

Tisbury Great Pond is a 700-acre coastal salt pond shared by the Towns of Chilmark and West Tisbury. Oyster Pond is a 200-acre coastal salt pond located in the Town of Edgartown. Both are separated from the Atlantic Ocean by a barrier beach. The barrier is breached 3 to 4 times each year by a committee of Pond Sewers (Tisbury Great Pond) or the Shellfish Department (Edgartown). The breach may last for months or for a matter of days. While open to the Ocean, the systems are tidal raising the salinity and removing large quantities of nutrients. After the breach has closed, the influx of fresh groundwater and stream flow gradually lowers the salinity and introduces new nutrients from the watershed. This effort is needed because the diverse nature of the tidal and non-tidal conditions in these two ponds makes it extremely difficult to model them compared to a continuously tidal system. In order to evaluate the system and prepare target nitrogen thresholds, two water quality models are required: a dispersion model that derives from the tidal phase in the system and a mass balance model that reproduces the dilution and nutrient changes that occur as the system refills with freshwater from the watershed.

Sampling to date has focused on the summer months when water quality is lowest. However, this time frame is not typically when the ponds are opened to the Ocean. We expect the sampling to occur in the late fall or early spring in order to gather detailed water quality and field data before, during and after a breach of the two ponds. This data is necessary as the basis to develop the water quality models.

Farm Pond is a 35-acre tidal pond situated in the Town of Oak Bluffs. The system has been enrolled into the MEP process with all the required water sampling data completed. The Town was the recipient of a Coastal Zone Management grant to allow the preparation of the hydrodynamic circulation model by the Applied Coastal team utilized by the MEP. We propose to prepare the land use statistics required for the nitrogen-loading model. The Commission prepared the Edgartown Great Pond land use database for the recently completed draft report and is familiar with the model requirements.

2. APPROACH TO THE PROBLEM (Provide a description of the project and the strategy to be implemented in response to the identified problem, including how appropriate interest groups in the watershed will be made aware of the project and how results of the project will be disseminated to these groups.):

The planned Tisbury Great Pond and Oyster Pond project will include preparation of a Sampling and Analysis Plan for the sampling methodology, sample handling and processing and lab analyses. The goal of this task is to collect adequate information to allow the MEP to model the systems fully and accurately. Managed ponds of this type require data collection timed to reveal both tidal and non-tidal conditions because their circulation varies dramatically through the drain-down, tidal and refill stages. The field data and water quality samples will be collected before, during and after the first successful inlet cut through the barrier beach following the project start date. Data to be collected at each of the 12 stations will allow an accurate determination of the refill rate and changes in pond volume, changes in conservative parameters such as salinity and changes in non-conservative parameters such as total nitrogen during and after a breach to the ocean. This information is crucial to accurately preparing the dispersion and mass balance water quality models required for these pond systems. We propose to carry out the following steps:

- ∞ Install two Global Water pressure transducers to record pond levels at 10-minute intervals before during and after the system is opened to the Ocean. Devices will be located near the barrier beach and remote from the breach.
- ∞ Collect salinity data as well as other in-field parameters and water quality samples at the stations sampled in the systems in 2007 (8 stations in Tisbury Great Pond and 4 in Oyster Pond). Data and samples will be collected before the system is opened to the Ocean and at regular intervals for five additional sampling rounds following the opening. At least three of the post-opening sample rounds will be scheduled after the breach has closed and the Pond system has begun to refill. The salinity, dissolved oxygen and temperature data will be collected in profile at no greater than 1-meter intervals to evaluate system mixing and stratification.

- ∞ Samples will be analyzed at the CMAST Coastal Systems Group lab for dissolved inorganic and organic nitrogen, particulate nitrogen and carbon and chlorophyll a.

The Farm Pond watershed land use analysis will be carried out using the methodology developed by the Cape Cod Commission for the nitrogen loading models for the Massachusetts Estuaries Project. The MVC followed this approach to prepare the database for the Edgartown Great Pond watershed utilized in preparing nitrogen loads for the recently released MEP Draft report. The Commission will identify parcel-level uses and their development potential and utilize Oak Bluffs Water District meter records to estimate residential wastewater production from all parcels in the watershed. A neighborhood survey of lawn size and fertilizer treatment level will be used to establish landscape nitrogen loading. Commercial source wastewater loads will be based on water meter data. Golf course turf will be measured from aerial photography and converted to nitrogen loading using standard agronomic fertilizer application rates and the MEP leaching rate. All the parcel level data will be entered in spreadsheets and provided to MEP personnel to review and finalize. A land use map will be prepared showing all parcels at a scale of approximately 500 feet to the inch.

PROPOSAL

SCOPE OF SERVICES

Please provide a brief descriptive statement for each objective and the task/activity, followed by the deliverable product(s) to be submitted. Tasks are to be content-specific which result in discrete deliverable products:

OBJECTIVE / TASK #1: Prepare for the sampling program.

Assemble necessary equipment, carry out maintenance and acquire supplies for sample collection and processing. Prepare a Sampling and Analysis Plan for the Tisbury Great and Oyster Pond sampling Tasks.

DELIVERABLES: A completed SAP approved by EPA and DEP.

COST: \$300.00

OBJECTIVE / TASK #2: Tisbury Great Pond data collection program.

Arrange for the use of a boat, collect, process and ship samples from 8 stations during 6 sampling rounds to the Coastal Systems Group Lab for analyses. Collect in-the-field data including salinity, temperature and oxygen saturation in profile at each station. Place two water level recording instruments tied to a common datum and set to record pond water level at 10-minute intervals over the course of the sampling project.

DELIVERABLES: Field data from 8 stations over 6 sampling rounds. 48 sets of sample analyses plus 6 blind duplicates. Pond surface elevation record over the course of the sampling program. Instrument and sample station locations will be recorded with GPS to within 3 feet.

COST: Request from 604(B): \$6595.00
Total Task Cost: \$8315.00

OBJECTIVE / TASK #3: Oyster Pond data collection program

Arrange for the use of a boat and collect, process and ship samples from 4 stations during 6 sampling rounds to the Coastal Systems Group for analyses. Salinity, temperature and oxygen saturation data will be collected in the field in profile at no greater than 1-meter intervals.

DELIVERABLES: Field data from 4 stations over 6 sampling rounds. 24 sets of sample analyses plus 6 blind duplicates. Pond surface elevation record over the course of the sampling program. Instrument and sample station locations will be recorded with GPS to within 3 feet.

COST: Request from 604(b) \$4762.00
 Total Task Cost: \$6482.00

OBJECTIVE / TASK #4: Farm Pond Land Use Data

Define Farm Pond watershed boundaries with MEP personnel. Utilize GIS data layers to identify all parcels within the watershed, their current land use and their potential for further development. All parcels and appropriate data will be entered into Microsoft Access database. Determine watershed-specific nitrogen loading parameters including residential water use from water meter data and lawn size and treatment level from residential survey. Determine golf course turf area, roads and rights-of-way, open space and town-owned parcels within the watershed. Identify areas contributing stormwater discharge to the watershed. Enter data into the Land Use Nitrogen Model spreadsheet and provide to MEP personnel for review and approval.

We are proposing to fund approximately half of the cost of this Task with MV Commission funds.

DELIVERABLES: MEP land use and nitrogen loading model for the Farm Pond Watershed. Land use map at a scale of approximately 500 feet to the inch displaying vacant, residential, commercial, open space, agriculture, golf course, landfill, public supply well, roads, rights of way etc.

COST: Request from 604(b): \$2750.00
 Total Task Cost: \$5539.00

OBJECTIVE / TASK # 5 : Reporting

Prepare quarterly progress reports. Prepare a final report discussing the lab results in the framework of the tidal data collected. The report will be converted to a web-ready format and posted on the Martha's Vineyard Commission's website.

DELIVERABLES: A) Quarterly Reports
 B) Final Draft Report and Final Report
 C) Post final report on MV Commission website

COST: \$1730.00

**PROPOSAL
 FFY 2008**

PROJECT BUDGET

(This budget is for proposal evaluation purposes. Use whole dollar method.)

Expense Items	604 (b) Amount	Cost Share (not required)	Total Amount
Respondent's Salary - By Title and salary range Water Resource Planner GIS Planner	\$9597.00	\$2789.00	\$12386.00
Subcontractual Services SMAST Lab analyses 84 samples @ \$75.00	\$6300.00	0	\$6300.00
Equipment	0	\$2000.00	\$2000.00

On hand at 10% of value			
Supplies (including printing, mailing) Shipping samples	\$120.00	0	\$120.00
Travel (for mileage only @ 0.40 cents/mile) 300 miles @ \$0.40	\$120.00	0	\$120.00
Other Use of Shellfish Department boats for sampling 36 hours @ \$40	0	\$1440.00	\$1440.00
Total Amounts:	<u>\$16137.0</u>	<u>\$ 6229.00</u>	<u>\$ 22366.00</u>

OVERHEAD RATE (%) 125%
TOTAL REQUEST FOR GRANT: \$ 16137.00 604 (b) Funds
TOTAL COST SHARE: \$ 6229.00 (Not Required)
TOTAL BUDGET AMOUNT: \$ 22366.00

All Respondents must clearly indicate in their proposal budgets the specific tasks with dollars amounts that will be used to meet or exceed the MBE/WBE "Fair Share" requirements.

We propose to request a waiver from the full MBE/WBE requirement for the following reasons: The primary work to be performed under this proposal is in-house using existing Commission staff. The sub-contract for sample analyses is to the UMass Coastal Systems Group Lab that has performed analyses for all previous 604(b) grants. Their commitment to meet MBE/WBE requirements is attached.

We propose to utilize \$500.00 of the overhead billed within Tasks 2, 3 and 4 to acquire office supplies from an MBE/WBE source.