As part of the Disposal Area Monitoring System (DAMOS) Program, monitoring surveys were conducted by Science Applications International Corporation (SAIC) at the Central Long Island Sound Disposal Site (CLIS) in September 1997 and March 1998. Field operations were concentrated over the CLIS 95/96 Mound Complex and the historic New Haven 1993 Mound (NHAV 93), as well as at nearby reference areas. The September 1997 field effort consisted of precision bathymetric and REMOTS® sediment-profile imaging surveys. These techniques were employed to examine the disposal mound morphology, stability, composition, and rates of benthic recolonization. The March 1998 field effort consisted of a follow-up sediment-profile imaging survey to examine the benthos during winter conditions, as well as a side-scan sonar survey over one of the CLIS reference areas (CLIS REF).

At the time of the September 1997 survey, the CLIS 95/96 Mound Complex was the newest bottom feature at the disposal site. It is an example of a medium-sized, capped, dredged material disposal mound. CLIS 95/96 is a product of dredged material deposition during the 1995-96 and 1996-97 disposal seasons. An estimated barge volume of 66,400 m^3 was deposited at the CDA 95 buoy position between October 1995 and March 1996, resulting in the formation of the CLIS 95 Mound. In September 1996, the CDA buoy was placed 120 m west of the new CLIS 95 Mound, and a secondary disposal point (Point A) was selected approximately 120 m northwest of the CLIS 95 Mound to accommodate a small capping project that occurred during the disposal season at CLIS. An estimated barge volume of 255,700 m^3 of dredged material was deposited in close proximity to the CDA 96 buoy and Point A during the 1996/97 disposal season. The resulting sediment deposit coalesced with the pre-existing CLIS 95 Mound to form a single bottom feature deemed the CLIS 95/96 Mound Complex.

The September 1997 survey indicated that the sediment placed at Point A merged with the CDA 96 deposit, as well as with the CLIS 95 Mound, to become the CLIS 95/96 Mound Complex, a regular-shaped, moderate-sized bottom feature on the CLIS seafloor. No bathymetric data documenting the interim stages of development were available. However, the compact nature of the deposit, the CDM to UDM ratio, and the results of the REMOTS® sediment-profile imaging survey over the CLIS 95/96 Mound Complex suggest the UDM deposit was completely capped. A well-developed benthic community (Stage III) was found to be widespread over the CLIS 95/96 Mound Complex. Comparisons between REMOTS® images collected over CLIS 95/96 and the CLIS reference areas (2500W, 4500E, and CLIS-REF) showed no significant differences in RPD depths or OSI values.

In addition to the survey operations performed over the CLIS 95/96 Mound Complex, benthic habitat conditions on the surface of the historic NHAV 93 Mound were examined. Although RPD depths were comparable to the previous monitoring survey of July 1996, the images collected over the NHAV 93 Mound in September 1997 displayed less Stage III activity, suggesting a decline in the benthic community. The benthic community inhabiting

the surficial sediments of the NHAV 93 Mound is generally more susceptible to environmental stress, due to the high apparent organic content and corresponding elevated oxygen demand of these sediments. As a result, the benthic community is impacted during seasonal hypoxic events when bottom water dissolved oxygen concentrations decrease to levels between 5.0 $mg \cdot l^{-1}$ and 3.0 $mg \cdot l^{-1}$. The results of the REMOTS® sediment-profile imaging survey indicated the benthic community was continuing to recover as expected, though impeded by the annual Sound-wide hypoxia events.

The results of a follow-up survey over NHAV 93 in March 1998 indicated a general improvement in benthic habitat quality, as increased near-bottom dissolved oxygen conditions apparently reduced environmental stress levels for the benthos. An increase in the number of Stage III organisms was detected at multiple stations, resulting in higher Organism Sediment Index (OSI) values. However, given the cyclical pattern of recovery and decline closely related to the onset and severity of seasonal hypoxia in the region, several benthic population cycles may occur at the mound as chemical and biological processes gradually reduce the level of organic carbon in the sediment. Barring a dramatic disturbance, complete benthic recovery should be achieved within the next few years, as continued chemical oxidation and increased biological activity dissipate the organic load within the sediment deposits.

The CLIS REF reference area was subjected to a detailed investigation in September 1997 and March 1998 to examine an area of apparent benthic disturbance. In July 1996, one replicate sediment-profile image obtained from Station 9 at CLIS-REF displayed an anomalous pocket of low reflectance, fine-grained material resembling non-ambient material and a physically disturbed surface layer. In 1997, one of six replicate images collected at the location of the 1996 disturbance displayed a physically disturbed surface layer and a chaotic sediment fabric. To further investigate the area, a nine-station REMOTS® survey and a five-lane side-scan sonar survey were conducted in early March 1998. No major areas of benthic disturbance were detected in the side-scan sonar record, and no obvious signs of further benthic disturbance were noted in the additional REMOTS® images. However, indications of recent trawling activity were found, and determined to be the most likely cause for the anomalous conditions noted in July 1996 and September 1997.