



Soil & Environmental Consultants, PA

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sandec.com

John S. Oldham
1415 Admiral Way
Wilmington, NC 28412

November 20, 2023
S&EC Project #13710.S8

Re: Soil/Site Evaluation on the Oldham Tracts on Old Lystra Rd & Big Rock Drive,
Approx. 57-Acre Site, Chatham County, NC

Dear Mr. Oldham:

Soil & Environmental Consultants, PA (S&EC) performed a detailed soil and site evaluation on the above referenced tracts. This was performed at your request as part of the preliminary planning process in order to determine areas of soil that have potential for subsurface wastewater disposal per our contract from September 8, 2023. Fieldwork was performed in November 2023.

S&EC traversed the property and observed landforms (slope, drainage patterns, past use, etc.) as well as soil conditions (depth, texture, structure, seasonal wetness, restrictive horizons, etc.) through the use of hand auger borings. The site was evaluated during dry soil conditions. From these observations, an evaluation of the site was developed, relative to subsurface disposal of wastewater. Soil areas were GPS located in the field then sketched onto the soils map. The soil/site evaluation criteria used is that contained in 15 A NCAC 18E "Wastewater Treatment and Dispersal Systems" [these on-site wastewater regulations go into effect January 2024].

FINDINGS

This site is located in the acid crystalline piedmont region of Chatham County. The upland soils on this tract are similar to the Wedowee, Durham, Appling, Pacolet, Vance, Helena, Wake, Rawlings, and Enon soil series. The Wedowee, Durham, Appling, and Pacolet soils have a sandy surface material over a clayey subsoil. These soils are generally useable for subsurface septic systems. The Vance, Helena, and Enon soils have a clayey subsoil that usually contains expansive clay mineralogy and/or soil wetness conditions. The Vance, Helena, and Enon soils are generally unsuitable for conventional subsurface septic systems but sometimes work for expensive alternative septic systems such as drip systems. The Wake and Rawling soils are generally shallow (about 10 inches to 40 inches deep) to rock or hard weathered rock. Rawlings soils, which are slightly deeper to rock, sometimes work for subsurface septic systems depending on the depth and amount of rock. Wake soils, which are shallower to rock, are generally unsuitable for subsurface septic systems. Most areas will need backhoe pit evaluations at the time of septic permitting due to steep slopes, saprolite (soft weathered rock), marginal soils, and/or gravelly soils. The slopes on this site generally ranged from about 5% to 40% slope.

The accompanying AutoCAD sketch map indicates the estimated areas with potential use for subsurface wastewater disposal. The red cross hatched units indicate areas of soils which are at least 25 to 40+ inches deep to prohibitive soil characteristics and these areas have potential for modified conventional, large diameter pipe (LDP), low profile chamber, and/or low pressure pipe (LPP) septic systems with some areas that may only be suitable for subsurface drip septic systems depending on further site/soil evaluations. To determine the most cost-effective septic system within targeted proposed septic areas in the red cross hatched units, the areas should be evaluated through backhoe pits at the time of septic permitting due to slope and/or depth to saprolite. The magenta hatched units indicate areas of soils which are at least 13 to 30+ inches deep to prohibitive soil characteristics and these areas have potential for pretreatment subsurface drip septic systems, depending on results of further specific site/soil evaluations with backhoe pits in these areas other subsurface septic options may be available. To determine the most cost-effective septic system within targeted proposed

septic areas in the magenta hatched units the areas should be evaluated through backhoe pits at the time of septic permitting due to slope, depth to saprolite, gravelly soils, and/or marginal soil. The blue hatched units indicate areas of soils which are at least 13 to 23+ inches deep to prohibitive soil characteristics and these areas have potential for pretreatment subsurface drip septic systems. Some of magenta and blue hatched areas may contain inclusions of unsuitable soil for subsurface septic systems. Unit "UN" on the attached map indicates areas of soils that are less than 13 inches to prohibitive soil characteristics and/or are unsuitable due to landscape position and are generally unsuitable for the type of systems mentioned above. Some of the "UN" areas could be suitable for pretreatment surface drip and/or spray irrigation septic systems depending on further soil/site evaluations, slope, and prevalence of rock. Pretreatment surface drip and/or spray irrigation septic systems are expensive septic systems that are permitted by NC Department of Environmental Quality Division of Water Resources. Unit "NP" on the attached map indicates areas of soils that would need backhoe pit evaluations by a soil scientist and/or county health department to determine any sort of suitability for septic due to slope, depth to saprolite, gravelly soils, and/or marginal soil.

The site plan for each lot must ensure that adequate soil area for system and repair is unaffected by site elements (house placement, driveway, wells, patios, decks, etc.) on that or adjacent lots. The area ultimately designated by the health department and/or licensed soil scientist on the site plan for the septic system and repair must remain undisturbed (no mechanical clearing, excavation, heavy traffic or other significant site disturbing activities) until authorized by the health department. A lot with initially adequate useable soil area may be rendered unusable as a result of improper site planning and/or disturbance. A field layout, backhoe pit evaluations, and/or a wastewater design of the proposed septic systems may be required as part of the individual lot development process.

CHATHAM COUNTY REGULATIONS

As part of Chatham County's subdivision recordation process, Chatham County requires a licensed soil scientist sign and seal the final mylar plat(s) to certify that each proposed lot meets the 18E NC wastewater and/or 2T wastewater regulations. This report and map is to assist in developing a preliminary subdivision plan but additional soils work and a soil scientist sealing the subdivision mylars will be needed once a subdivision plan is developed. Additional soils work may include additional hand auger soil borings and/or backhoe pits and (depending on the size of the usable, suitable soil area on each lot) a field septic layout of the system and repair utilizing the site plan showing the proposed house/building, driveway/parking lots, deck(s), well, etc that is prepared by your planner. Once the subdivision is recorded, individual lot owners can apply for septic permit(s) and can provide the soils/septic layout information for the given lot (if any additional work was performed on the lot) from the recordation process to aid in the septic permitting process. S&EC will be glad to provide a cost for the additional work needed to record a subdivision once a preliminary subdivision plan has been developed.

It is important to note that any preliminary certification for a subdivision final plat does not represent approval or a permit for any sitework, nor does it guarantee issuance of an improvement permit for any lot. Final site approval for issuance of improvements is based on regulations in force at the time of permitting and is dependent on satisfactory completion of individual site evaluations following application for an improvement permit detailing a specific use and siting.

GENERAL WASTEWATER CONSIDERATIONS

Once potentially useable areas are located through vertical borings, the next consideration is the horizontal extent of those areas. The size and configuration of the useable soil area dictate the utility of that area. The size of a subsurface disposal field is determined by: 1) the design flow from the source (120 gallons/bedroom/day in residences), and 2) the long term acceptance rate (LTAR) of the soil (based on the hydraulic conductivity of the soil, a function of the soil's texture, mineralogy, structure, porosity, etc.). The configuration must be such that an efficient layout of disposal lines (on contour) is possible. An additional consideration is the required setbacks for the system from various elements such as wells (50' to 100'), streams and ponds (50' to 100' depending on Chatham Subdivision approval conditions) or more (depending on watershed regulations), property lines (10'), top of embankment (15'), watershed buffers, etc. (see Attachment 1).

The utility of a potential useable soil area for a subsurface system is most accurately determined by an on-ground layout of the proposed system. The total area needed for system and repair areas will depend upon the system type, the layout of that system and the total design flow (factors mentioned above). In the red cross hatched soil areas and magenta hatched areas, a typical area needed outside of septic setbacks for a 4 bedroom residence is approximately 12,500 to 15,500 ft²

(could be more depending on site features) or 690 to 880 linear feet of conventional type Accepted 25% reduction product (EZ-Flow or Standard Quick4 Chamber) drain line (system and repair), 920 to 1,170 linear feet of low profile chamber or gravel drain line (system and repair), or approximately 3,200 to 4,000 linear feet of drip drain line (system and repair). In the blue hatched soil area, a typical area needed outside of septic setbacks for a 4 bedroom residence using subsurface drip is approximately 14,000 to 18,000 ft² (could be more depending on site features) or 3,200 to 4,800 linear feet of drip drain line (system and repair). These estimates reference Wastewater Treatment and Dispersal Systems for North Carolina and use a LTAR of 0.25 to 0.5 gpd/ft² for conventional and modified conventional septic systems (.0901), a LTAR of 0.1 to 0.2 gpd/ft² for LPP septic systems (.0907), and a LTAR of 0.1 to 0.2 gpd/ft² for drip septic systems (.0908). The ultimate septic system type and system LTAR will be determined by the health department and/or a licensed soil scientist after their lot specific evaluation. S&EC will be glad to assist in any system layout or sizing calculations if requested.

This report discusses the general location of potentially useable soils for on-site subsurface wastewater disposal and, of course, does not constitute or imply any approval or permit as needed by the client from the local health department. S&EC is a professional consulting firm that specializes in the delineation of soil areas for wastewater disposal and the layout and design of wastewater treatment systems. As a professional consulting firm, S&EC is hired for its professional opinion in these matters. The rules governing wastewater treatment (interpreted and governed by local and state agencies) are evolving constantly and, in many cases, affected by the opinions of individuals employed by these governing agencies. Because of this, S&EC cannot guarantee that areas delineated and/or systems designed will be permitted by the governing agencies. As always, S&EC recommends that anyone making financial commitments on a tract be fully aware of individual permit requirements on that tract prior to final action.

An individual septic system permit will be required for each lot prior to obtaining a building permit. This will involve a detailed evaluation by the local health department and/or licensed soil scientist to determine, among other things, system size and layout, well, drive and house location. Only after developing this information can a final determination be made concerning specifics of system design and site utilization. Additional site testing and evaluations will be required prior to signing and sealing the final mylar plat(s) to certify that each proposed lot meets the 18E NC wastewater and/or 2T wastewater regulations.

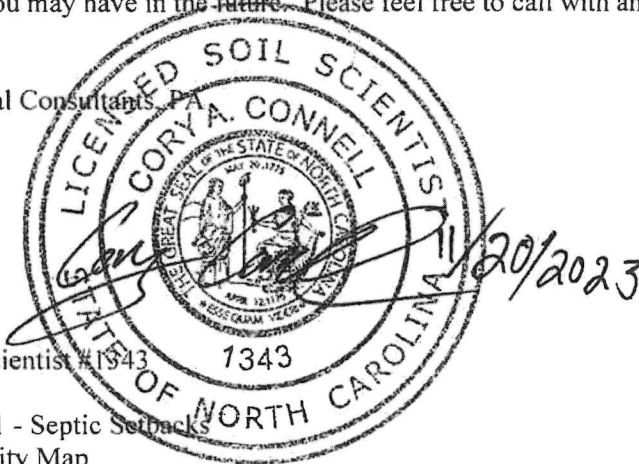
This report and site evaluation is not conformant to the Engineered Option Permit (EOP), AOWE, or A2 hybrid private septic permitting process. Additional site testing and evaluations will be required to utilize a private septic permitting process or obtaining a septic permit with the county health dept. The soil report and map associated with this project is for the exclusive use of the addressee and the use or reliance by all others is expressly denied without the written consent of S&EC.

Soil & Environmental Consultants, PA is pleased to be of service in this matter and we look forward to assisting in any site analysis needs you may have in the future. Please feel free to call with any questions or comments.

Sincerely,
Soil & Environmental Consultants, PA

Cory Connell
NC Licensed Soil Scientist #1343

Encl: Attachment 1 - Septic Setbacks
Soil Suitability Map



Attachment 1 15A NCAC 18E .0601 LOCATION OF WASTEWATER SYSTEMS

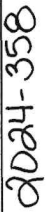
- (a) Every wastewater system shall be located the minimum setbacks from the site features specified in Table IX. The setback shall be measured on the ground surface, unless otherwise specified in this Rule, from the nearest wastewater system component sidewall or as otherwise specified in a system specific rule or PIA Approval.

TABLE IX. Minimum setbacks from all wastewater systems to site features

Site Features	Setback (feet)
Any transient or non-transient non-community water supply well, community well, shared water supply well, well that complies with 15A NCAC 18A .1700, or water supply spring	100
A private drinking water well or upslope spring serving a single-family dwelling unit	50
Any other well or source not listed in this table, excluding monitoring wells	50
Surface waters classified WS-I, from ordinary high-water mark	100
Waters classified SA, from mean high-water mark	100
Any Class I or Class II reservoir, from normal water level	100
Lake or pond, from normal water level	50
Any other stream, non-water supply spring, or other surface waters, from the ordinary high-water mark	50
Tidal influenced waters, such as marshes and coastal waters, from mean high-water mark	50
Permanent stormwater retention basin, from normal water level	50
Any water line, unless the requirements of Paragraph (l) have been met	10
Closed loop geothermal wells	15
Building foundation and deck supports	5
Patio, porch, stoop, lighting fixtures, or signage, including supporting structures such as posts or pilings	1
Any basement, cellar, or in-ground swimming pool	15
Buried storage tank or basin, except stormwater	10
Above ground swimming pool and appurtenances that require a building permit	5
Top of slope of embankment or cuts of two feet or more vertical height with a slope greater than 50 percent	15
Top of slope of embankment or cuts of two feet or more vertical height with a slope greater than 33 percent and less than or equal to 50 percent	15
Top of slope of embankment or cuts of two feet or more vertical height with a slope less than 33 percent	0
Groundwater lowering system, as measured on the ground surface from the edge of the feature	25
Downslope interceptor drains and surface water diversions with a vertical cut of more than two feet, as measured on the ground surface from the edge of the feature	15
Upslope and sideslope interceptor drains and surface water diversions with a vertical cut of more than two feet, as measured on the ground surface from the edge of the feature	10
A stormwater collection system as defined in 15A NCAC 02H .1002(48), excluding gutter drains that connect to a stormwater collection system, with a vertical cut of more than two feet as measured from the center of the collection system	10
Bio-retention area, injection well, infiltration system, or dry pond	25
Any other dispersal field, except designated dispersal field repair area for project site	20
Any property line	10
Burial plot or graveyard boundary	10
Above ground storage tank from dripline or foundation pad, <i>whichever is more limiting</i>	5
Utility transmission and distribution line poles and towers, including guy wires, <i>unless a greater setback is required by the utility company</i>	5
Utility transformer, ground-surface mounted	5
Underground utilities	5

Note: Collection sewers and septic supply lines shall be located the minimum setbacks to site features shown in Table IX (above), unless a different minimum setback is specified in Table XII. If the design flow is over 3,000 gallons per day (GPD) some setbacks may exceed the setbacks stated above, see Table XI. Depending on local and county regulations some setbacks may be more restrictive.

Areas that would need backhoe pit evaluations by a soils scientist and/or county health dept to determine any sort of suitability for septic due to slope, depth to saprolite, gravelly soils and/or marginal soils.



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END PAGE	0777
INSTRUMENT #	09573
EXCISE TAX	\$0.00

Prepared by/return to: Bagwell Holt Smith P.A., 400 Market Street, Ste. 202, Chapel Hill, NC 27516

NORTH CAROLINA

ROAD MAINTENANCE DECLARATION

CHATHAM COUNTY

THIS DECLARATION, made and entered into this the 9 day of Sept., 2019 by and between Eric F. Oldham ("Oldham") and Margaret O. Glosson and James Mark Glosson (together, the "Glossons"), hereinafter collectively called "Declarants;"

WITNESSETH:

WHEREAS, Oldham is the record owner of the property located at 82 Big Rock Drive, Chapel Hill, NC 27517, said property being located in Chatham County, North Carolina and having a Parcel ID No. of 0018660 (the "Oldham Property"); and

WHEREAS, the Glossons are the record owners of the property located at 448 Old Lystra Road, Chapel Hill, NC 27517, said property being located in Chatham County, North Carolina and having a Parcel ID No. of 0018692 (the "Glosson Property"); and

WHEREAS, the Oldham property and the Glosson Property have access to Old Lystra Road (the "State Road") via the private gravel/soil drive known as Big Rock Drive (the "Private Road") extending from Old Lystra Road to the Glosson Property; and

WHEREAS, Declarants, by this Declaration, wish to affirm and grant for themselves, their successors and assigns, and all owners of any portion of the Oldham Property or the Glosson Property perpetual ingress, egress and regress over the Private Road and to said State Road; and

WHEREAS, Declarants, by this Declaration and these restrictions, wish to bind themselves, their successors and assigns to provide for maintenance of said Private Road until such time as the Private Road is accepted by the State of North Carolina for maintenance.

NOW, THEREFORE, Declarants agree for themselves and any and all persons, firms or corporations hereinafter acquiring or subdividing any of the property described above, that the

same shall be subject to the following restrictions, conditions and covenants relating to the use and occupancy thereof, which restrictions, conditions and covenants shall run with said property and inure to the benefit of and be binding upon the heirs, successors and assigns of Declarants and other acquiring parties and persons.

ARTICLE I

Declarants hereby grant unto themselves and the future owners of the Oldham Property and the Glosson Property a perpetual non-exclusive easement for ingress, egress and regress along the private road to and from their respective residences or property.

ARTICLE II

This agreement shall only apply to the portion of the private road extending from Old Lystra Road to the end of the property line of the Oldham Property (the "shared portion"), such portion of road being shown as the gravel road on that plat and survey entitled "A Recombination of the Property of John A. Oldham and Frances Oldham", recorded at Plat Slide 94-71, Chatham County Registry. The shared portion of the road shall be maintained in good and passable condition and suitable for normal vehicular traffic as a partially gravel, partially soil roadway. The record owners of the Oldham Property and the Glosson Property shall be responsible for maintaining the shared portion of the road and shall bear on a pro-rata basis the costs of maintenance, including grading costs, gravel, or rock hauled in to fill ruts, holes, and washed out sections and necessary replacement of or additional drainage culverts. The record owners shall together evaluate and decide upon the necessary improvements.

Notwithstanding the other provisions within this Article, should one of the property owners cause damage to the shared portion of the road that goes beyond normal wear, the cost of repair or maintenance of such damage shall be born solely by the owner who caused the damage. This provision shall be read to include any damage caused by heavy machinery and/or any undue wear caused by vehicles being used for construction projects on either property.

ARTICLE III

This agreement is intended to provide only for maintenance and upkeep of the private road, and the record owners of the properties shall under no circumstance be obliged to pay for upgrades to the private road beyond its current state (i.e., no record owner shall be forced to pay for additional paving, new road amenities, or the like.)

ARTICLE IV

This agreement shall run with and be appurtenant to the land and shall be binding upon the heirs, successors and assigns of each record owner of either property. Should either property be subdivided, then each subdivided portion of said lot shall be subject to this agreement.

ARTICLE V

It is further stipulated and agreed that the record owners of lots within the property and their heirs, successors or assigns may enforce this agreement by injunction and that this shall not be in exclusion of, but in addition to, all other remedies available in law or equity.

ARTICLE VI

Invalidation of any one of these covenants by judgment or court order shall in no way effect any of the other provisions which shall remain in full force and effect.

ARTICLE VII

For the purpose of these restrictions, the singular shall include the plural, the masculine shall include the feminine and neuter, and vice versa, as the meaning may require.

ARTICLE VIII

This Declaration contains the entire understanding of the parties hereto and shall not be amended without the written agreement of all of the parties hereto.

IN WITNESS WHEREOF, Declarants have caused this instrument to be signed on the day and year above written.

[signatures to follow]

Margaret O. Glosson (Seal)
MARGARET O. GLOSSON

Eric F. Oldham (Seal)
ERIC F. OLDHAM

James Mark Glosson (Seal)
JAMES MARK GLOSSON

NORTH CAROLINA

COUNTY OF Chatham

I, a Notary Public, do hereby certify that **ERIC F. OLDHAM** personally came before me and acknowledged the due execution of the foregoing instrument.

Witness my hand and official seal this 9 day of Sept, 2019.

Margaret E. Ashness
Official Signature of Notary Public

Margaret E. Ashness
Notary's Printed or Typed Name, Notary Public

My commission expires: 5/12/2021



NORTH CAROLINA

COUNTY OF Chatham

I, a Notary Public, do hereby certify that **MARGARET O. GLOSSON and JAMES MARK GLOSSON** personally came before me and acknowledged the due execution of the foregoing instrument.

Witness my hand and official seal this 10 day of September, 2019.

Heather A. Rumley
Official Signature of Notary Public

Heather A. Rumley
Notary's Printed or Typed Name, Notary Public

My commission expires: 11/20/2019

