

June 25, 2013

Electronic Mail

Mr. Jay Donovan, Property Manager
 The Belmont Condominium Trust
 One Belmont Road
 West Harwich, MA 02671

Re: Coastal Resources Evaluation & Management Considerations [LEC File #TBe\13-182.01]
The Belmont Beachfront Area
West Harwich, Massachusetts

Dear Mr. Donovan:

In response to your request, LEC Environmental Consultants, Inc., (LEC) evaluated the existing physical and biological conditions along the beachfront area of The Belmont and has provided below several recommendations regarding seaweed management and beach erosion. A site evaluation was conducted on June 20, 2013 during mid-tide conditions with a slight breeze from the southeast in the presence of yourself and a long-time property owner. It is our understanding that as a result of a late May coastal storm, the beach was heavily eroded and that seaweed had been continuously deposited on the beach 2-3 feet thick throughout the intertidal zone across the entire property. Despite the removal of 16-18 truckloads the day before our site visit, the seaweed continued to build across the property during my evaluation.

The condition of the sandy beach is considered to have a post-storm configuration of a steeper and narrower intertidal area than normal. It is expected that the beach will rebuild itself following a 6-8 week period without any storms and/or long period, summer waves. The alongshore sediment transport in this area moves west to east towards the jetty. Ever since the jetty was built in the mid-1900's, the Belmont beach has accreted an average of 2 to 3.5 feet per year according to the Massachusetts Coastal Zone Management Office. Sand from offshore can also be deposited on this beach as waves generated from the southeast refract around the jetty.

Along with a pervasive deposit of green algae (*Codium fragile*), a relatively high amount of common slipper shell (*Crepidula fornicata*) was observed across the beach. Large, offshore clusters of these shells actually provide the substratum to which the algae attach themselves. Large mats of the algae form year-round, and during storms the algae are ripped apart from the shells. Thereafter, with assistance of the current, and tidal and wave action, an algae "invasion" typically occurs along nearby beaches and in areas where the algae are trapped by coastal engineering structures such as groins and jetties. Given time, the algae will dry out and take a much reduced form called "deadman's fingers".

Attempts to permanently remove seaweed from the beach can be a futile, as well as an expensive proposition. The quantity of algae is hard to determine and the influence of coastal processes is extremely difficult to control. In addition, such efforts would require permitting with the Harwich Conservation Commission, the Natural Heritage Endangered Species Program and potentially the Army Corps of Engineers. For example, in threatened or endangered species habitat and significant migratory shorebird staging areas, seaweed removal should be prohibited from April 1 to September 30. In addition, regulatory agencies will often require an alternative

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analysis and management plans to accompany permit applications. Consultants are usually needed to provide these services.

Beach replenishment or nourishment could address both the erosion and seaweed problem. However, since the beach is private property, all costs would be the responsibility of the owners without government assistance. If seaweed can be removed from one area and relocated to a pile nearby, sand can be used to cover the pile(s) thereby reducing the smell and enabling the algae to dry out. Wholesale covering of the seaweed also is an option as was conducted at Cockle Cove in Chatham several years ago. Finally, sand can be used to extend the height and width of the beach, thereby creating a larger high tide beach located landward of the seaweed deposit zone. The cost of importing sand can range from \$7.50 to \$25.00 per cubic yard depending on whether it's dredged material or screened from an upland source, respectively. While it would be cost prohibitive to hire your own dredge, there are instances where there has been private/public collaboration with use of the Barnstable County dredge. Future dredging of the Herring River adjacent to the property also may provide such an opportunity.

We will be happy to discuss any "next steps" with you and the Board that may involve permit strategy and applications to local, state and federal agencies. Thank you again for the opportunity to provide my professional opinion and more technical information to consider. Please contact me at 508-746-9491 or at shumphries@lecenvironmental.com.

Sincerely,

LEC Environmental Consultants, Inc.

A handwritten signature in black ink that reads "Stanley M. Humphries". The signature is written in a cursive style and is positioned above the printed name.

Stanley M. Humphries
Senior Coastal Geologist