resolution are maintained relative to the draft marks.

3.1.11 Hopper Ullage

Fore and aft hopper ullage values shall be measured to the nearest 0.01 foot with a minimum accuracy of $\pm$ 0.1 foot relative to the hopper dredge's zero reference elevation. If only two sensors are used, they shall be mounted in locations as near as possible to the hopper dredge centerline, and away from discharge flume turbulence, foam, and any structure that could produce sidelobe errors. If one

sensor is offset to port or starboard, the other sensor shall be offset to the opposite side of the hopper dredge. If more than one fore or one aft sensor is used, they shall be placed near the corners of the hopper dredge and the average value of the fore sensors and the average value of the aft sensors shall be reported.

3.1.12 Hopper Volume

Hopper dredge volume shall be reported in cubic yards, based on the most accurate method available for the dredge. The minimum standard of accuracy for hopper dredge volume is interpolation from the certified ullage table, based on the average fore and aft ullage readings.

3.1.13 Displacement

Dredge displacement shall be reported in long tons, based on the most accurate method available for the dredge. The minimum standard of accuracy for displacement is interpolation from the displacement table, based on the average draft. For this contract the density of water used to calculate displacement shall be_____ kg/cubic meter and shall be used for an additional interpolation between the fresh and salt water tables.

3.1.14 Empty Displacement

Empty displacement shall be reported in long tons, and shall be the lightship value of the dredge, or the weight of the dredge with no material in the hopper, adjusted for fuel and water consumption.

3.1.15 Draghead depths

Draghead depths shall be reported with an accuracy of $\pm$0.5 feet and a resolution to the nearest 0.1 feet as measured from the surface of the water with no tidal adjustments. Minimum accuracies are conditional to relatively calm water.

3.1.16 Slurry Densities of Dragarms

A density metering device, calibrated according to the manufacturer's specifications, shall be used to record the slurry density of each dragarm to the nearest 0.0001 g/cc with an accuracy of $\pm$ 0.001g/cc. If the manufacture does not specify a frequency of re-calibration, calibration shall be conducted prior to commencement of work.

3.1.17 Slurry Velocities of Dragarms

A flow metering device, calibrated according to the manufacturer's specifications, shall be used to record the slurry velocity of each dragarm to the nearest 0.0001 fps with an accuracy of $\pm$ 0.001 fps. If the manufacture does not specify a

frequency of re-calibration, calibration shall be conducted prior to commencement of work. The slurry velocity shall be measured in the same pipeline inside diameter as that used for the slurry density measurement.

3.1.18 Pump RPM

Pump RPM shall be measured with the highest level of accuracy that is standard on the vessel operational displays, either at the bridge, at the drag tenders controls, or in the engine room. Dredges with multiple pumps per side shall report RPM for the pump that best describes the dredging process (typically the outboard pump). If requirements of section 3.1.19 are determined based on pump RPM, then that value shall be reported.

3.1.19 Dragarm Production Criteria

For the purposes of DQM, a dragarm pump can only operate one of three ways and each shall be mutually exclusive of the other two.

3.1.19.1 Minimum Pumping Effort

For Minimum Pumping Effort a "TRUE" value shall mean the hopper dredge pumps are idling (assuring minimum dragarm intake velocity) or off. The logic can be triggered either with Pump revolutions per minute below a certain idle threshold or dragarm slurry velocity at or below the idle speed threshold (depending on the particular dredge plant and project). The only permissible values are "TRUE" and "FALSE". The criteria for minimum pump effort may be unique to each dredge.

3.1.19.2 Pumping Water

For Pumping Water a "TRUE" value shall indicate the dredge is not digging material but is pumping water (or very low-density material) through the dredge pump(s). For example, when the slurry density is less than 1.05 grams per cubic centimeter, the dredge is considered to be pumping water. Other parameters such as pump vacuum may be used to satisfy the pumping water requirement. These criteria may be unique to each dredge. The only permissible values are "TRUE" and "FALSE".

3.1.19.3 Material Recovery

For Material Recovery a "TRUE" value shall indicate the dredge is digging material. The only permissible values are "TRUE" and "FALSE". Example; when the slurry velocity is greater than 10 feet per second and the density is greater than 1.05 grams per cubic centimeter, material recovery is "TRUE". These criteria may be unique to each dredge.

3.1.20 Pumpout

When the hopper dredge is being pumped out, a "True" value shall be reported; when it is not, a "False" value shall be reported. The only permissible values are "TRUE" and "FALSE".

3.2 NATIONAL DREDGING QUALITY MANAGEMENT PROGRAM SYSTEM REQUIRMENTS

The Dredge shall be equipped with a DQM computer system consisting of a computer, monitor, keyboard, mouse, printer, data modem, UPS, and network hub. The computer system shall be a stand alone system, exclusive to the DQM monitoring system, and will have USACE DQM software installed on it. If a hardware problem occurs, or if a part of the system is physically damaged, then the Contractor shall be responsible for repairing it within 48 hours of determination of the condition.

3.2.1 Computer Requirements

The Contractor shall provide a dedicated on-board computer for use by the Dredging Quality Management system. This computer shall run the Corps' software and receive data from the Contractor's data reporting interface. This computer must meet or exceed the following performance specifications:

CPU:	Intel or AMD processor with a (non-overclocked) clock speed of at least 3 gigahertz (GHz)
Hard drive:	250 gigabytes (GB); internal
RAM:	2 gigabytes
Ethernet adapter:	10 or 100 megabit (Mbit) internal network card with an RJ-45 connector
Video adapter:	Must support resolution of 1024x768 at 16 bit color depth
Keyboard:	Standard 101-key
Mouse:	Standard 2-button mouse
Monitor:	17 inch viewable display; must support 1024x768 resolution at 16 bit color depth
CD-ROM drive:	16X read speed/8X write speed
Ports:	2 free Serial ports with standard 9-pin connectors; 1 free USB port

Other hardware: Category 5 (Cat-5) cable with standard RJ-45 plugs connecting the network adapter to the network hub; one spare cable

Contractor shall install a fully-licensed copy of Windows XP Professional on the computer specified above. Contractor shall also install any necessary manufacturer-provided drivers for the installed hardware.

This computer shall be located and oriented to allow data entry and data viewing, as well as to provide access to data ports for connection of external hardware. Location and orientation shall be subject to Contracting Officer's Representative's approval.

3.2.2 Software

The DQM computer's primary function is to transmit data to the DQM shore side database. No other software which conflicts with this function shall be installed on this computer. A copy of Symantec pcAnywhere™ 12.5 (Remote and Host) or newer shall be available on the dredge and installed on the DQM computer (host) and available for installation on the inspection computer (remote). Information required to log-in on the DQM computer (host) shall be in included in the DPIP. This shall include the DQM computers (host) static IP address, data port and status port information as well as any associated login name and password. The DQM computer will also have the USACE provided DQMOBS (Dredge Quality Management Onboard Software) installed on it by DQM personnel.

3.2.3 Network Hub

The DQM computer shall communicate via IEEE 802.3 Ethernet and the TCP/IP networking protocol. The Contractor shall provide a network hub to allow the temporary addition of the Contracting Officer's representative's portable computer to the computer network. The hub shall provide a minimum of four RJ-45 ports that support Category 5 (Cat-5) cable with standard RJ-45 plugs connecting the network adapter to the network hub; one spare cable shall be available on site to plug into the network hub.

3.2.4 UPS

The Contractor shall supply an Uninterruptible Power Supply (UPS) for the computer and networking equipment. The UPS shall provide backup power at 1kVA for a minimum of 10 minutes. The UPS shall interface to the DQM computer to communicate UPS status. The Contractor shall ensure that sufficient power outlets are available to run all specified equipment.

3.2.5 Printer

The Contractor shall supply a printer and driver software (when necessary) for use with the DQM computer. The printer shall support the Universal Serial Bus interface (cable supplied by the Contractor), and shall have a minimum resolution of 300 dots per inch and have a rated print speed of 6 pages per minute (black and white) or higher and support color. Additionally, the printer shall have minimum paper capacity of 50 pages of 8.5X11 inch paper. The Contractor shall be responsible for maintaining a supply of printer paper and other consumables such as printer cartridges. Printer usage will not exceed 500 pages per month.

3.2.6 Internet Access

The Contractor shall provide an internet connection to the DQM computer with connectivity in the area where they are working. The internet shall be always available to the DQM computer with connectivity at least 12 out of 24 hours. The Contractor shall acquire and install all necessary hardware and software to make this Internet connection available to the DQM on-board computer.

3.2.7 Data Routing Requirements

Onboard sensors shall continually monitor dredge conditions, operations and efficiency and route this information into the shipboard dredge-specific system computer (DSS) to assist in guiding dredge operations. Portions of this Contractor-collected information shall be routed to the DQM computer on a real-time basis for archival data storage and compilation into summary reports of dredging operations. Standard sensor data shall be sent to the DQM computer via an RS-232 19200-baud serial interface. The serial interface shall be configured as 8 bits no parity and no flow control.

3.2.8 Data Measurement Frequency

Disposal activities shall be logged with high temporal and spatial resolution. Data shall be logged as a series of events. Each set of measurements (i.e. time, position, etc…) will be considered an event. All required information in section 3.1 shall be collected within one second of the reported time. A data string for an event shall be sent to the DQM computer every 10 seconds or less; but never more frequently than once per every 5 seconds.

3.2.9 Data Format

Data shall be reported as an eXtensible Markup Language (W3C standard XML 1.0) document as indicated below. Line breaks and spaces are added for readability, but the carriage return, line feed character combination is only added to delineate records (HOPPER DREDGE_DREDGING_DATA tag) for actual data transmission.

```
<?xml version="1.0"?>
<HOPPER DREDGE_DREDGING_DATA version = “2.0”>
```

<DREDGE_NAME> **string32** </DREDGE_NAME>
<HOPPER DREDGE_DATA_RECORD>
<DATE_TIME> **time date string** </DATE_TIME>
<LOAD_NUMBER> **integer string** </LOAD_NUMBER>
<VESSEL_X coord_type = "LL"> **floating point string** </VESSEL_X>
<VESSEL_Y coord_type = "LL"> **floating point string** </VESSEL_Y>
<PORT_DRAG_X coord_type = "LL"> **floating point string**</PORT_DRAG_X>
<PORT_DRAG_Y coord_type = "LL"> **floating point string**</PORT_DRAG_Y>
<STBD_DRAG_X coord_type = "LL"> **floating point string**</STBD_DRAG_X>
<STBD_DRAG_Y coord_type = "LL"> **floating point string**</STBD_DRAG_Y>
<HULL_STATUS> **OPEN/CLOSED string** </HULL_STATUS>
<VESSEL_COURSE> **floating point string** <VESSEL_COURSE >
<VESSEL_SPEED> **floating point string** </VESSEL_SPEED>
<VESSEL_HEADING> **floating point string** </VESSEL_HEADING>
<TIDE> **floating point string** </TIDE>
<DRAFT_FORE> **floating point string** </DRAFT_FORE>
<DRAFT_AFT> **floating point string** </DRAFT_AFT>
<ULLAGE_FORE> **floating point string** </ULLAGE_FORE>
<ULLAGE_AFT> **floating point string** </ULLAGE_AFT>
<HOPPER DREDGE_VOLUME> **floating point string** </HOPPER DREDGE_VOLUME>
<DISPLACEMENT> **floating point string** </DISPLACEMENT>
<EMPTY_DISPLACEMENT> **floating point string** </EMPTY_DISPLACEMENT>
<DRAGHEAD_DEPTH_PORT> **floating point string** </DRAGHEAD_DEPTH_PORT>
<DRAGHEAD_DEPTH_STBD> **floating point string** </DRAGHEAD_DEPTH_STBD>
<PORT_DENSITY> **floating point string** </PORT_DENSITY>
<STBD_DENSITY> **floating point string** </STBD_DENSITY>
<PORT_VELOCITY> **floating point string** </PORT_VELOCITY>
<STBD_VELOCITY> **floating point string** </STBD_VELOCITY>
<PUMP_RPM_PORT> **floating point string** </PUMP_RPM_PORT>
<PUMP_RPM_STBD> **floating point string** </PUMP_RPM_STBD>
<MIN_PUMP_EFFORT_PORT> **true/false/unknown string** </MIN_PUMP_EFFORT_PORT>
<MIN_PUMP_EFFORT_STBD> **true/false/unknown string** </MIN_PUMP_EFFORT_STBD>
<PUMP_WATER_PORT> **true/false/unknown string** </PUMP_WATER_PORT>
<PUMP_WATER_STBD> **true/false/unknown string** </PUMP_WATER_STBD>
<PUMP_MATERIAL_PORT> **true/false/unknown string**</PUMP_MATERIAL_PORT>
<PUMP_MATERIAL_STBD> **true/false/unknown string** </PUMP_MATERIAL_STBD>
<PUMP_OUT_ON> **true/false/unknown string** </PUMP_OUT_ON>
</HOPPER DREDGE_DATA_RECORD>

</HOPPER DREDGE_DREDGING_DATA>
Carriage return – ASCII value 13
Line Feed – ASCII value 10

Example

```
<?xml version="1.0"?>
<HOPPER DREDGE_DREDGING_DATA version = "2.0">
 <DREDGE_NAME>Essayons</DREDGE_NAME>
   <HOPPER DREDGE_DATA_RECORD>
       <DATE_TIME>04/11/2002 13:12:05</DATE_TIME>
       <LOAD_NUMBER>102</LOAD_NUMBER>
       <VESSEL_X coord_type =  "LL">-80.123333</VESSEL_X>
       <VESSEL_Y coord_type =  "LL">10.123345</VESSEL_Y>
```

```
        <PORT_DRAG_X coord_type =  "LL">-80.1233371</PORT_DRAG_X >
        <PORT_DRAG_Y coord_type =  "LL">10.12335</PORT_DRAG_Y >
        <STBD_DRAG_X coord_type =  "LL">-80.123339</STBD_DRAG_X >
        <STBD_DRAG_Y coord_type =  "LL">10.123347</STBD_DRAG_Y >
        <HULL_STATUS>CLOSED</HULL_STATUS>
        <VESSEL_COURSE>258</VESSEL_COURSE>
        <VESSEL_SPEED>3.4</VESSEL_SPEED>
        <VESSEL_HEADING>302</VESSEL_HEADING>
        <TIDE>-0.1</TIDE>
        <DRAFT_FORE>10.05</DRAFT_FORE>
        <DRAFT_AFT>15.13</DRAFT_AFT>
        <ULLAGE_FORE>10.11</ULLAGE_FORE>
        <ULLAGE_AFT>10.22</ULLAGE_AFT>
        <HOPPER DREDGE_VOLUME>2555.2</HOPPER DREDGE_VOLUME>
        <DISPLACEMENT>4444.1</DISPLACEMENT>
        <EMPTY_DISPLACEMENT>2345.0</EMPTY_DISPLACEMENT>
        <DRAGHEAD_DEPTH_PORT>55.10</DRAGHEAD_DEPTH_PORT>
        <DRAGHEAD_DEPTH_STBD>53.21</DRAGHEAD_DEPTH_STBD
        <PORT_DENSITY>1.02</PORT_DENSITY>
        <STBD_DENSITY>1.03</STBD_DENSITY>
        <PORT_VELOCITY>22.1</PORT_VELOCITY>
        <STBD_VELOCITY>23.3</STBD_VELOCITY>
        <MIN_PUMP_EFFORT_PORT>false</MIN_PUMP_EFFORT_PORT>
        <MIN_PUMP_EFFORT_STBD>false</MIN_PUMP_EFFORT_STBD>
        <PUMP_WATER_PORT>true</PUMP_WATER_PORT>
        <PUMP_WATER_STBD>true</PUMP_WATER_STBD>
        <PUMP_MATERIAL_PORT>false</PUMP_MATERIAL_PORT>
        <PUMP_MATERIAL_STBD>false</PUMP_MATERIAL_STBD>
        <PUMP_OUT_ON>false</PUMP_OUT_ON>
    </HOPPER DREDGE_DATA_RECORD>
/HOPPER DREDGE_DREDGING_DATA>
cr>
lf>
DREDGE_NAME>Essayons</DREDGE_NAME>
  <HOPPER DREDGE_DATA_RECORD>
        <DATE_TIME>04/11/2002 13:12:10</DATE_TIME>
        <LOAD_NUMBER>102</LOAD_NUMBER>
        <VESSEL_X coord_type =  "LL">-80.123334</VESSEL_X>
        <VESSEL_Y coord_type =  "LL">10.123346</VESSEL_Y>
        <PORT_DRAG_X coord_type =  "LL">-80.1233372</PORT_DRAG_X >
        <PORT_DRAG_Y coord_type =  "LL">10.12336</PORT_DRAG_Y >
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        <STBD_DRAG_Y coord_type =  "LL">10.123348</STBD_DRAG_Y >
        <HULL_STATUS>CLOSED</HULL_STATUS>
        <VESSEL_COURSE>259</VESSEL_COURSE>
        <VESSEL_SPEED>3.5</VESSEL_SPEED>
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        <TIDE>-0.1</TIDE>
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        <ULLAGE_FORE>10.15</ULLAGE_FORE>
        <ULLAGE_AFT>10.20</ULLAGE_AFT>
        <HOPPER DREDGE_VOLUME>2555.5</HOPPER DREDGE_VOLUME>
        <DISPLACEMENT>4444.0</DISPLACEMENT>
        <EMPTY_DISPLACEMENT>2345.0</EMPTY_DISPLACEMENT>
        <DRAGHEAD_DEPTH_PORT>55.15</DRAGHEAD_DEPTH_PORT>
        <DRAGHEAD_DEPTH_STBD>53.19</DRAGHEAD_DEPTH_STBD
        <PORT_DENSITY>1.00</PORT_DENSITY>
        <STBD_DENSITY>1.01</STBD_DENSITY>
        <PORT_VELOCITY>22.5</PORT_VELOCITY>
        <STBD_VELOCITY>23.3</STBD_VELOCITY>
        <MIN_PUMP_EFFORT_PORT>false</MIN_PUMP_EFFORT_PORT>
        <MIN_PUMP_EFFORT_STBD>false</MIN_PUMP_EFFORT_STBD>
        <PUMP_WATER_PORT>true</PUMP_WATER_PORT>
        <PUMP_WATER_STBD>true</PUMP_WATER_STBD>
        <PUMP_MATERIAL_PORT>false</PUMP_MATERIAL_PORT>
        <PUMP_MATERIAL_STBD>false</PUMP_MATERIAL_STBD>
        <PUMP_OUT_ON>false</PUMP_OUT_ON>
    </HOPPER DREDGE_DATA_RECORD>
</HOPPER DREDGE_DREDGING_DATA>
<cr>
<lf>
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3.2.10 Data Reporting

The system shall transmit correctly formatted event data XML strings to the DQM Database continuously from mobilization until the last USACE post-dredging survey has been accepted. If the internet connection (section 3.2.6) is non-operable, either because of hardware failure or poor local operating conditions, manual backups shall be performed for each day the device is inoperable and submitted to the DQM center within 48 hours. Instructions on how to backup DQM data, perform DQM data transfer (Contractor) and the downloadable executable for Send Data can be found at https://si.usace.army.mil/hopper.aspx. In the event of data transfer, transmission, or hardware failure; a manually recorded disposal log shall be maintained. It shall consist of a series of events. These events are: start of dredging, end of dredging, pre-disposal and post-disposal events. Each event shall include: time stamp (GMT), position (Latitude and Longitude WGS84), draft, ullage, volume and displacement. Disposal logs shall be submitted on a daily basis to the Contracting Officer's Representative during the time when the system is not operational.

3.2.11 Contractor Data Backup

The Contractor shall maintain an archive of all data sent to the DQM computer during the dredging contract. The Contracting Officer's Representative may require, at no increase in the contract price, that the Contractor provide a copy of these data covering specified time periods. The data shall be provided in the HTML format which would have been transmitted to the DQM computer. Data submission shall be via storage medium acceptable to the Contracting Officer's Representative.

At the end of the dredging contact, the Contractor shall contact the National DQM Support Center prior to discarding the data to ensure it has been appropriately archived. The Contractor shall record in a separate section at the end of the dredge's on-board copy of the DPIP the following information:

a. Person who made the call
b. The date of the call
c. The DQM representative who gave permission to discard

The same day of the phone call and prior to discarding the data, the Contractor shall submit a "Data Appropriately Archived e-mail" to the local districts Contracting Officer's Representative with the above information, and Cc: the DQM Support Center representative providing permission. In addition to the above information, also include in the e-mail:

d. Project name and contract number
e. Dredge start and end dates
f. Name of hopper dredge

3.3 PERFORMANCE REQUIREMENTS

The Contractor's DQM system shall be fully operational at the start of dredging operations and fully certified prior to moving dredge material on the contract (see Section 1.4, National Dredging Quality Management Program Certification). To meet contract requirements for operability, in addition to certification, the Contractor's system shall provide a minimum 95 percent data return and be compliant with DPIP requirements (Section 1.5). DPIP compliance is determined by DQM support team. Data return percentage is defined as the total number of quality data strings sent by the DSS system to the DQM computer divided by the total possible number of records that could be sent by a system in good working order. Quality data strings are considered to be those providing accurate values for at least 34 of the 35 parameters reported. If repairs necessary to restore 95 percent data return are not made within 48 hours, or if the Contractor fails to report required data within the specified time window for dredge measurements (see Sections 3.2.8 "Data Measurement Frequency" and 3.2.10 "Data

Reporting"); the system will be declared not fully operational, and the Contractor will be assessed liquidated damages equivalent to the additional oversight hours that would be required for Corps personnel to be on site from the first full day after the system is deemed not operational through to the time when the system is returned to fully operational status. For this contract, the liquidated damages shall be $_____ per day. *(A spread sheet of how to calculate this is available at the DQM support center; this is NOT just the DQM day rate)*

3.4 COMPLIANCE INSPECTION AND QUALITY ASSURANCE CHECKS

For inspections and compliance monitoring, the Contracting Officers Representative shall include, but not be limited to, DQM support center personnel. The dredging contractor shall provide the Contracting Officers Representative transportation from the shore to any platform with a DQM certified system. Transportation to the DQM equipment shall be provided in a timely manner.

Quality assurance checks are required prior to the commencement of dredging, and at the discretion of a Contracting Officer's Representative periodically throughout the duration of the contract. Detailed instructions for performing these checks and a spreadsheet for recording the results are available at http://si.usace.army.mil/downloads.asp. Incoming data shall be periodically reviewed to assure compliance with performance requirements outlined in section 3.3.

3.4.1 Displacement (Draft) Check

The Contracting Officer's Representative shall periodically verify the accuracy of the fore and aft draft sensors by comparing the vessel hull draft marks to the corresponding sensor readings indicated on the DQM screen. The vessel's hull draft reading shall be viewed from a contractor supplied auxiliary vessel circling the dredge. The Contracting Officer's Representative shall review the difference between averaged drafts recorded by the instruments and those estimated from the draft marks to insure that the system is operating within the acceptable accuracy of approximately $\pm$ 0.1 ft. in calm seas conditions, and shall direct the Contractor to re-calibrate or repair system components as necessary. This check may be performed separately or as a part of the Water Load Test.

3.4.2 Draghead Depth Check

The Contracting Officer's Representative may require periodic calibration checks of the reported draghead depth using manual means such as tape measures or sounding lines to directly measure draghead depth. The Contractor shall furnish a steel tape, chain, or wire with clearly visible flags/tags placed at 1 foot increments within the operational range of the dragarm. These devices shall be capable of measuring the depth below the water surface to the lowest fixed point of each

draghead (often the heel) with sufficient length to measure 5 feet more than the maximum project depth. Pressure sensors may be used to verify calibration of the draghead sensors only in areas where current flow past the vessel/dragarm cannot be reduced sufficiently to allow safe handling of manual measuring devices. Pressure sensors, used for this purpose shall be vented pressure gages and shall be subjected to an annual manufacturer's calibration. Prior to the dragarm depth check, the sensor shall be checked at a known depth, and may be required to be zeroed at this point according to manufacturer's specifications. Care shall be taken not to kink the cable or restrict the vent during deployment.

The Contracting Officer's Representative shall review the draghead depth data to insure that the system is operating within acceptable accuracy, and may direct the Contractor to re-calibrate or repair system components as necessary. If a bubbler type system is used, weekly calibration of the draghead sensors is recommended, as they are sensitive to environmental conditions.

3.4.3 Hopper dredge Ullage Check

The Contracting Officer's Representative shall periodically check the reported hopper dredge ullage using a tape measure or other distance measuring device. The Contractor shall furnish a clearly readable weighted tape, marked in tenths of a foot, capable of measuring throughout the full range of hopper dredge depth. The weight for this tape shall be a 6-inch diameter disk weighing between 2 and 3 pounds. The Contracting Officer's Representative shall review the hopper dredge ullage data to insure that the system is operating within acceptable accuracy (0.1 feet), and may direct the Contractor to re-calibrate or repair system components as necessary. This check may be performed separately or as a part of the Water Load Test.

3.4.4 Position Check

During inspection the reported position of the dredge shall be verified by comparison with readings from a handheld GPS receiver. Throughout the contract, the Contracting Officer's Representative shall periodically take readings from an independent GPS to verify locations.

3.4.5 Water Load Test

Water Tests shall consist of pumping the hopper dredge out to its lowest level and then filling it to capacity with water, taking ullage and draft measurements at both levels to determine hopper dredge volume and displacement. The objective of the water test is to validate the dredge's reported displacement and hopper volumes. If the results of the water test indicate that the system is not operating within acceptable accuracy, the Contractor shall correct the deficiencies causing the error, and repeat the water test until the results are acceptable.

The Contractor shall provide a handheld refractometer with automatic temperature compensation to measure the hopper dredge water specific gravity during water tests. The refractometer shall be capable of measuring the hopper dredge water specific gravity with a resolution of 0.001 and minimum accuracy of ± 0.001. The Contractor shall also provide a water-sampling device to retrieve a sufficient volume of water from various depths in the hopper dredge to accurately determine specific gravity with the refractometer, and a sufficient volume of deionized water for calibration of the device.

3.5 CONTRACTOR QUALITY CONTOL

Dredging contractor shall designate a quality control systems manager (QCSM), who shall develop and maintain daily procedures to ensure quality control (QC) of the DQM system. These methods shall include a procedure by which data being collected is checked against known values, telemetry is verified to be functioning, and the DQM computer is verified to be on and the DQMOBS is running. These procedures shall be outlined in the DPIP and submitted prior to the start of the contract. In the event a Contractor Quality Control (CQC) Report is required, daily annotations shall be made in the Daily CQC Report documenting all actions taken on each day of work including all deficiencies found and corrective actions taken.

3.6 LIST OF ITEMS TO BE PROVIDED BY THE CONTRACTOR

DPIP	Sec 1.5 Dredge Plant Instrumentation Plan
DQM SYSTEM	
Sensor Instrumentation	Sec. 3.1 Specifications for Reported Data
DQM Computer	Sec. 3.2 National Dredging Quality Management System Requirements
DREDGE DATA	
Event documentation	Sec. 3.2.10 Data Reporting
Dredge Data Backups	Sec 3.2.11 Contractor Data Backups
QA EQUIPMENT ON DREDGE	
Ullage tape	Sec. 3.4.3 Hopper dredge Ullage Check
Dragarm depth chain	Sec. 3.4.2 Draghead Depth Check
Refractometer –measuring in grams/cubic centimeter with a resolution of 0.001 and a minimum accuracy of ± 0.001 with calibration water	Sec. 3.4.5 Water Load Test
Water sampling device	Sec. 3.4.5 Water Load Test