



Soil Suitability for Domestic Sewage Treatment and Disposal Systems

1533 Holden Rd,
Youngsville, NC 27596
Franklin County PIN: 005607

Prepared For:	Yuling Lan or Changxin Zhu, Client
Prepared By:	Jeff Vaughan, Ph.D., L.S.S. Senior Agronomist/Soil Scientist Jordan Harris, Assistant Soil Scientist
Report Date:	May 29, 2026



Agri-Waste Technology, Inc.
1225 Crescent Green, Suite 250, Cary NC 27518
agriwaste.com | 919.859.0669

**Soil Suitability for Domestic Sewage Treatment and Disposal Systems
1533 Holden Road, Youngsville, NC (Franklin County, Parcel ID 046897)**

PREPARED FOR: Yuling Lan or Changxin Zhu, Buyer

PREPARED BY: Jeff Vaughan
Jordan Harris

DATE: May 29, 2026

Soil suitability for domestic sewage treatment and disposal systems was evaluated on May 20, 2026, for the property (Parcel ID 005607) located at 1533 Holden Road near Youngsville, NC. Jordan Harris of Agri-Waste Technology, Inc. (AWT) conducted the soil evaluation. The detailed soil evaluation of the land area will follow. A property reference map is in Attachment 1. A review of the soil and landscape characteristics that dictate soil suitability for domestic sewage treatment and disposal systems can be found in Attachment 2.

The total property area is approximately 2 acres. The property is partially wooded, has a pond, and a house with an associated well and septic system. There are several drainage features with moderate slopes on the property (Attachment 3). Only one area on the property was evaluated as identified by the buyer.

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The aerial map in Attachment 3 details the approximate property boundaries, soil boring locations, soil types, and soil areas for septic systems. Approximately 6 soil borings were advanced within the suitable soils areas on the property (Attachment 3). A portion of the property contained drainage features, complex topography, and/or unsuitable soils and, thus, are unsuitable for septic systems. However, this evaluation was merely a preliminary review to determine what potential this land might have for domestic sewage treatment and disposal systems. Therefore, specific types of septic systems, exact locations of future drainfields and repair areas, plus buffers from property lines (current and potential future lot lines), building foundations, wells, etc. are not fully considered. These things will need to be more fully considered as the plans develop for the potential future of this site. It is possible that additional soil evaluations will be required once lot layouts are considered and developed for this property so that septic system types and the location of a septic drainfield can be more fully and appropriately considered.

One area (see map in Attachment 3) was identified with soil characteristics and soil depths (36" or greater) that is suitable for conventional trench septic systems. The area is approximately 31,385ft².

Typical profile descriptions of the suitable soil for this property are in Attachment 4. A distinct soil profile was observed in the soil borings on the property: a deep red clay subsoil.

The suitable soil borings had the following characteristics. No restrictive horizons were found in any soil borings within 36" of the soil surface. Soil texture was suitable and was estimated to be sandy loam near the soil surface (A horizons) and clay loam to clay in the subsoil (B horizons). Soil structure was suitable and was estimated to be granular near the soil surface (A horizons) and subangular blocky in the subsoil (B horizons). Clay mineralogy was suitable with very friable to firm moist soil consistence and non-sticky to sticky and non-plastic to plastic wet soil consistence. Indications of saprolite were detected in some soil borings, but were not dominant in profiles.

The major soil types on this property are Appling loamy sand (map symbol ApB) and Cecil sandy loam (map symbols CaC). The Franklin County Soil Survey indicates that moderate limitations exist for septic systems installed in these soils types (Attachment 5).

The land area required for a conventional or shallow conventional septic system is calculated based on the size of the proposed home and the Long-Term Acceptance Rate (LTAR) of the soil. The LTAR range for the suitable soils on this property is 0.1 – 0.4 GPD/ft² based on the most restrictive soil texture in the subsoil. The LTAR suggested by AWT for a majority of the suitable soil is 0.3GPD/ft², but the final LTAR for specific septic system types and septic drainfield locations will be set by the Franklin County Health Department. The detailed computations are in Attachment 6.

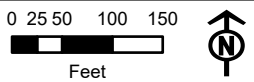
Conclusions

Based on the results of this evaluation, the installation of conventional septic systems seems very probable on this property in the areas designated on the map in Attachment 2.

We appreciate the opportunity to assist you in this matter. Please contact us with any questions, concerns, or comments.

ATTACHMENT 1: Property Reference Map

Franklin County NC



Franklin County cadastral data is prepared for the inventory of real property found within this jurisdiction and is compiled from recorded deeds, land surveys, and other public records and data. Users of this data are hereby notified that the aforementioned public primary information sources should be consulted for verification of the legal responsibility for the information contained in the data or any inappropriate use thereof. Non-cadastral data made available on this site is compiled for the use of Franklin County personnel for various purposes. The data is placed here for informational purposes only. Franklin County assumes no legal responsibility for the information contained in the data or any inappropriate use thereof.

- Web View Parcels
 - Address Points
 - Streets
 - County Boundary
- Orthos2025**
- RGB
- Red: Band_1
 - Green: Band_2

**ATTACHMENT 2: Property Map Detailing Soil Suitability
for Septic Systems and Soil Types**



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agriwaste.com | 919.859.0669

Overlay

Yuling Lan
Franklin Co., NC
PIN: 005607

GIS Acres: ~2

Area for Septic:

~31,385 sq. ft.

Soil Types:

ApB-Appling loamy sand
CaC-Cecil sandy loam

Notes:

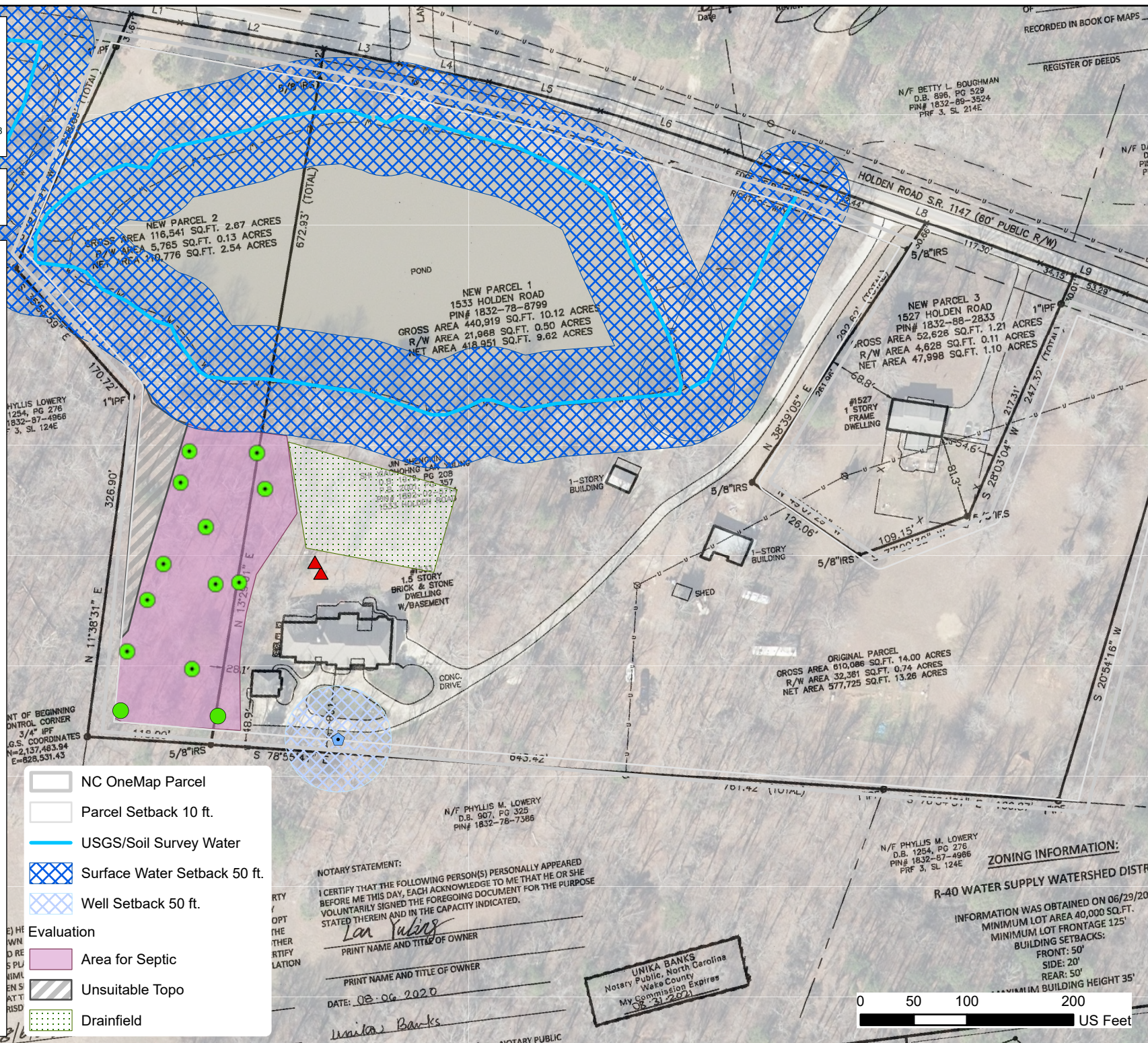
In Neuse Riparian Buffer
No mapped NWI wetlands

Drawn by: Clara Frickmann
Reviewed by: Jordan Harris
Date: 5/27/2026

- NC OneMap Parcel
- Parcel Setback 10 ft.
- USGS/Soil Survey Water
- Surface Water Setback 50 ft.
- Well Setback 50 ft.

Evaluation

- Area for Septic
- Unsuitable Topo
- Drainfield



**ATTACHMENT 3: Typical Profile Descriptions of
Provisionally Suitable Soil**

Property ID#: 046897
Property Recorded: yes
County: Franklin

**SOIL/SITE EVALUATION
FOR
ON-SITE WASTEWATER SYSTEM**

Applicant: Yuling Lan
Address: 45 Clearview Heights
King City ON L7B1H5 Canada

Buyer: X Agent: Phone: (919)746-1205
Date Evaluated: 5/20/2026
Proposed Facility: Residential
Property Size: Approximately 2 acres

Location Site: 1533 Holden Road, Youngsville, NC

Water Supply: On Site Well X Comm. Well Public Other

Evaluation Method: Auger Boring X Pit Cut

TYPICAL PROFILE

Horizon/ Depth (IN)	Matrix	Mottles	Mottle Abundance / Contrast	.0503 Texture	.0503 Structure	.0503 Minerology	.0504 Consistence Wet	Consistence Moist
A 0-8"	10YR 4/4	None	None	SL	GR	NEXP	NS, NP	Vfr
Bt1 8-14"	5YR 5/8	None	None	CL-C	SBK	SEXP	SS, SP	Fr
Bt2 14-36"	10R 4/8	None	None	C	SBK	SEXP	SS-S, SP-P	Fr-Fi

.0503 Landscape Pos/Slope %	- Suitable, <15%	Profile LTAR	- 0.3 GPD/ft ²
.0504 Wetness Condition	- Suitable	System Type	- Suitable for conventional systems due to texture, structure, and depth.
.0506 Saprolite	- Suitable		
.0507 Restrictive Horizon	- Suitable		
.0509 Profile Classification	- Suitable		

Comments: _____

EVALUATED BY: Jordan Harris

COMMENTS: _____

LEGEND OF ABBREVIATIONS FOR SITE EVALUATION FORM

<u>LANDSCAPE POSITION</u>	<u>TEXTURE GROUP</u>	<u>TEXTURE CLASS</u>	<u>.1955 LTAR</u> (gal/day/sqft)
CC - Concave Slope CV - Convex Slope DS - Debris Slump D - Depression DW - Drainage Way FP - Flood Plain FS - Foot Slope H - Head Slope I - Interflueve L - Linear Slope N - Nose Slope P - Pocosin R - Ridge S - Shoulder T - Terrace	I	S - Sand LS - Loamy Sand	1.2 - .08
	II	SL - Sandy Loam L - Loam	0.8 - 0.6
	III	SCL - Sandy Clay Loam CL - Clay Loam SiL - Silt Loam Si - Silt SiCL - Silt Clay Loam	0.6 - 0.3
	IV	SC - Sandy Clay C - Clay SiC - Silty Clay O - Organic	0.4 - 0.1
<u>STRUCTURE</u>	<u>MOIST CONSISTENCE</u>	<u>MOTTLES</u>	<u>WET CONSISTENCE</u>
G - Single Grain M - Massive CR - Crumb GR - Granular SBK - Subgranular Blocky ABK - Angular Blocky PL - Platy PR - Prismatic	Vfr - Very Friable Fr - Friable Fi - Firm Vfi - Very Firm Efi - Extremely Firm	1 - Few 2 - Common 3 - Many F - Faint D - Distinct P - Prominent f - Fine m - Medium c - Coarse	NS - Non Sticky SS - Slightly Sticky S - Sticky VS - Very Sticky NP - Non Plastic SP - Slightly Plastic P - Plastic VP - Very Plastic

ATTACHMENT 4: Soil Survey Information

Table 11.—Sanitary Facilities

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "fair," and other terms. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
AaA----- Altavista	Severe: wetness.	Severe: wetness.	Severe: wetness, too acid.	Severe: wetness.	Poor: too acid.
ApB----- Appling	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight-----	Fair: too clayey, hard to pack.
CaB----- Cecil	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight-----	Fair: too clayey, hard to pack.
CaC----- Cecil	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, hard to pack, slope.
CeB2----- Cecil	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight-----	Fair: too clayey, hard to pack.
ChA*: Chewacla-----	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: hard to pack, wetness.
Wehadkee-----	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness, thin layer.
DuA----- Duplin	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: too clayey, hard to pack, wetness.
GeB----- Georgeville	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight-----	Fair: too clayey, hard to pack.
GeC, GgC----- Georgeville	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, hard to pack, slope.
GhB, GkB2----- Georgeville	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight-----	Fair: too clayey, hard to pack.
GmD*: Georgeville-----	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, hard to pack, slope.

See footnote at end of table.

**ATTACHMENT 5: Septic System Area Computation
Spreadsheets**

Conventional Septic System Area ComputationCreated by: JH
Created on: 5/27/2025

Client Name: *Lan*
Number Bedrooms: **3**
Design Flow (gal/day): 360 (120 gal/day/bedroom, minimum 240 gal/day/dwelling)
LTAR (gal/day/ft²) 0.3
Trench Bottom Area (ft²): 1200 (Design flow/LTAR)
Trench Width (ft): 3
On-center distance between trenches (ft): 9
Trench Bottom Length (ft): 400 (Conventional - Pipe & Gravel)

Minimum Field Area Required (ft²): 3600 (Trench Bottom Length*Trench on-center distance)
Minimum Field Area Required (Innovative) (ft²): 2700 (25% reduction)
Minimum Field Area Required (Panel Block) (ft²) 1800 (50% reduction)
Total Field Area Required (ft²)⁽¹⁾: 9000 (Minimum field area*2.5)
Total Field Area Required (Innovative) (ft²)⁽¹⁾: 6750 (25% reduction from above)
Total Field Area Required (Panel Block) (ft²)⁽¹⁾: 4500 (50% reduction)
Total Field Area Required (ft²)⁽¹⁾: 10800 (Minimum field area*3)
Total Field Area Required (Innovative) (ft²)⁽¹⁾: 8100 (25% reduction from above)
Total Field Area Required (Panel Block) (ft²)⁽¹⁾: 5400 (50% reduction)

(1) Provides for reserve area and soil irregularity, 2.5 to 3 is multiplier.

Client Name: *Lan*
Number Bedrooms: **4**
Design Flow (gal/day): 480 (120 gal/day/bedroom, minimum 240 gal/day/dwelling)
LTAR (gal/day/ft²) 0.3
Trench Bottom Area (ft²): 1600 (Design flow/LTAR)
Trench Width (ft): 3
On-center distance between trenches (ft): 9
Trench Bottom Length (ft): 533.3333 (Conventional - Pipe & Gravel)

Minimum Field Area Required (ft²): 4800 (Trench Bottom Length*Trench on-center distance)
Minimum Field Area Required (Innovative) (ft²): 3600 (25% reduction from above)
Minimum Field Area Required (Panel Block) (ft²) 2400 (50% reduction)
Total Field Area Required (ft²)⁽¹⁾: 12000 (Minimum field area*2.5)
Total Field Area Required (Innovative) (ft²)⁽¹⁾: 9000 (25% reduction from above)
Total Field Area Required (Panel Block) (ft²)⁽¹⁾: 6000 (50% reduction)
Total Field Area Required (ft²)⁽¹⁾: 14400 (Minimum field area*3)
Total Field Area Required (Innovative) (ft²)⁽¹⁾: 10800 (25% reduction from above)
Total Field Area Required (Panel Block) (ft²)⁽¹⁾: 7200 (50% reduction)

(1) Provides for reserve area and soil irregularity, 2.5 to 3 is multiplier.

Client Name: *Lan*
Number Bedrooms: **5**
Design Flow (gal/day): 600 (120 gal/day/bedroom, minimum 240 gal/day/dwelling)
LTAR (gal/day/ft²) 0.3
Trench Bottom Area (ft²): 2000 (Design flow/LTAR)
Trench Width (ft): 3
On-center distance between trenches (ft): 9
Trench Bottom Length (ft): 666.6667 (Conventional - Pipe & Gravel)

Minimum Field Area Required (ft²): 6000 (Trench Bottom Length*Trench on-center distance)
Minimum Field Area Required (Innovative) (ft²): 4500 (25% reduction from above)
Minimum Field Area Required (Panel Block) (ft²) 3000 (50% reduction)
Total Field Area Required (ft²)⁽¹⁾: 15000 (Minimum field area*2.5)
Total Field Area Required (Innovative) (ft²)⁽¹⁾: 11250 (25% reduction from above)
Total Field Area Required (Panel Block) (ft²)⁽¹⁾: 7500 (50% reduction)
Total Field Area Required (ft²)⁽¹⁾: 18000 (Minimum field area*3)
Total Field Area Required (Innovative) (ft²)⁽¹⁾: 13500 (25% reduction from above)
Total Field Area Required (Panel Block) (ft²)⁽¹⁾: 9000 (50% reduction)

(1) Provides for reserve area and soil irregularity, 2.5 to 3 is multiplier.