

March 26, 2026

TO: Patriot Plots LLC  
Brian Desmarais  
1700 Mountain View Drive.  
Bethlehem, PA 18015

RE: Preliminary soil and site suitability evaluation of the 4.04 ac parcel off Lesane Rd., Tar Heel, Bladen County, NC. Parcel #: 035500652799. Job #:P.ENV0007914

Dear Brian,

On Thursday March 26<sup>th</sup>, 2026, Davey Resource Group (DRG) evaluated the parcel off Lesane Rd. in Tar heel , NC. The purpose of the evaluation was to determine the suitability of the soil resources for onsite wastewater for a possible residential dwelling on the property. Multiple shallow auger borings were observed, and limited soil information was collected. The property corners were not marked in the field. Accordingly, a GIS tax parcel boundary along with a hand-held GPS was utilized to determine the location of review during the evaluation. We utilized the 15A NCAC 18E laws and rules for subsurface wastewater application and the Southeast Regional Supplement to the US Army Corps of Engineers Wetland Manual as guides. Per NC State regulations, soil evaluations include and must meet the following 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 findings for this evaluation are cursory only. This information is our best professional judgement on whether septic system(s) for residential home(s) are feasible for this property. Accordingly, I offer the following guidance.

## **Generalized Septic System Requirements**

Each septic system drain field type requires different soil characteristics and has limiting soil conditions. In sandy soils a shallow conventional gravel system, chambers, and EZ Flow polystyrene require 30 inches of suitable soil and depth to the soil wetness condition (SWC). Loamy or clayey soils require 24 inches to the SWC for conventional systems. Low pressure pipe (LPP) requires 24 inches to SWC. T&J Panel Block is an alternative gravel aggregate that reduces the drain field area by 50% and requires 26 inches to SWC for all soil types. Fill mounds for both gravel, T&J Panels, or LPP require 12 inches to SWC and 18 inches of suitable structure. Drip irrigation requires 13 inches to SWC and 18 inches of suitable structure. Additional note on drip irrigation systems: while they can be a way to maximize the suitable soil area on a lot, also they are costly to maintain, require a pump and bi-yearly maintenance contract.

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%.

A residential structure will have a flow rate of 120 gallons per day (gpd) per bedroom. For example, a 3-bedroom home will have a residential flow rate of 360 gpd. Any lot in North Carolina recorded after January 1, 1983, requires area for an initial system to be installed and repair field area to be set aside in the instance of failure of the initial. The gallons per day of a home along with the estimated long-term acceptance rate (LTARs) and depth to the soil wetness condition (SWC) of the soil are used to calculate the size and parameters of a system for the different soils identified on the lot that will be described below.

## **Description**

The tract that was evaluated is approximately 4.04 acres and shown in the red outline in Figure 1. The property contained moderate vegetation with mature hardwoods and sparse to thick understory in some places. The topography of the tract consisted of a higher region on the western property line. It appears that the existing house is encroaching on this parcel and can be seen in Figure 1. The existing residential dwelling has a septic tank behind the house, but the drain lines were not located at the time of this evaluation. The existing residential structure will need its septic system located to ensure it is not encroaching on the parcel as well. Along with Moving property lines to rectify the encroachment of the residential dwelling and all its septic components. Figure 2 shows the located septic tank as the black square and the possible location of the septic system in Orange

which will need to be verified. Figure 2 also illustrates how much of the existing residential dwelling is encroaching on this parcel. There were several wells on adjacent parcels and can be seen as the yellow pins in Figure 1.

### **Soil Evaluation**

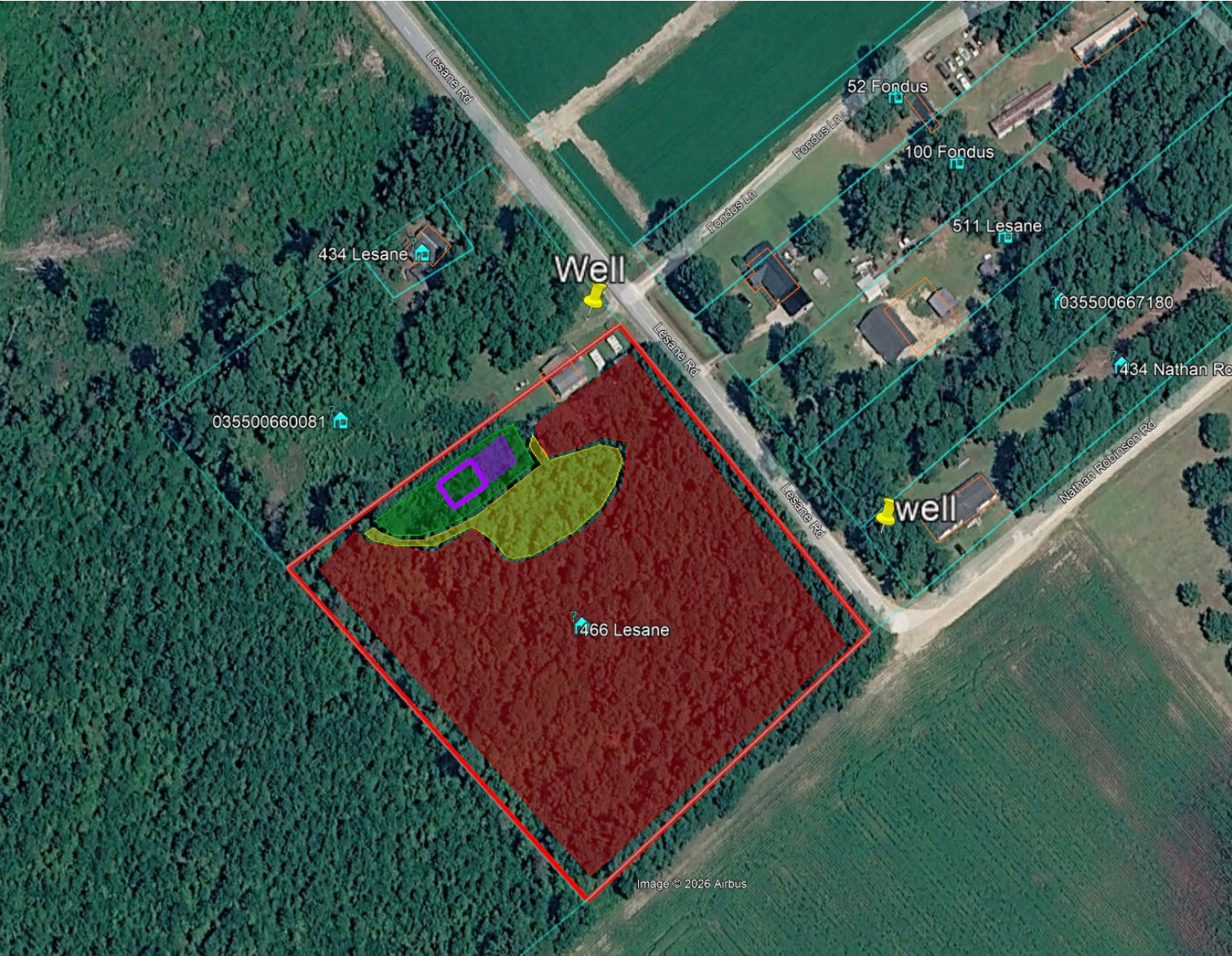
The soils identified on the site can generally be grouped into 3 types identified by the green, yellow, and red map units as seen in Figure 1. Suitable soils for any type of onsite wastewater are only within the yellow and green units. Soils in the green unit are coarse and fine loams with a 24-28 in depth to soil wetness condition (SWC) from the existing surface. This unit of soil has an estimated long-term acceptance rate (LTAR) of 0.5 gpd/ft<sup>2</sup> and 26 inches to the SWC being the most common. Soils in the yellow unit are sands with a 12-18 depth to soil wetness condition (SWC) from the existing surface. This unit of soil has an estimated long-term acceptance rate (LTAR) of 0.7 gpd/ft<sup>2</sup>. The red soil map unit would be considered unsuitable for onsite wastewater and portions of this unit may contain jurisdictional wetlands. This map unit contained soils that did not appear to meet the minimum separation to the SWC and/or were in unsuitable landscape positions. Portions of this soil were sand over coarse loams that had soil colors of 2 or less chroma and are unsuitable for any type of subsurface wastewater system design. These soils would be considered unsuitable for any onsite wastewater system as per rules .0504 and/or .0502.

### **Project Discussion**

The green soil map unit may provide a good option for an onsite wastewater system and represents soils that may be suitable for shallow T&J Panel block systems and other innovative systems. T&J Panel Block is an alternative gravel aggregate that reduces the drain field area by 50%. A shallow Horizontal T&J Panel Block system for a 4-bedroom system, designed with the most limiting LTAR for the green map unit on site (0.5 gpd/ft<sup>2</sup> LTAR) would be approximately 30ft x 40ft for 4, 40ft Panel block drain lines for a full-sized initial and the same area set aside for the repair. This area can be represented as the purple rectangle in Figure 1. Systems of this type can likely be placed anywhere within the green map unit with respect to parcel boundary setbacks and topography. However, the existing residential dwelling septic system must be located to ensure it does not interfere with this plan and to ensure all setbacks from any property line changes can be maintained. Our office can assist with permitting if desired, however, no guarantees can be made without a more detailed site investigation.

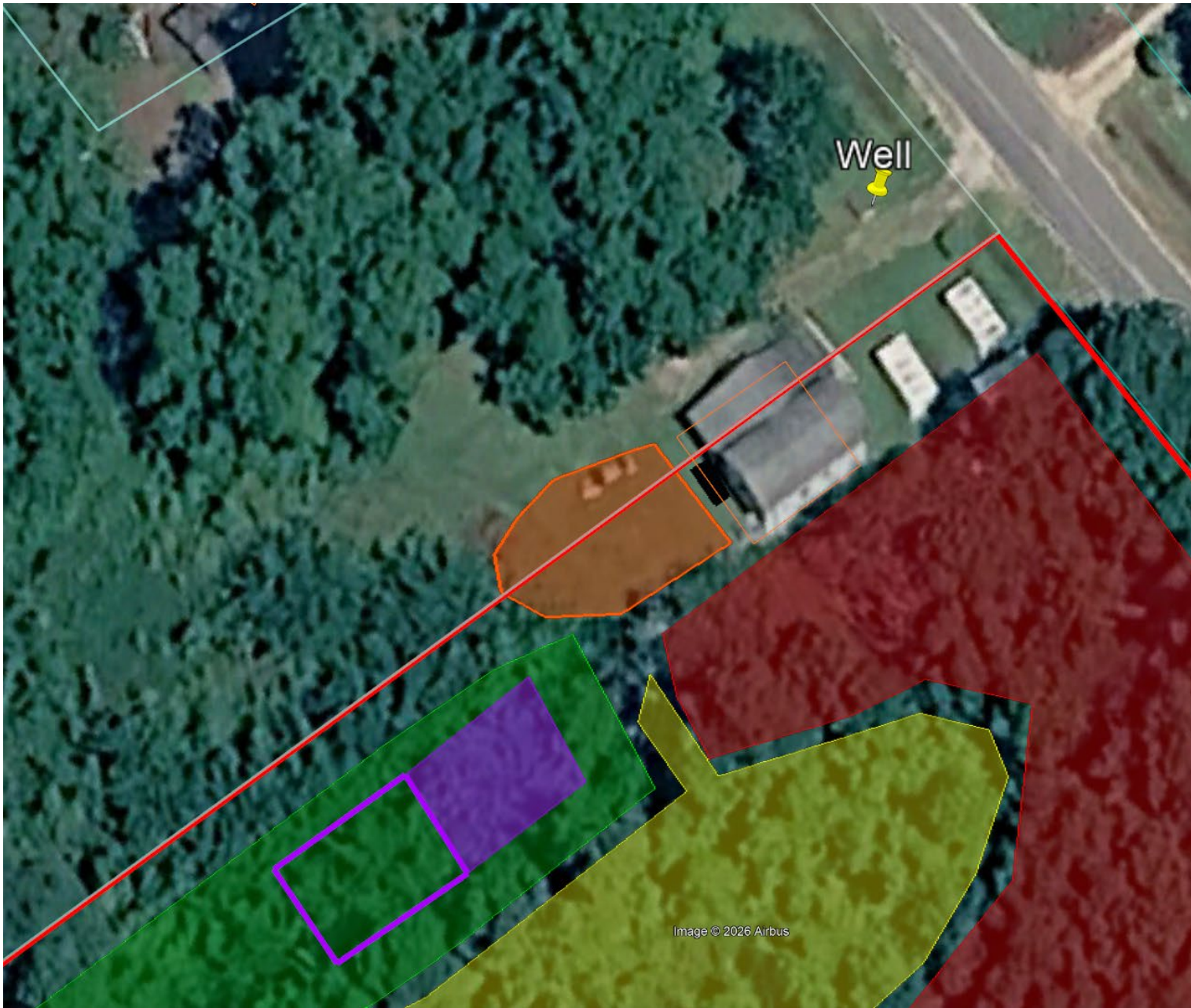
The soil in the yellow map unit may provide potential options for an onsite wastewater system and may be suitable for Drip Irrigation and will require a special site evaluation. Drip is expensive to design, install, and maintain.

Figure 1: Property boundary, soil map units, and potential general septic system footprint



Source: Google Earth Imagery with DRG Overlay

Figure 2: Property boundary, soil map units, and potential general septic system footprint



Source: Google Earth Imagery with DRG Overlay

## Summary

In summary the parcel off Lesane Rd. in Tar heel was evaluated for the placement of an onsite wastewater system for a 4-bedroom residential dwelling. It is possible that the property will be able to support a system within the green mapping unit if all setbacks to any new property lines can be met and that the existing residential dwellings septic does not impose on this area. Any proposed or existing well must maintain 50 feet from any septic systems and components and 25 feet from any house foundation. 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 as all areas are subject to review and approval by the appropriate local and/or state permitting agency. Please be advised that editing a document sealed by a licensed soil scientist is illegal and may result in legal action. Any unauthorized modification, alteration, or revision of a sealed document is strictly prohibited per NC Code Chapter 89F-19 (a). If you have any questions about this report or need any additional information, I may be reached at 910-452-0001, 910-471-0505, or at [nicholas.howell@davey.com](mailto:nicholas.howell@davey.com) .

Sincerely,

Mason Freeman  
Environmental Scientist

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

