

BOSTON
GROUNDWATER TRUST
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ANNUAL OPERATING REPORT
Fiscal Year 2003

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BOSTON GROUNDWATER TRUST INTRODUCTION

It is now known that over 2,000 acres of metropolitan Boston and several entire historic neighborhoods built in the 19th Century are vulnerable to foundation damage from deteriorated groundwater levels. Since massive repairs were made to the Boston Public Library in Copley Square, it is feared that negligent management of groundwater levels could devastate exposed woodpile foundations in the Fenway, Chinatown, South End, Beacon Hill, Bay Village, and Back Bay.

This is an environmental problem, apparently unique to metropolitan Boston. Sometimes this crisis strikes suddenly, as when houses in Chinatown and the Fenway were lost in the 1970's. The damage occurred more slowly on Beacon Hill's Brimmer Street in the 1980's. Other times it has been repairable as at the Boston Public Library – McKim Building in 1929 and, more recently, at the Trinity Church in Copley Square.

By identifying locations where groundwater levels are depleted putting foundation wood pilings at risk as well as making recommendations for groundwater remediation, the Boston Groundwater Trust helps safeguard residential and business buildings in the City's historic neighborhoods. It is hoped that these efforts will prompt the necessary time-sensitive restoration of groundwater elevations to safe levels whenever necessary.

The Trust has created a partnership with a group of concerned geo-technical engineers and currently utilizes an agreement with Wentworth Institute of Technology to provide technical assistance and labor through their Co-op program.

Existing monitoring wells have been inventoried and water levels read six times annually for the past three years. Critical locations needed for new wells have been identified and a program of new well construction initiated. At the conclusion of fiscal year 2003, the BGwT is monitoring just under 200 observation wells throughout the City.

The Trust also has established a communications program and operates a web-site for this purpose, www.bostongroundwater.org. Water level readings are compiled regularly into a computerized data base and, together with other related information, are made available by the web-site to all interested parties, such as city and state agencies, utility companies and other businesses as well as property owners and residents.

**A Summary of Activity of the Boston Groundwater Trust
Fiscal Year 2003**

- This year the City funded the Boston Groundwater Trust (BGwT) \$25,000.
- The Boston Water and Sewer Commission (BWSC) provided a \$25,000 grant, keeping the City operating funding for the Trust at \$50,000. Additionally, the BWSC pledged to the BGwT the 14 wells that will be installed during the construction of the water main improvements in Back Bay.
- The State granted the BGwT \$1.6 million through the Environmental Bond Bill to enable the Trust's capital improvement program to add an estimated 525 wells throughout the City over the next three years.
- This year NSTAR provided the Trust with a grant of \$9,750.
- During the year the BGwT has worked closely with residents, civic associations, and economic development projects as well as participated in public meetings to provide information about preventative action and remediation regarding the many buildings supported by wood pilings in Boston. Additionally, the Trust submits regulatory comments to City and State authorities concerning Environmental Impact proceedings for major real estate development proposals in the Trust's study area.
- The City Department of the Environment convened an information meeting, including the BGwT's co-chairs and the Department of Public Works. Commissioner Casazza announced a PIC policy that will expedite the BGwT's construction of new observation wells. Whenever possible, construction site groundwater wells will not be filled in at the end of the project but added to the the Trust's network.

- The City Council held a hearing on wood pile foundations and groundwater depression. Special attention was given to a South End neighborhood found to have critically low groundwater levels resulting in structural damage to some homes. The retaining structures utilized by the MBTA and the federal railroad may be involved with this problem. The need for a determination of facts and remediation was an important part of the discussion. Another area of concern was the Storrow Drive underpass where a number of wells reveal low groundwater levels that may effect the abutting residential neighborhood.
- BGwT's wells are read six times a year by the Trust's Wentworth Institute interns. The resulting database provides an expanding picture of groundwater levels in the City and is an invaluable resource. Identifying "hot spots", which require study and remediation for the preservation of commercial and residential buildings, is a critical and on-going task.
- During the year the BGwT also considered the significance of the pumping of water from basements and elevator pits in the City. By studying the discharge permits issued by the Boston Water and Sewer Commission, it is hoped that the impact of such pumping can be determined as well as assuring a more comprehensive permitting process.
- Working with Professor Culligan at MIT, the BGwT investigated the utility of radar analysis to determine groundwater conditions at a specific building. The test study in Back Bay suggested that such technology may one day provide reliable information without having to incur the expense of digging a test pit.
- The Trust continued to expand the information available to the public on its website, www.bostongroundwater.org. Local news (four new articles), documents (a letter from Bob Durand, Secretary of Environmental Affairs), and reports (WPA 1930 and 1940) have been posted along with the past and most current readings of the Trust's wells. A central artery map, a bulletin board, a guest book, and an observation well diagram have also been added to the website.

BOSTON GROUNDWATER TRUST

Operating Budget

FY2003

Income:

City of Boston	\$ 25,000
Boston Water & Sewer	<u>\$ 25,000</u>
Total FY 2003 Income	\$ 50,000

Expense:

Wentworth Researchers	\$ 50,637
Field Equipment	\$ 697
Website	<u>\$ 2,260</u>
Total FY 2003 Expense	\$ 53,594

**BOSTON GROUNDWATER TRUST
Capital Improvements Budget
FY 2003**

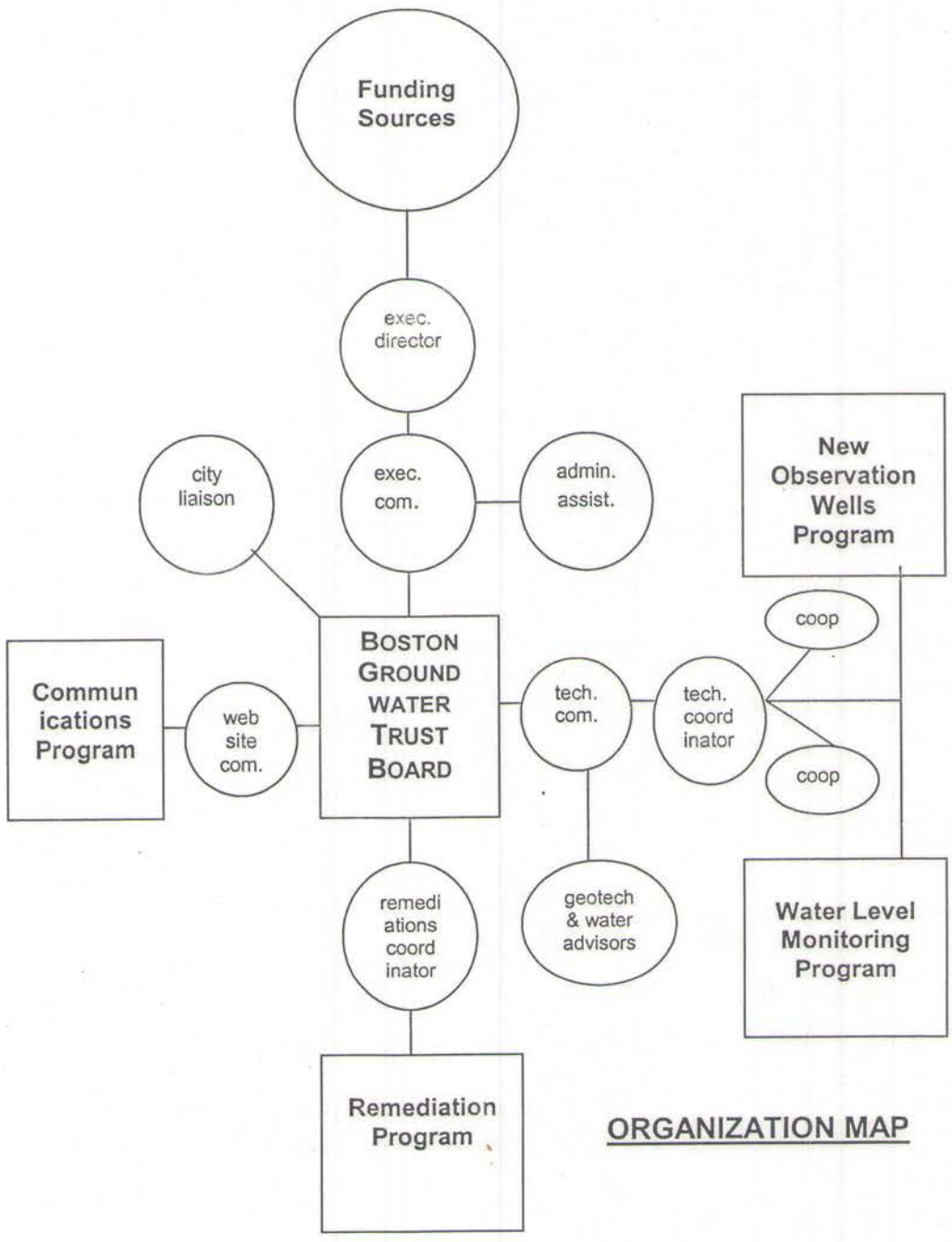
	<u>ACTUAL FY2003</u>
ENVIRONMENTAL BOND BILL APPROPRIATION *Funds rcvd in 2004	\$500,000.*
 COST OF OBSERVATION WELL INSTALLATION:	
Driller's unit cost	\$2,100.
Planning, permitting & testing.	325.
BGwT overhead expense (15%)	<u>364.</u>
Total unit cost per observation well.	\$2,789.
 NUMBER OF OBSERVATION WELLS:	
From previous year	186
Added this year.	<u>000</u>
Total wells monitored.	186

Note: Initially new observation wells will be located in a 700 well grid similar to the one developed in the 1930's to provide a citywide picture of groundwater levels in Boston. Wherever a lowered groundwater problem is identified, additional wells will be constructed in a concentrated pattern for a more complete analysis at that location. It is estimated that the total number of wells needed to accomplish this in the 2,000-acre vulnerable area will be 1,000.

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ORGANIZATION MAP