Central Long Island Sound Dredged Material Disposal Site

Site Management and Monitoring Plan

Revised
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ACRONYMS AND KEYWORDS

aRPD	Apparent Redox Potential Discontinuity
CFR	Code of Federal Regulations
CLDS	Central Long Island Sound Dredged Material Disposal Site (formerly CLIS)
CPUE	Catch per Unit Effort
CT	Connecticut
CTDEP	Connecticut Department of Environmental Protection
CTDEEP	Connecticut Department of Energy and Environmental Protection
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
DAMOS	Disposal Area Monitoring System
DEIS	Draft Environmental Impact Statement
DMMP	Dredged Material Management Plan
DQM	Dredging Quality Management
EIS	Environmental Impact Statement
EFH	Essential Fish Habitat
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
ITM	Inland Testing Manual
LISS	Long Island Sound Study
MPRSA	Marine Protection, Research, and Sanctuaries Act of 1972
NAD83	North American Datum 1983
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NY	New York
NYSDEC	New York State Department of Environmental Conservation
ODMDS	Ocean dredged material disposal site
OSI	Organism Sediment Index
QA	Quality Assurance
RHA	Rivers and Harbors Act
RIM	Regional Implementation Manual
SMMP	Site Management and Monitoring Plan
SPI	Sediment profile imaging
TOC	Total Organic Carbon
USACE-NAE	U.S. Army Corps of Engineers, New England District
USCG	U.S. Coast Guard
USFWS	U.S. Fish and Wildlife Service
QA	Quality Assurance
QAPP	Quality Assurance Project Plan

1.0 INTRODUCTION

The primary statutes governing the aquatic disposal of dredged material in the United States are the Marine Protection, Research, and Sanctuaries Act (MPRSA), 33 U.S.C. §§ 1401, et seq., and the Clean Water Act (CWA), 33 U.S.C. §§ 1251, et seq. The waters of Long Island Sound are *landward* of the baseline from which the territorial sea of the United States is measured. As with other waters lying landward of the baseline, all dredged material disposal activities in Long Island Sound, whether from federal or non-federal projects of any size, are subject to the requirements of section 404 of the CWA, 33 U.S.C. § 1344. The MPRSA generally only applies to dredged material disposal in waters *seaward* of the baseline and would not apply to Long Island Sound but for the 1980 amendment that added section 106(f) to the statute, 33 U.S.C. § 1416(f). This provision – commonly referred to as the "Ambro Amendment" after former New York Congressman Jerome Ambro – requires that the disposal of dredged material in Long Island Sound from federal projects (projects carried out under the U.S. Army Corps of Engineers civil works program or by other federal agencies) and non-federal projects involving more than 25,000 cubic yards of material, must comply with both the CWA and the MPRSA. This applies to both the authorization of specific disposal sites and the assessment of the suitability of specific dredged material for disposal. Disposal from non-federal projects involving 25,000 cubic yards or less of dredged material, however, is subject only to CWA § 404.

Section 102(c) of the MPRSA, 33 U.S.C. § 1412(c), authorizes the U.S. Environmental Protection Agency (EPA) to designate sites where ocean disposal of dredged material may be permitted. *See also* 33 U.S.C. § 1413(b) and 40 CFR § 228.4(e). Ocean dredged material disposal sites (ODMDS) designated by EPA under the MPRSA are subject to detailed management and monitoring protocols to track site conditions and prevent the occurrence of unacceptable adverse effects to the marine environment. *See* 33 U.S.C. § 1412(c)(3). Those management and monitoring protocols are described in a Site Management and Monitoring Plan (SMMP) developed jointly by EPA and the U.S. Army Corps of Engineers (USACE). *See id.*

The Region 1 office of EPA (EPA Region 1) designated the Central Long Island Sound Dredged Material Disposal Site (CLDS; formerly referred to as CLIS) in 2005 under Section 102(c) of the MPRSA (EPA, 2005). EPA designated the site to help meet the long-term needs for dredged material disposal in Long Island Sound (*see* Figure 1). In conjunction with the site designation,

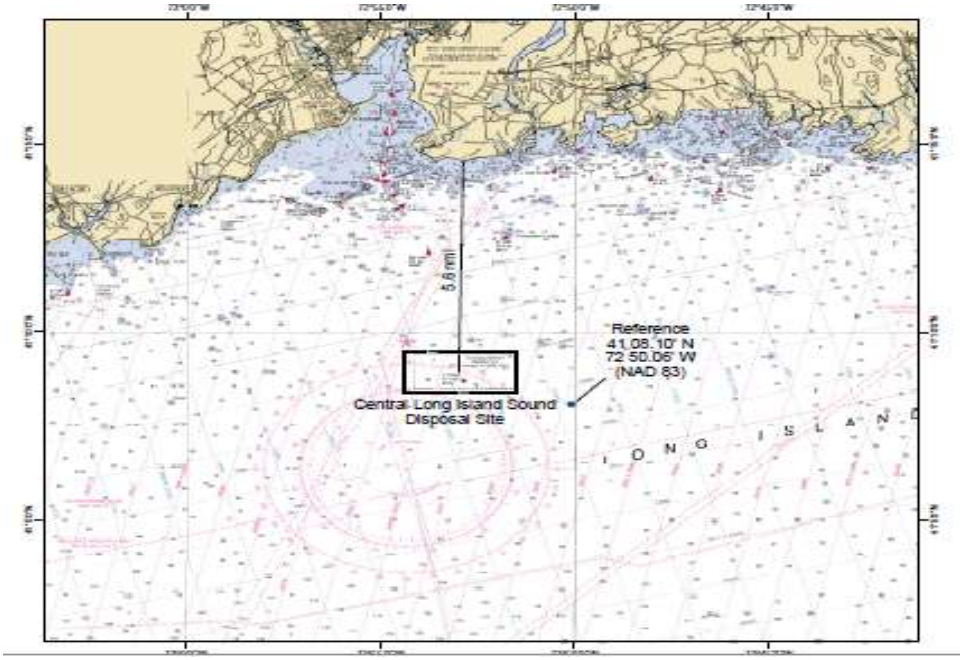

Figure 1 - Location of the Central Long Island Sound Dredged Material Disposal Site (USACE-NAE, DAMOS)

EPA Region 1 and the U.S. Army Corps of Engineers, New England District (USACE-NAE) also issued an SMMP for the CLDS.

The MPRSA further requires that SMMPs include a schedule for review and revision of the plan within 10 years after its adoption and then every 10 years thereafter. Since the SMMP for the CLDS was established in 2005, EPA Region 1 and the USACE-NAE have reviewed the plan annually. They also comprehensively reviewed the plan to support this revision of the plan. In March 2016, EPA Region 1 published on its website a draft of this Revised SMMP for public review and comment. *See* 81 Fed. Reg. 7055, 7060 (Feb. 10, 2016) (Proposed Amendments to Restrictions on Use of Dredged Material Disposal Sites in the Central and Western Portions of Long Island Sound; Connecticut). No public comments were submitted on the draft Revised SMMP.

EPA Region 1 and the USACE-NAE evaluate the data collected under the monitoring program annually. This data also is periodically evaluated by other federal agencies, such as the National Marine Fisheries Service (NMFS), and by state agencies, to determine whether additional monitoring or modifications in site usage, management, or testing protocols, are warranted.

From these reviews, EPA Region 1 and the USACE-NAE have determined that the original procedures and protocols established in 2005 continue to meet the management objectives of the CLDS and they will be retained for the Revised SMMP. This revision of the SMMP fulfills the 10-year revision requirement of the MPRSA.

2.0 REGULATORY FRAMEWORK AND AUTHORITIES

This SMMP is intended to describe a management framework and monitoring program that minimizes any potential for adverse impacts to the marine environment from dredged material disposal at the CLDS. To this end, the SMMP identifies actions, provisions, and practices necessary to manage the operational aspects of dredged material disposal at the site. This is consistent with the SMMP requirements of Section 102(c)(3) of the MPRSA. *See also* 40 CFR § 228.10(a) (the impact of disposal at designated sites should be evaluated periodically).

Management

Management of the disposal site involves: regulating the time periods for disposal and the quantity and physical/chemical characteristics of dredged material that may be disposed at the site; establishing disposal controls and conditions; and monitoring the site environment to verify that permit terms are being met and that potentially unacceptable conditions that could result in significant adverse impacts are not occurring from past or continued use of the disposal site.

In addition, this Revised SMMP also incorporates the following six requirements for ocean disposal site management plans that are described in MPRSA § 102(c)(3)(A) – (F):

1. Consideration of the quantity of the material to be disposed of at the site, and the presence, nature and bioavailability of the contaminants in the material [Section II C, *infra*];
2. A baseline assessment of conditions at the site [Section III, *infra*];
3. A program for monitoring the site [Section IV, *infra*];
4. Special management conditions or practices to be implemented at each site that are necessary for protection of the environment [Section V.A, *infra*);
5. Consideration of the anticipated use of the site over the long term, including the anticipated closure date for the site, if applicable, and any need for management of the

site after closure [Section VI, *infra*); and

6. A schedule for review and revision of the plan calling for review and revision not less frequently than 10 years after initial adoption of the plan and every 10 years thereafter [MPRSA § 102(c)(3); Section VII, *infra*).

This Revised SMMP is consistent with EPA regulations at 40 CFR § 228.10(c) calling for EPA to periodically assess disposal sites based on the available body of pertinent data. Recognizing and correcting any potential adverse condition *before* it causes an unacceptable adverse impact to the marine environment or presents a navigational hazard to any type of vessel traffic is a central objective of this Revised SMMP.

The practices that will be applied to address these management goals at the CLDS include the following: coordination among federal and state agencies; testing of material to ensure acceptability for disposal at the site; review of general and specific permit conditions; review of allowable disposal technologies and methods; implementation of inspection, surveillance and enforcement procedures; periodic environmental monitoring at the site and at relevant reference sites for comparative evaluation; and information management and record keeping.

Monitoring

Under 40 CFR § 228.10(b), the following types of potential effects should be considered when evaluating impact at a disposal site:

- Movement of materials into sanctuaries or onto beaches or shorelines [228.10(b)(1)];
- Movement of materials toward productive fishery or shellfishery areas [228.10(b)(2)];
- Absence from the disposal site of pollutant-sensitive biota characteristic of the general area [228.10(b)(3)];
- Progressive, non-seasonal, changes in water quality or sediment composition at the disposal site when these changes are attributable to dredged materials placed at the site [228.10(b)(4)];
- Progressive, non-seasonal, changes in composition or numbers of pelagic, demersal, or benthic biota at or near the disposal site when these changes can be attributed to the effects of dredged materials placed at the site [228.10(b)(5)];

- Accumulation of material constituents (including without limitation, human pathogens) in marine biota at or near the site (*i.e.*, bioaccumulation [228.10(b)(6)]); and
- Any non-compliance with CWA or MPRSA permit conditions (information about any non-compliance should be referred to enforcement authorities, as appropriate).

The monitoring approach defined in this Revised SMMP focuses on those factors that provide an early indication of potential unacceptable effects. The plan also incorporates ongoing regional monitoring programs in Long Island Sound that can provide additional information. The identification of unacceptable impacts, if any, from dredged material disposal at the CLDS will be accomplished in part through comparisons of the monitoring results to historical (*i.e.*, baseline) conditions, and in part through comparison to nearby reference locations.

If site monitoring demonstrates that the disposal activities are causing unacceptable impacts to the marine environment as defined under 40 CFR § 228.10(b), the site managers will place appropriate limitations on site usage to reduce the impacts to acceptable levels. Such responses may range from withdrawal of the site's designation (*i.e.*, de-designation), to limitations on the amounts and types of dredged material permitted to be disposed, or limitations on disposal methods, locations, or schedules.

3.0 MANAGEMENT PLAN

All dredged material projects using the CLDS are subject to CWA Section 404, while private projects larger than 25,000 cubic yards and all federal projects also must be authorized under MPRSA Section 103. The CLDS will be managed in a manner that ensures the following site management goals are met:

- Ensure compliance with permit conditions;
- Avoid or minimize loss of sediment from the disposal site;
- Avoid or minimize conflicts with other uses of the area;
- Maximize the retention of site capacity;
- Avoid or minimize any adverse environmental impact from sediments placed at the site; and

- Recognize and correct conditions that could lead to unacceptable impacts.

EPA Region 1 and the USACE-NAE will jointly manage the CLDS and will coordinate with the states of Connecticut and New York as appropriate. The effectiveness of the management approach depends on having efficient planning processes, consistent compliance and enforcement, a robust yet flexible monitoring plan, and an effective communication structure that includes timely receipt and review of information relevant to the site management goals. To support this approach, EPA Region 1 and the USACE-NAE utilize the New England Regional Dredging Team (NERDT) to share information and provide input on site management and monitoring issues. The NERDT is a federal-state interagency workgroup that meets 3-4 times per year to share information and coordinate activities on a wide range of issues related to dredging and dredged material management, including the management and monitoring of dredged material disposal sites like the CLDS. In addition, EPA Region 1 and USACE-NAE have an annual meeting at which they review monitoring data, establish monitoring objectives, and plan future monitoring surveys for disposal sites throughout New England coastal waters.

Management of the CLDS has historically included and will continue to include the following practices:

- Evaluation of the suitability of material for disposal in accordance with the applicable requirements for the specific type of project (*i.e.*, requirements under the MPRSA and CWA);
- Specification of disposal conditions, location, and timing in permits, as appropriate (*e.g.*, disposal will not occur between June 1 and September 30 to ensure that dredging windows for fisheries are met, and disposal may be restricted during spring tides to ensure that water quality criteria are not exceeded outside the boundaries of the site);
- Requiring compliance with all permit conditions;
- Requiring disposal to occur at specified target coordinates within the site (to be determined on an annual basis);
- To ensure compliance, all scows placing material at the CLDS are required to utilize tracking instrumentation in accordance with the USACE-NAE Dredging Quality Management (DQM) system to allow the determination of actual placement locations;

- Disposal coordinates will be set each year with the intent of minimizing environmental impacts and maximizing long-term site capacity;
- Limiting the buildup of material in height above the bottom so that disposal mounds do not become either a hazard to navigation or likely to be mobilized by storm events;
- Conducting disposal site monitoring in a consistent, systematic manner; and
- Specification of site de-designation (*i.e.*, closure) conditions and dates when it becomes appropriate.

Specific Management Practices

In addition, special management practices may be required for individual projects using the CLDS based on existing site monitoring data and long-term management goals:

- Specification of the volume of dredged material volume that can be placed at specific locations within the site or the total volume of dredged material that can be placed at the site;
- Modifications to the approved disposal methods, locations, or times; and
- Requirement for additional monitoring focused on a specific aspect of a project.

EPA regulations, *see* 40 CFR § 228.10(c), suggest that disposal sites be periodically assessed based on the available body of pertinent data. A central goal of this Revised SMMP is that any potential unacceptable condition will be recognized and corrected before it causes an adverse impact to the marine environment or presents a navigational hazard. Both EPA Region 1 and USACE-NAE will cooperate to ensure effective enforcement of all disposal requirements.

The USACE-NAE will provide EPA Region 1 with summary information on each project at two stages of the dredging and disposal process. A Summary Information Sheet will be provided when dredging operations begin, and a Summary Report will be submitted when dredging operations have been completed.

The following list describes special conditions to be applied to projects using the CLDS:

- At least ten working days before the start date, the USCG First District, Aids to Navigation Office, shall be notified of the location and estimated duration of the dredging and placement operations.
- At least ten working days before the start date, the USCG Captain of the Port, Long Island Sound, shall be notified of the location and estimated duration of the dredging and placement operations.
- The Captain of the Port, Long Island Sound, shall be notified at least two hours prior to each departure from the dredging site.
- The DQM system must be operational on each disposal scow and record each placement event. This information is automatically uploaded to a USACE-NAE database.
- Prior to the initiation of placement activity, and any time placement operations resume after having ceased for one month or more, the permittee or the permittee's representative must notify the USACE-NAE.
- The permittee must notify the USACE-NAE upon completion of dredging for the season by completing and submitting the form that the USACE-NAE will supply for this purpose.
- Except when directed otherwise by the USACE-NAE, all placement of dredged material shall adhere to the following: The permittee shall release the dredged material within the site at a set of coordinates specified by the USACE-NAE. All placement is to occur at the specified coordinates with the scow moving at less than two knots. This requirement must be followed except when doing so would create unsafe conditions because of weather or sea state, in which case placement within a specified distance (generally less than 350 ft.) of the specified coordinates with the scow moving only fast enough to maintain safe control is permitted. Placement is not permitted if these requirements cannot be met due to weather or sea conditions. In that regard, special attention needs to be given to predicted conditions prior to departing for the placement site.
- EPA Region 1 and the USACE-NAE (and/or their designated representatives) reserve all rights under applicable law to free and unlimited access to and/or inspection of: 1) the dredging project site, including the dredge plant, the towing vessel and scow, at any time during the project; 2) all records, including logs, reports, memoranda, notes, etc., pertaining to a specific dredging project (federal or non-federal); and 3) towing, survey monitoring, and navigation equipment.

- If dredged material regulated by a specific permit or federal authorization issued by the USACE-NAE is released in locations or in a manner not in accordance with the terms or conditions of the permit or authorization, the master/operator of the towing vessel shall immediately notify the USACE-NAE of the incident, as required by the permit or authorization, and provide the USACE-NAE with the relevant DQM data export. The USACE-NAE shall copy EPA Region 1 of such notification as soon as possible but no later than the next business day. In addition, the towing contractor shall make a full report of the incident to the USACE-NAE and EPA Region 1 within ten (10) days.

These conditions may be modified on a project-by-project basis based on factual changes (*e.g.,* administrative changes in phone numbers, points of contact) or when deemed necessary as part of the individual permit review process.

Modifications to the Management Plan

Based on the findings of the monitoring program, modifications to site use could be required. In such a case, corrective measures such as, but not limited to, those listed below, will be developed by EPA Region 1 and the USACE-NAE.

- Stricter definition and enforcement of disposal permit conditions;
- Implementation of even more conservative evaluation procedures for determining whether sediments proposed for dredging are suitable for open-water disposal;
- Implementation of special management practices to prevent loss of sediment to the surrounding area;
- Excavation and removal of any unacceptable sediments from the placement site (a highly unlikely, worst case scenario given that the permitting program should exclude such material from the site to begin with, and since excavation could make matters worse by releasing any contaminants during the process);
- Closure of the site as an available dredged material placement area (*i.e.*, to prevent any additional placement at the site).
- Use of marine mammal observers during disposal operations;
- Modification of dredging windows; and

- Any additional measures deemed necessary to further ensure compliance with the Endangered Species Act (ESA) and the Essential Fish Habitat (EFH) provisions of the Magnuson-Stevens Fishery Conservation and Management Act.

In addition to identifying management practices for the placement site and for individual projects, each SMMP also must include a monitoring plan, which is provided in Section 6.0. Coordination and outreach should occur on both a regular and as needed basis and include state and federal agencies, scientific experts, and the public. To ensure communications are appropriate and timely, site management activities and monitoring findings will be disseminated through a combination of scientific reports and peer-reviewed publications, participation in symposia, and public meetings and fact sheets.

As of this revision, no additional monitoring or management considerations beyond those specified in this SMMP are deemed necessary.

4.0 BASELINE ASSESSMENT

MPRSA 102(c) (3)(A) requires that the SMMP include a summary of baseline conditions at the site. Baseline conditions are reported in the Environmental Impact Statement for the site designation (EPA, 2005). This section provides a brief site description and overview of disposal at the CLDS. More detailed information is found in the EIS, the original SMMP, DAMOS reports, monitoring data from CTDEEP, and the Long Island Sound Study (LISS, a part of EPA's National Estuary Program).

Site Characteristics

The CLDS is defined as a rectangle measuring 4.1 by 2.0 km (total area of 8.2 km^2) (EPA, 2004). The center of the rectangle has coordinates at 41° 08.95' N and 72° 52.95' W (NAD 83) (Figure 1). The site is located approximately 10.4 km south of South End Point, East Haven, Connecticut.

The baseline assessment activities conducted at the CLDS as part of the EIS study sampled two historic disposal mounds, an active disposal mound within the site, a reference area outside of the disposal site, and two farfield stations outside of the disposal site. The DAMOS program has

maintained three reference areas outside the disposal site, and they (CLDS-REF, 2500W, and 4500E) are incorporated into this Revised SMMP.

The seafloor at the CLDS slopes from a depth of 59 feet (18 meters) at the northwest corner to 74 feet (22.5 meters) in the southeast corner. There are distinct disposal mounds from past dredged material disposal activities that reduce water depths in the site to as little as 46 feet (14 meters) deep in some locations. The bottom sediments at the CLDS are composed of fine silts and clays characteristic of the low-energy environment found in deep areas of the western and central basins. The site is in an area of sediment accumulation, which is indicative of a generally low current regime.

Site Capacity

The capacity of the CLDS was originally estimated at 38 million cubic yards (mcy) in the 2004 EIS, *see* FEIS for Designation of the CLDS and WLDS (April 2004), App. J-2 (SMMP for CLDS), p. 64. This estimate was based on a simplistic model that assumed material could be placed to form a level surface over the site at the controlling depth then identified for safe navigation (approximately 46 feet). The incorporation of advanced bathymetric survey technology into the monitoring of the CLDS since 2004 has provided a much more informed understanding of how dredged material released from a scow at the surface forms mounds on the seafloor. Based on that understanding, a more conservative approach has been followed in placing material at the site to ensure that the safe navigation depth is maintained over the entire site and to ensure mounded material does not spread beyond the site boundaries. Specifically, the site was managed to a deeper depth target to ensure adequate open-water depths over the site. This has the added advantage of allowing the passage of deeper draft vessels over the site. Using this more conservative approach based on managing the site for a deeper depth of open water, and accounting for the ongoing buildup of material at the site since 2004, the estimated site capacity was reduced to 20 mcy by the USACE-NAE, as described in its January 2016 Long Island Sound Dredged Material Management Plan (DMMP) (USACE-NAE, 2016).

The original 2004 capacity estimate of 38 mcy was mistakenly retained by EPA Region 1 and the USACE-NAE in the draft revision of the SMMP for the CLDS, *see* p. 11, that EPA Region 1 published for public comment in March 2016. The agencies should have cited the updated

site capacity estimate of 20 mcy consistent with the USACE-NAE's recently completed DMMP for Long Island Sound. *See* DMMP (2016), p. 4-27. Consistent with the value from the DMMP, the agencies here correctly provide an estimated capacity of 20 mcy for the CLDS.

Remaining site capacity will be updated periodically as additional bathymetric surveys are performed at the site. The need for collecting bathymetric data is based, in part, on the record of dredged material placement location and scow volume. The accuracy of this record has increased significantly with the implementation of the DQM system, which was developed by the USACE to provide detailed tracking of dredging and scow operations nationwide. Information on this system can be found at: http://www.sam.usace.army.mil/Missions/Spatial-Data-Branch/Dredging-Quality-Management/

Sediment and Water Quality

All dredged material projects proposed for disposal at the CLDS will be evaluated on a project-specific basis under the chemical and biological testing framework outlined in the EPA's Ocean Dumping Regulations (*see* 40 CFR Part 227) and guidance developed by EPA and the USACE (EPA/USACE, 1991). In addition, screening level modeling is performed to further evaluate the potential for water column effects as part of the dredged material suitability determination.

The SMMP does not require specific ambient water column monitoring at the CLDS. Rather, it relies on the LISS Water Quality Monitoring Program, administered by CTDEEP, for routine measurements. If issues are identified by this monitoring that indicate a potential relationship to the CLDS, then a responsive monitoring plan will be developed consistent with LISS methodologies.

The CLDS area is expected to exhibit similar water quality conditions to those present in the rest of the central basin of Long Island Sound, which currently meets state water quality standards. The average annual salinity is expected to be higher than those sites farther to the west and water temperatures in the summer and fall are expected to be slightly lower. The water clarity in the summer months at the CLDS will be higher than in the western basin of Long Island Sound.

The bottom sediments in Long Island Sound where the CLDS is located are composed primarily of fine silts and clays, characteristic of a low-energy environment. Although some of the sediment placed at the site has contained a higher fraction of coarse material than the ambient sediment, areas within the CLDS that have been the target of dredged material placement have consistently and rapidly returned to a healthy benthic community similar to established reference areas. This confirms the success of the suitability testing procedures. No negative impacts to sediment quality have been identified associated with dredged material disposal.

Living Resources

Commercial/Recreational Fish and Shellfish Resources

Long Island Sound, a semi-enclosed estuary, is an important economic resource for both commercial and recreational/sport fishermen. The region is utilized by more than 83 fish species; however, the majority of them are migratory and spend only part of the year in the Sound (Gottschall et al., 2000). Standard research tows for fish and shellfish conducted by the CTDEP between 1984 and 2000 document that the highest catch per unit effort (CPUE, defined as number of individuals per standard trawl) in Long Island Sound was in central Long Island Sound. The average fall CPUE near the CLDS was 1,982 and the average spring CPUE relatively low at 588. The long-term (16 years) seasonal average was 1,285 CPUE. Species richness in the vicinity of the CLDS was the highest with fall and spring values of 13.7 and 14.3 respectively. Species diversity at stations near the CLDS was almost identical to that inside the disposal site (USACE, 2003). More recent surveys (2000) show that spring trawls were dominated primarily by winter and windowpane flounder, while the fall trawls were dominated by scup and butterfish.

Based on the CTDEEP data, lobsters were most abundant on muddy substrates, occurred Sound-wide in all seasons during the study period (*i.e.*, 1984 to 2000), and were moderately abundant at the CLDS. The Long Island Sound lobster population has declined throughout Long Island Sound after a major die-off in 1998-1999.

Endangered and Threatened Species

This section provides a summary of known endangered, threatened, and "special concern" species within the Long Island Sound region. An endangered species is one whose overall

survival in all or part of its range is in jeopardy. A species could become endangered as a result of lost or changed habitat, exploitation by man, predation, adverse interspecies competition, and/or disease. Threatened species are those at risk of becoming endangered in the foreseeable future. A species also may be considered a species of "special concern." These could be native species for which a risk of endangerment has been documented within a state (New York State Department of Conservation or NYSDEC, 2003). While endangered and threatened species are protected under the ESA, 16 U.S.C. §§ 1531, *et seq.*, and state law, species of "special concern" are protected only by state law.

There have been some changes to endangered species listings that are applicable to the CLDS since the original SMMP was published. These changes are summarized in Table 1 and include the addition to the endangered species list of the Atlantic sturgeon (Acipenser oxyrinchus oxyrinchus) (in 2012). Atlantic sturgeon was discussed in the original SMMP as it was listed as a fish species of concern in the states of Connecticut and New York. The bald eagle (Haliaeetus leucocephalus) was removed from the endangered species list in 2007. No other changes to federally listed endangered species with potential habitat in the study area were noted.

Table 1. Changes in Endangered or Threatened Species

Summary of Changes since 2004
One species of endangered fish added (Atlantic sturgeon)
One species of bird removed from the endangered list (bald eagle)

Endangered and Threatened Mammals

Three endangered species of marine mammals were originally identified for the EIS study area, as described in Table 2. In general, whales and other marine mammals are not frequently observed in Long Island Sound; however, occasional sightings have resulted in the inclusion of several species on the endangered species lists for Connecticut and New York (EPA, 2004). NMFS concurred with the conclusion from the original EIS for the CLDS designation that marine mammals are not expected to spend significant portions of time within the western and central basins of Long Island Sound and that adverse impacts to marine mammals are not likely

(EPA, 2004). The information on endangered species was updated as part of this Revised SMMP.

Endangered and Threatened Reptiles

Sea turtles are the only endangered reptile species noted in the Long Island Sound area (Table 2). Sea turtles are highly migratory and are found throughout the world's oceans (NOAA, 1995). Pursuant to Section 7 of the Endangered Species Act, EPA Region 1 requested input from resource and state agencies (NOAA, USFWS, CTDEEP, and NYSDEC) on the identification of threatened and endangered species in Long Island Sound. This input indicated that there are five species of sea turtles that may be found in the waters of Long Island Sound.

Use of Long Island Sound by turtles appears related to the availability of prey, annual migration patterns, and age. The coastal waters of New York provide an important habitat for juvenile Kemp's ridley, green, and loggerhead turtles and adult-sized leatherbacks. Hawksbill turtles are only an incidental visitor to Long Island Sound; therefore, Long Island Sound is not considered important habitat to the Hawksbill turtle.

Table 2 – Endangered and Threatened Marine Mammals and Reptiles

Species	Federal Status	CT Status	NY Status
Humpback whale (Megaptera novaeangliae)	Endangered	NA*	Endangered
Fin whale (Balaenoptera physalus)	Endangered	NA*	Endangered
Right whale (Eubalaena glacialis)	Endangered	NA*	Endangered
Kemp's ridley sea turtle (Lepidochelys kempii)	Endangered	Endangered	Endangered
Loggerhead sea turtle (Caretta caretta)	Threatened	Threatened	Threatened
Leatherback sea turtle (Dermochelys coriacea)	Endangered	Endangered	Endangered
Green sea turtle (Chelonia mydas)	Threatened	Threatened	Threatened
Hawksbill sea turtle (Eretmochelys imbricata)	Endangered	NA*	Endangered

Notes: NA – not listed *previously listed as endangered in prior SMMP.
CT list accessed 12/29/15, effective 8/5/15.
http://www.ct.gov/dEep/cwp/view.asp?a=2702&q=323488&deepNav_GID=1628
NY list accessed 12/23/15 http://www.dec.ny.gov/animals/7494.html - last updated 8/8/2007

Endangered and Threatened Fish

Two endangered fish species may be found in the vicinity of the CLDS, as described in Table 3: the shortnose sturgeon (Acipenser brevirostrum) and the Atlantic sturgeon (Acipenser oxyrinchus oxyrinchus). The 2004 SMMP identified the shortnose sturgeon as being listed as endangered at both the federal level as well as by the states of Connecticut and New York. The original SMMP described the Atlantic sturgeon as only being listed as "threatened in inland waters" by the state of Connecticut, but this species is now a federally protected endangered species. Neither sturgeon species is expected to be impacted by disposal activities at the CLDS as they are both highly mobile species.

Shortnose sturgeon occur in the lower Connecticut River from the Holyoke Pool to Long Island Sound. Unlike other anadromous species, such as salmon and shad, shortnose sturgeon do not appear to make long-distance offshore migrations (NMFS, 2001a). It can be inferred that shortnose sturgeon utilize portions of Long Island Sound since they are known to spawn in the Connecticut River. Shortnose sturgeon have not been observed during CTDEEP trawls in Long Island Sound since 1984.

Table 3 – Endangered Fish

Species	Federal Status	CT Status	NY Status
Shortnose sturgeon (Acipenser brevirostrum)	Endangered	Endangered	Endangered
Atlantic sturgeon (Acipenser oxyrinchus oxyrinchus)	Endangered	Endangered	Endangered

The Atlantic sturgeon is an anadromous species that lives up to 60 years, reaching lengths up to 14 feet (4 meters) and potentially weighing over 800 pounds (363 kilograms) (NMFS, 2001b). Long Island Sound may be an important feeding or resting area on-the-way to and from spawning areas in the Hudson River because all sizes of Atlantic sturgeon have been seen or captured in the Sound. Atlantic sturgeon have been caught in all three basins of Long Island

Sound but were most common in the vicinity of Falkner Island (Savoy and Pacileo, 2003).

Endangered and Threatened Birds

Fourteen bird species were initially identified as endangered or threatened in the study area in the EIS. Of these species, only four are known to use offshore open water areas (Table 4). Of these, only the Roseate tern is on the federal endangered species list. Birds are highly mobile species and the identified species are only expected to occasionally use open waters for feeding/foraging. They can easily adjust their location during the few times disposal events are occurring. The red knot is now a federally listed endangered species but will not likely be present in the vicinity of the CLDS because it forages in intertidal areas along the shore.

Table 4 - Endangered and Threatened Birds

Name	Classifi-cation	Season Uses LIS	Federal Status	CT State Status	NY State Status	Offshore/ Open Water Use
Common tern (Sterna hirundo)	Colonial Waterbird	Spring-Early Fall	-	Special Concern*	Threatened	Occasional
Least tern (Sterna antillum)	Colonial Waterbird	Spring-Summer	-	Threatened	Threatened	Occasional
Roseate tern (Sterna dougallii)	Colonial Waterbird	Spring-Early Fall	Endangered	Endangered	Endangered	Occasional
Common loon (Gavia immer)	Pelagic	Winter	-	Special Concern*	Special Concern	Occasional

Notes: *Updated since last SMMP. CT list accessed 12/29/15, effective 8/5/15. http://www.ct.gov/dEep/cwp/view.asp?a=2702&q=323488&deepNav_GID=1628 NY list accessed 12/23/15 http://www.dec.ny.gov/animals/7494.html - last updated 8/8/2007

5.0 DISPOSAL HISTORY

The CLDS has been one of the most active dredged material disposal sites in New England, and it has the longest known continuous record of use of any disposal site in Long Island Sound (EPA, 2004). In the 2004 EIS and SMMP, EPA Region 1 stated that, based on USACE-NAE records, the quantity of dredged material that had been disposed at or in the general vicinity of

the current CLDS since 1941 was approximately 14 mcy (EPA, 2004). In the process of developing the DMMP, however, the USACE-NAE did extensive research and reviews of dredged material disposal data from several sources and determined that the actual amount of disposal at the CLDS was closer to half that, or approximately seven mcy.

The DMMP estimates that the total amount of dredged material placed at the CLDS from 1940 through 2016 is approximately 9.4 mcy for an average of approximately 122,000 c.y. annually (USACE-NAE, 2016). For the more recent timeframe of 1980-2016, the total amount of placement at the CLDS was approximately 4.8 mcy for an average of approximately 130,000 annually. The CLDS receives the largest volumes from federal navigation projects in New Haven, Stamford, Norwalk, and Bridgeport harbors, with smaller harbors in Connecticut and New York contributing to the total disposal volumes (EPA, 2004).

Beginning as early as 1974, dredged material has been placed at the CLDS in distinct mounds, and the site has been managed to maximize site capacity and containment of material (EPA, 2004). These mounds have been monitored individually to assess stability, thickness of dredged material, and benthic recolonization status relative to previous survey results and compared to nearby reference areas (Valente et al., 2012).

6.0 MONITORING

The USACE-NAE and EPA Region 1 share responsibility for monitoring the CLDS. The two agencies collect their own data but also use data collected by other agencies and organizations. Monitoring data from other agencies (*e.g.,* CTDEEP Trawl Surveys and the LISS Water Quality Monitoring Program, which is administered by CTDEEP) will be utilized as appropriate to maximize the availability of information on the CLDS.

EPA Region 1 is responsible for determining if an unacceptable impact has occurred from dredged material disposal at the CLDS. Any such determinations will be made in consultation with other agencies, however, and will be based on available monitoring data and any other pertinent information. EPA Region 1 is responsible for determining any modification to site use or de-designation.

Monitoring Methods

Monitoring surveys at the CLDS fall into two general categories: confirmatory studies and focused studies. Confirmatory studies are designed to test hypotheses related to expected physical and ecological response patterns following placement of dredged material on the seafloor at the active or recently active target locations within the CLDS. The data collected and evaluated during these studies provide answers to strategic management questions in determining the next step in the site management process. Focused studies are periodically undertaken within the monitoring program to follow up on any unexpected results from a confirmatory survey (*e.g.*, slower than expected recolonization following cessation of placement at a given target location) or to evaluate inactive or historical placement areas within the site (such as following the passage of a large storm).

The primary monitoring tools for confirmatory surveys are collection of acoustic and imaging data. Acoustic surveys include the collection of bathymetric, backscatter, and side-scan data. The bathymetric data provide measurements of water depth that, when processed, can be used to map the seafloor topography. The mapped data is used to track changes in the size and location of seafloor features. Backscatter and side-scan sonar data provide images that support characterization of surficial topography, sediment texture, and roughness. Backscatter data can be processed into a seamless image with corrections for topography, while side-scan sonar data retains a higher resolution image without correction for topography. The comparison of synoptic acoustic data types has the greatest utility for assessment of dredged material placement.

Sediment profile imaging (SPI) is a monitoring technique used to provide data on the physical characteristics of the seafloor as well as the status of the benthic biological community. The technique involves deploying an underwater camera system to photograph a cross section of the sediment-water interface. SPI is coupled with a plan-view camera system to provide imaging of a larger area of the seafloor to aid characterization of the benthic biological community.

In addition to the above techniques, focused surveys may include any of the following:

- Collection of sediment or water samples for laboratory analysis.
- Remotely operated vehicle surveys with camera and sampling capabilities.
- Additional remote sensing techniques such as sub-bottom profiling.

Specifics on monitoring techniques and data processing and analysis can be found in the most recent DAMOS contribution for the CLDS (Hopkins et al., 2015).

Material Movement

The following potential effects (as defined in 40 CFR § 228.10) will be discussed in this section:

1. Movement of materials into estuaries or marine sanctuaries or onto oceanfront beaches or shorelines.
2. Movement of materials toward productive fishery or shellfishery areas.

Mounding of material is apparent through sequential bathymetric surveys at the site (*e.g.*, a decrease in water depth over portions of the site). In addition, there is no evidence that indicates movement of materials from the CLDS to adjacent areas. Periodic bathymetric surveys of the CLDS provide a means of comparing depth changes in the disposal site. Several bathymetric surveys were completed at the CLDS since the last SMMP (Table 5). After site designation in 2004, a bathymetric survey was completed to establish a detailed, high-resolution baseline bathymetric dataset for the CLDS against which future bathymetric surveys could be compared (ENSR, 2007). This high-resolution dataset served to define the location, spatial extent, and long-term stability of mounds and other seafloor features associated with past disposal activities based on the most recent designation boundaries of the site by EPA Region 1 (AECOM, 2013). The most recent bathymetric survey of the entire CLDS was completed in August 2014. Active portions of the site were surveyed again in 2015-2016 (see table 5).

A depth comparison between the 2005 survey and the August 2014 survey revealed that during that ten-year span the historical mounds at the CLDS were stable, with little or no evidence of sediment loss or compaction (Hopkins et al., 2015). Mounds formed before the 2000 dredging season showed little to no change in topography in the ten-year period except for isolated surface disturbances at the NHAV 74 mound that were likely the result of an off-target placement event (Hopkins et al., 2015). The mounds formed in the seasons immediately preceding the 2005 baseline survey (CLDS-02, CLDS-03 and CLDS-04) did show expected increases in depth since 2005 due to gradual consolidation of the dredged material deposits

(Hopkins et al., 2015). Areas of sediment accumulation align with post-2005 disposal mound features (Hopkins et al., 2015). Mounds that received material after the 2005 survey (CLDS-05, CLDS-06, CLDS-07, CLDS-08, CLDS-09, CLDS-10 and MQR) exhibited accumulations of material consistent with the placement activity for each of those disposal seasons (Hopkins et al., 2015).

Review of 2009 and 2011 acoustic data from a limited portion of the CLDS allowed the comparison of 12 older inactive mounds over a shorter time-frame. Of the 12 mounds compared, a few had minor amounts of consolidation (CLDS 05 and CLDS 95/96), but the rest appeared unchanged (AECOM, 2013). The NHAV 74 capped mound (a practice allowed before the MPRSA was amended in 1980, *see* 33 U.S.C. § 1416(f), to cover all federal projects and private projects generating more than 25,000 cubic yards) had what appeared to be fresh dredged material placed on the mound creating consolidation, displacement, and accumulation of new material (AECOM, 2013). Apart from the presence of the new material at NHAV 74, however, all the older mounds surveyed were stable between 2009 and 2011 (AECOM, 2013).

A focused study on the FVP mound completed in 2011 reported that linear marks and small pits observed in 2005 and later attributed to lobster traps and the collecting 'warp' or lines were still visible at least six years after they were first recorded (AECOM, 2013). This provides further evidence of the stability of this mound.

As per the 2004 EIS, 20 mounds from 1974-2000 were reported (Table 12, CLDS SMMP April 2004). A total of 37 active and historical disposal mounds were evident in the August 2014 bathymetry survey of the entire site (Hopkins et al., 2015). The tallest mounds at the site (NHAV-74, CLDS-97/98 and CLDS-10) rose approximately 16 feet above the seafloor while several smaller mounds were less than three feet tall (Hopkins et al., 2015).

The frequency of monitoring at a given site is driven by the amount of material placed at the site as well as previous findings and other relevant factors such as the passage of a large storm or reported issues in the area. Given the large amount of use that the CLDS receives relative to other New England sites, it is one of the most frequently monitored. A summary of monitoring performed at the site around the time of completion of the 2004 EIS and thereafter is presented in the table below.

Table 5 - DAMOS Survey Activities in the CLDS since September 2003

Survey Date	Purpose of Survey	Reference
September 2003	Characterize potential impacts associated with recent disposal activity using single-beam bathymetry and SPI data collection.	ENSR, 2004 (DAMOS Contribution No. 159)
June 2004	Document distribution of dredged material associated with recent disposal events and further assess algal/detrital layer observed in summer 2003. Collected single-beam bathymetry and SPI data.	ENSR, 2005 (DAMOS Contribution No. 163)
July 2005	Obtain bathymetric baseline data (multibeam bathymetry) over CLDS after EIS was completed and site boundary was shifted as well as document the distribution of dredged material around the 2004-2005 disposal locations.	ENSR, 2007 (DAMOS Contribution 177)
September - October 2009	Characterize the seafloor topography and assess benthic recolonization status where recent disposal activities occurred. Collected multibeam bathymetry and SPI data.	Valente et al., 2012 (DAMOS Contribution No. 184)
September - October 2011	Confirmatory multibeam bathymetric and SPI survey over portion of CLDS actively receiving dredged material and a focused bathymetric and SPI survey over the older FVP mound.	AECOM, 2013 (DAMOS Contribution No. 192)
December 2013	Confirmatory studies of active portions of the disposal site. Collected multibeam bathymetry and sediment grab samples for physical characterization.	Hopkins, et al., 2015 (DAMOS Contribution No. 197)
August 2014	Document bathymetry over entire site and assess benthic recolonization status of recently active portions of the site. Collected: multibeam bathymetry, SPI and plan-view images, and sediment grab samples for physical characterization and benthic community structure.	Hopkins, et al., 2015 (DAMOS Contribution No. 197)
October 2015	Confirmatory multibeam bathymetric survey of active portions of the disposal site.	Carey and Beaver, 2017 (DAMOS Data Report DR2015-06

Biological Characteristics

The following potential effects (as defined in 40 CFR 228.10) will be discussed in this section:

1. Absence from the disposal site of pollution-sensitive biota characteristic of the general area.

2. Progressive, non-seasonal, changes in composition or numbers of pelagic, demersal, or benthic biota at or near the disposal site when these changes can be attributed to the effects of materials disposed at the site.
3. Accumulation of material constituents (including, without limitation, human pathogens) in marine biota at or near the site.

Based on results from 2009, 2011, and 2014 surveys, the benthic community within the CLDS is either recovered to the level of the reference sites in the case of historic inactive mounds or are in an intermediate state of recovery for recently active disposal mounds. No problematic changes in pelagic, demersal, or benthic biota were observed that could be attributed to disposal of material at the site. Bioaccumulation data collected as part of suitability determinations for individual dredging projects indicates that bioaccumulation is not a concern. A comprehensive site survey, including sediment and tissue analyses, was performed in 2016 but the final report was not available at the time of this revision.

The organism-sediment interactions in fine-grained sediments follow a predictable sequence of development after a disturbance such as dredged material disposal (Carey et al., 2014). This sequence has been divided into three successional stages (Rhoads and Germano 1982, 1986). Successional stage is assigned by assessing which types of species or organism-related activities are apparent in an SPI image. Stage 3 organisms, the most developed, are deposit-feeding infauna.

As previously described, SPI is a monitoring technique used to provide data on the physical characteristics of the seafloor as well as the status of the benthic biological community. The technique involves an underwater frame/camera system that can photograph a cross section of the sediment-water interface. Analysis of the resulting images for a standard set of characteristics allows comparison between different locations and different surveys. The DAMOS Program has successfully used SPI for over 25 years. One of the main characteristics described in SPI data is Apparent Redox Potential Discontinuity (aRPD) depth. This parameter provides a measure of the integrated time history of the balance between near-surface oxygen conditions and biological reworking of sediments (Carey et al., 2014). As biological activity increases, the aRPD depth increases as organisms move sediment particles from the sediment surface down deeper into the sediments.

The 2009 survey assessed the benthic recolonization of the four mounds created over the 2005 through 2008 disposal seasons. In general, the extent of recolonization was related to the age of each mound, consistent with expectations based on the standard theory of infaunal succession. The two older mounds (CLDS 05 and CLDS 06) were characterized by an advanced successional status; almost all the replicate images exhibited abundant evidence that deeper dwelling, Stage 3 organisms were widespread across the surface of each mound (Valente et al., 2012). These mounds also exhibited relatively well-developed aRPD depths (Valente et al., 2012). This was comparable to the Stage 3 conditions observed at the nearby reference areas.

Disposal mounds CLDS 07 and CLDS 08 were also surveyed and had received material during 2007 and 2008 disposal seasons. Both mounds exhibited substantial progress toward advanced recolonization, and CLDS 07 was characterized by an advanced successional status (AECOM, 2013). CLDS 08 exhibited some signs of recent disturbance and was in an intermediate successional status, as indicated by the widespread presence of transitional "Stage 1 going to 2" and "Stage 2 going to 3" successional series as well as high variability among replicate images (AECOM, 2013). Despite the presence of transitional successional series, mound-versus-reference statistical comparisons found that group mean successional status was significantly similar for all disposal mounds compared to reference values (AECOM, 2013). The NHAV 74 mound was also surveyed in 2011. All stations had aRPD depths and successional stages similar statistically to reference area values (AECOM, 2013).

The 2011 SPI survey indicated that the CLDS 09 mound had rapidly converged with reference area conditions indicating full recovery from the disturbance of dredged material placement (AECOM, 2013). Between October 2009 and April 2010 approximately 222,000 m^3 of material was placed on CLDS 09 (AECOM, 2013).

Other recently used mounds (MQR, CLDS-08, CLDS-09, and CLDS-10) were physically stable since the last survey, with the exception of expected areas of sediment accumulation due to disposal events and consolidation of older features (Hopkins et al., 2015). These mounds exhibited benthic conditions similar to those found at reference sites, highlighting the degree of benthic recovery expected several years after dredged material disposal (Hopkins et al., 2015).

All four of the mounds (CLDS-08, CLDS-09, CLDS-10, and MQR) exhibited fairly well-developed aRPD and advanced Stage 3 recolonization (Hopkins et al., 2015). While statistical

analysis showed that all mounds had significantly lower aRPD values than reference areas, the prevalence of Stage 3 communities suggests that all mound stations are approaching full benthic recovery (Hopkins et al., 2015). Overall, these mounds exhibited reference-like benthic conditions, indicating the degree of benthic recovery expected several years after dredged material placement (Hopkins et al., 2015).

The benthic succession at the NHAV14-N and NHAV14-S placement areas was predictably more variable and less advanced than the reference areas. These areas of the CLDS received dredged material approximately 4–6 months before the sediment-profile imaging survey and the collection of samples for benthic analysis. The prevalence of Stage 1, Stage 1 to 2, and Stage 2 to 3 successional stages suggests a transitional state of benthic recolonization which aligns with expected community characteristics following recent dredged material placement activity in Long Island Sound (Hopkins et al., 2015). It is expected that benthic recovery will continue to progress in both areas with additional time after cessation of placement events (Hopkins et al., 2015).

Water and Sediment Quality

As referenced in 40 CFR § 228.10, when evaluating impacts at a disposal site, the types of potential effects to be considered should include, "Progressive, non-seasonal, changes in water quality or sediment composition at the disposal site when these changes are attributable to materials disposed of at the site."

These types of effects are discussed in this section. Overall, sediment grain size composition at the disposal site has changed somewhat due to the past disposal of dredged material. However, there are no recorded negative sediment chemistry or water quality changes due to this disposal.

Sediment grabs were collected in December 2013 (six samples) and January 2014 (seven samples) for visual analysis (color, odor, texture). In August 2014, additional samples were collected from 12 stations and analyzed for grain size, TOC, and benthic community structure. At the CLDS-08, CLDS-10, NHAV14-N and NHAV14-S disposal mounds, the sediment was fine-grained dredged material, consisting of silt/clay with a grain size major mode of >4phi (Hopkins et al., 2015). Several stations at the northern margin of the CLDS-08 mound had light-

colored clayey silt distinct from other stations at the mound (Hopkins et al., 2015). At the CLDS-09 and MQR disposal mounds, most of the dredged material also consisted of silt/clay, but very fine sand (major mode of 4 to 3 phi) occurred as a distinct sand-over-mud stratigraphy at CLDS-09 and MQR (Hopkins et al., 2015). Many of the stations at CLDS-09 and MQR had a distinct layering with very fine brown sand on the surface, followed by alternating layers of gray, light brown, and rust colored silt-clay. A group of stations on the west side of the mound (28, 30, 33, 34, and 35) had light brown or gray clayey silt layers of varying thickness. The fine-grained dredged material observed at the majority of the stations was reduced, and there was evidence of subsurface methane at three of the stations. The mean replicate camera prism penetration depths varied widely across the disposal site stations, ranging from 6.2 to 20.1 cm. The stations located over NHAV14-S tended to have the deepest penetration depths, with a mean of 17.5 cm, reflecting the relatively uniform presence of fine-grained dredged material. Over the CLDS-09 mound, the dredged material was more variable in composition; some stations had more sand and shells present and others had clay.

All samples were dominated by silt, clay, and fine sand with smaller proportions of medium to coarse sand and, at one station, a small amount of gravel. Stations from the CLDS-10 mound had lower proportions of fine grained material than the other areas and one of the CLDS-10 stations was dominated by sand, while reference areas had fine grained material concentrations ranging from 89–96% with only small amounts of fine and medium sand.

Quality Assurance

An important part of any monitoring program is a quality assurance (QA) regime to ensure that the monitoring data are reliable. Laboratories are required to submit Quality Assurance (QA) sheets with all analyses on a project-specific basis. Monitoring activities will be accomplished through a combination of EPA Region 1 and USACE-NAE resources (*e.g.*, employees, vessels, laboratories) and contractors. Documentation of QA/QC is required by both agencies for all monitoring activities (*i.e.*, physical, chemical, and biological sampling and testing). QA is documented in the form of Quality Assurance Project Plans (QAPP) and/or Monitoring Work Plans. QAPPs are required for all EPA Region 1 and USACE-NAE monitoring activities. Analytical methods, detection limits, and QA procedures are contained in the EPA and USACE-NAE Regional Implementation Manual for the Evaluation of Dredged Material Proposed for Disposal in New England Waters (RIM, EPA/USACE, 2004). Additional sources of

information include the Ocean Testing Manual (OTM, or Green Book, EPA/USACE, 1991) and Inland Testing Manual (ITM, EPA/USACE, 1998),

7.0 ANTICIPATED SITE USE

MPRSA § 102(c)(3)(D) and (E) requires that the SMMP include consideration of the quantity of the material to be placed in the site, and the presence, nature, and bioavailability of the contaminants in the material, as well as the anticipated use of the site over the long term. The CLDS is designated to receive dredged material only. No other types of material may be placed at the site.

Projected dredging volumes for the central region of Long Island Sound include a mix of large and small federal navigation projects, a few large private projects, and many small private dredging projects (from marinas, boatyards, and harbors), which is consistent with the pattern of dredging in Long Island Sound over the past 20 years. In the DMMP, the USACE-NAE estimated that a total of 52.9 mcy will be dredged from Long Island Sound ports and harbors over the next 30 years. Of this volume, approximately 16 mcy of material are anticipated to be dredged from navigation projects in the central Long Island Sound region that usually utilize the CLDS. Of this volume, approximately 1 million cubic yards is anticipated to be derived from improvement dredging. Approximately 13.9 million cubic yards of material is expected to be from federal navigation projects with the rest of the volume coming from other facilities in central Long Island Sound. Sediments projected for disposal are expected to come primarily from maintenance dredging projects, although improvement dredging may be required for deeper draft vessels or from increased commerce in Long Island Sound.

Dredging and dredged material disposal in Long Island Sound has historically been accomplished using a bucket dredge to fill split hull or pocket scows for transport to the disposal site or by using hopper dredges. These types of equipment are expected to be the primary mode of any open-water placement in Long Island Sound in the future, although placement is not specifically limited to this equipment.

Historically one third of the dredged material volume comes from large projects (>500,000 cubic yards; 382,277 cubic meters), one third from medium sized projects (200,000 to 500,000 cubic yards; 152,911 to 382,277 cubic meters), and one third from small projects (<200,000 cubic

yards; 152,911 cubic meters). The sediment properties are expected to be variable, although the predominant sediment type is likely to be silty material (silts, organic silts, sandy silts, etc.). About 70 percent of the maintenance material volume can be characterized as silty material. Approximately 10 percent of the "improvement" dredged material is expected to be sand and clay.

All federal projects and private projects involving more than 25,000 cubic yards of material that propose to use the CLDS for disposal must be either permitted or authorized under the MPRSA and the CWA. The quality of the material will be determined on a project specific basis under the testing requirements necessary to meet open-water disposal requirements of CWA 404 and MPRSA 103.

National guidance for determining whether dredged material is acceptable for ocean disposal is provided in the OTM or Green Book (EPA/USACE, 1991) and for disposal in state waters in the ITM (EPA/USACE, 1998). The RIM, which builds on and is consistent with the Green Book and the ITM, provides specific testing and evaluation methods for dredged material projects at specific sites or groups of sites in Long Island Sound and elsewhere in New England. The quality of MPRSA-regulated material will be consistent with EPA's Ocean Dumping Regulations (40 CFR Part 227), as implemented under the Green Book and the RIM (EPA/USACE-NAE, 2004).

Site capacity will be evaluated and reported by USACE-NAE every three years. In addition, EPA Region 1 and the USACE-NAE will continue to report annually on dredged material disposal and other means of managing dredged material. This reporting began in 2006 as a condition of the 2005 rule that designated the CLDS and will continue as a requirement of the 2016 rule modifying the site use restrictions.

8.0 REVIEW AND REVISION OF THE PLAN

MPRSA 102 (c)(3)(F) requires that the SMMP include a schedule for its review and revision, which should be consistent with the requirement that SMMPs be reviewed and, as necessary, revised no less frequently than 10 years after adoption of the plan, and every 10 years thereafter. EPA Region 1, the USACE-NAE, and the states of New York and Connecticut have agreed to

review this plan annually as part of an annual agency planning meeting. A more comprehensive, formal review and revision of this SMMP will take place every 10 years beginning from the date of designation unless the agencies agree to do so more frequently at an annual agency planning meeting. Based on that schedule, and completion of the current Revised SMMP in 2018, EPA Region 1 and the USACE-NAE expect to undertake the next review and revision in 2028. EPA Region 1 and the USACE-NAE will coordinate with the USFWS, NMFS, and other federal and state agencies through the NERDT and other established regional networks for these reviews.

Section 102(c)(3) requires that "the Administrator and the Secretary shall provide opportunity for public comment" in developing SMMPs for each EPA-designated dredged material disposal site. EPA Region 1 and the USACE-NAE will provide an opportunity for public comment for future SMMP revisions, as occurred for the current Revised SMMP.

In addition to the 10-year review and revision process, EPA Region 1 and the USACE-NAE will continue to inform and involve the public regarding the monitoring program. The USACE-NAE monitoring reports are available at the USACE-NAE website (http://www.nae.usace.army.mil/Missions/Disposal-Area-Monitoring-System-DAMOS/Disposal-Sites/Central-Long-Island-Sound/), and information on the SMMP may be found at the EPA Region 1 website (http://www.epa.gov/ocean-dumping/dredged-material-management-long-island-sound).

9.0 FUNDING

The costs involved in site management and monitoring will be shared by EPA Region 1 and the USACE-NAE. This Revised SMMP will be in effect until it is further revised or the site is de-designated and closed.

Those monitoring programs conducted under other federal programs (*i.e.*, EPA's Long Island Sound Study) and state agencies (*i.e.*, CTDEEP Trawl Survey) will depend solely on funds allocated to those programs by those agencies or other supporting agencies.

The timing and scope of monitoring surveys and other related activities will be determined by funding levels, the frequency of disposal at the site, and the results of previous monitoring.

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Appendix A - Summary of Monitoring Framework

1: Movement of the Dredged Material	2: Absence of Pollutant-Sensitive Biota	3: Changes in Water Quality	4: Changes in Benthic Health and Diversity	5: Accumulation of Material Constituents in Biota
Baseline taken within 1 year after disposal; entire site bathymetry at 3-4 year intervals	SPI within 1-3 years of disposal and survey of historic mounds once every 5 years.	Annual water quality measured in site vicinity (LISS Monitoring program data)	Annual CTDEEP trawl survey data	Sediment bioaccumulation potential estimated for sediments collected within site and reference areas at least every 5 years.
Mound changes by > 1.0 feet w/in 5 year interval	Significant differences between site and reference areas	Consistent gradients in measures of long-term water quality changes in vicinity	Significant differences in community composition or abundance from baseline or contiguous areas is found	Significant increase in bioaccumulation potential relative to baseline conditions or reference areas
Bathymetry taken ≤ 2 months after 10-year storm	SPI w/in 1-3 years of disposal and survey of historic mounds once every 5 yrs.	No additional studies	No additional studies	No additional studies
Mound changes by > 1.5 feet from last survey	Significant differences between site and reference areas	No additional studies	No additional studies	No additional studies
Bathymetry and sediment survey w/in 1 km. of site boundary	SPI at site and reference areas; grain size analysis	Water quality measured at site and reference areas	Studies may include measurement of species distribution at site and reference	Studies may include the collection of biota from site and reference areas

Appendix B - Example Output from USACE Dredging Quality Management (DQM) Program

The DQM system provides for electronic tracking of all scows involved in dredging projects in New England. Logged data include position, draft, and hull status allowing for tracking the location the scow was filled, the path of the scow from the dredge to the disposal site, the location of release of material at the disposal site, and the return path of the scow back to the dredging site.