

My name is Elliott Laffer. I'm the Executive director of the Boston Groundwater trust, an entity that was established by the Boston City Council to monitor groundwater levels in sections of Boston where the integrity of building foundations is threatened by low groundwater levels and to make recommendations for solving the problem. Our 13 member unpaid board of trustees includes nine members appointed by the Mayor upon the recommendation of specific residential, commercial, and preservation groups, three appointed ex officio by the Mayor, and one appointed ex-officio by the President of the City Council. The bulk of our operating funds are provided by the City.

Boston has a low groundwater level problem that is relatively unusual for American cities because of a combination of our geography and our history. The original Town of Boston, located on the Shawmut Peninsula, was a very small place. Over the years, much of its physical growth, other than from annexing other towns, came from creating land. This "made land" makes up much of the Back Bay, Fenway, South End, Bay Village, Chinatown, Leather District, Flat of Beacon Hill, Fort Point and waterfront sections of South Boston, Downtown and North End waterfronts, Bulfinch Triangle, and much of East Boston. In these areas, the uncompacted fill was not strong enough to support buildings. Prior to 1920, the only technology that would allow construction in these neighborhoods was to support the buildings on wood pilings, essentially inverted tree trunks that were driven into the ground and then cut off evenly to support the building's foundation. Unlike in so many other American cities, many of the buildings in the made land neighborhoods are old, in many cases now protected in architectural or historic districts, so we continue to have a very large collection of wood piling supported structures.

Wood pilings had been used for centuries in Europe and elsewhere, and they proved to be a durable source of support as long as groundwater levels stayed relatively consistent. However, if levels dropped for a significant length of time, the pilings would rot, leading to a loss of support and differential settlement that could require expensive and difficult repairs or demolition. In Boston, this problem occurred at least as early as 1911 in the Back Bay, with major repairs to the Boston Public Library later costing as much as \$250,000 in 1929, the equivalent of many millions of dollars today. In response, the City persuaded the Works Progress Administration to fund the installation of a network of observation wells that were read from 1936 to 1940. Unfortunately, the system was abandoned after that time.

In 1986, as the problem once again reared its head, the City Council established the Boston Groundwater Trust. Unfortunately, no funding was provided, and little progress was made. In 1997, Mayor Menino, who had been on the Council when the Trust was established, agreed to appoint new trustees and provide some modest funding to enable the Trust to hire part-time students to discover existing wells and begin to reestablish a network. In 2002, the Legislature included \$1,600,000 in the Environmental Bond Bill to install a new network, the administration agreed to release the funds over a three year period, and well installation began. In addition, Congress provided \$200,000, thanks to the efforts of Rep. Capuano, to aid in the effort. The City also agreed to provide funding so that the Trust could hire its first full time staff. The network was largely completed in 2006, with small numbers of wells installed in later years to study particular areas of concern or to replace wells that were no longer providing reliable information. All of the current and historic well readings are available on our website, www.bostongroundwater.org.

In 2005, the City, the Commonwealth, and those public entities that have significant underground infrastructure in the area, as well as the Trust, signed a historic Memorandum of Understanding that established a City-State Groundwater Working Group. The groups agreed to meet quarterly to share information about groundwater conditions and what is being done to assure that levels are raised to where they are needed. Most importantly, all agreed to repair any infrastructure that was likely to be a cause of low groundwater levels. The group has been a remarkable case of cooperation across agencies and between the City and State governments, with significant funds spent on solving groundwater problems and substantial success in raising levels in areas where they have been chronically low. Efforts have been concentrated on solving problems, not on assessing blame.

The next year, the City established a Groundwater Conservation Overlay District in the zoning code, covering much of the made land areas. In the GCOD, projects have to be designed and built so that they will not cause a reduction in groundwater levels. In most of the area, projects that meet GCOD criteria must also provide a system to capture rainwater and recharge it into the ground. Thanks to the cooperation of the Inspectional Services Department, the Boston Water and Sewer Commission, the BRA, and the Board of Appeals, compliance has been excellent.

While all of these efforts have led to significant increases in groundwater levels in areas of concern, they will not eliminate the need to continue to measure these levels and to interpret what changes mean. Systems will develop new leaks that, if not discovered early enough, will once again cause problems. One example of rapid response to a problem revealed by our observations recently occurred in the North End. We discovered that levels had dropped sharply over two of our rounds of readings in wells along Commercial Street between Richmond and Cross Streets. BWSC investigated and discovered leaks in two manholes along the block. Repairs were made, and groundwater levels rapidly recovered.

The Trust is a small operation, with only two full time employees, but it has become a crucial part of the effort to maintain groundwater levels and preserve these buildings that represent so much history, a substantial part of Boston's attraction to visitors, and a huge part of our residential tax base. In 1940, a much less economically successful Boston allowed these observations to lapse. I believe that a wiser, more successful, and more confident Boston won't follow that course. I look forward to working with the new administration to continue our efforts to protect these resources that are such an important part of what makes Boston the city we love.