GROUNDWATER INVESTIGATIONS IN PLEASANT PLAINS, STATEN ISLAND, NEW YORK

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ABSTRACT

A 43 unit housing development was planned for a 4.3 acre site adjacent to and within the Mill Creek Wetland System(AR-27) in Pleasant Plains, Staten Island, New York. A subsurface disposal field consisting of seven 16 ft diameter seepage pits 12 feet deep designed to discharge 20,000 gpd of effluent was planned for the subsurface. The developer's DEIS also called for the installation of five drywells to accommodate a maximum storm runoff of 10,618 ft^3. The site exhibited high water table conditions. Local residents observed high water table conditions noting that the water table was less than one foot below the surface at certain times of the year. A geohydrologic reconnaissance study shows the water table at this site around 25 feet above sea level (Soren ,1988). Topographically, the site is between 24 and 26 feet above sea level. The developer maintained the existence of an aquitard resulting in a "perched water condition" and that the "real water table" was situated below the "perched water table". Furthermore, they maintained that there was a unsaturated zone between the two water tables and that the unsaturated zone was suitable for seepage pits.

In order to determine whether or not the perched water was present, monitoring wells were installed in June 1992. Split spoon samples of the sediment were also obtained. Blow counts were recorded. The first well(4" PVC pipe) was installed to 34 feet below the surface. Ten feet of slotted pipe was installed between 24 and 34 feet. A two foot bentonite seal was also installed at a level corresponding to the "claimed" aquitard layer. The second well was dug to a depth of 27 feet. However, the pipe was set to a depth of 20 feet and the well consisted of 5 feet of solid 4" PVC pipe followed by 15 feet of slotted 4" PVC pipe to a depth of 20 feet. Both wells show that the water table is less than five feet below the surface.

On the basis of soil boring data, analysis of split spoon samples and water table levels it was concluded that a perched water table did not exist. Instead, a single regional water table exists. This is in accord with the work of Soren(1988). The project could not have been built as designed and permitted due to the exceptionally high groundwater levels on the project site. It is clear that the entire parcel belongs within the Mill Creek Bluebelt.

References

Soren, J. (1988) Geologic and geohydrologic reconnaissance of Staten Island, New York: United States Geological Survey Water Resources Investigations Report 87-4048, 22 p.