CLE Engineering, Inc.
15 Creek Road
Marion, MA 02738
(508) 748-0937

Moorings Breakwater Trust
Marion, MA
Maintenance Dredging Project
October 16, 2008

POST DREDGE EEL GRASS MONITORING REPORT #3

Introduction:

The Moorings Breakwater Trust (MBT) completed (end of November 2007) maintenance dredging activities of marine sediment from an area of approximately 16,630 square feet from its mooring basin and slips in Sippican Harbor at Converse Point in Marion, Massachusetts. This monitoring report has been submitted in compliance with the conditions of the US Army Corps of Engineers Permit, NAE2005-257 specifically the "Eelgrass Monitoring & Mitigation Plan". In order to document the effects of dredging, or lack thereof, the eelgrass bed adjacent to the mooring basin was surveyed prior to dredging, within 10 days of completion of the dredging and to date, three times during the subsequent growing season. This report is the fourth and final post dredge eel grass monitoring report.

Methodology:

A visual underwater inspection was made by Jeffrey W. Oakes, P.E. of CLE Engineering, Inc. (CLE) using a wetsuit, snorkel and mask. The four monitoring plots shown as M1, M2, M3 and M4 on the attached plan entitled "Post-Dredge Conditions" by CLE dated 12/07/07 were established by driving PVC pipe fastened to steel fence posts into the sediment at the locations shown. The edge of the eelgrass bed was then determined based on visual observations and as located by field survey. The location of the PVC pipes marking the monitoring plots were also located by field survey. Photographs and measurements consisting of eelgrass stem density, leaf length, relative water turbidity and the percentage of leaf area covered by epiphytic growth were also made and relayed to a note taker on-shore. The pre-dredge survey was conducted on 9/13/07 and the post-dredge survey was conducted on 12/06/07. The fourth of four monitoring surveys was conducted on 10/15/08.

Results:

The results of the measurements before and after dredging are shown below:

MONITORING PLOT M 1

Date	Stem Density #/s.f.	Length inches	Relative Turbidity	% coverage epiphytes
9/13/07	25	18	Low	NR
12/06/07	12	12	High	50%
06/20/08	30	28	Moderate	20%
08/01/08	40	20	Low	<5% *
10/15/08	10	18	Low	75%

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MONITORING PLOT M 2

Date	Stem Density #/s.f.	Length inches	Relative Turbidity	% coverage epiphytes
9/13/07	25	16	Low	NR
12/06/07	12	10	Low	75%
06/20/08	30	18	Low	0%
08/01/08	25	26	Low	0%
10/15/08	25	12	Low	75%

MONITORING PLOT M 3

Date	Stem Density #/s.f.	Length inches	Relative Turbidity	% coverage epiphytes
9/13/07	16	16	Low	NR
12/06/07	10	10	Low	30%
06/20/08	30	22	Low	20%
08/01/08	16	26	Moderate	0%
10/15/08	36	18	Low	25%

MONITORING PLOT M 4

Date	Stem Density #/s.f.	Length inches	Relative Turbidity	% coverage epiphytes
9/13/07	20	24	Low	NR
12/06/07	4	12	High	50%
06/20/08	4	20	High	10%
08/01/08	6 (~ 20 w/in 1'of sample location)	28	Moderate	0%
10/15/08	16	13	Low	75%

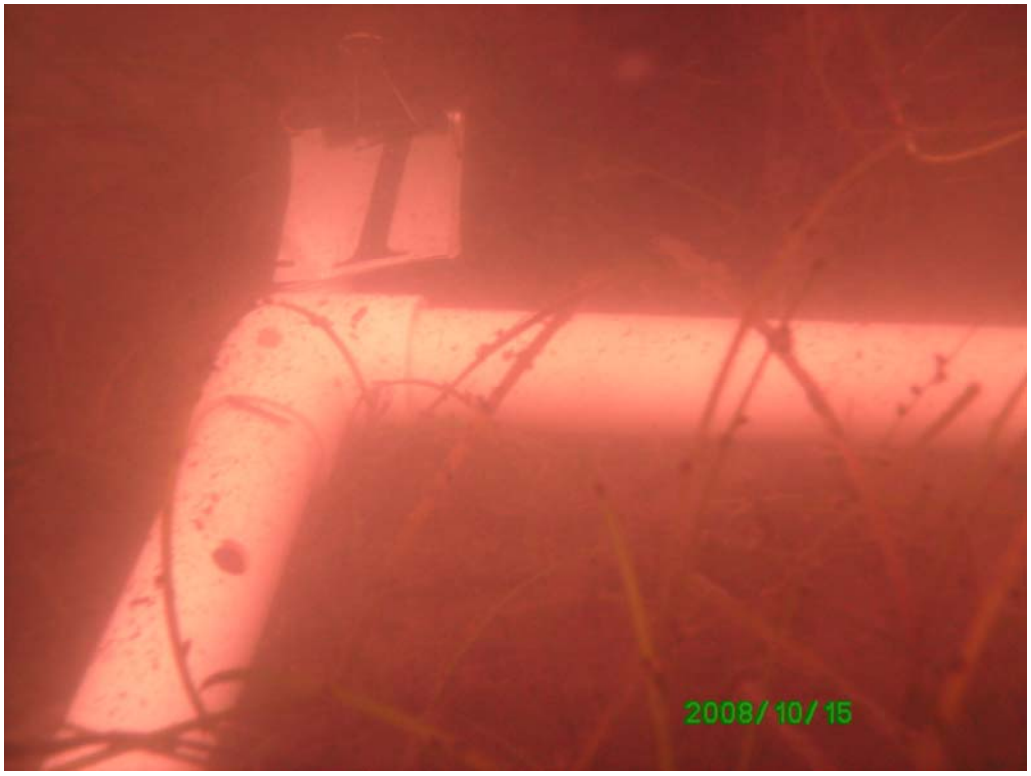
NR = Not Recorded

Notes:

* 10% of surface at Plot M 1 was covered with green filamentous algae, all plots exhibited barnacle growth on eel grass stems.

Photographs:

The following photographs depict conditions at the monitoring locations during the fourth and final monitoring survey.



M 1 on 10/15/08 Monitoring Survey 4

M 2 on 10/15/08 Monitoring Survey 4

M 3 on 10/15/08 Monitoring Survey 4

M 4 on 10/15/08 Post Dredge Survey 4

Conclusions:

As shown in the tables above, in all locations with the exception of M 1, the eel grass beds are currently denser and the leaves longer than observed upon completion of the dredging (12/06/07 observation date). As was observed during the previous monitoring events, eel grass was the only SAV observed at M 4, possibly a result of improved water quality that is less favorable to the Codium and other algae. The filamentous green algae previously observed at M 1 was not observed during this observation event. There was evidence of recently uprooted eel grass plants at M 1, possibly from grazing by water fowl, resulting in the reduced stem density at that location. In all locations with the possible exception of M 1 and M 4[1] the eel grass beds are currently similar in density and plant leaf length to their pre-dredge conditions.

[1] Within one foot of location M4, the stem density increased to 20 stems per square foot. The edge of a very dense bed of eel grass bed was noted 8' to the north of M 4 on 10/15/08