

# **Martins Pond Assessment and Remediation Project Water Flow Improvements and Public Outreach Report**



**by  
Martins Pond Reclamation Study Committee  
and  
Malcolm Pirnie Inc.**

**Town of North Reading  
January 18, 2006**

**Contract No: CTCEQE100053210000000**

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## APPENDICES

### A. TOWN-WIDE BEAVER ASSESSMENT

# **I. Scope of Services**

## **ATTACHMENT A SCOPE OF SERVICES NOVEMBER 2004**

### **Martins Pond – Assessment & Remediation**

#### **I. Purpose**

Martins Pond, a Great Pond of the Commonwealth, is highly eutrophic, exhibits very high levels of phosphorus, and is on DEP's Year 2002 Integrated List of Waters as impaired by turbidity, noxious aquatic plants, metals, and exotic species. The Town of North Reading, in collaboration with DEP, the Martins Pond Association, Merrimack College, and Malcolm Pirnie Inc has initiated a program to conduct assessments of water quality, wetlands, and hydraulic conditions and to develop recommendations to address identified problems. The work of this project will build upon the work completed in Martins Pond Assessment Study by Merrimack College and Malcolm Pirnie Inc (March 2003).

The General Court of the Commonwealth has directed the Department of Environmental Protection, hereafter called DEP, through Chapter 352 of the Acts and Resolves of 2004, Section 78, to expend \$300,000 toward the assessment and remediation of Martins Pond. The Town of North Reading, hereinafter the Town, agrees to use funds received from DEP specifically for the purpose of water quality problem identification and mitigation.

#### **II. Scope of Services**

The Scope of Services for this Contract shall consist of the following tasks.

- 1) The Town will continue water quality assessment work conducted on Martins Pond by towards the goal of completing a new Diagnostic/Feasibility Study for Martins Pond and an assessment of potential Nonpoint source pollution in the Martins Pond Watershed. A D/F study conducted in 1985 by Anderson Nichols and Lycott reported low levels of total phosphorus and N/P ratios exceeding 35 which indicated phosphorus limitation. Recently collected data by Merrimack College and DEP indicate that Martins Pond has extremely high total phosphorus in some years and moderately high total phosphorus in other years which appear to be related to the color of the water. Such high levels of phosphorus suggest phosphorus is not limiting. The D/F study should focus on resolving why the tributaries and pond vary from year to year in total phosphorus and other parameters and if the high levels are due to a natural source such as wetlands or due to anthropogenic pollution.

The ten month Diagnostic/Feasibility study will include:

- a. An introduction summarizing past studies and outlining current problems in the pond.

- b. Preparation of a Quality Assurance Project Plan (QAPP) for DEP approval that outlines sampling sites, sampling procedures, and analysis of samples.
  - c. Bi-monthly (every other month) sampling from an in-lake station, and a minimum of six upstream tributary stations and at least 2 wetland sites. In addition to monthly sampling collect sets of samples during three storm events at the tributary and wetland sites. The monitoring should include nutrients (ortho and Total phosphorus, nitrate+nitrite, ammonia and TKN (or TN), TSS, turbidity, true color (PCU), Secchi transparency, chlorophyll a, and E. coli bacteria; Sampling should include a quality assurance plan with field blanks, duplicates and lab spike samples. If non-state certified laboratories are used, at least 10 percent of samples should be duplicated by a certified laboratory. At each of the sites water discharge should be measured and at least 2 (maximum of 6) stage recorders installed to estimate daily flows. Groundwater levels and porewater quality should be monitored in the wetland sites.
  - d. Creation of a yearly phosphorus, nitrogen and hydrologic water budget. In the budget, detail how much of the phosphorus is coming from natural wetlands vs. septic systems vs. sediments, vs. other sources and detail how much is contributed by each subwatershed.
  - e. Analysis and discussion of all historic and current data to determine how does year to year changes in hydrology, groundwater levels or weather influence the concentration and export of nutrients to the lake and how does the nutrient budget change in wet vs. dry months. Modeling with SWMM or other appropriate software can be used for this task.
  - f. Delineate and describe wetland in the watershed and analyze the relationship between wetland area and export of phosphorus, iron and color from different subwatersheds.
  - g. Provide a recent macrophyte map of the lake, discuss changes in macrophyte communities since 1985 and management options including the use of recreational zoning (boat channels, swimming beach maintenance etc) and the use of benthic barriers and sediment curtains to enclose swimming areas. Include a discussion of rare or unusual species of algae or plants in the lake or bordering wetlands (e.g. moss, alder (N-fixing), duckweed, which may be adapted to the unusual nutrient and water quality conditions.
  - h. Determine how much of the light attenuation is due to true color vs. algae vs. suspended solids.
  - i. Determine the levels of E. coli bacteria in the pond and identify sources of bacteria in the watershed.
  - j. Review past studies of flow restrictions in Martins Brook and collect and analyze additional data on sediment depth and composition (organic matter content, grain size, and chemicals per 401 WQC for dredge spoils) in Martins Brook.
- 2) A draft D/F study will be delivered to DEP within 3 months of the final month of sampling and after addressing DEP comments will deliver 3 copies of the final D/F report to DEP within 2 months of receiving DEP comments.
- 3) The Town will implement a series of water flow improvements including culvert cleaning, removing flow restrictions, stormwater retention, adjustment of weir elevations,

and beaver dam modifications on the Skug River and Martins Brook. The Town will document these improvements in photographs and narrative description in a project summary report to DEP.

- 4) The Town will purchase equipment such as harvester, trailer and conveyor, for use in the continued maintenance of nuisance aquatic plants. A roll-in docking system will be purchased to facilitate the access of this equipment to Martins Pond.
- 5) The Town shall conduct pilot applications of an aquatic herbicide in enclosures to control nuisance and exotic aquatic plants and a pilot alum treatment in enclosures to study the effects of reduced release of sediment phosphorus.
- 6) The Town shall conduct a pilot study in the Martins Pond area to identify the sources of sedimentation migration to the Pond.
- 7) The Town will conduct public education activities including implementation of a Community Septic-system Management Program and Detergent Reduction Program. The programs will be conducted for households within 300 feet of Martins Pond or its tributaries.
- 8) The Town will conduct public outreach activities including the promotion of education for children and teenagers through other existing programs such as scouts and school activities. The Town will purchase and place signs in the watershed area as reminders of environmental issues. The Town will purchase materials to foster these programs including storm drain stencils. The public outreach program will also include discussion of a Beaver Management Plan in a public forum.
- 9) The Town will conduct long term planning and pilot a program to address beaver issues in the Skug River and Martins Brook.
- 10) The Town agrees to observe pertinent statutes, rules and regulations of the Commonwealth as pertains to procurement of subcontracts, records retention and construction.
- 11) The award of this Contract by DEP does not constitute a permit or any other approval that may be required for the implementation of the project funded by this contract. The Town shall timely obtain, and comply with, all federal, state and local permits and approvals that may be required for this project.

### **III. Method of Compensation under the Contract**

1. DEP will upon receipt of a properly executed Payment Voucher from the Town, reimburse the Town in the amount of \$300,000 (three hundred thousand dollars) for costs associated with Martins Pond.

2. **Upon execution of this contract, the Town may remit to DEP the attached Payment Voucher in order to obtain payment. The DEP mailing address is:**

**Steven J. McCurdy, Director  
Division of Municipal Services  
1 Winter Street, 5<sup>th</sup> floor  
Boston, MA 02108**

3. The Town agrees to execute said payment Voucher and submit it to DEP not later than June 30, 2005.
4. DEP agrees to process said Payment Voucher within 45 (forty-five) days of receipt.

**IV. Duration of the Contract**

The expected overall duration of the Contract is from on or about November 15, 2004 to June 30, 2005.

**ATTACHMENT B  
PROJECT BUDGET**

**Martins Pond – Assessment & Remediation**

EXPENSE ITEMS	Amount
<b>Subcontracts</b>	<b>\$300,000</b>
<b>TOTAL</b>	<b>\$300,000</b>

In consideration of work undertaken by or on behalf of the Town of North Reading to assess and implement improvements for Martin’s Pond, DEP is authorized by Chapter 352 of the Acts and Resolves of 2004, Section 78 to reimburse the Town in the amount of \$300,000 (three hundred thousand dollars).