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Julie:

This report concerns the preliminary soils and site investigations for septic system suitability on the Averette property (76.19 acres, map # 181600421536) located on the north side of Walters Road just east of Beaver Creek in southern Granville County.

The attached map shows the approximate locations of various soils areas on the property as well as selected cultural features and drainage features. This map was prepared using property information and aerial photography obtained from the Granville County GIS web site. The topographic contours were obtained from the NCDOT GIS web site. The USDA soil survey maps and the USGS topographic maps were also used as general guides to the soils, landforms and streams.

The soils areas and boundaries were estimated from hand auger borings made at selected locations and from field observations of soil related landforms and vegetation. Overall the soils occur in complex patterns relative to the criteria for septic system drain fields or other alternative on site sewage disposal measures. However this map should be detailed enough for general planning and discussion purposes for subdividing the property into smaller lots using septic systems or other alternative measures for on site sewage disposal. It is not necessarily detailed enough for the preparation of a final subdivision plat. Additional ultra-detailed soils investigations, the field layout of septic system drainfields and the preliminary design of effluent distribution systems may be required before individual sites can be considered for approved for on site sewage disposal permits.

SOILS GENERAL

The soils on this property are mainly formed over weathered sediments of the Triassic Basin. Typically these soils have grayish brown, dark grayish brown and pale brown sandy loam surface layers 6 to 12 inches or more in thickness. The underlying subsoils are yellowish brown to yellowish red clay to sandy clay, which have a firm to very firm and plastic to very plastic consistency and are mottled with gray within the upper 24 inches of the soil profiles. The subsoils are underlain by varicolored weathered sedimentary materials, which are somewhat dense and compact. Overall these soils will classify unsuitable for conventional or alternative septic system drain fields due to the presence of expansive soil materials and the presence of seasonally perched water in the subsoils. Locally there are some areas that have unsuitable landscape position and the bottom lands are subject to periodic flooding.

There are some areas scattered throughout the property where the upper 18 to 30 inches or more of the soil profiles consist of soil materials that have a friable to slightly firm consistency and are free or seasonal wetness indicators. These areas are designated as area 2 and area 3a on the attached map. These soils have potential for modified conventional or alternative septic system drain fields. Brief descriptions of the soils areas and specific suitability classifications are as follows:

SOILS AREA 2: These soils will classify provisionally suitable to unsuitable for standard conventional septic system drain fields. These soils generally have friable soil materials that are free of seasonal wetness indicators within the upper 24 to 30 inches or more of the soil profiles. These soils generally have potential for conventional septic system drain fields. Most of the unsuitable soils can be re-classified to provisionally suitable by using modifications for conventional drainfields as prescribed under State Sewage Disposal Regulations (15A NCAC 18A .1900-.1968). These modifications may include the installation of approved fill materials over the proposed drain field site (at grade system) or the use of up-slope interceptor drainage measures. The specific need for site or system modifications will be determined from additional investigations of the areas. The additional cost above normal for these measures may range from a few hundred to a few thousand dollars for septic system drain fields. The sewage loading rates (LTAR) are estimated to range from 0.30 to 0.40 gal./sq. ft. of trench bottom for modified conventional drain fields. Included in these areas are small areas of soils similar to those contained in area 3a and having similar interpretations.

SOILS AREA 3a: These soils will classify unsuitable for modified conventional septic system drain fields. These soils generally have friable materials that are free of seasonal wetness indicators within the upper 18 to 24 inches of the soil profiles. These soils have potential for on site sewage disposal using modified low pressure systems, that involve the installation of fill materials or by using subsurface drip irrigation systems. Systems involving the pre-treatment of septic system effluent may be considered subject to additional field investigations. The cost above normal for the use of these soils may range from \$ 7,000 to more than \$ 25,000 above normal per lot for sewage disposal. For modified low pressure systems and drip systems the sewage loading rate (LTAR) is estimated to range from 0.08 to 0.10 gal./sq. ft. of drain field area. The sewage loading rates for pre-treatment systems will be estimated from field observations of in situ hydraulic conductivity.

SOILS AREA 3: These soils will generally classify unsuitable for conventional or alternative septic system drainfields. These soils generally have firm plastic clays or other restrictive conditions within the upper 18 inches of the soil profiles. Significant areas of these soils also occur on the flood plains, which have a wetness limitation and flood hazard. Some areas have steep slopes and have been significantly affected by erosion. Overall these soils do not have potential for modified conventional or alternative septic system drain fields.

SUMMARY

This property has potential for further subdivision using conventional or alternative septic systems for on site sewage disposal. Soils area 2 is recommended for modified conventional septic system drainfields. For preliminary planning purposes you should allocate at least 15,000 sq. ft. of this soil type to each building lot to serve three bedroom dwellings. Area 3a has potential for alternative on site sewage disposal measures. For preliminary planning purposes you should allocate approximately 20,000 sq. ft. of this soil type to each building lot to serve three bedroom dwellings. Additional drainfield pace may need to be reserved for larger dwelling.

Additional consultations are recommended during the preparation of a subdivision plan. Some sites have been disturbed by logging activities will need to be identified and the specific need for site modifications will need discussion. In any case we will need to review any proposed subdivision plans for the property to identify potential problems. Additional field investigations will be needed if the property is to be developed to it's maximum potential. It may be recommended that permits from the Health Department be obtained for certain sites before the sale of the property is finalized, because of the

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marginal nature of some of the soils and the complexity of the soils patterns.

The investigations indicated that there are no significant wetland areas associated with the upland sections of the property. There are probably some wetlands located on the flood plain adjacent to Beaver Creek. You need to be aware that impacts to wetlands are required to be reported to the Army Corps of Engineers and NCDNER, Division of Water Quality. Impacts that exceed 0.10 acres require prior approval from these agencies.

There are several stream features on the property that appear as stream symbols on the USDA soil survey map of the are. A section of the soils map is attached with the features highlighted in blue. These features will be subject to riparian buffers unless they can be re-classified. Some sections of the features and the ponds do not appear to meet the minimum criteria for streams and can be re-classified. A field inspection by The Division of Water Quality will be required in order to re-classify the features.

Please call me if you have any questions concerning these investigations or the development of the property.

Sincerely

Daniel J. Bliley
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Licensed Soil Scientist



