

**Environmental and Soil
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September 3, 2008

Wayne Dunlap
P.O. Box 159
Staley, NC 27355

Subject: Preliminary evaluation for septic suitability of +/- 24.12 acres located on Day's Landing Road in Pamlico County, North Carolina.

Dear Mr. Dunlap:

As requested, ESS has completed a preliminary evaluation of the referenced tract to determine suitability of the soils/site with respect to septic systems. The property was evaluated using the *North Carolina Laws And Rules for Sewage Treatment and Disposal Systems* as a reference. Hand augured borings were used to analyze the soils. The field analysis was used to form a general septic/soil suitability map. The soils were delineated according to suitability for conventional, ultra-shallow (6" cap) and fill (mound) systems. Areas that were found to be unsuitable were also delineated. Locating existing irons and landmarks such as tree lines, roads, ditches, etc formed the boundary of the map. Soils are designated as "A", "B", "B1", "C" and "D" on the enclosed map.

The site had an existing house that was under construction and an existing garage/apartment. The house that was under construction had an existing septic system that is shown on the enclosed map. Most of the site was cleared and being maintained as grassed areas. There was a wooded area on the west side of the site that had been cleared and was accessible.

The site lies on a relatively flat landscape adjacent to Ball Creek in eastern Pamlico County. Slopes range from 0 to 2%. The soils on this site formed from Coastal Plain sediment. The soils were most like the Altavista, Fork and Yonges soil series. Altavista soils are somewhat poorly drained to moderately well drained and were typically located on convex landscape positions adjacent to the creek and drainage ways. The Fork soils are somewhat poorly drained and were found on flat landscape positions between the creek and the poorly drained areas where the Yonges soils were found. Yonges soils are poorly drained and were typically found in flat and slightly concave landscape positions. There were indications of 404 wetlands on the site. The enclosed map shows an approximate 404 wetland line. The areas shown as potential wetlands do not represent a wetland delineation. In order to provide a map that can be submitted to the Corps of Engineers that will identify specifically the areas that are wetlands, a thorough wetland delineation will need to be done.

The areas designated "A" are generally provisionally suitable for conventional septic systems. The bottom of the drain lines in these areas can range from 18 to 24 inches below the existing surface depending on the depth to the seasonal wetness condition. The seasonal soil wetness condition ranges from 30 to 36 inches below the natural soil surface. The sandy clay loam to sandy loam texture of the subsoil places these soils in the group 2 and 3 textural class. Based on soil texture the recommended long-term acceptance rate (LTAR) in this area is .4 to .6 gallons/day/ft². Given a three-bedroom residence, a septic system designed at a LTAR of .4 requires 300 linear feet of drain line. If four 75-foot drain lines were used in the primary system, an area of about 5,250 ft² of land area would be needed for the primary drain field and like repair area. A LTAR of .6 would yield a primary septic system with 200 linear feet of drain line and a land area of about 3,500 ft² for the primary system and a like repair area.

The areas designated "B" should meet the criteria for ultra-shallow placement of conventional drain lines (6-inch cap systems). These areas have seasonal wetness conditions that range from 24 to 30 inches below the soil surface. The bottom of the drain lines would typically be 12 to 18 inches below the natural soil surface. Systems

with 6-inch caps typically require 6 to 8 inches of imported fill to provide the minimum requirement of 6 inches of cover over the drain field. The imported fill and area around the drain field should be shaped to remove surface water. The group 2 and 3 soil texture would suggest a LTAR of .4 - .6 gallons/day/ft². Septic systems placed in these areas should be similar in size to those described for soil group "A".

Soil group "B1" should also be provisionally suitable for ultra-shallow placement of conventional drain lines but due to a higher clay content in the subsoil, septic systems located in these areas may be larger than those located in areas designated "B". The recommended LTAR in these areas is .3 gallons/day/ft². A septic system designed for a three-bedroom residence with a LTAR of .3 would have 400 linear feet of drain line in the primary system. If four 100-foot drain lines were used in the primary system, an area of about 7,000 ft² of land area would be needed for the primary drain field and like repair area.

The areas designated "C" should meet the requirements for fill (mound) systems. The amount of fill is determined by the depth to the soil wetness condition, which ranges from 13 to 24 inches below the soil surface in this area. It is imperative that the mound and the area around the mound are shaped to remove surface water. The typical LTAR for this area is .3 gallons/day/ft² based on the sandy clay loam to clay loam texture within 18 inches of the surface. If designed for a three-bedroom residence a mound with a LTAR of .3 and conventional drain lines will have 400 linear feet of drain lines. If four 100-foot drain lines are used and the mound is designed on a level site, the total area of the mound would range from 118 ft x 48 ft to 126 ft x 56 ft depending on the height of the mound. The size of the mound is based on an 18-inch separation to the soil wetness condition and a 4:1 sideslope. Assuming a flat topography, the maximum area required for the primary mound and a like repair area is about 14,115 ft². There may be minor inclusions that meet the criteria for soil group "B" or "B1". Several soil borings in this area indicated a soil wetness condition very close to 24 inches below the soil surface; however, the borings were sporadic and no consistent pattern could be determined.

The areas designated "D" are unsuitable for septic systems due to seasonal soil wetness conditions at less than 12 inches below the surface as indicated by the presence of chroma 2 soil color.

The findings of this report are based on soil indicators and morphological features present at the time of the fieldwork. Some soil conditions, such as drainage, may vary from reported findings because of influences that may not show up in common indicators or morphological features. In many cases further study is required to determine the effects of these influences.

The areas given for the septic systems and repair areas are based on conventional gravity flow drain lines for three-bedroom residences. If a proposed resident has a number of bedrooms other than three, the septic system size will have to be adjusted based on the number of bedrooms and the appropriate LTAR. In certain cases, alternative trench design and pretreatment options can reduce the size of the drain field by as much as 25% and 50%, respectively. Pretreatment options can also reduce vertical separations from the drain lines to unsuitable soil characteristics or reduce horizontal setbacks to wells, bodies of water, etc. When using pretreatment only one of the three reductions (size, vertical separation, or horizontal setback) can be taken. If you are interested in pursuing any of these options, please give me a call.

Areas for the septic tank and setbacks to well, water lines, property lines, foundations, bodies of water, CAMA lines, etc are not included in the square footage given for the systems and repair areas. The areas given for the septic systems and repair areas assume drain lines are parallel and the septic system and repair area are adjacent to one another.

Lot size is somewhat proportional to septic system size; however other factors such as the size of the residence, locations of driveways, outbuildings, water lines, setbacks, etc. need to be taken into account when designing lots.

All drain lines should be designed to follow the contour of the land.

Any disturbance of the soils in the form of filling or excavating can change the suitability class of the soils and in many cases render the site unusable. Filling or excavating in the area designated for a septic systems should be done only as a condition of an improvement permit issued by the local health department.

September 3, 2008

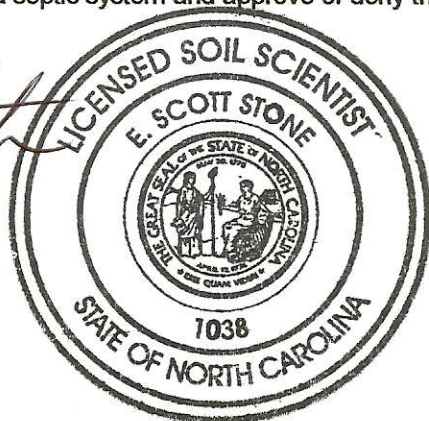
The depth to the soil wetness condition, which can be a limiting factor with respect to septic suitability, was determined in the field by standard analysis of soil color. Factors such as artificial drainage can alter the depth to the soil wetness condition. The only way

This report is submitted for information and planning purposes only. The local health department must evaluate each proposed site for a septic system and approve or deny the appropriate permits.

Respectfully Submitted,



Scott Stone
Licensed Soil Scientist
Registered Sanitarian



Enclosure

Cc Danny Grant, Grant & Associates