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THE HIGHS AND LOWS OF GROUNDWATER, AND HOW YOU CAN HELP

By Gordon Richardson, Chair, Citywide Groundwater Emergency TaskForce

Because groundwater has not been in the news much in recent months, it would be easy to conclude that not much has been going on. Easy, but erroneous. With this report, I would like to inform NABB members of what has been happening, mostly behind the scenes, or under ground.

Recent Progress:

The two most significant events concerning groundwater in Boston in recent years were the signing of a Memorandum of Understanding (MOU) in 2005 by the seven public agencies and authorities responsible for maintaining Boston's underground infrastructure, and the implementation of the Groundwater Conservation Overlay District (GCOD) by the Zoning Commission in 2006.

The MOU created the City/State Groundwater Working Group, which meets quarterly and is co-chaired by Jim Hunt, Boston's Chief of Environmental & Energy Services, and Phillip Griffiths, Undersecretary for Environment within the Massachusetts Executive Office of Energy & Environmental Affairs. These meetings are attended by representatives from the organizations that signed the MOU, including Elliott Laffer from the Groundwater Trust, staff from some legislators' offices, at least one representative from the Citywide Groundwater Emergency TaskForce, and occasionally, property owners and members of the press. Groundwater readings taken during the previous three months are reviewed. Areas where levels have dropped, or where they may have risen because of repair or remediation work by one of the public owners and operators of underground infrastructure are highlighted for the group.

In late January, the Working Group learned that groundwater levels were trending down in an area bounded roughly by Arlington, Boylston, Berkeley, and Marlborough Streets, while levels in most other parts of Boston were rising due to December precipitation which was about 2.6 inches above the mean. The most likely cause of these lowered levels was pumping needed to dewater the site where the new Arlington Street MBTA Station is being constructed. The good news is this pumping was halted at the end of

December and readings from groundwater monitoring wells taken in February indicate levels have risen substantially.

Other areas where lowered groundwater levels have recently caused concern include parts of the North End, East Boston, and the Fenway near Hemenway Street. Efforts to determine the causes of these groundwater depressions and identify possible repairs or remediation are ongoing.

The MBTA informed the Working Group it has developed a plan for long-term remediation of one of the largest groundwater depressions in Boston, east of Back Bay Station along the Amtrak and Orange Line tracks. The plan, outlined during a public workshop on January 30th, indicates construction of a large recharge system will begin during the summer of 2009. This is encouraging news for our friends in the South End.

In February, prompted by a neighbor's renovation plans, I attended a meeting of the Zoning Board of Appeal (ZBA). I was pleasantly surprised to see how well the process of requiring groundwater recharge by property owners and developers, which is now mandated by the GCOD, is working. More than half of the matters brought before the ZBA while I was there concerned groundwater and recharge systems, most of which had previously been seen and approved by the engineering staff at the Boston Water & Sewer Commission. These recharge systems, prompted by new construction and substantial renovation of older buildings, will have a long-term, positive effect on our groundwater levels.

What You Can Do:

I'm often asked, "What should a typical property owner or condominium association in the Back Bay do about groundwater?" If your building was built before 1920, you should begin by becoming informed. The website of the Boston Groundwater Trust, <http://www.bostongroundwater.org/>, shows the latest and historic groundwater levels in the approximately 800 monitoring wells that are now installed. Look up the levels in the three or four wells closest to your location.

The next thing you need to know is the height at which the pilings supporting your building were cut off. Conventional wisdom was that pilings in the Back Bay were cut off at Boston City Base (BCB) level +5, which is about five feet above low, low tide in Boston Harbor and about three feet below the level of the Charles River. During the last two years, we have learned of some buildings where the pilings were cut off higher $\text{\textcircled{D}}$ some as high as +7 feet $\text{\textcircled{D}}$ making it more likely they will be exposed to air and rot. It is probable that pilings cut off at seven feet or higher will have lost much of

their structural integrity. Original construction records usually indicate the piling cut off height. However, many of these old records have been lost. Without the records, digging a test pit is the only way to determine with certainty the cutoff height of your pilings. Such a pit will also provide access to your pilings, so you will be able to determine their condition.

Digging a test pit, while simple in concept, is almost always difficult in practice. Access is often problematic and working space limited, so the work usually is done by hand. It would be wise to engage the services of a qualified engineering firm to plan the location and construction of the test pit. Then the property owner or the engineering firm will need to hire a contractor to do the work. The cost of such a project might range from \$12,000 to \$20,000, or more, depending on the design of the original structure and difficulty of access.

I don't want to suggest that all owners in the Back Bay should have test pits dug under their buildings! First, take a look at the recorded groundwater levels near you. Have there been any construction projects nearby that might provide insight into groundwater levels? Then look at your structure with a critical eye. Do you see any signs of movement, such as cracks in masonry or plaster walls, or doors that stick?

Unfortunately, there is no easy (or inexpensive) fix to the problem of low groundwater levels. That is why preventing the drawdown of groundwater is so important. Of course, stopping leaks in the underground infrastructure operated and maintained by our public agencies and authorities is essential. But private property owners can have a positive effect on groundwater, too! Rainwater that finds its way into your downspouts can be redirected into a drywell (leaching pit or French drain). Parking areas and walkways should be paved with bricks or other porous surfaces that permit precipitation to flow naturally into the ground. Basement sump pumps that pump during dry weather should be disconnected from public sewers and their output directed into drywells. Together, we all can contribute to higher groundwater levels and sound foundations.

The web site of the Citywide Groundwater Emergency TaskForce, <http://www.groundwateremergency.org/>, contains a selection of useful technical articles. Go to Technical Handbook from the home page, accept the Disclaimer, and click on "Site Map."