MEMORANDUM

To: Groundwater Advisory Council  
From: H. Bokuniewicz  
Re: Minutes of the meeting of 22 January 2008  
Date: January 23, 2008

PRESENT

R. Alvey  
H. Bokuniewicz  
S. Colabufo  
S. Jones  
M. Nofi  
D. Paquette  
G. Proios  
K. Roberts  
W. Spitz  
S. Terracciano

REGRETS

M. Alarcon  
N. Bartilucci  
L. Koppelman  
R. Liebe  
R. Mazza  
A. Rapiejko  
K. Willis

1. The minutes of the last meeting (17 December 2007) had been amended. The discussion of the SCWA press release on automatic lawn irrigation was corrected to indicate a consumption of 10,000 gallons per household. The revised minutes were distributed.

2. The success of the iron-removal program of the Suffolk County Water Authority was discussed. Since 1995, complaints of “rusty water” have dropped from about 5000 per year to about 700 as the number of iron filtration plants in service increased steadily from zero in 1995 to 24 in 2007. These plants are mostly in Babylon, Islip, Mastic-Shirley and a few in Montauk, where the deep Magothy is tapped. More are scheduled for construction. Complaints did increase during periods of dry weather, like in 2002, when the volume of water delivered increased. Some experimentation has been done with the filter medium and some of the plants use two holding pits so that filtration is not interrupted while one holding pit is being cleaned. Problems can continue, as expected, near dead-ends in the distribution system or when repairs are made to the line or when fire hydrants are opened. BNL has occasionally experienced similar iron problems, in part, due to old piping. BNL has six active supply wells, and they also have seen a problem with microbe induced corrosion in pipes of the sprinkling system as little as 15 years old.


BNL has installed all 16 of the planned groundwater remediation systems. These systems are located both on-site and off-site. There are 13 for VOCs, and three for...
radionuclides. They treat about 1.5 billion gallons a year for a total of more than 12 billion gallons treated to date. Two of the systems have met the clean-up goals: one air sparge/soil vapor extraction system that was used for a mixed petroleum/solvent spill and one pump and treat system used for a carbon tetrachloride spill. Monitoring shows that the other treatment systems have also been effective in reducing the size of contaminant plumes and pinching off plumes. For VOC plumes, a variety of treatments are used at the source, at the site boundary and at the leading edge of a plume. These include air-stripping towers, in-well air stripping, and air sparging/soil vapor extraction, activated-carbon filters, and chemical oxidation. In areas where limited space prevents the installation of conventional treatment systems and recharge basins, BNL has used in-well air sparging. The water is treated in a small stripping tray at the top of the well and the treated water is recharged at a shallower level within the same well. The recharge and extraction of the water results in a recirculation pattern within the aquifer. Because tritium is integral to some of the water molecules, it cannot be stripped or filtered like other contaminants. When needed, a pump-and-recharge system can be used to control the migration of a tritium plume. Such a system is used for the tritium plume originating from the high-flux beam reactor that was first detected in 1997. Several on-site remediation systems are in place to treat strontium-90 contamination in groundwater. Unlike tritium which migrates at the same rate as groundwater (~275 ft/yr), Strontium-90 migrates slowly (about 25 feet per year) due to retardation. The Strontium-90 treatment systems are located close to the source areas, and the extraction wells are shallow (typically within 20 feet of the water table). Strontium-90 is removed by a zeolite-clinoptilolite, ion-exchange resin. The treated water is recharged on site.

George Proios asked where does the used resin go? The used resin is currently sent off site (Envirocare in Utah) as a very low level waste. BNL recently shipped some low level radioactive contaminated soil from the former waste management facility by the New York and Atlantic Freight Company using the LIRR tracks. These shipments are being coordinated with NYC Emergency Management and municipalities along the route. However, some Nassau communities along the route expressed concern about their need to have early notifications to ensure that their local emergency management organizations were aware of the shipments – there were some newspaper and TV articles about this (see http://newsday.com/news/printedition/longisland/ny-lilirr135536541jan13,0,2375555.story and http://real.bnl.gov/ramgen/bnl/2008/01/soil2.rm).

A Record of Decision was signed in early 2007 that dealt with tritium contaminated soil that was produced at a former particle accelerator experiment referred at as “g-2” and at the active Brookhaven Linac Isotope Production (BLIP) facility which generates short-lived radio isotopes for medical procedures. Impermeable caps are installed over both source areas to prevent rainwater infiltration through the activated soil. Rainwater can leach the tritium from the activated soils and into the groundwater. Monitoring data indicate that natural fluctuations in the water-table can flush residual tritium previously transported to the vadose zone close to the water table; this has resulted in periodic spikes in tritium concentrations in source area monitoring wells. Monitoring has shown that the caps are working, and the tritium concentrations are decreasing. Bill Spitz noted that this “smear zone” effect is a well-known phenomenon, which occurs also for other spills like petroleum plumes and monitoring is intended to take this into account.
Pumping from water supply wells and remediation wells can alter the position of adjacent plumes. Because many of the plumes are narrow, care must be taken not to significantly alter groundwater flow directions. Otherwise, it can become difficult to track the plumes using the established monitoring well networks. BNL has a planning committee that reviews plans for new groundwater extraction wells, building of new recharge basins or plans for changing pumpage or recharge rates.

Adjustments to three treatment systems were made based on the 2006 monitoring results. A new area of elevated strontium-90 (1,530 pCi/L) was found downgradient of the former chemical holes source area, and two additional extraction wells were installed in order to meet the drinking-water standard of 8 pCi/L by 2040. Levels of tritium within the HFBR plume near BNL’s Weaver Drive were over the 20,000 pCi/L trigger level defined in the Record of Decision. In response, several of the existing HFBR plume extraction wells were reactivated and an additional extraction well was installed. The pumped water is discharged to an upgradient recharge basin. A new extraction well was also installed at the VOC treatment system located near the Brookhaven Town Airport.

Most groundwater treatment facilities are intended to be shut down by 2015 and most monitoring is scheduled to end in 2030. The CAC continues to meet every month and BNL effort seems to be well received now by the public. BNL has recently issued the decommissioning plan for the former High Flux Beam Reactor. The proposed plan can be found at http://www.bnl.gov/bnlweb/pubaf/pr/PR_display.asp?prID=08-X2. The public comment period ends on March 17, 2008. A significant issue is the timing of the removal and disposal of some of the reactor components which can be very radioactive, such as the control rod blades.

There are groundwater clean-up activities going on at many of the other DOE facilities. BNL is somewhat unique in that it is situated over a sole-source aquifer; it is smaller than some of the other DOE facilities (e.g., Hanford), and the facility is surrounded by residential areas.

4. Nitrogen budgets have been done for the north shore embayments by a contractor to the Suffolk County Department of Health Services and another is being done for Great South Bay by Dr. Ivan Valiela (Wood Hole, MA). There is also the work being done on nitrogen loading of the Forge River and the USGS (Woods Hole, MA) is beginnings studies in Manhasset Bay and Huntington Bay this spring (’08) and along the north shore of Fire Island for the National Park Service. Dowling College (John Tanacredi?) has completed a study of non-point source pollution in the Carmens and Patchogue rivers associated with the upgrade of STPs and the USGS is working with TNC in coastal ponds. TMDLs are on the horizon for the western bay (Hempstead Harbor, South Oyster Bay etc). In view of all these parallel, independent studies, it would be useful to attempt some arbitration of assumption, baseline data, models, etc. entering into each.

In addition, contributions due to underflow, or submarine groundwater discharge, need to be resolved because they are critically important to decisions on new and pending infrastructures (like aquifer recharge from STPs), and possibly the re-examination of the types of septic systems installed on Long Island. The Suffolk
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County STP in Port Jefferson, for example, discharges into the harbor with Long Island Sound designated as the “receiving water” in the legal sense. This STP is prohibited from receiving additional sewage input by limits on its mass loading even though it is state-of-the-art treatment. As a result, septic wastes that could be treated by this plant must instead continue to be passed through less efficient septic systems.

As a first step, we will try to assemble a special session at the next meeting (Saturday, 15 April, 2008) of the Long Island Geologists devoted to the various nitrogen-budget studies.

5. We will try to organize a “webinar” (a computer-based seminar) on the latest USGS study of run-off from sealed parking lots. The presentations will be given by Barbara Mahler in Texas. It is intended to be available on Web Ex (for a demonstration see: http://www.webex.com/quicktour/mc/mcstart.htm). The first step is to identify an audience of ten or twenty people who would definitely participate. They could do this at their desk computer, or as a subgroup in a conference room with suitable computer connections. The web-based connection is free but a conference call will also be needed which limits the number of participants or groups. I will try contacting Louise King (DEC/Stormwater), and the Cornell Co-op Extension (who has an “electronic” conference room) and the EPA.

There are other web-cast seminars open in the USGS “lunch-and-learn” program and also the American Water Works Association, the latter with Fax or email questions. We can try also to publicize these.

6. On February 27, the University will host a group from Tanzania. They are interested in Aquifer Storage and Recharge (and water harvesting). It was suggested that they might contact Don Cohen and Associates (Dan St Germaine) about the ASR in Queens. Paul Misut (USGS) did the modeling for that project. Steve Colabufo also knows about an interesting project in California using an inflatable dam to capture water during periods of high runoff.

7. Pharmaceuticals continue to be a hot topic. Testing instrumentation, however, is very expensive. Some work is done by the USGS but, unless there’s a demonstrable risk, it is unlikely that routine testing will be done locally. The instruments to analyze for these compounds does exist at the University (Bruce Brownawell) and perhaps some consortium could be set up for incidental testing.

Little work has been done in groundwater but the data from Stony Brook and the USGS suggests that it is not a threat although it can be a cause for alarm in the mind of the general public. Studies might be useful, however, to examine groundwater pathways in detail, perhaps around packet STP’s at elderly housing or hospitals. Tracers might be tried to document how much is due to disposal of old medicines and how much passes through the body.

8. SCWA has proposed to dispose of waste brine in East Marion on Orient Point into deep, salty groundwater. This has been approved by the NYS DEC and is awaiting a decision from the EPA in Washington.

The SCWA Public Relations’ Office is preparing a release targeting doctors about bottled water. Many seem to be advising patients to use bottled water out of
ignorance of the issues. He will also include an advisory about disposing of medicine down the toilet, which, at the moment is considered the proper method.

9. The next meeting will be on Monday, February 25, 2008 at Dvirka and Bartilucci in Woodbury from 9:30 – 11:00 AM.