STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

COASTAL RESOURCES MANAGEMENT COUNCIL

INTER-OFFICE MEMORANDUM

DATE: March 26, 2012

TO: Grover J. Fugate, CRMC Executive Director
Anne Maxwell Livingston, CRMC Chair; and CRMC Members

FROM: James Boyd, Coastal Policy Analyst
Janet Freedman, Coastal Geologist
Dan Goulet, Marine Infrastructure Coordinator
Dave Reis, Supervising Environmental Scientist
Tracy Silvia, Senior Environmental Scientist

SUBJECT: Staff Report for CRMC File 2011-12-017 - South Kingstown petition for Matunuck shoreline feature designation

Staff Recommendation

Based on the evidence and facts presented herein it is CRMC staff opinion that the shoreline within the petition segment could be characterized as a manmade shoreline as defined in CRMP 210.6. However, since the pending application is a contested case and CRMC staff has not had the opportunity to review and consider new testimony and evidence that will likely be presented at the public hearing, CRMC staff defer to the Council's decision in this matter. Should the Council grant the Petitioner's request a number of stipulations are provided herein that CRMC staff recommend that the Council adopt and include in its final decision in this matter.

Summary

- The Town's petition seeks the Council's determination to affirmatively characterize the petition segment shoreline as a "manmade shoreline" as defined by CRMP Section 210.6; the Town's petition is <u>not</u> a request for a coastal program rule change.
- There are about 1000 feet of existing shoreline protection structures (rip-rap revetments and concrete block walls) that comprise 70 percent of the 1400-foot petition segment, and existing shoreline protection structures are present at both ends of the petition segment.
- CRMC staff recommends the designation of a Matunuck Coastal Natural Area for the shoreline east of the petition segment within the Salt Pond Region SAMP as mitigation.
- CRMC staff recommends that any new structural shoreline protection or the reconstruction of existing shoreline protection include a flat top section, approximately15-feet wide, to provide dedicated public access (mitigation) and construction and maintenance equipment access along the top of the revetment.

- Any new proposed shoreline protection structure, if approved by the Council in a future application, will be logistically challenging and very costly to construct due to the configuration of existing buildings and the current site conditions that will dictate design requirements including U.S. Army Corps of Engineers and CRMC design standards.

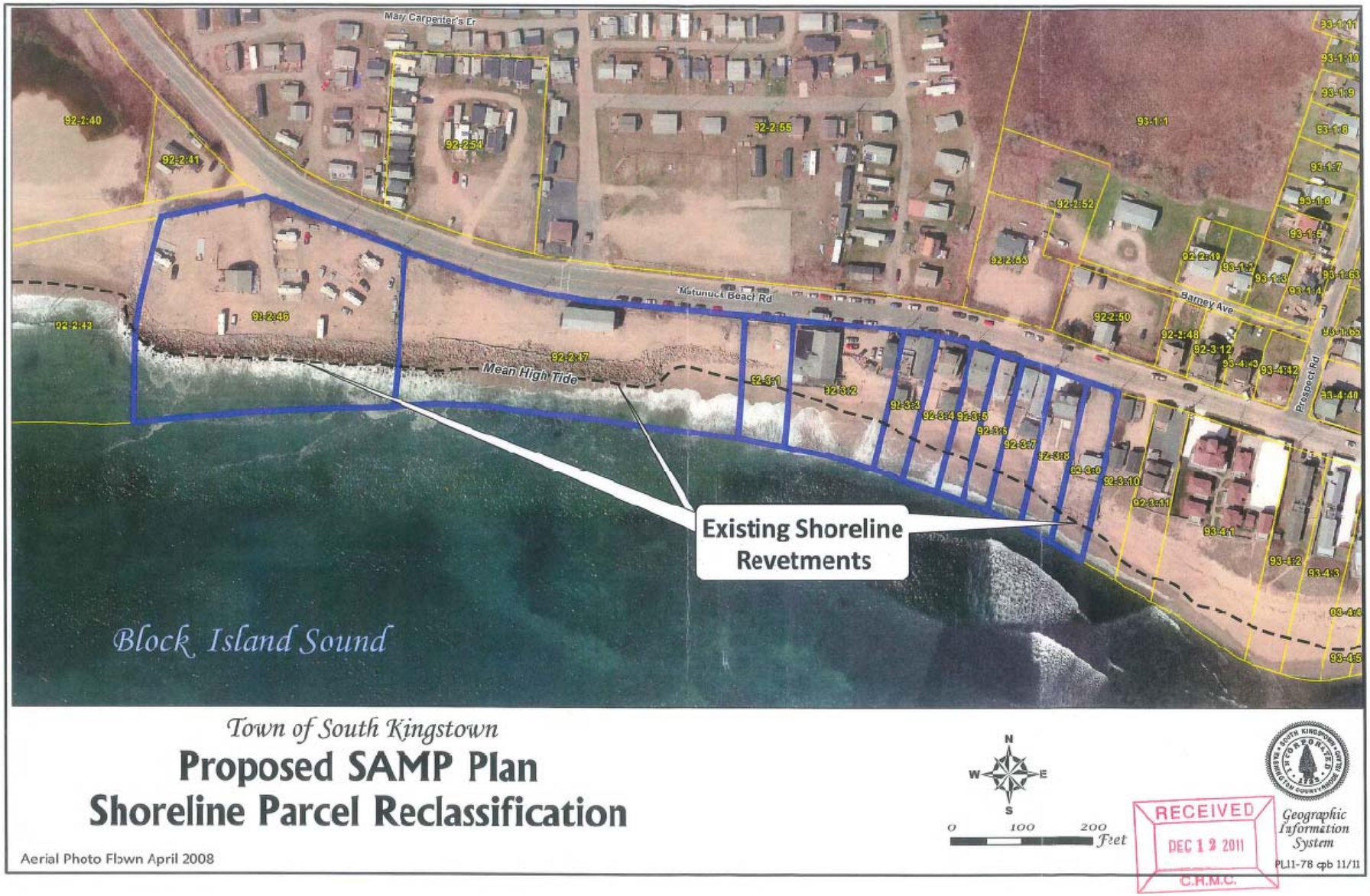
The CRMC has been aware of the erosion problem at Matunuck for well over two decades and has continuously advocated for beach replenishment as a method to address the erosion. From a coastal policy perspective, beach replenishment is the best solution for restoring beachfronts as demonstrated by the recent Charlestown Town beach project and at other locations in Rhode Island and elsewhere. Various attempts primarily consisting of "soft" and temporary techniques have been applied by Matunuck property owners to the erosion problem there. However, as described in this report, there has been significant coastal policy, environmental, public perception and construction issues associated with implementing a "permanent" solution that appropriately balances all of these issues. Of primary concern is the public's rightful perception that the permanent hardening of the shoreline will result in the loss of coastal beach and the public access along with many recreational opportunities currently provided by the Matunuck shoreline. Second, the affected area is located on a highly exposed shoreline with very limited access for both the construction and maintenance of a hardened shoreline. Third, there is no practical structural solution that will protect the affected shoreline from major coastal storms, hurricanes and sea level rise. Even the massive scope of the single, unified revetment structure discussed herein will not protect the shoreline from a major hurricane nor will it preserve Matunuck Beach Road as an evacuation route during a major storm. In addition, the unified and continuous single structure approach recommended by CRMC staff will likely face objections by the affected landowners based on cost, construction logistics and the necessary maintenance responsibilities. Thus, CRMC staff conclude that there has never been nor will there ever be a "perfect" solution that satisfies all the concerns of all the affected parties. This includes the Town of South Kingstown, local property owners, environmental advocacy groups and the public in general. The implementation of the long-term solution discussed herein will require compromise on behalf of all affected and interested parties and it remains to be seen if the necessary compromise can be achieved.

Staff Report

The Town of South Kingstown filed a petition with the Coastal Resources Management Council on December 12, 2011 requesting the CRMC to designate a portion of the Matunuck shoreline as Manmade Shorelines (defined in CRMP Section 210.6) between and inclusive of parcels 92-2:46 through 92-3:9, as shown on the Town's exhibit in **Figure 1** below. The 1400-foot[1] shoreline segment along Matunuck Beach Road as identified above is herein referred to as the "petition segment." Such a designation, if approved by the Council, would allow the installation of new structural shoreline protection facilities for the affected parcels provided the property owners apply for and receive a CRMC Assent. Currently the installation of new structural shoreline protection facilities is prohibited along this shoreline pursuant to the Coastal Resources Management Program (CRMP). However, existing authorized shoreline protection structures, including those within the petition segment, can be maintained with application to the CRMC in accordance with CRMP 300.14 – Maintenance of Structures.

[1] The Town states in its petition that the shoreline segment is 1272 linear feet, but upon CRMC staff review it was determined that the petition segment is approximately 1400 linear feet.

Figure 1. – Town of South Kingstown exhibit submitted as part of its petition filed with the CRMC



In consideration of the facts in this matter as well as the experience of CRMC staff in the review of applications along the entire Rhode Island south shore, we want to make clear that there is a very significant distinction between characterizing manmade shorelines on headlands as opposed to barriers. Although about 15% of the south shore from Watch Hill to Point Judith is currently armored with various types of shoreline structures, most of the armoring is concentrated along the headland areas. Coastal headlands, as defined in CRMP 210.4, are generally elevated land forms ranging from low bluffs of easily erodible sediment, or in glacial till, to bedrock cliffs. Generally the headland areas along the south shore are relatively well developed with residential and in some cases commercial structures and contain more public utilities and infrastructure than are typically found on barriers. On the other hand, barriers, as defined in CRMP Section 210.2, are relatively thin ribbons of shoreline separating the ocean from coastal ponds. They consist of multiple shoreline features including beaches, dunes and coastal wetlands and are composed of sand deposits that are constantly shifting as a result of storm impacts and wind. Since the formation of the barriers about 6000 years ago, barriers have been retreating landward as sea levels have steadily risen.

The barriers along the south shore are high hazard areas that are particularly susceptible to frontal erosion and overwash during storms. Due to the dynamic nature of barriers, they are unsafe places to build upon. In addition, they provide protection from the brunt of storm surge and wave energy for the many homes and other development on the northern sides of the salt ponds. Barriers are important coastal habitat and also serve to protect the fragile coastal ponds and associated ecosystems that are found along the south shore.

Barriers are formed from sediment that is carried by waves and currents. As such, they are important sediment sources for the beaches that front the barriers and the headlands. Shoreline structures impound the sediment found in dunes and coastal bluffs that would normally erode during storms. Once a shoreline protection structure is installed the natural sediment transport processes are curtailed at that location, thus diminishing the sediment supply to neighboring beaches. This leads to sediment starved coastal beaches.

CRMC staff would not recommend characterizing any shoreline segments along barriers as manmade shorelines to facilitate the installation of new shoreline protection structures. In some cases, however, CRMC staff may support the characterization of some headland areas as a manmade shoreline provided sufficient and convincing facts supported such a characterization consistent with CRMP 210.6.

In arguing the procedural aspects of the Town's petition, one Objector raises the point that "any designation change has to go through the Council's regular rule-change process." We do not believe this is the case, as the Council has previously approved applications where CRMC staff evaluated individual locations as part of the application review process and determined that they fit the definition of a manmade shoreline bordering Type 1 waters. These applications for proposed structural shoreline protection facilities were processed as Category B applications, which entail a 30-day public notice and a public hearing before the Council. Furthermore, the Town's petition does not seek to modify any existing rule of the Council or a modification of any definitions as used in the Coastal Resources Management Program. Rather, the Town's petition is a formal request of the Council to determine whether a specific shoreline segment in Matunuck can be characterized as a manmade shoreline as defined in CRMP Section 210.6.

History

The Matunuck erosion problem has been an ongoing issue and was described in the CRMC staff report of April 20, 2011. A series of storms in the early 1980s caused significant damage within the petition segment (e.g., see Narragansett Times of April 28, 1983). The CRMC issued several Assents at that time including one for reconstructing a portion of the Ocean Mist. The beach in this area fully recovered and by the early 1990s extended tens of feet seaward of the erosional scarp and existing shoreline structures within the petition segment. Another series of storms hit the Matunuck shoreline in the late 1990s. The CRMC and the Army Corps of Engineers analyzed the erosion issue and produced several reports that recommended building relocation (shoreline retreat), beach replenishment. The U.S. Army Corps of Engineers investigated replenishing the beaches with 30,000 to 50,000 cubic yards of sand hydraulically dredged from nearby Potter Pond. That project, however, was never fully funded at the federal level and therefore did not occur. Subsequently, as a part of the initial Ninigret Pond restoration project in 2003, there was an opportunity for the Town of South Kingstown to obtain 32,000 cubic yards of sand to replenish the beach at Matunuck at no cost provided they would truck it from Charlestown to Matunuck. The Town, however, declined the offer at that time. In addition, during the spring of 2010 the CRMC offered 6000 cubic yards of sand from the dredging project conducted at Allen's Harbor at no cost to the Town provided the Town could haul it from North Kingstown. The Town, however, declined that offer as well.

Currently, there are no large sand resources available from dredging projects for beach replenishment, but there are potential opportunities for the Town to negotiate for some of the sand resources that will be available from future maintenance dredging of the Ninigret Pond sedimentation basin. Maintenance dredging at Ninigret Pond was just completed last month with the removal of 80,000 cubic yards of sand from the sedimentation basin, which was used to successfully replenish the Charlestown Town Beach. The next required maintenance dredging cycle, however, will not occur for several years depending on the storm climate.

The Matunuck Headland beaches never fully recovered from the storms of the late 1990s. Since 1998, the CRMC has issued about 70 permits for non-structural shoreline protection measures (i.e., sand bags) along this segment of the Matunuck shoreline. As noted in the April 2011 CRMC staff report, the erosion rate along the petition segment has been observed to be about 20 feet since 1999 or less than 2 feet per year. While the CRMC's Shoreline Change Maps (http://www.crmc.ri.gov/maps/shorechange/South-Kingstown_Matunuck-Headland.pdf) show an erosion rate along the petition segment between 0.3 and 0.9 feet/year, the Town beach area immediately west of the petition segment has a higher erosion rate ranging from 2.2 to 2.8 feet/year. While the perception is that the erosion rates are much higher because of the periodic storm wave impacts to the existing structures and the current erosion threat to Matunuck Beach Road, the actual erosion rates along the Matunuck shoreline do not appear to be "some of the highest sustained erosion rates seen on the East Coast in recent decades" as alleged by one petition Objector. A 2010 U.S. Geological Survey report on long-term erosion rates along the New England and Mid-Atlantic coasts indicates that the Mid-Atlantic region has a higher long-term erosion rate than New England with the highest erosion rates in Southern Virginia and the Delmarva Peninsula at 2.9 meters/year (9.5 feet/year), which is much greater than any erosion rate measured along the Matunuck shoreline.

The affected property owners along Matunuck Beach Road have stated at recent CRMC public meetings that all of their previous non-structural shoreline protection efforts have failed and they must now be allowed to install structural shoreline protection facilities to protect their properties. Much of these property owner efforts primarily involved CRMC-permitted sand bag installation, but also included various temporary structures that were not authorized and were improperly designed. Indeed, several property owners have been issued CRMC Notices of Violation for installing unauthorized structural shoreline protection. Nevertheless, following the April 2011 CRMC staff report, the Council authorized the affected property owners along the petition segment to install temporary wooden bulkheads upon application and approval by the CRMC, while long-term solution options were developed. To date, not one property owner has applied for these temporary measures.

The erosion has progressed to a point where the beach has receded farther inland and now threatens to undermine Matunuck Beach Road in the vicinity of parcel 92-3:1 immediately west of the Ocean Mist property. The Town has previously stated (and as shown on the Town's website as of January 2012) that Matunuck Beach Road at this location provides the sole means of access for 240 properties. The Town submitted an application to the CRMC (2011-09-005) to construct a vertical sheet pile wall within the Town's roadway easement to address the erosion threat to Matunuck Beach Road. Phase I of the project involves the installation of a sheet pile wall along a 200-foot segment west of and adjacent to the Ocean Mist parcel within the petition segment. The issues pertaining to the proposed sheet pile wall are addressed in the CRMC staff report for that application. Several months after filing its sheet pile wall application, the Town then submitted its petition to the CRMC requesting the shoreline designation change, which is the subject of this memorandum. A timeline depicting the Town's actions and joint meetings of the CRMC and Town Council is detailed within the CRMC staff report for the Town's pending application (2011-09-005) for the proposed sheet pile wall.

The Council will need to resolve pending CRMC enforcement matters. On April 12, 2010 four property owners within the petition segment were issued Notices of Violation (NOV) for the construction of unauthorized shoreline protection structures consisting of various wooden bulkheads. These four property owners are: Hang Ten, LLC (parcel 92-3:2); Clonmel Realty, LLC (parcel 92-3:4); Beachview Partnership, LLC (parcel 92-3:7; and Mark Melnick (parcel 92-3:8). The NOVs did not include any administrative fines. In addition, work continues to occur without CRMC authorization. However, last year CRMC staff were instructed by the Council to hold in abeyance further action on any enforcement matters pending Council adoption of a long-term solution for the Matunuck erosion issue. Should the Council grant the petition and a complete application is not filed for a shoreline protection structure within one year, it is CRMC staff opinion that the Council at that time should resolve the outstanding enforcement matters. Staff would recommend the removal of all unauthorized structures in their entirety. Any unauthorized work conducted in the interim and following the Council's decision in this matter will be considered illegal and will warrant enforcement action. CRMC staff recommend enforcement action proceed on all outstanding enforcement matters following one year of the Council's decision in this matter unless a complete application is filed with and accepted by the CRMC.

Characteristics of the Petition Segment: Is it a Manmade Shoreline?

Section 210.6 of the coastal program defines manmade shorelines as "those characterized by concentrations of shoreline protection structures and other alterations, to the extent that natural shoreline features are no longer dominant. They most commonly abut Type 3, 5, and 6 waters. The presence of isolated seawalls, bulkheads, and similar structures does not constitute a manmade shoreline, as the term is used in this Program." See CRMP Section 210.6.A.1.

In the present matter, existing revetments are located on parcels 92-2:46, 92-2:47 and 92-3:1 at the western end of the petition segment and a concrete seawall fronted by a rock revetment on parcel 92-3:9 at the eastern end of the petition segment. The petition segment has shoreline protection structures at both ends of the segment and are in close proximity to one another (i.e., within about 400 feet). The combined length of these existing shoreline protection structures is 1000 feet, and they cover more than 70 percent of the 1400-foot long shoreline segment that the Town is requesting the Council to define as a manmade shoreline. The remaining 400 feet of the petition segment is located between the existing shoreline protection structures and has many manmade alterations including exposed building foundations, exposed remnant cesspool tiles, temporary shoreline erosion control measures (many installed without requisite CRMC permits, see enforcement discussion above), concrete rubble and other manmade debris to the extent that the coastal bluff is no longer dominant along most of this 400-foot shoreline segment. The bluff, however, appears to be intact on about 100 feet within the petition segment. Nevertheless, the eroding coastal bluff is in very close proximity to the building foundations and septic systems within the petition segment.

As to whether the present characteristics of the petition segment meet the CRMC definition of manmade shoreline, as defined above, the existing shoreline protection structures occupy more than 70 percent of the shoreline segment, there are structures at both ends of the segment, and there is a relatively short distance (400 feet) between the existing shoreline protection structures. The entire shoreline of the petition segment appears to have been altered to the extent that natural shoreline features are no longer dominant in this location. Further, the petition segment has a concentration of shoreline protection structures. Thus, given the combination of all these factors it is the opinion of CRMC staff that the petition segment can be characterized as a manmade shoreline as defined in CRMP 210.6.

One Objector described the petition segment as "[t]he shoreline in this area consists almost entirely of beach." While we do not disagree that there is certainly beach along some portions of the petition segment this shoreline segment in our view has a preponderance of manmade shoreline protection structures. Further, Objectors note that CRMC staff in a memo to the Town dated February 25, 2011 had indicated that the stretch of shoreline in question does not meet the criteria for classification as manmade shoreline. However, the exact language in that memo is "this shoreline does not appear to meet the definition of manmade shoreline." See CRMC memo at 2. Moreover, the February 2011 assessment was a general characterization of the Matunuck shoreline from the Town beach to Deep Hole. Since that time the Town has identified a specific shoreline segment as depicted in the Town's exhibit as part of its December 2011 petition application. Notwithstanding the previous CRMC staff assessment, based on the current findings as articulated above, it is the opinion of CRMC staff that the petition segment can be characterized as manmade shoreline.

Consequences of Changing the CRMC Shoreline Designation

In the event that the Council grants the Town's petition and agrees that the petition segment meets the definition of manmade shorelines in CRMP Section 210.6, the Council's action would allow affected property owners to install new structural shoreline protection facilities upon application and approval by the CRMC. New structural shoreline protection facilities are considered a Category B application for Manmade Shorelines adjacent to Type 1 waters, and would therefore require approval by the Council. See Table 1 in CRMP Section 100. As noted above, several revetments and a sea wall already exist on 1000 feet of the 1400-foot long petition segment at both ends with the remaining interior 400 feet of shoreline comprised of seven parcels that presently do not have permanent structural shoreline protection.

The ultimate outcome of installing new structural shoreline protection along the 400-foot stretch between the existing revetments and seawall is that the beach fronting the petition segment will be subject to increased scour and erosion forces, a direct result of the new hardened shoreline protection structures. (The scour and erosion process is articulated in more detail within the April 2011 CRMC staff report.) Additionally, the hardened shoreline prevents the landward migration of the beach. Consequently, the combined effects of these factors will eventually result in the beach fronting these seven parcels to disappear entirely. This is precisely what has occurred to the beach fronting the existing revetment on the each end of the petition segment and is evident in the aerial photograph included as an exhibit in the Town's petition (see **Figure 1**). Public access along the beach and around these structures has been eliminated. The lesson here is to expect more of the same if new structural shoreline protection is installed along the seven parcels within the petition segment. Public access along the shoreline in this specific location will also be severely limited due to the eventual loss of the beach face and the corresponding lack of lateral access along the beach due to the presence of new shoreline protection structures.

To offset these negative impacts should the petition be granted, it is recommend that the Council: (1) require public access along the entire length of the petition segment for all new and reconstructed shoreline protection structures; and (2) adopt the CRMC staff proposed Matunuck Headland Coastal Natural Area, as explained in more detail under Proposed Mitigation for New Structural Shoreline Protection below.

Notwithstanding the consequences of beach loss and impedance of lateral public access along the shore, there are other serious ramifications if a coordinated and comprehensive application process is not followed for the permitting of any new structural shoreline protection facilities in this location. First and foremost is that CRMC staff would recommend that a single engineered design that connects into the existing shoreline protection structures at both ends of the petition segment be required by the Council and that it must be installed in one phase. Otherwise, allowing a disparate application process with different structural designs and installation at different time periods will result in premature failure due to concentrated and exacerbated erosive forces onto properties that have not yet constructed a shoreline protection structure within the petition segment. Additionally, the failure of a single property owner within the petition segment to install a structural shoreline protection structure will have dire consequences on the abutting parcels within the petition segment as erosion and scour will be concentrated onto and around the parcel without a structure. In fact, this appears to be happening now in that the existing unauthorized shoreline protection structures are exacerbating erosion onto abutting parcels and increasing the erosion threat to Matunuck Beach Road.

There are significant constraints to constructing a shoreline protection structure along the petition segment. Heavy construction equipment, including cranes large enough to hoist 22-ton stones, will only have access to the shorefront from parcels 92-2:47 and 92-3:1, as there is a concentration of buildings immediately east that prevent access from Matunuck Beach Road. Additionally, a barge-mounted crane would not be able to land along this shallow exposed shoreline. Construction of a revetment would have to start where there is access to the shorefront on the previously identified parcels and proceed to the east. The heavy construction equipment will need access along the top of the revetment to facilitate construction and removal of the equipment from a single access point. This is the reason for the CRMC staff recommendation for a 15-foot wide flat section on top of the revetment. The difficulty with constructing a revetment in this location will require the cooperation and coordination among the affected property owners. Therefore, they should be required to apply as a single entity or as co-applicants on a single application to ensure a unified approach to the design, permitting, installation and long-term maintenance of any new structural shoreline protection facility. The Town also appears to encourage this process as they state in their petition that "the reclassification would allow the affected property owners to collaborate on a comprehensive design approach." See Town's Petition at 1.

One Objector notes that if the Town's petition is granted, the Council's actions "will eventually lead to the hardened armoring of the entire Matunuck beachfront." As previously noted herein, the granting of the petition could potentially lead to an additional 400 linear feet of new hardened shoreline, but only within the petition segment. If one considers the Matunuck beachfront as consisting of the segment of shoreline from the Town Beach to and including the Deep Hole state recreation area, the total shoreline length is about 3400 linear feet. Approximately 1000 feet of existing hardened shoreline is located within the petition segment with the possibility of an additional 400 feet in this segment. There are also some existing isolated shoreline protection structures directly east of the petition segment, but as discussed herein CRMC staff are recommending that no new structural shoreline protection be permitted beyond the petition segment. While admittedly the beach within the petition segment would be impacted by the Council's action, it would not "ultimately cause the last section of beach to disappear once and for all." There is more than a two-mile stretch of beach west of the petition segment to the Green Hill headland, including the South Kingstown Town Beach, which is free of shoreline protection structures. Additionally there is about one-third of a mile of beach east of the petition segment that includes the CRMC staff proposed Matunuck Headland Coastal Natural Area. Other than the petition segment, we do not anticipate the installation of any new structural shoreline protection from the Green Hill headland to Deep Hole in Matunuck. Therefore, the granting of the petition will not eventually lead to the shoreline armoring of the entire Matunuck beachfront, especially if the Council adopts the CRMC staff-proposed Matunuck Headland Coastal Natural Area.

With regard to potential cumulative impacts, the existing shoreline protection structures including recent unauthorized structures within the petition segment have caused erosion and loss of beach fronting and adjacent to those structures. Erosion impacts on properties adjacent to the petition segment have already occurred because of the existing structures. Therefore, the infill construction or reconstruction of structural shoreline protection along the entire petition segment is not expected to significantly increase the impacts to adjacent properties.

Precedent and Town's Approach to Addressing Erosion Issue

Should the Council grant the Town's petition, one Objector notes that they oppose the Town's petition because it "would set a precedent that strikes at the very core of Rhode Island's coastal management program" and that the Council "could be faced with hundreds of similar requests and no basis for distinguishing this case from those that will follow." While undoubtedly there will be future requests to the CRMC for a determination as to whether a particular segment of shoreline should be characterized as manmade, as have occurred in the past, we do not believe anyone can say how many such requests may be filed in the future with the CRMC.

Approximately 15 percent of the south shore between Watch Hill and Point Judith is currently armored with various types of shoreline protection structures with most of these structures concentrated along the headland areas. It is likely there may be future requests for classifying some parcels in the vicinity of these existing shoreline protection structures as manmade shoreline. We believe, however, that the Council should evaluate each proposal on its own merits and the facts presented as part of a specific request. Moreover, some of the facts of the present matter may prove constructive in assessing future requests for a determination of whether a specific segment of shoreline can be characterized as a manmade shoreline consistent with CRMP 210.6.

Sea level will continue to rise into the future and erosion of shorelines from storm events has been and will continue to be a factor along Rhode Island's shoreline. Consequently, shoreline property owners will likely continue to seek remedies to protect their property. Adaptation to rising sea levels and the expected future erosion will generally be accomplished by several methods; namely the retreat (relocation) of existing structures farther inland, the installation of non-structural (soft) shoreline protection, the installation of living shorelines (only for less exposed areas), and the armoring of the shoreline in existing developed areas, or a combination of any of these methods. There are about 3.5 miles (15%) of existing structural shoreline protection along the 20 plus mile coast line from Watch Hill to Point Judith, primarily concentrated along the headland areas. Thus, CRMC policy should be to encourage shoreline retreat where ever practical along the south shore as the best adaptation strategy to rising sea levels and continued erosion, especially on the barrier beaches.

Objectors insist that the Town's petition is "based on limited and short-term considerations" because the matter "continues to come to the Council on a piecemeal basis." Additionally, Objectors cite the numerous CRMC notices of violations that have been issued to property owners over the years within the petition segment, the Council's temporary shoreline erosion control Assent program (April 2011), the Town's pending application (2011-09-005) to construct a sheet pile wall, and the present petition. In our view, however, the Town's petition is intended as a remedy to address the long-term erosion issue in this location. In fact the designation of the petition segment as a manmade shoreline was one of the options presented by CRMC staff in the April 2011 report to address long-term considerations.

The Town has claimed that relocating Matunuck Beach Road would be difficult because of the expense and the number of properties along the north side of the road that would have to be purchased or taken through eminent domain. Additionally, the Town has determined that the managed retreat of Matunuck Beach Road would "be infeasible, impracticable, and inequitable" as stated in its March 13, 2012 letter to the CRMC Executive Director. See Town letter at 3. In

the interim, erosion continues and Matunuck Beach Road is constantly under threat of exposure from the next storm event.

Meeting the Requirements of CRMP Section 300.7

One party noted in their objection that should the Council rule favorably on the Town's petition property owners would be "freed from CRMC regulations." This is simply not the case. If the Council does grant the Town's petition, then the design and installation of any new structural shoreline protection must conform to the requirements and standards contained within Section 300.7 of the coastal resources management program. The Town's petition does not seek any diminution of the current CRMC requirements; rather it states "the reclassification will not in any way affect or diminish the existing design standards required by the CRMC for proposed manmade shoreline protection structures." See Town's Petition at 2. However, it is CRMC staff opinion as discussed further below that it is likely that a number of variances to the standards within CRMP Section 300.7 will be necessary depending on the specific design and location of any proposed revetment structure.

Due to the strong ocean wave forces exerted along this exposed shoreline, any proposed structural shoreline protection would have to be constructed to rigorous engineering standards. In the case of a proposed riprap revetment it would have to consist of extremely large granite rocks, upwards of 22 tons. A properly designed rip-rap revetment constructed along this segment of shoreline will be massive in size and scope when designed in accordance with the currently applicable construction standards contained in the U.S. Army Corps of Engineers Coastal Engineering Manual and the CRMP. Indeed, the initial design consideration by the Town was a granite rip-rap revetment of enormous size before the current sheet pile wall design was proposed in the Town's pending application (CRMC File 2011-09-005). The cost to construct the Town's initial revetment design was estimated at $5000 per linear foot. Due to limited access requiring difficult construction staging, a similar revetment design for the petition segment would be significantly higher than the Town's initial cost estimate of $2 million.

In accordance with CRMP Section 300.7.B, riprap revetments are preferred to vertical steel, timber, or concrete seawalls and bulkheads, except in ports and marinas. Additionally, due to the significant fetch (unobstructed exposure distance) in this location and the fact that there is no ability to provide tie-backs for other methods due to the close proximity of the roadway and other public utilities, a riprap revetment is the only practical means of structural shoreline protection in this location. Therefore, should the Council grant the Town's petition and the affected parcel owners apply for and receive approval from the CRMC; the shoreline protection structure would have to be a riprap revetment. Section 300.7.B.3 requires that "the owner exhaust all reasonable and practical alternatives including, but not limited to, the relocation of the structure and nonstructural shoreline protection methods." Based on the long record of CRMC Assents for temporary erosion control for the petition segment parcels, and that most of the property owners have existing buildings that directly abut Matunuck Beach Road, and thus cannot be relocated farther inland on their existing parcels, it appears that they may be able to meet this requirement of Section 300.7.B.3.

Section 300.7.F.1 requires that the base of the revetment be constructed as close as practicable to the shoreline feature it is designed to protect. Further, Section 300.7.D.3 prohibits filling on a coastal feature or tidal waters beyond that which is consistent with the preceding standard. In

other words, the shoreline protection structure cannot be installed farther seaward than specified in Section 300.7.F.1. Additionally, Section 300.7.D.4 prohibits structural shoreline protection when proposed to regain property lost through historical erosion or storm events. Consequently, should the Council approve new structural shoreline protection for the parcels within the petition segment, then the base of the structure will have to be installed as close as practicable to the shoreline feature it is designed to protect (in this case what remains of the eroding bluff) and cannot involve the reclamation of property lost due to historic erosion and storm events. The result will likely be that one or more existing buildings within the petition segment will have to be removed from or repositioned on their respective parcels to meet the design standard specified by Section 300.7.F.1. For example, Hang Ten, LLC, which owns the Ocean Mist building on the left in **Figure 2** below, previously received a CRMC Preliminary Determination (PD) to relocate the existing large building from the left side to the right side of parcel 92-3:2.

CRMC staff have used this PD proposal to depict the building rotated 90 degrees in order to reduce the seaward extent of the building and allow any proposed revetment to be installed as close to the shoreline feature as practicable in accordance with the requirement of Section 300.7.F.1. Furthermore, CRMC staff have proposed a construction line for any proposed revetment that would be reasonably compliant with Section 300.7.F.1 as shown in **Figure 2** below. Accordingly, CRMC staff recommend that the Council require any future structural shoreline protection to conform to the CRMC staff proposed construction line, which is consistent with CRMP Section 300.7.D.3 and based on the past approvals of the Council for these types of structures. The construction line, however, may need to be adjusted at the time of a complete application being filed with the CRMC depending on the site conditions and further erosion that may occur.

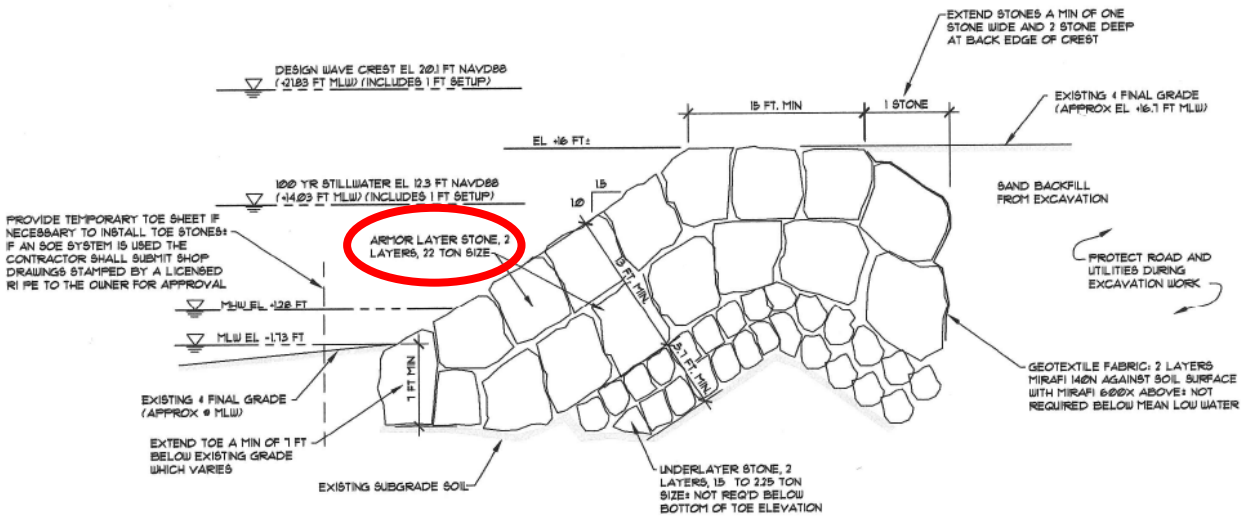
Figure 2. CRMC staff proposed revetment construction line consistent with the CRMP.

Because of the engineering design and limits due to the size of needed stone (22 tons) for a riprap revetment in this location, and the need to provide a 15-foot wide flat section on the top of the structure for construction staging and maintenance access, the toe of the riprap revetment would extend almost 50 feet seaward from the base of the structure. A design of this nature will be massive in size and would likely have the top of the revetment about equal in elevation with Matunuck Beach Road fronting the Ocean Mist (about elevation 12 NAVD88).

Alternatively, if the shoreline protection structure is designed to mitigate the breaking wave height associated with the 100-year storm event (elevation 21.2 NAVD88), the top of the revetment would be at least 8 feet higher than the roadway. Another way to imagine this design is to consider that if one were standing on the Ocean Mist deck, the revetment would be over one's head, thus obstructing the view of Block Island Sound. This taller revetment design would also protrude farther seaward.

Moreover, a revetment will likely intensify the storm wave damage potential to abutting buildings because large waves would be ramped upward along the revetment face and strike the buildings at higher elevations than if the revetment were not present. Neither design, however, will be sufficient to protect the petition segment in the event of a hurricane due to storm surge penetrating the surrounding area.

Figure 3. Typical rip-rap revetment design needed for the coastal environment at Matunuck. Note that typical stone size is 22 tons.



Another issue of concern is that absent any formal maintenance agreement and financing mechanism the revetment structure could fall into disrepair in the future and jeopardize the adjoining properties and Matunuck Beach Road. Accordingly, CRMC staff recommend that the Council require the applicant(s) to file with the CRMC a maintenance plan to include a financing mechanism and responsible party for any proposed structural shoreline protection at the time of CRMC Assent application. Moreover, the Council may need to recognize and take action on issues such as future ownership and maintenance, as well as shoreline restoration, and what role the Town of South Kingstown may have in regard to these issues.

Given the current site conditions, construction access and long-term maintenance issues, revetment design requirements, cooperation and coordination among affected property owners, designation of a responsible entity for financing the construction and long-term maintenance of the revetment and the very expensive cost associated with the project, it appears that the construction of a shoreline protection structure of the magnitude and scope required for the site will be a considerable task based on the discussion herein.

Other State or Federal Permitting Requirements

As already established, any new shoreline protection structure will require approval by the CRMC. And, due to the expected design, size and scope of a proposed riprap revetment, the base and toe of the revetment will likely be located below the mean high water (MHW) mark and extend into tidal waters. Thus, the construction activity for the placement of fill material in tidal waters would require a DEM Water Quality Certification and a federal U.S. Army Corps of Engineers Section 404 permit. This issue is further detailed in the CRMC staff report of April 2011. CRMC staff recommend that any proposed revetment be designed in accordance with the applicable standards contained in the CRMP and the most recent version of the U.S. Army Corps of Engineers *Coastal Engineering Manual* EM-1100-2-1100.

Proposed Mitigation for New Structural Shoreline Protection

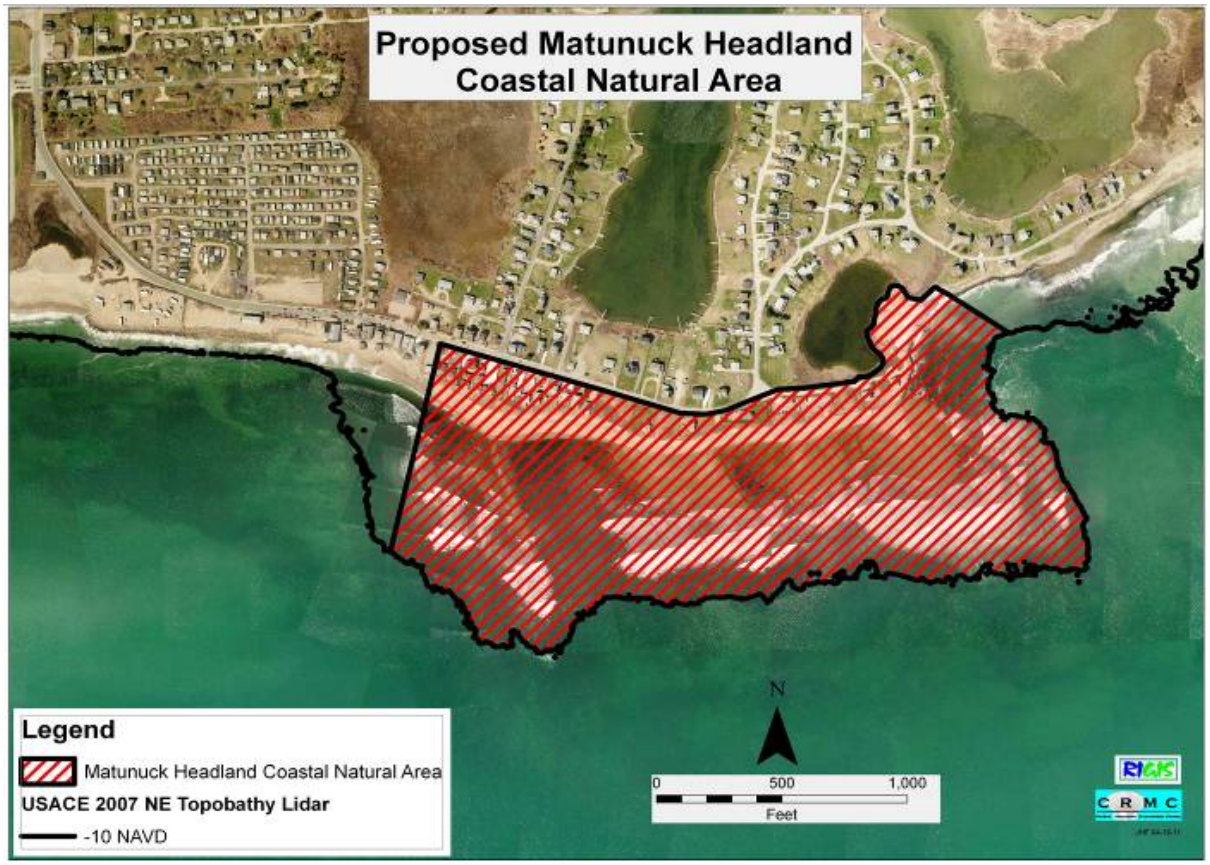
Should the Council determine that the petition segment is a manmade shoreline and the affected property owners apply for and receive approval from the CRMC for new structural shoreline protection, then CRMC staff recommend the following conditions to mitigate the negative impacts associated with any new structural shoreline protection or the reconstruction of existing structures along the petition segment and the impacts to public trust resources.

First and foremost, CRMC staff recommends that the Council designate a "Matunuck Headland Coastal Natural Area" for the shoreline segment area located between the petition segment and the end of Matunuck Beach Road to include the Deep Hole recreational area, as depicted in **Figure 4** below. This proposed Matunuck Headland Coastal Natural Area would preserve the many existing recreational uses and natural coastal features as described in the April 2011 CRMC staff report. The geologic features of this area, namely the shallow, near-shore cobble terrace, help to protect the existing residential buildings and roadway along this segment of shoreline from potentially damaging waves as described in the April 2011 CRMC staff report. It is recommended that this designation of the Matunuck Headland Coastal Natural Area be achieved through a regulatory amendment to the Salt Pond Region Special Area Management Plan. Staff will prepare draft amendment text and a related map, if so directed, for the Council's consideration as part of the Council's normal rule-making procedures.

The CRMC has designated a number of headland areas within the State as Coastal Natural Areas as detailed in CRMP Section 210.4. These Coastal Natural Areas have well recognized scenic values, support low-intensity recreational uses, and are tourist attractions. In accordance with CRMP policy, the Council's priority is the preservation and restoration of scenic qualities for these areas when considering proposed alterations on or adjacent to these designated areas. The CRMC staff-proposed Matunuck Headland Coastal Natural Area would help to preserve a highly scenic headland area, one that supports an important variety of low-intensity uses as detailed in

the April 2011CRMC staff report. In addition, the proposed area also contains the heavily used State-managed Deep Hole recreational area. The Council's designation of the Matunuck Headland Coastal Natural Area would be consistent with the description and policies for such headland areas pursuant to CRMP Section 210.4.

Figure 4. CRMC staff proposed Matunuck Headland Coastal Natural Area.



The Council's adoption of the CRMC staff-proposed Matunuck Headland Coastal Natural Area would ensure that the headland beach and dune area along this shoreline segment remain unaltered and that their current functions are preserved so that they can continue to protect abutting upland area without resorting to the use of shoreline protection structures. Moreover, by adopting the proposed coastal natural area, the Council would be fulfilling its statutory mandate of balancing competing uses of the shoreline and preserving and restoring the coastal resources of the state, as articulated in R.I.G.L. § 46-23. The Council's designation of the petition segment as a man-made shoreline, accompanied by the designation of the proposed coastal natural area would be consistent with and supportive of the Council's policy to "balance multiple uses of the region, while preserving and, where possible, restoring the environmental quality." See RICRMP Section 325.B.1. Further, the designation by the Council of the proposed Matunuck Headland Coastal Natural Area would fulfill its mandate pursuant to the Coastal Zone Management Act, to manage "coastal development to minimize the loss of life and property caused by improper development in flood-prone, storm surge, geological hazard, and erosion-prone areas and in areas likely to be affected by or vulnerable to sea level rise, land subsidence, and saltwater

intrusion, and by the destruction of natural protective features such as beaches, dunes, wetlands, and barrier islands." See 16 USC § 1452(2)(B).

Additionally, public access along the shoreline will most certainly be constrained should new structural shoreline protection be installed along the petition segment. Therefore, to mitigate for such loss, CRMC staff recommend that any new revetment or reconstruction of existing shoreline protection structures be designed and constructed to provide dedicated lateral public access along the entire petition segment on top of the revetment. This can be accomplished by providing a reasonably wide and level surface along the top of the revetment (think Point Judith breakwater) for the public to traverse from one end of the structure to the other, and will also serve as construction equipment and maintenance access. In addition, public access would have to be provided at the end points of the structures. This will necessitate the construction of public access along the existing shoreline protection structures at both end points to include access stairs. Given the significantly high recreational uses of this shoreline, the Council should also consider requiring at least two stairways along the shoreface of the revetment to provide emergency access from the water or shoreline up and onto the top of the revetment. In addition, public access signage should be required to clearly demarcate and identify the public access.

CRMC Staff Recommended Stipulations

Should the Council grant the Town's petition CRMC staff recommend the following conditions be adopted by the Council and incorporated into the Council's written decision. Alternatively, should the Council deny the petition CRMC staff continue to recommend Council adoption of the Matunuck Headland Coastal Natural Area as described herein.

1. The CRMC staff proposed **Matunuck Headland Coastal Natural Area** shall be designated and adopted by the Council through a coastal program amendment. CRMC staff will prepare the amendment for the rule-making process if so directed by the Council.
2. Construction of any proposed revetment or reconstruction of existing shoreline protection structures shall be designed to include **public access** on top of the structure along the entire petition segment length with lateral access from Matunuck Beach Road and access from the shoreline at both ends of the structure. The structure must also feature at least two access points (e.g., stairs inset into the stone) along the petition segment to provide emergency access from the water onto the top of the structure.
3. Construction of any proposed revetment or reconstruction of existing shoreline protection structures shall integrate a flat 15-foot wide **construction and maintenance access** along the top of the revetment to accommodate construction equipment. Heavy construction equipment must be able to access the construction and maintenance access from Matunuck Beach Road for the life of the project. (This flat section will also serve as the public access component.)
4. **Public access signage** must be installed and maintained on the project site for the life of the project as approved and required by the CRMC.
5. Affected property owners along the petition segment shall file a **single, unified application** for the proposed shoreline protection structure to ensure that a single engineered design is submitted to the CRMC for review. Affected property owners shall

sign as co-applicants or form a property owners association as a single entity for purposes of filing an application with the CRMC.

6. The shoreline protection structure shall be designed in conformance with the most recent version of the **U.S. Army Corps of Engineers *Coastal Engineering Manual*** EM-1100-2-1100. See: http://publications.usace.army.mil/publications/eng-manuals/

7. The proposed new revetment shall be installed along the **construction line** identified by CRMC staff as shown in **Figure 2**. The construction line, however, may need to be adjusted depending on site conditions at the time of a complete application filing with the CRMC.

8. A **designated party** such as the property owners and perhaps the Town itself shall be identified in the application and shall be responsible for the financing of all necessary maintenance for the shoreline protection structure. The designated party shall file with the application a Maintenance Plan that describes how the shoreline protection structure will be maintained over its design life. The plan shall also identify a maintenance financing mechanism for the designated party that demonstrates that there will be a viable source of funding to ensure proper long-term maintenance of the structure to be filed at the time of CRMC Assent application.

9. A complete application for a shoreline protection structure must be **filed with the CRMC within one year of the Council's decision**. Any application for a shoreline protection structure within the petition segment may need to be re-evaluated for the location of the structure in the event of a significant erosion event or after the one-year time frame following the Council's decision, which ever comes first.

10. All **unauthorized structures** within the petition segment shall be removed in their entirety within one year of the Council's decision, unless a complete application for structural shoreline protection consistent with the Council's decision has been filed with the CRMC within that time. Should new structural shoreline protection be approved by the Council, then all unauthorized structures within the petition segment shall be removed in their entirety concurrently with the installation of the new structure.

11. **Enforcement action** will proceed on all outstanding enforcement matters following one year of the Council's decision in this matter unless a complete application is filed with the CRMC. New violations shall be subject to enforcement action as of the date of the Council's decision on the Town's petition.