

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Environmental Permits, Region 1

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Responses to Public Comments Received for the Village of Quogue Beach Nourishment Project DEC Permit # 1-4736-01875 / 00010

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The Department of Environmental Conservation recently issued a Tidal Wetlands, Protection of Waters and Water Quality Certification permit to the Village of Quogue authorizing its proposed project to replenish and build the ocean beach within the limits of the Village with sand dredged from an offshore borrow site. The application process which concluded with the issuance of this permit included a period for the acceptance of written public comments in conjunction with the 2013 Notice of Complete Application and a second public comment period associated with the August 2015 legislative public hearing, both of which yielded a large number of comments. The comments were mostly from Village residents and expressed objections to, or concerns about, the issuance of the permit. The purpose of this letter is to explain the reasons for DEC's decision to approve the project and to address the issues raised in the over 200 comments received on the permit application. After a discussion of how the approved project meets the permit issuance standards contained in the applicable regulations, the main issues and concerns raised in the comments received from the public are summarized and responded to.

Standards of Permit Issuance

The Quogue Beach Nourishment Project requires approval under two Environmental Conservation Law (ECL) regulations, the Tidal Wetlands Land Use Regulations (6 NYCRR Part 661) and the Use and Protection of Waters Regulations (6 NYCRR Part 608).

Tidal Wetlands Land Use Regulations Part 661.9 – Standards for Issuance of Permits

(b) Standards for permits on any tidal wetland.

(1) *Overall standards.*

The department shall issue a permit for a proposed regulated activity on any tidal wetland only if it is determined that the proposed activity:

(i) is compatible with the policy of the act to preserve and protect tidal wetlands and to prevent their despoliation and destruction in that such regulated activity will not have an undue adverse impact on the present or potential value of the affected tidal wetland area or adjoining or nearby tidal wetland areas for marine food production, wildlife habitat, flood and hurricane and storm control, cleansing ecosystems, absorption of silt

and organic material, recreation, education, research, or open space and aesthetic appreciation, as more particularly set forth in the findings in section 661.2 of this Part, taking into account the social and economic benefits which may be derived from the proposed activity;

(ii) is compatible with the public health and welfare;

(iii) is reasonable and necessary, taking into account such factors as reasonable alternatives to the proposed regulated activity and the degree to which the activity requires water access or is water dependent;

(iv) complies with the development restrictions contained in section 661.6 of this Part; and

(v) complies with the use guidelines contained in section 661.5 of this Part. If a proposed regulated activity is a presumptively incompatible use under such section, there shall be a presumption that the proposed regulated activity may not be undertaken in the subject area because it is not compatible with the area involved or with the preservation, protection or enhancement of the present or potential values of tidal wetlands if undertaken in that area. The applicant shall have the burden of overcoming such presumption and demonstrating that the proposed activity will be compatible with the area involved and with the preservation, protection and enhancement of the present and potential values of tidal wetlands. If a use is a type of use listed as an incompatible use in the use guidelines for the area involved, it shall not be undertaken on that area.

Use & Protection of Waters Regulations – Excavation & Fill in Navigable Waters Part 608.8 – Standards

The basis for the issuance or modification of a permit will be a determination that the proposal is in the public interest, in that:

(a) the proposal is reasonable and necessary;

(b) the proposal will not endanger the health, safety or welfare of the people of the State of New York; and

(c) the proposal will not cause unreasonable, uncontrolled or unnecessary damage to the natural resources of the State, including soil, forests, water, fish, shellfish, crustaceans and aquatic and land-related environment.

Section 661.9(b) (1) (i) & Section 608.8(c): The Department, through the review of the permit application, has determined that the authorized activity is compatible with the policy of the Tidal Wetlands Act to protect tidal wetlands and to prevent their despoliation and destruction because the activity will not have an undue adverse impact on the present or potential values of the ocean beach littoral zone tidal wetland to provide the benefits listed in this paragraph. These benefits include marine food production, wildlife habitat, flood and hurricane and storm control, cleansing of ecosystems, absorption of silt and organic material, recreation, education, research, or open space and aesthetic appreciation. It should be noted that the offshore borrow site is located in water depths which exceed six feet at low tide and is therefore outside the area regulated pursuant to Part 661. The authorized activity involves the placement and grading of clean sand on the beach in order to increase the beach elevation and width and thereby enhance its ability to function as a natural protective feature by delivering the flood, hurricane and storm control benefits cited in this standard. The applicant has stated that the most important goal of the project is to reinforce and improve the barrier island's ability to function as a protective feature for the mainland portion of the Village. The sand will be added to the beach by placing it above (landward) of the line of apparent high water and either allowing the natural processes (the sand and water mixture from the dredge discharge establishing its natural angle of repose or the seaward movement of the material from the action of waves), or the mimicking of natural processes (pushing material seaward with mechanical equipment) to extend the beach to the south. The marine food production benefits provided by the ocean beach and intertidal zone are modest compared to a vegetated intertidal or high marsh, so the addition of a layer of clean sand and the temporary burial of the organisms adapted to living in these areas will result in a minor, temporary impact. The invertebrate species comprising the lower trophic levels of the ocean beach food web are able to survive and withstand the sudden removal, addition or redistribution of sand because they are adapted to the dynamic nature of this habitat, where major changes in beach width, elevation and slopes can be wrought in a matter of hours by a storm. Several of the other listed benefits provided by this wetland will either be maintained or enhanced by the authorized activity, including wildlife habitat, (particularly for beach nesting shorebirds), recreation (by the restoration of the Village beach facility), education and research opportunities, and open space / aesthetic appreciation.

Similarly, DEC has also found that the authorized activity is consistent with the Use & Protection of Waters standard of Section 608.8 (c) in that, as a project proposed by a municipality to increase the resiliency and level of protection from coastal storms of the entire community, it is in the public interest, and it will not result in unreasonable, unnecessary or uncontrolled damage to the natural resources of the State, including water, fish, shellfish, crustaceans or the aquatic or land related environment. As outlined above, the negative impacts to the physical and biological characteristics of the receiving beach are expected to be temporary and minor. The project's impacts to the offshore borrow site are also expected to be minor and of short duration. Some of the selection factors which led to the choice of the authorized borrow site include an abundance of sand of suitable grain size for the Quogue beach, the borrow site's location seaward of the zone of regular sediment transport or interaction with the beach and near shore area, and the low abundance of the commercially important surf clam. Our experience with numerous, completed offshore borrow projects off Long Island's south shore has shown that impacts at the borrow site are minimized when the depth of excavation is limited to around ten feet or less and the side slopes of the excavated area are kept shallow. Even though it may not seem so upon initial consideration, excavating a larger area to a shallower depth results in fewer, long term physical and biological impacts than the digging of a smaller footprint area much deeper. The Quogue project will lower the ocean bottom elevation over a 100 acre area by a maximum of seven feet, with side slopes no steeper than 1 vertical to 5 horizontal (1:5), which is well within the range our previous experience with this type of project has shown results in very minor long term disturbance or changes. The shallow cut of the excavation will not leave a deep hole in the bottom to collect fine sediment and become hypoxic. The shallow side slopes over a relatively large area will not interfere with the operations of commercial finfishing. The sand being removed is predominantly of a grain size which is equal to or slightly larger than the sand on the receiving beach, which increases the tendency for the material to stay on the beach and reduces turbidity at the placement site. The granular nature of the material being dredged and the suction involved with the method of dredging will minimize turbidity at the borrow site. The cutterhead of the dredge moves slowly enough over the dredge area that finfish are able to avoid the machinery before it gets close enough to entrain or trap the animal. The benthic organisms living in the sand layer to be removed from the borrow site are typical of the ocean floor of the south shore and common. Our experiences from the post-project monitoring of nearby borrow areas has shown that the excavated area is recolonized by these typical benthic species from the adjacent, undisturbed areas. The permit requires that the Village include specific conditions in the bid documents and awarded contract for the dredge crew to monitor for and avoid marine turtles, marine mammals and Atlantic Sturgeon during dredging operations.

Section 661.9(b) (1) (ii) & Section 608.8(b): DEC has made the determination that the approved activity is compatible with the public health and welfare, and will not endanger the health, safety or welfare of the people of the State of New York. As mentioned above, the activity is in the public interest because it is being proposed by a municipality for the main purpose of enhancing the resiliency and level of protection from coastal storms afforded by the barrier island for the entire Village, which is compatible with protecting the public welfare. The project is also designed, and is required by the permit, to be carried out in a manner which is compatible with and protects the public's safety during construction.

Section 661.9(b)(1)(iii) & Section 608.8(a): The agency has determined that the approved activity is reasonable necessary, taking into account such factors as reasonable alternatives to the proposed regulated activity and the degree to which the activity requires water access and is water dependent. The permit application and supporting materials, and the direct observation of the ocean beach in the Village and surrounding area by DEC staff since Hurricane Sandy have established that there is an ongoing trend of net sand loss from the barrier island within Quogue, particularly in the eastern half of the community. The phrase "net sand loss" refers to the condition of the beach and dunes after the natural seasonal cycles of beach widening in the summer and beach narrowing in the winter are accounted for. Direct observation of the Quogue Village Beach facility and a number of private properties in the eastern portion of the community, particularly after Hurricane Sandy and subsequent storm events has confirmed the significant loss of material from dunes, and even the loss of entire dunes with associated overwash conditions. An ultra-precise accounting of the exact volume of material lost per year is not needed to detect the trend, which has been recognized by the Village since at least the late 1990s when it published a generic environmental impact statement (GEIS) describing the situation and identifying solutions. Understanding the geographic position of the Village, which includes acreage on both the barrier island and the nearby "mainland" just across the narrow Quogue Canal, the municipal leadership recognizes that the barrier island is the only effective protection for the mainland from ocean wave attack during coastal storms and that maintaining the structural integrity of the island is the key to maintaining this protection. That the barrier island in Quogue has been largely developed for many decades is a complicating factor when searching for viable options for its maintenance, but it does not change the fact that the island is essential for the protection of the mainland portion of the Village. Based on previous efforts to understand the dynamics of the barrier beach and the littoral system which has such a great influence upon it, the Village has correctly decided that the best approach for maintaining the beach should encompass its full length within the municipal boundaries. This sound reasoning clearly shows that the need for a project to replenish and reinforce the entire length of the beach within the Village limits has been established.

The approved activity is reasonable because:

- Beach nourishment has proven to be a successful method of replenishing and enhancing the capability of many beaches to function as natural protective features and provide protection from wave attack for the mainland. While it has proven successful in some cases, there are plenty of examples where the method has not performed according to expectations and even some which were completely unsuccessful. However, even in the most unsuccessful situations, the material placed on the beach ended up back in the littoral system where natural processes transported it downdrift or redistributed to an offshore bar where it could provide benefits elsewhere.

- Beach nourishment provides the benefit of natural protective feature enhancement without the negative effects of induced erosion or scour of beaches and dunes, or the loss of public beach access which often result from the installation of hard shoreline stabilization structures to slow erosion.

- Because they enhance the ability of beaches to function as natural protective features without causing significant or long term negative impacts, beach nourishment projects tend to be consistent with the standards and policies of most regulatory agencies. Regulatory agencies authorize beach nourishment projects much more easily than proposals to install hard erosion control structures such as revetments or bulkheads, particularly in situations involving large areas or long stretches of shoreline.

Reasonable alternatives to the approved activity were identified and evaluated by both the applicant, as part of the supporting information submitted with the application, and DEC, during its review of the application. Among them were:

- The alternative of using material dredged from the navigation channel in Shinnecock Inlet to replenish the Quogue beach. While this alternative would be consistent with the desirable coastal management practice of bypassing sand across the obstruction in the littoral system caused by the inlet, the Village of Quogue does not control the management or maintenance of the Shinnecock Inlet and therefore has little or no say in what happens to the sand removed from it. In addition, the volume of sand removed from the inlet when it is maintenance dredged is only a fraction of the approximately 1.1 million cubic yards the Village needs for its project.

- The alternative of the Village postponing its own project to replenish the beach with material from an offshore borrow area in order to allow a regional-scale beach nourishment project to be developed which would encompass Quogue by the federal or state government or other entity.

This approach has the advantage of being regional in scale, which is desirable from the perspective of coastal processes and project efficacy, but has the significant drawback of being controlled by an agency or agencies the Village has very little influence over. The Village would not be able to control its own fate in terms of deciding whether, when, where and how to act to protect its section of the barrier island. This level of uncertainty is unacceptable for a municipality endeavoring to maintain its natural protective features in a proactive manner.

- Replenishing the beach with material obtained from a source other than the ocean floor also appears to be a feasible alternative until the details of what is involved and the cost are understood. Obtaining sand from an upland source such as a mine requires the purchase of the material from the mine, the cost of which would be in the neighborhood of double that of dredging an offshore borrow site, if the required volume of sand is even available from the sand mines within a reasonable distance of Quogue. An upland sand source also means that the 1.1 million cubic yards of material required for the project would have to be delivered to the barrier island by truck, which would entail a protracted, large scale trucking operation through the mainland Village streets, over the Post Lane Bridge, and up and down Dune Road. In addition to the traffic obstructions and quality of life impacts this would cause for Village residents, all of this heavy trucking will greatly increase wear and tear on the streets and bridge, requiring even more expenditures by the Village to effect repairs to the infrastructure. The Village actually obtained approval from DEC in the mid-2000s for a project to replenish dunes for the full length of its ocean beach using sand obtained from an upland source, but quickly recognized these challenges and never undertook a full length project under the authority of that permit.

Section 661.9(b) (1) (iv): This permit issuance standard is not applicable to the approved project because it does not involve new development activities (such as the construction of new buildings or other structures) undertaken in a tidal wetland or adjacent area.

Section 661.9(b) (1) (v): The use guidelines chart of Section 661.5 does not contain a specific entry for beach nourishment. The closest activity is Use # 31, the disposal of dredged material, which is listed as Generally Compatible – Permit Required when it is undertaken in the adjacent area and Presumptively Incompatible – Permit Required when undertaken in the unvegetated tidal wetland zones identified as coastal shoals, bars & flats; and littoral zone. The approved project involves the direct placement of the sand removed from the borrow site onto the beach landward of the line of apparent high water, which is considered the adjacent area. However, the point of the authorized activity is to build the beach horizontally, toward the ocean, as well as vertically.

The sand placed landward of the apparent high water line will be allowed to establish its natural angle of repose, which is essentially the slope that the sides of the mass of deposited material establishes on its own after placement, and is a function of the average grain size of the material in the mass. In a beach nourishment project, this sloping face of the deposited material is at the seaward edge of the mass and is allowed to extend below the line of apparent high water into the intertidal zone. This is the basic mechanism by which beach nourishment is accomplished, particularly when a hydraulic dredge is used. There can be variations on this basic process, which can include the use of mechanical equipment to push deposited material into the intertidal area to hasten this horizontal building of the beach.

This movement of material seaward of or below the line of apparent high water, whether it happens naturally or with human assistance, should be considered the placement of dredged material in a coastal shoals, bars & flats tidal wetland zone. This activity is listed as a presumptively incompatible use as set forth in the excerpt from the regulation on page 7 of 27 above. This excerpt also states that the applicant proposing the presumptively incompatible activity has the burden of overcoming this presumption of incompatibility and showing that their specific activity will be compatible with the area involved and the identified tidal wetland values. The application and supporting materials clearly show that the sand movement into the intertidal zone associated with the Quogue beach nourishment project will be compatible with the area involved and with the preservation, protection and enhancement of the present and potential values of the ocean beach intertidal zone / coastal shoals, bar & flats / littoral zone. It must be understood that the dredged material being "disposed of" in this case is clean sand from the ocean of a grain size compatible with the receiving beach, which is being placed for the specific purpose of widening the beach. In addition, the intertidal and surf zones of a high energy, dynamic ocean beach are not rich in the types of organisms which undergird a diverse, high productivity food chain system of the type seen in a vegetated tidal marsh. The biota which does exist in these areas is able to withstand the constant agitation of the substrate from wave action and the sometimes sudden and severe changes to the beach caused by strong coastal storms. The gradual movement of new layers of sand into this active zone or even the mechanical placement of such material associated with the approved activity is no more traumatic for these organisms than the changes to the beach profile caused by a storm. The movement of compatible and appropriate sand into the intertidal zone associated with the deposition of the majority of the material in the non-wetland adjacent area is compatible with this area. Furthermore, the approved action is compatible with preservation, protection and enhancement of several of the listed values of this tidal wetland, including wildlife habitat, (particularly for beach nesting shorebirds), recreation (by the restoration of the Village beach facility), education and research opportunities, and open space / aesthetic appreciation.

Main Issues Raised in Public Comments & DEC Responses

Project Need

- *The proposed project is not necessary.*
- *The problematic erosion area is a small fraction of Quogue's overall ocean frontage. This erosion should be addressed with a solution centered on the problem area, not the full 2.7 miles of ocean shoreline.*
- *The ocean beach has been building and eroding seasonally, and in response to major storm events, for thousands of years. Let nature take its course.*

The activity authorized by the permit has been designed as a comprehensive measure to address the condition of as much of the barrier beach as the Village has authority for. This approach is sound given the net loss of material from the section of the barrier island within Quogue's village limits as described in the application materials and the erosion trends which are visible on the ground, particularly since Hurricane Sandy. While there may be some confusion or dispute concerning the methods of data collection for the calculations used to determine the quantity and rate of sand loss from the beach, there is ample observational evidence to show that there have been significant erosional losses, particularly in the eastern half of the Village. This includes the loss of portions of dunes, and even entire sections of dunes, since at least 2012 with associated overwash conditions. The Village Beach facilities have been at risk for even longer, as indicated by DEC issuing emergency authorizations and other urgent approvals for measures to protect the pavilion building over the last decade or so. This net loss of material can be considered an underlying or background condition on which the seasonal cycle of summer beach widening and winter narrowing is overlain. It is also true that enough material can be pulled off the beach during some storm events to drastically narrow and lower its profile in the course of a day or less, most of which seems to move back onshore in the storm's aftermath. There is also the zone of faster or stronger erosion affecting a portion of the beach, which appears to move slowly from east to west and is not well understood that is referred to as an "erosion hot spot" or the "hole in the bar". Considered in total, what we know about the existing condition of the subject beach and the erosive forces affecting it clearly show the need for the project. The long term, less apparent, net loss of material from the beach is largely caused by the interruption of the east to west movement of sand in the longshore transport system at locations updrift or to the east of Quogue. The Shinnecock Inlet is the closest such interruption. While the rate of sand loss is not uniform over the full 2.7 miles of beach within the municipal limits, material is being eroded from the full length of the beach.

Accordingly, the design concept of the approved project to add material to the full 2.7 miles makes sense.

The different fill templates, which correspond to the different estimated rates of sand loss and place more material on the eastern third of the beach where the most erosion has occurred are also sound. This design also takes advantage of the east to west dominant direction of littoral drift to distribute some sand to the remainder of the beach.

Allowing “nature to take its course” on a substantially developed barrier beach gets very complicated very quickly. If the barrier island is not replenished and reinforced, the erosion effects observed during and after Hurricane Sandy and subsequent storms are likely to be seen with future storms. Lowered, narrowed sections of beach backed by partially or fully eroded dunes can allow overwashes (ocean waters meeting the waters of the canal during high water periods) or even a breach (a flowing connection between ocean and canal at all tidal stages) in the barrier island. In addition to the significant changes to the tidal regime in the back bay and the flooding of the mainland portion of the Village this could cause, Dune Road could easily be washed out and severed, which could prevent some Village residents from reaching their homes, or worse, strand them in their homes with no utilities. Emergency vehicles would also be prevented from reaching the cut off portion of Dune Road. It should also be noted that several locations on Dune Road between Quogue and the Ponquogue Bridge regularly flood on even modest storm tides, which eliminates the eastern route off the barrier island for residents.

Alternatives

- *A detailed, public, cost – benefit analysis should be done to determine whether it is appropriate for the Village to undertake such a large scale project.*
- *The relatively few homeowners who feel threatened by the current beach conditions should consider designing, proposing and undertaking a project which addresses the problem/s at their few properties which doesn't involve the whole Village oceanfront.*
- *The relatively few homeowners affected by beach erosion in Quogue should consider relocating their homes landward.*
- *The Village, as the project sponsor and applicant, has not discussed or considered feasible alternatives to the proposed action.*
- *As an alternative to the proposed action, enhanced bypassing of sand across the Shinnecock Inlet should be explored.*

- *A regular sand bypassing program should be established at Shinnecock Inlet before sand is taken from the ocean bottom for beach nourishment.*
- *Instead of dredging sand from the ocean bottom, the Village should rely on its existing beach management program consisting of snow fence installation and maintenance, and beach scraping to maintain the beach.*
- *The proposed project should only be undertaken if and when a regional-scale study of shoreline erosion and beach loss, which incorporates sea level rise and related resiliency principles, concludes that it should be.*
- *How can the proposed action be taken seriously by the Village and the regulatory agencies when the US Army Corps of Engineers Fire Island to Montauk Point plan (FIMP) does not recommend any action to reinforce or expand Quogue Beach?*

While a regional-scale study of shoreline erosion and beach loss specifically centered on the Village of Quogue's coast does not exist, just such a study focusing on the Atlantic Ocean shoreline of Long Island from Fire Island Inlet to Montauk Point has been underway since 1960. Known as the Fire Island to Montauk Point (FIMP) project, the geographic area under consideration includes Quogue's ocean shoreline. The voluminous collection of reports, studies and recommendations produced to date by this ongoing effort take into consideration sea level rise and resiliency, as is required for a planning effort involving the sea coast which spans 50+ years. Various FIMP reports produced over the life of the study so far include recommendations for beach nourishment and dune enhancement for the coastal reach which includes Quogue. FIMP's early recommendations included the construction, via the placement of sand obtained from offshore borrow sites, of a 100-foot wide beach with 20-foot tall dunes. In 2007, it recommended the development of a feeder beach in East Quogue, which would have provided material to Quogue via the action of littoral drift. In 2013, a study recommended the development and maintenance of a beach of 90 feet in width backed by 13 foot dunes for the entire barrier island from Moriches Inlet to Shinnecock Inlet. It is clear that several documents prepared in conjunction with the FIMP project, documents which incorporate and consider the increase in sea level and related issues over time, have recommended action of the type proposed by the Village of Quogue as a viable measure to respond to erosion of the beach.

Using material dredged from the navigation channel in Shinnecock Inlet to replenish the Quogue beach is one of the measures the Village considered as an alternative to dredging sand from an offshore borrow area.

While this alternative would be consistent with the desirable coastal management practice of bypassing sand across the obstruction in the littoral system caused by the inlet, the Village of Quogue does not control the management or maintenance of the Shinnecock Inlet and therefore has little or no say in what happens to the sand removed from it. In addition, the volume of sand removed from the inlet when it is maintenance dredged is only a fraction of the approximately 1.1 million cubic yards the Village needs for its project.

The beach maintenance program the Village of Quogue conducts consists of the installation and maintenance of snow fencing at the toe of dunes and beach scraping, IE: the redistribution of existing sand on the beach. Snow fencing is a very beneficial tool for capturing some of the sand which is moved on and off the beach and dunes by the wind. It also helps by keeping people from trampling on dunes and dune vegetation. While snow fencing can capture a surprising amount of sand over the course of a windy winter and markedly increase the footprint of dunes; for the most part, the wind is transporting material which is already on the barrier island. Snow fencing does not capture new material leading to a net increase in the volume of sand on the island. The situation is similar with beach scraping, which involves the mechanical regrading of sand from the dry beach (landward of the line of apparent high water) during the period of the year when the beach is at its widest and highest to enlarge existing dunes or to shape new ones. Like the installation of snow fencing, this practice does not add new sand to the beach. It moves material from the beach berm to the dunes. Because beach scraping removes sand from the beach, it lowers the beach berm elevation. It is not at all clear that this reduction in beach berm elevation and related storm wave protection benefits in order to enhance dunes actually increases the system's overall protective value. It may be "robbing Peter to pay Paul", and as such, is insufficient to realize the large scale replenishment of sand volumes and increase in storm protection benefits the approved activity will produce.

The Village of Quogue has actually been seeking and evaluating feasible alternatives to the approved action for many years. Its serious efforts began in 1997 with the development of a Generic Environmental Impact Statement (GEIS) for the purpose of examining options to control beach erosion. The document identified and evaluated a range of options, including the no action alternative, the relocation of structures, soft erosion control measures (such as beach nourishment), semi-hard structures (such as sand-filled geotextiles) and hard structures (such as bulkheading, seawalls and stone revetments). The options were analyzed for efficacy, cost, constructability, environmental impacts and approvability (likelihood of obtaining regulatory approvals). This GEIS effort led to the adoption of several new Village laws and the implementation of the beach management program described above.

The GEIS and the fact that whatever measure the Village carried forward would have to meet the permit issuance standards of its own Coastal Erosion Hazard Areas Ordinance narrowed the range of alternatives which appeared feasible for implementation for the full ocean frontage of the Village to some type of a beach nourishment action.

Suggestions to abandon the approved action and have the owners of the oceanfront properties currently experiencing the most severe erosion relocate their houses landward and / or design and implement private projects to address the erosion on their own land are not viable solutions to an erosion situation which is affecting the full length of the barrier island within Quogue. Relocating existing structures will do nothing to address the net loss of sand from the barrier island or deliver material to the island to offset and reverse the loss. Where feasible, relocating the homes may place them at less risk of flooding and related damage, but it will do nothing to solve the problem of sand loss. Individuals, or small groups of neighbors in the more severe erosion area/s undertaking their own projects to protect their properties will at best maintain the current situation on their properties for a period of time. By adding sand to their properties, or building erosion protection structures, the loss of material on their properties may be forestalled for a period of time, but the underlying loss of material from the full length of the barrier island will still be going on around them and the nearby, unprotected properties will eventually erode back and put them at risk from the sides. Hard erosion control structures, if approved, are likely to induce scour and erosion of adjacent, unhardened properties.

DEC agrees that the Village of Quogue should conduct a public assessment of the benefits and drawbacks of implementing the approved project prior to making a decision on whether to move forward with it.

Project Cost / Funding Mechanisms

- The proposed project is too costly.

- All Village taxpayers should not have to pay for a project which will directly benefit a relative few.

- Since the problem erosion area is relatively small and confined, financial responsibility for addressing the erosion should rest with the affected property owners. These affected property owners should consider a much smaller scale, less costly project to deal with the localized problem.

- Since the longevity of large scale beach nourishment projects nationwide is variable at best and poor at worst, all concerned need to understand that the long term efficacy of the proposed project is not guaranteed.

- Funds expended to carry out the project could be wasted and there could be the expectation of the expenditure of additional funds to re-nourish the beach after the material from the first nourishment erodes.

- The Village needs to undertake a cost – benefit analysis to determine whether such a large expenditure of municipal funds is justified by the project benefits which can reasonably be expected from the action.

- The supply of suitable sand within a reasonable distance offshore of the Village, like the Village's budget, is finite and should be used only when absolutely necessary.

- The expenditure of \$15 million by the Village for this project should be the subject of a vote by all Quogue residents.

- The proposed project will do nothing to protect against flooding from the bay. Bay side property owners, who are already in the position of having to pay increased flood insurance premiums after Sandy, will find themselves also paying increased Village taxes to support a project which will not directly benefit them.

- As the public only has legal access to the portion of the beach seaward of the line of mean high water in front of private property, the proposed project seems like a very large public expense which will do little to increase the area of the beach available to the public.

The general subject of project cost, including how the project should be funded and by whom, elicited the largest number of comments received by far. While these are undeniably vital factors in determining whether the approved project is viable overall, they are not among the factors DEC must consider when making the decision on the permit application. The permit issuance standards for the applicable regulations appear at the beginning of this document. None of these standards involve the evaluation of the cost of the project, how it will be funded or the entity or entities which will fund it. These and similar issues involving the cost of the project, the expenditure of municipal funds to pay for it, whether all Village residents or some subset thereof should be taxed to raise the funds, etc., are all questions which should be addressed by the Village of Quogue as the project sponsor. A project has been designed which DEC has determined meets the permit issuance standards of the applicable Environmental Conservation Law regulations.

With the DEC permit in place, it is up to the Village to obtain any and all other required regulatory approvals and to undertake the municipal government process necessary to decide whether to move forward with construction. This process is public.

As discussed in the responses to the comments on project alternatives, the statement that the problematic erosion is limited to a few properties which should be the focus of a smaller-scale, privately funded project misses the premise on which the approved project is based – that there is a demonstrated, long term, net loss of sand from the barrier island within the limits of the Village of Quogue which can lead to a widespread reduction in the natural protective feature benefits the island provides. The properties where the sand loss is the most dramatic may be relatively small in number, but the Village recognizes that the trend of loss extends throughout its oceanfront, and has designed the approved project to address the whole oceanfront. The costs associated with this comprehensive project, how it will be funded, and the decision on whether to undertake it are the purview of the Village.

How long the renourished beach and dunes resulting from the approved project, if it is undertaken, will last is not known with certainty. The project sponsor and its consultants have developed a design which takes into consideration that there is a long term, net loss of material from the Quogue ocean beach, indeed the main purpose of the approved project is to address this fact. The volume of material to be placed and the three placement templates were designed based on the current understanding of the rate and volume of sand loss throughout the project area. The volume of material approved for placement is intended to restore the barrier island within Quogue to a condition which provides the necessary level of natural protective feature function for about ten years. Since this is a highly complex and dynamic natural system, the service life and even the efficacy of the project cannot be guaranteed. If the approved project is undertaken and somehow underperforms, it will be the decision of the project sponsor and permittee, the Village of Quogue, whether or not to incur the costs associated with additional beach nourishment cycles.

The US Army Corps of Engineers and other agencies have been doing numerous studies and data collection efforts to characterize and quantify the sand resources which exist in the ocean floor off the south shore of Long Island since the FIMP project began in the early 1960s. These efforts have led to the designation of over 20 borrow areas with useable material off Suffolk County alone. While the quantity of sand within a reasonable distance offshore of Quogue is indeed finite, it is also so large that the funding available to extract the material will be exhausted long before the supply will be put under strain.

As mentioned above, the purpose of the approved project is to restore and maintain the barrier island's functions as a natural protective feature in order to sustain the protection of the mainland portion of the Village of Quogue from storm-related, ocean wave attack. The project is not designed to address flooding and high water issues from the bay (north) side of the barrier island. While the funding formula for the approved project, if the Village decides to go forward with it, is currently unknown and not an issue DEC has authority over, it is at least conceivable that a property owner on the north side of the barrier island could end up in the position of paying higher, post-Sandy flood insurance premiums as well as higher Village taxes to support the approved project. The approved project is also not intended or designed to increase the area of the beach available to the public.

Village Governance / Municipal Issues

- *The Board of Trustees of the Freeholders and Commonality of the Town of Southampton has notified DEC that the placement and manipulation of sand on the beach between the toe of the primary dune and the ocean as proposed will require the approval of that body. It has expressed concern that the Village has not consulted or otherwise contacted it to discuss issues of concern and application requirements for the project.*
- *The Village of Quogue needs to hold a public forum at which all issues associated with this project can be discussed.*
- *The consultant hired by the Village for this project is not objective and is biased toward the proposed project design.*
- *The affected landowners may have contributed to or even caused their own problems with the development decisions they made on their properties.*
- *The Village of Quogue may have contributed to the problems in the eroding area by issuing local land use and building authorizations for development requiring variance relief from the Coastal Erosion Management minimum standards.*
- *The current development pattern on the barrier island in Quogue is unwise and unsustainable. The very large, very expensive, permanent homes which now exist on the oceanfront engender in the owners the understandable desire to protect them, at almost any cost, against the forces of nature, to the detriment of the beach and dunes.*

In the not so distant past, many people contented themselves with much smaller, less permanent, less valuable beach cottages, structures which they could afford to lose and/or replace if they were damaged by erosion or storms.

- Is the Village proposing this project to protect a small number of houses, or to protect the natural protective feature of the beach?

- Oceanfront property owners must know that they are taking on considerable risk when they purchase or otherwise acquire their properties. These property owners, not the municipality, should be responsible for maintaining them.

- Pursuing a beach nourishment project while at the same time allowing the installation of geotubes, sand cubes and other shoreline stabilization structures is a contradiction in approaches.

The issuance of a permit by DEC does not absolve the permittee from the responsibility of obtaining all of the other federal, state and municipal regulatory approvals which are required for the approved action as well as the permission of the owner/s of any lands on which project related work will occur which are not owned by the permittee. This notification is included in all DEC permits. The permit issued to Quogue also includes a specific Natural Resource Permit Condition (#1) which states that the activities authorized by the permit are subject to any property interest in favor of the Trustees of the Freeholders & Commonality of the Town of Southampton under the Dongan Patent.

A number of the comments in this section make the point that the land use decisions made by barrier island homeowners with regard to the construction or modification of houses and accessory structures, along with the regulatory decisions by the Village to approve these projects may have contributed to or caused the erosion problems experienced on some properties. It is conceivable that the way a parcel is developed, including the development design, how much of the lot area is covered with structures, construction methods and project site management all have the potential to cause erosion or damage to the dune or beach on the subject site and the adjacent properties. However, the purpose of the approved project is to address the long term, net loss of material from the entire stretch of the barrier island within the Village which is linked to the effects of the interrupted long shore sediment transport system. Since it was formed, the stabilized Shinnecock Inlet has captured and continues to capture most of the material in the littoral system which would make its way into Quogue if the inlet did not exist. With an insufficient volume of material being delivered into the Village limits by the littoral system to replace the quantity which it simultaneously removes from the beach, the long term pattern of net sand loss throughout the Quogue barrier island described in the application materials is established.

This is by far the more important cause of beach loss and the concomitant reduction in the ability of the barrier island to provide the natural protective feature benefits necessary to protect the rest of the municipality, and is the problem addressed by the approved project. The Village has designed the proposed project to reinforce the natural protective feature of the barrier island, as evidenced by the fact that the scope of the action encompasses the full 2.7 miles of the Quogue oceanfront.

While the addition of sand to the beach in front of some at-risk houses will definitely increase the level of protection for those homes, sand will be added to the beach throughout the Village frontage, whether the houses landward of the beach are in imminent danger or not. The approved project provides the Village of Quogue with the DEC permit necessary to undertake the beach nourishment project. The fact that a permit is issued does not obligate the permittee to do the project. Accordingly, measures taken by the owners of individual oceanfront parcels to protect those properties, such as the installation of sand filled geotextiles, the placement of grade adjustment fill, or the elevation of existing houses, is not a contradiction in approaches. The Village may or may not decide to undertake the approved project during any of the ten years of the permit term. Individual property owners faced with this uncertainty and who may need to take action to protect their homes under the authority of all required regulatory approvals are within their rights to do so.

Environmental / Natural Resource Impacts

- *The proposed project may have a negative impact on the physical structure and organisms inhabiting the 100 acre borrow site on the ocean floor.*
- *The project may have a negative impact on the material placement area, which is the entire ocean frontage of the Quogue Village. In particular, the deepening of the borrow area may result in more energetic, powerful waves reaching the beach and increasing erosion rates for the nourished beach.*
- *All existing erosion control structures should be removed from the ocean beach if the proposed project is constructed.*
- *The impact of the proposed project on the ocean beach to the east and west of Quogue has not been evaluated / considered and should be.*

As described in the section discussing the approved project's compliance with the Use & Protection of Waters regulation's standard at Section 608.8 (c) on pages 3 of 27 and 4 of 27 above, the approved project's impacts to the physical structure and organisms inhabiting the offshore borrow site will be minor and of short duration.

The approved design includes a relatively shallow cut or excavation depth of seven feet over a 100-acre area of ocean bottom and gentle slopes of the excavation area. This modest change in bottom elevation over a large area will ensure that the borrow site will not be a deep hole in the sea floor which could develop lower dissolved oxygen levels than the adjacent areas and collect silt, resulting in degraded habitat characteristics which could discourage its recolonization by benthic organisms adapted to the sandy bottom conditions which prevail in this region. The side slopes of the borrow site will not exceed a vertical to horizontal change ratio of 1:5, which is significantly flatter than the natural angle of repose for sandy material. Considered together, the modest elevation change, large footprint and shallow side slopes of the approved borrow area design will result in a post-excavation condition which more resembles naturally occurring variation in the ocean bottom topography than a defined, precipitous hole in the sea floor.

One of the selection parameters applied in identifying the approved borrow area was the low concentration of surf clams found during the benthic sampling done by the US Army Corps of Engineers as part of its FIMP-related survey efforts to locate viable sources of compatible sand for beach nourishment projects. Subsequent sampling of surf clam abundance conducted by DEC in its role as the manager of shellfish resources for the state also indicated that the concentration of this commercially important species is low in the project area. The findings of other sampling efforts to identify the make-up of the overall benthic community in the area of the borrow site showed invertebrate species typical of the sandy bottom off the south shore of Long Island in average to below average concentrations. DEC's experiences with other, previously approved projects involving the removal of sand from borrow areas very close to the site approved for the Quogue project have shown that limiting the depth of the excavation into the bottom to less than ten feet and establishing gentle side slopes for the disturbed area leaves it in a condition which allows the rapid recolonization of the bottom sediments by the benthic invertebrates from nearby, undisturbed areas. The modest change in bottom elevation also encourages the quick return of fish and other water column fauna to the disturbed area.

The biological impacts of the placement of sand to renourish the barrier beach are also minor in nature and temporary. As explained in the discussion on page 3 of 27 above, this is due to the relatively low abundance and diversity of species which inhabit the beach just above the intertidal zone and the surf zone, and the dynamic, rapidly changing nature of the beach itself. The offshore borrow area is located in a position relative to the shoreline which is seaward of the zone in which most sand moves in the littoral system. It is also seaward of the location where the bar tends to form when waves remove material from the beach. The removal of sand from the offshore borrow area should not modify the active zone in which the littoral system moves material on and off the beach, or along the beach.

In addition, since it is located well seaward of the offshore bar, the deepening of the borrow area will not change or modify the bar, which under most conditions acts to trip incoming waves and begins the process of dissipating their energy. It should also be noted that the maximum change in bottom elevation in the excavated borrow area will not exceed seven feet with very shallow side slopes, a modest deepening which is within the natural range of bottom elevation variability at this distance off shore and should not result in the propagation of waves which are significantly larger or more energetic than the existing condition. Since the approved action will not result in significantly larger or more powerful waves and will not modify the existing, protective offshore bar structure, it should not result in more energetic waves reaching and breaking on the shore and increasing erosion rates.

Neither the submitted application materials nor the analysis of the expected project impacts undertaken by DEC indicate that the Quogue beach nourishment project is likely to have significant negative effects on the beaches to the east or west of the Village. Since the dominant direction of littoral drift is from east to west, the net or overall movement of material placed on the beach within Village limits is to the west. This is why the largest of the three beach nourishment templates is located in the eastern portion of the project area. Material which the system removes and transports from the eastern template area will travel to the west, to the remainder of the Quogue ocean frontage and beyond. However, there is a possibility, depending on such variables as weather and wave conditions during the time period that the eastern template beach is built, for a temporary reversal of the direction of the littoral transport system which could push some of material added to this area to the east, out of the Village, to increase the beach width and elevation in the area immediately east of the project limits. This would probably be seen as more of a beneficial effect than a negative impact. The natural westward movement of sand in the system will transport some of the material added to the beach in Quogue beyond the Village line into Westhampton Beach, where it will be available for natural processes to accrete the beach, build the offshore bar or become captured by the Westhampton groin field, in the same way material of natural origin is. If anything, this effect would probably be seen as beneficial or at worst, neutral.

The blanket statement that all existing erosion control structures should be removed from the beach if the proposed project is constructed is impractical and unsupportable. As described above, the Quogue Beach Nourishment Project is proposed to be undertaken by the municipality, over the full ocean frontage of the Village to restore and enhance the capability of the barrier island to function as a protective feature for the entire community. The project design is intended to address the long term net loss of material from the barrier island within Village limits due to interruption or obstruction of the longshore movement of material into the Village from the updrift (easterly) direction.

As described in the application materials, the rate of material loss is not uniform or constant over time or location in the Village ocean frontage. Some individual properties have experienced substantial beach berm erosion and loss of dunes with associated flooding of the interior of the parcels from storm tides, overwash and back-bay flooding. This situation worsened with Hurricane Sandy and subsequent storms. The use of sand filled geotextiles such as sand cubes, particularly after Hurricane Sandy, was largely limited to the direct protection of existing structures such as houses or as the core of reconstructed dunes intended to provide protection to existing development. This type of application has little or no effect on the overall, Village-wide erosion condition described above. In addition, these structures were installed on private property, under the authority of the applicable regulatory approvals. The Village of Quogue Beach Nourishment Project has not been designed as a replacement for or an alternative to measures required to protect significant, existing structures on private properties which become threatened by erosion. While the approved project will increase the level of protection afforded by the natural protective feature of the beach, individual owners who have legally installed erosion protection measures on their private property will not be required to remove them.

Erosion Protection / Project Efficacy

- *The submitted application materials provide no long term guarantee that the project will be effective; IE: that the material placed on the beach will remain in place to provide protection for a period of time which justifies the effort and expense of the project.*
- *The benefits of beach fill projects from offshore borrow sources have been shown to be short lived in many east coast locations, requiring subsequent nourishment cycles to maintain the project design template. Has this fact been taken into consideration for the Quogue project?*
- *Has any type of investigation or analysis been undertaken to gain a better understanding of the nature and mechanism of the erosion "hot spot" area which is affecting some Quogue properties and may be the main driver of the project under consideration? Is there enough known about this phenomenon to expect that the proposed project might correct it or address it in a permanent way, or to suggest an alternative project design or measure which might address the "hot spot" directly without pumping sand onto 2.7 miles of beach?*
- *It should be understood that the proposed project, if implemented, would not be significantly protective of the barrier island if the area were to experience a storm with similar characteristics to the 1938 hurricane.*

- *Beach nourishment, while a stopgap measure, seems to have less negative effects than the installation of hard shoreline stabilization structures.*
- *The project description provided with the application is not complete because it does not include the periodic renourishments of the initial project which will undoubtedly be required.*
- *The proposed project will do nothing to address the flooding / storm surge which engulfs the barrier island from the bay side.*

The application materials include no guarantee that the sand placed and graded on the Quogue beach will remain in place to provide protection for a period of time which justifies the effort and expense of the project because the ocean and barrier beach comprise an imperfectly understood natural system capable of producing a vast array of tidal, wave and wind conditions which can change in an instant. It is impossible to provide a meaningful guarantee of project success under such conditions. What the applicant has done, however, is study the conditions in the project area and nearby locations over time. It has also reviewed the design details and post-construction performance of similar beach nourishment projects which have been completed along the south shore in recent years. The site specific data and observations collected over the length of the Quogue beach were used to estimate erosion rates, which were in turn used to estimate the quantity of material required to restore the beach to a width and elevation that will provide a sufficient level of protection over a period of about ten years. The resulting design was then compared with the designs of previous, similar projects in the area which performed well, and refined to produce the conceptual design described in the permit and depicted in the drawings. The design approach is consistent with those of beach nourishment projects conducted by the US Army Corps of Engineers, New York State and Suffolk County along the south shore as well as projects carried out by the federal government, states and municipalities in other locations along the Atlantic coast. So, while there can be no guarantee of the effectiveness of the project, particularly in the later years of the projected project life, it is safe to expect that it will maintain beach width and elevation in a range which provides an acceptable level of protection for the mainland portion of the Village because the design is based on the measured and observed erosion rates for the project area over recent years. While the possibility that the approved project may not perform as expected is acknowledged, the application materials do not request approval for more than one dredging cycle. A large hurricane or a series of nor'easters over the course of a season could remove material from the beach at a substantially faster rate, which may result in an overall project life of less than the projected ten years.

If such a situation were to occur during the life of the permit, the Village would have to decide whether undertaking the project a second time is viable from the municipal fiscal and policy perspectives, then approach the regulatory agencies if it decides to proceed. It is true that some beach fill projects undertaken on the east coast have not lasted for the intended period and required re-nourishment to maintain their design templates. Many more have performed as intended and have provided the full level of protection for their full design lives. The design of the Quogue project was developed after the completion of the existing conditions investigation and project formulation steps described in the Feasibility Report and in accordance with the principles of coastal geology and engineering contained in the US Army Corps of Engineers Shore Protection Manual.

The project authorized in the permit is intended to restore the elevation and width of the ocean side barrier beach within the Quogue village limits to levels which afford a reasonable and appropriate level of protection for the mainland portion of the municipality in the event of a significant coastal storm. It should be understood that the addition of sand is intended to reinforce and enhance the ability of the barrier island to serve its function to protect the mainland from high energy storm waves, not necessarily to protect existing development on the barrier. Increasing the elevation and width of the island's ocean beach will have the beneficial effect of increasing protection for oceanfront properties on the barrier under normal conditions, and may forestall damage to these properties from ocean wave attack and ocean flooding for some period during a severe storm like Hurricane Sandy, but a truly catastrophic event with a large enough storm surge and high enough waves will overwhelm any barrier island and severely damage any existing structures on the island. Also, the addition of sand to increase the width and elevation of the berm and dunes on the ocean beach will provide no additional protection for the existing houses and other buildings on the barrier island from storm surge and flooding entering from the north (Quogue Canal or bay) side. The approved project is designed to provide a measure of protection from ocean waves and high water, not back bay flooding.

The section of the Quogue ocean shoreline which displays an accelerated or faster rate of erosion when compared with adjacent areas (the "erosion hot spot") has been known since the 1990s. The comprehensive analysis of erosion rates for the full length of the Village's frontage described in the Feasibility Report has shown that from the 1990s to 2013 or so, the "erosion hot spot" has expanded westward from the vicinity of the eastern municipal boundary to the vicinity of 148 Dune Road, a distance of over a mile. The beach and dunes in this section show little or no natural recovery during the late spring / summer seasonal accretion period. The beach profiles and sediment budget developed as part of the project planning process did not identify a definitive, single cause for this area of accelerated erosion, but they did confirm its existence.

One of the reasons that the project design template for the eastern portion of the Village includes a sand placement rate of 127 cubic feet per linear foot of beach compared with 51 cubic feet per linear foot and 42 cubic feet per linear foot for the central and western reaches respectively is to address this area of accelerated erosion.

Beach / Shoreline Data Collection & Related Project Design Issues

Several questions or issues related to the beach and shoreline data collected or referenced by the Village's consultant were raised by a speaker at the August 2015 public hearing and expanded upon in a subsequent letter. Since this data was used to calculate erosion rates, establish the need for the project and to develop the sand placement quantity estimates for the three project reaches, the issues must be adequately addressed.

- The hearing comments and subsequent letter suggest that the design consultant's estimates of sand losses due to erosion and the quantities of material required to be added to the beach are based primarily on a single measurement using proprietary technology and may not be accurate.

The beach nourishment design developed for the Quogue project involves two considerations. The first is an estimate of the deficit volume of sand compared with the volume of a beach and dune profile which provides an acceptable level of protection at a specific point in time. IE: How much material would have to be added in order to re-establish a beach / dune profile which provides the desired level of protection? The second consideration involves developing an estimate of the quantity of material which would need to be added in order to establish an acceptable dune / beach profile and to maintain that profile for the 10-year design life of the project. The first or deficit volume estimate can be developed from a set of beach profile measurements taken on a single day because the estimate is intended to represent the quantity required on that day, essentially a snapshot in time. The Village's consultant, Coastal Science & Engineering (CSE), used the set of profiles it took in 2011 to develop the deficit volume estimate. The estimate of the volume needed in order to maintain the design template for the multi-year life of the project requires the calculation of the approximate erosion rate for the project area over time, which necessarily entails the comparison of beach profile data sets done on multiple dates. For this CSE analyzed the data from profiles done in 1955, 1979, 1995, 2001 and 2011. An additional set of profiles was taken in 2015, which is now also available.

Erosion rate estimates by comparative profiles also require the raw data to be collected along the same lines and referenced to a common vertical datum, or reconciled properly with respect to the beach line if they are situated a few hundred feet apart.

Where historical data (such as the Atlantic Coast of New York Monitoring Program, ACNYMP) were situated close to CSE's 2011 profile lines, volumetric change estimates were made. However, because the historical data involved many fewer profile lines than CSE's 2011 survey, direct comparisons were not possible at all locations along the Quogue shoreline. To develop a long term average annual erosion rate estimate, CSE used published results from several studies including: USACE 1958; USACE 1980; RPI 1985; Kana 1995; Rosati et al 1999; URS 2010; and Hapke et al 2010. The average annual erosion rate estimates for the various periods represented by the published studies were reported in the relatively narrow range of 2.6 cubic yards per linear foot per year (cy/ft/yr) to 4.6 cy/ft/yr for the Quogue area, which is consistent with the estimate CSE developed based on the 2011 data it collected. CSE recommended the adoption of an erosion rate for planning purposes related to the long term average losses. This adopted rate was 40% above the average for the reported studies (IE: $3 \text{ cy/ft/yr} \times 1.4 = 4.2 \text{ cy/ft/yr}$). Given the Quogue shoreline's relatively short length and similar exposure to waves from one end to the other, this rate was applied uniformly to derive the estimated "advance" nourishment quantity. This represents the portion of nourishment that is available to accommodate future erosion for the 10 year design life of the project.

For the deficit volume, CSE used the 53 profiles from 2011 along with other nearby profiles from healthy beaches. In addition, observations on the ground during data collection provided qualitative evidence of which profiles represented healthy sections of beach and which areas appeared to have a sand deficit. Some of these differences were associated with normal variations in beach width along the shoreline, but the fact that some areas exhibited a narrow beach with dune scarping confirmed that, in total, there is a sand deficit along the Quogue shoreline. These observations tended to correlate with unit volumes, as CSE staff has observed along many other studied beaches. Sections of Quogue shoreline that exhibited a wider beach and healthy foredune were used to derive a "minimum healthy profile volume". The deficit formulation was based on increasing the unit volumes along less healthy sections to the "minimum healthy volume".

The project formulation methodology employed by CSE for the Quogue project has been used successfully in other areas. It is a volumetric approach which takes into account the entire littoral zone instead of the extrapolation of linear shoreline changes. The approach is also based on directly observed and measured site conditions instead of theoretical changes derived from the modeling of waves or littoral system sediment movement. While more plentiful historic data is always desirable when planning beach nourishment projects, the technique used for the Quogue project has been effective for the development of the type of conceptual or preliminary design authorized in the Quogue permit.

If and when the Village decides to undertake the authorized work, the permit requires the submission of a complete set of updated project plans which provide new quantity estimates along with current beach width, elevation and other measurements for DEC approval prior to commencement of work. While achieving the best degree of accuracy practicable with regard to the rate of erosion and the quantity of material necessary to complete a successful project is an important consideration, particularly for a public project, it is also very important to not lose sight of the fact that there is abundant qualitative evidence of the ongoing erosion and loss of material from the beach and dunes in Quogue as outlined on page 9 of 27 above.

- The consultant made use of beach profile data obtained from the Atlantic Coast of New York Monitoring Program (ACNYMP). This data includes a disclaimer indicating that the information is not intended to represent official estimates of shoreline change rates, volume changes or other measurements of coastal processes. Is the use of this data by the consultant for the purpose of estimating erosion rates or volume changes for the Quogue project valid?

The Atlantic Coast of New York Monitoring Program (ACNYMP) was a US Army Corps of Engineers (USACE) project funded jointly by the USACE and New York State that operated from 1995 to 2001. Measurements for ACNYMP were conducted using professionally accepted standards and practices (see below for full disclaimer language) under contract to the USACE and were collected and compiled to conform to industry standards. In fact, the complete disclaimer clarifies this:

“Data included in the Atlantic Coast of New York Monitoring Program Data Viewer site are provided for informational purposes only. They should be considered an advisory tool for general erosion hazard awareness, education and coastal management. They are not intended to represent legal or official estimates of shoreline change rates, volume changes or other measurements of coastal processes. Although the data were collected using professionally accepted standards and practices and have been reviewed for quality, the US Army Corps of Engineers (USACE), New York Sea Grant, and the New York Department of State, cannot guarantee the accuracy of these data and assumes no responsibility for errors or problems caused by its use.”

The disclaimer statement appears to be included more for limitation of liability purposes than as notification that the data is unreliable or inaccurate. Regardless, ACNYMP profile data was not the only data CSE used in its work on the Quogue project design, several other published sources were made use of as described above. In addition, the only ACNYMP profile data used by CSE was for profiles located in close proximity to CSE's own 2011 profile lines which could be readily reconciled and met the company's quality control standards.

The Village and its consultants do not claim that the ACNYMP data represent official or legal estimates, only that the ACNYMP was collected in accordance with professional industry standards as described in the disclaimer language and that any ACNYMP data used in CSE's analysis met the consultant's own quality control standards. This limited usage of the ACNYMP data is valid and appropriate.

Conclusion

The permit issued to the Village of Quogue authorizes an option the municipality may undertake, if it so chooses, to reinforce the barrier beach which protects the mainland. The permit does not commit the Village to undertaking the project. This approval provides the Village with the ability to act in its own interest in an environmentally responsible manner. It therefore strikes the appropriate balance between the municipality's responsibility to provide reasonable protection of its citizens and their property and need to protect and minimize impacts to natural resources.