

## EXECUTIVE SUMMARY

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During January and May 2000, an estimated total of 14,200 m<sup>3</sup> of sediment dredged from the U.S. Coast Guard Base in East Haven, Connecticut, was placed in a small, man-made depression (borrow pit) in Morris Cove, located in outer New Haven Harbor. The initial environmental monitoring survey to examine the impacts associated with the dredged material placement and subsequent recovery of the seafloor was completed in late September 2000. A follow-up monitoring survey was conducted over the Morris Cove borrow pit in late May 2002, to document the continued recovery of the benthic habitat within the borrow pit, to examine the distribution of sediments at the disposal area, and to calculate the remaining dredged material capacity within the pit for future dredged material placement.

The environmental monitoring activity involved the use of single-beam bathymetry, side-scan sonar, sediment-profile imaging, and benthic grab sampling to evaluate conditions within and adjacent to the Morris Cove borrow pit. Sediment-profile images and benthic samples were also obtained at a reference area located at the mouth of Morris Cove to provide a comparison between the findings within the borrow pit with conditions over the ambient New Haven Harbor seafloor.

The bathymetric and side-scan sonar data showed a clearly defined borrow pit boundary and good differentiation between softer sediments within the borrow pit and the coarser, more compact sediments that comprise its outer margin. Water depths within the survey area ranged from 3 m over the ambient Morris Cove seafloor to 9 m within the deepest portion of the borrow pit. Several bottom features with increased vertical relief and surface roughness were detected within a 50 m radius of the central disposal point employed during the 2000 disposal activity and attributed to dredged material deposition. Using the 3.5 m contour to represent the margins of the borrow pit, it is estimated that the managed placement of approximately 468,000 m<sup>3</sup> of additional dredged material would fill the man-made depression and return the bottom of Morris Cove to its original uniform topography. The placement of 577,000 m<sup>3</sup> of sediment would yield a depth of 3 m (MLLW) within the survey area and result in positive relief, or mounding over ambient bottom.

The sediment-profile images confirmed the presence of dredged material in close proximity to the disposal buoy position and extending out 100 to 150 m from this central disposal point. The measured thickness of the dredged material layer typically exceeded the penetration depth of the sediment-profile camera (i.e., greater than approximately 10 to 15 cm). The dredged material was predominantly fine-grained and consisted of soft, sandy silt. No evidence of erosion or sediment transport (i.e., winnowing) was identified in the replicate images.

## EXECUTIVE SUMMARY (continued)

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Benthic recolonization of the dredged material deposit was progressing as expected two years post-disposal, with a well established benthic community detected within the Morris Cove borrow pit. An advanced Stage II and/or Stage III community was observed at the majority of stations (73%), many in combination with Stage I pioneering polychaetes at the sediment water interface. A Stage I benthic community was seen at four of the remaining borrow pit stations, while two stations were classified as indeterminate due to low camera prism penetration. Oxygen penetration into the surficial sediments was found to be relatively deep, with redox potential discontinuity (RPD) depths greater than 2 cm observed at the majority of the stations sampled. A wide range of Organism-Sediment Index (OSI) values (-3 to +11) were calculated over the survey area. However, 16 of the 22 stations displayed OSI values of +6 or greater, suggesting an undisturbed or non-degraded benthic habitat exists over most of the survey area.

Comparisons to the September 2000 survey indicate improved benthic habitat conditions over the majority of the sediment deposit. However, degraded benthic habitat conditions were observed at two stations on the eastern side of the dredged material deposit (50E and 100SE). The median OSI values calculated for both stations declined significantly over a two year period due to shallow RPD depths, lack of an advanced successional stage and the presence of methane gas within the sediments. Continued monitoring of this portion of the borrow pit is recommended.

Results from the sediment grab samples showed that species richness across the sampling stations totaled 38 discrete taxa. Sixteen of these taxa were annelids, eight were mollusks, and eleven were arthropods. These taxa coincided with the sediment-profile image results that also showed primarily advanced Stage II and/or Stage III communities present over most of the sediment deposit.