

Petrucelli Site Development Proposal

Lenny Meyerson, PE

1. Eutrophication

Phosphorus is a critical nutrient for plants and animals. In lakes, it is typically the limiting nutrient. In a balanced ecosystem, natural lake flora take in the nutrient, but when there is excess P, algal blooms occur. As the algae go through its life cycle, the biomass sinks to the bottom and its decomposition consumes oxygen. This cycle leads to anoxic conditions, causing a decline in macroinvertebrate population and aquatic species at the bottom of the food chain. This cycle continues until lower dissolved oxygen no longer sustains larger fish and water clarity declines. The New Croton NYC water supply reservoirs suffer from eutrophication. Nearby, Peach Lake suffered eutrophication and had sewers constructed, receiving \$10 million in watershed funds.

CSLAP's 2012 report rates Lake Waccabuc a threatened. Deepwater D.O. concentration is poor. Hypolimnion phosphorus has trended upwards 2003-2012 and surface phosphorus trended upwards from 1986-2012. Research shows that threatened lakes reach a tipping point. ["Flickering gives early warning signals of a critical transition to a eutrophic lake" Wang, et al NATURE January 2012]. Reaching this threshold has grave consequences. Prevention is the key. Remediating an impaired lake is difficult, costly and takes years.

2. Wetlands

In my experience wetlands near streams and lakes should not be examined piecemeal. Even when separated by roads, berms and manmade obstacles, these wet areas remain connected predominantly subsurface. Simpson acknowledged this in 1988 discussing the East Brook property, calling the wetland on this site "part of a larger wetland system connecting Lake Oscaleta... and Lake Waccabuc."

By observation, the pipe discharge from the Rosenbaum property has only a small influence on this site. Photos reveal substantial standing water that indicates there must be other sources of storm and/or ground water.

Look at the big picture. Herein lays a wet area between the road and the lake. Rosenbaum and other neighbors experience wet basements. Site abuts a DEC wetland buffer. All of this points to the need to protect this wetland site.

Construction plans call for disturbance of the DEC buffer. The role of the buffer is key.

3. Mitigation

Consider the consequences of building on this wetland. There will be 830 cubic yards of fill. Over 19,000 ft² will be disturbed out of a total of 30,420 ft². At least 32 trees will be removed. Every tree takes in a large quantity of phosphorus for its nutrition. Then there is

the human impact of phosphorus loading. On average, a single family residence sends 19 mg/l phosphorus to their septic tank. Septic tank effluent discharges 10 mg/l phosphorus. (Lowe, et al 2007)

Attenuation occurs as wastewater seeps through soil to optimally reduce phosphorus to less than 0.5 mg/l. This travel distance from the septic system drain field to the point of contact with a water body is the key factor. In a study by Corbett, et al (2002) the recommended distance is 190 feet. However, “for some sensitive lakes already considered to be ‘at capacity’ for P loading, a distance of no less than 1000 feet is recommended.” (Robertson 2008)

NYSDEC Freshwater Wetlands Regulation Guidelines on Compensatory Mitigation calls for mitigation to duplicate wetlands benefits that primarily include flood control, nutrient removal and flora and wildlife habitat. By this measure Tim Miller Associates’ proposed mitigation plan has several shortcomings.

1. Permeable pavers only address flooding.
2. Infiltrators basic function is for storm water control, but do remove some sediment.
3. The small enhancement area abutting a newly installed retaining wall will likely impact hydrology and may do more harm than good. There is no hydrological analysis to clarify the source of water on this site.
4. The low mow zone above the berm with plantings amounts to no real change from current site.
5. Enhancing DEC buffer area by removing invasive plants and replanting is a minor enhancement.
6. Wetland functional analysis ignores apparent benefits for local wildlife as a probable corridor down to the lake.
7. Excavation of one to two feet for Area 5 (Wetland Creation Area) confirms that this is a wetland area needing conservative wetland protection.

Evaluating the points above leads me to conclude the following:

1. The mitigation plans focus is on storm water and flood control. It is weak on nutrient removal and wildlife habitat.
2. The phosphorus loading is bound to be more severe and wildlife mitigation is certainly questionable.
3. DEC states that mitigation design and implementation must be a “legitimate project expense.” No double dipping; i.e. infiltrators, porous pavers would be installed for storm water even without mitigation requirements.

4. DEC calls enhancement the least preferred option for mitigation and the proposed enhancements are minimal.

5. Mitigation projects need guarantees. There must be a minimum of 5 years monitoring. Goals must be set and evaluated. The mitigation proposal fails to address these requirements.

6. Per 6NYCRR 663.5 (g), regardless of size, mitigation wetlands are regulated by the Freshwater Wetlands Act. How will long term protection be assured?

4) Engineering Questions

a. Revised plans dated 9/19/12 shows proposed residence in local wetland. In revised plans dated 8/28/13 proposed residence is moved outside of wetland and wetland boundary has both shifted and diminished in size. Which wetland boundary is correct?

b. In the NYSDOH Residential OWTS Design Handbook (2012) it is stated that high ground water levels in a deep test hole are usually at its highest March 15 to June 30. With all the questions re: wetlands and site dispute, a conservative approach is needed to assess soil testing. Why wasn't deep hole testing done during normal spring high ground water period? It was done July 26, 2010.

In addition. The handbook states that soil mottling be investigated to insure that the actual high water mark is accurate. Why wasn't soil mottling in deep holes investigated?

credentials

NYSDEC – Environmental Engineer – Division of Water 1986-2001

NYSDEC – Regional Water Engineer 2001-2007

Westchester County DOH - Deputy Commissioner – Environmental Health 2007-2009

Westchester County Board of Legislators – Environment and Energy - Septics Sub-Committee

NYS Certified Professional Engineer

Teach Seminars on “Ecosystems and Human Impact – Nutrients” to PE's and RA's