

# Town Committees

Sudbury, Massachusetts



## Ponds and Waterways Committee Master Plan

March 5, 2010



## Table of Contents

Acknowledgments.....	3
Introduction.....	4
Vision.....	4
Goals .....	4
Activities .....	4
Functions.....	5
Issues & Opportunities.....	6
Universal Issues .....	6
SUASCO CISMA .....	8
Sudbury Priority Issues .....	8
Ponds:.....	8
Brook systems:.....	8
Rivers: .....	8
Hop Brook System, Including Grist Mill, Carding Mill and Stearns Mill Ponds.....	9
Sudbury River .....	10
Willis Pond.....	11
Cutting Pond .....	12
Conclusion .....	13
List of Appendices .....	14
Appendix 1 – Detail of activities to date .....	14
Appendix 2 – Report on Pond Committees .....	14
Appendix 3 – Watersheds .....	14
Appendix 4 – Water Body Inventory.....	14
Appendix 5 – Inventory of Environmental studies of Sudbury’s Water Resources – July 7, 2006.....	14
Appendix 6 – NPDES permit summary.....	14
Appendix 7 – 1978 Wetlands Evaluation Report .....	14
Master Plan Appendix 1 – Activities .....	15
Table 1: Ponds and Waterways Committee Activities .....	15
Report on Pond Committees .....	15
Watershed Identification Project.....	16
Comprehensive Map Suite.....	17
Water Body Inventory.....	19
Eco-friendly Lawn Seminar .....	19
Eco-friendly Lawn Program .....	19
Why? .....	19
How? .....	19
When? .....	20
The PWC Middle School Class Seminar .....	20
Town Crier Articles .....	20
PWC Website.....	21
Sudbury Day .....	21
Riverfest.....	21

## PWC Master Plan

Monitoring Hop Brook Remediation .....	21
Adopt-A-Pond Program .....	21
Invasive Plant Species Identification Guides.....	21
Master Plan Appendix 2 – Report on Pond Committees .....	22
Master Plan Appendix 3 – Watersheds .....	35
Master Plan Appendix 4 – Waterbody Inventory .....	36
Master Plan Appendix 5 – Environmental Studies .....	37
ENVIRONMENTAL STUDIES OF SUDBURY’S WATER RESOURCES .....	37
Master Plan Appendix 6 – NPDES Permit Summary.....	43
Master Plan Appendix 7 – Wetlands Evaluation Report .....	50

## Acknowledgments

The Sudbury Ponds & Waterways Committees acknowledges its members, associate Members, and former members for their various contributions to Committee and this Master Plan:

### **Current Members:**

Mary Addonizio  
Alan Bascom  
Dave Blohm (Vice Chair)  
Susan Crane (Chair)  
Michael Dufault  
Stephen Gabeler  
Paul Greenspan  
Rob Hershfield  
Ted Klein

### **Associate Members:**

Nancy Hershfield  
Frank Lyons

### **Former Members:**

Rich Davison  
Mark Ensign  
Michael Fee  
Paul Griffin  
William Leslie  
Ted Pickering  
Joel Singer

## **Introduction**

The Town of Sudbury is rich in natural beauty. The Town's abundant waterways - ponds, streams, rivers and wetlands - and their proximity to vast acres of National Wildlife Refuge, Sudbury Valley Trustees (SVT) and Town-owned lands give Sudbury its special character. Safeguarding the integrity of Sudbury's ponds and waterways is critical to maintain the Town's quality of life. This Master Plan describes the current activities and future plans of the Ponds and Waterways Committee (PWC) and provides a brief history and current status of Sudbury's ponds and waterways. It is a living document that will be updated as necessary.

## **Vision**

The PWC considers the Town's ponds and waterways sustainable public resources that allow a wide range of recreational uses. The PWC envisions an active Sudbury community, educated about its waterways, involved in building a sustainable system, and ready to reap the benefits in the Town's improved quality of life.

## **Goals**

The purpose of the PWC is to advise the Board of Selectmen about the quality of publicly-owned ponds and waterways throughout Sudbury. Working closely with all Town boards, committees and departments, the primary goals of the PWC are to:

- Assess the condition and recreation potential of the Town's major ponds, waterways and tributaries, and create a body of knowledge about their scope and character.
- Educate and engage the community and its leaders in this process.
- Recommend actions and remediation strategies where necessary.
- Enhance opportunities and respond to the community's needs for recreational use as appropriate.

## **Activities**

The PWC undertakes many activities in pursuit of its goals to assess and remediate Sudbury's ponds and streams, to educate the public, and to enhance opportunities for recreation. The PWC's activities are determined on an ongoing basis. Current activities are detailed in Appendix 1.

The PWC's initial focus is on assessment. This includes observing and aligning with other Town committees with similar interests, developing a methodology for dividing Sudbury into individual watersheds, creating a comprehensive suite of maps of Sudbury's water bodies, and building an inventory of information and photographs of each water body.

Following an initial assessment, the PWC educates through seminars, articles, web site information, and various community events. Topics include building awareness of Sudbury's water bodies, eco-friendly lawn care, storm water issues, invasive plant species, remediation efforts, and recreational activities. Remediation efforts are ongoing and involve closely monitoring events, developments, and activities of related organizations and neighboring towns (including federal and state permitting of the Marlborough Easterly Waste Water Treatment Plant). The PWC will continue to pursue activities that enhance recreational opportunities for Sudbury by building on information gathered from assessment and remediation efforts, and by working in conjunction with other Town departments and committees. Appendix 1 lists the PWC activities and current status.

## ***Functions***

The PWC performs the following functions to achieve its goals of preserving and enhancing the integrity and use of Sudbury's ponds and waterways.

- **Surveys Similar Organizations** - Identify similar ponds and waterways groups in other towns in Massachusetts (or elsewhere, if applicable), summarize and evaluate their mission, makeup, relationship to other Town boards and commissions, success rate, challenging issues, etc. (See Appendix 2).
- **Builds a Constituency** - A large number of individuals and entities (corporations, governmental, non-profit organizations and foundations) in the region committed to the vision are needed as stewards, financial supporters and advocates for the Town's ponds and waterways. The PWC will explore potential partnerships with such organizations and advocate for their sustained commitment to maintaining pond and waterway quality. The PWC considers Sudbury's citizens as a "key constituency" whose support and cooperation are critically important.
- **Studies and Monitors Water Bodies** - Actively promote and/or initiate research as necessary to assess conditions, evaluate remedial alternatives, support pond sustainability and explore future uses of the Town's ponds and waterways as a public, recreational resource. Pond and stream water quality and wildlife monitoring will provide an important scientific database for future actions. (Appendices 3 and 4 are inventories of the Town of Sudbury's Watersheds and Water Bodies.)
- **Educes** - The PWC must raise public awareness, provide education about the problems and solutions, and build public support in the community for the proposed monitoring and remediation efforts. The PWC will be a strong advocate for the ponds and waterways of Sudbury.
- **Restores Ponds and Waterways** - Make recommendations to the Selectmen, to be implemented cooperatively with other stakeholders, which would timely restore the ecological health of the Town's publicly-owned ponds and waterways. Identifies Funding Sources

Private philanthropy and public grant assistance will be critical components of assessment, education, and implementation of any long-term remediation efforts. Although the Committee is not authorized to fund raise independently, it should identify all potential funding sources for these efforts, assess their viability, and coordinate their execution.

- **Administers Responsibilities** - Report annually to the Board of Selectmen regarding ponds and waterways quality and their potential for public recreational usage.

Participate in the review of Town Meeting warrant articles and present comments and recommendations on those that affect the ponds and waterways.

- Respond to periodic inquiries about the Town's ponds and waterways posed by Sudbury residents and Town officials.

## Issues & Opportunities

### ***Universal Issues***

The PWC has identified the following list of historical, current, and potential impairments to water quality. These issues are not unique to Sudbury; similar ones are being faced by communities across the state, nation and globe. The PWC will endeavor to identify water bodies that have or may potentially have such impairments and will make recommendations regarding various types of prevention and remediation. Since these are universal issues, we recognize the value and importance of seeking collaborations with other groups and organizations that are also working to address them.

- **Eutrophication** – An excess of nutrients in a water body that leads to algal blooms, potentially toxic cyanobacteria, hypoxia, and disrupts the balance of plant and animal species. The nutrients are most often from inadequate wastewater treatment, failed septic systems, and runoff from agricultural and residential use of fertilizer.
- **Invasive species** – A rapidly increasing population of plant or animal species not native to the location causing a decrease or collapse of native species. Invasive species can be initiated or promoted by eutrophication. Water chestnuts and milfoil, both Eurasian, are two examples of problematic aquatic invasives in much of the Northeast, including Sudbury. Remediation of an out of control population can be costly. Prevention, early detection, and small scale remediation are economically wise investments. Occasionally, native species can also present problems when populations are out of balance.
- **Toxic chemical contamination** – Industrial, commercial, municipal, agricultural and residential use and disposal of toxic chemicals have always been and will remain a source of water quality impairment. Regulation and education in proper and selective

storage, use and disposal of these compounds are major tools to minimize their flow into Sudbury's ponds and waterways. Remediation of historical long-term contamination, such as mercury in the sediments of the Sudbury River, is extremely complex and costly. It requires cooperation and creativity on the part of many governmental and private organizations and entities.

- **Storm water management** – Nutrients, toxins, sediments, debris, and litter can be transported by the flow of storm water. Whenever land is disturbed and its contours are altered, there is a likely risk of erosion, silting, and flooding downstream of the disturbance. Water soluble nutrients and toxins can be transported significant distances even on undisturbed land. Controlling the content and path of this water flow is a major tool in the protection of water quality.
- **Protection of Town wells** – Most of the above issues can have an impact on our public water supply, which relies on clean and plentiful groundwater. Prevention must have the highest priority since the cost of remediation can be extreme.
- **Recreational opportunities** - The PWC recognizes the universal value of the recreational opportunities of Sudbury's public ponds and waterways. There can be many opportunities for physical recreation, such as boating, swimming, walking, fishing and skating. Aesthetic and intellectual engagement, such as photography, painting, meditation, birding and studying aquatic life, is also important to many of our citizens. The following list of "impairments" to the full realization of these opportunities needs serious consideration and improvements:
  - **Access** – Many Sudbury citizens are unaware of the Town's large number of public ponds and waterways. Some information they need includes where these resources are, what is there, where to park, what land is public or private, and what footpaths are available. Easily available descriptive information and maps can help to address some of these issues. The Town web site is an excellent place to create, collect, and access these materials. Simple signage on location would also be helpful. Some impediments to use, such as ample or nearby parking, might require more significant efforts and coordination among multiple Town departments.
  - **Safety** – Active development of these recreational activities carries with it a responsibility to educate the public on safety. Some of these water bodies are located in remote areas (at least by suburban standards). Serious attention to water safety becomes critical when alone, even on a small body of water. Other safety issues include winter ice, poisonous plants and difficult terrain, such as in swampy areas.
  - **Protection** – The potential exists for recreational use to damage places we treasure. Careless trash disposal, irresponsible fires, inadvertent transport of invasive species on the hull of a boat, trespass on private property, disturbance of nesting wildlife, and overuse in areas of fragile ecosystems are among some of the

obvious. Education can reduce carelessness due to ignorance. Active participation of those who value and understand these natural places can help reduce damage caused by reckless indifference.

## **SUASCO CISMA**

The Sudbury - Assabet – Concord Cooperative Invasive Species Management Area (SUASCO CISMA) was launched May 1, 2009 with participation of a significant variety of non-profit, municipal, state and federal organizations and agencies, including the Town of Sudbury. Invasive species have been identified as a leading threat to native biodiversity in our region. Collaboration on experience, expertise, plans, and resources within this group will benefit all in dealing effectively with invasive species control.

### ***Sudbury Priority Issues***

Sudbury has five major ponds that are greater than 10 acres, two major brook systems, and one major river, which are listed below.

#### **Ponds:**

Grist Mill Pond – 14 acres  
Carding Mill Pond – 40 acres  
Stearns Mill Pond – 18 acres  
Willis Pond – 68 acres  
Cutting Pond – 17 acres

#### **Brook systems:**

Pantry / Cold Brooks draining the northern part of Sudbury  
Hop / Run / Dudley / Allowance / Wash Brooks draining the southern part of Sudbury

#### **Rivers:**

The Sudbury River drains all but the northwest corner of Sudbury. The northwest corner is in the Assabet River watershed.

Issues and opportunities to protect and remediate these water bodies and to enhance recreation on them, including the creation of public access points, need top priority. The 2009-2013 Open Space and Recreation Plan also addresses issues of ponds and waterways and is incorporated herein by reference. See:  
<http://www.town.sudbury.ma.us/documents/dl/5051/OSRPCFINALJune2009.pdf>

Protecting present and potential future Town wells that supply potable water to our communities is critical.

Encouraging and assisting community-based efforts to protect and remediate Sudbury's numerous small water bodies are high priorities. Some critically necessary efforts require Town-wide participation to have a significant impact on protection and remediation. One example is reducing fertilizer runoff and maintaining naturally-vegetated buffer zones

around water bodies. Advocacy for the stewardship of public and private water bodies may be the only effective way to improve and protect their conditions, as they are all in one common greater watershed.

## **Hop Brook System, Including Grist Mill, Carding Mill and Stearns Mill Ponds**

Hop Brook and its impoundments do not meet state water quality standards. Hop Brook's ponds suffer from low dissolved oxygen levels and excessive growth of aquatic vegetation, primarily caused by excessive phosphorus loading, which degrades aquatic habitat. The nutrient phosphorus above normal background levels in water bodies causes overgrowth of floating and rooted aquatic plants. Excessive vegetative growth and decomposition reduce dissolved oxygen in the water column. Adequate dissolved oxygen is necessary to support aquatic life, such as fish.

Phosphorus loadings originate from point and non-point sources. In the Hop Brook system, the primary original source is the point source discharge from the Marlborough Easterly Wastewater Treatment Plant (MEWWTP). Non-point sources include internal recycling of phosphorus from sediments and storm water runoff. [Source: "Hop Brook Sediment and Dam Removal Study – Draft Report – U.S. Army Corps of Engineers – July 29, 2008"] See:

[http://www.town.sudbury.ma.us/documents/dl/5474/Hop\\_Brook\\_Draft\\_Report\\_ver\\_7-29-2008.pdf](http://www.town.sudbury.ma.us/documents/dl/5474/Hop_Brook_Draft_Report_ver_7-29-2008.pdf)

The most critical restoration needs in Sudbury concern Hop Brook's severely eutrophied mill ponds: Grist Mill Pond, Carding Mill Pond, and Stearns Mill Pond. Hop Brook's phosphorus-laden sediments primarily impact the Town of Sudbury. In the Hop Brook system, phosphorus that is trapped particularly in the mill ponds' sediments is an ongoing nutrient source to this waterway, exacerbating eutrophication problems.

Both EPA and MassDEP may have jurisdiction over the cleanup of Hop Brook and its ponds under the state and federal Clean Water(s) Acts. More specifically, those agencies have jointly issued a NPDES permit to the Marlborough Easterly Wastewater Treatment Plant, whose treated sewage effluent discharges into the headwaters of Hop Brook. The permit limits the levels of certain contaminants in the effluent, including phosphorus; however, elevated phosphorus levels are still present in the treated sewage being discharged. Excessive discharges of phosphorus through the plant's effluent over many decades are primarily responsible for Hop Brook's excessive nutrient levels and its resulting eutrophication.

The agencies are currently evaluating potential long-term solutions to Hop Brook's eutrophication issues, including further reductions of phosphorus in Marlborough's wastewater plant's effluent and dredging portions of the Hop Brook system to remove contaminated sediments. The Hop Brook Protection Association, a local non-profit organization, has been instrumental in advocating for restoration of Hop Brook and its mill ponds. The Town of Sudbury has an ongoing opportunity to advocate proactively

for the highest level of protection possible for Hop Brook, both through the NPDES permitting process and by continuing to be involved in proposed restoration measures.

Remediation of the Hop Brook system's three major ponds will likely involve the following:

1. **Public education:** The PWC can play a key role here. Opportunities include drafting newspaper articles, preparing educational materials (e.g., multimedia presentations for schools) for public dissemination, hosting public events (e.g., walks, public forums), and posting information on the PWC's web site.
2. **Data collection/assessment:** This is an ongoing process. *See Inventory of Environmental Studies of Sudbury's Water Resources*, dated July 7, 2006, attached as Appendix 5. In winter 2006, funded by MassDEP, the Army Corps of Engineers gathered sediment data from Hager (upstream in Marlborough), Grist Mill, Carding Mill, and Stearns Mill Ponds. Evaluating long-term remedial options for the ponds will require reviewing studies performed to date, assessing data gaps, and collecting and analyzing any necessary additional data.
3. **Short-term remedial measures:** Nuisance aquatic weed harvesting is among the short-term, interim remedial measures. The Hop Brook Protection Association, with support from the Community Preservation Act, Sudbury DPW, and U.S. Fish and Wildlife, has spearheaded this effort on Carding Mill Pond. The PWC should continue to support appropriate short-term measures.
4. **Long-term remedial measures:** Potential remedies for the long-term restoration of the three ponds include dredging phosphorus-contaminated sediment, alum treatment, chemical treatment, dam removal, and any combination thereof. Remedial options involving dam removal, dam breaching, and dredging have been evaluated by MassDEP and the Army Corps. They have issued a report presenting their options, but have made no recommendations.
5. **Reduction of nutrient loading by the Marlborough Easterly Wastewater Treatment Plant's effluent:** This is the subject of a negotiated NPDES permit jointly issued by EPA and MassDEP to Marlborough after years of litigation. See the attached summary in Appendix 6.
6. **Review of efforts in similar situations at other locations:** Other towns and locales are addressing problems similar to Hop Brook's. The PWC and its partners should build on the research and experiences of others.

## Sudbury River

The Sudbury River is the single largest body of water accessible in the Town for a wide range of recreational uses. In 1999, Congress designated 29 miles of the Sudbury, Assabet, and Concord Rivers as federally-protected Wild & Scenic Rivers, including the entire segment flowing through Sudbury. Many Sudbury citizens treasure the

opportunities for canoeing, kayaking, wildlife observation, and just witnessing the passing of seasons along the Sudbury's meandering course. Unfortunately, it also has one of the most significant sediment contamination problems (particularly with respect to mercury) in the nation, which will be with us for many years to come. As a result, fish in the Sudbury River are unsafe for human consumption. The River also suffers from invasive species problems, such as abundant purple loosestrife and water chestnuts. The Town of Sudbury will be engaged with other organizations on the state, federal, and private levels continuously for an indefinite period to address these problems.

In 1998, various Massachusetts and Federal entities (the natural resource "Trustees") entered into a Natural Resource Damages settlement for natural resources injured, destroyed, or lost by the release of hazardous substances from or at the Nyanza Chemical Waste Dump Superfund Site in Ashland, Massachusetts.

The overarching goal of the Trustees is to restore the injured natural resources of the Sudbury River, including adjacent wetlands and floodplains, and species that are present or historically present, including fish, amphibians, reptiles, other aquatic organisms, birds, and mammals. The objective of Restoration Planning is to identify projects that will improve natural resources above the baseline level because the injury has occurred over time.

The Trustees have identified the following priorities for restoration of injured natural resources:

- aquatic biological resources and their supporting habitats and food sources;
- riparian and floodplain biological resources and their supporting habitats and food sources;
- groundwater;
- water-dependent recreational uses, e.g. recreational fishing, and
- environmental education and stewardship.

Human health and ecological risk assessments have been conducted downstream of the Nyanza Site in and along the Sudbury River. Media sampled include fish, sediment, surface water, crayfish, mink, as well as tree swallows, songbirds, kingfisher and ducks. Various remedial alternatives are being considered. EPA is expected to issue a Draft Feasibility Study sometime in 2009.

[Source: Rescrit.doc supplied by Massachusetts Office of Energy and Environmental Affairs Nyanza Natural Resources Damages Restoration Coordinator]

## **Willis Pond**

Willis Pond, the largest pond in Sudbury, is in good condition. It is in the Wayside watershed but is upstream from the contamination in Hop Brook. Its outlet flows into Hop Brook through Run Brook. The entire north shore of the pond is unpopulated wetland bordering on the Assabet National Wildlife Refuge. The pond deserves high priority for protection and improvement. This is a prime example of where community engagement in the vigilance against invasive species can assist in identifying and addressing problems before they require expensive remedial efforts to eradicate. In recent

years, rising water levels caused by beaver activity have created problems. The water in nearby Crystal Lake has been rising with it, accompanied by reports of property flooding. Although Willis Pond has a public dock and beach, access is not well known or easy to find. Reports of broken glass embedded deep into the sandy beach need further investigation. The pond is used for fishing, boating, and ice skating. Recreational opportunities can be improved significantly with modest investments in cleanup, signage, and easily available public information.

### **Cutting Pond**

Significant wetlands exist between Cutting and Puffer Ponds. Portions of the Cutting Watershed are in Sudbury, although most of it lies in Maynard and Stow. A 1978 wetlands evaluation report identified it as having moderate value to the Town's water supply. The Cutting Watershed also provides excellent habitat for wildlife, particularly waterfowl, songbirds, and small mammals. Now that much of this area is part of the Assabet River National Wildlife Refuge, land surrounding the wetlands is protected from development; however, these wetlands can still be affected by runoff from nearby developed areas.

Further research should be done into potential recreational uses for Cutting Pond including access from the Assabet River National Wildlife Refuge. There is public access from the abutting Cutting Farm Conservation Area. Although access appears to be possible from the Refuge, it is not on the current map of legitimate trails. Discussions of access development would have to be opened with U.S. Fish and Wildlife, which manages the Refuge. Recreational uses for Pond C3 (3.5 acres) might also be further explored. Also, the beaver dam at the outflow of Cutting Pond should continue to be monitored for opportunities to remediate problems associated with flooding and tree loss in the wetlands along Route 27 and flooding of residential property in Maynard.

## Conclusion

Since its creation, the majority of the PWC's activities have focused on assessment and education as essential places to start, and a great deal has been accomplished. The PWC members greatly appreciate the opportunity in the chartering of this committee to be creative in how we approach these tasks. During the next several years, the PWC will continue these activities and will also expand into the areas of small scale prevention and remediation, monitoring and advocacy of large scale remediation (especially for Hop Brook and its mill ponds), and developing increased and diverse recreational opportunities on and around Sudbury's water bodies.

The development of the Adopt-A-Pond program is expected to be a major tool for the protection and small scale remediation of some of the unnamed water bodies. It will also contribute to assessment, education, and recreation. Increased coordination with other Town committees and boards will be part of assessing potential development to enhance recreational opportunities on some of the larger Town-owned water bodies. Where funds are needed, a strong consensus is required. The PWC expects to play a significant role in assessing the community's interest in any proposals and in working to build a public consensus.

The PWC recognizes that the two major potential remediation projects (Hop Brook's mill ponds and the Sudbury River) have been under consideration for many years, are extremely complex, and involve private, non-profit, municipal, state, and federal stakeholders. Our role may not be as a major stakeholder, but we can put our efforts into monitoring new developments and making recommendations to the Selectmen, educating the community, and advocating timely progress towards the overall objectives of the remediation of these important waterways.

The response of the children to the Middle School seminars taught us and reminds us that our children love to explore the world of frogs and bugs and plants in and around our ponds and waterways just as we did when we were young and still do. Much of what we do is for them and for future generations.

## **List of Appendices**

### ***Appendix 1 – Detail of Activities to Date***

Future activities will be described in the Annual Report of the PWC.

### ***Appendix 2 – Report on Pond Committees***

This appendix was submitted to the Sudbury Board of Selectmen on December 19, 2006 to fulfill a requirement to identify, summarize, and evaluate similar ponds and waterway groups in other towns in Massachusetts, or elsewhere if applicable.

### ***Appendix 3 – Watersheds***

This appendix describes each watershed and provides a history of each one to the present. Developing this appendix further will be an ongoing activity of the PWC. This information is available as a separate document on the PWC section of the Town website.

### ***Appendix 4 – Water Body Inventory***

This appendix catalogs each identified water body and includes photographs and a description. The further development of this appendix will be an ongoing activity of the PWC. These are available as separate documents on the PWC section of the Town website, identified by watershed.

### ***Appendix 5 – Inventory of Environmental Studies of Sudbury’s Water Resources – July 7, 2006***

### ***Appendix 6 – NPDES Permit Summary***

Marlborough Easterly Wastewater Treatment Plant National Pollutant Discharge Elimination System Permit

### ***Appendix 7 – 1978 Wetlands Evaluation Report***

Available at the Conservation Commission office

# Town Committees

Sudbury, Massachusetts



## Ponds and Waterways Committee

### Master Plan Appendix 1 – Activities

**Table 1: Ponds and Waterways Committee Activities**

Activity	Assessment	Education	Remediation	Recreation
Report on Pond Committees	✓			
Watershed Identification	✓			
Comprehensive Map Suite	✓	✓		
Water Body Inventory	✓			
Eco-friendly Lawn Seminar		✓		
Eco-friendly Lawn Program		✓		
Middle School Class Seminar		✓		
Town Crier Articles		✓		
PWC Website		✓		
Sudbury Day		✓		
Riverfest		✓		✓
Monitor Hop Brook Remediation	✓		✓	
Adopt-A-Pond	✓	✓	✓	✓
Invasive Species Identification		✓	✓	

#### ***Report on Pond Committees***

The Report on Pond Committees is Appendix 2. It was submitted by the PWC to the Sudbury Board of Selectmen on December 19, 2006. This report fulfills a requirement to identify, summarize, and evaluate similar ponds and waterway groups in other towns in Massachusetts, or elsewhere, if applicable. An updated report may be created periodically as these groups evolve.

## ***Watershed Identification Project***

Using geographic data supplied by the Commonwealth of Massachusetts, the PWC divided Sudbury into nine watersheds to facilitate assessment of the Town's ponds and waterways. A watershed is a region draining into a river, river system, or other body of water. Delineating the Town into watersheds allows Committee members to focus on a manageable area, to highlight any issues and opportunities, and to develop a cohesive plan that takes into account each watershed's unique features.

The Town of Sudbury covers approximately 24.4 square miles. All of Sudbury is in the 5,000-square mile Merrimac River watershed which flows into the Atlantic Ocean at Newburyport, Massachusetts. The Merrimac watershed includes the Nashua River, Wachusett Reservoir, Souhegan, and Contoocook rivers, Lakes Winnipesaukee and Squam, the Pemigewasset River and Franconia Notch. The Sudbury, Assabet, Concord River (SuAsCo) subwatershed covers 400 square miles and includes all or part of 36 towns.

Detailed descriptions of the watersheds are provided in Appendix 3. Ponds and waterways may be named (e.g., Hop Brook and Carding Mill Pond), but most do not have names. They may be partially or entirely situated on public or private land.

- Sudbury has nine watersheds.
- All but one watershed (Goodnow) cross into neighboring towns.
- Two watersheds (Cutting and Powder Mill) flow into the Assabet River.
- The remaining watersheds flow into the Sudbury River.
- There are approximately 190 ponds and 45 streams in Sudbury.
- Approximately 36% of unnamed ponds are on public lands.

Watershed	Unnamed Ponds	Unnamed Streams	Named Ponds	Named Streams	Unnamed ponds on private land
Cutting	9	1	3		8
Frost Farm	52	11		2	27
Goodnow	17	1	2	1	12
Great Meadows	32	4			17
Nobscot	13	6			12
Pelham Island	4	0			2
Powder Mill	9	1			10
Wayside	36	13	6	2	22
Woodside	7	3			4
<b>Totals</b>	<b>179</b>	<b>40</b>	<b>11</b>	<b>5</b>	<b>114</b>

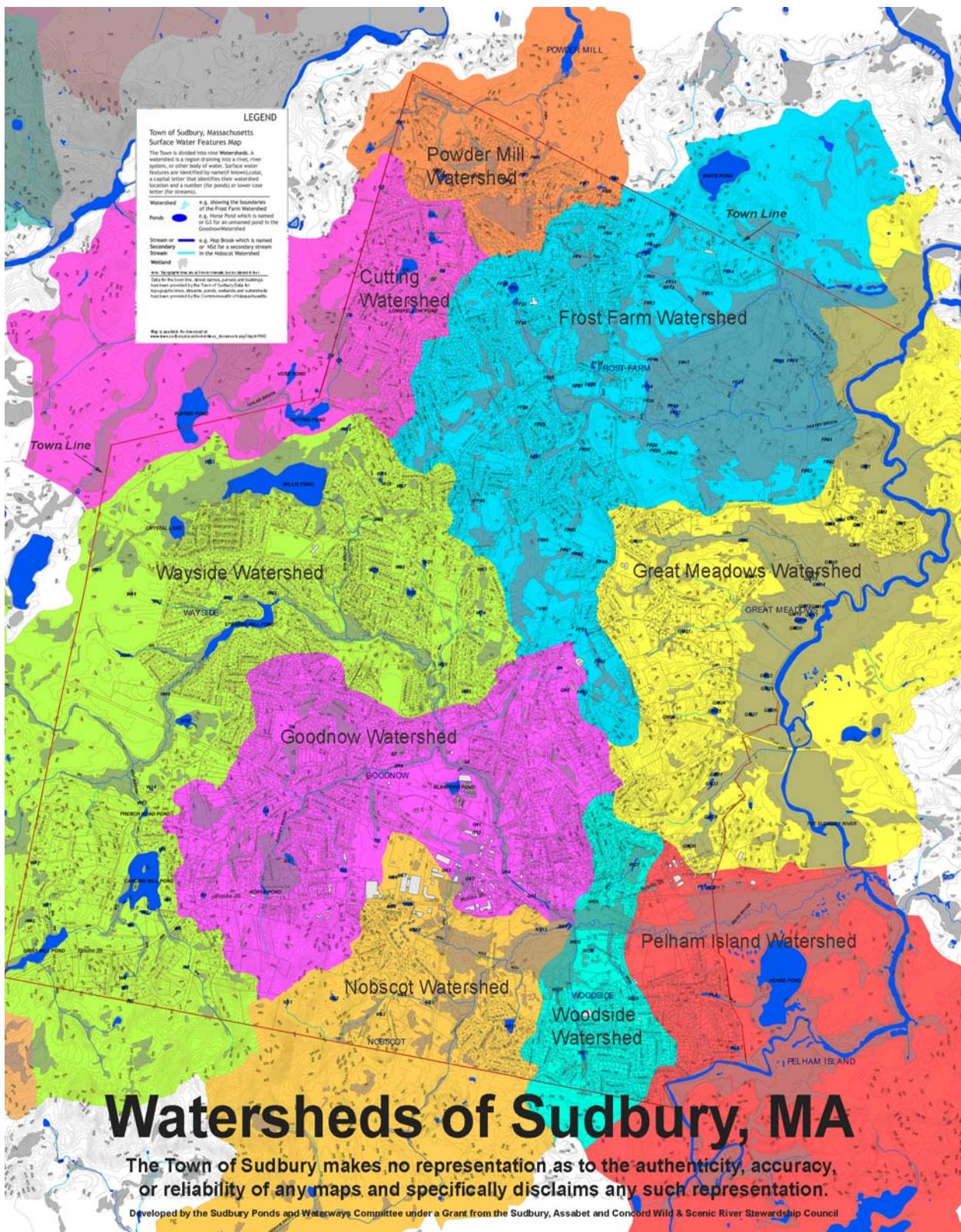
*Note: All numbers are approximate, since the process of identifying and cataloging is ongoing. The term "unnamed" refers to ponds that have no official name and have been assigned watershed and number references.*

### ***Comprehensive Map Suite***

With a grant from The Sudbury, Assabet, & Concord Wild & Scenic River Stewardship Council in 2007, an intern developed a geographic database and produced maps of the Town's water bodies.

Several maps were developed and published on the PWC's website. Ten maps have been printed and framed for display in the schools, Goodnow Library, and Town offices. Ten laminated maps were also produced for distribution to the middle school and Conservation Commission.

## PWC Master Plan



The nine watersheds comprising Sudbury

## ***Water Body Inventory***

In 2007, PWC members began developing an on-going water body inventory and assessment. Structured by watershed, this extensive compilation of photographs and notes on the Town's approximately 235 ponds and waterways is a valuable resource for understanding the relationships among water bodies and identifying the issues needing attention. Options for publishing this information will be discussed. The inventory is included in the Master Plan as Appendix 4.

## ***Eco-friendly Lawn Seminar***

The PWC sponsored an Eco-Friendly Lawn Seminar at Goodnow Library on June 14, 2008, which was open to the public. The seminar featured three speakers who discussed ways to maintain a lawn while minimizing the impact on surrounding water bodies. Similar seminars may be offered in future years.

## ***Eco-friendly Lawn Program***

The Eco-friendly Lawn Program will help protect Sudbury's ponds and waterways by minimizing the impact of lawn care on the surrounding environment. It is supported by River Stewardship Council grant monies to purchase lawn signs for the program, and is designed to promote water body friendly lawn care and water conservation.

### **Why?**

Chemicals used to promote growth and make lawns green can wash into nearby ponds and waterways and turn them green by promoting growth of unwanted algae and aquatic plants. Dense weeds and algae reduce oxygen in the water that can harm fish and other aquatic life. "Green water" is also unattractive for scenic and recreational uses.

### **How?**

Voluntarily comply with the following tips for creating a green lawn without creating green ponds and waterways:

- Use fertilizer sparingly, sweeping any overspray back onto the lawn to prevent runoff.
- Use pesticides and herbicides sparingly, spot treating affected areas only.
- Try using organic lawn care products and methods.
- Mow 2.5 to 3 inches high with a sharp blade to encourage dense growth and deter weeds.
- Mulch lawn clippings on the lawn to lessen the need for fertilizer; in autumn compost the clippings for use the following year.
- Do not over-water your lawn; instead water deeply and less frequently, timing watering to avoid evaporation and directing spray to avoid runoff.
- Re-seed bare spots with drought-tolerant varieties of grass to minimize the need for watering.
- Display a lawn sign to show your participation in the program and encourage your fellow Sudbury residents to do likewise.

### **When?**

One hundred lawn signs are available on a first-come, first-serve basis. They were approved for display beginning Earth Week, from Saturday, April 18 through Sunday, May 31, 2009 and again at the start of autumn, from Tuesday, September 1 through Wednesday, September 30, 2009. Dozens of property owners participated in the launch of the program in the spring 2009. More signs are expected to be displayed in the fall, including on many town-owned properties.

### ***The PWC Middle School Class Seminar***

PWC members created a Ponds & Waterways multi-media presentation for middle school earth science classes. The presentation package includes a PowerPoint slide show of animal life found in Sudbury's waterways, interactive work with the watershed map, and a fun quiz based on identifying the animal life seen in the slides.

In fall 2008, with enthusiastic support from the science coordinator and individual science teachers, the presentation was given to several classes at Curtis Middle School. The students were extremely engaged with the content and asked great questions. After the presentation, they sent the PWC colorful, hand-made thank-you cards, which were later incorporated into the PWC Sudbury Day Poster.

At the initial PWC multi-media presentation, a suggestion was made that laminated watershed maps would be more interactive for classroom use than framed maps. Though not in the original plan, the PWC produced laminated watershed maps, funded by the Conservation Commission.

The PWC believes that the Middle School Ponds & Waterways multi-media presentation will become an annual program. We also hope that this program will heighten interest in having science classes participate in the Adopt-A-Pond program.

### ***Town Crier Articles***

In 2008, the PWC began running a series of articles in the Sudbury Town Crier to raise awareness of water quality issues. Four articles have been published including, "Why stormwater matters, and how you can keep it clean"

<http://www.wickedlocal.com/sudbury/archive/x1529758334>

"Going green on lawn care"

<http://www.wickedlocal.com/sudbury/news/lifestyle/columnists/x356877633/Hershfield-Going-green-on-lawn-care>

"Take me to the river" an article about recreational uses of the Town's ponds and rivers,  
<http://www.wickedlocal.com/sudbury/news/lifestyle/columnists/x469165217/Hershfield-Take-me-to-the-river>

and "Garlic farmer uses compost harvested from invasive plants at Carding Mill Pond"

<http://www.wickedlocal.com/sudbury/news/x1972889596/Garlic-farmer-uses-compost-harvested-from-invasive-plants-at-Carding-Mill-Pond>

More articles are planned.

### **PWC Website**

The PWC maintains a website on the Town website with several informational resources, including the comprehensive map suite, a set of FAQs, links to the Town Crier articles, and information on other committee programs.

### **Sudbury Day**

The PWC participates each year in the annual Town event “Sudbury Day” with an educational display.

### **Riverfest**

The PWC participates each year in the Sudbury, Assabet, & Concord Wild & Scenic River Stewardship Council’s Riverfest, promoting recreational uses of the Town’s water bodies with such events as kayaking, trout fishing, and a rubber duck race for kids.

### **Monitoring Hop Brook Remediation**

Frank Lyons, a PWC associate member, is the President and an early member of the Hop Brook Protection Association. With his assistance, the committee will monitor ongoing remediation efforts and make recommendations to Town boards, committees, and departments.

### **Adopt-A-Pond Program**

The Sudbury Adopt-A-Pond program is in the planning stages and is intended to be a community involvement program designed to benefit Sudbury’s ponds and streams and to be rewarding and educational for the volunteers involved. The program will give residents hands-on experience in improving our environment.

### **Invasive Plant Species Identification Guides**

An important component of invasive species remediation is to increase awareness of the issues and to increase the numbers of those able to identify these plants. There are several excellent identification guides currently available for our specific region. The best printed guide is, “A Guide to Invasive Plants in Mass,” published by the Division of Fisheries & Wildlife (1998 edition, and the 2nd edition, revised in 2008) – available at the New England Wildflower Society bookstore for \$5.00. An excellent online version, published by the USDA may be found at: <http://www.invasivespeciesinfo.gov/aquatics/main.shtml>.

The SUASCO CISMA described above will be paying close attention to existing and new populations of invasive species. The PWC will use its website, Town Crier articles, Middle School seminars and the Adopt-a-Pond program in these educational efforts.

# Town Committees

Sudbury, Massachusetts



Ponds and Waterways Committee

## Master Plan Appendix 2 – Report on Pond Committees

### MEMORANDUM

**TO:** Sudbury Board of Selectmen

**CC:** Maureen Valente

**FROM:** Ponds & Waterways Committee

**DATE:** December 19, 2006

**RE:** Report of the Ponds and Waterways Committee on Other Towns' Similar Committees

---

#### The Mission Statement of the Ponds and Waterways Committee

(“PWC” or the “Committee”) established by the Sudbury Board of Selectmen (“BOS”) requires the PWC “to identify similar pond and waterway groups in other towns in Massachusetts (or elsewhere if applicable), and summarize and evaluate their mission, make up, relationship to other town boards and commissions, success rate, [and] challenging issues.”

## I. Regional Groups

There currently exists a plethora of regional nonprofit organizations dedicated specifically to the conservation of rivers, ponds and waterways. The most visible local organizations are the Organization for the Assabet River (“OAR”) and, to a lesser extent, Sudbury Valley Trustees (“SVT”). The Federally-designated Sudbury, Assabet & Concord Wild and Scenic River Stewardship Council (“RSC”) is another active local organization. These regional organizations are important resources for information sharing. The RSC offers potential grant funding. We assumed for the purposes of this initial inquiry, however, that the BOS is interested in evaluating the function of *municipal* committees similar in structure to the PWC.

## II. Analogous Municipal Committees

A non-exhaustive search of available public records indicates the existence of hundreds of local non-profit associations or committees that are similar in scope, structure and organization to the Hop Brook Protection Association (“HBPA”). These private groups generally strive to work in partnership with municipalities, in order to effectuate site-specific goals.

On the municipal level in Massachusetts, generally pond and waterway conservation efforts are managed exclusively by local conservation commissions. The PWC’s structure appears to be a hybrid of the two models, i.e. a municipal committee dedicated to water quality issues that is separate and distinct from the Conservation Commission.

**In Massachusetts, we identified four that we believe might be instructive in evaluating the organization and function of the PWC. They are:**

- Wayland Surface Water Quality Committee;
- Wellesley Natural Resources Commission;
- Edgartown Pond Advisory Commission; and
- Walpole Water Quality Commission.

**1. Wayland Surface Water Quality Committee**

The Wayland Surface Water Quality Committee (“SWQC”) was chartered by the Board of Selectmen in 1976 to “oversee, monitor, maintain and improve the health and quality of bodies of water in the Town of Wayland... SWQC shall take appropriate action to maintain water quality, contain invasive weed growth, and seek and manage appropriate grants to improve the surface waters.”

The SWQC is comprised of five appointed volunteers and works closely with Park & Recreation, Board of Health, Water Department, Conservation Commission. It is a member of the state-wide council on lakes and ponds. According to the SWQC Chairperson, Jackson Madnick, despite roadway, storm drain, septic and water quality improvements, invasive weeds plague the Town’s waters. Restoration, remediation and conservation are the SWQC’s greatest challenges. SWQC members attended a major international conference of lakes management in November 2003 to review new approaches, techniques and other towns’ water management successes to see what might work in Wayland.

During the past several years, according to Madnick, SWQC successfully addressed and performed the following projects and programs:

- **Dudley Pond**

For management of the invasive weed called Eurasian Watermilfoil, in 2003 Dudley was tested with a “plan test” to create a scientific baseline to determine how much Sonar herbicide was necessary to control the weeds. Two applications of Sonar were applied during the summer of 2003. However, repeated use of herbicides is expensive and can create herbicide resistant plants. There are also environmental concerns for native fish, birds and wildlife. Equally, there are health concerns for children, elderly and drinking water. A range of complimentary programs and research was implemented to try to eliminate or seriously extend the period between future chemical treatments. The SWQC researched weed control methods used around the country and brought in experts to explore options.

Alternative programs were also developed. A waterproof barrier was installed in Dudley Pond to protect a small stand of invasive weeds from the herbicide as part of a pilot test area. Weevils, native weed-eating beetles, were introduced to the test site in the spring of 2005 to see if they would survive in the ecology of Dudley Pond. A weed management consultant did a “draw down” feasibility study of Dudley Pond and found that this method could “save the Town millions of dollars over the long run.” Draw down can be used alone or in conjunction with hand pulling weeds and/or beetles, or a fish called Japanese Carp (when legal) or other methods.

**In the spring of 2004, SWQC was informed of the success of a Clean Water Act § 319 grant filed by the Dudley Pond Association, that will be financially managed by SWQC. This grant will cover the introduction of more beetles, address a runoff problem by the middle school, and fund some public education and stenciling of storm drains.**

**Since 2004, under SWQC organization, divers have been hand pulling milfoil weeds. In 2004, 12,000 weeds were pulled; the next year, 40,000 weeds were pulled; and last summer, 140,000 weeds were pulled. The problem is not close to being eradicated yet. In conjunction with this effort, there are two ongoing pilot tests using biological controls: 1) milfoil-eating weevils are still being studied; and 2) mechanical pond circulators that mix the water column are also being evaluated.**

**This past fall, the SWQC received Town funding to perform water and soil testing in and around Dudley Pond for baseline pollutants, including pesticides and nutrients.**

- **Heard Pond**

**A harvesting vendor (ACT) was selected by SWQC to harvest invasive water chestnut. SWQC devised a plan to compost the weeds at the Wayland landfill instead of using a private contractor to haul them away. SWQC tested the weeds to affirm acceptable quality and non-toxicology of the final compost. The SWQC worked with the Departments of Health, Highway, and landfill to use excess Town resources to bring the cut water chestnut weeds to the Wayland landfill. According to Madnick, “This saved the Town over**

**\$150,000 from 2003-2005 in private contractor hauling and incineration fees and Massachusetts from more air pollution.”**

**During the first year of harvesting, 1.2 million pounds of high grade weed compost were created. In 2004, that number dropped to .5 million pounds. In 2005, 140,000 pounds were extracted, and in 2006, the volume was reduced to 26,000 pounds. The success in reducing the water chestnut volume has resulted in a program that has nearly paid for itself. The composed water chestnuts are offered free to Town citizens. The remaining volume has then been traded for necessary top soil for Town projects, which the Town otherwise would have had to have purchased. The SWQC intends to continue overseeing Heard Pond’s harvesting for the next couple of years in an effort to eradicate this weed completely. The SWQC will also explore getting the Federal government to cover most of the future harvesting cost at Heard Pond, which is mostly on Federal land.**

**SWQC was also successful in persuading Channel 4 TV News to do a live remote broadcast to promote the environmental and cost savings activity at Heard Pond and bring positive public relations to the Town. Positive print stories were also placed in the Boston Globe and Metrowest News.**

**In the future, SWQC intends to assemble a joint meeting of Town boards, departments and committees related to ground and surface waters, to discuss Town water-related issues and public education. It is in the process of installing new signage at boat launch areas to prevent the spread of weeds. It is also seeking to undertake an aerial infrared remote scanning project to**

identify leaking septic from septic systems in the vicinity of the Town's three great ponds (and possibly also certain public water supplies). The remote scanner would also identify buried oil or chemical storage tanks. Although the cost of the scanning has been estimated at between \$5,000 and \$6,000 in the immediate vicinity of the three ponds, the company offering these services, A W Research, must fly a plane from Minneapolis for this purpose, at a cost of an additional \$20,000. To defray that cost, the SWQC is seeking partners in other nearby Towns, including Sudbury.

The greatest challenge to the SWQC is funding. For the past thirty years, the Town has provided annual line item funding to the SWQC of \$5,000, which in today's dollars is far too little for the tasks at hand, according to Madnick. Over the years, supplemental Town funding has come from Town Meeting approval of various warrant articles. This year, the SWQC will be seeking a sizable increase in line item funding. In addition to Town funds, the SWQC is constantly researching and pursuing different sources of State and Federal funding. Chairman Madnick stated that he has to be very creative in organizing volunteers and encouraging community spirit as a result.

## **2. Wellesley Natural Resources Commission**

The Wellesley Natural Resources Commission ("NRC") was formed in 1992 "to provide stewardship, education and advocacy of the Town of Wellesley, park, conservation, recreation and open space system so that the full value of the Town's natural assets can be passed on to future generations."

**The NRC has five elected board members and functions as a coordinator of the activities of the Conservation Commission, the Park Commission, the Tree Warden, the Town Forest Commission, the CPC, and Pesticide Application Controllers.**

**The NRC’s department head, Janet Hartke Bowser (“Bowser”) provided information regarding the NRC’s relationship to other Town boards, success rate and challenging issues. Bowser stated that NRC works closely with the Department of Public Works, as well as with “friends of ponds” groups, which are mainly neighborhood associations, and the Charles River Watershed Association. The NRC maintains a distribution list of organizations to help keep them plugged in to local activities and events.**

**Bowser characterized the NRC’s success rate as “high,” but “not as high as they would want.” She stated that the NRC has secured funding for the remediation of four (4) ponds, a significant accomplishment given the dearth of available state funding. However, she did note that the NRC has been successful in obtaining Water Quality Improvement Grants under the Federal Clean Water Act, § 319. This has been one of the NRC’s largest funding sources.**

**Bowser opined that permitting can be a major challenge and that they had hired an independent consultant to assist. She also noted that the town engineer and the DPW have taken a special interest in the NRC, and that this has helped them significantly. The biggest challenge is clearly managing the complexities of pond restoration. She said their Longfellow Pond was**

particularly challenging in that they expect that they will need to do weed harvesting indefinitely. However, she pointed out that they have a new harvesting technique using a depth finder, which allows them to do selective targeting.

Finally, Bowser noted that the Community Preservation Act (CPA) has been key in helping them with some of their funding challenges. Additional information regarding the NRC can be found at

[http://www.ci.wellesley.ma.us/Pages/WellesleyMA\\_NRC/index](http://www.ci.wellesley.ma.us/Pages/WellesleyMA_NRC/index)

### **3. Edgartown Pond Advisory Commission**

The Edgartown Pond Advisory Commission (“PAC”) was formed in 1990 when pond water quality was identified by the Town as “an area of critical concern.” Its mission is set forth in its By-laws:

The Board of Selectmen shall appoint an Edgartown Ponds Advisory Committee for the purpose of advising Town Boards, Commissions, Committees or Departments with respect to the use and management of uplands, wetlands and surfaces waters within the Edgartown Ponds Area District as set forth in the Edgartown Zoning By-laws Section 14.6.2 and assist in carrying out the programs designed to meet the needs of the commercial shellfishing industry and the family shellfish program of the Town of Edgartown.

We spoke with PAC member Jane Varkonda. The make-up of the PAC

includes:

- A representative of the Marine Advisory Board;
- A representative of the Planning Board;
- A representative of the Conservation Commission;

- A representative of the Board of Health;
- A representative of the Shellfish Committee;
- Four representatives of the riparian owners and property owners whose interests and properties are located in the Edgartown Ponds District;
- A representative of the commercial shell fishermen; and
- A representative of the interests of conservation groups.

Ms. Varkonda stated that a representative on the PAC was also a member of a private group called the “Great Pond Foundation” (<http://www.greatpondfoundation.org>). She said that this private group worked cooperatively with the PAC to raise money to support the initiatives of the PAC. She said it also paid for related studies. Ms. Varkonda noted that representatives on the PAC work cooperatively with “Friends of Sengekontacket,” which she described as a ‘powerful neighborhood association, as well as the ‘Martha’s Vineyard Barrier Beach Task Force.”

As noted, PAC members include representatives designated by these various Town boards and commissions. Ms. Varkonda believes the model has been very successful. She noted as examples of successful projects: (i) regulating the horsepower of motors on certain bodies of water; (ii) initiating by-laws for reviewing construction near waterways; and (iii) educating the public.

Ms. Varkonda identified several success factors for the PAC, noting that Committee members are driven, motivated, and keep the committee

running effectively. She highlighted the presence of a strong chairperson, who has been instrumental to “get at the PAC to work together, bring new ideas, be creative, and get things done.” She also noted that working with the external groups has been very important. They have helped provide emphasis on priority setting, and they have assisted with cooperative fund raising.

#### **4. Walpole Water Quality Commission**

The Town of Walpole Ponds Management Committee (“PMC”) acts in an advisory capacity. The group is made up of 5 appointed members who have a general interest in the conservation issues regarding preservation of the waterways. Some members have specialized knowledge and interest that assist the group in meeting the goals of the committee.

According to Conservation Commission Ponds Liaison Roger Turner, the mission of the PMC is to protect Town-owned watersheds. In addition, it offers outreach education to the general public. Some of the educational programs offered by the committee are co-sponsored with the Department of Conservation and Recreation or the Department of Natural Resources at the state level. The PMC also writes and secures grants to be used for the evaluation and planning of aquatic treatments.

Several of the committee members sit on other Town boards such as Conservation, Finance and Capital Budgets, Emergency Management and Land Development & Management. Involvement in these other Town committees and boards assists with facilitating funding, and keeps the

**committee members abreast of other Town activities that might affect the committee goals.**

**The PMC is also involved with other groups, such as the Neponset Watershed Association, which offers a quality assurance program. This program assures continuity across all groups that conduct water samplings for all towns that are members.**

**The PMC struggles with securing funding to provide educational outreach programs to the general public. Lack of funding directly affects PMC's ability to apply aquatic management treatment and planning to the waterways as well. Many of the grants that had been offered in the past are no longer available. The Town does not adequately fund the goals of this committee because other needs, such as education, are seen as a higher priority.**

**A single most challenging issue that the PMC faces is controlling privately-owned water bodies. They can become polluted, and some flow into publicly-owned waterways, resulting in even greater concerns. Another challenge is the control of invasive water plants by non-chemical means.**

**Some of the successes the PMC has experienced in years past include securing funds to support a trial use of beetles to control invasive water plant growth versus chemical treatment. The PMC also performs harvesting of water chestnuts on an annual basis to control this invasive plant. Finally, the PMC has co-sponsored educational programs annually with the Department of Conservation and Recreation, such as "Exotic Plants in Waterways." The**

**PMC has also organized an educational fair in cooperation with state groups**

**(such as Water Watch), vendors (such as LYCOT Environmental) and**

**UMASS Amherst to provide a venue of all interested parties to come together**

**and share information.**

### **III. Conclusion**

**The municipal groups studied share similar goals and organizational structures with the PWC. All struggle with insufficient funding but rely upon building relationships with town departments and local watershed associations in order to achieve levels of effectiveness. Of all the groups, however, the Wayland Surface Water Quality Committee emerged as the brightest example of an organization that consistently accomplishes positive results. We attribute the SWQC's strength to several factors, including: (i) creative leadership and innovative event planning; (ii) support from a broad spectrum of Town departments and political constituencies; and (iii) a willingness on the part of Town government to lend credibility and financial support to well-planned initiatives, including but not limited to dedicated line item funding in the annual Town budget. We believe the Wayland model is a good example of how the PWC could be most effective in accomplishing the goals outlined in the Mission Statement.**

# Town Committees

Sudbury, Massachusetts



Ponds and Waterways Committee

## Master Plan Appendix 3 – Watersheds

[Please refer to the PWC website to view the maps that comprise this appendix.  
[http://sudbury.ma.us/committees/committee\\_documents.asp?dept=PWC1](http://sudbury.ma.us/committees/committee_documents.asp?dept=PWC1)

# Town Committees

Sudbury, Massachusetts



Ponds and Waterways Committee

## Master Plan Appendix 4 – Waterbody Inventory

[Please refer to the PWC website to view the documents that comprise this appendix.

[http://sudbury.ma.us/committees/committee\\_documents.asp?dept=PWC1](http://sudbury.ma.us/committees/committee_documents.asp?dept=PWC1)

# Town Committees

Sudbury, Massachusetts



Ponds and Waterways Committee

## Master Plan Appendix 5 – Environmental Studies

Note that the following is a document prepared in 2006. In places it references documents, plans and reports that have been superseded by more recent versions. The list is in chronological order and some reports appear more than once when there were releases on different dates.

The Sustainable Sudbury Master Plan of 2001 issued by the Sudbury Planning Board is not referenced in the document below and can be found at:  
<http://www.sudbury.ma.us/documents/dl/510/MasterPlan.pdf>

## ENVIRONMENTAL STUDIES OF SUDBURY'S WATER RESOURCES

**Inventory<sup>1</sup> prepared by Susan Crane  
Sudbury Ponds and Waterways Committee  
July 7, 2006**

Natural Resources Program of the Town of Sudbury, Phase I Study and Evaluation of Sites with Natural Resource Potentials, by Natural Resources Technical Team of Middlesex County, 10/71 [PB]

Sudbury Master Drain Plan prepared for the Highway Commission by Weston and Sampson, 2/74 [PB]

Sudbury Open Space and Recreation Plan, 1978-1993 [PB]

Report on the Raymond Road Aquifer, H2O Engineering for the Sudbury Water Dist., 1/85 [PB]

Report Relative to the Water Needs and the Long Range Water Resource Plan, H2O Engineering for the Sudbury Water Dist., 3/86 [PB]

Town of Sudbury Trail Linkage Plan, Appendix to 1984-88 Open Space and Recreation Plan, dated 5/89 [PB]

MetroWest Water Supply Protection Study, Metropolitan Area Planning Council, 6/89 [PB]

Hop Brook Ponds System Study, Sudbury, MA, Prepared by Whitman & Howard , Inc., for Board of Health, Town of Sudbury, July 1989 [HBPA] [PB]

---

<sup>1</sup> The following abbreviations are used to identify report locations: PB (Planning Board); CC (Conservation Commission); HBPA (Hop Brook Protection Association); and SWD (Sudbury Water District). The Board of Health has no additional documents, according to Bob Leupold.

## PWC Master Plan

Study of Local Sources, prepared by Jonathan L. Yeo, MWRA, and Claudia N. Murray, Stone and Webster 1992 [SWD]

MWRA Study of Local Water Supply in Non-MWRA Supplied Communities, Stone & Webster, 1/16/92 [PB]

Report of the Land Use Priorities Committee, May 1992 [CC]

Well 5 Zone II Delineation, prepared by Edward T. T. Chiang, Ph.D., H<sub>2</sub>O Engineering, 1993 [SWD]

Report on Well No. 5 Zone II Delineation, Sudbury Water District, Aug. 1993 [PB]

In-stream Phosphorus Reduction and Restoration of the Hop Brook Ponds System, prepared by Stephen Meyer, Hop Brook Ponds Study Committee, Sudbury, MA. 1993 [HBPA]

Nitrogen Loading Analysis for Groundwater Supplies, prepared by Edward T. T. Chiang, Ph.D., H<sub>2</sub>O Engineering, 1993 and 1994 revision [SWD]

Reports on Nutrient Loading Analysis for Groundwater Supplies, H<sub>2</sub>O Engineering for the Sudbury Water Dist., 12/93, 5/94 [PB]

An Algae Harvesting System for the Hop Brook Protection Association, Inc., prepared by Tomas Matusaitis, Environmental Engineering Clinic, MIT, 1994 [HBPA]

Improving the Water Quality of the Hop Brook Watershed through Aggressive Algal Harvesting, July-August, 1994, prepared by John P. Gambino, Environmental Engineering Clinic, MIT 1994 [HBPA]

Report for Sudbury Water Dist. on Nitrogen Loading Analysis for Groundwater Supplies, prepared by H<sub>2</sub>O Engineering Consulting Assoc., 5/94 [PB]

Algae Harvesting Experiments Report on Grist Mill Pond, Sudbury, Massachusetts, prepared by Francis T. Lyons and Lael M. Meixsell, Hop Brook Protection Assn., Inc., June -August 1994 [HBPA]

A Natural History of the Hop Brook, prepared by Marilyn Novak, Hop Brook Ponds Study Committee, Sudbury, MA, November, 1994 [HBPA]

Shoreline Survey of Hop Brook, Sponsored by the Hop Brook Protection Association with the Sudbury Conservation Commission and under the auspices of the MA Riverways Program, fall 1994 and spring 1995 [HBPA]

Nitrate Loading Analysis for Well 5, prepared by Edward T. T. Chiang, Ph. D., H<sub>2</sub>O Engineering, 1995 [SWD]

## PWC Master Plan

A Study of the Upper Sudbury River Watershed, prepared for MDC by CE Maguire, (investigation of water supply development), 1995 [PB]

Shoreline Survey Summary - State of the Hop Brook, 1994-1995, prepared by Karen Riggert, Supported by Hop Brook Protection Association, Inc., Sudbury Conservation Commission, Massachusetts Riverways, Adopt-A-Stream Program, June 26, 1995 [HBPA]

Middlesex County Massachusetts Interim Soil Survey Report, prepared by USDA Natural Resources Conservation Service, 7/95 [CC]

Rt. 20 Wastewater Disposal Options, 8/95 [PB]

Algae Harvesting Experiment on Grist Mill Pond, Sudbury, Massachusetts, prepared by Robert S. Egan, Hop Brook Protection Association, Inc., October 23, 1995 [HBPA]

Use of Barley Straw as an Algal Inhibitor to Improve Pond Water Quality, prepared by Edward Hermeno, Environmental Engineering Clinic, MIT, May 15, 1996 [HBPA]

Sudbury, Assabet & Concord Wild & Scenic River Study, DRAFT 9/96 [PB]

Nitrate Loading Analysis Well. No. 5, DEP letter to Sudbury Water Dist., 10/10/96 [PB]

Sudbury Open Space and Recreation Plan, 1997-2002 [PB]

Mechanical Harvesting to Control Algal Blooms of the Green Algae Hydrodictyon reticulatum, prepared by Rick Haywood, Hop Brook Protection Association, Inc., 1997 [HBPA]

Assessing the Role of Sediments as a Phosphorus Source in the Eutrophication of Ponds along Hop Brook, Sudbury, MA, prepared by Laurel Schaider, Environmental Engineering Clinic, MIT, 1997 [HBPA]

Pilot Plan for Phosphorus Removal from the Effluent of the Easterly Wastewater Treatment Plant in the City of Marlborough, MA, prepared by Barbara Keesler, MIT Plasma Science and Fusion Center and Micromag Corporation, Wayland, MA, September, 1997; and Notification of Test Results, Addendum to September, 1997 Report, prepared by Barbara Keesler, October 29, 1997 [HBPA]

Marlboro/Sudbury Pilot Study Phosphorus Removal Project Update and Extension Proposal for the Marlboro Easterly Wastewater Treatment Plant by Ronald L. Lavigne, Ph.D. MPH, Principal Investigator, Department of Plant and Soil Sciences, University of Massachusetts, Amherst (this was the constructed wetlands study begun in 1995), February 1998 [HBPA]

Remediation Options for Elodea Dominated Ponds along Hop Brook, MA, prepared by Weslynne Ashton, Environmental Clinic, Massachusetts Institute of Technology, Final Report, Spring, 1998 [HBPA]

## PWC Master Plan

Micromag Wastewater Treatment Phosphate Control Project Pilot Plant, June, 1998 [HBPA]

Test Report, by Ionel Wechsler and Peter G. Marston (results and discussion of the "Co-Mag Process" Pilot Plant demonstration series at the Marlborough, Massachusetts Easterly Wastewater Treatment Plant during the period November 1997 to June 1998) [HBPA]

Problems and Solutions for Hop Brook, prepared by Tara Cargill, Wentworth Institute of Technology, 1999 [HBPA]

Effects of Phosphorus Contamination on Species Diversity in Hop Brook, prepared by Edward Cavallerano of Lincoln-Sudbury Regional High School, May 1999 [HBPA]

Aerial Photo Survey of Potential Vernal Pools in Middlesex County, prepared by Natural Heritage, Spring 2000 [CC]

Greenways Plan for the SuAsCo Watershed, by SVT, 4/00 [PB]

SuAsCo Biodiversity Protection and Stewardship Plan, by Frances Clark 8/00 [CC]

Nutrient Impact Evaluation of Hop Brook in Marlborough and Sudbury, MA, prepared by ENSR Corporation for the Commonwealth of Massachusetts DEP, October 2000 [HBPA]

Assessment of Wastewater Management Needs for the Route 20 Business District [DRAFT], prepared by Weston & Sampson, 4/01 [CC]

SuAsCo Watershed Archeological Inventory Project: Exploring the Cultural Resources of a Suburban Area, by Dr. Curtiss Hoffman and Adrienne Edwards, 2002 [PB]

Town of Sudbury Report of the Land Use Priorities Committee, 5/02 [PB]

SuAsCo Wild & Scenic Rivers: Unprotected Land Inventory, SVT 1/03 [PB]

Town-wide map of drainage structures produced by the Sudbury Engineering Department, May 2003 [CC]

Town-wide inventory of drainage structures (on CD) produced by the Sudbury Engineering Department, May 2003 [CC]

Phase II Storm Water Management Program, included in the Sudbury Conservation Commission's Annual Report, July 30, 2003 [CC]

Bio Map and Living Waters: Core Habitats of Sudbury, prepared by Natural Heritage and Endangered Species Program, 2004 [CC]

## PWC Master Plan

Supplemental Nutrient Loading Evaluation of Hop Brook (Draft), by ENSR, prepared for MassDEP, April 2004 [HBPA]

Letter from Maureen Valente, Sudbury Town Manager, to the Mass. Bureau of Resource Protection and EPA, regarding the MS4 Phase II Storm Water Permit for the Town of Sudbury, April 24, 2004 [CC]

Town of Sudbury Master Plan, 6/3/04 [CC]

Hop Brook Protection Association 2004 Harvesting Report for Carding Mill Pond, HBPA Annual Report, 10/04 [HBPA]

Hydrogeological Site Investigation and Analysis, Town of Sudbury, prepared by Earthtech, 9/17/04 [PB]

SuAsCo River Project: Analysis of Existing Protection [DRAFT], 10/04 [CC]

Letter from Maureen Valente, Sudbury Town Manager, to the Mass. Bureau of Resource Protection and EPA, regarding the MS4 Phase II Storm Water Permit for the Town of Sudbury, April 28, 2005 [CC]

2005 Harvesting Report for Carding Mill Pond, HBPA Annual Report, prepared by Hop Brook Protection Association 10/05 [HBPA]

Letter from Maureen Valente, Sudbury Town Manager, to the Mass. Bureau of Resource Protection and EPA, regarding the MS4 Phase II Storm Water Permit for the Town of Sudbury, April 28, 2006 [CC]

Undated:

Numerous maps, set #193, showing surface waters and groundwater favorability [PB]

# Town Committees

Subury, Massachusetts



Ponds and Waterways Committee

## Master Plan Appendix 6 – NPDES Permit Summary

## M E M O R A N D U M

**To:** Sudbury Ponds & Waterways Committee

**From:** Susan Crane<sup>2</sup>

**Date:** November 10, 2006

**Re:** Summary of EPA and MassDEP Final NPDES Permit to the Marlborough Easterly Wastewater Treatment Plant

On October 19, 2006, EPA and DEP jointly issued its final NPDES permit modification to the Marlborough Easterly Wastewater Treatment Plant for the discharge of treated wastewater into Hop Brook. The permit will go into effect in 60 days (December 18, 2006), unless appealed within thirty days. No appeals are anticipated. The permit's expiration date is January 16, 2010.

### **Phosphorus limits**

Interim limits until June 18, 2013<sup>3</sup> from April through October: 0.5 mg/l Total Phosphorus (TP)

Limits post-June 18, 2013 from April through October: 0.1 mg/l TP (60-day rolling average)

November through March: 0.75 mg/l TP (monthly average)

*Comment by HBPA:* There is no requirement that a percentage of the TP discharged at the higher permitted winter level be dissolved (*i.e.*, presumably enabling it to pass through the system) versus particulate (raising the concern that it might more readily precipitate out and adhere to sediments).

### **Compliance schedule**

1. **Feasibility Study:** Marlborough and other interested parties, including the Town of Sudbury, have voluntarily agreed to participate in a feasibility study

---

<sup>2</sup> This summary is the opinion of the author, a member of the Sudbury Towns & Waterways Committee, but does not necessarily reflect the view of the Committee.

<sup>3</sup> Interim limits will be in effect until the upgraded facility goes online.

funded by MassDEP and conducted by the Army Corps of Engineers. To ensure compliance with water quality standards with respect to P in Hop Brook, it will:

- Develop and evaluate effective and feasible alternative plans
- Present recommended options

Then EPA and MassDEP will determine which (if any) of the options would ensure compliance when implemented in combination with the permitted P effluent limits (the “Approved Option(s)”), and Marlborough will review and comment on drafts of the Feasibility Study.

Anticipated date of completion by the Corps: April 2007

*Comment:* Among the options being studied is the removal of dams in the Hop Brook system, which effectively would eliminate the existence of the ponds.

2. **MOU among Marlborough, Sudbury and MassDEP:** These entities will enter into a Memorandum of Understanding providing for their collaboration in developing a strategy and action plan concerning the implementation of the nonpoint source (i.e., P-laden sediments) reductions associated with the Approved Option(s). It shall not impose legal obligations, however, on any party.

Timing: no deadline specified

3. **Initiate Facility Improvements Planning:** Marlborough must initiate planning of facility improvements for TP reductions and submit a status report.

Deadline: December 18, 2007

4. **Initiate Facility Improvements Design:** Marlborough must initiate design for TP reductions and submit a status report.

Deadline: December 18, 2008

5. **Design Status Report:** Marlborough must submit a status report to MassDEP and EPA relative to the design.

Deadline: December 18, 2009

6. **Completion of Planning and Design:** Marlborough must complete the facility improvements planning and design which, to the extent practicable and approved by MassDEP, shall be consistent with the Approved Option(s).

Deadline: June 18, 2010

7. **Initiate Construction:** Marlborough must initiate construction of the facility improvements.

Deadline: December 18, 2010

8. **Construction Status Report:** Marlborough must submit a status report to EPA and MassDEP pertaining to construction of the facility improvements.

Deadline: December 18, 2011

9. **Second Construction Status Report:** Marlborough must submit a second status report to EPA and MassDEP pertaining to construction of the facility improvements.

Deadline: December 18, 2012

10. **Construction Completion:** Marlborough must complete construction of the facility improvements.

Deadline: June 18, 2013

*Comments:* This is a very long construction/implementation schedule. In part, this was to allow Marlborough to stagger its construction upgrade plans and associated costs pertaining to both this facility and the Marlborough Westerly Wastewater Treatment Plant, which discharges to the Assabet River pursuant to a separate NPDES permit.

According to an August 2006 EPA Fact Sheet, this schedule is intended to address both point and nonpoint sources of nutrient impairment in Hop Brook. EPA believes this approach will restore designated uses more rapidly than with an immediate imposition of more stringent point source P limits alone. “Even with a more stringent phosphorus effluent limit, existing accumulations of phosphorus in the sediment will continue to cycle through the water column for a long period of time before abating and thus continue to contribute to the nutrient impairment of the receiving waters.”

**Agency Reopener**

EPA shall reopen the permit before its expiration date and either modify, or revoke and reissue the permit to include limits and conditions (including a new compliance schedule) necessary to ensure compliance standards *if*:

EPA and MassDEP determine that nonpoint source P reductions associated with the Approved Option(s) have not been assured by October 1, 2009, either through voluntary agreements or activities and/or regulatory agency action.

Actual implementation of nonpoint source reductions is not necessary to demonstrate compliance.

Deadline: Before January 16, 2010

*Comment:* According to the August 2006 EPA Fact Sheet, if the nonpoint source (i.e., sediment) reductions have not been assured, a more stringent point source effluent limitation will be imposed. The construction schedule is intended to provide Marlborough and other interested parties with a limited opportunity to explore the potential for sediment P remediation.

## M E M O R A N D U M

**To:** Sudbury Ponds & Waterways Committee

**From:** Frank Lyons

**Date:** May 5, 2009

**Re:** Update to Summary of EPA and MassDEP Final NPDES Permit to the Marlborough Easterly Wastewater Treatment Plant dated November 10, 2006

### Compliance schedule

#### **Feasibility Study:**

Anticipated date of completion by the Corps: April 2007  
This study was completed by the Corps in August 2008.

**Initiate Facility Improvements Design:** Marlborough must initiate design for TP reductions and submit a status report.

Deadline: December 18, 2008

(Note: This report has not been submitted)

#### ***Comment:***

When the NPDES permit for the Marlborough Easterly Plant was issued, Marlborough had plans to update the Westerly Plant first. Since then, they have sought a substantial increase in flow from the Westerly Plant. A permit modification has been issued and may be appealed by OAR (the Organization of the Assabet River). All of this could add months, if not years, to the implementation schedule for the Westerly Plant.

While there is no schedule dependency between the Westerly Plant upgrade and the Easterly Plant upgrade written into the permit for the Easterly Plant, there is a strong possibility that Marlborough believes there is and won't plan to upgrade the Easterly Plant until the Westerly has been updated. The HBPA is in contact with the EPA attempting to find out what their position is on this matter. This is an extremely important issue at this time.

**M E M O R A N D U M**

**To:** Sudbury Ponds & Waterways Committee  
**From:** Susan Crane<sup>4</sup>  
**Date:** January 18, 2010

**Re:** **Summary Update of EPA and MassDEP NPDES Permit to the Marlborough Easterly Wastewater Treatment Plant**

On December 10, 2009, EPA issued an Order to the City of Marlborough, based on EPA's findings that the City had failed to comply with certain terms of its modified NPDES permit, dated December 19, 2006 (the "Modified Permit"), for discharges into Hop Brook from the City's Easterly Wastewater Treatment Plant. The Modified Permit imposed new Phosphorus limits and set a number of interim deadlines for the City's compliance with mandated facility upgrades. Based on EPA's findings that the City violated these terms, EPA issued the following Order:

IV. ORDER

Accordingly, it is hereby ordered that the Permittee shall:

1. By February 1, 2010, initiate planning and design of the treatment facility upgrades necessary to comply with the Phosphorus limits in the NPDES Permit.
2. By October 15, 2011, complete design of the treatment facility upgrades necessary to comply with the Phosphorus limits in the NPDES Permit.
3. By May 1, 2012, initiate construction of the treatment facility upgrades necessary to comply with the Phosphorus limits in the NPDES Permit.
4. By January 31, 2014, complete construction of the treatment facility upgrades necessary to comply with the Phosphorus limits in the NPDES Permit.

REPORTING

5. Through January 2014, the City shall provide by each July 1 and January 1 a report identifying what steps the Permittee undertook to comply with this order in the previous six months and what steps the Permittee will undertake in the following six months to comply with this Order.

For the complete order, see the PCW website:

[http://www.town.sudbury.ma.us/committees/committee\\_home.asp?dept=PWC](http://www.town.sudbury.ma.us/committees/committee_home.asp?dept=PWC)

---

<sup>4</sup> This summary is the opinion of the author, a member of the Sudbury Towns & Waterways Committee, but does not necessarily reflect the view of the Committee.

## **Master Plan**

### **Appendix 7 – 1978 Wetlands Evaluation Report**

This report is available at the Conservation Commission office.