

Re: Sanford Road Martville gravel mining issues

July 8, 2015

Dear Dr. Fichera:

In response to your concerns about the potential effects of the proposed Sanford Road Martville gravel mining operation on the water table and local wells, and on the possible erosion and siltation/sedimentation from the steep slope adjoining a national wetland and the Sterling Creek (itself adjoining a principal aquifer), I have read most of the materials you sent (Mined Land Use Plan, Storm Water Control Plan, EAF, your formal Comments to the NYSDEC, etc.).

You have done an excellent job of compiling the weaknesses, omissions, and faults with the applications and associated documents and I share your concerns about the water table and erosion of the steep slope adjoining those sensitive environmental areas.

The shallow groundwater table is extrapolated from a single well that is not in the area to be excavated. There is no accurate way to construct an accurate site-wide groundwater gradient (as extrapolated in the cross-section profile provided by the permit applicant) from such meager and deficient data, especially beneath such irregular topography (water tables usually tend to mirror the topography to some degree).

There might be lenses of coarser and finer-grained glacial materials that would affect the actual shape of the groundwater table (and/or the presence of perched water), as well as the topography itself. Without a true contour (3-D) map of the existing (pre-excitation) groundwater surface, it is not possible to show beforehand what the actual limits of excavation should be if, "a minimum of five feet of undisturbed material will be maintained above the seasonal high groundwater elevation." The only general statement that might be made is that the local water table is ultimately graded to the elevation of Sterling Creek, and will not fall below that level, should the excavation go that deep. If deeper than the Creek elevation, the pit could fill with groundwater. A pond might also be formed at some other level if sand and gravel deposits are inter-bedded with finer silts or clays (perched water table condition). These are currently unknown possibilities.

Whenever such sand and gravel excavations occur, the very fact that overburden materials are removed changes the groundwater table (creates a new, lower, water table), and there is no assured way of accurately determining where the original seasonal high groundwater table was after the fact (in most cases). This could only be done accurately with pre-excitation borings throughout the site. Only then could a calculation be made of what the limits of excavation should actually be (based on this problematic "requirement"). This requirement is a problem with all such excavations that presume to maintain undisturbed material above the original groundwater table. The regulation itself is problematic, because any excavation changes the original conditions and reconfigures the water table.

Furthermore, there is the unusual complication that arises from the DEC Region 7 mining division's reporting structure, which apparently does not require it to report or consult with the natural resources division. The mining division might later grant the applicant a variance to mine below the

water table, which would further compromise the area. This reporting structure is apparently unique among the nine DEC Regions, where all other mining divisions apparently report to the natural resources division.

An additional environmental concern relating to changes in the water table involves the potential effects on local private water wells. Because such sand and gravel excavations tend to lower the area water table over time, they can have a corresponding impact on water levels in local residential wells. It is unclear to me how many local wells are close to the site and might be impacted. It would be important to know the water levels in residential wells surrounding the site to draw conclusions concerning this potential impact. I would recommend a local water well survey prior to the project's inception to avoid controversy in the future. Such a survey should include both high water and low water conditions during the different seasons, as well as basic water quality.

The description of dust issues is patently ridiculous. I have never worked around any sand and gravel operation that did not generate dust under some condition (such as drought conditions or a few dry and windy days). Water trucks are never in continuous operation on a site-wide basis in any such operation I am familiar with. Generally such excavations have erratic schedules depending on demand for the resource. This means there are varying times, including weekends, when dust is not and cannot be realistically controlled.

The comments concerning soil types, while valid and perhaps required in such applications, are essentially meaningless. "Soil" refers only to the top few inches to a couple of feet of material (in this glacially modified climatic zone), and the soil descriptions indicate little about the types of glacial deposits or glacial environments that created the deposits in question, when the last ice sheet was melting and receding.

Much of the area surrounding Sterling Creek (including the LOM of the mine east of North Victory) has actually been mapped as consisting of glacial lake sediments "lsc" or lacustrine silt and clay, which are generally fine-grained (Reference: Finger Lakes Sheet of NYS surficial geology map at http://ngmdb.usgs.gov/Prodesc/prodesc_19735.htm, which I took part in creating), but scattered pockets of coarser glacial outwash deposits occur across the region. Without the more detailed geological/topographic field studies referred to above, however, it is not possible to know just what is the nature and overall extent of the "gravel" below the topsoil. The Comprehensive Plan for Sterling has maps on pages 76, 77, and 83 that reflect this geology as well, and refer to what appears to be most of the Life-of-Mine area as prime farmland, assessed at some of the highest 2009 values in the entire Town of Sterling.

All of this gives rise to concerns for possible groundwater fluctuations and contamination of water supplying nearby residential wells, and for the ultimate integrity of the steep slopes (both natural and created) with respect to erosion and siltation/sedimentation of the wetland and Sterling Creek from wind/water erosion, clearing, and mining operations. It should be noted that the diagrams submitted call for the intentional creation of a 2 to 1 steep slope on the mining side of the existing steep slope, with vegetation to be reestablished on the resultant floor during reclamation, but only after the close of that mining phase, which could be several years or even two decades later. This creation of a

double-sided steep-sloped land structure or berm bears further analysis as to its stability and impact on the local hydrology.

Additionally, proposed alterations of the mining areas and phases, and abandoning some phase areas within the LOM in order to conform to local ordinance requirements, will likely affect how the reclamation is able to be conducted, as well. The resultant land structure and topography may ultimately be very different from what has been represented in the application, and may persist for years if not the proposed twenty-year duration; this would require further analysis as well.

I note that multiple official Town of Sterling Land Use Regulations (LUR) maps (cf. <http://www.cayugacounty.us/portals/1/sterling/government/minutes/LURfinal.pdf>, especially pages 110, 111, 112, 114, and 115) show that the area's steep slopes and adjoining wetland, aquifer, and flood hazard areas are clearly documented by the Cayuga County Planning Department and were formally adopted by the Town of Sterling both in the LUR and the Comprehensive Plan. I especially note the composite map on page 112 of the LUR labeled "Sensitive Environmental Areas." One can clearly see that the LOM is adjacent to two such areas: flood hazard and steep slopes areas. I believe that the Town's LUR requirements in Section 18-2 (pages 89 and 90) are sensible because they appear to call for exactly the pre-development field studies I have referred to before any clearing or excavation of such steep slopes is undertaken.

It does not appear from the main DEC permit application documents (Mined Land Use Plan, Storm Water Control Plan, EAF, etc.) that such studies as described in my review have ever been performed, and I recommend that you encourage your Town government and the DEC of the logic and necessity of acquiring this information before excavation begins or the slopes are further disturbed.

I see from your submitted drone aerial photographs that the area bordering the steep slope to the wetland and the Sterling Creek was apparently grubbed last fall with no apparent run-off controls in place for the immediate past winter melting and intense spring rains. I would expect that the DEC, Army Corps of Engineers, and/or your Town government should assess the wetlands and the creek for appropriate run-off and siltation/sedimentation concerns, as well as to test for the elevations and quality of residential well waters, before any further mining preparation and related impacts occur, inasmuch as such studies are generally part of both the SEQR process and, inter alia, your Town's overlay-district wetland and steep slope requirements.

It is unfortunate that the citizenry must go to such lengths to ask their leaders to conform to the laws and regulations they were elected to uphold, as per the editorial in today's Democrat and Chronicle.

Best regards,



Richard A Young, PhD
Distinguished Service Professor Emeritus of Geological Sciences
SUNY Geneseo
(Updated resume attached separately)