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SEVERSON SOIL CONSULTING, PLLC

Site Suitability for Domestic Sewage Treatment and Disposal Systems

0 Glover Land
Oxford, NC
Vance County
Parcel ID# 24250

Prepared for: Jennifer Kelly, Land Duo

Prepared by: Erik Severson, Severson Soil Consulting, PLLC

Report Date: 1/15/2023

SYNOPSIS

This report shows the findings of a preliminary soil and site evaluation of the referenced parcel in Vance County, NC. There were three separate areas found that could potentially support the installation of a conventional septic system. However, due to the lay of the land and the variability in suitable soil depths, these same areas also have the potential of being suitable for a drip distribution system. A combination of a septic design and or an evaluation of the soils via a soil pit would provide more clarity than this reconnaissance.

To: Jennifer Kelly

Re: Soil Feasibility for parcel: 0 Glover Land
Parcel ID# 24250

Jennifer, 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 and locations are approximate.

Site Description

The 39.44-acre tract was located off Barker Road in Vance County near the Granville/Vance county line (figure 1). The site lay in the Piedmont province with parent materials weathering from both igneous and metamorphic rocks. The soil map showed several soils mapping units on the subject property: WeE, Wedowee on 15 to 40 percent slopes; TaE, Tatum soils on 15 to 30 percent slopes; and the PaE, Pacolet soils on 15 to 40 percent slops, and the ApB, Appling soils on 2 to 8 percent slopes. .

The soil evaluation was limited to those areas and landscapes ideal and suitable for an onsite septic system. Steep slopes, floodplains, drainageways, narrow ridgetops, or other disturbed areas were excluded from the evaluation. The ridgetop of Appling soils were the primary area of focus. There were several old logging roads on the main ridgetop with heavy rutting that were also considered unsuitable.

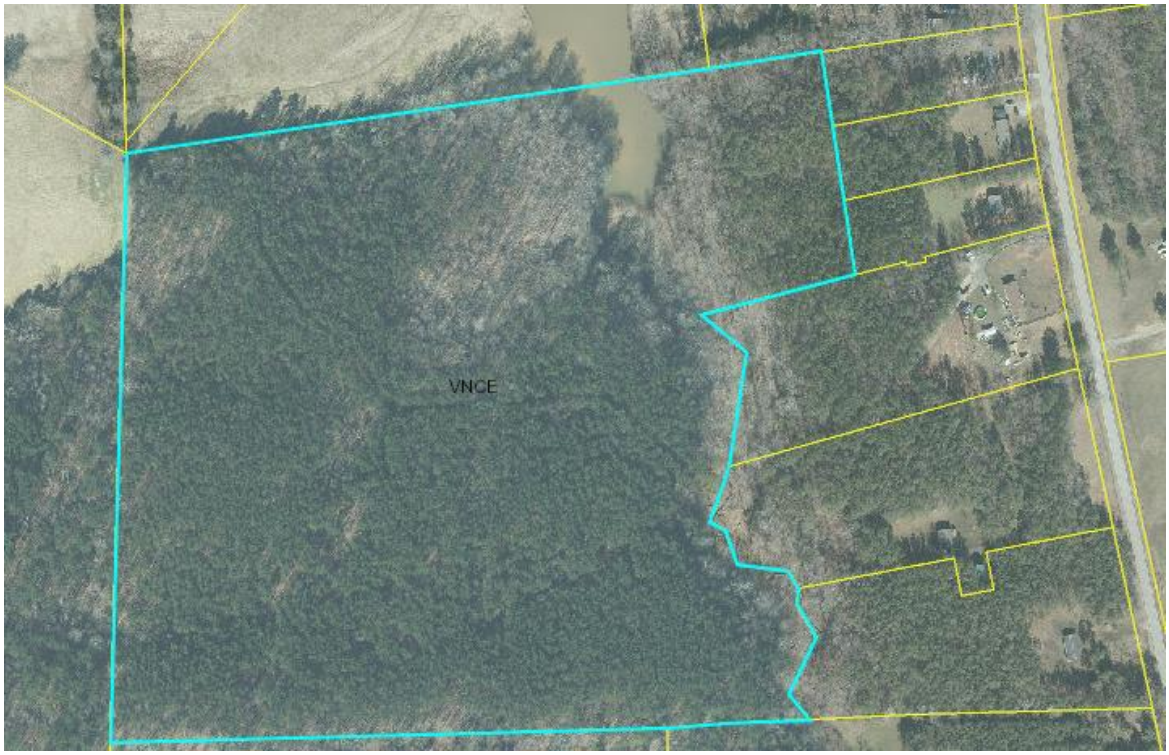

Figure 1. Property Location (Vance County, NC GIS)

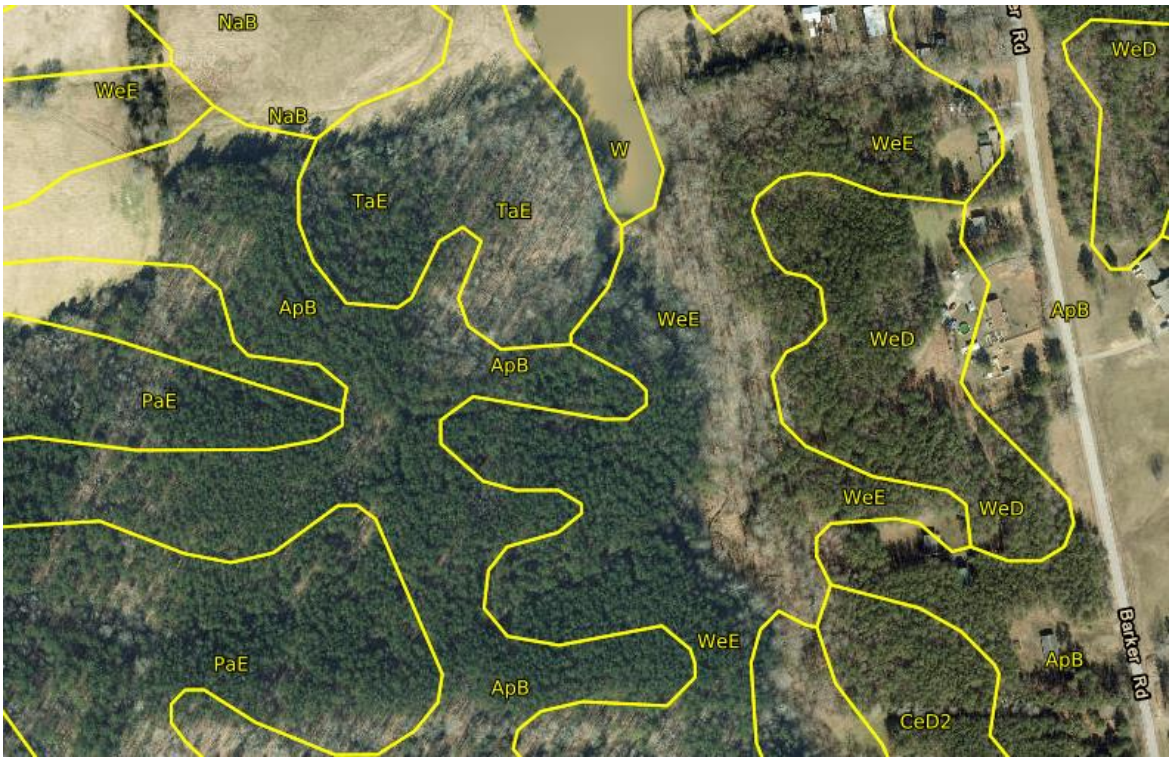

Figure 2. Soil map of the of the subject property (Soilweb).

Soil Borings

Over 51 soil borings were advanced on the parcel as seen in figure 3. Their depths to suitable soils categorized the soils. The red dots were suitable to 30"; the brown dots are suitable soils from 20–24" (shallow placed conventional); the yellow dots contain suitable soils to 18–19" (anaerobic drip); the purple dots represent soils that are suitable from 13–17" (pretreated drip system); and black dots, which represented soils that were unsuitable for any in ground septic system type.

The red dots were the Appling soils. The brown dots were an eroded Nason soils, the yellow and purple were the Helena soils, while the black dots were the Cid soils. The Helena and Cid soils contained expansive soils and shallow water table indicators. The Nason soils matrix color was yellowish brown and contained relatively unweathered parent material from depths to 20–24 inches. The recommended loading rate (LTAR) for Appling and Nason soils are 0.3 gallons per day per square foot per each separate area.

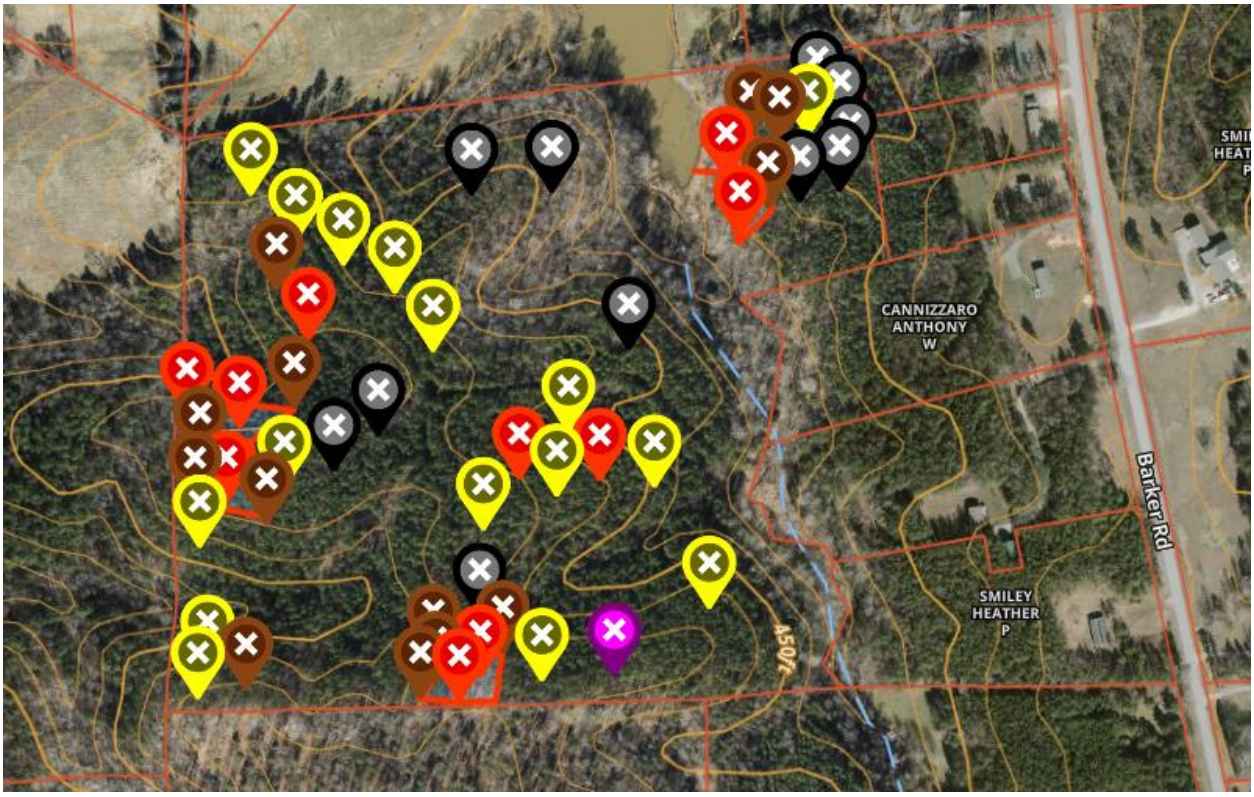

Figure 3. Soil boring locations within the lot as located by the onX Hunt application.

Usable Areas

Three separate areas were found that would support the potential installation of a conventional septic system (figures 4 and 5). All areas had soil depths that were suitable for an in ground system. The soil variability within each area was such that did not allow for a clear-cut delineation of deep versus not deep (i.e. 30" vs. 20") to allow one area to be the primary and the other to be the potential reserve area.

Additionally, all areas also had soil depths (i.e. 20 inches to a soil based limitation) that, in conjunction with slope percentages, could potentially force the system to be either an at-grade or a drip distribution system. This means the systems could potentially be either a conventional system or a drip system depending on the lay of the land and the soil depths.

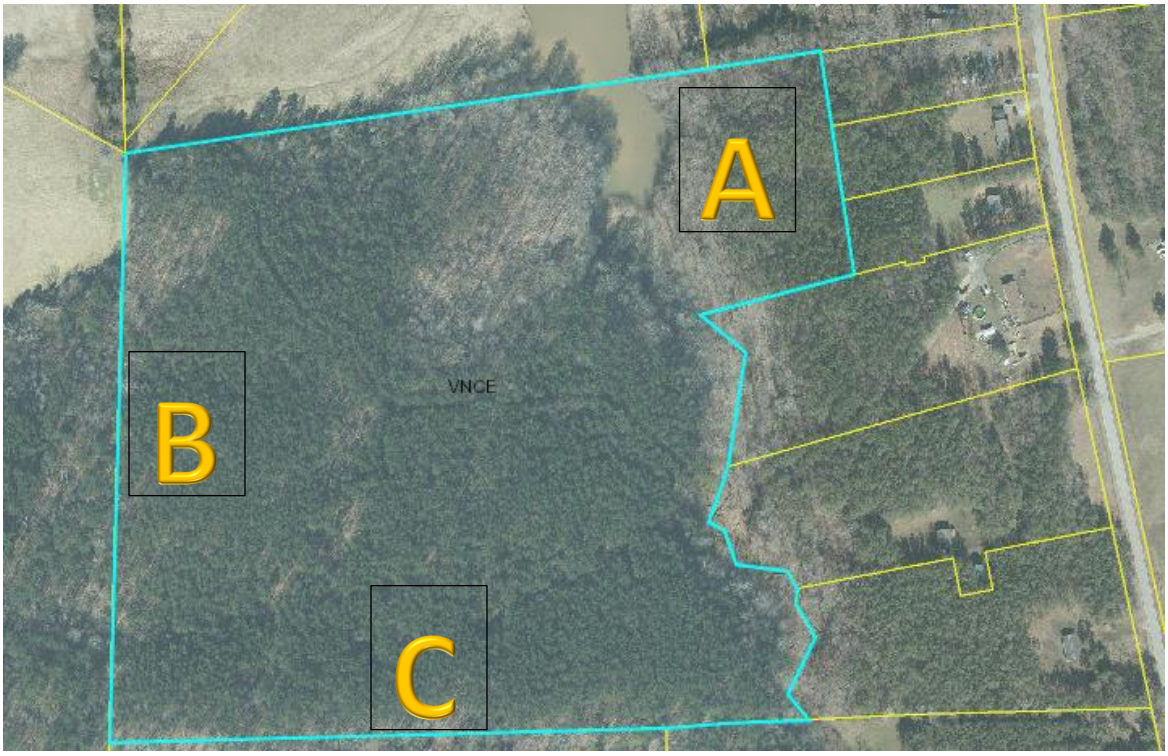

Figure 4. Approximate locations of usable areas A, B, and C.

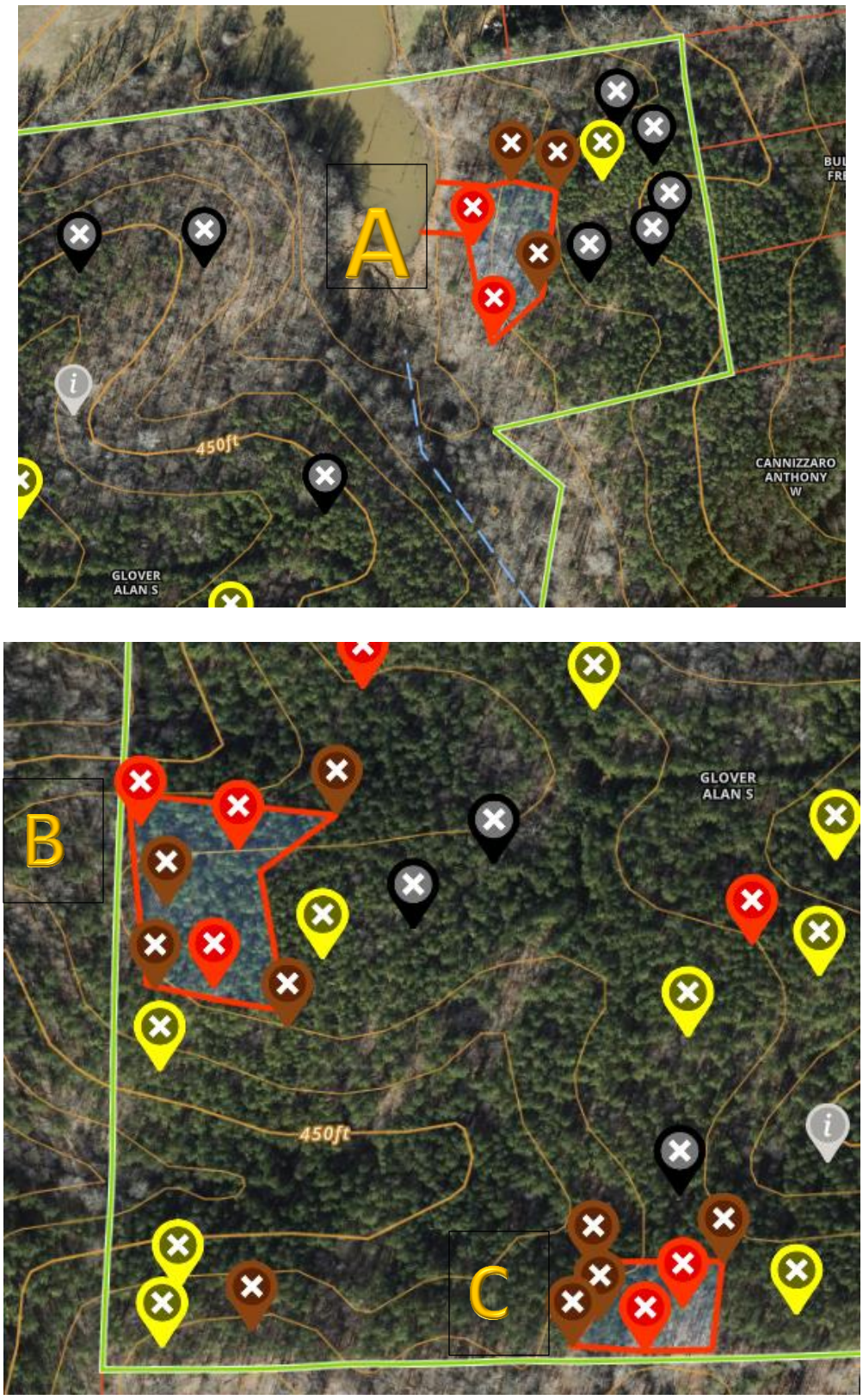

Figure 5. Approximate locations of usable areas A, B, and C.

Minimum Space Required

The minimum area needed for a primary septic system for a three-bedroom house using a 0.3 gpd/ft2 loading rate an accepted status product is 4,800 ft2. Adding 20% for unforeseen obstacles, this number becomes 5,700 ft2. The repair area would need to be 5,700 ft2. The total minimum area needed for primary and repair is 11,400 ft2. The total minimum area needed for the same scenario using low profile chambers (no reduction) would be 15,800 ft2. This number will be used in further comparisons.

Area A

An area in the upper right of the property was found to contain suitable soils that were upslope from a small pond. The better soils were sound closer to the pond. The slopes ranged from 9 to 13% on this sideslope. Figure 6 shows the area to be more than 50 feet from the top of pond elevation. The area was 0.41 acres in size (17,859 ft2). This is 1.3 times the minimum area needed.

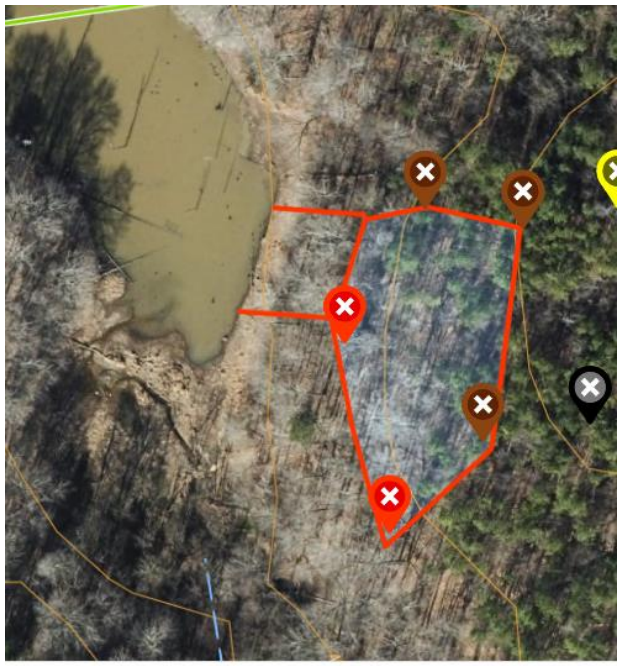

Figure 6. Area 1 approximate location.

Area B

The entirety of this area was 0.84 acres, or 36,590 ft2 (figure 7). This is 2.3 times the minimum area needed. Slope range was 7–13% on the summit/shoulder. The brown holes were 20", 22", and 24" from bottom to top. They were interspersed with the deeper, better soils.

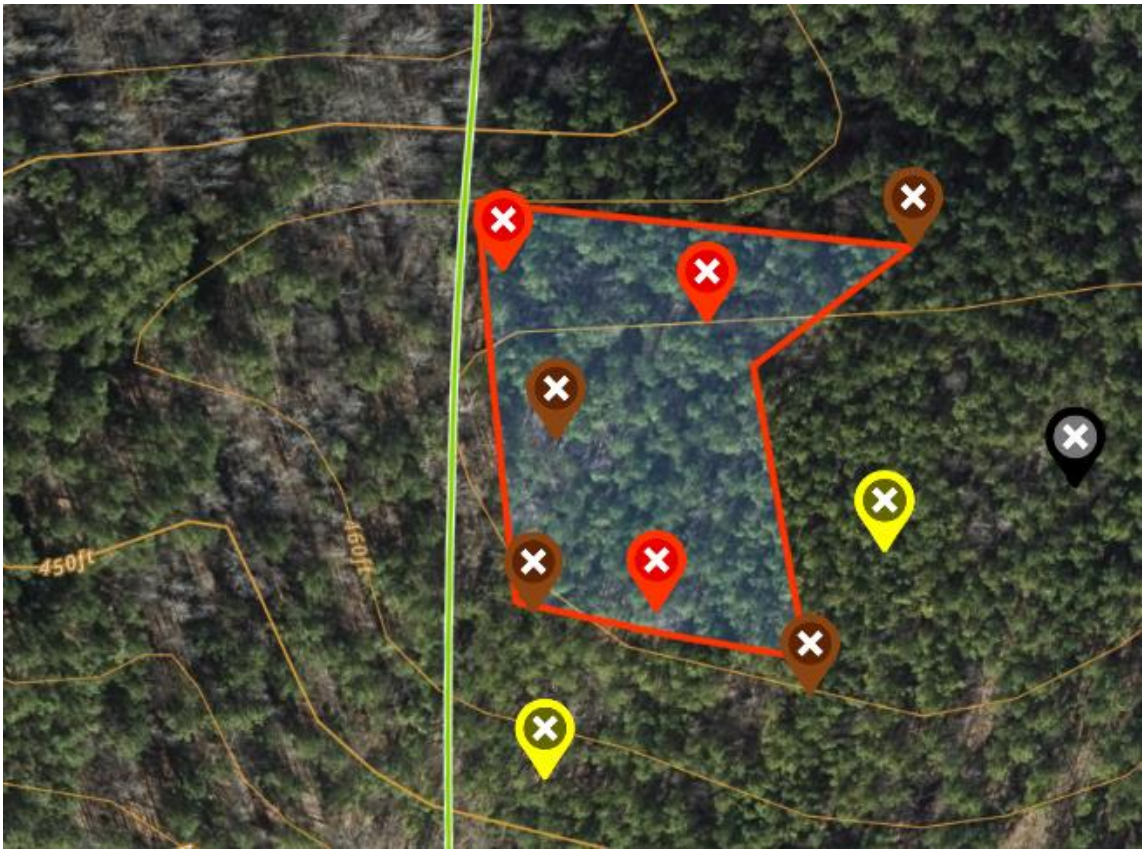

Figure 7. Usable area B on the parcel.

Area C

The entirety of this area was 0.37 acres, or 16,117 ft2 (figure 8). This is 1 times the minimum area needed. Slope ranged 6-11% on this summit. The brown holes were 24" and 28" from west to east. The better soils were on the eastern side of this area. A layout and soil pit evaluation could more clearly define a suitable area.

Figure 8. Area C.

Usable Soil Depth Discussion

The state rules governing onsite septic systems in North Carolina require that there be a minimum of 6 inches of soil cover over the entirety of each conventional drainfield line. The vertical separation distance from the bottom of the drainfield product and a limiting feature for a conventional system is 12 inches. The steeper the slope, the more total overall soil depth is required to maintain both cover and vertical standoff distance requirements. The number of inches on the upslope portion of the trench is always going to be higher than the downhill side of the trench. For example, the minimum 6 inches of cover that is maintained on the downhill side of the trench would need the six inches plus the added distance due to slope. This is calculated by multiplying the slope percentage by the trench width. For example, a three-foot wide trench with a 10% slope would equal a 3.6-inch slope (rounded up to 4 inches) correction. This would mean that there would be an additional four more inches needed to an unsuitable soil condition. There are no slope correction requirements for a drip system.

The soils would need to be evaluated by soil pit to more accurately assess the usable depths and or a septic layout would need to be performed to ensure the potential drainfields would fit within the usable areas.

Permitting

Prior to the issuance of a septic permit, the lot will require a soil and site evaluation by the Vance County Health Department. 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 and the nature of the proposed system this lot will require a septic system utilizing a pump.

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. However, the areas of suitable soil have 1-1.5 times the needed space for a conventional system and repair depending on the final loading rate. This report may be used to assist the local permitting agency and or design consultant 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

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North Carolina Licensed Soil Scientist #1275