



March 4, 2024

TO: Jon Langley
380 Masters Dr
Southport, NC 28461

C/O: Timothy Lee Smith

RE: Preliminary Soil and Site Suitability Evaluation
Wood Haven Road (Lot 405)
Southport, Brunswick County, NC.
Parcel #: 156DD037

Dear Mr. Langley,

On Thursday, February 29, 2024, Davey Resource Group (DRG) evaluated the lot at Wood Haven Road, located in Boiling Spring Lakes, Brunswick County, NC. The purpose of the evaluation was to determine the suitability of the soil resources for the possibility to place a single-family unit with an onsite wastewater system on the property. Multiple shallow auger borings were observed, and limited soil information was collected. The property corners were not marked in the field. As such, the GIS tax parcel boundary along with a hand-held GPS unit were utilized to determine the location of review during the evaluation. For this evaluation, I utilized the 15A NCAC 18E .0100 seq. laws and rules for subsurface wastewater application and the Southeast Regional Supplement to the US Army Corps of Engineers Wetland Manual as guides. The findings for this evaluation are cursory only. Per NC State regulations, soil evaluations include and must meet the following in order for a location to be deemed suitable for subsurface onsite septic systems- landscape position, soil characteristics (structure, color, and minerology), soil wetness condition (SWC), restrictive horizons, and available space. The information contain herein is our best professional judgement on whether a septic system for a single-family dwelling is feasible for this property. Accordingly, I offer the following guidance.

The lot is approximately 0.24 acres. The lot contained few trees with an open to moderate understory. The lot is indicated by the red outline shown in Figure 1 below. The lot contains a ridge along the roadside portion that gradually drops towards the back of the lot. A powerline runs along the front of the property within the lot. The approximate location of the powerline is shown as a white line in Figure 1.

Typical Septic Systems

Each septic system drain field type requires different soil characteristics and limiting soil conditions. A shallow conventional gravel system and EZ Flow polystyrene require 30" of suitable soil and depth to SWC in sandy soils. Loamy or clayey soils require 24" to the SWC for conventional systems. Low pressure pipe (LPP) requires 24" to SWC. T&J Panel Block is an alternative gravel aggregate that reduces the drain field area by 50% and requires 26" to SWC for all soil types. Fill mounds for both gravel, T&J Panels, or LPP require 12" to SWC and 18" of suitable structure. Drip irrigation requires 13" to SWC and 18" of suitable structure. Reduction systems and configurations such as T&J Panels, Chambers, EZ Flow, or Bed configurations may be considered to reduce the overall size of the drain field. These system types can reduce the amount of linear line length and field area by 25% to 50%. T&J Panel Block is the only system that can utilize the reduction in space within a fill mound.

Soil Evaluation

The soils on the site can generally be grouped into 2 types of soils: suitable soils identified by the yellow unit and unsuitable soils, identified by the no color unit (Figure 1). Suitable soils in the yellow unit were sandy soils with a 12 to 28 inch depth to soil wetness condition (SWC) indicators (typical 18" to the SWC) from the existing ground surface. This unit of soil has an estimated long-term acceptance rate (LTAR) of 0.8 gpd/ft². The irregularly shaped yellow unit is approximately 2,200 square feet in total area.

The unsuitable soils noted by no color code were found to be black or gray over light gray or brownish gray sandy soils. These soils may also be located within low depressional landscape positions. Due to low chroma soil colors (i.e. gray, dark

gray, black) of less than two chroma, these soils would be considered unsuitable for an onsite wastewater system as per rule 18E .0504. Some of these soils may be considered an unsuitable landscape position for onsite wastewater per rule .0502. These soils not noted by a color on Figure 1 are considered unsuitable for any type of onsite wastewater system and portions of this unit may also be considered 404 wetlands.

Figure 1. Preliminary Suitable Soil on Site



*Google Earth Imagery with Parlay GIS Tax parcel Boundaries and DRG site testing Overlay.

System Details

The yellow soil map unit may provide options for an onsite wastewater system and represents soils that are suitable for alternative septic systems and other innovative systems. A residential structure will have a flow rate of 120 gallons per day (gpd) per bedroom with a 3-bedroom home having a flow rate of 360 gpd, etc. In North Carolina, each new septic permit requires an initial area plus a full-sized repair area to use in the instance of system failure. However, this lot was platted in 1964 grandfathering this rule, requiring only area for an initial system. System types suitable for this lot include modified fill systems, drip irrigation, peat, or presby pipe. Due to the limiting space of suitable soils, there is not enough space for a conventional gravel fill mound system for a 3-bedroom system. A 3-bedroom T&J Panel Block in fill system with a 20 inch fill mound based on the 18 inches to SWC and 0.8 gpd/ft^2 LTAR would be sized roughly 41 feet by 45 feet square feet (1,850 square feet). A 3-bedroom anaerobic drip system would be sized roughly 900 square feet. Pretreatment for drip can be used to reduce the size to 450 square feet to save space. A peat system for a 3-bedroom house would be sized roughly 340 square feet. Depending on house location and type, a pump tank will likely be required for any of these options as the fill mound will be above ground. The drip and peat systems require a pump tank as well as a bi-yearly maintenance contract.

Figure 1 shows a T&J Panel Block in fill system outline area in purple. This system will not require a bi-yearly maintenance contract as well as no pretreatment components. Any bedroom count above 3-bedroom will be too large for any type of fill system on this lot. Possibilities for type of septic system depend on house size (square footage and bedroom count) and lot plans. It may be likely to utilize drip or peat if limited space is available. Pretreated drip or peat could be utilized for both initial and repair. Any of these options would require a detailed layout and additional sitework in order to prove absolute potential for any permit proposal.

Summary

In summary, lot 405 on Wood Haven Road was evaluated for onsite wastewater

system placement for a single-family residential unit. Any proposed or current irrigation or water supply wells would need to be placed no closer than 50 feet from any portion of a septic system or any neighboring septic system, and can be no closer than 25 feet from the house foundation. Buildings can be placed no closer than 5 feet from septic tank and field and can be located as far away as desired. The parcel can likely support a modified T&J Panel Block in fill or alternative system such as drip or peat within the yellow map unit on the front of the lot. DRG can assist with the permitting process if desired. The findings listed in this report are based upon limited ground truthing, available records, and our best professional judgement. This report does not guarantee a wastewater permit and is not an official wastewater system design proposal nor can it be utilized along with any proposal of other firms. All proposals are subject to review and approval by the appropriate local and/or state permitting agency. Additional private permitting options are available under the Engineered Option Permit, LSS Session Law Permit, and the Authorized Onsite Wastewater Evaluator Permit. These options can be discussed further at your request. If you have any questions about this report or require assistance with individual site plans for wastewater permitting, 404 wetland delineation, or Phase I site assessments, I may be reached 910-452-0001, 910-471-0505 or at nicholas.howell@davey.com .

Sincerely,



Shannon Bradley
Environmental Scientist



NC Licensed Soil Scientist #1294
Nicholas "Nick" P. Howell

