Lost Lake Sewer Committee Minutes
September 12, 2013

Present: Dr. Horowitz, Board of Health; Thomas D. Orcutt, Water/Sewer Superintendent; John G. Petropoulos, Selectman; Jay Prager, Finance Committee, Michael Rosa, Lost Lake

Also present: Jessica Cajigas and Eileen Pannetier of Comprehensive Environmental Inc.

Meeting was called to order at 6:30

The meeting had a considerable public audience, likely in response to the fact that notice was posted that lake water quality testing results would be reviewed.

The discussion began with an announcement to the audience that the purpose of the meeting was twofold: First was to review the test results as a Committee in order to have an opportunity to generate questions for Comprehensive Environmental Inc (CEI). The second would be to go over results with CEI. Mr. Petropoulos asked the audience if there were any questions.

Connie Sartini of the Groton Herald noted that she understood that pharmaceuticals had been found in the Whitney Well and asked if the Committee could comment. Mr. Petropoulos explained that, for the purposes of this study, Emerging Contaminants (ECs) are used as markers to identify the flow of materials from human activity) through groundwater. The premise is that substances such as pain killers are ingested and then passed through human waste into septic systems. If they are found elsewhere in water testing it may be that they arrived there as a result of a hydrological connection between the septic system and the test site. The term contaminants is misleading. Really, at least in this case, they are used as markers for (ground water migration . Mr. Petropoulos explained that there is no data to indicate a level at which such things as pharmaceuticals in drinking water are harmful. Mr. Prager went on to note that the levels found were in the parts per trillion range and may be more reflective of science's amazing ability to measure incredibly small concentrations of substances than it is of anything else. Mr. Orcutt was asked to comment and stated that ECs are markers for human contamination and show that nitrates are coming from Humans.

Jessica Angels provided Baby Beach test data showing the results from E.Coli sampling done this year. Samples are taken weekly beginning on May 20, 2013 with the last sample taken August 27, 2013. Results were provided in parts per 100ml. The Massachusetts Department of Public Health standard for E. Coli in swimming water is that no sample shall exceed 235 colonies per 100ml and the 'geo mean' (avg of the last 5 tests taken in any swimming season) must not exceed 126 colonies per 100ml. Samples are taken by the Nashoba Associated Boards of Health. The tests this year have ranged from 0 to 64 colonies per 100ml. One test showed 64 with all other tests showing 10 or fewer. The geo mean ranged between 4 and 11.

A question was raised about historical testing methods. Michelle Collette reviewed historical testing methods used in prior studies and stated her belief that the detection of pharmaceuticals in public drinking water supplies represents a cause for concern.

Dr. Horwitz noted that there was an implication that there was a connection between the lake and the Whitney Well.

Carol Quinn pointed out that the highest levels of contamination are in zone 2 of the drinking water area. Mr. Orcutt was asked to describe the importance of zone 2. He described zone 2 as the area that is estimated to be influenced by the well. Mr. Petropoulos asked if that meant that this is the area where hydraulic flow changes when a well is created, as the well creates an influence on groundwater flow. Mr. Orcutt confirmed this interpretation. Ms. Collette produced the Water District map that showed the location of Zone 2 and demonstrated that it is largely on the eastern and northern part of the Lost lake. She read the technical definition of a Zone 2 to the audience.

Bev Rodruquez asked if there was testing of private wells. Mr. Petropoulos answered that a (limited) number of wells (6) had been tested but that locations were being kept confidential as a condition of being allowed access to private wells.

The members of the committee noted that the '89 data seemed to measure phosphorus at a more granular level than was measured in the '13 survey.

Mary Metzger asked about the seasonal effects on water quality. Mr. Petropoulos responded that there are known to be peaks and valleys in various levels of measurable substances such as nitrogen and phosphorus as the lake goes through the seasons and plants grow and die. The question was asked about the effect of the interruption of that seasonality by the weed kill. The Committee determined to ask CEI about that factor.

CEI arrived at 7:30.

Ms. Pannetier noted the highest concentration of concerning substances is in the northern end of the lake. She was asked why this was the case and stated that she could not be sure but that a number of factors could help to explain:

1. This is the end of the lake with the outlet (the dam). Decomposing materials and sediment tend to accumulate at the outlet. Decomposing materials produce their own measurable substances such as ammonia and phosphorus, and sediment may contain substances as well.
2. This is the end of the lake with the highest concentration of homes and so the effect of the avg. home is concentrated here.

Ms. Cajigas described how pore water tests were conducted. The study attempted to replicate the 21 tests that were done in 1988. Pore Water Samplers were inserted at the lake's edge at an approximate depth of 1' of water. The sampler went down approximately 2 ft and drew its sample from there. 4 samples were taken from each of 21 locations around the lake in approximately the same locations as the 88 study. The 4 samples were combined together to create a single, composite sample for each location.

Samples were delivered to the laboratory unfiltered. The Lab then filtered and analyzed each sample. Ms. Cajigas described this sampling methodology as different from the 1988 method which filtered the composite samples in the field. The 1988 method did use composite samples as well. When asked why samples were not taken in the same manner as the 88 study, Ms. Pannetier indicated that methodologies have changed over time and this is the way that samples are collected today. She also explained that the main difference between the two methodologies was the size of the filter used to filter the samples. Laboratories typically use a .45 micron filter, where the field apparatus used in 1988 used a 1 micron filter. Both sets of data should be reported as "dissolved", however, there is an expectation that more particulates would have made it through the 1 micron filter than the 0.45 micron filter, and that may explain some of the high results from 1988. There was some discussion as to whether the difference in methodology provides comparable data. Ms. Pannetier stated that the results provide a good indication of what is happening in different portions of the lake relative to the rest of the lake, but that exact comparisons to prior studies may be compromised somewhat by the different methodologies and even by the fact that different labs did the testing with possibly different methods. Ms. Pannetier noted that the lab that did the testing in 1988 is no longer in business. Mr. Rosa asked what the implications were for the different methodologies and asked what affect the different methodologies could have on the testing outcomes? Ms. Pannetier indicated that the affect could be considerable, and that is why their assessments are qualified. She indicated that CEI did the best they could to duplicate the '88 study but given the changes that have taken place in testing methodology and resources and funding etc, exact replication is impossible. So many parts of the testing process are not standardized that a comparative analysis needs to be taken with a grain of salt.

Mr. Petropoulos asked Ms. Pannetier if the pore water tests were testing groundwater or lake water. She indicated that pore water generally tests groundwater but that there is often a shifting of the movement of water from groundwater to lake and vise versa. Depending on seasonality, water can be moving from the lake to groundwater or from groundwater to lake water. She indicated that Lost Lake is a truly unique structure in her experience and that its geological characteristics makes it very hard to analyze the hydrological connection with 100% confidence.

Ms. Pannetier described the testing of private wells and the unregulated ECs. She clarified that 'unregulated' means that no standards for the presence of these contaminants have been set by regulatory authorities. She stated that they are meaningful in that they definitely indicate the contribution of waste water. Mr. Prager asked if swimmers who foul the water could contribute to ECs. Ms. Pannetier acknowledged that this is possible. Mr. Petropoulos noted that a DEET level of 9600 seemed extraordinarily high as a contaminant coming through a septic system and asked how it could be could be found in the testing. Ms. Pannetier agreed that the level was very high and that she had no way to explain that level. The suggestion was made that it could come from someone emptying a bottle of insect repellant near the lake or in the lake itself.

Mr. Petropoulos noted that one pore water site showed ECs but the private well in the same area showed no ECs. He asked how that could happen. Ms. Pannetier stated that

she could not explain the different results, but it could depend on the location of the well in relation to the septic system and to the lake.

Ms. Pannetier indicated that testing for Emerging Contaminants was worth doing because it was interesting but that it is not necessarily meaningful. The most meaningful use of testing for ECs is for its effect on aquatic life.

Carol Quinn stated that while there was no DEET found in the private well tested near her home, the pore water tests near her home (PW9) showed DEET in the results, and that she was concerned about this.

Mr. Rosa noted that 2 out of 2 of the Pore water tests that were sampled for ECs returned positive results for ECs, He noted that this was a 100% hit rate and speculated that this could imply a meaningful attribute worth pursuing. He noted that although ECs and their effect on drinking water are not part of the Committee's charter, they go a long way to telling us that we have a problem. He asked what our ability to test other samples for ECs was. Ms. Pannetier stated that the collected samples are not available for testing. She noted that testing for ECs costs $400 per sample. Each sample requires the collection of 2 liters of water from each sample location. All parties agreed that additional EC sampling would be interesting to have.

Dr. Horwitz asked how ECs got to the Whitney well. She noted that we have not done hydrological studies and that we just do not know based on our data. Mr. Prager responded that all that ECs tell us is that the soil does not filter ECs well. The fact that an EC can get from a septic to a well does not tell us that the other things we do not want in a well will ever get there. He asked if that is true. Ms. Pannetier agreed that Mr. Prager's statement was correct, and that "we just do not know".

Ms. Pannetier stated that pore water testing will not tell us about the impact of phosphorus. Mr. Prager stated that we should wait till we have more data.

Mr. Orcutt asked if there is a correlation between the ECs and the health of the lake? Ms. Pannetier stated that this was correct.

Mr. Prest asked what the drinking water regulations are for Nitrates. Ms. Pannetier stated that the level of 10 ppm is the danger level and that a level of 5 ppm represents concern. Of the 21 Pore Water tests 17 had levels that were less than 1 ppm were1 ppm is the lowest level of measurement available. The 4 tests that came in above 1 were: 1.1 ppm, 1.7 ppm, 2.04 ppm and 2.16 ppm. Dr. Horwitz stated that when the Board of Health is notified of a private well with levels exceeding 5, they require that the well be tested. Ms. Pannetier stated that it is in fact the Nitrate + Phosphorus levels that are the most important indicator. Mr. Prager reminded people that lake water does not, and cannot be expected to, meet drinking water standards.

Mr. Petropoulos asked why, if groundwater is a shared pool, are there spikes? Ms. Pannetier responded that groundwater moves slowly and so spikes in one location may not have dispersed. Mr. Prager asked if spikes in Nitrates and Phosphates can be from fertilizer. Ms. Pannetier responded that they can be.

Mr. Prager asked Ms. Pannetier if substances in the groundwater could, in fact, be coming from any of the homes in the Zone 2 watershed and not just from homes around the lake. Ms. Pannetier answered in the affirmative -- that substances in the lake could come from any home in the watershed. Mr. Prager repeated the question to be sure that he understood the answer and Ms. Pannetier provided the same answer.

Ms. Pannetier was asked if there was anything else that she felt we should consider at this time. She responded that it was still way too early to draw any conclusions and that it would be best to wait for the remaining data to come in. All parties agreed.

The Committee decided to wait for the remaining data and analysis to come in before meeting again. No next meeting date was set. The balance of data should arrive by the end of September.

9:15 Mr Orcutt excused himself from the meeting

It was agreed that a presentation to town meeting should not review specific test results, but instead focus on the process that is being followed and our current status.

There was discussion around the possibility that the public may be unnecessarily concerned with the news that ECs were found in the public well. Mr. Petropoulos will ask CEI to provide some relevant information to provide to the public to put the ECs in perspective.

Mr. Rosa made a motion the minutes of 8-22-13 be accepted as amended 2nd by Dr. Horwitz The vote was unanimous with Tom Orcutt absent.

Mr Rosa Motion to adjourn at 9:30 2nd by Mr. Prager. The vote was unanimous with Tom Orcutt absent.

Meeting adjourned at 9:30

Action Items

I. Mr. Petropoulos to get a useful and easy to understand point of reference from CEI to put the Emerging Contaminants in perspective.