

**MEMORANDUM**

To: Groundwater Advisory Council  
From: H. Bokuniewicz  
Re: Minutes of the meeting of 8 April 2013  
Date: April 9, 2013

**PRESENT:**

N. Bartilucci  
H. Bokuniewicz  
S. Colabufo  
A. Rapiejko  
M. Scorca  
W. Spitz  
S. Terracciano  
D. Tonjes

**REGRETS:**

M. Alarcon  
R. Alvey  
C. Gallagher  
L. Koppelman  
R. Liebe  
R. Mazza  
M. Nofi  
D. Paquette  
K. Roberts

1. The minutes of the last meeting (March 11) were distributed. There were no comments at this time.
2. Paul Granger, formerly of the Plainview Water District and now at H2M, asked to join us on behalf of the LI Water Conference. I will check with Mike Nofi but we can have two (or three) representatives of a group. Having no objections I will invite him on board.
3. Robert K. Sweeney, Member of NY Assembly, Chairman of Committee on Environmental Conservation, held a public hearing Tuesday, April 2, 2013, at Farmingdale State College. Stephen Terracciano provided opening comments on "Natural and Human Influences on Water Quality in a Shallow Regional Unconsolidated Aquifer, Northern Atlantic Coastal Plain". This hearing was intended to solicit comments on the new Long Island pesticide policy proposed by The Department of Environmental Conservation. The Suffolk County Department of Health Services representatives, Ron Paulsen and Doug Feldman had made a statement at Assemblyman Sweeney's hearing. The NY Farm Bureau had sent out a mass mailing encouraging a strong attendance in support of the Strategy.
4. David Tonjes (Stony Brook's Department of Technology and Society) has worked on groundwater impacts around landfills and compost facilities for many years. He opened a discussion on the topic. There has not been much (any) research on the groundwater impacts of compost. Out of some 350 published articles only one was concerned with compost facilities as a source of contaminants. In fact, compost is sometimes used as a source of organic carbon for groundwater remediation. Local research has been done at Islip, Manorville, Holtsville, and East Hampton. The facility at Islip is on a deep recharge area and built on "virgin ground; it had not been used as a waste site or landfill earlier. All the rest have complicated past histories which confound interpretations of the available data.

Manorville was in use in the 1930's. The water table here is 60 to 70 feet deep. Open burns were done there. This may actually have been a beneficial unintentionally providing an ash barrier (activated charcoal) for leachate. The site was also used for scavenger waste-treatment in settling ponds and leaching pools. Two aerated lagoons had been installed on this site. (The site seems to have a local climate cooler in the winter and warmer in the summer). 7-12 monitoring wells were placed in 1992. Water quality was monitored.

In 1983 Manorville began composting leaves for the Town and in 1992 the Town was required to get a DEC permit that specified bi-annual monitoring initially, then subsequently annual monitoring. No pesticides were detected in the monitoring. A large borrow pit was put in at the north part of the facility which may have altered the groundwater flow. There is still some agriculture in the area but the region is now developed to the property boundary. Some composting is done at this facility. The Great Gardens facility receives yard wastes, ships small (<10,000 c.y.) batches out to be composted on farms and receives the composted material back for distribution.

Chloride concentrations in the monitoring wells, as well as total ion concentration increased around 1999. Originally this was thought to be due to changes in annual precipitation; '94 and '95 were relatively dry years but '96 to '98 were wet. However, the high levels persisted through the next decade. A shift in the plume, perhaps due to the influence of the recharge basin may be a possible cause of the change in concentrations. "Stiff diagrams" which graphically represent chemical analyses can resolve upgradient groundwater from that influenced by the historical landfill and from surface water sources.

In general, the impacts included reduced nitrogen (elevated ammonium), high concentrations of both soluble salts (Na, K, Ca, Cl) and redox-sensitive elements (Mn, Fe), and an absence of pesticides. The organic-rich plume had, as expected, low D.O. and high alkalinity. Potassium levels (K) were elevated as were the resulting concentrations of radioactive K-40. K-40 probably accounts for high gross-β. The source of K is very likely the biological material placed on this site.

Leachate from landfills tend to have more salts and high levels of phosphorus. Landfills are now intended to be lined but the older ones certainly leak or were not lined at all. Landfill plumes, however, can be difficult to distinguish from compost plumes because most composting facilities started out life as landfills.

Andy provided water quality data on Manorville, Great Gardens, Hololab, and the Town of Islip facility on Railroad Avenue in Ronkonkoma.

Great Gardens is underlain by a shallow water table (10 to 15 feet). Monitoring wells had been in place north and east of the site to investigate a (deep) perchlorate plume from the Grucci fireworks facility. Mn was notably elevated, metal concentrations were high, as were ammonia, K, and K-40 as indicated by gross-β. High values of gross-α were found to be from elevated radioactive (228,226) isotope. Ra-226 has a half life of 1601 years and Ra-228 has a half-life of 5.75 years. Radium is mobilized, like Mn, under low oxygen conditions. Its source is probably the uranium naturally occurring in the aquifer material itself. Thallium was also detected (it is also sometimes found in landfill plumes). Pharmaceutical and personal care products, like dilantin were also detected. These suggest a sewage source perhaps from the nearby nursing home. Some of the wells indicating detections of pharmaceuticals and personal care products are

not located downgradient of any obvious source (e.g., nursing home STP) and need further evaluation.

PPCP's were also detected at Manorville. Since yard waste and compost piles are watered primarily to reduce dust, it may be that sewage sludge is used to provide moisture and organic material to the yard waste. The water is provided from dedicated wells on site. It may be that the PPCP and septic signature is introduced with this recirculated groundwater. PPCP's are also found in surface water puddles. Fertilizer may be a potential source; things like "Milorganic", a sewage derive product from Milwaukee (breweries) is still being used as a fertilizer. There is also a possibility that sewage related contaminants could have been mixed in with the compost material.

Similar suites of chemicals were found at Hololab.

It was noted that there is no DEC regulation of compost piles under 3000 c.y.; piles between 3000 and 10,000 c.y. need to be registered but no permit is required, and that a permit is needed for facilities over 10,000c.y. Facilities are most often closed because of complaints of dust and/or odors, but in principle, solid waste facilities cannot operate in such a manner as to contravene groundwater quality. It seems clear that private (shallow) wells near these few, large facilities are at risk, at least, because of changes to the groundwater chemistry caused, by, for example, low levels of dissolved oxygen. The presence of radioactive elements and PPCPs may yet be an additional cause for concern. Public wells are, in general too deep to be at risk but could conceivably be impacted in the long-term. The DEC regulations are being "reconstructed" under the conventional wisdom that composting is part of a sustainable solution to yard waste preferable to shipment off-island. (What happens now to grass clippings?) While composting is not a problem upstate areas of low population density, it may be that "in-vessel" operations will be needed here to protect water quality of neighboring wells. Alternatively, public water may be required at residence around large composting facilities. If hazardous waste sites are found to impact supplies of potable water the DEC will (and does) supply and alternate source of water within 24 hours. Solid waste sites, however, have no comparable response required.

In light of the wealth of data available from the Suffolk County Department of Health Services and the dearth of published literature on compost plumes, we will see if a student can take this on as a project.

5. The issue of salt contamination in the vadose zone due to flooding by Sandy was raised at the last meeting. The USGS estimates that some 100 monitoring wells were flooded. Farmers' experience from previous flooding suggest that it will be two to three years for the salt impact on crops to abate. A student has looked into the problem briefly. The persistence of salt in the vadose zone is dependent not only on the rate of application of fresh water but also on evaporation and evapotranspiration rates, root uptake, soil moisture and wetting and drying cycles. Saline water can be held in insulated interstices of the soil and salt can be precipitated on the soil matrix as it dries. There apparently is a model that can be used to calculate flushing (leaching) rates. It is called HYDRUS-2D. We are looking for a (free) copy to try.
6. The USGS has restarted basic monitoring in Nassau County with financial support from the Water Commissioners and the Water Conference (pending). NYC has decided not to continue monitoring and the USGS measurements will cease in about a month.
7. The USGS has applied for funding from the SANDY recovery to attend to flooded monitoring wells. Other Sandy research initiatives are being proposed variously, but it seems that few, or

none, involve groundwater initiatives. It seems that the Commissioner of the DEC may have decided that the new breach at Old Inlet has not caused serious flooding. Tide ranges have not appeared to have increased; however, there are reliable, anecdotal reports of increased frequency of coastal flooding. The new inlet may be altering the response of the bays to the usually changes in ocean water levels.

8. The annual meeting of the Long Island Geologists will be held this Saturday (13 April, 2013): <http://www.geo.sunysb.edu/lig/>. David Tonjes will be talking on the search for evidence of sea level rise on LI water table. There are several papers on the work on groundwater underflow being done in Port Jefferson Harbor (see minutes of January 14, 2013), as well as papers on the impact of Sandy.
9. The “Long Island Clean Water Partnership” will be holding a meeting on Thursday 18 April (10-noon) at the Wind Watch Golf and Country Club (Hauppauge) to launch their Island-wide campaign to protect and restore water quality.
10. The next meeting will be on **May 13, 2013** at the SCWA in Oakdale.