



Central Carolina Soil Consulting, PLLC

1900 South Main Street, Suite 110

Wake Forest, NC 27587

919-569-6704

August 5, 2021

Project # 3813

Sword Development, LLC.
Attention: Donald Denihan

RE: Preliminary soil/site evaluation on approximately 125-acres north of Seaforth Road in Chatham County.

Dear Mr. Denihan:

Central Carolina Soil Consulting, PLLC conducted a Preliminary soil evaluation on the parcel listed above to determine the areas of provisionally suitable soils that are suitable for subsurface wastewater disposal systems (conventional, LPP & Low Profile Chamber). The soil/site evaluation was performed with hand auger borings and excavator test 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 provisionally suitable soils and unsuitable soils in the field through ground truthing along with gps location of borings/pits with Trimble 6000 GEO XT GPS units. Please note the site contains thick vegetation and a forestry mulcher was required to gain access for the soils mapping. Due to the thick vegetation there may be areas of unsuitable soils/topography in the areas mapped as provisionally suitable due to lack of access throughout the site.

The above referenced parcel is located north of Seaforth Road in eastern Chatham County. This area lies in the Carolina Slate Belt geologic unit. The soils that have formed on this parcel are similar to Georgeville, Herndon, Tatum and Worsham soil series. The attached soils map indicates the areas of provisionally suitable vs. unsuitable soils. The Georgeville & Herndon soil series are generally provisionally suitable for subsurface wastewater systems. That is, the morphology of the soils contains provisionally 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. The Tatum soils have expansive clays and/or field indicators of a perched water table within 24 inches which are unsuitable. The Worsham soil series are poorly drained soils which have formed in the floodplain/streams of the property. These soil types are unsuitable for subsurface septic systems. Additional unsuitable soils are due to complex topography. Please note the site contains thick vegetation.

The attached soils map indicates the areas of soils which are provisionally 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 may be inclusions of soils that can only support LPP or ultra-shallow conventional septic systems in the areas mapped as conventional. The "cross hatched" soil units on the attached map indicates areas of soils with 24-29 inches of provisionally suitable soil material. These areas have potential for LPP or ultra-shallow conventional septic systems. 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. Central Carolina Soil Consulting cannot guarantee that every square foot of area shown as potentially suitable for septic systems will be permitted by the local health department due to the variability of naturally occurring soils.

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. 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 flow rate is based on the number of bedrooms in the proposed residence (120 gal/day per bedroom). The amount of suitable soils required to support a 4-bedroom residence will range between 11,000 ft² - 14,000 ft² (could be more or less) per lot. These soil area estimates are based upon soil application rates for a 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 and 0.125 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 of each lot depending on which

jurisdiction a future lot is located. Septic system field layouts may be required before the local Health Department can issue any permits on future lots.

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.

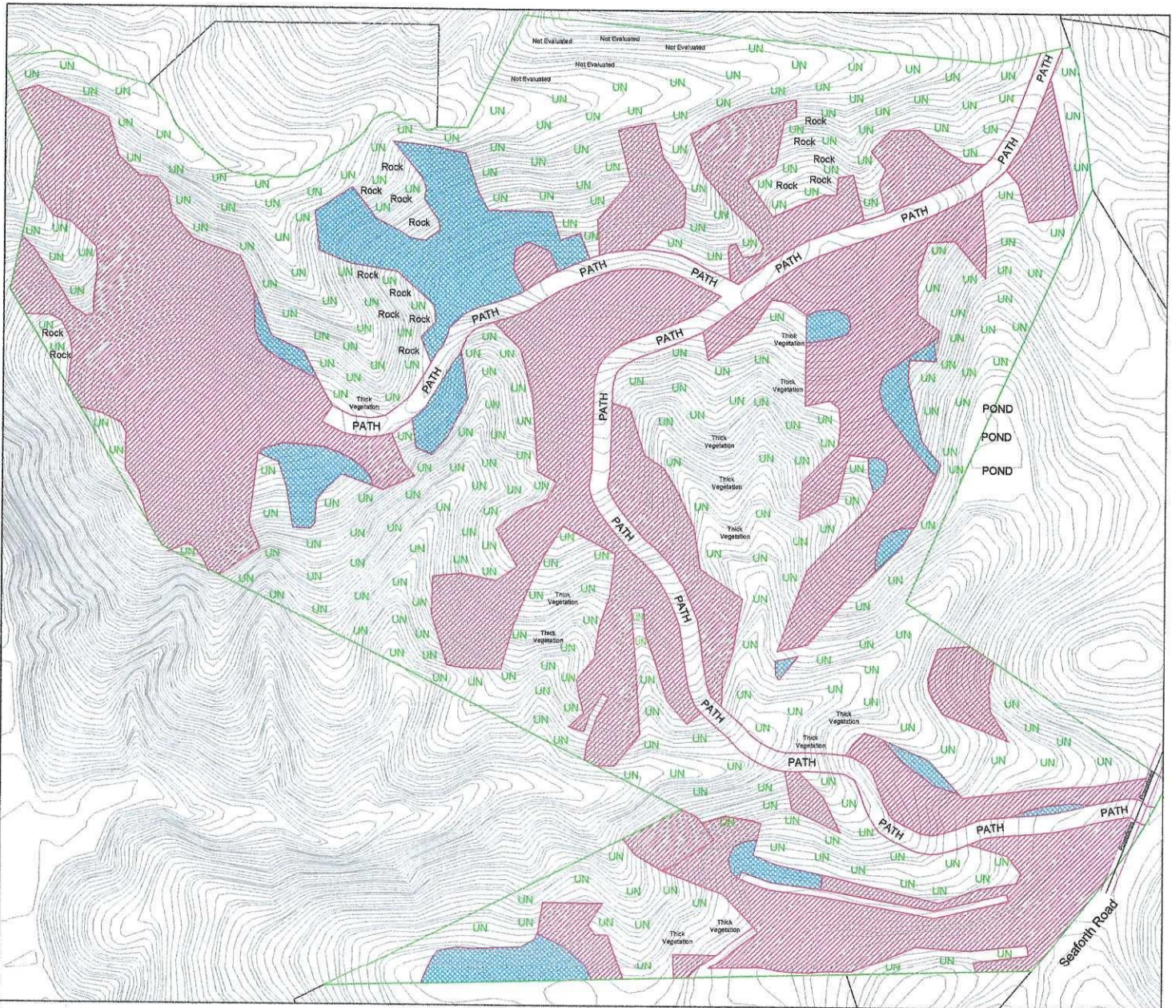
If you have any questions regarding the findings on the attached map or in this report, please feel free contact me at anytime. Thank you allowing Central Carolina Soil Consulting to perform this site evaluation for you.

Sincerely,





Jason Hall
NC Licensed Soil Scientist #1248

Encl: Soil Map



Legend

	Areas contain soils with 30 inches or more of provisionally useable material and have potential for conventional or modified conventional septic systems. There will be inclusions of soils in these areas that may only be suitable for LPP septic systems.
	Areas contain soils with 24 to 29 inches or more of provisionally useable material and have potential LPP or ultra-shallow conventional septic systems. These areas will contain small areas of soil with greater than 30 inches of suitable soil material that can be used for conventional septic systems.
ROCK	Areas with shallow rock unable to be evaluated by on hand auger. Pits will be needed in these areas.
Thick Vegetation	Areas to thick to be evaluated by CCSC.
UN	Areas unsuitable for septic.
Not Evaluated	Areas not evaluated by CCSC.

*Soil borings flagged in the field and GPS located.
 *Not a survey.
 *Septic system setbacks listed below for new lots.
 1) 10' from property lines.
 2) 50' from wells for primary systems (100' if in saprolite).
 3) 50' from wells for repair systems (100' if in saprolite).
 4) 50' from surface waters (streams, ponds, lakes).
 *Any mechanical disturbances such as grading, cutting and filling of the suitable soil areas can render areas unsuitable for future septic systems.
 *See accompanying report for additional information.
 *Base map acquired from Chatham County GIS website.
 *Due to soil variability, CCSC cannot guarantee that the areas shown as suitable will be permitted by the local Health Department.
 *The preliminary (approximate) soil lines cannot be used as legal descriptions for purposes of a land transfer or legal documentation.
 *Additional field work may be required for a septic permit (septic system field layout/design)



GRAPHIC SCALE
 1" = 200'



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Preliminary Soils Evaluation
 125.46 Acres
 Seaforth Road
 Chatham County, North Carolina

Job# : 3813
 Drawn By : JR
 Date : 08/05/2021