

RECONNAISSANCE SOIL & SITE EVALUATION

7924 Midnight Lane
PIN: 1738900068
Wake Forest, Wake County, NC
Three Oaks Job # 20-718

Prepared For:

David Catalano
7605 Ligon Mill Road
Wake Forest, NC 27587

Prepared By:

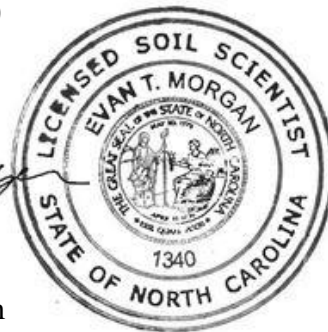


324 Blackwell Street, Suite 1200
Durham, NC 27701
(919) 732-1300

March 20, 2020



Evan T. Morgan



INTRODUCTION & SITE DESCRIPTION

A Reconnaissance Soil & Site Evaluation was performed on a 4-acre portion of a 10-acre tract located at 7924 Midnight Lane in Wake Forest, Wake County, NC (PIN: 1738900068). Three Oaks Engineering (Three Oaks) was retained to evaluate the current soil and site conditions and identify suitable areas for placement of an on-site subsurface wastewater system for a five-bedroom single-family residence with a design daily flow of 600 gallons per day (GPD). The property was evaluated in accordance with Wake County and North Carolina statutes for waste disposal (“Regulations Governing Wastewater Treatment and Dispersal Systems in Wake County”, effective October 27, 2011 and “Laws and Rules for Sewage Treatment and Disposal Systems”, amended December 6, 2018).

The property is a mix of open field and mature hardwoods. The Neuse River borders the rear of the property. The property is to be served by a private well.

INVESTIGATION METHODOLOGY

The field survey was conducted on March 5, 2020, by Evan T. Morgan, LSS. Soil borings were advanced with a hand-auger and soil color was determined using a Munsell Soil Color Chart. Observations of the landscape as well as soil properties (depth, texture, structure, soil wetness, restrictive horizons, etc.) were recorded. Soil borings were described per the USDA-NRCS, *Field Book for Describing and Sampling Soils, Version 3.0*. Soil borings and site features were located using a hand-held GPS with sub-meter accuracy. Soil borings were flagged in the field with various colored flagging. A proposed house site was provided after the field investigation but was not staked prior to the field investigation.

FINDINGS

Fourteen (14) soil borings were advanced and their locations noted on Figure 1. Detailed soil boring descriptions are attached.

Provisionally Suitable for Conventional Systems (blue flagging). Soil borings rated as Provisionally Suitable for Conventional Systems typically exhibited a friable, loamy sand or sandy loam textured surface with a firm, sandy clay loam or clay, textured subsurface that ranged in depth from 32 to 36 inches below the ground surface. These soils appeared adequate to support a long-term acceptance rate (LTAR) of 0.3 GPD/sq-ft.

Provisionally Suitable for Modified/Alternative Systems (blue flagging). Soil borings rated as Provisionally Suitable for Modified/Alternative Systems typically exhibited a friable, sandy loam textured surface with a firm, sandy clay loam or clay, textured subsurface that ranged in depth from 28 to 29 inches below the ground surface. These soils appeared adequate to support a LTAR in the range of 0.275 to 0.3 GPD/sq-ft.

Provisionally Suitable for Innovative Systems (pink/black flagging). Soil borings rated as Provisionally Suitable for Innovative Systems typically exhibited a friable, loamy sand or sandy loam textured surface with a firm, clay, textured subsurface that ranged in depth to 21 inches below the ground surface. These soils appeared adequate to support a LTAR of 0.25 GPD/sq-ft.

Provisionally Suitable for Subsurface Drip Systems (pink/black flagging). Soil borings rated as Provisionally Suitable for Subsurface Drip Systems typically exhibited a friable, sandy loam textured surface with a firm, clay, textured subsurface that ranged in depth to 18 inches below the ground surface. These soils appeared adequate to support a LTAR of 0.1 GPD/sq-ft.

Site Features. The Neuse River is located along the western boundary of the property. The area within 200-feet of the river was not evaluated as septic components will not be sited here.

DISCUSSION

One area of soil was rated as Provisionally Suitable for Conventional Systems that encompasses approximately 22,000 sq-ft with usable soil depths extending to 36 inches below the ground surface. Based on topographic position, texture, and soil depth, an LTAR of 0.3 GPD/sq-ft is expected for this soil unit. It is estimated a minimum of 12,000 to 14,000 sq-ft of usable soil would be required to support the initial septic system and 100% repair area for a five-bedroom single-family residence.

One area of soil was rated as Provisionally Suitable for Modified/Alternative and/or Innovative Systems that encompass approximately 43,000 sq-ft. Usable soil depths in these areas range from 21 to 36 inches below the ground surface. Based on topographic position, texture, and soil depth, an LTAR of 0.25 to 0.3 GPD/sq-ft is expected for this soil unit. It is estimated a minimum of 16,000 to 18,000 sq-ft of usable soil would be required to support the initial septic system and 100% repair area for a five-bedroom single-family residence. The specific system type, LTAR, and drainfield size of a septic system sited in this soil unit will be dependent upon the exact placement of the drainfield. The soils in this area varied across three potential system types and a final determination on the type cannot be made until the drainfield is sited. Septic drainfields sited in this area may require a soil cap up to 6-inches.

It is recommended the initial system be sited in the open field near soil borings B8-B10, and the repair area allocated in the woods near soil borings B11-B14. Septic system components and drainlines will need to maintain a minimum 5-foot setback from any building foundation, 3-feet from any sidewalk or patio, 15-feet from the edge of the pool, 50-feet from any well, and 10-feet from a property line.

CONCLUSIONS

The findings presented herein represent Three Oaks' professional opinion based on our Reconnaissance Soil and Site Evaluation and knowledge of the current laws and rules governing on-site wastewater systems in North Carolina. Two areas of Provisionally Suitable Soil were identified on the parcel. It is recommended the new five-bedroom single-family residence site its initial system drainfield within the Provisionally Suitable for Modified/Alternative and/or Innovative Systems soil area near borings B8-B10. The repair system is recommended to be allocated in the Provisionally Suitable for Conventional Systems soil unit located near borings B11-B14. Together the initial and repair systems are anticipated to require a minimum of 12,000 to 14,000 sq-ft of usable soil utilizing an LTAR in the range of 0.275 to 0.3 GPD/sq-ft. A septic system design and layout is recommended to site the system in the most suitable soil and minimize the overall footprint of the septic system and achieve the desired site plan.

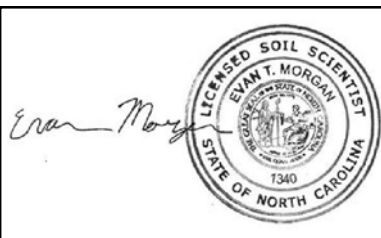
Soils naturally change across a landscape and contain many inclusions. As such, attempts to quantify them are not always precise and exact. Due to this inherent variability of soils and the subjectivity

when determining limiting factors, there is no guarantee that a regulating authority will agree with the findings of this report. Any concurrence with the findings of this report will be made by Wake County at the time of Improvement Permit application.



Soil Borings

- Provisionally Suitable for Conventional Systems
- Provisionally Suitable for Modified/Alternative Systems
- Provisionally Suitable for Innovative Systems
- Provisionally Suitable for Subsurface Drip Systems
- Provisionally Suitable for Conventional Systems
- Provisionally Suitable for Modified/Alternative and/or Innovative Systems



Reconnaissance Soil & Site Evaluation

7924 Midnight Lane

Wake County, North Carolina

Date: March 2020	
Scale: 0 30 60 Feet	
Job No.: 20-718	
Drawn By: ETM	Checked By: MGW

Figure

1

Soil Evaluation Form

Three Oaks Engineering
324 Blackwell Street, Suite 1200
Durham, NC 27701
919.732.1300

Sheet 1 of 1
Job: 20-718 Midnight Ln
County: Wake
Date: 3-5-2020

Soil Borings

	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10
Landscape Position	L	SS	L	L	L	L	L	L	L	L
Slope (%)	4	5	4	4	4	4	4	4	5	8
Horizon 1 Depth	8	8	10	8	10	10	10	10	10	6
Texture	LS	LS	LS	SL	SL	SL	SL	SL	SL	LS
Consistence	UFL	UFL	UFL	FR	FR	FR	FR	FR	FR	FR
Structure	GR	GR	GR	GR	GR	GR	GR	GR	GR	GR
Clay Mineralogy	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Horizon 2 Depth	15	21	20	28	18	29	21	16	28	12
Texture	SL	C	SL	C	C	C	C	SL	C	SL
Consistence	FR	FI	FR	FI	FI	FI	FI	FR	FI	FR
Structure	GR	SBK	GR	SBK	SBK	SBK	SBK	GR	SBK	GR
Clay Mineralogy	NE	SE	NE	SE	SE	SE	SE	SE	SE	NE
Horizon 3 Depth	30		29					22		36
Texture	C		SCL					SCL		C
Consistence	FI		FI					FI		FI
Structure	SBK		SBK					SBK		SBK
Clay Mineralogy	SE		SE					SE		SE
Horizon 4 Depth			36					29		
Texture			C					C		
Consistence			FI					FI		
Structure			SBK					SBK		
Clay Mineralogy			SE					SE		
Horizon 5 Depth										
Texture										
Consistence										
Structure										
Clay Mineralogy										
Soil Wetness									28	
Restrictive Horizon										
Saprolite	30	21		28	18	29	21	29	28	
Other										
CLASSIFICATION	PS	PS-Ima	PS	PS	PS-Drip	PS	PS	PS	PS	PS
LTAR (gpd/ft ²)	0.275	0.25	0.3	0.275	.1	0.275	0.25	0.275	0.275	0.3

Comments:

Evaluated by: ETM

Soil Evaluation Form

Three Oaks Engineering
324 Blackwell Street, Suite 1200
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Sheet 2 of 2
Job: 20-718 Midnight Lane
County: Wake
Date: 3-5-2020

Soil Borings

	B11	B12	B13	B14						
Landscape Position	L	L	L	L						
Slope (%)	8	15	16	15						
Horizon 1 Depth	8	16	15	16						
Texture	LS	SL	SL	SL						
Consistence	FL	FR	FR	FR						
Structure	GR	GR	GR	GR						
Clay Mineralogy	NE	NE	NE	NE						
Horizon 2 Depth	16	22	20	32						
Texture	SL	SCL	SCL	C						
Consistence	FI	FI	FI	FI						
Structure	SBH	SBH	SBH	SBH						
Clay Mineralogy	SE	SE	SE	SE						
Horizon 3 Depth	36	36	34							
Texture	C	C	C							
Consistence	FI	FI	FI							
Structure	SBH	SBH	SBH							
Clay Mineralogy	SE	SE	SE							
Horizon 4 Depth										
Texture										
Consistence										
Structure										
Clay Mineralogy										
Horizon 5 Depth										
Texture										
Consistence										
Structure										
Clay Mineralogy										
Soil Wetness										
Restrictive Horizon										
Saprolite			34	32						
Other										
CLASSIFICATION	PS	PS	PS	PS						
LTAR (gpd/ft ²)	0.3	0.3	0.3	0.3						

Comments:

evaluated by: ETM