

## MEMORANDUM

To: Groundwater Advisory Council  
From: H. Bokuniewicz  
Re: Minutes of the meeting of 6 June 2011  
Date: June 8, 2011

### PRESENT

N. Bartilucci  
H. Bokuniewicz  
S. Colabufo  
D. Paquette  
K. Roberts  
C. Schubert  
M. Scorca  
W. Spitz  
S. Terracciano

### REGRETS

M. Alarcon  
S. Jones  
L. Koppelman  
R. Liebe  
R. Mazza  
M. Nofi  
A. Rapiejko

1. There were no comments on the minutes of the last meeting (May 2).
2. Both the USGS and the SCWA have done studies of road-salt contamination in Southold (presented at a NGWA meeting) and in recharge basins in Northport. In spots, salt can be twice sea-water salinity but the distribution is patchy depending on the road size, intersections etc. One recent concern has been with the use of sodium ferrocyanide as an anticaking agent. This is not applied as free cyanide, but concerns have been raised nonetheless. There is no testing for cyanide, but the University has the capability for such tests.
3. The County (SCDHS) had tested groundwater at a private composting facility on Horseblock Road in Yaphank. Elevated levels of potassium-40, gross-alphas, gross-betas, and metals (e.g. strontium and barium) have been detected. The SCDHS detected elevated potassium-40 levels in shallow groundwater and surface runoff samples near the compost piles. Contamination seems to be distributed over the entire site not just around the compost pile. The Grucci fireworks' facility is up-gradient but the percholate plume is deep while the abovementioned contamination is shallow. For the most part, the elevated gross beta concentrations are likely due to potassium-40, but other nuclides might be contributing to the elevated counts. The SCDHS and NYSDEC will be conducting additional radiological analyses to identify the nuclides that might be responsible for the elevated gross alphas and other beta emitting nuclides. Metals such as strontium, barium and potassium are used in fireworks, but a possible link to the composting facility is unclear. Newsday recently contacted the USGS for information on radioactivity in LI groundwater.

After the meeting Steve Terracciano provided the following information:

“...high radioactivity and high radium are possible regionally, in North Atlantic Coastal Plain aquifer (NACP) of which LI is part. There are numerous NJ Coastal Plain Investigations (a prominent part of NACP). The primary driver has been low pH for Ra mobility. While far less common in NACP (though occurs occasionally), low DO is also a cause for Ra mobility, and is usually the driving force in the rest of the eastern USA

The best published reports remain some of the NJ NACP studies. But they do focus on the low pH not the low DO:

Szabo, Zoltan, dePaul, V.T., Kraemer, T.F., Parsa, Bahman, 2005, Occurrence of radium-224 and comparison to that of radium-226 and radium-228 in water from the unconfined Kirkwood-Cohansey Aquifer System, Southern New Jersey: U.S. Geological Survey Scientific Investigations Report 2004-5224, 92 p.  
[<http://pubs.er.usgs.gov/pubs/sir/sir20045224>]

Szabo, Zoltan and dePaul, V.T., 1998, Radium-226 and Radium-228 in shallow ground water, southern New Jersey: U.S. Geological Survey Fact Sheet FS-062-98, 6 p.  
[<http://nj.usgs.gov/publications/FS/FS-062-98.pdf>]

Focazio, M.J., Szabo, Zoltan, Kraemer, T.F., Mullin, A.H., Barringer, T.H. and dePaul, V.T., 2001, Occurrence of selected radionuclides in ground water used for drinking water in the United States: A reconnaissance Survey, 1998: U.S. Geological Survey Water Resources Investigations Report 00-4273, 35 p.  
[<http://water.usgs.gov/pubs/wri/wri004273/pdf/wri004273.pdf>] “

4. Studies in Hempstead Bay were discussed. Work is being done at Stony Brook under an MOU with the NYS-DOS is “pending further study”. To set a TMDL, the regulatory authority must be able to identify the limiting nutrient, determine its budget in order to identify the significant sources, show that the regulated activity can control the Ulva problem.

The study is funded by the NYS Department of State. It includes a review of historical data on water quality, a series of new observations and modeling of water movement. The historical data goes back to and although it contains gaps and some uncertain quality, trends can be seen in, for example, a rise in summer nitrate values and an increase in water temperature. The temperature increase could be due to climatic changes but also could be due to shoaling in the bay system or an alteration of tidal conditions.

Recent measurements of dissolved oxygen (Summer 2010) show low, but not hypoxic, conditions in the bays except in Hewlett Bay where hypoxic and even anoxic conditions were seen.

New bathymetry has been measured to support the hydrodynamic modeling. In some places, the new bathymetric measurements (multibeam) seem to show disturbance of the sea floor at the outfalls and preliminary modeling shows that input from the Bay Park and Long Beach outfalls only escapes the Bay with difficulty if at all and there's some tendency for transport north into Hewlett Bay. Measurements of quaternary ammonia compounds (QACs) which are sewage indicators also find elevated values (0.5 to 0.35 micrograms/gram) at the north end of Hewlett Bay as well as around the outfalls.

The SBU studies seem to be tending to support an ocean outfall. The Bay Part STP, in a consent agreement with the DEC, will investigate the feasibility of an ocean outfall. (We might ask advice from Tom Gulbransen).

Other studies on marsh loss are done at Adelphi University by Dr. Beth Christensen and her colleagues Jess Dutton and Jonna Coombs. A study done by one of Beth's master's students on marsh loss found:

"In 1926, the total amount of marshland found in all of Hempstead Bay was 5,461.3 hectares (ha). By 1983, 47% of this land had been lost largely due to the expansion of Nassau County as part of large scale dredge and fill operations; however, marshland continued to be lost after these operations ceased. By 2004, an additional 3% of marshland was lost, totaling 2,750.48 ha of marshland lost within this time. Losses after 1983 have a more subtle visualization and are seen most clearly as perimeter retreat of shorelines. Such forms of erosion are amplified by increased wave energies and boat wakes".

5. The preliminary student report on STP's was distributed. This had been started as a student project to examine case studies of STP's in Suffolk County stemming, in part, from our involvement in pollution issues in the Forge River and the interest in the SCWA in potential impacts to the freshwater supply. We had studied the situation at the Stony Brook STP regarding the relative impacts of using seepage pits instead of open water discharge into Port Jefferson Harbor as is done now. The better option seemed to be an increase of open-water discharge to accommodate increased use. Port Jefferson Harbor sits as a "reaction vessel" and may even import nitrogen from the Sound. The seepage pits option had uncertainties regarding the geohydrologic conditions, attenuation of nitrate, as well as siting difficulties.

The STP at BNL was another case. BNL is eliminating all open-water discharge (to the Peconic) primarily because of Hg contamination. Hg (and other metals) are not remediated at the STP and the existing seepage pits had accumulated Hg over the year making them a source. In addition, mounding was observed under the existing pits where a shallow confining layer about 20 feet thick of interlayerd clay was found. The mound was about 8 feet high and couple of 1000 feet in diameter, perched on a layer of interbedded clays about 20 feet thick. The layer, however, appears to be discontinued; it probably can be avoided by relocating the pits. There was concern that the mounding would allow groundwater to "break through" and runoff into the Peconic River. Mounding may be a more general issue at recharge pits and in clustered developments. Treatment for metals or other contaminants may itself have adverse impacts.

The Northport STP was also studied in light of our recent work on underflow (groundwater flowing naturally under the shoreline) as a source of nitrate. This was work done collaboratively by the USGS and SBU which detected sewage indicators from the sewerred areas in the groundwater, indicating leakage. In the course of these studies other interesting issues arose. One was the concept of "nitrogen credits". This involved the situation at Northport. The NPT STP is not operating at full capacity but they will not be able to meet the TMDL if they go to full capacity even with the best treatment technology. Currently about half of the village uses septic systems which discharges into groundwater and indirectly into the harbor. One strategy would be to eliminate these systems by hooking up to the STP and raising the STP's TMDL by the nitrate reduction thus achieved.

There is a long history of monitoring in the Southwest Sewer District (SWSD). Initial predictions of the decline in the water table elevation did not materialize. In fact, over about 20 years declines were obscured, in part, by natural cycles of precipitation. Measurable depression in the western part of the area were clearly attributed to the cone of depression from Nassau County rather than drainage from the SWSD itself.

In discussion, it was pointed out that this was also a time of increased development upgradient (north) of the SWSD. Recharge basins were construction which would have increased recharge upgradient of the SWSD perhaps mitigating the impacts of withdrawals and STP discharges to the ocean. We are still tracking down recent measurements of water table elevations and groundwater quality.

6. Alternative septic systems were discussed briefly. Cost (some \$30,000 per household), space on small lots and homeowners maintenance are serious obstacles. Hamlet-based systems (as discussed recently by Walter Hibbert) may be another option. These are smaller, multi-unit systems, they are less expensive for developments than STP's. The County currently limits them to 15,000 gal/day.
7. Another interesting situation was the inadvertent redirection of the tritium plume at BNL. The tritium plume was being monitored by a series of wells, but when a discharge of cooling water was reduced to nearby recharge basins the local hydraulic gradients change, probably due to a reduction in mounding, and the path of the tritium plume changed removing it from the monitoring wells. Now the situation is managed by control of recharge and pumping but the experience emphasized the importance of "transient analyses" including changes in pumping and recharge. (A similar situation occurred at the Grumman site).
8. A Suffolk County Legislative Committee has heard testimony on the use of coal tar from both the USGS (Coram and the Texas Water Science Center) and from industry representatives. The EPA is also looking into toxicity associated with coal tar. Suffolk County seems to be moving toward a ban on coal tar produces and other entities (e.g. NY and other states) have sufficient information upon which to base decisions.
9. We will break for the summer and the next meeting will be on September 19, 2011 (Monday).