



Soil Suitability for Domestic Sewage Treatment and Disposal Systems

1712 Avent Ferry Rd.
Holly Springs, NC 27540
Wake County PIN: 0648156062

Prepared For:	Mark Scarnecchia, Client
Prepared By:	Jeff Vaughan, Ph.D., L.S.S. Senior Agronomist/Soil Scientist Brent Purdum, Assistant Soil Scientist
Report Date:	April 13, 2023

Soil Suitability for Domestic Sewage Treatment and Disposal Systems
1712 Avent Ferry Rd. Holly Springs, NC 27540

PREPARED FOR: Mark Scarnecchia, Client

PREPARED BY: Jeff Vaughan
Brent Purdum

DATE: April 13, 2023

Soil suitability for domestic sewage treatment and disposal systems was evaluated on April 13, 2023, for property located at 1712 Avent Ferry Rd. Brent Purdum, of Agri-Waste Technology, Inc. (AWT) conducted the soil evaluation. A detailed soil evaluation of the land area will follow. Property reference maps are 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.

Approximately 2.2 acres of the property were evaluated. The property has a home site on the front portion of the property, a shelter, well, and wooded area. The well is located behind the home. According to the current owner, the septic system is located in the front yard on the left side of the house (Attachment 1). The drainfield was not located during the soil evaluation.

Soil Suitability for Domestic Sewage Treatment and Disposal Systems

The aerial map in Attachment 1 details the approximate property boundaries, soil boring locations, soil types, and soil areas for septic systems. Numerous soil borings were advanced on the property (Attachment 1). 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 1) evaluated on the property exhibited soil characteristics and soil depths (18" or greater) that are provisionally suitable for drip septic systems.

Typical profile descriptions of the provisionally suitable soil for this property are in Attachment 4. One distinct soil profile was observed in the soil borings on the property: a reddish yellow subsoil with parent material.

The provisionally suitable soil borings had the following characteristics. No restrictive horizons were found in any provisionally soil borings within 19" of the soil surface. Soil texture was provisionally suitable and was estimated to be sandy loam near the soil surface (A horizons) and a sandy clay loam to a clay in the subsoil (B horizons). Soil structure was provisionally suitable and was estimated to be granular near the soil surface (A horizons) and subangular blocky in the subsoil (B horizons). Clay mineralogy was provisionally suitable with friable to firm moist soil consistence and non-sticky to sticky and non-plastic to plastic wet soil consistence.

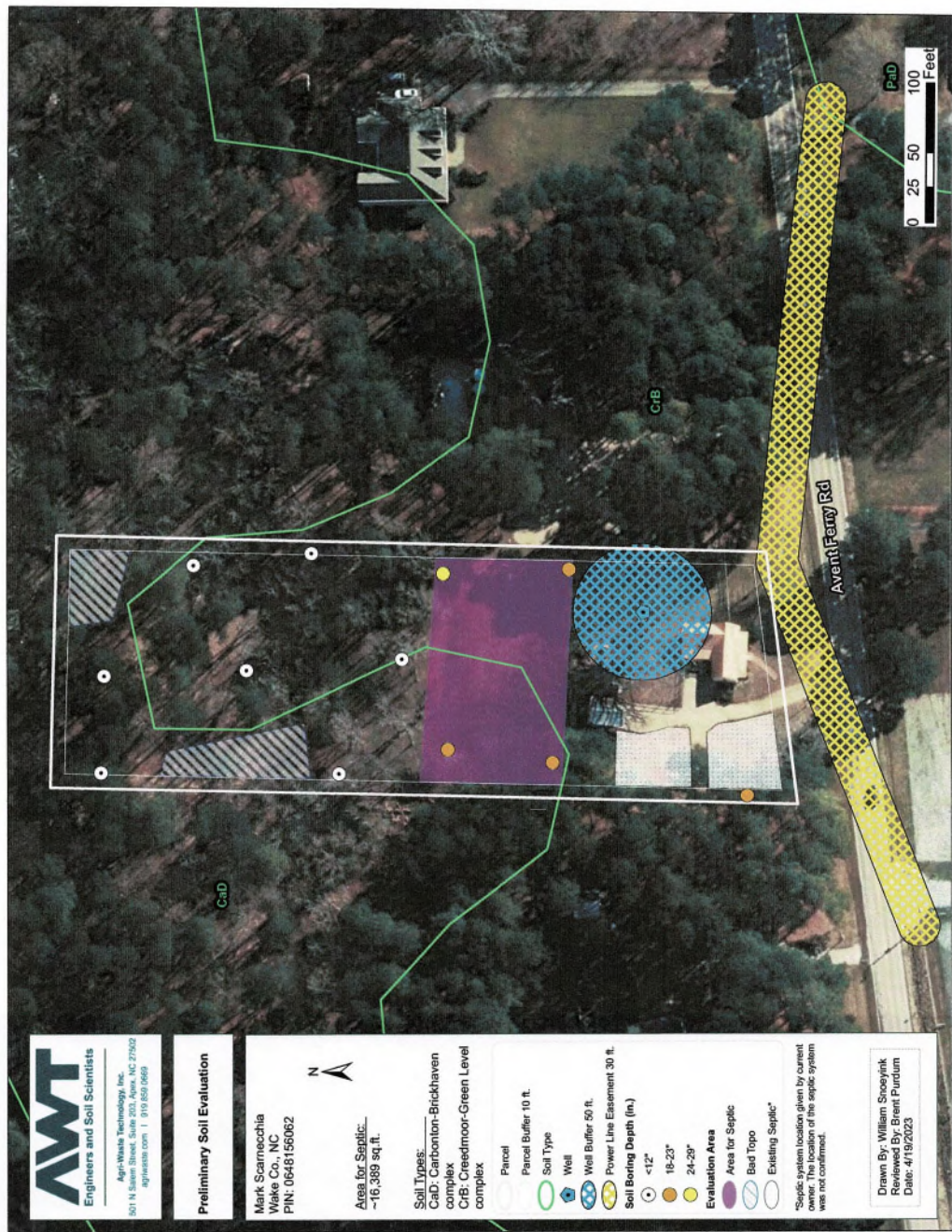
The predominantly mapped soil type on this property is Creedmoor sandy loam. The Wake County Soil Survey indicates that severe limitations exist for septic systems installed in these soil types (Attachment 4).

The land area required for a drip 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 provisionally suitable soils on this property is 0.05 – 0.15 GPD/ft² for drip septic systems based on the most restrictive soil texture in the subsoil. The LTAR suggested by AWT is 0.1 GPD/ft², but the final LTAR for specific septic system types and septic drainfield locations will be set by the Wake County Department of Environmental Services and possibly will be based on saturated hydraulic conductivity tests. The detailed computations are in Attachment 6.

Conclusions

Based on the results of this evaluation, the installation of a conventional system does not seem probable on this property. However, drip systems are a probable option for this property. The proposed soils area is designated on the map in Attachment 1.

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





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Preliminary Soil Evaluation

Mark Scarnecchia
Wake Co., NC
PIN: 0648156062

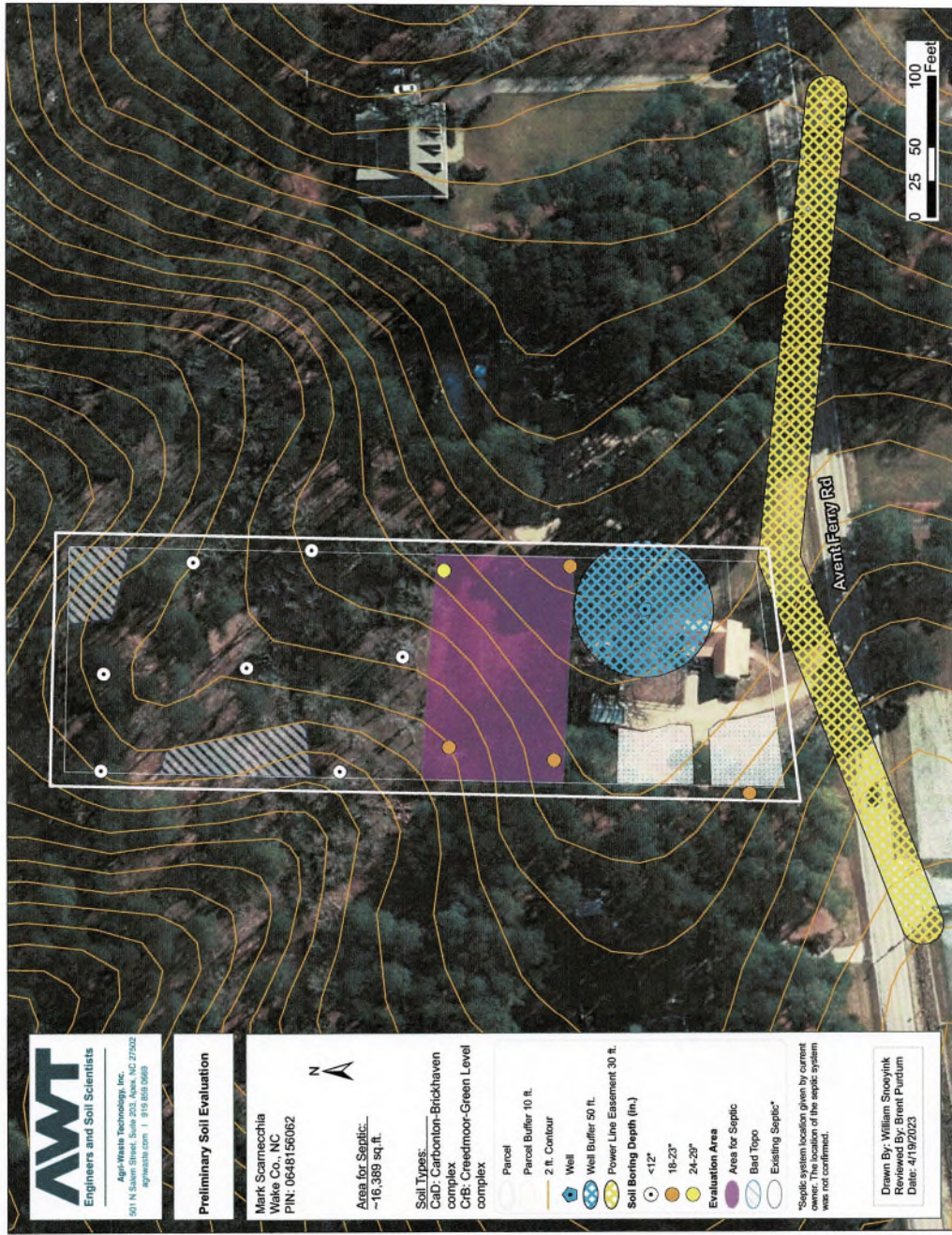
Area for Septic:
~16,389 sq. ft.

Soil Types:
CaD: Carbonate-Brickhaven
complex
CrB: Creedmoor-Green Level
complex

- Parcel
Parcel Buffer 10 ft.
2 ft. Contour
Well
Well Buffer 50 ft.
Power Line Easement 30 ft.
Soil Boring Depth (in.)
• <12"
• 18-23"
• 24-29"
Evaluation Area
Area for Septic
Bad Topo
Existing Septic*

*Septic system location given by current owner. The location of the septic system was not confirmed.

Drawn By: William Stooynink
Reviewed By: Brent Purdum
Date: 4/19/2023



Surface water and/or bad topo areas have not been officially evaluated for stream ID according to local regulatory requirements. This map is intended for preliminary purposes only and not to be used as a plat survey or can it be assumed all streams are identified on this property.

Property ID#: 0648156062
Property Recorded: _____
County: Wake

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

Applicant: Mark Scarnecchia
Address: 16 Hunter Heath Dr. N Topsail Beach, NC 28460

Owner: _____ Agent: _____ Phone: _____
Date Evaluated: _____
Proposed Facility: Residential
Property Size: 2.2 acres evaluated

Location Site: 1712 Avent Ferry Rd. Holly Springs, NC 27540

Water Supply: On Site Well ☒ Comm. Well _____ Public _____ Other _____ Evaluation Method: Auger Boring ☒ Pit ☐ Cut _____

TYPICAL PROFILE

Horizon/ Depth (IN)	Matrix	Mottles	Mottle Abundance / Contrast	(a)(1) Texture	(a)(2) Structure	(a)(3) Minerology	Consistence Wet	Consistence Moist
Ap 0-5"	10YR 3/4	None	None	SL	GR	NEXP	NS, NP	Vfr
Bt1 5-13"	7.5YR 5/8	10YR 8/6	None	CL	SBK	SEXP	S, P	Fr
Bt2 13-29"	5YR 6/8	10 YR 8/6 and 7.5R 5/8	None	C	SBK	SEXP	S, P	Fi

.1940 Landscape Pos/Slope %	- Suitable, <15%	Profile LTAR	- 0.4 – 0.1 GPD/ft ²
.1942 Wetness Condition	- Suitable	System Type	- Provisionally suitable for shallow conventional systems due to texture, structure, and depth.
.1943/.1956 Saprolite	- Suitable		
.1944 Restrictive Horizon	- Suitable		
.1948 Profile Classification	- Provisionally suitable		

Comments: _____

EVALUATED BY: Brent Purdum

COMMENTS: _____

LEGEND OF ABBREVIATIONS FOR SITE EVALUATION FORM

**LANDSCAPE
POSITION**

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

TEXTURE GROUP

I

II

III

IV

TEXTURE CLASS

S - Sand
LS - Loamy Sand

SL - Sandy Loam
L - Loam

SCL - Sandy Clay Loam
CL - Clay Loam
SiL - Silt Loam
Si - Silt
SiCL - Silt Clay Loam

SC - Sandy Clay
C - Clay
SiC - Silty Clay
O - Organic

.1955 LTAR

(gal/day/sqft)
1.2 - .08

0.8 - 0.6

0.6 - 0.3

0.4 - 0.1

STRUCTURE

G - Single Grain
M - Massive
CR - Crumb
GR - Granular
SBK - Subgranular Blocky
ABK - Angular Blocky
PL - Platy
PR - Prismatic

MOIST CONSISTENCE

Vfr - Very Friable
Fr - Friable
Fi - Firm
Vfi - Very Firm
Efi - Extremely Firm

MOTTLES

1 - Few
2 - Common
3 - Many

F - Faint
D - Distinct
P - Prominent

f - Fine
m - Medium
c - Coarse

WET CONSISTENCE

NS - Non Sticky
SS - Slightly Sticky
S - Sticky
VS - Very Sticky

NP - Non Plastic
SP - Slightly Plastic
P - Plastic
VP - Very Plastic

TAKAHASHI, S. — *Shingijun* 1950, p. 100.[illegible]

Drip Septic System Area Computation

Created by: JV
Created on: 6/20/2001
Updated on: 4/21/2019

Client Name: *Scamecchia*
Number Bedrooms: 3
Design Flow (gal/day): 360 (120 gal/day/bedroom, minimum 240 gal/day/dwelling)
LTAR (gal/day/ft²): 0.05
Trench Bottom Area (ft²): 7200 (Design flow/LTAR)
Trench Width (ft): 0
On-center distance between trenches (ft): 2
Trench Bottom Length (ft): 3600

Minimum Field Area Required (ft²): 7200 (Trench Bottom Length*Trench on-center distance)
Total Field Area Required (ft²)⁽¹⁾: 18000 (Minimum field area*2.5)
Total Field Area Required (ft²)⁽¹⁾: 21600 (Minimum field area*3)

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

Client Name: *Scamecchia*
Number Bedrooms: 3
Design Flow (gal/day): 360 (120 gal/day/bedroom, minimum 240 gal/day/dwelling)
LTAR (gal/day/ft²): 0.15
Trench Bottom Area (ft²): 2400 (Design flow/LTAR)
Trench Width (ft): 0
On-center distance between trenches (ft): 2
Trench Bottom Length (ft): 1200

Minimum Field Area Required (ft²): 2400 (Trench Bottom Length*Trench on-center distance)
Total Field Area Required (ft²)⁽¹⁾: 6000 (Minimum field area*2.5)
Total Field Area Required (ft²)⁽¹⁾: 7200 (Minimum field area*3)

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

Client Name: *Scamecchia*
Number Bedrooms: 3
Design Flow (gal/day): 360 (120 gal/day/bedroom, minimum 240 gal/day/dwelling)
LTAR (gal/day/ft²): 0.1
Trench Bottom Area (ft²): 3600 (Design flow/LTAR)
Trench Width (ft): 0
On-center distance between trenches (ft): 2
Trench Bottom Length (ft): 1800

Minimum Field Area Required (ft²): 3600 (Trench Bottom Length*Trench on-center distance)
Total Field Area Required (ft²)⁽¹⁾: 9000 (Minimum field area*2.5)
Total Field Area Required (ft²)⁽¹⁾: 10800 (Minimum field area*3)

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

Drip Septic System Area Computation

Created by: JV
Created on: 6/20/2001
Updated on: 4/21/2019

Client Name: *Scamecchia*
Number Bedrooms: 4
Design Flow (gal/day): 480 (120 gal/day/bedroom, minimum 240 gal/day/dwelling)
LTAR (gal/day/ft²): 0.05
Trench Bottom Area (ft²): 9600 (Design flow/LTAR)
Trench Width (ft): 0
On-center distance between trenches (ft): 2
Trench Bottom Length (ft): 4800

Minimum Field Area Required (ft²): 9600 (Trench Bottom Length*Trench on-center distance)
Total Field Area Required (ft²)⁽¹⁾: 24000 (Minimum field area*2.5)
Total Field Area Required (ft²)⁽¹⁾: 28800 (Minimum field area*3)

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

Client Name: *Scamecchia*
Number Bedrooms: 4
Design Flow (gal/day): 480 (120 gal/day/bedroom, minimum 240 gal/day/dwelling)
LTAR (gal/day/ft²): 0.15
Trench Bottom Area (ft²): 3200 (Design flow/LTAR)
Trench Width (ft): 0
On-center distance between trenches (ft): 2
Trench Bottom Length (ft): 1600

Minimum Field Area Required (ft²): 3200 (Trench Bottom Length*Trench on-center distance)
Total Field Area Required (ft²)⁽¹⁾: 8000 (Minimum field area*2.5)
Total Field Area Required (ft²)⁽¹⁾: 9600 (Minimum field area*3)

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

Client Name: *Scamecchia*
Number Bedrooms: 4
Design Flow (gal/day): 480 (120 gal/day/bedroom, minimum 240 gal/day/dwelling)
LTAR (gal/day/ft²): 0.1
Trench Bottom Area (ft²): 4800 (Design flow/LTAR)
Trench Width (ft): 0
On-center distance between trenches (ft): 2
Trench Bottom Length (ft): 2400

Minimum Field Area Required (ft²): 4800 (Trench Bottom Length*Trench on-center distance)
Total Field Area Required (ft²)⁽¹⁾: 12000 (Minimum field area*2.5)
Total Field Area Required (ft²)⁽¹⁾: 14400 (Minimum field area*3)

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

Drip Septic System Area Computation

Created by: JV
Created on: 6/20/2001
Updated on: 4/21/2019

Client Name: *Scarnecchia*
Number Bedrooms: 5
Design Flow (gal/day): 600 (120 gal/day/bedroom, minimum 240 gal/day/dwelling)
LTAR (gal/day/ft²): 0.05
Trench Bottom Area (ft²): 12000 (Design flow/LTAR)
Trench Width (ft): 0
On-center distance between trenches (ft): 2
Trench Bottom Length (ft): 6000

Minimum Field Area Required (ft²): 12000 (Trench Bottom Length*Trench on-center distance)
Total Field Area Required (ft²)⁽¹⁾: 30000 (Minimum field area*2.5)
Total Field Area Required (ft²)⁽¹⁾: 36000 (Minimum field area*3)

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

Client Name: *Scarnecchia*
Number Bedrooms: 5
Design Flow (gal/day): 600 (120 gal/day/bedroom, minimum 240 gal/day/dwelling)
LTAR (gal/day/ft²): 0.15
Trench Bottom Area (ft²): 4000 (Design flow/LTAR)
Trench Width (ft): 0
On-center distance between trenches (ft): 2
Trench Bottom Length (ft): 2000

Minimum Field Area Required (ft²): 4000 (Trench Bottom Length*Trench on-center distance)
Total Field Area Required (ft²)⁽¹⁾: 10000 (Minimum field area*2.5)
Total Field Area Required (ft²)⁽¹⁾: 12000 (Minimum field area*3)

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

Client Name: *Scarnecchia*
Number Bedrooms: 5
Design Flow (gal/day): 600 (120 gal/day/bedroom, minimum 240 gal/day/dwelling)
LTAR (gal/day/ft²): 0.1
Trench Bottom Area (ft²): 6000 (Design flow/LTAR)
Trench Width (ft): 0
On-center distance between trenches (ft): 2
Trench Bottom Length (ft): 3000

Minimum Field Area Required (ft²): 6000 (Trench Bottom Length*Trench on-center distance)
Total Field Area Required (ft²)⁽¹⁾: 15000 (Minimum field area*2.5)
Total Field Area Required (ft²)⁽¹⁾: 18000 (Minimum field area*3)

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