Central Carolina Soil Consulting, PLLC
1900 South Main Street, Suite 110
Wake Forest, NC 27587

January 25, 2018
June 8, 2019
Job # 1580-B

Jones Ferry Properties, LLC.
Attention: Wesley Lloyd
227 Opus Way
Chapel Hill, NC 27516

RE: Preliminary soil/site evaluation on ~80-acres (Morgan Ridge Phase II) in Chatham County, NC

Dear Mr. Lloyd:

Central Carolina Soil Consulting, PLLC conducted a preliminary soil evaluation on the parcel listed above to determine the areas of soils that are suitable for subsurface wastewater disposal systems (conventional & LPP). The soil/site evaluation was performed with hand auger borings and backhoe pits under moist soil conditions based on the criteria found in the State Subsurface Rules, 15ANCAC 18A .1900 "Laws and Rules for Sewage Treatment and Disposal Systems". From this evaluation, CCSC sketched the boundary between the suitable soils and unsuitable soils onto an aerial and topographic map of the property through ground truthing and GPS field location of soil borings and backhoe pit locations.

The above referenced parcel is located south of Jones Ferry Road just south of the Chatham/Orange County line. This area lies on the fall line Carolina Slate Belt geologic unit and mixed felsic crystalline geologic unit, where soils have formed from residual parent material such as volcanic argillites or gneiss or schists. The soils that have formed on this parcel are similar to the Herndon, Wedowee, Helena and Lignum soil series. The attached soils map indicates the areas of provisionally suitable vs. unsuitable soils. The Herndon and Wedowee soil series are generally provisionally suitable for subsurface wastewater systems. That is, the morphology of the soils contain suitable characteristics that would support subsurface septic systems such as clay textured subsoils that are not considered expansive, blocky structure and no indicators of restrictive characteristics within 24 inches of the soil surface in the areas of the evaluation (auger borings and pits). The Lignum and Helena soils contain field

indicators of a perched water table within 18 inches of the soil surface and are unsuitable for conventional and LPP septic systems.

The attached soils map indicates the areas of soils which are suitable for subsurface wastewater systems. The “hatched soil units” on the attached map indicates the areas of soils that have 30+ inches or more of provisionally suitable soil material. These areas have potential for conventional and modified conventional septic systems. There will be inclusions of soils that can only support LPP or ultra-shallow conventional septic systems in the areas mapped as conventional. The “cross hatched” soils units on the attached map indicate areas of soils with 24-29 inches of provisionally suitable soil material. These areas have potential for LPP or ultra-shallow conventional septic systems. Units “AR” on the attached soils map indicates areas of soils with dense amounts of rock in the soil profile and will require backhoe test pits for final site evaluation. Unit “UN” on the attached map indicates areas of unsuitable soils that are located in unsuitable soils or topography and cannot be used for the systems mentioned above but may have potential for subsurface or surface drip in certain areas.

Future Subdivision Considerations

Several factors should be considered before a final subdivision plan is created for any property. One consideration is that each proposed lot shall contain an adequate amount of suitable soils, which can support a primary septic system along with a repair septic system. The suitable soil areas cannot be affected by future homes, driveways, patios, excavation or filling activities and if an on-site well is used then a 100’ setback is required around the well head for all system and repair components. The location of the well must be greater than 10’ from a property line and 25’ from a proposed homesite. An exact square footage of suitable soils required per lot to obtain a permit cannot be given due to soil variability and topographic characteristics on each lot. The amount of suitable soils required to support a 4-bedroom residence will range between 12,000 ft2 - 15,000 ft2 (could be more or less) per lot. These soil area estimates are based upon soil application rates for a clay to a silty clay textured subsoil with a range of 0.25 gallons per day/square foot and 0.3 gallons per day/square foot for conventional type systems 0.1 to 0.13 gallons per/day/square foot for low pressure pipe septic systems. The ultimate application rate will be assigned by the Chatham County Health Department based on a detailed evaluation.

Septic system field layouts and backhoe pits were completed in early 2019 after the initial soils evaluation. The attached septic layout map indicates the approximate location of the test pits with depths to restrictive horizons or 36” plus of provisionally

suitable soils. Individual septic system layouts were completed to maximize lot yield in the best soil areas. Most of the lots will require off-site septic systems which will require installation of the supply lines prior to lot recordation. Lots 17-22 and 29 have more than 1 supply line in the same trench so these lots will fall under the off-site supply line regulations. They will have to be engineered, water tested and either both system and repair fields installed for the easements or a PE designed road (gravel) is constructed to all off-site fields.

Due to the limited areas of suitable soils for subsurface septic systems on this parcel you may want to consider maximizing the areas of suitable soils with septic system easements. This would allow you to maximize the total number of lots the parcel can support for subsurface wastewater disposal. A detailed soils evaluation and septic system field layouts may be required and should be completed before a final plan is developed along with a few field layouts to help define each septic easement configuration.

During the road construction process of a subdivision it is important not to impact any suitable soil areas with such activities as excavating or filling. Only the actual roadways and required drainage ditches and/or sediment basins should be constructed during this process. If the contractor requires a staging area to place fill from the construction process, then areas of unsuitable soils on the property should be utilized as long as they are not state/county buffers, jurisdictional wetlands or other areas protected by local zoning regulations. If this is not possible, then the disturbed areas should be minimized as much as possible. The same precautions should be taken when the individual lots are cleared for home sites. Only the vegetation should be removed in the areas of the proposed drain fields on lots to prevent any disturbance of the naturally occurring soil. A lot with adequate areas of suitable soils can be deemed unsuitable due to poor planning or site disturbance. Central Carolina Soil Consulting recommends that all lot clearing activities are delayed until a permit is issued by the local health department, with the exception of clearing thick vegetation to access the lot.

This report discusses the location of suitable soils for subsurface wastewater disposal systems and does not guarantee any permits or approval required by the local health department. Central Carolina Soil Consulting, PLLC is a professional consulting firm specializing in soil delineations and design for on-site wastewater disposal systems. The rules governing on-site wastewater disposal systems are complex and the interpretation of the rules are based upon the opinions of regulators (state and county level). Due to the subjective nature of the permitting process and the variability of naturally occurring soils, CCSC cannot guarantee that areas delineated as suitable for

on-site wastewater disposal systems will be permitted by the governing agencies. Central Carolina Soil Consulting does not guarantee that the areas shown as potentially suitable for septic systems will be granted septic permits by the local health department. These permitting considerations should be taken into account before a financial commitment is made on a tract of land.

If you have any questions regarding the findings on the attached map or in this report, please feel free contact me at anytime. Thank you allowing Central Carolina Soil Consulting to perform this site evaluation for you.

Sincerely,

Jason Hall
NC Licensed Soil Scientist #1248

Encl: Soil Map