ARM Group Inc.
Earth Resource Engineers and Consultants

September 8, 2008

Eric Epstein, Chairman
Stray Winds Area Neighbors
4100 Hillsdale Road
Harrisburg, PA 17112

Re: Issues of Potential Concern Associated with the
Stormwater Management Plans for "The Estates at Autumn Oaks"
Lower Paxton Township, Dauphin Co., PA

Dear Mr. Epstein:

Based on discussions with you and representatives of Centennial Acres, this letter has been prepared by ARM Group Inc. (ARM) to present a summary of questions and issues of potential concern associated with the stormwater management plans for the proposed Estates at Autumn Oaks in Lower Paxton Township, Dauphin County, Pennsylvania. It is understood that this letter and/or its contents may be shared with representatives of Centennial Acres, Lower Paxton Township, and/or the site Developer (i.e., The McNaughton Company). The purpose of this letter is to highlight engineering issues of potential concern during the site planning stage so as to avoid a much greater degree of damage, response costs, legal fees and effort that might otherwise be incurred by the residents, Township, and/or developer in the event that proper measures are not incorporated into the design before construction.

Background

ARM understands that preliminary plans have been prepared for the construction of a residential development in Lower Paxton Township to be named The Estates at Autumn Oaks. As part of the proposed development, trees and vegetation will be cleared from the existing hillside, and stormwater management basins and other facilities will be constructed immediately upslope and adjacent to the existing Centennial Acres development. Many of the existing residents of Centennial Acres, particularly those with properties that border the proposed development and/or that are located along the drainage channels that exit the proposed development, have concerns regarding potential impacts to their properties (e.g., damage, flooding) as a result of the proposed development activities at Autumn Oaks.

Information reviewed by ARM in support of this letter included the following:

1129 West Governor Road • P.O. Box 797 • Hershey, PA 17033-0797
voice: (717) 533-8600 • fax: (717) 533-8605 • e-mail: info@armgroup.net

- "Preliminary Subdivision Plan for the Estates at Autumn Oaks", drawings 1-1, 1-2, 4-1 thru 4-6, 5-12, and 6-1, prepared by Mellot Engineering, Inc., and dated November 21, 2007.

- Comment memorandum dates July 30, 2008 from Robert C. Grubic, HRG, Inc., Township Engineer to Lori Wissler, Lower Paxton Township, regarding the Preliminary Subdivision Plan for the Estates at Autumn Oaks.

- Letter dated August 4, 2008 from SWAN (Stray Winds Area Neighbors) to the Lower Paxton Township Board of Supervisors regarding the proposed Estates at Autumn Oaks.

- Undated letter from the concerned citizens, provided to the developer on August 25, 2008, and titled "Autumn Oaks Action Plan: Suggestions & Recommendations". This letter presents 10 questions regarding the proposed developed.

- Undated PowerPoint presentation of the Preliminary Subdivision Plan for Autumn Oaks, reportedly prepared by representatives of the site developer in response to questions and concerns presented by residents of the adjoining Centennial Acres development.

It should be noted that ARM has not been provided with a copy of, and has not reviewed, the NPDES Permit application for the proposed project, or the associated erosion and sediment control details and stormwater management report and calculations. It is possible that some of the issues presented in this letter are addressed in these other documents that were not reviewed by ARM.

Identified Issues of Potential Concern

Based on ARM's review of the cited information, the following issues of potential concern have been identified for the proposed development with respect to stormwater management and related engineering issues. It should be noted that this letter does not address other site planning concerns and questions associated with the proposed project, many of which have been presented to the Township and/or developer separately.

1. ***Flooding/Erosion of Downslope Areas***: Based on ARM's previous experience with similar projects, the locations and configurations of the currently proposed stormwater management basins along the southern boundary of the proposed development present a number of potential concerns with respect to flooding and/or other damage to downslope houses and structures. The major concerns and supporting rationale are summarized below:

a. Increased Runoff Volume: As a result of the clearing of trees, significantly reduced evapotranspiration, and the construction of impervious surfaces (roads, houses, etc.), the volume of stormwater runoff from the site will significantly increase. Based on discussions with nearby property owners, increased surface water runoff and subsurface water flow were observed as a result of previous, limited tree harvesting activities on the slope, and much greater impacts would be expected with the much greater degree of tree clearing and impervious surface construction that is currently proposed. Although the proposed stormwater management basins will help to control the peak rate of runoff, they will not address the increased volume of runoff. As a result of the increased volume of runoff, and the concentration of such runoff at the basin discharge locations (i.e., generally just upslope from Centennial Acres), there is a significantly increased potential for flooding of properties located downslope from the basins and along the receiving drainage ways. The relatively poor drainage of the existing soils is reflected by the presence of wetlands on the slope and in the vicinity of many of the basins, and the capacity of such soils to effectively drain this water away from these areas will be exceeded. Additionally, the average flow rate in the receiving streams will now be greater (because of the greater volume of water), which increases the potential for erosion.

b. Concentrated Infiltration and Subsurface Flow: By itself, but particularly in conjunction with the concerns presented in paragraph "a." above, concentrated stormwater infiltration and increased subsurface flow presents a major concern with respect to flooding and damage of downslope areas and properties. Although not specifically designed as infiltration basins, the basins are expected to result in the concentration of a significant volume of stormwater infiltration as a result of their proposed construction (i.e., the removal of up to 10 feet of existing soils, potentially intersecting higher-permeability soils and lateral flow paths, the storage of up to 10 feet of water across the basin footprints, and the flat basin bottoms with no low-flow channels, which further promotes infiltration and reduces free drainage), and the typical subsurface flow patterns along a steep, mountain slope. Based on ARM experience with similar projects, the introduction of significant volumes of water to the subsurface, just upslope of existing homes and along a relatively steep slope, presents a significant potential for flooding of basements and structures, new seeps, structural and property damage, surface drainage problems, and related concerns. The most appropriate approaches for addressing these concerns are considered to include: increasing the buffer distance between the basins and the downslope properties to provide for greater attenuation; the completion of an appropriate geological investigation

to characterize anticipated subsurface flow conditions; and/or lining of the basins with clay or some other low-permeability barrier to prevent concentrated stormwater infiltration.

c. Increased Runoff Velocity. Runoff velocities will be significantly increased as a result of the proposed development, as heavily wooded and vegetated slopes are stripped of vegetation, and grass and impervious surface s are constructed. Of particular concern are the areas located immediately downslope of the stormwater management basins, where wooded, 15% slopes will be converted to tall, grass-covered slopes at 33% to 50%. This change will result in increased runoff volume and velocities to the homes located downslope of the basin berms. It is recommended that the wooded buffer distance between the toe of the berms and the existing homes be increased to provide for better attenuation of these increased flow velocities.

2. ***Slope Stability***: If not previously completed, a slope stability analysis, supported by actual subsurface information collected from the site, should be completed to ensure the long-term stability of the stormwater management basin berms, particular the tallest and steepest berms. The stability of these berms is a concern because: many of these berms will be constructed along existing slopes that are relatively steep; some of the berms will be relatively steep (potentially up to 2H:1V); and they will need to retain the pressure caused from up to 10 feet of water (15 feet requires permitting as a dam), even when the underlying and downslope soils are potentially saturated during a storm event. It is expected that an increase buffer zone of undisturbed ground down slope of the basin berms will increase the factor of safety against potential failure.

3. With respect to the answers that were recently provided by the developer in response to questions provided by the concerned citizens:

   a. Although the developer has named two communities where similar conditions have not been known to cause any notable flooding problems, ARM has been involved with dozens of projects where similar conditions have resulted in flooding problems. One of these projects was located in the adjacent Forrest Hills development, while another example is the Good Hope Farms South community (Hampden Twp), which was also developed by the McNaughton Company.

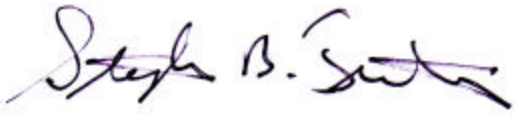
   b. With regard to the developer's offer to install buffer planting along the southern boundaries of the stormwater basins, ARM believes that the preservation of existing trees in these areas will have significantly greater benefits, and would be more practical.

4. ***Increase Buffer Distance***: Based on the identified issues of concern, an increased buffer distance between the proposed basins and the existing homes presents a significant number of potential benefits, and should be practical to implement. For example, the southern drainage channel in the western portion of the proposed project could be shifted to the north, which would: decrease potential flooding concerns associated with the channel and increased infiltration; increase the channel slope so as to reduce concentrated infiltration along the channel; and allow for a larger, contiguous stand of existing trees in this area, rather than the currently proposed "island" of trees. Similarly, a 30-foot buffer has been proposed along the western side of the proposed development, and a similar or greater buffer distance should be maintained along the much more critical southern, downslope property boundary.

Closing

If you have any questions or comments regarding the contents of this letter, please do not hesitate to contact me (717-508-0521) at you earliest convenience.

Sincerely yours,
ARM Group Inc.



Stephen B. Fulton, P.E., P.G.
Vice President of Environmental Services
and Senior Engineer