

## **MEMORANDUM**

To: Groundwater Advisory Council  
From: H. Bokuniewicz  
Re: Minutes of the meeting of 23 October 2006  
Date: October 25, 2006

### **PRESENT**

R. Alvey  
H. Bokuniewicz  
S. Colabufo  
F. Mancini  
G. Manzo  
M. Nofi  
S. Pacenka  
G. Proios  
S. Robbins  
K. Roberts  
W. Spitz  
S. Terracciano

### **REGRETS**

M. Alarcon  
L. Koppelman  
R. Liebe  
R. Mazza  
B. Nemickas  
D. Paquette

1. The minutes of the meeting of 18 September were distributed. Please send any corrections to me.
2. The DNYFLOW groundwater model is being rerun for the Suffolk County Comprehensive Water Resources Study. Paul Ponturo has been in touch with all the water districts to correct some of the data in the earlier model, like screened intervals, and to include future well fields in the model projections. Of course, it's difficult to decide on parameters like pumping rates for proposed wells.

CDM has examined water quality trends in selected public supply wells. Areas with quarter-acre zone might be expected to have nitrate problems and one of the most serious negative trends are in Huntington north of the Long Island Expressway. Land-use correlates well with nitrate concentrations. About a dozen wells were studied, chosen to have a relatively stable level residential development, some with sewerage. These are to be used to test the Sanitary Code standards which are less strict in Suffolk County than many places in the country. There are caps on nitrogen export from STP's but well-head treatment may be the most practical solution.

It was suggested that the nitrate data might be examined in light of the redox condition of the local aquifer or the presence of lignite which may affect the degree of denitrification.

The Suffolk County Department of Health Services still has a \$200,000 contract with NYS DEC to study pesticides. There are about a half a dozen sites with TCPA, a breakdown product of Dactyl. The USGS has found many compounds like Temex, dieldrin and atrazine, to be present but below common detection limits. Soluble compounds like Aldicarb, are expected to have a low residence time in the soil and exponential decreases have been found in USGS test wells. In other sampling the original pesticides is absent, but its breakdown products are still detected; DDT is not found but DDE is still present. Non-soluble compounds, like Cordane, would have long residence times in the soil.

Pharmaceuticals do not seem to be an issue.

3. Gretchen Manzo, a graduate student at SBU discussed the intended use of the HOBO monitoring system for investigating microclimates. Ms. Manzo has worked professionally as an industrial hygienist and is now in the MAT (teaching) program at SBU conducting field research.

Gil Hanson is her advisor; he could not attend the meeting, however, because he was giving a presentation on “Research for Earth Science Teachers” at the annual meeting of the Geological Society of America. Researchers at Stony Brook have submitted a proposal to EPA to develop a “Program for Integrated Natural Environmental Sustainability for the Long Island Pine Barrens Region”. Its goal is to develop dynamic predictive models that can be used as a tool for assessing consequences of management programs like that for the transfer of development rights, and for supporting land management decisions. Another goal is to utilize economic modeling and systems engineering design principles. The effort is multidisciplinary and involves a team from Stony Brook consisting of Gary Halada, (Engineering), Warren Sanderson, (Economics), Jessica Gurevitch, (Ecology), and Gil Hanson (Geosciences).

Brian Colle, an atmospheric scientist at SBU, is involved in the microclimate work. Microclimates are localized climates, uniform over a small area, perhaps only a few hundred yards in extent. Variations may be in temperature, precipitation, ground moisture or any combination of climatic variables caused by the landscape structure including land use, topography, vegetation, and the presence of water bodies or other environmental parameters. Microclimates influence the terrestrial ecology but, relevant to groundwater issues, microclimates can influence the patchiness of recharge and run-off. The proposal is also directed at the impacts of global warming on Long Island microclimates.

The HOBO monitoring system was chosen to be used in this study because of its field capabilities. It has been used in the Amazon and Antarctica and recommended by meteorologists at BNL and by others. It is relatively inexpensive (\$2,200) rugged, mobile and versatile. One HOBO system has been brought with the support of LIGASE (the Long Island Group Advancing Science Education at Stony Brook) and another will be provided by FERN (Foundation for Ecological Research in the Northeast). Eventually, we anticipate its deployment at 5 or 10 stations to measure local air temperature, humidity, soil temperatures, soil moisture and atmospheric pressure. It might also be configured to provide information for the estimation of evapotranspiration. The ability to collect long-term continuous data is essential to statistically distinguish microclimates. We intend to relate differences in the

measured parameters to the landscape structure in order to be able to extrapolate the distribution of microclimates island wide.

Ms. Manzo's particular interest is in the use of these data for educational opportunities. Research projects could be done as part of the training of both undergraduate and graduate students in GIS application, hydrogeology and meteorology. In addition, access to the information could be provided to secondary schools to allow teachers and students to conduct real-world research in Earth Science education.

The SCWA is also using HOBOT instrumentation. Frank Mancini showed a water level sensor being used in monitoring wells at Laurel Lake. SCWA is already pumping water from deep wells in the vicinity and proposed to install additional, shallow wells. There's a golf course in the vicinity that also pumps water from private wells. Monitoring of the water level is intended to document natural variations in the water table that might affect the lake and investigate how pumping might influence the lake hydrology. The USGS has a lake-level gauge there and an observation well in a ball field about a mile away.

The HOBOT instrument costs about \$500. It is set to record water levels every eight hours but could record every second for long periods of time (a year?). It is available to cover a range of 0-100 feet or 0-30 feet. Data is downloaded through an optical reader that plugs into the USB port of a laptop computer and a second instrument is used to simultaneously record atmospheric pressure.

The USGS is not using HOBOT instrumentation, but has extensive experience. The instrument should be bench-tested to insure their calibration before deployment. Some of the problems to be anticipated are flooding of the cases, loss of the desiccant, battery failure, and security (people tend to shoot at them). In other areas, "Radiation" stickers or signs warning of "Tick Infested Area" are rumored to have been used to reduce vandalism.

The systems described might be useful to investigations of coastal plain ponds (e.g. are they semi-perched or merely groundwater "outcrops"?) and for the documentation of microclimates in recharge basins especially as they might relate to the management of vegetation. Vineyards are also interested in microclimates and might be engaged in the proposed research.

4. Steve Pacenka (NYS Water Resources Institute at Cornell) is working with the DEC and DOH to study the intentions of new NYS legislation to regulate wastewater reuse. Forty other states already have regulatory for waste-water reuse notably CA and FL. Florida and California even have dual distribution systems in some places to make use of treated waste water. In NY, its regulation may become an extension of the SPDES system. The DEC has one person (Cheryl Weber) working on this in cooperation with NYS-ERDA and Ag-and-Markets.

Southeast NY is of special interest because we have the highest intensity of water use with respect to rainfall. In Riverhead, treated wastewater is used on the Indian Island Golf course. Financed by the State the golf course received water from a nearby, "uphill" STP. Stony Brook might be another location for the application of water reuse, because the University would like to expand but their STP discharges into

Long Island Sound are capped. There is a nearby golf course that might use treated wastewater from SBU.

There are public health concerns like the presence of pharmaceuticals or disinfectant by products. In addition, in other areas, golf courses could not control the supply of water so greens became water logged and ponds had eutrophication problems.

Waste-water reuse is essentially a conservation issue, driven by the economics of limited water supply. In Suffolk, however, there's little incentive for wastewater reuse. Groundwater is abundant and relatively inexpensive. For example, there is resistance here to using recycled water in car washes not because it wouldn't be cost effective but because groundwater is plentiful and readily available. In addition, Suffolk County is also a sole source aquifer and runoff into surface streams would require dechlorination.

In other places in NY State this is not the case. In Verona, the Oneida Turning Stone Casino pumps reused water three miles because local supplies are inadequate. Other locations use treated waste water to meet water quality mandates. A demonstration program at the Bronx Zoo uses "grey water" from sinks for irrigation and "Green Buildings" in Manhattan (Solaire and at Battery Park City) use grey water to flush toilets. It was suggested that waste-water might be reused for snow making on NY ski slopes.

DOH is currently examining the standards used in other states and those recommended by the World Health Organization. CA and FL have an extensive matrix of treatment levels related to end use, mostly defined by total coliform, although viruses and parasites are to be considered also. Here, as elsewhere, special programs would need to be made, for example, for water used to irrigate human edible crops as opposed to non-edible crops.

A draft report is expected in early December with a final report to the Governor ready by next spring. The "COMPS" study is examining the transmission of potable water, perhaps the transmission of reused wastewater could be considered in this same context.

5. We will help the USGS run a Groundwater Symposium (6 June, 2007 at BNL). A very tentative agenda was distributed for discussion purposes. We may offer a poster session if there is sufficient interest or run concurrent sessions but, for now, we're planning on 20-minute oral presentations. We would appreciate any suggestions for topics or particular speakers that should be included.
6. The next meeting will be on Monday December 4, 2006 at the Offices of the Suffolk County Water Authority in Oakdale.