Appendix A

TOWN OF WAYLAND
WATER DEPARTMENT
WELLHEAD PROTECTION COMMITTEE

41 COCHITUATE ROAD
WAYLAND, MASSACHUSETTS 01778

TOWN BUILDING
41 COCHITUATE ROAD
TEL (508) 358-3699
www.wayland.ma.us
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The Town of Wayland is committed to protecting all valuable sources of potable drinking water and ensuring a safe and reliable water supply for all current and future town residents. To this end, a Wellhead Protection Committee has been established on November 1, 2007 to develop, maintain, and oversee the Wellhead Protection Plan and ensure that every effort is made to carry out its details. In furtherance of its mission the Wellhead Protection Committee shall encourage community discussion through public outreach and education; develop strategies needed to protect our water supply in accordance with the Massachusetts Department of Environmental Protection's Source Water Assessment and Protection (SWAP) report and other pertinent information; advise the Board of Water Commissioners and make recommendations regarding wellhead protection issues; and support ongoing source protection efforts.

The Wellhead Protection Committee shall consist of five members appointed by majority vote of the Board of Water Commissioners. The term for a committee member is three years.

Adopted November 27, 2007 Wayland Board of Water Commissioners

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TOWN OF WAYLAND
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Appendix B

Some of the accomplishments of the WPC since its inception in 2007 include:

- Championing capture zone analysis project by Earth Tech AECOM for town's wells;
- Acquiring services of MassRWA to help develop wellhead protection plan at no cost to town;
- Collaborating with Town Surveyor and GIS Coordinator to update and create water-related maps for town's records;
- Working with Board of Health (BOH) for adoption of floor drain regulations;
- Working with High School Building Committee (HSBC) on wellhead protection issues;
- Advising Board of Public Works (BOPW) on compliance with MassDEP regulations;
- Co-sponsoring amendments to Aquifer Protection District Bylaw with Planning Board;
- Submitting written public comment for proposed Framingham Project reopening Birch Road Wells;
- Restoring hydrological report, *The Groundwater Resources of Wayland, Massachusetts* by Richard Fortin (1981), and plates I-VIII to town's records;
- Working with USGS to provide data in Fortin study for groundwater modeling;
- Sending out outdoor water use reduction information to top tier water users in Wayland (approximately 455 addresses in 2009);
- Compiling sodium sample testing results and recommending appropriate public health advisory;
- Compiling list of residential in-ground pool owners for educational outreach;
- Creating website of links and information regarding wellhead protection issues;
- Co-sponsoring Drinking Water Forum featuring Duane LeVangie, Water Management Act Program Director, with League of Women Voters in 2009;
- Co-sponsoring Demonstration Organic Lawn Project at Mellen Green;
- Attending University of New Hampshire Stormwater and Salt Best Management Practices (BMP) workshops;
- Partnering with Sudbury-Assabet-Concord (SuAsCo) Watershed Community Council in grant applications;
- Obtaining Wayland Cultural Council grant for RiverFest family program "The River Comes Out of Your Faucet" and presenting program with MassAudubon in 2010;
- Purchasing model aquifer simulator and arranging demonstrations at RiverFest, Earth Day and local farmers' market;
- Writing *Town Crier* guest columns on sustainable lawn care and water conservation issues;
- Sending out water program and educational announcements in Wayland's tax bill insert;
- Sponsoring public service announcements on WayCAM, Wayland's Public Access Cable TV station;
- Participating in Wayland's 2010 and 2011 Earth Day celebrations;
- Joining EPA WaterSense program and MassRWA.

EARTH TECH | AECOM

Earth Tech AECOM
300 Baker Avenue Suite 290, Concord, MA 01742
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October 17, 2008

Ms. Sherre Greenbaum, Chairwoman
Wayland Wellhead Protection Committee
161 Plain Road
Wayland, MA 01778

Re: **Capture Zones**
Wayland Municipal Water Supply Wells

Dear Sherre:

In accordance with your committee's authorization, we have completed the capture zone analysis of the Town's existing wells. The following briefly summarizes the methodology and results of our analysis. We are also including pertinent data as attachments, and three maps of the capture zones: one with a topographic base map, one with land use and one with zoning. A fourth map shows the surficial geology.

Records Reviewed

Earth Tech/AECOM collected and reviewed records of a hydrogeologic nature dating from the 1940s to the present. These included:

1. Pumping test records of all wells, except for Meadowview (which were not available). Pumping test data were analyzed to determine aquifer hydraulic characteristics, namely transmissivity and hydraulic conductivity.
2. Well drilling records. Test well drilling records were used to understand the stratigraphic conditions.
3. Consultant reports. These included reports completed by GZA, IEP, Anderson Nichols, D.L. Maher Co., and Geosphere. All of these reports, except for the D.L. Maher report, were available from the Wayland Water Department.
4. Masters Thesis, "The Groundwater Resources of Wayland, Massachusetts", by Richard L. Fortin, 1981.
5. Published U.S. Geological Survey surficial geologic mapping.
6. Other miscellaneous records.

Summary of Geologic Conditions

The Sudbury River is the predominant physiographic feature in Wayland. In general, the land surface slopes gently from the river valley along the Town's western boundary to a number of low hills in the eastern part of Town. The soils in Wayland are largely glacially derived. Whereas the eastern hills are largely underlain by glacial till and bedrock, the remainder of town is underlain by stratified drift consisting of layered sand, gravel, silt and clay. The glacial till and bedrock are typically viewed as "non-aquifer areas", whereas the stratified drift is considered generally as "aquifer areas". The aquifer areas are made up generally of sandy or gravelly soils. However, nearest the Sudbury River and its flood plain, fine-grained soils, such as clay, silt and fine sand are present. These fine-grained soils may be discontinuous laterally, and may be present close to the surface but underlain by sand and gravel.

Based on the geologic and pumping test records, it appears that the Happy Hollow and Baldwin Pond Wells are located in areas where the soils consist largely of sand and gravel, with no significant overlying layers of fine-grained soils. Such aquifers are termed "unconfined aquifers" because flow of groundwater is not restricted vertically by a "confining layer" of clay or fine-grained soil. The Campbell Road well, in contrast, exists under confined conditions because a layer of fine sand and clay, approximately 50 feet thick, overlies the sand-and-gravel aquifer, which is only 15 feet thick or so. The Chamberlain well exists under partially confined conditions, as a few layers of clay are reported at the well, but in other areas nearby, no clay is reported.

Capture Zone Methodology

Capture zones were delineated largely using pre-existing data. Detailed groundwater elevation contours indicating groundwater flow were taken from IEP (1987, Aquifer Mapping Project, Town of Wayland, MA). These show that, in general, groundwater flows from the east to the west toward the Sudbury River. Earth Tech/AECOM analyzed existing pumping test records to determine aquifer transmissivity for all wells except Meadowview Well. Since we were not able to identify any pumping test records for Meadowview, we relied on the report of a previous consultant for a transmissivity value. Rather than assume Zone II pumping conditions, we assumed average pumping conditions for the period 2001 to 2007, as reported to us by the Wayland Water Department. For purposes of this study, average conditions are more realistic. For Zone II, one assumes that the well is pumped at its full capacity, 24 hours per day for 180 days with no rainfall recharge. As a result, the capture zones delineated under this study are considerably smaller than the Zone IIs.

We began the capture zone delineation process by determining the "downgradient stagnation point", which is the theoretical downgradient capture distance. The stagnation point is computed as follows:

$L = Q/2\pi Ti$, where

L = the downgradient stagnation point, in feet
Q = pumping rate, in ft^3/day
T = Transmissivity, in ft^2/day
i = groundwater gradient

For each capture zone analysis:

Q is the average pumping rate, 2001-2007
T was determined as described above, and
i was interpreted from the regional groundwater contour mapping completed by IEP (1987)

The downgradient stagnation point was plotted for each well. From the downgradient stagnation point, the downgradient boundary was extended north and south of each well through the aquifer area, then upgradient perpendicular to the groundwater contours.

Once the capture zone was delineated for each well, we checked the reasonableness of the size of the capture zone through a simple validation step, as follows. We first determined the area of the capture zone, A, in square miles. We then applied a rainfall recharge rate, R, of 0.8 million gallons per day per square mile (MGD/mi^2). Multiplying A by R, we computed the theoretical volume, V, of water recharged to the capture zone on a daily basis. This volume, V, should be roughly equal to the daily volume pumped, P, from each well.

Capture Zones

The capture zones are shown on three maps:

1. Topographic base map with groundwater elevation contours
2. Land Use base map
3. Zoning base map

Water Quality Issues – Happy Hollow Wells

There are a number of activities in the capture zone for the Happy Hollow wells that are cause for concern with respect to water quality:

1. The Wayland High School has a large septic system reportedly 530 feet from the wells. Aside from domestic wastewater, the septic system has received other wastes from the chemistry labs, photo-processing room, art room, and boiler room. The most recent water quality for Happy Hollow indicates a nitrate level of 2.5 mg/L. This is perhaps related to the school septic system as well as other septic systems to the east, including the Dudley Pond area. The drinking water standard for nitrate is 10 mg/L, however, DEP normally increases the frequency of monitoring when the nitrate level exceeds 5 mg/L.
2. The Massachusetts Department of Environmental Protection (DEP) requires ownership or control of all land within 400 feet of the well, known as Zone I. DEP requires that there be no activity in Zone I except for those related to water supply. We note several unrestricted activities in Zone I, including parking areas, recreational areas, and uncontrolled activities in the former gravel pit.
3. The High School has at least one underground fuel storage tank (UST) on site, installed in 1991. While the UST has the required alarms for detecting leakage, two consultant reports indicate that these are not in working order. A new football field has been constructed with artificial turf. The impact of the turf on water quality, if any, has not been examined.
4. The intermittent stream that passes directly to the north of the Happy Hollow wells receives drainage from unknown or uncontrolled sources. It is our understanding that this drainage is going to be re-routed outside of Zone I. Other road drainage from Route 126 is reportedly routed to catch basins in the capture zone for Happy Hollow.
5. The capture zone delineated for Happy Hollow represents a preliminary representation of the area that contributes most of the recharge to the wells.

6. In summary, there are a number of activities in the capture zone of the Happy Hollow wells, some in Zone I, which cumulatively degrade or threaten the quality of well water. In an ideal world, there would be no human activity in the capture zone. However, these wells were built decades ago, when the land was less congested and before widespread recognition of the vulnerabilities of groundwater supplies. Additional studies should be undertaken to define the capture zone with more precision and to evaluate potential sources of well contamination in more detail.

It has been a pleasure to assist the Wellhead Protection Committee on this important project.

Very truly yours,

Earth Tech|AECOM

Douglas DeNatale,
Project Manager/Senior Hydrogeologist

Town of Wayland, MA
Summary of Aquifer Characteristics and Conrtibuting Areas
September 2008

Earth Tech/AECOM
300 Baker Ave., Suite 290
Concord, MA 01742

Well ID	Calculated Transmissivity (ft^2/day)	Hydraulic Gradient	Pumping Rate (gpm)	Computed downgradient stagnation point (ft)	Theoretical Contributing Area (sq. miles)*	Mapped Contributing Area (sq. miles)
Happy Hollow #1	13,800	0.017	234	31.2		
Happy Hollow #2	12,000	0.017	376	57.7		
Happy Hollow (Combined)	13,200	0.017	610	85.1	1.10	0.75
Meadowview	6,685	0.001	82	350.5	0.15	0.15
Baldwin #1 and #2		0.005	145			
Baldwin #3	19,750	0.005	165	54.1		
Baldwin (Combined)	19,750	0.005	310	101.8	0.56	0.46
Chamberlain	9,320	0.012	185	53.2	0.33	0.30
Campbell	19,900	0.003	102	51.0	0.18	0.39

*Based on 0.8 MGD per square mile for areas underlain by sand and gravel.

Average Pumpage from Wayland Wells 2001 - 2007

Well ID	Pumpage in MGY for the Year Shown							Total	Years	Yearly Average MGY	Daily Average GPD	Daily Average GPM	Daily Average ft3/day
	2001	2002	2003	2004	2005	2006	2007						
Baldwin #1 and #2	84	90	62	71	74	0.1	0	381.1	5	76	208822	145	27917
Baldwin #3	92	84	64	93	86	73	114	606	7	87	237182	165	31709
Campbell	42	84	52	53	8	48	88	375	7	54	146771	102	19622
Chamberlain	112	73	70	81	128	121	95	680	7	97	266145	185	35581
Meadowview	51	0.5	0.8	4	29	0.9	0	86.2	2	43	118082	82	15786
Happy Hollow #1	124	149	127	83	108	129	142	862	7	123	337378	234	45104
Happy Hollow #2	233	203	215	172	162	201	199	1385	7	198	542074	376	72470

DRD 104915 Aug 28 2008

Appendix D

July 20, 2010

Mr. Donald Ouellette, P.E.
Department of Public Works
Town Office Building
41 Cochituate Road
Wayland, MA 01778

Re: Final Report
Phase II Hydrogeologic Investigation
Happy Hollow Wells

Dear Mr. Ouellette:

AECOM Technical Services, Inc. (AECOM) is pleased to present the results of our Phase II Hydrogeologic Investigation of the Happy Hollow Wells. Our investigation consisted primarily of:

- The installation of eight monitoring wells and three hand-driven well points in March-April 2009 and three additional monitoring wells in May 2010;
- A seven-day pumping test of the Happy Hollow wells in June 2010;
- An evaluation of hydrogeologic data, including the preparation of geologic cross-sections and water-table contour maps; and
- Approximating the capture zone for the Happy Hollow Wells under quasi-steady-state conditions.

Well Installation

AECOM contracted with Boart-Longyear Company of North Reading, MA to install eight monitoring wells, and three hand-driven well points in March and April 2009. The monitoring wells, labeled MW-1 through MW-8, were installed using a "cable-tool rig" by driving 2.5-inch diameter threaded/coupled steel well casing and washing out soil from inside the casing with a one-inch diameter steel wash rod (see Table 1 for construction details). Soils were classified in the field, and representative samples were jarred. Four of the monitoring wells were finished with 1.5-inch diameter PVC casing and screen, with a section of 2.5-inch diameter steel well casing left-in-place as a guardpipe. The remaining monitoring wells were installed as conventional 2.5-inch diameter test wells, with stainless steel well screen. Water used to drill the wells was obtained from a Wayland Water Department hydrant near the Happy Hollow Wells. In addition, all wells were chlorinated at the conclusion of drilling. These steps were to taken to minimize the potential for introducing bacteria into the aquifer. Well Logs are in Appendix A.

The three 1.25-inch diameter drive points, labeled DP-1 through DP-3, were driven by hand in the wetlands adjacent to the Happy Hollow Wells (see Table 1 for construction details). At the time of their installation, there were several inches of standing water at each drive point location. Each drive point was constructed of a five-foot section of galvanized steel and two-foot-long stainless steel well point. The soils at each location were determined by drilling a two-inch diameter auger hole several feet from each drive point. The auger holes were backfilled with bentonite to close any hydraulic connection that the borehole might have created between the surface water and groundwater.

AECOM determined the locations of each well and drive point with a hand held Global Positioning System (GPS) unit. AECOM contracted with Schofield Brothers of Framingham, MA to determine well elevations. Elevations are referenced to mean sea level (National Geodetic Vertical Datum of 1929).

AECOM contracted with F.G. Sullivan Drilling Co. to install three shallow monitoring wells in May 2010. These wells, labeled MW-1S, MW-2S and MW-5S, were installed above the clay layer two feet from existing monitoring wells MW-1, MW-2 and MW-5, respectively. The shallow wells were intended as a means of observing shallow groundwater flow conditions. The shallow wells are all constructed of 1.5" diameter PVC with a section of 2.5-inch diameter steel well casing for protection. The Town of Wayland determined the elevations of these three shallow wells relative to NGVD 1929. Table 1 summarizes construction details for the shallow wells.

AECOM incorporated three additional groundwater monitoring wells into the monitoring network: SH-2, SH-3 and SH-4. The primary purpose of these wells, installed in 2009 by Sanborn-Head, is to monitor the groundwater quality for the High School leaching fields.

Seven-Day Pumping Test

With the assistance of the Wayland Water Department, AECOM conducted a seven-day pumping test in June 2010. The ultimate goal of the pumping test was to approximate the capture zone of the Happy Hollow wells under normal pumping conditions. Water levels during the pumping test (and the preceding recovery period) were measured manually, normally twice daily, using an electronic water-level probe. In addition, water-level data loggers were installed in the "Test Well", IEP-B3, IEP-B1, MW-2 and MW-6 for automated reading.

At 1 p.m. on June 2, 2010, both Happy Hollow wells were taken out of operation and AECOM/Wayland began measuring water-level recovery in the monitoring wells. Water-level recovery measurements continued until June 7, when water levels reached static groundwater conditions (see Figure 1). Static conditions refer to natural groundwater flow conditions, unaltered by man-made influences, such as the pumping of wells.

TABLE 1
MONITORING WELL CONSTRUCTION DETAILS
HAPPY HOLLOW WELLS
WAYLAND, MASSACHUSETTS

Well ID	Well Type	Distance (feet) from Happy Hollow Well 1	Elevation, Top of Casing/PVC	Elevation, Ground Surface	Depth of Screened Interval (ft bgs)
MW-1	2.5" steel	880	123.84/NA	122.3	67-73
MW-1S	1.5" PVC	880	124.06/124.06	122.3	5-8
MW-2	2.5" steel	570	128.22/NA	125.2	60-63
MW-2S	1.5" PVC	570	127.58/NA	125.2	4-9
MW-3	1.5" PVC	1,270	137.35/137.43	134.4	32-42
MW-4	2.5' steel	920	130.90/NA	129.6	41-47
MW-5	2.5" steel	435	124.93/NA	121.2	70-74
MW-5S	1.5" PVC	435	123.65/NA	121.2	3-8
MW-6	1.5" PVC	245	124.51/124.58	122.2	60-65
MW-7	1.5" PVC	645	145.12/145.11	141.4	50-55
MW-8	1.5" PVC	1,215	130.45/130.53	127.4	50-60
IEP B-1S	2" PVC	485	134.27/133.62	132.1	18-28
IEP B-1M	2" PVC	485	134.37/133.82	132.4	38-48
IEP B-1D	2" PVC	485	134.30/134.13	132.3	55-65
IEP B-3S	2" PVC	340	130.63/130.00	127.9	15-25
IEP B-3M	2" PVC	340	130.07/128.69	127.3	38-48
IEP B-3D	2" PVC	340	130.18/128.64	127.8	65-75
Test Well	2.5" steel	110	124.17/NA	122.9	35 +/-
DP-1	1.25" steel	180	119.61/NA	116.1	3-5
DP-2	1.25" steel	175	117.39/NA	114.0	3-5
DP-3	1.25" steel	375	116.44/NA	113.2	3-5
SH-2	2" PVC	1,400	NA/153.21	153.3	35-45
SH-3	2" PVC	1,430	NA/130.15	130.2	20-25
SH-4	2" PVC	1,230	NA/130.71	130.7	20-25
Happy Hollow Well 1	24" x 54" GPW	N/A	NA	122 +/-	30-40
Happy Hollow Well 2	24" x 48" GPW	250	NA	122 +/-	35-50

All elevations in feet, NGVD 1929; NA = not available; bgs = below ground surface; GPW = gravel-packed well.

At 11 a.m. on Monday, June 7, 2010, Happy Hollow Well #1 began pumping into Wayland's water-distribution system. The well was pumped continuously at a rate of approximately 300 gallons per minute (gpm) until Tuesday, June 15, 2010. Between June 7 and June 10, the data loggers collected frequent and regular water-level drawdown measurements, sufficient to allow AECOM to compute aquifer hydraulic characteristics.

At 1 p.m. on Friday, June 11, 2010, Happy Hollow Well #2 began pumping into the distribution system. The well was pumped continuously at a rate of approximately 475 gpm until June 15, 2010. A final round of water levels was measured manually on June 14. Pumping was terminated early on June 15 because Wayland's water demand had declined due to cool, overcast weather conditions. Figure 2 shows the groundwater flow conditions based on the June 14 water-level measurements. Groundwater levels of June 14 were relatively stable in many of the wells. From this, we have concluded that water-levels had reached a quasi-steady state condition.

Pumping Test records are in Appendix B.

Stratigraphic Conditions

Based on the well drilling completed in 2009/2010 and previous drilling in the area, AECOM has constructed three geologic cross-sections. Surficial geologic mapping conducted by the U.S. Geological Survey (USGS) indicates that the Happy Hollow Wells are at the northern edge of a glacial delta, composed primarily of sand and gravel. USGS mapping further indicates that the flat areas to the north of the Happy Hollow Wells – the areas now occupied by Wayland High School ball fields – is underlain chiefly by clay deposited in a glacial lake.

AECOM's geologic cross sections – shown on Figure 3 – tend to confirm the USGS findings, though we have added considerable refinement and detail. The area around the Happy Hollow wells and the low hills nearby to the south and east (MW-7, MW-8, and the IEP wells) are underlain by thick (up to 75 feet thick) layers of sand and gravel, which can be silty. The sand-and-gravel layers constitute the aquifer that supplies the Happy Hollow Wells. The football field and tennis courts (MW-5 and MW-1) are underlain by a thick layer of clay (about 60 feet thick), though there is a thin sand-and-gravel unit on top of the clay and another sand-and-gravel unit below. These upper and lower sand layers are hydraulically connected to the aquifer that feeds the Happy Hollow Wells, though they do not contribute a significant proportion of well yield. The intervening areas (MW-2, MW-4 and MW-6) are transitional between glacial lake and glacial delta deposits, where the clay is 15 to 30 feet thick, and the remainder is sand and gravel.

The geologic cross sections shed considerable light on the structure of the aquifer system that supplies the Happy Hollow Wells. The presence of clay complicates the aquifer structure. Whereas, the sand-and-gravel units transmit water readily, the clay transmits water very poorly. Understanding the distribution of sand-and-gravel versus clay is one of the principle factors in understanding how groundwater moves toward the Happy

Hollow Wells when they are pumped, and the proportionate contribution from each geographic area.

Aquifer Hydraulic Characteristics
AECOM collected water-level drawdown measurements using electronic data logging equipment during the pumping of Happy Hollow Well #1, and used this data to compute aquifer hydraulic characteristics. Data was collected from the "Test Well", IEP-B3, IEP-B1, MW-2 and MW-6, however only the data from the first three wells was suitable for aquifer analysis. Using time-drawdown analysis methods, we estimate an aquifer transmissivity of approximately 22,000 ft^2/day, and a specific yield of 0.03 to 0.11. Assuming an aquifer thickness of 55 feet, the hydraulic conductivity is estimated to be about 400 ft/day.

Using the distance-drawdown method, we computed an aquifer transmissivity of about 16,000 ft^2/day and a specific capacity of 0.12. Assuming an aquifer thickness of 55 feet, the hydraulic conductivity is estimated to be 290 ft/day.

Aquifer analysis curves are included in Appendix C.

Conclusions
Based on the Phase II Hydrogeologic Investigation, AECOM concludes the following:

- The U.S. Geological Survey has mapped the Happy Hollow wells at the northern edge of a large kame delta, which is bordered to the north by glacial lake deposits. In general, the kame delta is composed of sand and gravel; the lake deposits, which occupy the flat areas north of the well, generally contain thick clay sequences. Between the kame delta and the thick clay, the geology is transitional, with varying thicknesses of water-bearing sand-and-gravel and impermeable clay. For this reason, the aquifer supplying the Happy Hollow wells is geologically complex. See Figure 3 for detailed stratigraphic information.

- In the immediate vicinity of the Happy Hollow wells, the kame delta is composed largely of sand-and-gravel up to 75 feet thick. The glacial lake deposits beneath the tennis courts and football field north of the wells are largely made up of gray clay up to 65 feet thick. The clay is overlain and underlain by sand layers, as little as five feet thick.

- The distribution of glacial soils – especially the clay – plays an important role in controlling groundwater flow under both static and pumping conditions. The thick clay north of the wells acts as a partial barrier to groundwater flow.

- Under static conditions (see Figure 1), groundwater flows westerly toward the Sudbury River, and parallel to Dudley Brook. The drive points installed in the brook just north of the wells indicated that groundwater was discharging to Dudley Brook in June 2010. Under these conditions, Dudley Brook would be termed a "gaining stream".

- Under pumping conditions, most of the groundwater that reaches the wells originates from the east and probably the south of the Happy Hollow wells (see Figure 2). The groundwater contribution from the area of the High School tennis courts and football field is expected to be minor, transmitted only through a thin upper layer of sand that overlies thick clay deposits. Similarly, the groundwater contribution from the existing high school leach field is also expected to be minor. Much of the discharge to the leach fields appears to flow northwesterly to the wetlands bordering the Sudbury River.

- The drive points installed in the brook indicate that water from the brook is induced into the aquifer under pumping conditions, the more so when both wells are pumped simultaneously. The relative contribution of induced infiltration is relatively minor where the brook is narrow, but is likely to increase where the brook flows into the broad wetland directly north of Happy Hollow Well #2. Therefore, protecting water quality in the brook will protect water quality in the wells. It was beyond the scope of this investigation to evaluate how much water is induced into the wells from the wetlands bordering the Sudbury River (directly west of the wells), but it could be fairly significant.

- Figure 2 shows the approximate northern limit of the capture zone of the wells under pumping conditions of June 7 to June 14, 2010. By June 14, water levels in the area had reached a near-stable condition, indicating that the capture zone should not expand significantly under similar pumping and rainfall conditions. While most school activities are relatively benign, the sheer intensity of activities and their proximity to the Happy Hollow wells pose a threat to groundwater quality. Parking areas and drainage, in particular, are threats to water quality. These and other deleterious activities should be removed from Zone I and moved as far from the wells as practical.

In closing, it has been our pleasure to assist the Town of Wayland on this important project. We would be pleased to discuss this report with you in detail.

Very truly yours,

AECOM Technical Services, Inc.

Douglas DeNatale, PG
Senior Project Director