Central Long Island Sound Disposal Site

Site Management and Monitoring Plan

March 2016

The following document is a revision of the Site Management and Monitoring Plan (SMMP) for the Central Long Island Sound Dredged material disposal site (CLDS).

This document has been developed, revised, and agreed to pursuant to the Water Resources Development Act Amendments of 1992 (WRDA 92) to the Marine Protection, Research, and Sanctuaries Act of 1972 for the management and monitoring of ocean disposal activities, as resources allow, by the U.S. Environmental Protection Agency New England Office and the U.S. Army Corps of Engineers New England District.

This revision fulfills the 10 year requirement and no further modifications to site management or monitoring are recommended at this time.

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ACRONYMS AND KEYWORDS

aRPD	Apparent Redox Potential Discontinuity
CFR	Code of Federal Regulations
CLDS	Central Long Island Sound Dredge Material Disposal Site (formerly CLDS)
CPUE	Catch per Unit Effort
CT	Connecticut
CTDEEP	Connecticut Department of Energy and Environmental Protection (formerly CT DEP)
CWA	Clean Water Act
CZM	Coastal Zone Management
DAMOS	Disposal Area Monitoring System
DEIS	Draft Environmental Impact Statement
DMMP	Dredged Material Management Plan
EIS	Environmental Impact Statement
EFH	Essential Fish Habitat
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
ITM	Inland Testing Manual
LIS	Long Island Sound
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
NYDOS	New York State Department of State
NYSDEC	New York State Department of Environmental Conservation
OSI	Organism Sediment Index
QA	Quality Assurance
RHA	Rivers and Harbors Act
RIM	Regional Implementation Manual
SMMP	Site Management and Monitoring Plan
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
WLIS	Western Long Island Sound Dredged Material Disposal Site
WRDA	Water Resources Development Act of 1992 (Public Law 102-580)
QA	Quality Assurance
QAPP	Quality Assurance Project Plan

1.0 INTRODUCTION

The U.S. Environmental Protection Agency New England designated the Central Dredged Material Disposal site (CLDS formerly CLIS) in 2005 (EPA, 2005), to meet the long-term needs of dredged material disposal in Long Island Sound (see Figure 1). The US Army Corps of Engineers (USACE) estimates that 52.9 million cubic yards of material will be needed to be dredged over the next 30 years in Long Island Sound over the next 30 years (2015-2045). However, it is not likely that entire amount will be dredged during this period due to available funds and scheduling.

To ensure that ocean dredged material disposal sites are managed to minimize adverse effects of disposal on the marine environment, the Marine Protection, Research, and Sanctuaries Act (MPRSA) §102(c) as amended by §506(a) of the Water Resources Development Act (WRDA) of 1992, requires the completion of a Site Management and Monitoring Plan (SMMP) upon designation of a site [MPRSA Section 102(c) (3)].

The data gathered from the monitoring program will be evaluated annually by EPA and NAE and periodically by other agencies such as the National Marine Fisheries Service (NMFS) and state regulatory agencies (see sections 4 and 9) to determine whether modifications in site usage, management, testing protocols, or additional monitoring are warranted.

MPRSA further requires that an SMMP established for sites like the CLDS include a schedule for review and revision of the plan to occur not less than 10 years after adoption of the plan, and every 10 years thereafter. Since this SMMP for the CLDS was established 10 years ago, EPA New England and the USACE – New England District (USACE-NAE) have reviewed the plan annually and have found that the intent of the original procedures and protocols continue to meet the management objectives of the CLDS, and will continue to be used. EPA and USACE-NAE are requesting comment on this document. This updated SMMP fulfills the 10 year revision requirement of the MPRSA.

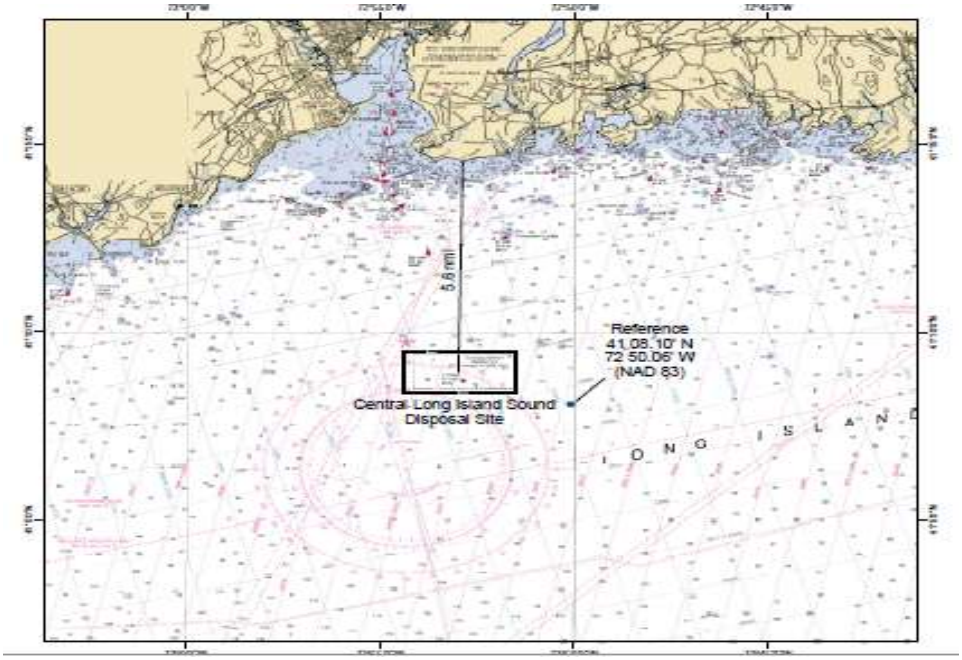

Figure 1. Location of the Central Long Island Sound Dredged Material Disposal Site (USACE, DAMOS)

2.0 REGULATORY FRAMEWORK AND AUTHORITIES

The intent of this SMMP is to provide a management framework and monitoring program that strives to minimize the potential for adverse impacts to the marine environment from dredged material disposal at CLDS. To this end, the SMMP identifies actions, provisions, and practices necessary to manage the operational aspects of dredged material disposal at CLDS. Section 40 CFR § 228.10(a) of the Ocean Dumping Regulations requires that the impact of disposal at a designated site be evaluated periodically.

Management

Management of the disposal site involves: regulating the times, quantity, and physical/ chemical characteristics of dredged material that disposed at the site; establishing disposal controls, conditions, and requirements; and monitoring the site environment to verify that potential unacceptable conditions which may result in significant adverse impacts are not occurring from past or continued use of the disposal site and that permit terms are met.

In addition, the plan also incorporates the six requirements for ocean disposal site management plans discussed in MPRSA § 102(c)(3), as amended. These are:

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 [§102(c)(3) Section II C];
2. A baseline assessment of conditions at the site [§102(c)(3) Section III];
3. A program for monitoring the site [§102(c)(3) Section IV];
4. Special management conditions or practices to be implemented at each site that are necessary for protection of the environment [§102(c)(3) Section V.A);
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 [§102(c)(3) Section VI);
6. A schedule for review and revision of the plan (which shall not be reviewed and revised less frequently than 10 years after adoption of the plan, and every 10 years thereafter) [§102(c)(3) Section VII).

40 CFR Section 228.10(c) requires that a disposal site be periodically assessed based on the available body of pertinent data. Recognizing and correcting any potential unacceptable condition before it causes an adverse impact to the marine environment or presents a navigational hazard to commercial and recreational water-borne vessel traffic is central to this SMMP.

The practices that will be applied to address these management goals at CLDS include coordination among Federal and state agencies, testing of material for 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

Section 40 CFR § 228.10(b) specifically requires consideration of the following types of potential effects when evaluating impact at a disposal site:

- Movement of materials into sanctuaries or onto beaches or shorelines [228.10(b)(1)];
- Movement of materials towards 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 materials disposed of 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 materials disposed 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)]).
- Evaluating compliance with CWA or MPRSA permit conditions and conduct enforcement actions where warranted and as appropriate;

The monitoring approach defined in this 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 from dredged material disposal at 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 § Section 228.10(b), the site managers may place appropriate limitations on site usage to reduce the impacts to acceptable levels. Such responses may range from withdrawal of the site's designation to limitations on the amounts and types of dredged material permitted to be disposed or limitations on the specific disposal methods, locations, or schedule.

Any proposal for the open-water placement of dredged material from a particular project must begin with an examination of the nature of the material. Federal and non-Federal projects evaluated under MPRSA are subjected to the same qualitative analysis. In order to be approved for open-water placement, or most other placement options, dredged material must be found suitable by applying the tiered testing protocols and evaluating the results.

Material that includes silts, material with high organic content, and other shoal material from harbors and areas with a history of contamination and industrial use are subjected to additional chemical testing to determine the relative likelihood of suitability. For materials exhibiting higher concentrations of contaminants in comparison to reference site values, project proponents may elect not to incur the cost of further testing and investigate non-open-water alternatives such as containment and treatment. For materials with chemical test results that do not exhibit high concentrations of contaminants, or where the project proponents wish to maintain the option of open-water placement and other uses, the sediment is subjected to further tests aimed at predicting the biological response to exposure to the material during different phases of the placement process. These tests are generally described as bioassay (toxicity) testing and bioaccumulation (tissue uptake of contaminants) testing.

The next tier of testing, the toxicity test, consists of exposing test organisms to the dredged material and comparing survivability rates to those of organisms exposed to reference and control materials. Where the dredged material exhibits greater toxicity to benthic test species than the reference sediments (using statistical tests and nationally developed interpretation

guidance), project proponents may elect to forgo any further cost of testing for suitability for open-water placement and seek alternate disposal options. Otherwise, material that exhibits toxicity comparable to the reference sediments shall undergo bioaccumulation testing before any determination on suitability for open-water placement can be made. In general terms, bioaccumulation involves a long exposure of test organisms to the sediment followed by analysis of their tissues to determine the potential for uptake of contaminants form the dredged material. The test results are evaluated to determine the risk of exposure to ecological and human health.

Dredged material that is determined through these testing protocols to pose no unacceptable risk to the human or ecological health is deemed suitable for open-water disposal. These findings may be accompanied by specific management requirements, such as limitation on disposal rates to minimize water column concentrations.

Dredged Material Disposal Authorities

The primary authorities that apply to the disposal of dredged material in the U.S. are the Rivers and Harbors Act of 1899 (RHA), WRDA, CWA and MPRSA. The RHA regulates dredging and discharge of material in navigable waters and WRDA addresses research and funding in support of specific water resource projects for various needs (i.e., transportation, recreation). It also modifies other Acts, as necessary (e.g., MPRSA).

All dredging, dredged material transport, and disposal must be conducted in compliance with permits issued for these activities. Surveillance and enforcement responsibilities at the disposal site are shared between the USACE-NAE and EPA with assistance from the U.S. Coast Guard [33 USC Sec 1417(c)]. The permittee is responsible for ensuring compliance with all project conditions including placement of material at the correct location and within applicable site use restrictions. EPA has enforcement responsibility under MPRSA. The EPA and the USACE-NAE will cooperate to ensure effective enforcement of permit violations.

Section 404 of the Clean Water Act (33 U.S.C. §1344) authorizes the USACE to issue permits for the disposal of dredged materials in the territorial sea, the contiguous zone, and ocean as long as the material meets guidelines developed by EPA pursuant to CWA §404(b)(1). EPA's guidelines are promulgated at 40 CFR Part 230. These guidelines set forth environmental standards and analytical requirements for use in determining when the USACE should authorize disposal of particular dredged material at a particular location. The USACE regulations governing the issuance of §404 permits are codified at 33 CFR Parts 320-338.

Because Long Island Sound is an estuary, it falls within the geographical jurisdiction of Section 404 of the Clean Water Act as described above. However, in 1980, Congress enacted the "Ambro Amendment," an amendment to the MPRSA requiring that the disposal of dredged material in Long Island Sound from all Federal projects and non-federal projects that

exceed 25,000 cubic yards (19,114 cubic meters) of dredged material comply with the MPRSA provisions, also known as the Ocean Dumping Act.

Under Section 103 of MPRSA, the USACE-NAE is assigned permitting responsibility for dredged material, subject to EPA review and concurrence that the material meets applicable ocean disposal criteria. The USACE-NAE is required to use EPA-designated open-water disposal sites for dredged material disposal to the maximum extent feasible. If EPA designated sites are not available, the USACE-NAE may select ocean disposal sites. The USACE-NAE may select a site if a designated site is unavailable and the selected site may be used for two, 5-year periods.

All projects authorized for dredged material disposal at CLDS are required to obtain a cut State Water Quality Certificate from the CTDEEP pursuant to Section 401 of the CWA [33 U.S.C., § 1341]. A state water quality certificate is also required for Federal disposal projects that receive authorization from the USACE-NAE. To receive certification, the dredged material discharge must be consistent with the provisions of the CWA and the Connecticut Water Quality Standards (Sections 22a-426 through 22a-363f of the Connecticut General Statues - Structures, Dredging, and Fill) and water quality certification is made in conjunction with issuance of a state permit under this statute. In some cases applicants may qualify for authorization under a state Programmatic General Permit, which is a more expedited process (CTDEP, 2001).

3.0 MANAGEMENT PLAN

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

- Ensure and enforce compliance with permit conditions;
- Minimize loss of sediment from the disposal site;
- Minimize conflicts with other uses of the area;
- Maximize site capacity;
- Minimize environmental impact from sediments placed at the site; and
- Recognize and correct conditions that could lead to unacceptable impacts.

EPA and the USACE-NAE will jointly manage CLDS and will also coordinate with the states of Connecticut and New York. 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 this end, the

New England Regional Dredge Team meets quarterly and includes participation by the relevant Federal and state agencies and standard agenda items of monitoring and compliance at open water sites including CLDS. In addition, EPA and USACE-NAE have an annual meeting dedicated to the review of monitoring data, setting of monitoring objectives, and scoping of investigations for each open water site.

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

- Evaluation of the suitability of material for disposal in accordance with the applicable requirements for the specific type of project (i.e., 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 or disposal may be restricted during spring tides to ensure that water quality criteria are not exceeded outside the boundaries of the site);
- Enforcement of all permit conditions;
- Disposal specified to occur at the specified target coordinates (to be determined on an annual basis);
- To ensure compliance, all scows placing material at CLDS are required to utilize tracking instrumentation in accordance with the USACE-NAE Dredging Quality Management (DQM) system to allow determination of actual placement locations;
- Positioning of disposal coordinates are 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 such that it is not a hazard to navigation or more likely to be mobilized by storm events;
- Conducting disposal site monitoring in a consistent, systematic manner; and
- Specification of de-designation (i.e., closure) conditions and dates as appropriate [§102(c)(3) Section VII).

Specific Management Practices

In addition, special management practices may exist at CLDS for individual projects based on site monitoring data and long-term management goals:

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

40 CFR Section 228.10(c) requires that a disposal site be periodically assessed based on the available body of pertinent data. Recognizing and correcting any potential unacceptable

condition before it causes an adverse impact to the marine environment or presents a navigational hazard to commercial and recreational water-borne vessel traffic is central to this SMMP. Both agencies will cooperate to ensure effective enforcement of all disposal requirements. The MPRSA gives authority to EPA to enforce permit conditions.

The USACE-NAE will provide EPA 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 represents special conditions that are to be applied to projects using CLDS. 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:

- At least ten working days in advance of the start date, the First Coast Guard 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 in advance of the start date, the Coast Guard 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.
- For 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 at a specified set of coordinates within the site. All placement is to occur at the specified coordinates with the scow at a complete halt. The USACE-NAE will provide the coordinates. This requirement must be followed except when doing so will 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 (generally less than two knots) 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 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 (through permit conditions): 1) the dredging project site including the dredge plant, the towing vessel and scow at any time during the course of the project; 2) any and all records, including logs, reports, memoranda, notes, etc., pertaining to a specific dredging project (Federal or non-Federal); 3) towing, survey monitoring, and navigation equipment.
- If dredged material regulated by a specific permit issued by the USACE or Federal authorization is released (due to an emergency situation to safeguard life or property at sea) 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 and/or the Disposal Inspector shall immediately notify the USACE-NAE of the incident, as required by permit. The USACE-NAE shall copy EPA on such notification no later than the next business day. In addition, both the towing contractor and the USACE-certified disposal inspector shall make a full report of the incident to the USACE-NAE and EPA within ten (10) days.

Modifications to the Management Plan

Based on the findings of the monitoring program, modifications to the site use may be required. Corrective measures such as those listed below, but not limited to, will be developed by EPA and the USACE-NAE.

- Stricter definition and enforcement of disposal permit conditions;
- Implementation of more conservative evaluation procedures on whether sediments proposed for dredging are suitable for open-water disposal;
- Implementation of special management practices to prevent any additional loss of contaminants to the surrounding area;
- Excavation and removal of any unacceptable sediments from the placement site (an 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 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;
- Establishment of dredging windows;
- Compliance with Essential Fish Habitat (EFH) under the Magnuson Stevens Act and Endangered Species Act (ESA) concerns

In addition to management practices for the placement site and for individual projects, each SMMP must also include a monitoring plan as described 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 communicated 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 are necessary.

4.0 BASELINE ASSESSMENT

MPRSA 102(c) (3)(A) as amended by WRDA 92 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 CLDS, more detailed information is found in the EIS, initial SMMP document, DAMOS reports, and monitoring data from CTDEEP, and the Long Island Sound Study.

Site Characteristics

The CLDS site was defined as a rectangle measuring 4.1 by 2.0 km (total area of 8.2 km2) (EPA, 2004). The center of the rectangle has coordinates at 41°08.95' N and 72° 52.95' W (NAD 83) (Figure 1). This location is approximately 10.4 km south of South End Point, East Haven, Connecticut.

The baseline assessment activities conducted at 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, three of which (CLDS-REF, 2500W, and 4500E) are incorporated into this SMMP.

The seafloor at CLDS slopes from a depth of 59 feet (18 meters) at the northwest corner to 74 feet (22.5 meters) in the southeast corner, with distinct disposal mounds from past dredged material disposal activities as high as 46 feet (14 meters) deep. The bottom sediments at the CLDS site 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 estimated site capacity of CLDS was estimated by the USACE-NAE as 38 million cubic yards in the 2004 EIS (EPA, 2004). This estimate was calculated as the volume between the seafloor and a depth of 46 feet below MLW, assuming a mound with a side slope of 1:10 (EPA, 2004). From 2005 to 2014, approximately 2.4 MCY have been disposed of at CLDS, leaving an estimated 36 MCY in remaining capacity. The capacity of the site will continue to be evaluated periodically.

Sediment and Water Quality

In order to be determined as suitable for placement at CLDS, sediment must meet chemical and biological criterion that are defined as protective of water quality. In addition, screening level modeling is performed to further evaluate the potential for water column effects as part of the suitability determination. Given this level of testing, the SMMP does not require specific water column monitoring at CLDS. Rather, it relies on the National Estuary Program's Long Island Sound Study's (LISS) routine measurements; if issues are identified by this monitoring that indicate a potential relationship to CLDS, then a monitoring plan will be developed consistent with LISS methodologies.

CLDS is expected to exhibit similar water quality conditions to the central basin of Long Island Sound. 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 CLDS will be higher than in the western basin of Long Island Sound. Water quality at CLDS continues to meet state water quality standards.

The bottom sediments in the area of Long Island Sound where 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, the consistent, rapid return of areas within CLDS that have been the target of dredged material placement to a healthy benthic community similar to set reference areas confirms the success of the suitability testing procedures. No negative impacts to sediment quality have been identified associated with the dredged material disposal.

Living Resources

The benthic communities evaluated using sediment profile camera images found a range of sediment characteristics and generally advanced successional stages both within CLDS and at its reference stations. The SPI data indicates that the quality of the sediments and benthic community are recovering after disposal and are stable.

Commercial/Recreational Fish and Shellfish Resources

Long Island Sound, a semi-enclosed estuary, is an important economic resource for both commercial and recreational/sport fisherman. The region is occupied by more than 83 fish species; however, only a few of them are considered year-round residents (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 (CPUEs) in Long Island Sound were found in central Long Island Sound. The average fall CPUE near CLDS was 1,982 and the a5verage spring CPUE relatively low at 588. The long-term (16 years) seasonal average was 1,285. Species richness in the vicinity of CLDS was the highest with fall and spring values of13.7 and 14.3 respectively. Species diversity at stations near 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, which 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 CLDS have declined in the sound.

Endangered/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 a particular region or locality is in jeopardy as a result of loss or change in habitat, overall exploitation by man, predation, adverse interspecies competition, or disease. Unless an endangered species receives protective assistance, extinction may occur. Threatened or rare species are those with populations that have become notably decreased because of the development of any number of limiting factors leading to a deterioration of the environment. A species may also be considered as a species of "special concern." These may be any native species for which a welfare concern or risk of endangerment has been documented within a state (NYSDEC 2003). Endangered and threatened species are protected under the Federal Endangered Species Act, 16 U.S.C. §§ 1531 et seq. and under state law while species listed as "special concern" are protected only by state law.

In 2015, the Rufa Red Knot (Calidris canutus rufa) was added to the endangered species list and in 2012 the Atlantic sturgeon (Acipenser oxyrinchus oxyrinchus) was added. 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) Atlantic sturgeon was discussed in the original SMMP as it was listed as species of concern in the States of Connecticut and New York.

The red knot is not expected to be present at CLDS with any regularity because the red knot forages in intertidal areas. Formal consultation with USFWS was deemed unnecessary because disposal activities in CLDS have not changed since the initial SMMP and the red knot, which is under the purview of USFWS is not expected to be present in the project area.

Table 1. Endangered or Threatened Species Summary

Summary of Changes since 2005
Red knot (not expected to be in area)
8 marine mammals and reptiles (unchanged)
2 endangered fish (added)
14 birds (1 is on the endangered list)

Endangered and Threatened Mammals

Eight endangered marine mammals and reptiles were originally identified for the EIS study area. In general, whales and other marine mammals are not frequently observed in LIS, however, incidental sightings have resulted in the inclusion of several species on the endangered species list for Connecticut and New York (EPA, 2004). NMFS concurred in the original EIS that marine mammals are not expected to spend significant portions of time within the western and central basins of LIS and that adverse impacts to mammals are not likely (EPA, 2004). The information on endangered species was updated as part of this SMMP.

Endangered and Threatened Reptiles

Sea turtles are the only endangered reptile species noted in the Long Island Sound area. Sea turtles are highly migratory and are often found throughout the world's oceans (NOAA, 1995). Pursuant to Section 7 of the Endangered Species Act, EPA requested input from resource and state agencies (NOAA, USAFWS, CTDEEP and NYSDEC) on the identification of Threatened and Endangered Species in Long Island Sound. Their assessment noted the five species of sea turtles as possibly being 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 Marine Mammals and Reptiles for Connecticut and New York

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 may be located in the vicinity of CLDS, the shortnose sturgeon (Acipenser brevirostrum) and the Atlantic sturgeon (Acipenser oxyrinchus oxyrinchus). The original SMMP identified the shortnose sturgeon as federally endangered as well as endangered in both CT and NY. The Atlantic sturgeon was listed as "threatened in inland waters" for the state of Connecticut in the prior SMMP and is now a federally protected endangered species. The state of CT now lists it as endangered. Sturgeon are not expected to be impacted by disposal activities at CLDS as they are highly mobile species.

Shortnose sturgeon occur in the lower Connecticut River from the Holyoke Pool to Long. 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 utilizes portions of Long Island Sound since it is known to spawn in the Connecticut

River. Shortnose sturgeon have not been observed in Long Island Sound during CTDEEP trawls since 1984.

The Atlantic sturgeon (Acipenser oxyrinchus oxyrinchus) is listed as "threatened in inland waters" for the state of Connecticut (CTDEP, 2003). This designation means that the Atlantic sturgeon is not protected within the waters of Long Island Sound under the Connecticut's endangered species legislation, but a moratorium on harvesting the species in Long Island Sound has been enacted. In February 2003, a proposal was made to change the status of the Atlantic sturgeon to "endangered in all state waters" (personal communication Tom Savoy, Connecticut Marine Fisheries Division), and is still under consideration at this time.

Atlantic sturgeon is an anadromous species that lives up to 60 years, reaching lengths up to 14 feet (4 meters) and 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 were caught in all three basins of Long Island Sound but were mainly located in the vicinity of Falkner Island (Savoy and Pacileo, 2003).

Endangered and Threatened Birds

Fourteen birds were initially identified as endangered or threatened in the study area by the EIS. Of these species, only four are known to use offshore open water areas (Table 3). 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, as previously described, is now a federally listed endangered species but will not be present in the vicinity of CLDS as it feeds in the shallows along beaches and dunes.

Table 3 - Endangered 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

CLDS has been one of the most active dredged material disposal sites in New England, it has the longest known continuous record of use of any disposal site in Long Island Sound (EPA, 2004). In 2004, a total of nearly 14 million cubic yards had been recorded as placed at the site since 1941 (EPA, 2004), and an additional 2 million cubic yards has been placed since 2004 (see Table 4). CLDS receives the largest volumes from Federal navigation projects in New Haven, Stamford, Norwalk and Bridgeport harbors, with numerous smaller harbors in Connecticut and New York contributing to the total disposal volumes (EPA, 2004).

Beginning as early as 1974, dredged material at CLDS has been placed at distinct mounds and 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 in comparison to nearby reference areas (Valente et al., 2012).

Table 4 - Disposal Events and Associated Mounds

Disposal Season	Mound /Target	Projects(s) with Largest by Volume Indicated	DAMOS Contribution #	Estimated Volume (yd^3)
Oct 2000 - May 2001	CLDS 00	Multiple small projects	142	92,956
Oct 2001 - May 2002	CLDS 01	Multiple small projects	159	69,375
Oct 2002 - May 2003	CLDS 02	Multiple smaller projects and New Haven Harbor	159	409,327
Oct 2003 - May 2004	CLDS 03	Multiple smaller projects and New Haven Harbor	163	557,641
Oct 2004 -	CLDS 04	Multiple small projects	177	76,515
Oct 2005 - May 2006	CLDS 05	Norwalk Harbor and several other small projects	184	178,017
Oct 2006 - Jun 2007	CLDS 06	Multiple small projects – largest was Saugatuck River	184	78,024
Oct 2007 - May 2008	CLDS 07	Multiple small projects – largest was Menunketesuck & Patchogue rivers	184	24,576
Oct 2008 - May 2009	CLDS 08	Multiple small projects and Norwalk Harbor	184	424,665
Oct 2009 - Apr 2010	CLDS 09	Multiple small projects and New London Navy Submarine Base bottom of CAD cell (suitable material)	192	290,581
Oct 2010 - Feb 2011	CLDS 10	Small marina projects, largest was Guilford Yacht Club	192	44,223
Oct 2011 - May 2012	CLDS 10	Small marina projects, largest was Guilford Town Marina	Draft 197	84,500
Oct 2012 - May 2013	CLDS 10	Small marina projects, largest was Guilford Yacht Club	Draft 197	93,024
Oct 2013 - Apr 2014	NHAV14-N and NHAV14-S	Norwalk Harbor, New Haven Harbor, Multiple private projects	Draft 197	1,204,553

6.0 MONITORING

The USACE-NAE and EPA share responsibility for monitoring of the CLDS site. In addition, monitoring data may be generated by the agencies or through coordination or use of data gathered under other programs. Monitoring data from other agencies (e.g., CTDEEP Trawl Surveys and Long Island Sound Study programs) will be utilized as appropriate to maximize the availability of information at CLDS.

EPA has the responsibility for determining that an unacceptable impact has occurred as a result of dredged material disposal at CLDS. However, such determinations will be made in consultation with other agencies and be based on available monitoring data EPA is responsible for determining any modification to site use or de-designation.

Monitoring Methods

Monitoring surveys at 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 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 (such as 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 CLDS (Hopkins et al., 2015).

Material Movement

The following potential effects (as defined in 40 CFR 229.10) 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.

Overall there is no evidence of movement of materials from CLDS to adjacent areas. Impacts are on average a decrease in depth over the site.

Periodic bathymetric surveys of CLDS provide a means of comparison of depth changes in the disposal site. Several bathymetric surveys were completed at CLDS since the last SMMP (Table 5). After site designation in 2004, a bathymetric survey was completed to establish a detailed site-wide, high resolution baseline bathymetric dataset against which future bathymetric surveys could be compared (AECOM, 2013). 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 USEPA (AECOM, 2013). The most recent full bathymetric survey of CLDS was completed in August of 2014.

A depth comparison between the 2005 survey and the August 2014 survey revealed that during that ten-year span the historical mounds at CLDS demonstrated stability 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 with the exception of 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 proportion to the placement activity for each of those disposal seasons (Hopkins et al., 2015).

On a shorter time frame, review of 2009 and 2011 acoustic data of a limited portion of CLDS allowed the comparison of 12 older inactive mounds. 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 NAV 74 capped mound had what appeared as 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, 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 3 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 of CLDS receives relative to other New England sites, it is one of the most frequently monitored. A summary of monitoring performed at the site since completion of the Environmental Impact Statement in 2004 is presented in the table below.

Table 5 - DAMOS Survey Activities in CLDS since EIS in December, 2004.

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 all of 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.	Data in process

Biological Characteristics

The following potential effects (as defined in 40 CRF 229.10) 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.

Overall, based on results from 2009, 2011 and 2014 surveys, the benthic community within 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 sites. No changes in pelagic, demersal or benthic biota were observed that could be attributed to disposal of material at the site. Although no bioaccumulation studies have been completed at the site, bioaccumulation data does exist for individual projects. The combination of these data and the recovery of healthy benthic habitat indicates that bioaccumulation is not a concern.

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

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 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 of 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.

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, 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 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 were 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 statistically similar to reference area values (AECOM, 2013).

The 2011 SPI survey indicated that 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).

The three 2013/2014 monitoring surveys of the New Haven placement areas included sediment-profile imaging and benthic grab sampling. These data indicated a transitional state of benthic recovery consistent with the expected pattern for post-disturbance recolonization in Long Island Sound (Hopkins et al., 2015). It is expected that benthic recovery will continue to progress with additional time after placement events (Hopkins et al., 2015).

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 reference like benthic conditions highlighting the degree of benthic recovery expected several years after dredged material disposal (Hopkins et al., 2015). Portions of the CLDS-08 mound exhibited inconsistent benthic recovery and may require continued monitoring (Hopkins et al., 2015).

All four of the mounds (CLDS-08, CLDS-09, CLDS-10, and MQR) exhibited fairly well developed apparent redox potential discontinuities (aRPD) and advanced Stage 3 recolonization (Hopkins et al., 2015). While statistical analysis showed that all of the 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 highlighting 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 capping areas was predictably more variable and less advanced than the reference areas. These areas of 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 capping areas with additional time after placement events (Hopkins et al., 2015).

Water and Sediment Quality

Inclusive of 40 CRF 229.10 the following types of potential effects when evaluating impact at the disposal site discussed in this section include:

1. 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.

Overall, sediment grain size composition at the disposal site has changed somewhat due to the disposal of dredged material. There are no recorded negative sediment chemistry or water quality changes due to this disposal.

Sediment grabs were collected in December 2013 (6 samples), January 2014 (7 samples) for visual analysis (color, odor, texture). Additional samples were collected in August from 12 stations and analyzed for grain size, TOC and benthic community structure. At CLDS-08, CLDS-10, NHAV14-N and NHAV14-S disposal areas the sediment was fine-grained dredged material, consisting of silt/clay with a grain size major mode of >4phi (Hopkins et al., 2015). A number of 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 stations was reduced, and there was evidence of subsurface methane at three of the stations. The means of replicate camera prism penetration depth 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. The stations had relatively similar grain size compositions with fine grained material ranging from 74.9% to 83.5% in all samples and reference areas were ranging from 88.7–95.7% with only small amounts of fine and medium sand.

Total Organic Carbon at the CLDS-10 stations averaged 43% while the CLDS-10 samples were slightly elevated over reference.

Quality Assurance

An important part of any monitoring program is a quality assurance (QA) regime to ensure that the monitoring data are reliable.

Relevant laboratories are required to submit Quality Assurance (QA) sheets with all analyses on a project-specific basis (see RIM, ITM and Green Book for further details).

Monitoring activities will be accomplished through a combination of EPA 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 Plan. QAPPs are required for all EPA and USACE-NAE monitoring activities. Analytical methods, detection limits, and QA procedures are contained in the EPA and USACE-NAE Regional Testing Manual (EPA/USACE, 2009).

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. CLDS is designated to receive dredged material only. No other material may be placed in the site.

Projected dredging volumes for the western and central regions of Long Island Sound include a mix of large and small Federal navigation projects and many small private dredging projects (marinas, boatyards, and harbors, and a few large private projects), which is consistent with the pattern of dredging in Long Island Sound over the past 20 years.

A total of 52.9 million cubic yards is expected to be dredged in Long Island Sound over the next 30 years. Of that, approximately 16 million cubic yards of material are anticipated to be dredged in western and central Long Island Sound. 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 Long Island Sound. Sediments projected for disposal are expected to come primarily from maintenance dredging projects, although expansion 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 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 the expansion material are expected to be sands and clays.

All projects using CLDS for disposal must be either permitted or authorized under MPRSA and the CWA (see Section 3.0). 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 either CWA 404 or MPRSA 103. The quality of MPRSA material will be consistent with EPA's Ocean Dumping Regulations (40 CFR Part 227), as implemented under the EPA and Regional Testing Manual (EPA/USACE, 2009).

National guidance for determining whether dredged material is acceptable for open-water disposal is provided in the Ocean Testing Manual (Green Book; EPA and USACE, 1991) and in the Inland Testing Manual (ITM; EPA and USACE, 1998). The Regional Implementation Manual (RIM; Guidance for Performing Tests on Dredged Material to be Disposed in Open Waters, EPA New England Region/USACE-NAE, 1997), consistent with the Green Book and the Inland Testing Manual, provides specific testing and evaluation methods for dredged material projects at specific sites or groups of sites. The Regional Implementation Manual that covers Long Island Sound is currently under review by EPA and the USACE-NAE, and should be finalized in 2003.

Site Capacity will be evaluated and reported by USACE-NAE every three years. In addition, EPA will continue to provide annual reporting on dredged material disposal which was initiated as part of the LIS DMMP. Annual reports will be available at the EPA website.

8.0 REVIEW AND REVISION OF THIS PLAN

MPRSA 102 (c)(3)(F) requires that the SMMP include a schedule for review and revision of the SMMP, which shall not be reviewed and revised less frequently than 10 years after adoption of the plan, and every 10 years thereafter. The EPA, the USACE-NAE, and states have agreed to review this plan annually as part of the annual agency planning meeting.

9.0 COORDINATION AND OUTREACH

Section 307 of the Coastal Zone Management (CZM) Act of 1972 requires that Federal agencies proposing activities within or outside the coastal zone, that affect any land or water use, or natural resource of the coastal zone, ensure that those activities are conducted in a manner which is consistent to the maximum extent practicable, with the enforceable policies of approved State coastal management programs. As part of the National Environmental Policy Act (NEPA) process, EPA prepared a Federal determination of consistency with the Connecticut and New York approved Coastal Zone Management Programs in 2004. As part of this SMMP revision both states received notification in February that the SMMP would be available for public review in March 2016.

Concurrence regarding the Endangered Species Act, Section 7 was obtained during the NEPA process from the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS) (EPA, 2004). The NMFS and USFWS concurrence confirmed that the selection of CLDS will not adversely affect threatened or endangered species or adversely modify critical habitat. NMFS stated that no conservation recommendations are needed due to the use of ongoing and mutually agreed upon seasonal constraints on disposal operations (June 1 through October 1) as well as the ongoing disposal site monitoring program.

Several changes to the federal endangered species list that are applicable to CLDS have occurred since the prior SMMP and coordination (see chapter 5). No conservation recommendations were made in the original EFH as documented in the EIS and no changes to management of the site have occurred since that time. However, EPA is coordinating with NMFS and USFWS as part of this SMMP revision.

Additionally, an Interagency Regional Dredging Team, comprised of representatives from EPA, NAE, NMFS, USFWS, and representatives from the New England States within the USACE New England District (inclusive of Rhode Island and Massachusetts), meets approximately

every six months to discuss management and monitoring of New England dredged material disposal sites. Monitoring activities may be discussed at these meetings or additional meetings may be coordinated to discuss the SMMP.

The EPA and the USACE will continue to inform and involve the public regarding the monitoring program and USACE-NAE monitoring reports are available at the USACE-NAE website (http://www.nae.USACE.army.mil/Missions/DisposalAreaMonitoringSystem(DAMOS)/DisposalSites/CentralLongIslandSound.aspx) or information on the SMMP revision may be found at the EPA New England website (http://www.epa.gov/ocean-dumping/dredged-material-management-long-island-sound).

10.0 FUNDING

The costs involved in site management and monitoring will be shared between EPA the USACE-NAE. This SMMP will be in place until modified or the site is de-designated and closed.

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

The timing of monitoring surveys and other activities will be governed by funding resources, the frequency of disposal at the site, and the results of previous monitoring data.

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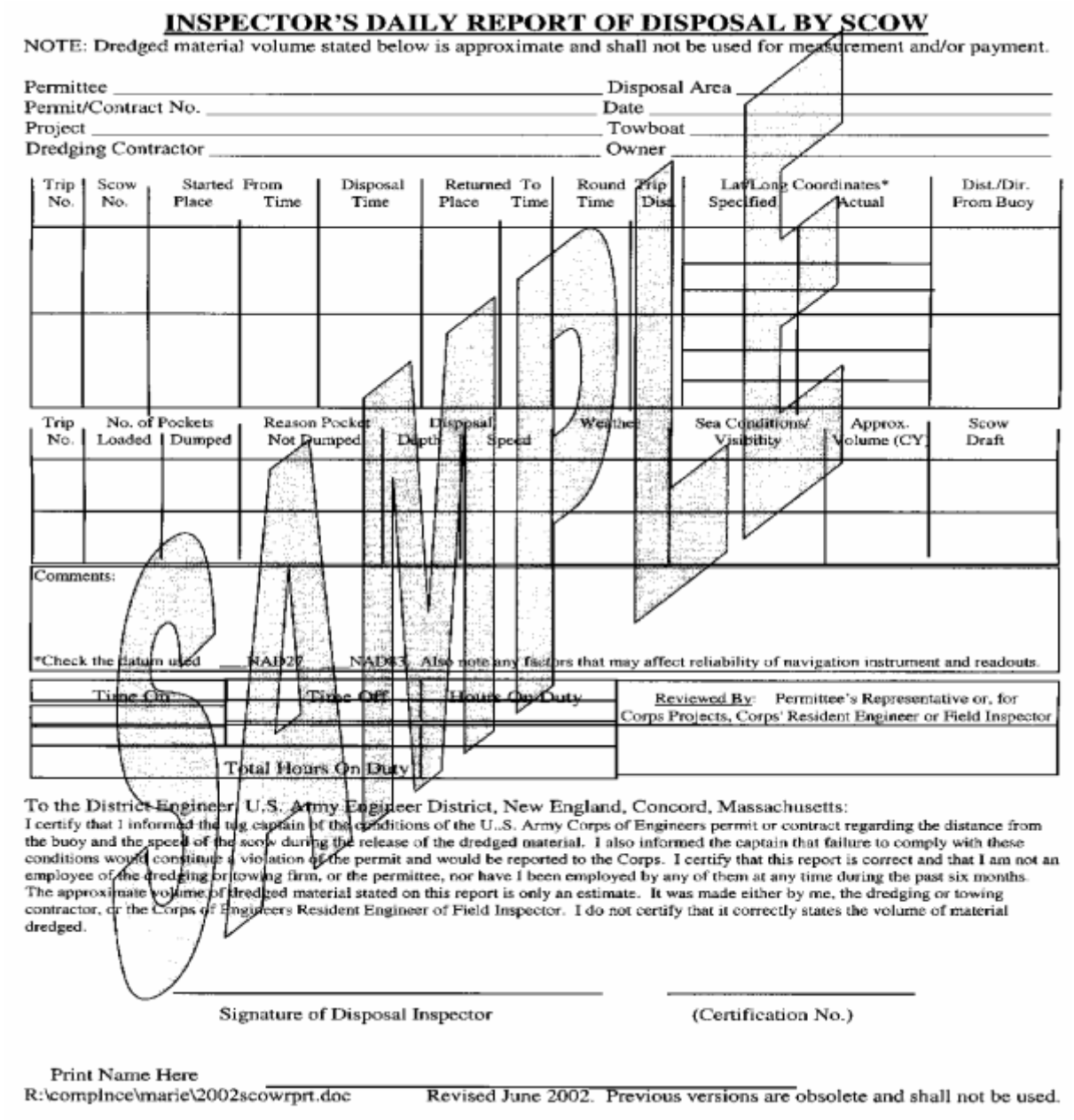
APPENDIX A. Summary Monitoring Framework

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 Scow Log



INSPECTOR'S DAILY REPORT OF DISPOSAL BY SCOW

NOTE: Dredged material volume stated below is approximate and shall not be used for measurement and/or payment.

Permittee _____ Disposal Area _____
Permit/Contract No. _____ Date _____
Project _____ Towboat _____
Dredging Contractor _____ Owner _____

Trip No.	Scow No.	Started From Place	Started From Time	Disposal Time	Returned To Place	Returned To Time	Round Trip Time	Round Trip Dist.	Lat/Long Coordinates* Specified	Lat/Long Coordinates* Actual	Dist./Dir. From Buoy

Trip No.	No. of Pockets Loaded	No. of Pockets Dumped	Reason Pocket Not Dumped	Disposal Depth	Speed	Weather	Sea Conditions/ Visibility	Approx. Volume (CY)	Scow Draft

Comments:

*Check the datum used ___NAD27 ___NAD83. Also note any factors that may affect reliability of navigation instrument and readouts.

Time On	Time Off	Hours On Duty	Reviewed By: Permittee's Representative or, for Corps Projects, Corps' Resident Engineer or Field Inspector
	Total Hours On Duty		

To the District Engineer, U.S. Army Engineer District, New England, Concord, Massachusetts:
I certify that I informed the tug captain of the conditions of the U..S. Army Corps of Engineers permit or contract regarding the distance from the buoy and the speed of the scow during the release of the dredged material. I also informed the captain that failure to comply with these conditions would constitute a violation of the permit and would be reported to the Corps. I certify that this report is correct and that I am not an employee of the dredging or towing firm, or the permittee, nor have I been employed by any of them at any time during the past six months. The approximate volume of dredged material stated on this report is only an estimate. It was made either by me, the dredging or towing contractor, or the Corps of Engineers Resident Engineer of Field Inspector. I do not certify that it correctly states the volume of material dredged.

_____ _____
Signature of Disposal Inspector (Certification No.)

Print Name Here _____

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