Friends of Squibnocket LLC PO Box 267 Chilmark, MA 02535 August 19, 2014

Town of Chilmark The Squibnocket Committee Chilmark, MA 02535

Dear Jim and Members of The Squibnocket Committee,

We are writing this to set the context for our meeting with the Committee on August 26. While that meeting will focus on 'existing conditions,' we thought it would be helpful to explain our perspective on the issues surrounding Squibnocket, an update on what we have learned to date and a preview of our September alternative proposal.

# Squibnocket

We all agree on the issues facing the Squibnocket area: the loss of beach due to the advancing tides, the vulnerability of the revetments with resulting loss of parking, and the loss of confidence in the roadway system to Squibnocket Farm.

# The Recent Past

There are issues at Squibnocket; however the characterization of the current situation as "in crisis," may not be warranted:

- The revetments have not failed in 22 years and there has been no analysis that concludes that their failure is imminent.
- Access to Squibnocket Farm has not been interrupted in any material way over this same period. There has been annoyance from debris on the road in storms and one incident of a brief conduit outage.
- Should there be an issue with access before a solution is implemented, Squibnocket Farm and/ or the Town can readily address the problem. We have detailed the Commonwealth's regulations for emergency response to crises on our web site - <u>www.squibnocket.org/</u> <u>emergencyresponse/</u>:

Proactive and reactive steps are taken by "MassDEP to further protect public health and safety...that allow municipalities and others...to restore those conditions...without going through a permitting process at the local or state level".

The only crisis we can foresee may be caused by acting prematurely instead of working methodically through a detailed analysis and review of alternative solutions. We are pleased to be working with the Committee to present other possible alternatives.

### **Overview of Friends of Squibnocket Analytic Effort**

Our process includes the following steps:

- History: Review of the history at Squibnocket to attempt to understand the topography and terrain to determine if the use patterns have had any effect on the erosion over time.
- Wetland Resources Area: Delineation of the various resources in the Squibnocket area (e.g. Barrier Beach, Wetlands, etc.) to determine how the Wetlands Protection Act and the Chilmark Wetlands By-Laws apply and what guidance they provide.
- Survey and topographical analysis: Development of a current topographical and survey base plan. The Base Plan is used to define the 'departure point' for subsequent analysis of the area. The departure point is a reconfigured shoreline with the revetments removed and the area

naturalized to reflect its state had nature been allowed to take its course without the obstructing revetments. This is referred to as 'Base Plan Zero Years'.

- Erosion Projections: Development of a set of projected erosion rates for the shoreline between Weldon's Coastal Bank and the western end of Money Hill. The projected shoreline for Base Plan Plus 25 Years and Base Plan Plus 50 Years will be overlaid on the topographical maps. (Sept)
- Nearshore wave & water level assessment: Data will be used to determine run-up of waves based on various input conditions (e.g. dune dimensions and wave/surge conditions). (Sept)
- Land use input for Squibnocket area: Consistent with the Wetlands Protection Act, the advice
  of consultants, and the data determined through this analytic process, develop a set of highlevel ideas for land use for the Squibnocket beach area (barrier beach, coastal dune, east end
  of the Pond). The objective of this work is to develop a land-use context that can be used in
  the on-going tactical decision decision-making process for the area. (Sept)
- Dune Ridge Design: Recommend scale of dune system needed to provide sustainable protection of a roadway relative to footprint available. (Sept)

# History at Squibnocket

While we have completed a more complete review of the last few hundred years at Squibnocket (<u>http://squibnocket.org/history-of-squibnocket-2/</u>, including details some of the use patterns, we thought it would be helpful to present one photograph of Squibnocket Beach and the parking lot area from 1951 showing a large dune:



The dune or dune ridge (center of the photograph above male figure) appears to be aligned with the eastern and the western coastal banks. This documents that a dune ridge was a natural feature of this terrain. The fencing and openings to the beach indicate significant use which could point to the fact that this active use of the area in the vicinity of the parking lot may have contributed to its decline over time. It also indicated that reconstructed dune ridge would be consistent with the natural terrain.

# **Resources delineation**

As mentioned above, we need to complete a delineation of the Wetland Resource Areas in the target area in order to understand the applicability of the Commonwealth's Wetlands Protection Act (WPA) and the Chilmark Wetlands Protection Bylaw (CWPB) to the area. The Act and Bylaw provide guidance for each resource and delineation via mapping is required to determine which regulations apply in each different type of area. We have delineated the resources, following the delineation, we can identify the relevant regulations for each area vs. the proposed activities (e.g. excavating, fill, grading; erecting structures; removal of vegetation, etc). We have delineated the following resources: Land Under the Ocean, Coastal Beach, Coastal Dune, Bordering Vegetated Wetlands (BVW) and Bank, Salt Pond, Barrier Beach, Land Subject to Coastal Storm Flowage, and Coastal Bank (with a 100' Buffer Zone).

The BVW was delineated by our surveyors. We flagged some portions of the area that had not been addressed. And, for the Town-leased and Vineyard Open Land Foundation parcels, we validated that the existing flags were in the correct locations and surveyed them for our mapping. At this point, we are comfortable that we have a valid, surveyed Wetlands Delineation and that our view of the wetlands should be consistent with the view of other interested parties that have completed surveys. As for the remaining, non-surveyed BVW, the Barrier Beach, and the Coastal Bank, we have used publicly available maps to define these areas. We recommend that these delineations be submitted to the Chilmark Conservation Commission as a Request for Determination of Applicability. Once accepted by the Conservation Commission, these delineations can be used by all interested parties for planning purposes.

# Survey and topographical analysis

As mentioned above, developing a plan for this area should start with a new baseline that shows the shoreline after it has naturalized following the removal of the revetments. While detailed analysis has been performed on the topographical and survey data for the area, it's also helpful to visualize how the shoreline would have evolved if the revetments had not been built. As the



aerial photograph in the photo above indicates, the 'hypothetical' shoreline bisects the existing parking lot while the top of bank connects on south side of the revetments to the natural line for the banks:

Next, following standard engineering practices, we developed a surveyed Base Plan to approximate the high water mark and the coastal bank after the removal of the revetments. This *Base Plan Year Zero Years* reflects the adjusted basis that we will use in estimating the effects of erosion on the area over time. Base Plan Zero shows a new high water mark (located where high water will be after revetment removal) and a new location for the bank/dune after the area 'naturalizes.'

We will present three different 'existing conditions' maps at the August 26th meeting (maps may be viewed at <u>http://squibnocket.org/surveymaps/</u> and PDF's may be downloaded:

- <u>Overview of Resources:</u> This map is a high-level view of the area from Vytlacil's to Squibnocket Farm and shows the location of all of the resources Barrier Beach, Coastal Dunes, Coastal Bank. Additionally, the map shows the Bordering Vegetated Wetlands, Natural Heritage Priority Habitats of Rare Species, Mean High Water, etc. This provides an orientation to the general area and shows the high-level complexity of the entire area but especially in the Money Hill and existing parking lot area.
- <u>Base Map With Revetments</u> (Wetlands Resource Map Aug 13): This map is a detailed map of the target area. The map was updated to reflect the current state of the banks in front of Weldon and at Money Hill. And, it shows the high water mark at the edge of the revetments and mean sea level. Additionally, the map shows the complete Wetlands Delineation and the accretion at the eastern end of Squibnocket Pond. Plus, the map indicates the location of the FEMA Velocity Zones (EL 15 and 16).

The third map provides a view of conditions immediately after removal of the revetments. Map is available at <u>http://squibnocket.org/surveymaps/</u>.

• <u>Base Map Zero Years</u>: This map shows the adjusted high water mark and the updated top of bank after the revetments are removed. The intent is to estimate the new topography after it naturalizes following the removal of the boulders. Note that the high water mark is upland from the original front of the revetments. Also note that the updated top of bank runs across the parking lot and behind the backside of a section of the causeway revetment. This map will be used as the departure point for understanding the effects of erosion on this area in 25 year increments.

### Dune Ridge/Road Solution

The Dune Ridge/Road alternative is beginning to take shape. The objective is to create a dune of consistent width that adequately provides for storm damage prevention and flood control. We are allowed to fill 5,000 square feet of wetlands. The survey map with the Wetlands Delineation was used to determine the 'fill area' that best meets our objectives. This footprint will be used in modeling the height and shape of the dune ridge to provide a sustainable roadway on the back or leeward side of the dune ridge. The near term wave and water level assessment data will be used in this design process.

The issues for the Dune Ridge/Road Solution will be related to sustainability and the effects of the solution on the pond and on the wetlands. As mentioned, the WPA may allow the filling of up to 5,000 square feet of wetlands as a 'limited project' for a roadway of 'minimum legal and practical width' consistent with local Planning Board guidelines, where reasonable alternative means of access from a public way to an upland area of the same owner is unavailable'.

The Commonwealth has set a high bar through the WPA for Barrier Beaches and the related, cross-referenced systems such as Coastal Dunes.

### (See extract of key sections from the Wetlands Protection Act in the Appendix.)

# Revetments

The regulatory situation for the stone revetments (i.e., coastal engineering structures) comes in many permutations and combinations relative to their licensing status under Chapter 91. We did not have any information with regard to existing licenses and only wish to point out the obvious. All of the boulders from the western end of Money Hill to the east end of the parking lot have led to the loss of a recreational beach, exacerbate erosion of adjacent beaches and banks, and may even contribute to the damage of landward areas from wave run-up and overtopping. Total removal of these coastal engineering structures would unquestionably be an environmental improvement once the parking and access problems are resolved.

# Installing Utilities Under The Pond

As discussed in previous meetings, a Dune Ridge/Road strategy requires alternate routing of the conduits in order to provide flexibility in road maintenance. There are two possible alternate routes. One is over the barrier breach. The second is under the pond in a highly secure location. The simpler permitting strategy for underground utilities is under the barrier beach, not the pond, as only a Wetlands permit would be required (activity in or within 100-feet of a wetland). The permitting becomes more complex to cross over, through, or under the pond. This is because Squibnocket Pond is a Great Pond and DEP would require a Chapter 91 license which would require a review of "water dependent use". Chapter 91 specifies that If an upland (non-pond) route is feasible, a proposed pond crossing would be required. However, If it can be demonstrated that there is not a feasible upland route, the crossing would be considered water dependent and easier to license.

There is a good chance that routing the conduits under the pond would be considered a "water dependent use" and that a pond crossing would be allowed. The reasons for a determination that this is a water-dependent use include the congestion at the barrier beach location due to dune & roadway construction and revetment removal. Additionally, placing the conduits under the barrier beach would require a significant disturbance to that resource due to the required depth to avoid the effects of beach and sea floor erosion.

# What Data Is Needed on the Bridge Solution?

We would like to evaluate the Bridge Solution using the same analytic process we are applying to the Dune Ridge because it may be the best solution. However, we cannot do so without access to a plan that provides basic elements such as the survey map location of the bridge and the design of the endpoints, including the abutments. Your committee has the same need for this data as we do. In fact, there is little that the Committee can say about the advisability, feasibility, or sustainability of the Squibnocket Farm proposal until Squibnocket Farm provides a plan that everyone can review.

### Analytic Review and Development of Proposals

We are developing analytic reviews and proposals for several elements and these will be presented at our September meeting with the Committee.

- Vehicular access: dune ridge/road or bridge
- Conduits: a separate proposal for access for conduits will be proposed if the Dune Ridge/Road strategy is pursued.
- Parking: parking alternatives that could be considered for either solution (dune ridge or bridge).

Sincerely,

Friends of Squibnocket

# Appendix:

### Regulatory review/ Barrier Beach and Coastal Dune

### Definition from WPA:

Barrier Beach means a narrow low-lying strip of land generally consisting of coastal beaches and coastal dunes extending roughly parallel to the trend of the coast. It is separated from the mainland by a narrow body of fresh, brackish, or saline water or a marsh system. A barrier beach may be joined to the mainland at one or both ends.

#### Preamble from WPA:

- Barrier beaches are significant to storm damage prevention and flood control and are likely to be significant to the protection of marine fisheries and wildlife habitat and, where there are shellfish, the protection of land containing shellfish.
- Barrier beaches protect from wave action such highly productive wetlands such as salt marshes, estuaries, lagoons, salt ponds, and fresh water marshes and ponds, which are in turn important to marine fisheries and protraction of wildlife habitat. Barrier beaches and the dunes thereon are also important to the protection of wildlife habitat in the ways described in 310 CMR 10.27(1) (coastal beaches) and 10.28 (1) (coastal dunes).
- Barrier beaches are maintained by the alongshore movement of breach sediment caused by wave action. The coastal dunes and tidal flats on a barrier beach consist of sediment supplied by wind action, storm wave overwash and tidal inlet deposition. Barrier beaches in Massachusetts undergo a landward migration caused by the landward movement of sediment by wind, storm wave overwash and tidal current processes. The continuation of these processes maintains the volume of the landform which is necessary to carry out the storm and flood buffer function.
- When a proposed project involves removal, filling, dredging or altering of a barrier beach, the issuing authority shall presume that the barrier beach, including all of its coastal dunes, is significant to the interest(s) specified above. The presumption may be overcome only upon a clear showing that a barrier beach, including all of its coastal dunes, does not play a role in storm damage prevention, flood control, or the protection of marine fisheries, wildlife habitat, or land containing shellfish, and if the issuing authority makes a written determination to such effect.
- When a barrier beach is significant to storm damage prevention and flood control, the characteristics of coastal beaches, tidal flats and coastal dunes listed in 310 CMR 10.27(1)and 10.28(1) and their ability to respond to wave action, including storm overwash sediment transport, are critical to the protection of the interests specified in 310 CMR 10.29.

### Coastal Dunes

The section on Coastal Dunes is referenced in the section on Barrier Beaches and is also applicable in this resource area.

### **Definition from WPA:**

Coastal dune means any natural hill, mound, or ridge of sediment landward of a coastal beach deposited by wind action or storm overwash. Coastal dune also means sediment deposited by artificial means and serving the purpose of storm damage prevention or flood control.

### Preamble from WPA (key paragraphs):

- All coastal dunes aid in storm damage prevention and flood control.... Coastal dunes are also significant to the protraction of wildlife habitat.
- Coastal dunes aid in storm damage prevention by supplying sand to coastal beaches. Coastal dunes protect inland coastal areas from storm damage and flooding by storm waves and storm elevated sea levels because such dunes are higher than the coastal beaches which they

border. In order to protect this function, coastal dune volume must be maintained while allowing the coastal dune shape to conform to natural wind and water flow patterns.

- Vegetative cover contributes to the growth and stability of coastal dunes by providing conditions favorable to sand deposition.
- On retreating shorelines, the ability of the coastal dunes bordering the coastal beach to move landward at the rate of shoreline retreat allows these dunes to maintain their form and volume, which in turn promotes their function of protecting against storm damage or flooding.
- When a proposed project involves dredging, filling... (Same as paragraph for Barrier Beaches...)

When a coastal dune is determined to be significant to storm damage prevention, flood control, or protection of wildlife habitat, the following shall apply:

- An alteration of...a coastal dune within 100' of a coastal dune shall not have an adverse effect on the coastal dune by (a) affecting the ability of waves to remove sand from the dune, (b) disturbing the vegetative cover so as to destabilize the dune, (c) causing any modification of the dune form that would increase the potential for storm or flood damage, (d) interfering with the landward or lateral movement of the dune, (e) causing removal of sand from the dune artificially, or, (f) interfering with mapped or otherwise identified bird nesting habitat.
- The following may be permitted: (a) pedestrian walkways designed to minimize the disturbance to the vegetative cover and traditional bird nesting habitat, (b) fencing and other devices to encourage dune development, and (c) plantings compatible with the natural vegetative cover.