Erik D. Severson, Ph.D., LSS
2714 Blaydon Dr. Raleigh, NC 27606
919-623-6175 seversonsoil@gmail.com

SEVERSON SOIL CONSULTING, PLLC

Site Suitability for Domestic Sewage Treatment and Disposal Systems

Pony Farm Road
Siler City, NC
Chatham County
Parcel ID#: 14457

Prepared for: Pete Reese, ReelVest

Prepared by: Erik Severson, Severson Soil Consulting, PLLC

Report Date: 11/21/2023

SYNOPSIS

This report shows the findings of a preliminary soil and site evaluation of the referenced parcel in Chatham County, NC. The soil evaluation found that there was an area of suitable soil for a conventional primary system and anaerobic drip repair. The area of conventional soil is narrow along a hillslope. Citing of a potential drainfield must not deviate from this area as the soils and site suitability has a high lateral variability. The system type could change from a conventional to an alternative system if the area is not adhered to. This report is intended to assist the permitting authority pursuant to citing onsite wastewater systems.

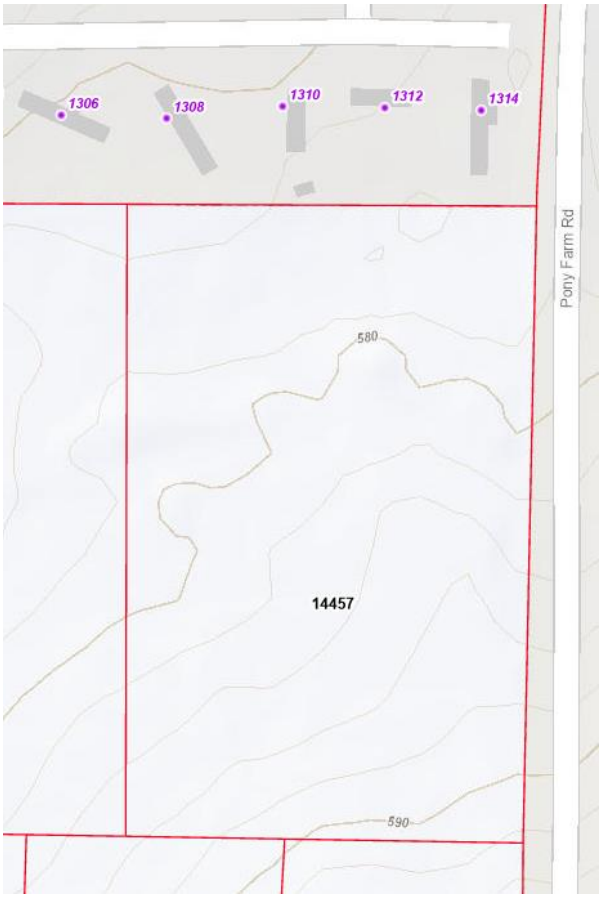


Figure 1. Property Location (Chatham County, NC GIS)

Pete, this is a summary of my findings:

Severson Soil Consulting, PLLC (SSC) conducted a preliminary onsite wastewater soil feasibility study on the above referenced parcel to determine the area of soils, suitable for a subsurface onsite wastewater disposal system. The soil and site evaluation were performed by using a hand auger boring during moist soil conditions based on the recommended criteria found in the "Laws and Rules for Sewage Treatment and Disposal Systems", 15NCAC 18A. 1900. From this evaluation, SSC sketched an area suitable for the installation of a septic system. All dimensions, locations are approximate.

Site Description

The 4-acre tract was located off Pony Farm Road in Siler City, NC (figure 1). The site lies in the Carolina Slate belt sub province. The NRCS soil map (figure 2) shows three soil units on the property: CmB (Cid), NaC (Nanford), and GeB2 (Georgeville). The Georgeville soils are generally suitable for conventional septic systems, the Nanford is marginally suitable, and the Cid soils are unsuitable. The property had a disturbed concave area that ran parallel to Pony Farm Road. This area was not evaluated. The property was heavily wooded with young pines.

Figure 2. Soil map of the of the subject property (Soil Web).

Soil Borings and Soil Pits

Over 34 soil borings and soil pits were advanced on the parcel (figure 3-7). Their depths of suitable soils categorized the borings. The brown dots were suitable soils to 20-24" (*at grade conventional with low profile chambers*). These were the Nanford and Badin soils. The yellow dots represented soils that were 18-19" to a restriction (Cid soils). The purple dots represented soils that were 13-17" to a restriction (Cid soils). The black dots represented soils that were <12"to a restrictive layer (Misenheimer soils). The primary restriction was fractured argillite rock (slate) and resultant redoximorphic features occurring because of a perched water table upon the rock. The recommended loading rate (LTAR) the brown dot soils is 0.25 gallons per day per square foot (GPD/ft2).

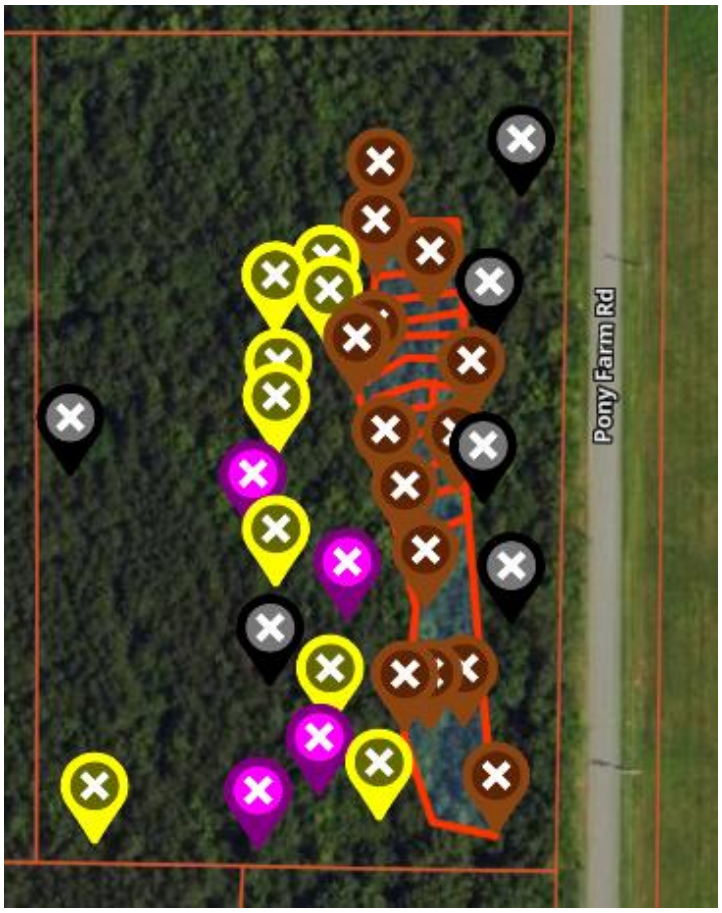


Figure 3. Soil boring locations within the lot as located by the onX Hunt application.

Figure 4. Nanford Soil Pit

Figure 5. Nanford Soil

Figure 6. Transition soil between Badin and Cid, representing the lateral boundary of suitability.

Figure 7. Cid soil with hard slate present at the bottom of the pit.

Usable Area

The upper red polygon represents the area for the primary area for a conventional low profile chamber system (at-grade). It is 0.26 acres. The bottom red polygon represents the reserve area in which the soils necessitate an anerobic drip repair. It is 0.24 acres.

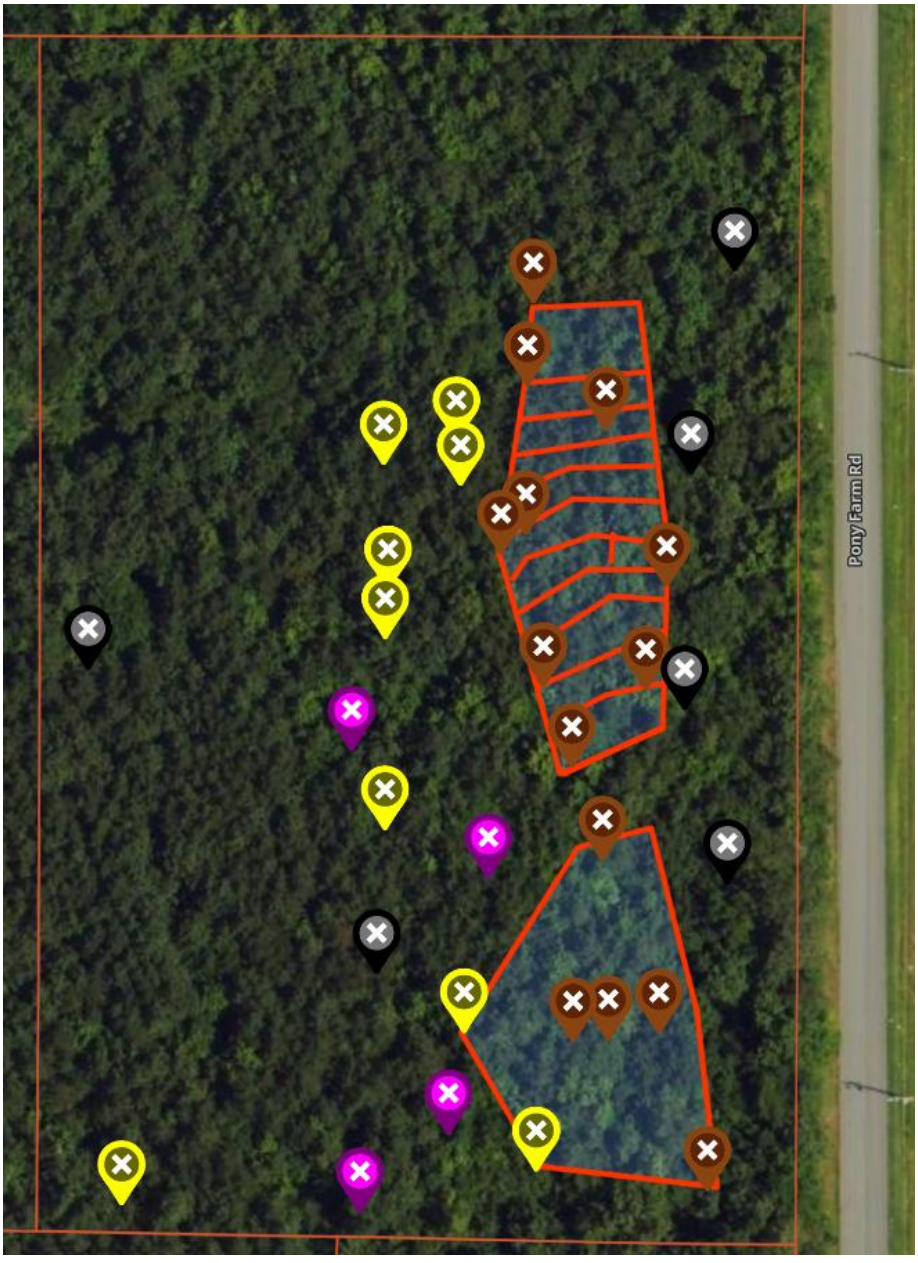


Figure 8. Primary and reserve areas.

Primary Area

There was a narrow spine of soils that were suitable for the potential installation of a conventional system utilizing at-grade low profile chambers. The width ranged from 45 to 72 feet, and it was 180 feet long. The slope of this area was 3%, thus the slope correction would be minimal to negligible.

Figure 9. Primary area.

Repair Area

This area contained soils that were both 18-19” (yellow dots) and 20-22” (brown dots) to an unsuitable soil characteristic. There is insufficient space of the 20-22” soils for a full replacement of the primary system (i.e., 640 linear feet of trench product), so this area must also include the lesser suited soils. Therefore, this area will require the use of an anaerobic drip distribution system. These types of systems require a maintenance contract with a certified subsurface operator.

The brown dots represented a continuation of the spine of 20-22” soils. However, there is not sufficient space and the soils have a high lateral variability which may preclude the use of this area for a potential conventional repair system.

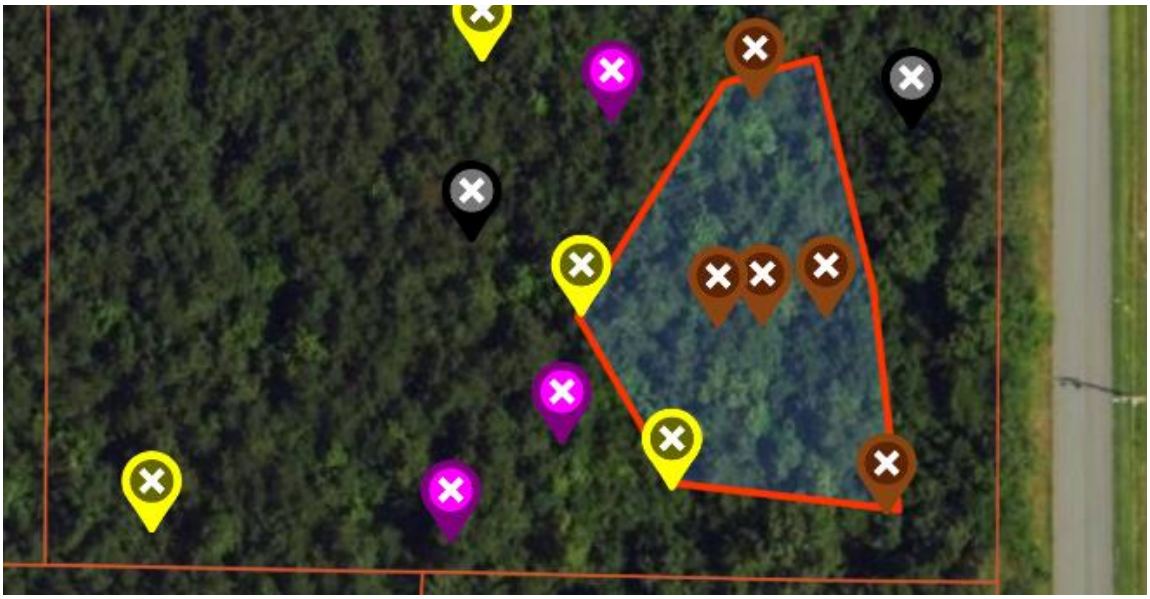


Figure 10. Reserve area.

Required Area Needed

Primary Area

The required linear footage of trench product is calculated by dividing the flow rate (4-BR= 480 gpd) by the LTAR (0.25), then dividing that by 3 feet (for a 3-foot-wide trench). The low-profile chambers do not get a linear foot reduction.

480gpd / 0.25 gpd/ft2= 1,920 ft2 / 3ft wide trench = *640 linear feet of low-profile chambers*

Assuming a potential configuration of twelve- 45-to-72-foot lines, the total approximate area required would then be 6,300 ft2 for the primary area. There is no margin for error in utilizing this conventional soil area. A septic layout will dictate precisely how much area is needed.

Deviating outside area found in figure 9 would potentially nullify its suitability for a conventional system.

Reserve Area

The reserve area will require anaerobic drip distribution. The required linear footage of drip tubing is calculated by dividing the flow rate (4-BR= 480 gpd) by the drip LTAR (0.1), then dividing that by 2 feet (2-foot- center spacing).

480gpd / 0.1 gpd/ft2= 4,800 ft2 / 2ft wide centers = *2,400 linear ft of drip tubing*

The minimum area required would be 4,800ft2, or 6,000ft2 when adding a 25% safety factor.

This type of system will require a contract with a certified subsurface operator.

Permitting

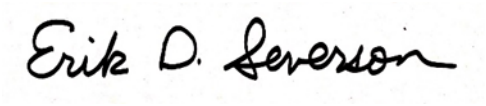
Prior to the issuance of a septic permit, the lot will require a soil and site evaluation by the Chatham County Health Department or other permitting authority. The specific trench product type and final soil loading rate will be determined by their assessment. The areas for proposed drainfields shall not be impacted by home sites, pools, garages, nor be mechanically altered from the natural lay of the land. Regulatory setbacks to property lines, roads, wells, etc. are to be maintained.

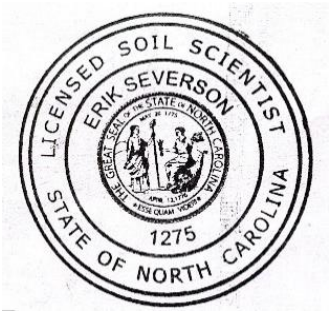
Exact locations of future drainfields, repair areas, buffer from property lines (current and future), building foundations, pools, decks, and well locations are not addressed in this report. Those items should be fully considered as the plans develop for the potential future use of the site. Depending on the position of the house location, house size, property lines and setbacks that may encroach on available usable space, this lot may require a septic system utilizing a pump and a pressure manifold.

Due to the subjective nature of the permitting process, zoning, variability of naturally occurring soil, and unforeseen circumstances, SSC cannot guarantee that areas delineated as suitable for on-site wastewater disposal systems will be permitted, as the permits are issued by the local governing agency or permitting authority. The area of suitable soil has approximately the needed space for the primary conventional system depending on the final loading rate. The primary area must not encroach outside of the suitable area. The reserve will need to be an anaerobic drip system. This report may be used to assist the local permitting agency to issue a septic permit.

Thank you for your business. Please do not hesitate to ask for more information regarding this report.

Sincerely,





Erik D. Severson, Ph. D., LSS
North Carolina Licensed Soil Scientist #1275