

## MEMORANDUM

To: Groundwater Advisory Council  
From: H. Bokuniewicz  
Re: Minutes of the Meeting of 18 October, 2004  
Date: October 20, 2004

### PRESENT

M. Bartilucci  
A. Belote  
H. Bokuniewicz  
S. Jones  
R. Liebe  
R. Mazza  
J. Milazzo  
B. Nemickas  
D. Paquette  
G. Proios  
S. Robbins  
W. Spitz  
K. Willis

### REGRETS

M. Alarcon  
L. Koppelman  
M. Nofi  
K. Roberts

1. There were no comments on the minutes of the last meeting (June 7, 2004).
2. H. Bokuniewicz apologized for having to cancel the September meeting because of a change in his academic schedule.
3. Gil Hanson could not attend but H. Bokuniewicz offered comments on the nitrate studies. In general these are undertaken to address three issues: the importance of controlling fertilizer, the need for sewerage and waste-water reuse. One of our first studies was done by Patti Bliefus looking at isotopic signatures of groundwater from Northport to distinguish fertilizer nitrogen from septic system sources. There did not seem to be denitrification (conversion of nitrate to nitrogen gas) in the groundwater. The groundwater was oxygenated which is compatible with the lack of a denitrification signal but the high oxygen content could be the result of pumping.

Peter Schuchman and Jennie Munster began the lysimeter studies of nitrate leaching from turf treatments. Concentration through the vadose zone seemed low, except for occasional spikes; raising the possibility that denitrification is occurring in the layers before water reaches the water table. Jennie's master's thesis is currently under review by Marty Petrovic, at Cornell.

Jennie Munster is developing mass spectrometric analytical techniques for the conservative elements bromide, chloride, iodide and boron and the boron isotope

systems for use as tracers to distinguish the relative proportions of fertilizers and sewage in groundwater.

Graduate student, Valery Slonecki, will continue the lysimeter studies. It was suggested that we add perchlorate to the tests. We are preparing the methods to run these analyses. Many commercially available fertilizers list perchlorate as an ingredient.

Graduate student Suan Xu is developing approaches to evaluate whether denitrification is occurring in the soil horizon or in the groundwater.

Because cations are retarded in groundwater is it possible to use cations to evaluate the sources of nitrate in groundwater? Linda Liu who is completing her master's thesis has developed an exchange model for cations (Mg, Ca, K, N) in groundwater. The results are encouraging and even though the cations are strongly sorbed an early signal of desorption allows these elements to be used to discriminate between contamination by septic system plume and lawn fertilizer.

It was pointed out that the deep aquifer has low oxygen triggering the Fe problem. A comprehensive study of denitrification may include a review of what is known about the distribution of oxygen in the aquifer. On another issue, it was pointed out that the Riverhead Municipal Golf course has completed a pilot project using grey water ("light grey water") as turf fertilizer. They hope now to move to the next phase of routine applications, and perhaps, a lysimeter study would be useful there.

4. Angela Belote has begun work on the Groundwater Clearinghouse. Angie joins the Groundwater Institute with a degree in engineering from the Colorado School of Mines and graduate work at the South Dakota School of Mines and Technology.

She presented a GIS system she has begun to develop. The base map of Long Island has location data for National Weather Service (NWS) sites where precipitation measurements are made, for supply wells in Nassau and Suffolk, and grid points (nodes) of the Suffolk Dynflow Model. Any of these data can be interrogated interpolated and contoured. The NWS stations, for example, can show average annual rainfall, monthly rainfall values and other statistics. There is currently a 19-year record ending in the mid-'90's. Plans are to update this.

In discussion, it was pointed out that the precipitation data and other information from different stations may not be of comparable quality. Various collectors, especially the older collectors, are thought to undercatch systematically by about 10%. The GIS might include some warning attached to these data, but, because they are provided by the NWS, they should be available. Each well location can be interrogated, to provide well number, elevation, screen interval, aquifer tapped, pumpage (usually in 1994) and other information. These data should be checked against the SCWA database, if possible. Also, well data might be checked against the completion reports (a.k.a. "drillers report") filed for each well with the DEC. It was pointed out in discussion that some of this information needs to be rechecked. In addition it would be desirable to have a time-series of actual pumpage like we have for the rainfall data. Monthly and annual pumpage reports are filed on paper with the DEC but it would all have to be entered manually. We will, preliminarily, enter the most recent data to investigate the magnitude of the task. We will also consider ways

that the procedure might be changed to allow direct, electronic submission from the water purveyors.

A third type of data in the GIS is the interpolated parameters on the model grid, such as hydraulic conductivity and hydraulic head. It is intended that the shape files in this GIS be readily applicable to model exercises. To this end we intend to have the files in a general, widely used format. However, some files may not match the input requirements of various models, or, some models will only accept inputs from the version of the GIS program in use when they were written. This should not be a serious problem but the clearinghouse model input files cannot be foolproof. Suggestions were also discussed for other information that should be included in a Groundwater Clearinghouse GIS. These include:

1. Expand the model data to include Brooklyn and Queens
2. Include the input parameters for the Nassau County model
3. Add soil types and recharge correction factors
4. Add digitized aerial photographs. We believe that several sets are available (dates?) that might be used to identify the land use at the time source water for various wells were generated.
5. Delineate the Special Groundwater Protection Areas
6. The monitoring well locations from the U.S.G.S. and the SCDHS. It was also suggested that we discuss the BNL Database with Mary Dalman, although this may be an inactive program at BNL.

It is intended that water quality data would be eventually included in the system. It was recommended that, when this task is to be started, the Suffolk County Department of Health Services (SCDHS) data base be the first source to be included and that selected contaminants, like nitrate, be prioritized for inclusion. The SCDHS database is a custom program that would have to be transformed, somehow, into shape files.

5. There was discussion on laundry detergent as an emergency issue especially the contamination by I-4 Dioxane and other non-ionic Dioxane and other surfactants. In Shirley some foaming has been reported in water downgradient of a 250-machine laundromat.

The standard test now for foaming agents is the Methalene Blue Active Substance (MBAS) test which doesn't detect some of the new foaming agents. As a result, treatment systems designed on the basis of the MBAS test may be allowing foaming agents through. Studies are needed on the fate of these agents. In addition, perchlorate has been found in some bleaches and there is some DEET in laundromats efficient as it is washed out of clothes.

6. H. Bokuniewicz will be offering an on-line graduate course in LI Groundwater in the spring. These are taken primarily by teachers and it seems a good way to reach them. A course outline is being developed now; any advice would be appreciated. An

important part of such course is weekly on-line discussion of a specific topic, usually involving some 100 short e-mail messages a week. It helps to have an additional expert or two, besides the instructor, involved with the discussion. If anyone wants to consider participating in the course discussions, just let me know.

7. The next meeting will be at the offices of Dvirka and Bartilucci in Woodbury on Monday 15 November, 9:30 -11:00 AM.

HB/ed

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**Revised 11/30/04 - - M. Alarcon did not attend the meeting**