S&EC

Soil & Environmental Consultants, PA

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February 22, 2016
Project #10719.S1

Polk Sullivan LLC
Attn: Robbie Swain
Po box 5689
Cary, NC 27512

Re: Soil/Site Evaluation at Intersection of Pea Ridge Road and Seaforth Road, approximately 194-Acre Site, Chatham County, NC

Dear Mr. Swain:

Soil & Environmental Consultants, PA (S&EC) performed a preliminary soil and site evaluation on the above referenced tract. This was performed at your request as part of the preliminary planning process in order to determine areas of soil that have potential for subsurface wastewater disposal. Fieldwork was performed in May 2007.

S&EC traversed the property and observed landforms (slope, drainage patterns, past use, etc.) as well as soil conditions (depth, texture, structure, seasonal wetness, restrictive horizons, etc.) through the use of hand auger borings. The site was evaluated during dry soil conditions. From these observations, an evaluation of the site was developed, relative to subsurface disposal of wastewater. Soil borings were flagged in the field and were located by S&EC using a GPS unit. The soil/site evaluation criteria used is that contained in 15 A NCAC 18A .1900 "Laws and Rules for Sewage Treatment and Disposal Systems".

FINDINGS

This site is located in the Slate Belt region of Chatham County. The upland soils on this tract are similar to the Georgeville/Tarrus, Badin, Secrest, Pittsboro, and Cid/Lignum soil series. The Georgeville/Tarrus soil series has a loam surface material over a clay subsoil. These soils are at least 24 inches deep to prohibitive soil characteristics and are generally useable for subsurface septic systems. The Badin soils can be shallow to rock prior to 24 inches making these soils unsuitable for conventional subsurface septic systems. The Cid/Lignum, Pittsboro, and Secrest soils exhibit unsuitable soil characteristics prior to 24 inches such as expansive clay mineralogy and/or soil wetness. These soils are typically unsuitable for conventional subsurface septic systems.

The accompanying GPS/AutoCAD sketch map indicates the estimated areas with potential use for subsurface wastewater disposal. The hatched units indicate areas of soils which are at least 18 inches deep to prohibitive soil characteristics and these areas have potential for a subsurface drip septic system, a conventional septic system, a modified conventional (shallow

placed lines with no fill required over the disposal area) or a low pressure pipe system (LPP) and/or ultra-shallow conventional (shallow placed lines with fill required over the disposal field) system. Please note however that site accessibility was limited due to the thick vegetation encountered on portions of the tract. Therefore, areas shown as suitable on the map may contain areas with unsuitable soil characteristics and/or site conditions. Unit "UN" on the attached map indicates areas of soils that are less than 18 inches to prohibitive soil characteristics and are generally unsuitable for the type of systems mentioned above. However, they may be suitable for more expensive alternative septic systems, i.e. pretreatment drip or spray irrigation, etc.

The site plan for each lot must ensure that adequate soil area for system and repair is unaffected by site elements (house placement, driveway, wells, patios, decks, etc.) on that or adjacent lots. The area ultimately designated by the health department on the site plan for the septic system and repair must remain undisturbed (no mechanical clearing, excavation, heavy traffic or other significant site disturbing activities) until authorized by the health department. A lot with initially adequate useable soil area may be rendered unusable as a result of improper site planning and/or disturbance. A field layout of the proposed septic systems may be required as part of the individual lot development process.

GENERAL WASTEWATER CONSIDERATIONS

Once potentially useable areas are located through vertical borings, the next consideration is the horizontal extent of those areas. The size and configuration of the useable soil area dictate the utility of that area. The size of a subsurface disposal field is determined by: 1) the design flow from the source (120 gallons/bedroom/day in residences), and 2) the long term acceptance rate (LTAR) of the soil (based on the hydraulic conductivity of the soil, a function of the soil's texture, mineralogy, structure, porosity, etc.). The configuration must be such that an efficient layout of disposal lines (on contour) is possible. An additional consideration is the required setbacks for the system from various elements such as wells (100'), streams and ponds (50') or more (depending on watershed regulations), property lines (10'), top of embankment (15'), watershed buffers, etc.

The utility of a potential useable soil area for a subsurface system is most accurately determined by an on-ground layout of the proposed system. The total area needed for system and repair areas will depend upon the system type, the layout of that system and the total design flow (factors mentioned above). A typical area needed for a 4 bedroom residence is approximately 14,000 to 16,000 ft^2 (could be more depending on site features) or 800 to 960 linear feet of conventional line (system and repair) or 1920 linear feet of LPP line (system and repair). These estimates reference Laws and Rules for Sewage Treatment and Disposal Systems for North Carolina and use a LTAR of 0.25-0.3gpd/ft^2 for conventional septic systems (.1955), a LTAR of 0.25-0.3gpd/ft^2 for modified conventional (.1956), 0.1gpd/ft^2 for LPP septic systems (.1957a), and 0.08-0.1gpd/ft^2 for subsurface drip septic systems. The ultimate LTAR will be determined by the health department after their lot evaluation. S&EC will be glad to assist in any system layout or sizing calculations if requested.

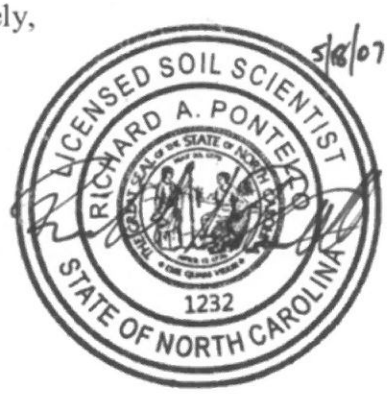
This report discusses the general location of potentially useable soils for on-site subsurface wastewater disposal and, of course, does not constitute or imply any approval or permit as

needed by the client from the local health department. S&EC is a professional consulting firm that specializes in the delineation of soil areas for wastewater disposal and the layout and design of wastewater treatment systems. As a professional consulting firm, S&EC is hired for its professional opinion in these matters. The rules governing wastewater treatment (interpreted and governed by local and state agencies) are evolving constantly and, in many cases, affected by the opinions of individuals employed by these governing agencies. Because of this, S&EC cannot guarantee that areas delineated and/or systems designed will be permitted by the governing agencies. As always, S&EC recommends that anyone making financial commitments on a tract be fully aware of individual permit requirements on that tract prior to final action.

An individual septic system permit will be required for each lot prior to obtaining a building permit. This will involve a detailed evaluation by the local health department to determine, among other things, system size and layout, well, drive and house location. Only after developing this information can a final determination be made concerning specifics of system design and site utilization.

Soil & Environmental Consultants, PA is pleased to be of service in this matter and we look forward to assisting in any site analysis needs you may have in the future. Please feel free to call with any questions or comments.

Sincerely,



Ricky Pontello
NC Licensed Soil Scientist

Derrick A. Smith
NCSSIT

Encl: Soil Suitability Map

Form 2

ADEQUATE SOILS CERTIFICATION OF REVIEW BY LICENSED SOIL SCIENTIST

I HEREBY CERTIFY THAT LOT(S) 1-45 SHOWN ON THIS PLAT FOR SEAFORTH LANDING HAVE BEEN REVIEWED IN ACCORDANCE WITH THE .1900 NORTH CAROLINA LAWS AND RULES FOR SEWAGE TREATMENT AND DISPOSAL SYSTEMS. AS OF THIS DATE, AND BASED ON THIS REVIEW OF EXISTING SITE CONDITIONS THE LOTS NUMBERED ABOVE ON THIS PLAT MEETS THESE REGULATIONS.

CERTIFICATION DOES NOT REPRESENT APPROVAL OR A PERMIT FOR ANY SITE WORK. FINAL SITE APPROVAL FOR ISSUANCE OF IMPROVEMENT PERMITS IS BASED ON REGULATIONS IN FORCE AT THE TIME OF PERMITTING AND IS DEPENDENT ON SATISFACTORY COMPLETION OF INDIVIDUAL SITE EVALUATIONS FOLLOWING APPLICATION FOR AN IMPROVEMENT PERMIT DETAILING A SPECIFIC USE AND SITING.

ANY CHANGE IN USE OR ANY SITE ALTERATION MAY RESULT IN SUSPENSION OR REVOCATION OF CERTIFICATION.

LICENSED SOIL SCIENTIST
RICHARD A. PONTELLO
1232
STATE OF NORTH CAROLINA

2/22/16
Date

NC LICENSED SOIL SCIENTIST (SEAL)