

MEMORANDUM

To: Groundwater Advisory Council
From: H. Bokuniewicz
Re: Minutes of the meeting of 11 May 2009
Date: May 15, 2009

PRESENT

R. Alvey
N. Bartilucci
H. Bokuniewicz
C. Cannon
S. Colabufo
A. Gromadzka
S. Jones
D. Mahajan
P. Modelewski
D. Paquette
K. Roberts
J. Roccaro
W. Spitz
S. Terracciano
M. Trent

REGRETS

M. Alarcon
L. Koppelman
R. Liebe
R. Mazza
M. Nofi
K. Willis

1. The last regular meeting was on 23 February 2009 (because of the turf-grass symposium in March). Minutes from that meeting had been distributed and copies were available. There were no comments.
2. Martin Trent spoke about the new ban on fertilizer applications in Suffolk County (between 1 November and 1 April).

Sewering has been effective in reducing the loads in Nassau County. However, between 1987 and 2005, nitrate levels in Suffolk County have increased 38% in the Upper Glacial Aquifer and 67% in the Magothy Aquifer. Increases have also been detected in the Lloyd. Ten percent of private wells exceed the drinking water MCL of 10 ppm and 29% exceed GMZ targets (4 ppm). Most of these are on the north and south forks but there are both individual wells and clusters scattered throughout Suffolk County in, for example, Nissequoque, Nesconset, Old Field and around Moriches Bay. The number of private wells being tested by the Suffolk County Department of Health Services has decreased, perhaps, because the fee went up to \$100.00.

Although agricultural fertilizers seem to be the main source of groundwater nitrogen, residential fertilizers from medium density development are thought to contribute almost half of the load of nitrogen to groundwater. There is some isotopic evidence to identify fertilizer sources but the distribution of nitrate and associated contaminants also implicate fertilizer. That is, contamination might be found right at the water table and/or associated with trace pesticides. Only part of the problem is due to high levels of nitrate that might be found in areas where agricultural land was converted to housing. In some areas of Huntington, high concentrations were found in areas that were never used for agriculture. Vineyards are an exception. There seems to have been a reduction of groundwater nitrate levels around vineyards. Legacy contamination from previous land use, such as potato farms, now seems to be decreasing.

There are ecological impacts, also, when groundwater nitrate reaches surface water. A concentration of 0.7 mg/L is considered optimal for stream water quality and 0.15 mg/L for eelgrass beds.

Local law 41-2007 is directed at reducing residential fertilizer applications and only applies to turf. Farms are exempt. Fertilizer applications are prohibited on any turf in Suffolk County between November 1 and April 1. County golf courses must adhere to the County Organic Maintenance Plan; the County Farm in Yaphank will use AEM practices and county athletic fields use BMPs.

An amendment (L2 41-2007) on 24 March, 2009 also prohibits fertilizer applications within 20 feet of any "regulated surface water" (not artificial ponds) except where there is a continuous natural-vegetation buffer at least 10 feet wide.

Signs will be posted in stores and brochures made available to the public. Contractors will need to obtain a license after taking on approved turf-management courses. Public outreach is being done by the Cornell Cooperative Extension.

Beginning 1 January 2009, the law is enforced by the Suffolk County Department of Health Services. Fines are not to exceed \$1,000 per violation and, with the present staff limitations, the Department is mostly responding only to complaints.

We are not aware of comparable laws in other areas of the country. The bill passed here with no opposition except for some discussion of the dates. There is some advantage to stimulating grass root-growth by a fall application but by mid-September there is also a higher risk of leaching. The recommendation is also not to fertilize before Memorial Day. Before the end of May, fertilizer promotes top growth rather than root growth.

This law is seen as a step in the right direction towards continued, long-term progress.

3. Three students from Stony Brook University, Courtney Cannon, Anna Gromadzka and Paul Modelewski, presented a study they did in cooperation with Joe Roccaro of the Suffolk County Water Authority. These students were in a senior design course in chemical engineering (CME 441) under the supervision of Dr. Devinder Mahajan. Granular activated carbon (GAC) is used to remove contaminants at about 110 wells of the Suffolk County Water Authority, at a cost of about \$3.2 million annually. When necessary to remove contaminants such as VOC's, pesticides, perchlorate, nitrate, or metals, GAC systems are run in tandem typically at 1200 gallons per minute allowing for a contact time of between 8 and 15 minutes. Replacing GAC runs about \$60,000. The project was to design a rapid, small-scale, column test (RSSCT) so that GAC filter-design can be optimized for specific wells.

GAC has the high surface area needed to absorb contaminants. As much as 120 acres of surface are available in one pound of carbon. Large pores in the carbon provide transport pathways to be small pores where contaminants are absorbed on the particles. Air strippers are generally not needed but there can be some risk of bacterial contamination and some contaminants, such as MTBE, 1, 4 Dioxane, Freons, low molecular weight ketones etc. are poorly absorbed and can break through the GAC system relatively quickly. Because individual wells will have specific mixes of contaminants, there is no

generally applicable GAC design, therefore GAC systems have to be site-tested to optimize performance.

The RSSCT is to be a column about 25 mm in diameter and 10 to 20 cm long using small mesh (100 x 200) carbon and operating parameters approximately scaled to mimic full-size GAC systems. They are estimated to cost about \$1100 and would provide a kinetic test over the course of about six days. To optimize a system for the specific matrix of contaminants in a particular well, test can be done using (a) hybrids, (b) different GAC types, such as coal, wood, coconut, pine cone, etc., (c) pretreatment, such as the addition of surfactants and (d) different methods of regeneration of spent carbon such as heat, electric oxidation of hydrogen peroxide.

In discussion, it was emphasized that results would probably be unique to the tested well only, hence, the need for an easy, rapid test, but even so, with such a wide range of contaminants and options, some protocol for the systematic prioritization of test will be needed.

4. The USGS has completed a depth-to-groundwater map with thanks to all their cooperating agencies. It is intended to be served through GIS files. The 2006 map of water-table elevations is available on-line.
5. There's an update of the Suffolk County Comprehensive Water Resources Management Plan scheduled on 23 June in Yaphank.
6. The turf-grass symposium (30 March, 2009) was followed by a two-page article in Newsday on the issue of fertilization. The symposium was featured on, at least, two TV news presentations. Steve Jones did a phone interview with WLIU. Jennie Munster was also interviewed by Newsday. Information and photographs were sent to all the LI weekly papers in Suffolk County. The Suffolk County Water Authority intends to put a video link to the symposium on their homepage.

Unfortunately, Marty Petrovic had last-minute travel problems which we could not solve on that day, so he did not attend. He would be willing to do a "webinar" and, as suggested, we will schedule one in the fall before the "fertilizer ban" starts in November.

7. The Pine Barrens Research Forum is scheduled for Thursday, October 1. It is loosely based this year on the theme of Ecosystem Based Management, an initiative in NYS initiated by the Department of State.
8. There will be a new \$50 fee for reporting on groundwater wells. Bill Spitz will provide further information that I will distribute.
9. Tom Shanahan has provided his legislative briefing to the LI Water conference. Assemblyman Englebright (still) has a bill to prohibit the storage or pumping of water into the Lloyd Aquifer. It seems that it would also prevent any water from being withdrawn from the Lloyd for any reason other than chloride contamination. It's been referred to "environmental conservation" (DEC?).
10. Geothermal wells were briefly discussed. In Nassau County recently 18 geothermal wells are being proposed for a 25,000 square foot house. The DEC is reconsidering its policy on geothermal systems. Currently, if the well is greater than 500 feet, a mineral

resources permit is required, and if the total pumpage is greater than 45 gpm a NYS, LI well permit is needed. The wells must also be in the same aquifer and there are buffer restrictions. Geothermal systems are routinely offered, as an upgrade, further south. They are becoming more popular on Long Island although they have been banned in Shelter Island last week.

11. The next Groundwater meeting will be on **Monday, June 15, 2009** at the offices of Dvirka & Bartilucci in Woodbury.

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