# EXECUTIVE SUMMARY

A monitoring survey was conducted in June 2004 at the Central Long Island Disposal Site (CLDS) as part of the Disposal Area Monitoring System (DAMOS). The 2004 field effort consisted of bathymetric and sediment-profile imaging surveys designed to document changes in seafloor topography, evaluate the physical distribution of dredged material, and assess whether the algal/detrital layer observed in the September 2003 survey had persisted or reoccurred in 2004.

The June 2004 bathymetric survey was performed over a 1.44 $km^2$ area in the northeast portion of CLDS. The survey area encompassed the region where disposal occurred during the 2003-2004 disposal season, overlapping partially with the 2003 survey. The 2004 bathymetric results indicated the formation of a new mound, CLIS 03, at the location of the CDA 03 buoy, approximately 300 m west of the CLIS 99 Mound. It was formed by the disposal of approximately 426,000 $m^3$ of material during the 2003-2004 disposal season. The base of the mound was approximately 400 m in diameter with two peaks that rose approximately 1.5 m above the surrounding seafloor. The two peaks were aligned in an east-west direction, approximately 150 m apart. This mound was positioned to further the ongoing development of confined aquatic disposal (CAD) cells within CLDS.

The previous CLDS SPI survey (September 2003) noted the ubiquitous occurrence of a thin, rust-colored surface layer of what appeared to be degraded phytoplankton (phytodetritus). This layer was observed at all three reference areas, as well as at each of the five disposal mounds that were surveyed. It was hypothesized that this layer had resulted from mass settling of phytoplankton cells following a Sound-wide phytoplankton bloom that had occurred roughly 18 to 20 days before the SPI survey.

The objective of the 2004 SPI survey was to assess whether the phytodetrital layer had persisted or reoccurred in 2004 by collecting images at 15 stations within CLDS that had not been subject to recent disposal activity and 15 stations located among the three CLDS reference stations (5 stations at each reference). The historic CLIS 95/96 Mound Complex was chosen for the SPI survey within CLDS because it was not likely to have experienced any recent disposal and previous SPI surveys had shown the mound to be completely recovered from past disposal activities.

A surface layer of tan or rust-colored sediment, similar to the layer observed in 2003, was observed consistently in the 2004 SPI images at both the reference area stations and the CLIS 95/96 Mound stations. As in 2003, it was hypothesized that the orange hue was at least in part due to the presence of elevated levels of phytodetritus on the sediment surface and in the upper 1 to 2 cm of the sediment column. The ubiquitous

presence of this rust-colored layer in both 2003 and 2004 suggests that its origin or cause(s) were regional in nature, as opposed to site-specific or disposal-related phenomena.

In the September 2003 survey, the phytodetrital layer appeared more distinct and concentrated. In the June 2004 survey, the layer was more diffuse and appeared to have been mixed downward to a greater extent than the one observed in 2003. Given the relatively rapid rates at which organic matter is known to be consumed at the sediment surface in temperate estuaries like Long Island Sound, it was considered unlikely that the 2004 layer was the same as the 2003 layer (i.e., unlikely that the 2003 layer had persisted over the 9 months between surveys). Rather, it was deemed more likely that the 2004 layer was of more recent origin, resulting from one or more phytoplankton blooms that had occurred in the weeks or months preceding the 2004 survey.

The results of both the 2003 and 2004 SPI surveys indicate that these pulses of organic matter to the sediment surface were processed rapidly and efficiently under aerobic conditions, and no significant changes in RPD depths or localized zones of elevated sediment oxygen demand (SOD) were observed. In both years, the algal/detrital layer did not appear to have a negative impact on benthic recolonization at CLDS.