

November 19, 2008

Hand Delivered at Zoning Board Hearing

Zoning Board of Adjustment
Township of Hamilton
2090 Greenwood Avenue
Hamilton, NJ 08650-0150

Re: CareOne – Preliminary and Final Site Plan
Block 2167, Lot 416
Hamilton Township, Mercer County, NJ
Hamilton Township Application No: 99-01-005B
Princeton Hydro Project No. 527.008

Dear Members of the Board:

Princeton Hydro was hired by Save Hamilton Open Space, Inc. to review the above referenced application. I was present at the Zoning Board of Adjustment hearings on May 27, 2008 and June 24, 2008 to listen to the testimony given by the applicant's engineer and other professionals. I have reviewed the following materials provided to me:

1. CareOne at Hamilton, Preliminary and Final Site Plan, Block 2167, Lot 416 by Taylor Wiseman & Taylor dated March 30, 2007, last revised February 26, 2008;
2. Drainage & Detention Calculations for CareOne by Taylor Wiseman & Taylor dated March 30, 2007, last revised February 26, 2008;
3. Detention Facilities Operation and Maintenance Manual, by Taylor Wiseman & Taylor dated June 22, 2007, last revised February 29, 2008.

The following are my comments with regard to compliance with the Township's **Chapter 158 - Stormwater Control Ordinance** and the New Jersey Administrative Code 7:8 – Stormwater Management Rule referencing the New Jersey Best Management Practices Manual (BMP Manual, referenced by NJAC 7:8), which regulate stormwater peak discharge, surface water quality and groundwater recharge in the Township. In my professional opinion, deficiencies exist in the application with regard to stormwater management and the current design should not be accepted. My specific comments are as follows.

Princeton Hydro, LLC

- 1108 Old York Road Suite 1, PO Box 720 Ringoes, NJ 08551 t. 908.237.5660 f. 908.237.5666
- 1200 Liberty Place, Sicklerville, NJ 08081 t. 856.629.8889 f. 856.629.8866
- 120 East Uwchlan Avenue Suite 204 Exton, PA 19341 t. 610.524.4220 f. 610.524.9434

1. There are very limited non-structural/Low Impact Development strategies incorporated into the proposed design. Hamilton Township's **Stormwater Control Ordinance 158-4. E. 1.** titled Nonstructural stormwater management strategies states that:

To the maximum extent practicable, the standards in Sections 158-4 (F) and 158-4 (G) [pertaining to groundwater recharge, runoff quantity and stormwater runoff quality] shall be met by incorporating nonstructural stormwater management set forth at Section 158-4 E.

158-4 E. 2. list as nonstructural stormwater management strategies: protect areas that provide water quality benefits; minimize impervious surfaces; maximize the protection of natural drainage features and vegetation; minimize the decrease in the time of concentration; minimize land disturbance; and minimize soil compaction.

While the applicant submitted a Non-structural Point System analysis, with an inspection of the plan, one determines a serious lack of non-structural techniques that should be inherent in a design to be consistent with the Township Ordinance. The analysis takes credit for using lightweight construction equipment, but the plans make no mention of this technique and it is difficult for the Township to dictate that certain equipment is utilized during construction. NJAC 7:8-5.3 (b) and the New Jersey Stormwater Best Management Practices Manual, Chapter 2 outline the non-structural/Low Impact Development techniques. With the applicant's density and alteration of the site that necessitates a use variance, front yard setback variance, maximum floor area ratio variance, residential zone buffer variance, and off-street parking buffer variance, the proposal is anything but Low Impact.

2. It appears that the design is attempting exemption for existing impervious for groundwater recharge, where NJAC 7:8-5.4 does not exempt existing impervious. This development expansion is an opportunity to retrofit the prior construction with recharge measures, since the prior stormwater management had no groundwater mitigation or stormwater runoff volume control
3. The engineer acknowledges in the narrative of the Drainage & Detention Calculations that the design post-development rate of runoff is higher than the pre-development rate in two locations. The engineer in the section titled Discussion states "For point of analysis '1 & 3' the post-development peak flows are very small, and [it] has been determine[d that] the flow increases are insignificant and detention is not required because both areas have an impervious increase less than ¼ of an acre.." There is nothing in NJAC 7:8 or in the BMP Manual where this conclusion is supported. In addition, Chapter 4 of the BMP Manual speaks to points of discharge on page 4-5, which reads

“In addition, if runoff is discharged from a site at multiple points, the 80 percent TSS removal requirement will have to be applied at each discharge point.” There is no water quality treatment at these uncontrolled discharge locations.

Consistent with the above, Hamilton Township **Ordinance 158-4. F. 1. c. (3)** requires post-construction peak runoff rates for the two-, ten- and 100-year storms to be 50, 75, and 80 percent, respectively, of the pre-construction peak runoff rates, and **Ordinance 158-4. G. 1.** states that:

“Stormwater management measures shall be designed to reduce the post-construction load of total suspended solids (TSS) in stormwater runoff by 80 percent of the anticipated load from the developed site, expressed as an annual average.” There is no allowance for points of discharge that don’t meet the above standards.

4. The USDA-NRCS Web Soil Survey 2.0 (attached) shows the site as having A, B and B/D soils. The applicant’s engineer did not consider the A soils. There is also a lack of proof on what hydrologic soil group is used for the post-development filling/compaction in the area of the existing basin and wetlands.
5. The manufactured treatment devices are limited in treatment capacity. According to **Ordinance 158-6 (c)**, “manufactured treatment devices may be used to meet the requirements of Section 158-4 of this chapter, provided the pollutant removal rates are verified by New Jersey Corporation for Advanced Technology and certified by the Department”. As proposed in the design, the devices do not have a bypass for up to the 100-year storm event since the storm sewer conveys the flows to the detention basin (as a note: the storm sewer system has only been analyzed for the 25-year storm) The below statement is from the NJDEP Division of Science, Research & Technology:

*The NJDEP is currently developing a re-suspension test protocol for those manufactured treatment devices (MTDs) that seek approval for use as an online water quality device. An online water quality device allows the passing of storms greater than the NJDEP water quality design storm through the device. Until such protocol is developed and testing has been submitted and deemed acceptable under that protocol, **all MTDs approved on this Webpage shall be used offline for all storms that exceed the NJDEP water quality design storm effective April 11, 2008.***
6. The design proposes a long retaining wall to create the basin, violating the Safety Standards for Stormwater Management Basins (NJAC 7:8-6.2 (c) 3), whereby “In new stormwater management basins, the maximum interior slope for an earthen dam, embankment, or berm shall not be steeper than 3 horizontal to 1 vertical.” The basin fronts public roadways with a lengthy perimeter retaining wall that

presents a safety risk that the Stormwater Rule prohibits. Retaining walls are needed only in this condition to compensate for a self-imposed hardship - maximizing the developable area to the detriment of public safety.

Hamilton Township **Ordinance 158-8. (b) (3) c.** repeats the same restriction that “In new stormwater management basins, the maximum interior slope for an earthen dam, embankment, or berm shall not be steeper than 3 horizontal to 1 vertical.”

7. The Operation and Maintenance Manual addresses the care for a dry detention basin only. A wetland basin, which the proposed basin will become due to the high groundwater table, requires a different and higher standard of care for establishing the plant community. Goose control, invasive species control, and other measures are needed in the plan. There is no mention of the retaining wall and how this will be inspected. The recharge beds are not mentioned in the manual and these are a vital component in the design. Also, the manufactured treatment devices are not mentioned in the manual and these must be cleaned out often to be credited for the anticipated TSS removal. The manual must be site specific to instruct the operator how to specifically take care of the stormwater management systems. **Ordinance 158-4.** titled Stormwater management requirements for major development suggests the use of LID and nonstructural stormwater methods for their ease of maintenance.
8. The engineer did not include the contributions of the existing wetland to be filled in the reduction of pre-development offsite runoff for POA #2. According to the Chapter 4 of the BMP Manual, page 5-26 under Tc Routes [below emphasis added by bolding]:

*Tc routes should not cross through significant flow constrictions and ponding areas without considering the peak flow and time attenuation effects of such areas. As noted in the NJDEP Stormwater Management Rules, such areas can occur at hedgerows, undersized culverts, fill areas, sinkholes, and **isolated ponding areas.***
9. Onsite soil testing logs are in error with regard to the depth to seasonal high groundwater. In the following, mottling is evident at depths that are shallower than what is reported: the depth to seasonal high water table for Test Pit 1 is 85-inches; Test Pit 3 at 20-inches; Boring No. 4 at 14-inches.
10. Test Pit 2 was only dug to 44-inches, and did not reach the depth required to satisfy the below requirement. Chapter 9.4 for Extended Detention Basin, page 9.4-3 states:

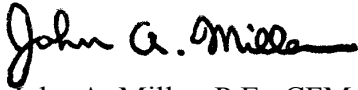
The lowest elevation in an extended detention basin, excluding low flow channels, must be at least 1 foot above the seasonal high groundwater table. The lowest elevation in any low flow channel, including any underdrain pipes and bedding material must be at or above the seasonal high groundwater table.

In addition, the test pit should have been completed in the deepest location of the proposed basin to verify groundwater depth.

11. The Web Soil Survey report showing depths to groundwater (attached) contradict the analysis of the Test Pit/Boring Logs in the Drainage & Detention Calculations and agree with the fact that the existing basin formed wetlands. The Plummer sandy loam has depth to water table from 0 to 10-inches below the surface. The Statement of Compliance filed with the NJDEP for the GP-6, Boring 1 has the seasonal high water table at the surface, which is consistent. In reality, the proposed basin will become a wetland basin. The applicant's engineer, Gary V. Vecchio testified before the Hamilton Township Zoning Board on May 27, 2008 (page 102 of the transcript attached) that “It’s a dry basin. It’s going to dry out. It has to dry out in, 72 hours is the rules.” While the plans note an extended detention basin, the Board should expect that this basin will be wet and not function as a dry extended detention basin.
12. The Annual Groundwater Recharge Analysis is flawed. There is a missing soil unit of Galloway where a great deal of the existing woods resides. The Galloway soil is Hydrologic Soil Group A and would have a much greater contribution to the pre-development recharge. This may be why the recharge pits are so small with respect to the impervious area.
13. Dry well design, as detailed by the BMP Manual Chapter 9.3, must consider the depth to seasonal high water table in the design to prove the system’s functioning and to verify that there is 2-feet of groundwater separation to the bottom of the proposed system. Boring No. 3 (which most proximate to one of the proposed dry well storm chambers) shows mottles at 20-inches and thus indicates that the seasonal groundwater elevation violated the 2-foot separation.
14. The engineer does not describe the sequence of the project to ensure stormwater management is maintained during the filling of the existing basin and construction of the proposed basin.

I reserve the right to make additional comments as the design is modified. Thank you again for considering these concerns.

Sincerely,



John A. Miller, P.E., CFM
Water Resources Engineer
Certified Floodplain Manager

Attachments: Web Soil Survey reporting – soils and groundwater
CV

c: Ms. Susan Tierney, by email: susan.tierney@amec.com
Mr. Rocky Swingle, by email: rockys512@gmail.com
Ms. William Potter, Esq., by email: Potterrex@cs.com
File