



Town of Oak Bluffs, Massachusetts
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Mr. Ewell Hopkins Chairman
Oak Bluffs Planning Board
56 School Street
Oak Bluffs, MA 02557

Re: Lagoon Ridge Development

Dear Planning Board

Unfortunately I have another commitment and I cannot attend the Planning Board hearing on this project. I ask that you read and, consider this letter as my testimony.

The letters from the Lagoon Pond Association and Tisbury Waterways Inc. have already addressed have correctly testified as to the volumes of nitrogen that needs to be removed to have a healthy pond. I will point out additional efforts that have and are being conducted within the pond.

Excess nitrogen loading into our beloved coastal ponds is a serious matter. The Town of Oak Bluffs and Tisbury have supported and expended thousands upon thousands of dollars determining and assessing the health of lagoon pond. See attached project listing including funding. These projects are quality work and several have been presented at regional, national and international conferences (see attached). Several have also been published in peer reviewed scientific journals (also see attached).

The results are clear that the pond is affected detrimentally from excess nitrogen entering the pond from its watershed. This puts the pond into non-compliance status of the Federal Clean Water Act of 1972. There are several sources of nitrogen loading. Some sources we cannot do anything about it locally as in rainfall directly into the pond. The towns' have tried to address some of the "low hanging fruits". Storm water mitigation projects have been done at three sites (Lagoon Rd., Vineyard Ave Extension, and Hudson Ave.). All three sites are engineered to collect the first half inch of any rainfall event. This first half inch contains about 90% of the pollutants from road runoff.

The local Boards of Health have determined that nitrogen is a pollutant. This declaration was the enabling condition for all six island towns to vote in fertilizer regulations.

The shellfish departments are growing additional shellfish in Lagoon Pond to take advantage of the filter feeding as they incorporate nitrogen in their growth.

The excess nitrogen entering the pond is of course a fertilizer and it promotes the growth of seaweeds as well as microscopic plants referred to as phytoplankton. Reducing the volume of

nitrogen entering the pond would reduce the opportunities for these blooms to occur. As when conditions are right the phytoplankton can reproduce extremely fast and can become dense enough to discolor the water. There are many species that can be harmful to animals in the pond and some species are harmful to humans (think red tide). When these blooms do occur and have been occurring annually there isn't much we can do about it hope in doesn't have a lasting effect on the pond. When they are dense enough to discolor the water; light does not penetrate to the bottom of the pond where eelgrass grows. If the eelgrass cannot photosynthesize it will die. Eelgrass meadows are one of the most productive and diverse ecosystems in the world. Unfortunately there is not much eelgrass left in the Lagoon Pond any more. As a child I was fascinated by all the creatures in the eelgrass meadows especially in Lagoon Pond, This may have been what got me interested in marine biology, sadly this id not what we see today.

The Martha's Vineyard Commission is moving toward stricter and possibly a no net nitrogen discharge for projects that will come before them.

The single largest source that we can act on is nitrogen from our septic systems. Both Oak Bluffs and Tisbury have been meeting jointly to assess and decide next steps. The Oak Bluffs Wastewater Commission is asking for millions of dollars to improve and expand the sewage plant. Tisbury is moving forward as well and have two new projects to help alleviate the nitrogen issue. They received grants to try newer designed effluence discharge into deep vertical leaching fields. They have also received grant funding to install one of the most promising de-nitrogen septic systems as a pilot project. They will install five systems at private homes.

For the past few years we have observed the growth of several invasive colonial sea squirts. Several of these species started to be seen here as recently as the 1980s. They settle on both hard structures and more recently on both eelgrass and some seaweed. As they grow and expand they also keep sunlight from the submerged vegetation. They are filter feeders but their damage to eelgrass and seaweeds has a larger impact than having them be beneficial in mitigating nitrogen load. These may also be controlled IF we can reduce the nitrogen loading.

Bottom line – there are a lot of hard working people in both towns that are committed to the protection, preservation and enhancement for the Lagoon Pond. I will point out that Lagoon Pond is the only coastal pond on the island that has two non-profit advocacy groups (Lagoon Pond Association and Tisbury Waterways Inc.) that are very concerned about the pond. This is an opportunity for the Oak Bluffs Planning Board to join with several conservation groups and deny this project and to always move forward in fostering environmental stewardship that will allow future generations to enjoy the Lagoon Pond in better health than it is now.

Respectfully submitted,

Cc: Doug Reece president of the Lagoon Pond Association
George C. Hokanson president of Tisbury Waterways Inc.
Danielle Ewart Tisbury Shellfish Constable

Grants or Projects that have been conducted to assess Lagoon Pond since 2000

2000	Preliminary Nitrogen Loading of Lagoon Pond Multi-year funding to the MVC from DEP 604b funding	\$30,000
2001	Storm Water Renovation Lagoon Pond – Three Sites Funding from MA DEP 319 program`	\$73,300
2002	Investigate Hazardous Algal Bloom in Lagoon Pond Funding from MA DEM as well is some local advocacy Groups	\$17,300
2003	Nitrogen Loading of Lagoon Pond Multi-year funding to the MVC from DEP 604b funding	\$30,000
2003	Additional Water Quality Monitoring Lagoon Pond Funded by Lagoon Pond Association	\$1,700
2004	Lagoon Pond as placed into the MA Estuaries Program State match funding	\$52,000
	Town appropriated (both towns) funds	\$52,000
2004	Develop Bay Scallop Habitat Model for restoration Projects funded by US EPA Atlantic Ecology Division Five year project	\$200,000
2005	Nitrogen Loading Source Evaluation Using Nitrogen Isotope Ratios funded by MA Coastal Zone Management	\$5000
2008	Rapid Assessment Sea Squirt Survey of MV Salt Ponds Funded by Sailor Snug Harbor of Boston to Dr. Mary Carman of Woods Hole Oceanographic Institute	\$16,000
2009	Expanded Sea Squirt Monitoring and Research (inc. Lagoon Pond Funded by US EPA Atlantic Ecology Division and Region 1 (Boston), WHOI, and US Geological Survey	\$46,000
2010	Nitrogen Attenuation of the Upper Lagoon Pond (fresh water) Funded by Community Preservation Act	\$50,000
2010	Lagoon Pond Sea Squirt Monitoring Community Preservation Act to Dr. Carman WHOI `	\$5,000
2011	Lagoon Pond Sea Squirt Monitoring Community Preservation Act to Dr. Carman WHOI `	\$5,000
2012	Investigation of Impacts to Eelgrass from Sea Squirt Colonization Funded by US EPA Region 1 (Boston) funded 2 years	\$100,000
2014	Monitoring Eelgrass and Sea Squirts in Lagoon Pond Funded for 2 years by Community Preservation Act	\$13,200

Total \$601,500

The above funding does NOT include the in-kind hours that were put in by the Shellfish Department's staff and use of town owed boats and equipment in support of the above projects.

Papers/publications/major presentations of work done in Lagoon Pond Since 2000:

- “Initial Investigation of an Annual *Prorocentrum* Bloom in Lagoon Pond, Martha’s Vineyard”**
presented at the Milford Aquaculture Seminar Feb. 2003, abstract published in the Journal of Shellfish Research
- “Development of Computer Modeling to Assist in Bay Scallop (*Argopecten irradians*) Restoration Efforts”** Co-author, presented at the 98th Annual National Shellfisheries Association Meeting and was published in the 2006 summer issue of the Journal of Shellfish Research.
- “Restoration Without Borders Cooperative Wetlands Restoration on Martha’s Vineyard Island, MA”** ;Co-authored presented at Restore America’s Estuaries conference December 2006
- “Bay Scallop (*Argopecten irradians*) Habitat Attributes in a Massachusetts Salt Pond with an Active Scallop Restoration Efforts”** Co-authored; Presented at Ecological Society meeting in San Jose, CA. August 2007
- “Tunicate faunas at two North Atlantic- New England islands: Martha’s Vineyard, MA and Block Island, RI;** Co-authored; presented at International Invasive Sea Squirt Conference in Prince Edward Island October 2-4, 2007 Published in the Aquatic Invasions journal
- “Invasive tunicates identified at shellfish aquaculture sites in New England and mid Atlantic states”**, USA; Mary Carman¹, Richard Karney², James Morris³, Porter Hoagland¹, David Grunden; presented at Managing Alien Species for Sustainable Development of Aquaculture and Fisheries conference; Florence, Italy.
- “Invasive Tunicates at Shellfish and Aquaculture Sites on Martha’s Vineyard, Massachusetts”;** Richard Karney , David Grunden, Mary Carman, James Morris, and Porter Hoagland; poster presentation
- “Epibiotic tunicates at shellfish aquaculture and shellfish restoration areas at Martha's Vineyard, Massachusetts: Summer 2008 surveys”** by Mary Carman, David Grunden, James Morris, Porter Hoagland, Richard Karney – presented to the Knight Journalism Fellows in Woods Hole, MA September 12, 2008
- “First Occurance of the Invasive Colonial Ascidiens *Didemnum vexillum* and *Diplosoma listerianum* Eelgrass *Zosteramarina*”**, by Mary Carman, Dan Blackwood and David Grunden; Aquatic Invasions journal Volume 1 pages 23-29
- “An Initial Assessment of Native and Invasive Tunicates in Shellfish Aquaculture of the North American East Coast”** (2010); by Carman MR, Morris JA, KArney RC, Grunden DW; Journal of Applied Ichthyology Vol.26 pg8-11
- “First Occurance of the Invasive Colonial Ascidian *Didemnum vexillum* to utilize eelgrass *Zostera marina* as Substrate”**, Presented by Mary Carman and David Grunden and published in “Status, Trends, and Conservation of Eelgrass in Atlantic Canada and the Northeastern United States” Edited by Neckles, H. A., A. R. Hanson, P. Collausso, R. N. Buchsbaum, and F. T. Short
- “Composition and Distribution of Invasive Tunicates at Shellfish Aquaculture sites of New England and the Mid-Atlantic States, USA;** by Mary Carman, R. Karney, J Morris, D. Grunden, and P. Hoagland; submitted to the Journal of Ichthyology.
- “Impact of Invasive Tunicates in Marine Coastal Eelgrass Habitats in Massachusetts”**, co-authored with M. Carmen, P. Colarusso, M. Chintala, and D. Blackwood; December 2010, Ascidian News; published by University of Washington

- “Invading Populations of Epiphytic Non-native and Native Tunicates on Seagrass at Martha’s Vineyard”** Mary Carman, Phil Colarusso, Eric Nelson Dave Grunden, Dann Blackwood, and Marty Chintala; 2012 New England Association of Environmental Biologists Meeting.
- “Restoring Winter Flounder (*Pseudopleuronectes americanus*) Populations on Martha’s Vineyard MA Through Stock Enhancement”** Shelley Edmunson, Elizabeth Fiarchild, Warren Doty, Nathan Rennels, John Armstrong, Brett Stearns, Serel Garvin, Danielle Ewart, David Grunden; Presented at North East Aquaculture Conference and Expo (NACE) December 1012 Abstract to be published in Journal of Shellfish Research
- “Using a System Level Approach to Bay Scallop Enhancement and Management”** Marnita Chintala, David W. Grunden, Anne Kohn, Karin Tammi, Presented at 2014 National Shellfisheries 106th Annual Meeting.
- “Distribution and Density of Invasive Tunicates on Eelgrass in Eastern North America – a Latitudinal Study Between N 40 degrees and N50 degrees – New Jersey to Newfoundland”** Carman, Colarusso, Grunden et al; 2014 presented at the 8th National Summit on Coastal and Estuarine Restoration and the 25th Biennial Meeting of The Coastal Society. Also presented at the International Invasive Sea Squirt Conference 2014; Management of Biological Invasions 2015
- Cold Water Reattachment of Colonial Tunicate *Didemnum vexillum* Fragments to Natural (Eelgrass) And Artificial (Plastic) Substrates in New England;** Carman, M., Grunden DW, Ewart, D.; 2014, published by Regional Euro-Asian Biological Invasions Centre.
- “Researching with Locals”** Grunden; 2014 presented at the International Invasive Sea Squirt Conference V-Woods Hole.
- “Quantifying the Ecological Impact of Invasive Tunicates to Coastal Water Systems”** P. Colarusso, S. Avysian, E. Nelson, M. Carman, M. Chintala, S. Grabbert, D. Grunden; presented at the International Invasive Sea Squirt Conference 2014; Management of Biological Invasions 2016
- “Distribution of Tunicates (Ascidians) Utilizing Eelgrass as substrate in the Northwest Atlantic Between New Jersey and Newfoundland”;** Presented at the Benthic Ecology Society meeting 2015.
- Tunicates (Ascidacea) utilizing eelgrass as substrate in the western North Atlantic between 39° and 47° north latitude (New Jersey to Newfoundland);** 2016, Mary R. Carman; Philip D. Colarusso; Eric P. Nelson; David W. Grunden; Melisa C. Wong; Cynthia McKenzie; Kyle Matheson; Jeff Davidson; Sophia Fox; Hilary Neckles; Holly Bayley; Stephen Schott; Jennifer A. Dijkstra; Sarah Stewart-Clark; presented at the Benthic Ecology Meeting
- “Nitrogen Mitigation by Oyster Culture: Striving to Comply with the Clean Water Act”,** (2016) Grunden, D. W., Bagnal, P., Caseau, S. (2016) Presented at the Joint meeting of the Restore America’s Estuaries and The Coastal Society