WithersRavenel
Our People. Your Success.

November 12, 2024

Ms. Jennie Turner
Currituck County Planning and Community Development
P.O. Box 73
Currituck, NC 27927

Re: **Major Site Plan Application for**
1120 Corolla Village Rd
Corolla, Currituck County, North Carolina

Dear Ms. Turner,

On behalf of Duck Land Co., LLC, WithersRavenel hereby submit for your review the enclosed application package for 1120 Corolla Village Rd. Major Site Plan. Enclosed in this package, please find the following:

One (1) digital copy of each:

1. Signed Major Site Plan Application Form and Checklist;
2. Signed Major Stormwater Form SW-002,Checklist, and SW 003;
3. Full Size Major Site Plan Set;
4. Site Plan Narrative and supporting calculations including wastewater commitment to serve;
5. DRAFT wastewater permit package;
6. Draft NCDOT Driveway Access Application and Encroachment Agreement;
7. Full Size Architectural Elevations;
8. Lighting Fixtures Cut Sheets;

Site lighting is anticipated to be minimal. At this time we are providing cut sheets for the anticipated fixtures. All proposed lighting will be full cut off and meet the requirements within the Currituck County UDO. It is acknowledged that an invoice for site plan application and stormwater review will be provided after initial review for completeness.

Please review the attached application and do not hesitate to contact Michael W. Strader, Jr., PE, or myself at 252.491.8147 if you have any questions, comments or requests for additional information.

Sincerely,
WithersRavenel

Cathleen M. Saunders, P.E.
Senior Project Manager

Major Stormwater Plan
Form SW-002

OFFICIAL USE ONLY:
Permit Number: _____
Date Filed: _____
Date Approved: _____

Contact Information

APPLICANT:		PROPERTY OWNER:	
Name:	Duck Land Co., LLC	Name:	Duck Land Co., LLC
Address:	1181 Duck Road	Address:	1181 Duck Road
	Duck, NC 27949-4568		Duck, NC 27949-4568
Telephone:	252-457-1177	Telephone:	252-457-1177
E-Mail Address:	dtwiddy@twiddy.com	E-Mail Address:	dtwiddy@twiddy.com

Property Information

Physical Street Address: 1120 Corolla Village Rd Corolla, NC

Parcel Identification Number(s): 9937-21-3504

FEMA Flood Zone Designation: AE 4'; shaded X; X

Request

Project Description: Commercial Building with accessory dwelling structure

Total land disturbance activity: 15,177 sf

Calculated volume of BMPs: 1,726 cf ~~sf~~

Maximum lot coverage: 14,803 sf

Proposed lot coverage: 7,590 sf

TYPE OF REQUEST

- ☐ Major subdivision (10-year, 24-hour rate)
- ■ Major site plan (5-year, 24-hour rate)

METHOD USED TO CALCULATE PEAK DISCHARGE

- ■ Rational Method
- ☐ NRCS Method (TR-55 and TR-20)
- ☐ Simple volume calculation for small sites (less than 10 acres)
- ☐ Alternative stormwater runoff storage analysis
- ☐ Downstream drainage capacity analysis

I hereby authorize county officials to enter my property for the purpose of determining compliance. All information submitted and required as part of this process shall become public record.

Applicant _____ Date 8-23-24

Property Owner(s) _____ Date 8-23-24

***NOTE: Form must be signed by the owner(s) of record, contract purchaser(s), or other person(s) having a recognized property interest. If there are multiple property owners/applicants a signature is required for each.**

Major Stormwater Plan Design Standards Checklist

The table below depicts the design standards of the major stormwater plan application. Please make sure to include all applicable listed items to ensure all appropriate standards are reviewed.

Major Stormwater Plan

Design Standards Checklist

Date Received: _____

Project Name: 1120 Corolla Village Rd

Applicant/Property Owner: Duck Land Co.,LLC

Minor Stormwater Plan Design Standards Checklist		
	General	
1	Property owner name and address.	✓
2	Site address and parcel identification number.	✓
3	North arrow and scale to be 1" = 100' or larger.	✓
	Site Features	
4	Scaled drawing showing existing and proposed site features: Property lines with dimensions, acreage, streets, easements, structures (dimensions and square footage), fences, bulkheads, septic area (active and repair), utilities, vehicular use areas, driveways, and sidewalks.	✓
5	Approximate location of all designated Areas of Environmental Concern (AEC) or other such areas which are environmentally sensitive on the property, such as Maritime Forest, CAMA, 404, or 401 wetlands as defined by the appropriate agency.	✓
6	Existing and proposed ground elevations shown in one foot intervals. All elevation changes within the past six months shall be shown on the plan.	✓
8	Limits of all proposed fill, including the toe of fill slope and purpose of fill.	✓
9	Square footage of all existing and proposed impervious areas (structures, sidewalks, walkways, vehicular use areas regardless of surface material), including a description of surface materials.	✓
10	Existing and proposed drainage patterns, including direction of flow.	✓
11	Location, capacity, design plans (detention, retention, infiltration), and design discharge of existing and proposed stormwater management features.	✓
12	Elevation of the seasonal high water level as determined by a licensed soil scientist.	✓
13	Plant selection.	✓
	Permits and Other Documentation	
14	NCDENR stormwater permit application (if 10,000sf or more of built upon area).	N/A
15	NCDENR erosion and sedimentation control permit application (if one acre or more of land disturbance).	N/A
16	NCDENR coastal area management act permit application, if applicable.	N/A
17	Stormwater management narrative with supporting calculations.	✓
18	Rational Method Form SW-003 or NRCS Method Form SW-004	✓
19	Alternative stormwater runoff storage analysis and/or downstream drainage capacity analysis, if applicable	N/A
20	Design spreadsheets for all BMPs (*Appendix F – Currituck County Stormwater Manual*).	✓
21	Detailed maintenance plan for all proposed BMPs.	✓

Certificate		
22	The major stormwater plan shall contain the following certificate: I, Douglas Twiddy, owner/agent hereby certify the information included on this and attached pages is true and correct to the best of my knowledge. On the plan entitled 1120 Corolla Village Road, stormwater drainage improvements shall be installed according to these plans and specifications and approved by Currituck County. Yearly inspections are required as part of the stormwater plan. The owner is responsible for all maintenance required. Currituck County assumes no responsibility for the design, maintenance, or performance of the stormwater improvements. Date: 8-23-24 Owner/Agent:	✓

Major Stormwater Plan Submittal Checklist

Staff will use the following checklist to determine the completeness of your application. Please make sure all the listed items are included. Staff shall not process an application for further review until it is determined to be complete.

Major Stormwater Plan Form SW-002

Submittal Checklist

Date Received: _____

Project Name: 1120 Corolla Village Rd

Applicant/Property Owner: Duck Land Co.,LLC

Major Stormwater Plan Form SW-002 Submittal Checklist – Documents provided on USB flash drive or CD		
1	Completed Major Stormwater Plan Form SW-002	✓
2	Completed Rational Method Form SW-003 or NRCS Method Form SW-004	✓
3	Stormwater plan	✓
4	NCDENR permit applications, if applicable	N/A

Comments

Rational Method Peak Flow
Form SW-003

Project Information

Project Location: 1120 Corolla Village Rd

Parcel Identification Number(s): 9937-21-3504

Drainage area: 0.28 ac

Average Slope: 2.0 %

Maximum Slope Length: 170 ~~[illegible]~~ ft

Calculations

*The Rational Method may only be used where development will impact less than 10 acres

Time of Concentration (Tc)
(Use additional sheets if necessary)

	Pre-	Post-	
Sheet Flow			
Manning's roughness, n (Table 2-4)	0.2	0.57	
2-year, 24-hour Rainfall, P	4.0	~~6.0~~ 5.0	in
Slope, S	1.2%	1.5%	ft/ft
Length of Sheet Flow, L (<=300 feet)	170	40	ft
Total Time for Sheet Flow	12.1	0.6	**min**
Shallow Concentrated Flow			
Surface Paved (P) or Unpaved (U)	U	P	
Length of flow, L	N/A	N/A	ft
Slope, S	↓	↓	ft/ft
Average Velocity, V (Table 2-3)		↓	ft/min
Total Time for Shallow Concentrated Flow	0.0	0.0	**min**
Channel Flow			
Pipe (P) or Channel (C)	N/A	N/A	
If pipe: Diameter, D	↓	↓	in
If channel: Bottom Width, w			ft
If channel: side slope 1 (___:1)			
If channel: side slope 2 (___:1)			
Cross sectional flow area, A			sq ft
Wetted perimeter, Wp			ft
Hydraulic radius, R = A/Wp	↓	↓	ft

10yr should be 5yr

Time of Concentration (Tc) (Use additional sheets if necessary)			
	Pre-	**Post-**	
Channel slope, S	↓	↓	ft/ft
Manning's roughness, n (Table 2-4)	↓	↓	
Channel velocity	↓	↓	ft/sec
Length of Flow, L	↓	↓	ft/sec
Total Time for Channel Flow	0.0	0.0	**min**
Total Time of Concentration, Tc	12.1	5.0*	**min**

* MIN.

Pre-development Conditions			
Land Use Description	C	Area (acres)	C*A
Woods	0.2	0.28	0.056
Total			

Intensity for 2-year, ~~24-hour storm~~ (Table 2-5) 4.52 in/hr

24 HR STORM WOULD BE 4.0 (PREV. CALC)

Pre-development peak flow, Q = CiA 0.253 cfs

Post-development Conditions			
Land Use Description	CN	Area (acres)	C*A
IMPERVIOUS COVER	98	0.047	4.63
PAVERS	98	0.0313	3.11
OPEN SPACE	49	0.15	7.48
Totals		0.23	15.228

Area-weighted CN 65.70 C: 0.57

24 HR STORM WOULD BE 5.0 (PREV. CALC)

Intensity for ~~10~~ 5-year, ~~24-hour storm~~ (Table 2-5) 6.82 in/hr

5-yr (Commercial Site Plan)

Post-development peak flow, Q = CiA 1.08 cfs

Minimum Storage Volume Required – Refer to *Section 2.4.4* for Volume Calculations

Storage Volume, V_s 49.1 cy 1,325 ft³

CM Smith, WithersRavenel

Applicant

11/12/24

Date

WithersRavenel
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Site Plan Narrative

1120 Corolla Village Road

Currituck County

Specialty Eating Establishment

Prepared For:
Specialty Eating Establishment
c/o Doug Twiddy
1181 Duck Road
Duck, NC 27949

Prepared By:
WithersRavenel
115 MacKenan Drive
Cary, NC 27511
(919) 469-3340
License No.: F-1479

WithersRavenel Project No. 24-1038

November 12, 2024

Table of Contents

Appendices

Project Description

Duck Land Company, LLC (Owner) is proposing to construct a 1,778 sq. ft. specialty eating establishment with accessory dwelling structure and decking located at 1120 Corolla Village Road, Corolla, Currituck County. The proposed construction will include the addition of nine (9) parking spaces, installation of an interconnected stormwater infiltration basin, connection to the County's water system, and connection to the existing offsite sanitary sewer collection system. As the site disturbance is less than 1 acre, a NCDEQ State soil erosion and sediment control permit is not required. Additionally, the site proposes less than 10,000 sf of impervious coverage and is not required to obtain an NCDEQ stormwater permit.

The following narrative will detail the site details and stormwater management plan for the proposed site improvements for 1120 Corolla Village Rd in Corolla, Currituck County, NC.

Access

Access to the site is available from Corolla Village Road (SR 1185). A 20' wide all-weather asphalt drive aisle capable of supporting 75,000 pounds is proposed to allow for fire access. A loading zone has not been provided since the site is less than 7,500 gross floor area, per Currituck County Unified Development Ordinance UDO 5.1.8 requirements.

A loading zone is not required per Currituck County UDO, Section 5.1.8. As the building is less than 7,500 SF.

Parking

The proposed project will install nine (9) additional parking spaces. Calculations for the parking count are based on the current ordinance using 1 space per 200 sf of enclosed specialty eating establishment. The eating establishment requires 8 parking spaces. An additional parking space for the accessory dwelling unit is provided at 1 space per bedroom.

The proposed building is 1,778 sq. ft. enclosed and requires 8 parking spaces. 1 parking space will be required for the accessory dwelling unit. Therefore, 9 total parking spaces are required and 9 parking spaces on site have been provided (including 1 ADA accessible parking spaces).

Utilities

The existing water supply is provided by Currituck County. The water service and associated appurtenances are proposed from the existing main within Corolla Village Road to the building. The water service line will include a double check valve with backflow prevention device.

A fire hydrant is also proposed within the Corolla Village Road right-of-way. The buildings are not designed to be sprinker protected. This proposed fire hydrant will allow the hose length to come within 400' of all portions of all buildings. Based on the North Carolina Public Water Supply (PWS) Engineering, Planning, and Development Guidance Document (2013), PWS review and permitting are not required unless the Currituck County public water system requires additional review. At this time a PWS review and permitting is not proposed for the service and hydrant.

The proposed wastewater effluent from the Specialty Eating Establishment will be conveyed via gravity to a proposed on-site pump station. This pump station will then convey the flow via a 2-inch force main to a forcemain within Corolla Village Rd.(to be designed any permitted by others). Sanitary sewer flows have been estimated using State regulations (15 NCAC 02T.0114) at 1,778 sf of floor area at a rate of 50 gpd/100 sf and 120 gal/unit rounded up to 1,080 gpd total sewer flows. A commitment to serve letter has been obtained from Carolina Water Service, Inc. of North Carolina to confirm the system can handle this additional capacity and a copy is included with this site plan package within **Appendix 4**. The existing onsite septic field and associated tanks will be removed/abandoned with this project.

Buffers and Site Vegetation

The Currituck County UDO defines a heritage tree as any live oak greater than 12" diameter at breast height and trees or other tree species greater than 24" diameter at breast height. Heritage trees within this site appear to be outside of the limits of disturbance. Site clearing does not propose removal of any heritage trees.

The commercial building use proposed requires 2 ACI of Canopy trees per acre and 1 shrub per every 5 ft of building façade facing a street. As such, one (1) canopy tree and eight (8) shrubs have been proposed between the building and the adjacent street to meet site landscaping requirements. Canopy trees and shrubs have also been proposed within the parking area for vehicular landscaping.

The site is zoned GB and has C-GB and GB to the North, South, and East. A buffer is not required adjacent to this zoning. Property to the west is vacant, but zoned single family residential (SFO). This requires a Type B buffer requirement at 25' wide, 8 ACI of canopy trees, 10 ACI of understory trees, and 15 shrubs per 100 lf. The existing trees within the wetlands are proposed to be maintained to meet screening requirements adjacent to this property. Landscaping it no proposed within the wetlands to minimize impacts.

Summary of Existing Stormwater Conditions

The property is in the coastal plain of North Carolina. The existing property is currently a combination of developed areas along with open space with natural vegetated areas and asphalt/gravel drives to facilitate the current onsite construction staging facility. Wetlands are on the property and have been delineated by Quible personnel and have been field verified by USACOE. Ground elevations range between 4' and 15' with an average surface slope of 1.0%. Existing stormwater runoff is via sheet flow to the existing wetlands to the West, some of which is conveyed from an existing drainage ditch to the wetlands, which eventually flows into the Albemarle Sound.

Summary of Proposed Stormwater Conditions

Infiltration Basin

Stormwater to serve the proposed site improvements includes an interconnected infiltration basin to meet local permitting requirements only. This basin is located on either side of the proposed parking area and is connected via 12" stormwater pipe and permeable pavers. The

infiltration basins will not be permitted by NC DEQ and is not required for State stormwater storage requirements. The proposed stormwater management facilities have been designed and installed to provide for approximately 1,726 of storage for the entirety of the site, which retains the post developed 5-yr storm back to pre-developed 2-yr wooded storm conditions, per Currituck County standards. Impervious coverage calculations for Currituck County storage requirements considered permeable concrete with 6-inches of gravel base as 60% credit as managed grass. County calculations for storage requirements are provided within **Appendix 1**.

A summary for all storage onsite to meet Currituck County requirements are provided in Table 1 below. Calculations for the interconnected basins (above grade) are provided within **Appendix 1** for reference.

Table 1: Currituck County Stormwater Storage Summary

Elev (Ft.)	Area (Sf)	Avg Area (Sf)	Volume (Cf)
4.00	1,202		
		1,456	728
4.50	1,709		728
		1,997	998
5.00	2,285		1,726 (Vg)

The interconnected infiltration basin is 12-inches deep for peak attenuation volume. The bottom of this basin is set at elevation 4.0 ft, allowing for 1 ft of separation between the bottom of the basin and the seasonal high-water table (+/-3.0 ft elevation). The 1.5-inch storm will be collected and treated within the first 12-inches along with the County storage requirements. The soils infiltration rate within the existing fill material (per onsite soils testing) is anticipated to be 20 in/hr. Based on the infiltration rate of 20 in/hr and a maximum storage depth of 12-inches, the north basin drawdown time is estimated at 0.03 days. Borings within this area did not encounter pockets asphalt or peat and undercut of the native soils is not anticipated.

Permeable Pavement

Permeable pavers will be provided onsite to provide additional stormwater storage and infiltration. Permeable pavers will not be permitted through NC DEQ as the interconnected stormwater infiltration basin storage meets storage requirements and the site proposes less than 10,000 sf of impervious coverage. All parking areas will be installed using Belgard® ADA approved permeable pavers or approved equal. A cross section for these pavers is provided with the associated plan set.

These stormwater management facilities will provide an adequate system to meet local requirements for stormwater storage. The interconnected infiltration basin will be designed and permitted through Currituck county. A high-density stormwater permit is not required by NC DEQ for the interconnected infiltration basins.

Soils

The USDA NRCS Soil Survey lists the soil in the vicinity of the stormwater infiltration basins as described below. Geotechnical reports for the site indicate the seasonal high-water table is approximately at elevation 3.0'. A copy of on-site soils analysis is provided within **Appendix 2.** On-site soils analysis and testing were completed by Quible and Associates, P.C. and a summary memo, dated January 31, 2023, is included within this package.

- Os – Osier fine sand

This soil typically has 0 to 2 percent slopes. Osier fine sand typically has a very high runoff rate and is poorly drained. This soil is categorized in Hydrologic Soil Group: A/D

- OuB—Ousley fine sand

This soil typically has 0 to 6 percent slope. Ousley fine sand typically has a very low runoff class and is moderately well drained. This soil is categorized in Hydrologic Soil Group: A.

Calculations

A copy of the Drainage Calculations for State and County requirements are provided in **Appendix 1** of this narrative.

Summary and Conclusions

The proposed stormwater management plan for this site provides stormwater treatment in excess of the State required 1.5 inch rainfall event for all proposed impervious surfaces. In addition, the site provides onsite storage of the County required 2-yr, 24 hour predeveloped wooded condition routing. The proposed system will offer preliminary and primary methods of treatment as well as an alternate method of disposal should the capacity be exceeded. This proposed design will adequately serve the stormwater management requirements of the site.

Appendix 1: Stormwater Calculations

Currituck County Calculations

Project Name: 1120 Corolla Village Rd
Quible Project Number: P08045
Date: 11/12/2024

Currituck County Stormwater Calculations *(In Lieu of Forms SW-002 and SW-003)*

Step 1: Drainage Area 12,171.00 square feet
0.28 acres

Step 2: Determine Runoff Coefficient
C = 0.20

Step 3: Determine Time of Concentration

Sheet Flow

$Tc_1 = \frac{0.42(nL)^{0.8}}{P^{0.5}S^{0.4}}$

n = 0.1 (woods) Elev. Start = 5.03
L = 170 feet Elev. End = 3.07
P = 4 inch
S = 0.012 ft/ft
Tc_1 = **12.1** mins

Shallow Concentrated Flow

L = 0 feet
S = 0.01 ft/ft
unpaved
$V_{unpaved}$ = 134.64 fpm
Tc2= **0.0** mins

Channel Flow

(n/a)

Tc = Tc1 + Tc2
Tc = **12.1** mins

Step 4: Determine Peak Rainfall Intensity
Time of Concentration

T (yrs)	5 mins	10 mins	15 mins	30 mins	1 hr	2 hr	3 hr
2	6.06	4.84	4.06	2.8	1.76	1.03	0.731
5	6.82	5.46	4.6	3.27	2.1	1.26	0.897
10	7.82	6.26	5.28	3.82	2.49	1.51	1.09

I = **4.52** in/hr

Interpolation Formula =

$$y_2 = \frac{(x_2 - x_1)(y_3 - y_1)}{(x_3 - x_1)} + y_1$$

	X	Y
1	10	4.84
2	12.07	
3	15	4.06

y_2 = **4.52**

Step 5: Determine the 2-year Pre-Development peak discharge, Q
Q = CIA
Q 2= **0.25** cfs

Step 6: Determine the weighted runoff coefficient, Cw for post-development

			C - Value
Impervious Area =	5,237.90	sq.ft.	0.95
Open Area =	6,933.10	sq.ft.	0.25
Total =	**12,171.00**	sq.ft.	

Cw = **0.55**

Step 7: Determine Time of Concentration for post-development

Sheet Flow

$Tc_1 = \frac{0.42(nL)^{0.8}}{P^{0.5}S^{0.4}}$

n =	0.013	(smooth pavement)
L =	40.00	feet
P =	5	inch *(From NOAA Rainfall Depth Data)*
S =	0.015	ft/ft
Tc_1 =	**0.6**	mins

Shallow Concentrated Flow

Tc_2 = L =	0.00	ft
	paved	
Slope =	0.024	ft/ft

Paved Areas $V = 1302(S^{0.53})$

Unpaved Areas $V = 972(S^{0.53})$

V =	**180.4**	ft/min
Tc_2 =	**0.0**	mins

Channel Flow

(n/a)

Tc = Tc1 + Tc2

Tc = **5.0** mins **5 min minimum Tc (worst case scenario)*

Step 8: Determine Peak Rainfall Intensity

	Time of Concentration						
T (yrs)	5 mins	10 mins	15 mins	30 mins	1 hr	2 hr	3 hr
2	6.06	4.84	4.06	2.8	1.76	1.03	0.731
5	6.82	5.46	4.6	3.27	2.1	1.26	0.897
10	7.82	6.26	5.28	3.82	2.49	1.51	1.09

I5= **6.82**

Step 9: Determine the 5-year Post-Development peak discharge, Q

Q = CIA

Q5 = **1.05** cfs

Step 10: Determine the weighted curve number, CN, for the post-development conditions.

Hydrologic Soil Type: A *(From NRCS Soils Report)*

Land Use	CN	Area
Impervious Area	98	2,089.90
Permeable Pavers	98	1,259.20
Open Space	49	6,933.10
	Total =	**10,282.20**
	CN_W =	**64.96**

Step 11: Determine the 5-year post-development runoff depth, Q

$Q = \frac{(P-0.2S)^2}{(P+0.8S)}$ $S = \frac{1000}{CN} - 10$

P =	5	in
S =	**5.39**	
Q =	**1.65**	in

Step 12: Determine the Runoff Volume, V_r

$V_r = \frac{Q}{12} * A$

Q =	1.65	in
A =	0.28	acres
V_r =	**0.04**	ac-ft

Step 13: Determine the Required Storage Volume, V_s

$V_s = 1613.33 * V_r * (1 - \frac{Q_{2\_pre}}{Q_{10\_post}})$

V_r =	0.04	ac-ft
$Q_{2\text{-pre}}$ =	0.25	cfs
$Q_{5\text{-post}}$ =	1.05	cfs
V_s =	**47.11**	CY
	1,271.89	CF

SPECIALTY EATING ESTABLISHMENT

date 11/12/2024
page 1

NCDEQ Stormwater Calculations

Storage Calculations

	Infiltration Basin (A)	
	(sq.ft.)	(acre)
Drainage Area =	12,171	0.28
Open Space	6,933	0.16
Gravel =	0	0.00
Building =	3,129	0.07
Asphalt/concrete =	850	0.02
Impervious =	3,979	0.09
Permeable Pavers=	3,148	0.07
Reduced Permeable Pavers =	*1,259*	*0.03*
Total Impervious (including permeable) =	5,238	0.12

Runoff generated by Rainfall Event (NCDEQ Simplified Method)

Ia = Impervious Percentage = Impervious Area/Drainage Area
Rv= Runoff Coefficient, 0.05+0.9Ia
Rd= Rain fall depth
V= Runoff Volume, 3630*Rd*Rv*A

	A (1.5")
Ia =	43.0%
Rv=	0.44
Rd (in.)=	1.5
A (ac.) =	0.28
V (cf.)=	**665**

Total Storage Required by Currituck County = 1,300.00 cf

Above Grade Storage Provided In Infiltration Basin (SHWT +/- 3.0' Assumed)

A - Above Grade Storage				
Elev	Area (sf)	Avg area (sf)	Volume (cf)	Cum Vol. (cf)
4.00	1202			0
		1456	728	
4.50	1709			728
		1997	998	
5.00	2285			1726 (Vg)

Above Grade Storage Provided = 1726 cf
3.9 in

Infiltration Basin Drawdown Calculations

Hydraulic Conductivity = 20 in/hr
Max Stored Depth = 12 in
Drawdown Time = Stored Depth / Hydraulic Conductivity
Drawdown Time = 0.60 hrs or 0.03 days

Appendix 2: On-site Soils Map and Data

MEMORANDUM

Quible & Associates, P.C. SINCE 1959
ENGINEERING * CONSULTING * PLANNING
ENVIRONMENTAL SCIENCES * SURVEYING
Phone: (252) 261-3300
Fax: (252) 261-1260
Web: www.quible.com

To: **Dylan Tillett, P.E., Quible & Associates**

From: Brian Rubino, P.G.

Date: January 31, 2023

Re: **P08045 Soil and Groundwater Investigation**

Dylan,

On Tuesday January 17, 2023, representatives from Quible visited the Site to conduct shallow soil borings in the locations of potential a future stormwater collection and infiltration system. The purpose of our evaluation was to understand lithologic conditions, to determine the depth and elevation of the Static Water Table (WT), Season High Water Table (SHWT), and to measure infiltration rates for Stormwater Management System design. The attached exhibit shows the location of the borings.

Soils consisted of:

SB-1
- 0-28" bgs: fine-grained sand (10 YR 4/4)
- 28-40" bgs: fine-grained sand (10 YR 4/3)
- 40-60+" bgs: fine-grained sand (10 YR 5/1)

SB-2
- 0-32" bgs: fine-grained sand (10 YR 4/4)
- 32-39" bgs: fine-grained sand (10 YR 4/3)
- 39-50" bgs: fine-grained sand (10 YR 5/1)
- 50-60+" bgs: fine-grained sand (GLEY 5/10Y)

A summary of elevation data collected and observed is as follows:

Soil Boring	Ground Elevation (ft); (NAVD 88)	Groundwater Elevation (ft); (NAVD 88)	Approx. Elevation of SHWT (ft); (NAVD 88)	Measured infiltration Rates (in/hr.)
SB-1	5.54'	2.50'	3.00'	>20
SB-2	5.41	2.48	2.98	>20

Ground elevation data was collected on the date of the soil borings using an RTK GPS system. Temporary piezomters, using a two-inch .010 slot pvc well screen were installed at the boring locations and was allowed to recover for a period of at least 1 hour before the depth to groundwater was measured using an electronic water level checker.

Infiltration rate field testing of the in-situ soils in the immediate vicinity of the soils boring location was conducted using a double ringed infiltrometer (12-inch inner diameter and 24-inch outer diameter). This procedure measures the natural downward movement of water to the groundwater table which can be relied upon to design Site stormwater collection, storage and treatment systems in the area tested. The infiltration test was done on in the soil unit at the surface. All soil units encountered at this location should be considered very well drained. Prior to measuring the infiltration rates, water was added to the rings to saturate underlying soils until a constant infiltration rate was obtained. Duplicate 15-minute infiltration tests were conducted and the results were averaged (see table above). The infiltration rate is greater than 20"/hr which can be expected in unconsolidated sand-dominated substrata. There were no confining layers encountered.

Q:\2008\P08045\Drawings\P08045-ENV.dwg 1/31/2023 8:32 AM Tmurphy

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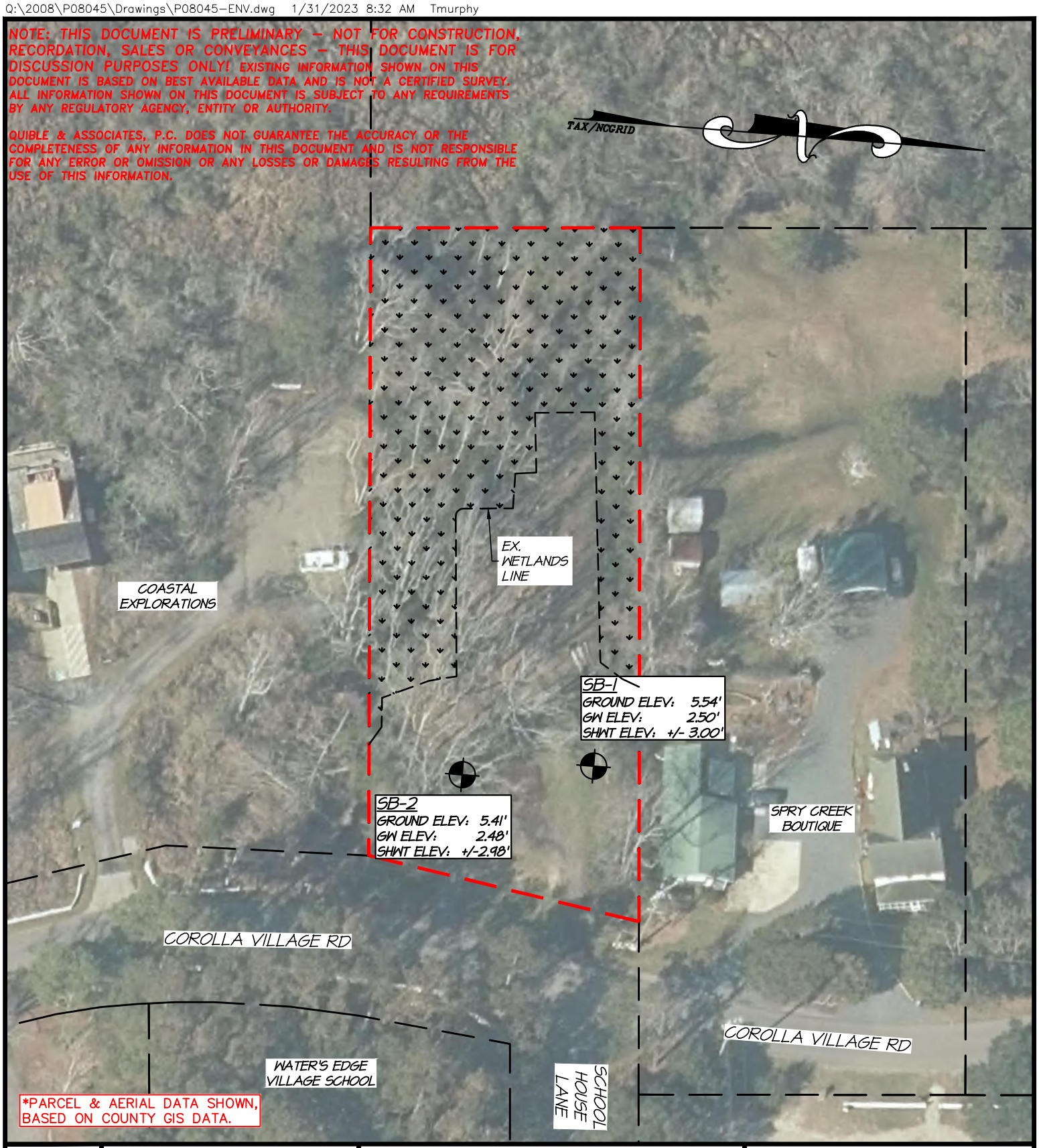

PROJECT	P08045
DRAWN BY	JTM
CHECKED BY	BDR
DATE	01/24/23

SOIL BORING EXHIBIT

1120 COROLLA VILLAGE RD
DUCK LAND CO, LLC

COROLLA CURRTIUCK COUNTY
NORTH CAROLINA

0 50 100
GRAPHIC SCALE IN FEET 1"=50'

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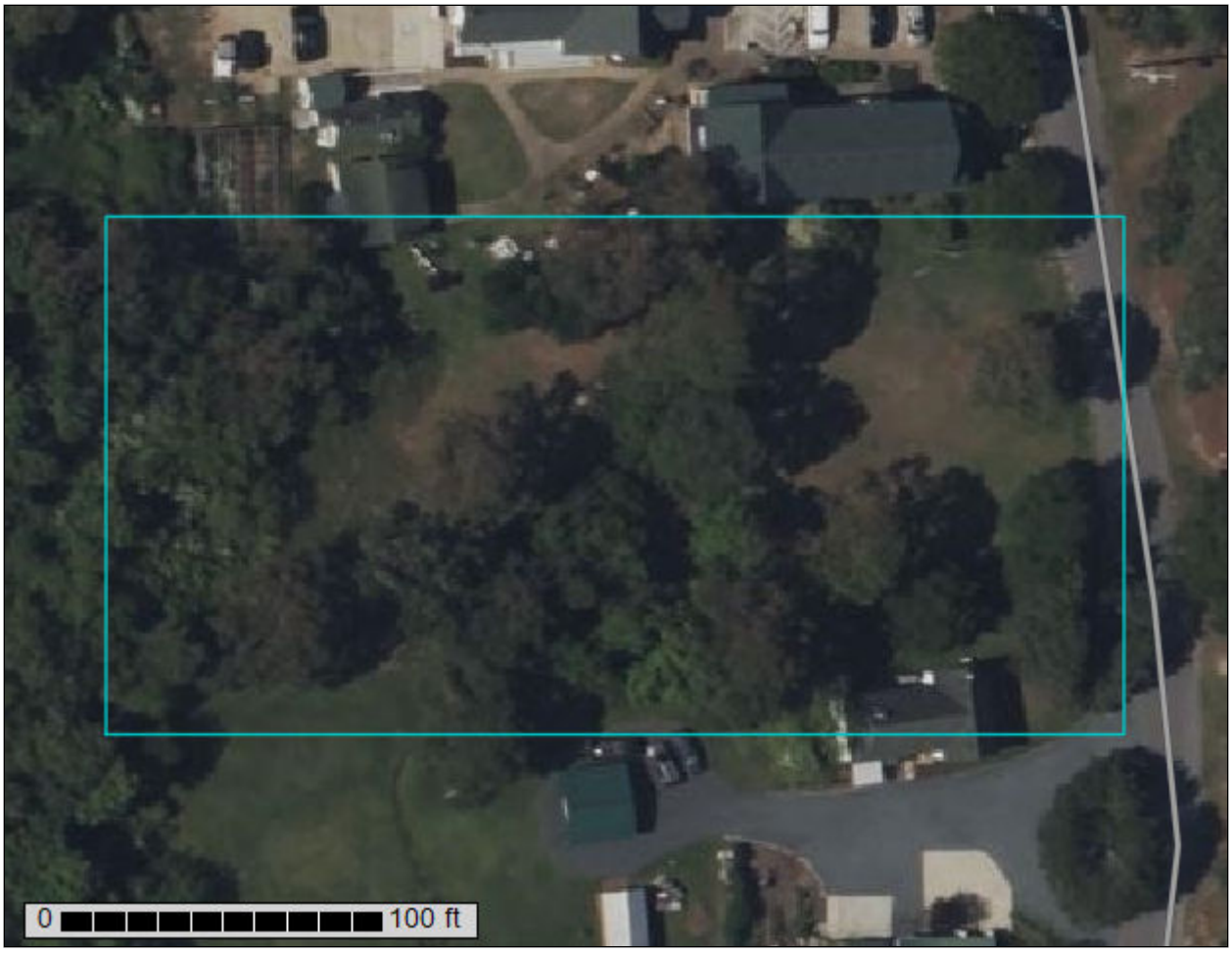
United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Currituck County, North Carolina



August 16, 2024

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

Map Scale: 1:531 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 5 10 20 30

Feet
0 25 50 100 150

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Currituck County, North Carolina
Survey Area Data: Version 23, Sep 13, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: May 18, 2022—May 31, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Os	Osier fine sand	0.5	42.5%
OuB	Ousley fine sand, 0 to 6 percent slopes	0.7	57.5%
Totals for Area of Interest		**1.2**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however,

onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Currituck County, North Carolina

Os—Osier fine sand

Map Unit Setting

National map unit symbol: 3rnw
Elevation: 0 to 20 feet
Mean annual precipitation: 42 to 58 inches
Mean annual air temperature: 61 to 64 degrees F
Frost-free period: 190 to 270 days
Farmland classification: Not prime farmland

Map Unit Composition

Osier, undrained, and similar soils: 80 percent
Osier, drained, and similar soils: 10 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Osier, Undrained

Setting

Landform: Depressions
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Eolian sands and/or beach sand

Typical profile

A - 0 to 3 inches: fine sand
Cg - 3 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: Rare
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: R153BY120NC - Wet Dune Slack
Hydric soil rating: Yes

Description of Osier, Drained

Setting

Landform: Depressions
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Eolian sands and/or beach sand

Typical profile

A - 0 to 3 inches: fine sand
Cg - 3 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: Rare
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: A/D
Ecological site: R153BY120NC - Wet Dune Slack
Hydric soil rating: Yes

Minor Components

Conaby, undrained

Percent of map unit: 5 percent
Landform: Pocosins, depressions
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F153BY060NC - Wet Loamy Flats and Depressions
Hydric soil rating: Yes

OuB—Ousley fine sand, 0 to 6 percent slopes

Map Unit Setting

National map unit symbol: 3rnx
Elevation: 0 to 20 feet
Mean annual precipitation: 42 to 58 inches
Mean annual air temperature: 61 to 64 degrees F
Frost-free period: 190 to 270 days
Farmland classification: Not prime farmland

Map Unit Composition

Ousley and similar soils: 85 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ousley

Setting

Landform: Troughs on dunes
Landform position (two-dimensional): Backslope, toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Eolian sands and/or beach sand

Typical profile

A - 0 to 3 inches: fine sand
C - 3 to 43 inches: fine sand
Cg - 43 to 82 inches: fine sand

Properties and qualities

Slope: 0 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Very high (19.98 to 39.96 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: Rare
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 2.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: A
Ecological site: R153BY110NC - Coastal Strand, Beaches, and Dunes
Hydric soil rating: No

Minor Components

Conaby, undrained

Percent of map unit: 3 percent
Landform: Depressions, pocosins
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F153BY060NC - Wet Loamy Flats and Depressions
Hydric soil rating: Yes

Duckston

Percent of map unit: 2 percent
Landform: Depressions
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R153BY120NC - Wet Dune Slack
Hydric soil rating: Yes

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Appendix 3: NOAA Precipitation Intensity (Currituck County)

NOAA Atlas 14, Volume 2, Version 3
Location name: Corolla, North Carolina, USA*
Latitude: 36.3785°, Longitude: -75.8328°
Elevation: 2 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

G.M. Bonnin, D. Martin, B. Lin, T. Parzybok, M.Yekta, and D. Riley

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.439** (0.398-0.485)	**0.511** (0.463-0.565)	**0.573** (0.520-0.633)	**0.662** (0.598-0.731)	**0.745** (0.670-0.822)	**0.823** (0.738-0.907)	**0.891** (0.797-0.984)	**0.959** (0.852-1.06)	**1.04** (0.915-1.15)	**1.12** (0.979-1.24)
10-min	**0.702** (0.636-0.774)	**0.817** (0.741-0.903)	**0.918** (0.833-1.01)	**1.06** (0.956-1.17)	**1.19** (1.07-1.31)	**1.31** (1.18-1.44)	**1.42** (1.27-1.56)	**1.52** (1.35-1.68)	**1.64** (1.45-1.82)	**1.76** (1.54-1.95)
15-min	**0.877** (0.795-0.968)	**1.03** (0.931-1.14)	**1.16** (1.05-1.28)	**1.34** (1.21-1.48)	**1.50** (1.35-1.66)	**1.66** (1.49-1.83)	**1.79** (1.60-1.98)	**1.92** (1.70-2.12)	**2.07** (1.82-2.29)	**2.21** (1.94-2.45)
30-min	**1.20** (1.09-1.33)	**1.42** (1.29-1.57)	**1.65** (1.50-1.82)	**1.94** (1.75-2.14)	**2.23** (2.01-2.46)	**2.50** (2.24-2.76)	**2.74** (2.45-3.03)	**2.98** (2.65-3.29)	**3.29** (2.90-3.64)	**3.58** (3.13-3.97)
60-min	**1.50** (1.36-1.65)	**1.78** (1.61-1.97)	**2.12** (1.92-2.34)	**2.53** (2.28-2.79)	**2.97** (2.67-3.28)	**3.38** (3.04-3.73)	**3.78** (3.38-4.17)	**4.19** (3.72-4.62)	**4.72** (4.16-5.22)	**5.23** (4.57-5.80)
2-hr	**1.75** (1.58-1.95)	**2.09** (1.88-2.32)	**2.52** (2.27-2.80)	**3.07** (2.76-3.40)	**3.68** (3.30-4.07)	**4.28** (3.81-4.73)	**4.86** (4.30-5.37)	**5.47** (4.82-6.05)	**6.30** (5.49-6.96)	**7.09** (6.13-7.84)
3-hr	**1.87** (1.68-2.10)	**2.23** (2.00-2.50)	**2.71** (2.43-3.03)	**3.31** (2.97-3.70)	**4.02** (3.58-4.48)	**4.72** (4.18-5.24)	**5.41** (4.76-6.01)	**6.16** (5.38-6.83)	**7.19** (6.21-7.97)	**8.19** (7.01-9.09)
6-hr	**2.22** (2.00-2.49)	**2.64** (2.37-2.96)	**3.21** (2.88-3.60)	**3.94** (3.52-4.40)	**4.79** (4.26-5.34)	**5.65** (4.99-6.27)	**6.50** (5.71-7.20)	**7.43** (6.47-8.22)	**8.70** (7.50-9.64)	**9.97** (8.49-11.0)
12-hr	**2.63** (2.36-2.96)	**3.12** (2.79-3.52)	**3.81** (3.41-4.29)	**4.69** (4.18-5.28)	**5.76** (5.09-6.44)	**6.84** (6.00-7.63)	**7.92** (6.90-8.83)	**9.13** (7.87-10.2)	**10.8** (9.18-12.0)	**12.5** (10.5-13.9)
24-hr	**3.11** (2.86-3.41)	**3.79** (3.48-4.15)	**4.89** (4.48-5.36)	**5.82** (5.32-6.36)	**7.19** (6.52-7.84)	**8.37** (7.53-9.12)	**9.66** (8.61-10.5)	**11.1** (9.78-12.1)	**13.2** (11.4-14.4)	**15.0** (12.8-16.5)
2-day	**3.61** (3.31-3.96)	**4.37** (4.01-4.79)	**5.61** (5.14-6.14)	**6.67** (6.10-7.30)	**8.27** (7.49-9.01)	**9.65** (8.67-10.5)	**11.2** (9.94-12.2)	**12.9** (11.3-14.1)	**15.5** (13.3-17.0)	**17.7** (15.0-19.5)
3-day	**3.83** (3.53-4.18)	**4.63** (4.27-5.06)	**5.92** (5.45-6.46)	**7.01** (6.42-7.63)	**8.61** (7.83-9.36)	**9.98** (9.01-10.8)	**11.5** (10.3-12.5)	**13.1** (11.6-14.3)	**15.6** (13.6-17.1)	**17.9** (15.3-19.7)
4-day	**4.04** (3.74-4.40)	**4.90** (4.53-5.34)	**6.23** (5.76-6.78)	**7.34** (6.76-7.97)	**8.95** (8.18-9.71)	**10.3** (9.35-11.2)	**11.8** (10.6-12.8)	**13.4** (11.9-14.5)	**15.8** (13.8-17.2)	**18.0** (15.5-19.8)
7-day	**4.72** (4.38-5.12)	**5.69** (5.28-6.18)	**7.14** (6.61-7.74)	**8.34** (7.70-9.03)	**10.1** (9.25-10.9)	**11.5** (10.5-12.5)	**13.1** (11.8-14.1)	**14.7** (13.2-16.0)	**17.1** (15.1-18.7)	**19.1** (16.6-21.0)
10-day	**5.29** (4.95-5.69)	**6.35** (5.92-6.82)	**7.86** (7.33-8.44)	**9.11** (8.47-9.78)	**10.9** (10.1-11.7)	**12.4** (11.4-13.3)	**14.0** (12.7-15.0)	**15.7** (14.1-16.9)	**18.1** (16.1-19.6)	**20.1** (17.6-21.9)
20-day	**7.19** (6.75-7.68)	**8.56** (8.04-9.15)	**10.4** (9.76-11.1)	**11.9** (11.1-12.7)	**14.1** (13.1-15.0)	**15.8** (14.6-16.9)	**17.7** (16.2-18.9)	**19.6** (17.8-21.0)	**22.4** (20.0-24.1)	**24.6** (21.8-26.6)
30-day	**8.85** (8.35-9.42)	**10.5** (9.92-11.2)	**12.7** (11.9-13.4)	**14.4** (13.5-15.3)	**16.7** (15.6-17.8)	**18.6** (17.3-19.8)	**20.5** (19.0-21.9)	**22.5** (20.7-24.0)	**25.2** (22.9-27.1)	**27.3** (24.6-29.5)
45-day	**10.9** (10.3-11.6)	**12.9** (12.2-13.8)	**15.5** (14.6-16.5)	**17.5** (16.5-18.7)	**20.5** (19.1-21.8)	**22.8** (21.2-24.3)	**25.3** (23.4-26.9)	**27.9** (25.6-29.7)	**31.5** (28.5-33.7)	**34.3** (30.8-36.9)
60-day	**13.1** (12.4-13.9)	**15.5** (14.6-16.4)	**18.3** (17.3-19.3)	**20.5** (19.4-21.7)	**23.6** (22.2-24.9)	**26.0** (24.3-27.5)	**28.4** (26.5-30.2)	**30.9** (28.6-32.9)	**34.3** (31.4-36.7)	**36.9** (33.5-39.6)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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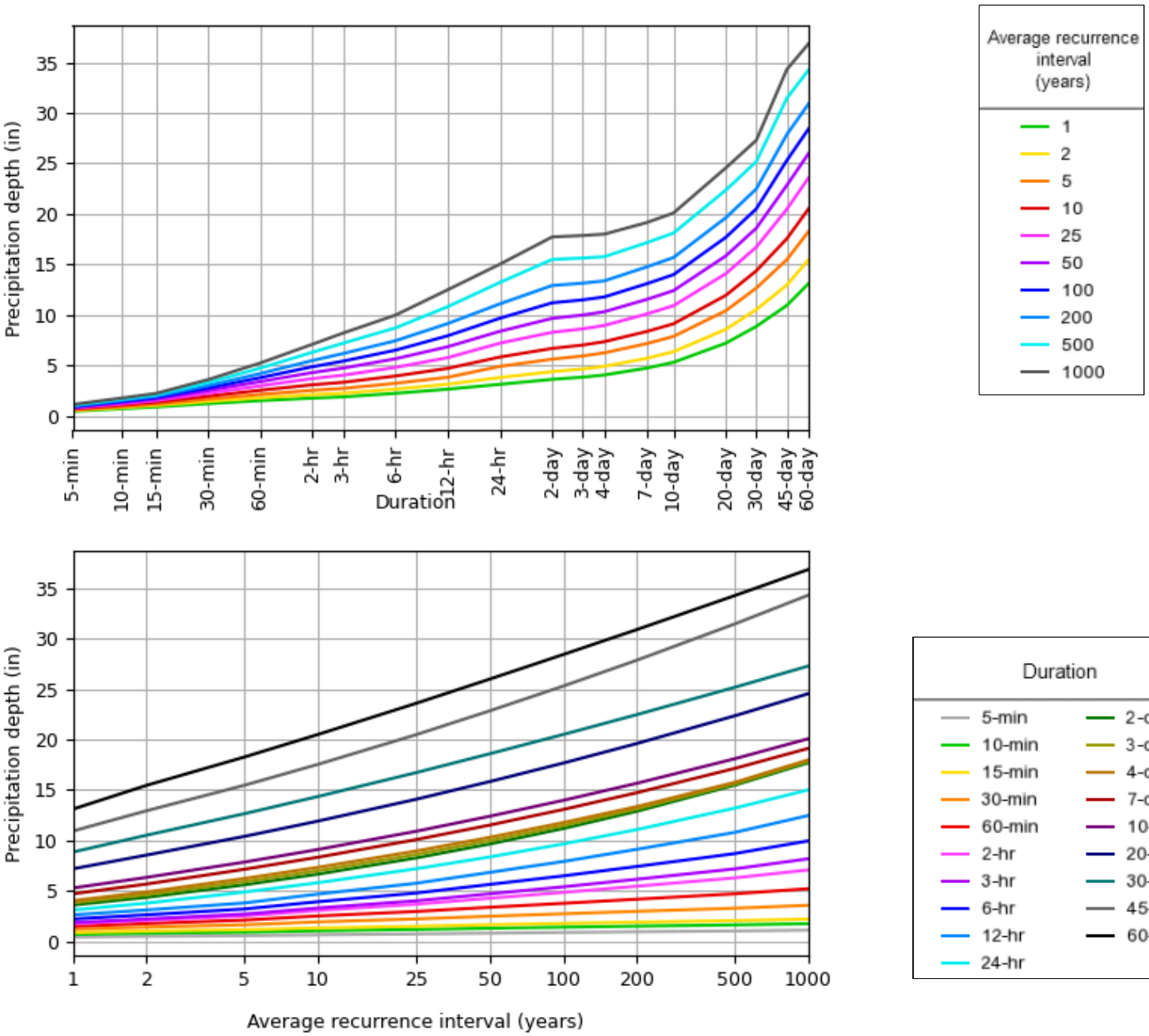
PF graphical

PDS-based depth-duration-frequency (DDF) curves
Latitude: 36.3785°, Longitude: -75.8328°



NOAA Atlas 14, Volume 2, Version 3

Created (GMT): Thu Oct 24 15:21:37 2024

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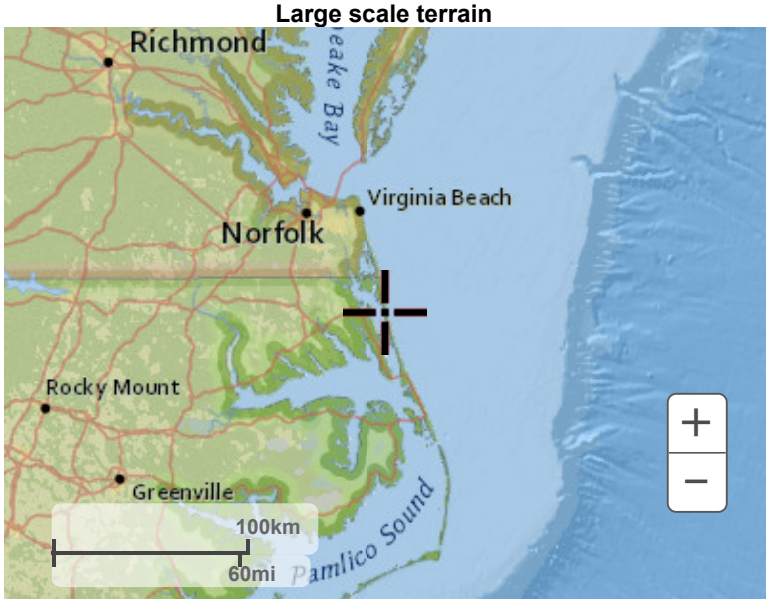
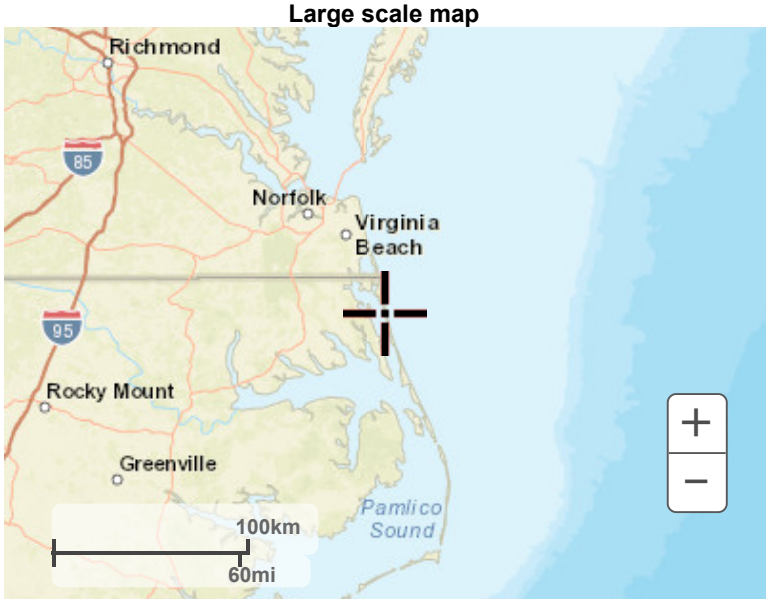
Maps & aerials

Small scale terrain

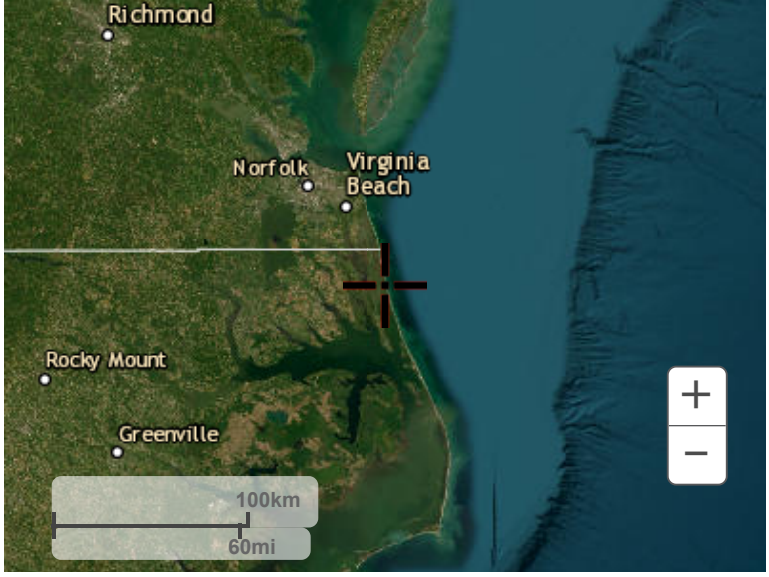
Large scale terrain



Large scale map



Large scale aerial



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US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

Appendix 4: Willingness to Serve (Carolina Water, Inc.)

Carolina Water Service of North Carolina

11/6/2024

Mr. Mike Strader P.E.
WithersRavenel
8466 Caratoke Highway Building 400
Powells Point, North Carolina 27966

RE: Wastewater Willingness & Capability Letter
1120 Corolla Village Rd, Corolla Currituck County NC, (PID 011400000520000)
Monterey Shores WWCS & WWTP

Dear Mr. Strader:

This letter shall serve as notification that Carolina Water Service of North Carolina (CWSNC) has the willingness and capability to provide for wastewater service, 1120 Corolla Village Rd, Corolla, NC, 27927 (PID 011400000520000) project consists of proposed 1,778 sf of floor area at a rate of 60 gpd per 100 sf (1,067 gpd) + 120 gpd (for single bedroom dwelling unit), for estimated total daily wastewater usage of 1,187 gpd equivalent when completed.

All applicable tap fees shall be paid and contractual obligations with CWSNC shall be completed by the project developer, which may include system improvements external to the development site.

If change in use of the proposed subject project has not occurred within twelve (12) months from the date of this letter, this commitment shall expire. If you have and questions or concerns regarding this project, please contact Michael Thomas (Development Project Manager) by email at michael.thomas@corix.com or by phone at (704) 340-5722

Sincerely,

Travis Dupree

Travis Dupree, P.E. – SC & NC
Vice President, Project Management and Engineering

State of North Carolina
Department of Environmental Quality
Division of Water Resources

FAST TRACK SEWER SYSTEM EXTENSION APPLICATION
INSTRUCTIONS FOR FORM: FTA 10-23 & SUPPORTING DOCUMENTATION

This application is for sewer extensions involving gravity sewers, pump stations and force mains, or any combination that has been certified by a professional engineer and the applicant that the project meets the requirements of 15A NCAC 02T and the Division's Minimum Design Criteria (Gravity Sewer & Pump Stations/Force Mains) and that **plans, specifications and supporting documents have been prepared in accordance with 15A NCAC 02T, 15A NCAC 02T .0300, Division policies, and good engineering practices.**

While no upfront engineering design documents are required for submittal, in accordance with 15A NCAC 02T .0305(b), design documents must be prepared prior to submittal of a fast track permit application to the Division. This would include plans, design calculations, and project specifications referenced in 15A NCAC 02T .0305 and the applicable minimum design criteria. **These documents shall be immediately available upon request by the Division.**

Projects that are deemed permitted (do not require a permit from the Division) are explained in 15A NCAC 02T.0303.

Projects not eligible for review via the fast track process (must be submitted for full technical review):

- Projects that do not meet any part of the minimum design criteria (MDC) documents;
- Projects that involve more than one variance from the requirements of 15A NCAC 02T;
- Pressure sewer systems utilizing simplex septic tank-effluent pumps (STEPs) or simplex grinder pumps;
- Simplex STEP or simplex grinder pumps connecting to pressurized systems (e.g. force mains);
- Vacuum sewer systems.

General – When submitting an application, please use the following instructions as a checklist in order to ensure all required items are submitted. Adherence to these instructions and checking the provided boxes will help produce a quicker review time and reduce the amount of requested additional information. **Failure to submit all required items will necessitate additional processing and review time, and may result in return of the application**. Unless otherwise noted, the Applicant shall submit one original and one copy of the application and supporting documentation.

A. One Original and One Copy (second copy may be digital) of Application and Supporting Documents

☒ Required unless otherwise noted. Signatures on original must be "wet ink" or secure digital signatures. Please do not submit engineering design plans with the application unless specifically requested.

B. Cover Letter/Narrative Description (Required for All Application Packages):

☒ List all items included in the application package, as well as a brief description of the requested permitting action.
- Be specific as to the system type, number of homes served, flow allocation required, etc.
- Include the permit number/status of any other required sewer permits (downstream/upstream)
- If necessary for clarity, include attachments to the application form.
- If the project is funded by American Rescue Plan Act (ARPA) funds, please include the ARPA project number in the cover letter and in parentheses under Project Name (Section II.1. of the application).

C. Application Fee (All New and Modification Application Packages):

☒ Submit a check or money order in the amount of **$600.00,** dated no more than 90 days prior to application submittal.
- Payable to North Carolina Department of Environmental Quality (NCDEQ)

D. Fast Track Application (Required for All Application Packages, Form FTA 10-23):

☒ Submit the completed and appropriately executed application.
- If necessary for clarity or due to space restrictions, attachments to the application may be made.

☐ If the Applicant Type in Item I.2 is a corporation or company, provide documentation it is registered for business with the North Carolina Secretary of State.

☐ If the Applicant Type in Item I.2 is a partnership or d/b/a, enclose a copy of the certificate filed with the Register of Deeds in the county of business.

☒ The Project Name in Item II.1 shall be consistent with the project name on the flow acceptance letters, agreements, etc.

☒ The Professional Engineer's Certification on Page 5 of the application shall be signed, sealed and dated by a North Carolina licensed Professional Engineer.

☒ The Applicant's Certification on Page 5 of the application shall be signed in accordance with 15A NCAC 02T .0106(b). Per 15A NCAC 02T .0106(c), an alternate person may be designated as the signing official if a delegation letter is provided from a person who meets the criteria in 15A NCAC 02T .0106(b).

E. Flow Tracking/Acceptance Form (Form: FTSE 10-23) (If Applicable):

☒ Submit the completed and executed FTSE form from the owners of the downstream sewers and treatment facility.

- Multiple forms maybe required where the downstream sewer owner and wastewater treatment facility are different.
- The flow acceptance indicated in form FTSE must not expire prior to permit issuance and must be dated less than one year prior to the application date.
- Submittal of this application and form FTSE indicates that owner has adequate capacity and will not violate G.S. 143-215.67(a).
- Intergovernmental agreements or other contracts will not be accepted in lieu of a project-specific FTSE.

F. Site Maps (All Application Packages):

☒ Submit an 8.5-inch x 11-inch color copy of a USGS Topographic Map of sufficient scale to identify the entire project area, including the closest surface waters.

- General location of the project components (gravity sewer, pump stations, & force main)
- Downstream connection points and permit number (if known) for the receiving sewer

☒ Include an aerial location map showing general project area (such as street names or latitude/longitude) so that Division staff can easily locate it in the field.

G. Existing Permit (Application Packages for Modifications to an Existing Permit):

☐ Submit a copy of the most recently issued existing permit.

☐ **Include a descriptive and clear narrative identifying the previously permitted items to remain in the permit, items to be added, and/or items to be modified** (the application form itself should include only include items to be added/modified). The narrative should also include whether any previously permitted items have been certified.

☐ **The narrative should clearly identify the requested permitting action and accurately describe the sewers to be listed in the final permit.**

H. Power Reliability Plan (Required if portable reliability option utilized for Pump Station):

☒ Per 15A NCAC 02T .0305(h)(1), submit documentation of power reliability for pumping stations.

- This alternative is only available for average daily flows less than 15,000 gallons per day
- It shall be demonstrated to the Division that the portable source is owned or contracted by the applicant and is compatible with the station. The Division will accept a letter signed by the applicant (see 15A NCAC 02T .0106(b)) or proposed contractor, stating that "the portable power generation unit or portable, independently-powered pumping units, associated appurtenances and personnel are available for distribution and operation of this pump station."
- **If the portable power source or pump is dedicated to multiple pump stations, an evaluation of all the pump stations' storage capacities and the rotation schedule of the portable power source or pump, including travel timeframes, shall be provided in the case of a multiple station power outage. (Required at time of certification)**

I. Certificate of Public Convenience and Necessity (All Application Packages for Privately-Owned Public Utilities):

☒ Per 15A NCAC 02T .0115(a)(1) provide the Certificate of Public Convenience and Necessity from the North Carolina Utilities Commission demonstrating the Applicant is authorized to hold the utility franchise for the area to be served by the sewer extension, or

☐ Provide a letter from the North Carolina Utilities Commission's Water and Sewer Division Public Staff stating an application for a franchise has been received and that the service area is contiguous to an existing franchised area or that franchise approval is expected.

J. Operational Agreements (Applications from HOA/POA and Developers for lots to be sold):

☐ Home/Property Owners' Associations

- ☐ Per 15A NCAC 02T .0115(c), submit the properly executed Operational Agreement (FORM: HOA).
- ☐ Per 15A NCAC 02T .0115(c), submit a copy of the Articles of Incorporation, Declarations and By-laws.

☐ Developers of lots to be sold

- ☐ Per 15A NCAC 02T .0115(b), submit the properly executed Operational Agreement (FORM: DEV).

For more information, visit the Division's collection systems website

THE COMPLETED APPLICATION PACKAGE INCLDING ALL SUPPORTING INFORMATION AND MATERIALS, SHOULD BE SENT TO THE APPROPRIATE REGIONAL OFFICE:

REGIONAL OFFICE	ADDRESS	COUNTIES SERVED
Asheville Regional Office Water Quality Section	2090 US Highway 70 Swannanoa, North Carolina 28778-8211 (828) 296-4500 (828) 299-7043 Fax	Avery, Buncombe, Burke, Caldwell, Cherokee, Clay, Graham, Haywood, Henderson, Jackson, Macon, Madison, McDowell, Mitchell, Polk, Rutherford, Swain, Transylvania, Yancey
Fayetteville Regional Office Water Quality Section	225 Green Street Suite 714 Fayetteville, North Carolina 28301-5095 (910) 433-3300 (910) 486-0707 Fax	Anson, Bladen, Cumberland, Harnett, Hoke, Montgomery, Moore, Robeson, Richmond, Sampson, Scotland
Mooresville Regional Office Water Quality Section	610 E. Center Avenue Mooresville, North Carolina 28115 (704) 663-1699 (704) 663-6040 Fax	Alexander, Cabarrus, Catawba, Cleveland, Gaston, Iredell, Lincoln, Mecklenburg, Rowan, Stanly, Union
Raleigh Regional Office Water Quality Section	3800 Barrett Drive Raleigh, North Carolina 27609 (919) 791-4200 (919) 571-4718 Fax	Chatham, Durham, Edgecombe, Franklin, Granville, Halifax, Johnston, Lee, Nash, Northampton, Orange, Person, Vance, Wake, Warren, Wilson
Washington Regional Office Water Quality Section	943 Washington Square Mall Washington, North Carolina 27889 (252) 946-6481 (252) 975-3716 Fax	Beaufort, Bertie, Camden, Chowan, Craven, Currituck, Dare, Gates, Greene, Hertford, Hyde, Jones, Lenoir, Martin, Pamlico, Pasquotank, Perquimans, Pitt, Tyrrell, Washington, Wayne
Wilmington Regional Office Water Quality Section	127 Cardinal Drive Extension Wilmington, North Carolina 28405 (910) 796-7215 (910) 350-2004 Fax	Brunswick, Carteret, Columbus, Duplin, New Hanover, Onslow, Pender
Winston-Salem Regional Office Water Quality Section	450 W. Hanes Mill Road Suite 300 Winston-Salem, North Carolina 27105 (336) 776-9800 (336) 776-9797 Fax	Alamance, Alleghany, Ashe, Caswell, Davidson, Davie, Forsyth, Guilford, Rockingham, Randolph, Stokes, Surry, Watauga, Wilkes, Yadkin

State of North Carolina
Department of Environmental Quality
Division of Water Resources

FAST TRACK SEWER SYSTEM EXTENSION APPLICATION
FTA 10-23 & SUPPORTING DOCUMENTATION

Application Number: _____ (to be completed by DWR)

All items must be completed or the application will be returned

I. APPLICANT INFORMATION:

1. Applicant's name: Carolina Water Service of NC (company, municipality, HOA, utility, etc.)
2. Applicant type: ☐ Individual ☐ Corporation ☐ General Partnership ☒ Privately-Owned Public Utility
   ☐ Federal ☐ State/County ☐ Municipal ☐ Other
3. Signature authority's name: Travis Dupree per 15A NCAC 02T .0106(b)
   Title: VP of Engineering
4. Applicant's mailing address: 4944 Parkway Plaza Blvd, Suite 375
   City: Charlotte State: NC Zip: 28217-____
5. Applicant's contact information:
   Phone number: (800) 525-7990 Email Address: travis.dupree@corix.com

II. PROJECT INFORMATION:

1. Project name: 1120 Corolla Village Road
2. Application/Project status: ☒ Proposed (New Permit) ☐ Existing Permit/Project ☐ ARPA funded
   If a modification, provide the existing permit number: WQ00_____ and issued date: _____,
   For modifications, also attach a detailed narrative description as described in Item G of the checklist.
   If new construction, but part of a master plan, provide the existing permit number: WQ00_____
3. County where project is located: Currituck
4. Approximate Coordinates (Decimal Degrees): Latitude: 36.3785° Longitude: -75.8324°
5. Parcel ID (if applicable): 0114-000-0052-0000 (or Parcel ID to closest downstream sewer)

III. CONSULTANT INFORMATION:

1. Professional Engineer: Mark S. Bissell License Number: 010362
   Firm: Bissell Professional Group
   Mailing address: P.O. Box 1068
   City: Kitty Hawk State: NC Zip: 27949-____
   Phone number: (252) 261-3266 Email Address: mark@bissellprofessionalgroup.com

IV. WASTEWATER TREATMENT FACILITY (WWTF) INFORMATION:

1. Facility Name: Monteray Shores WWTP Permit Number: WQ00097720
   Owner Name: Carolina Water Service of NC

V. RECEIVING DOWNSTREAM SEWER INFORMATION:

1. Permit Number(s): WQ_____
2. Downstream (Receiving) Sewer Information: _____ inch ☐ Gravity ☐ Force Main
3. System Wide Collection System Permit Number(s) (if applicable): WQCS_____
   Owner Name(s): _____

VI. GENERAL REQUIREMENTS

1. If the Applicant is a Privately-Owned Public Utility, has a Certificate of Public Convenience and Necessity been attached?

   ☒ Yes ☐ No ☐ N/A

2. If the Applicant is a Developer of lots to be sold, has a Developer's Operational Agreement (FORM: DEV) been attached?

   ☐ Yes ☐ No ☒ N/A

3. If the Applicant is a Home/Property Owners' Association, has an HOA/POA Operational Agreement (FORM: HOA) and supplementary documentation as required by 15A NCAC 02T.0115(c) been attached?

   ☐ Yes ☐ No ☒ N/A

4. Origin of wastewater: (check all that apply):

☒ Residential (Individually Owned)	☐ Retail (stores, centers, malls)	☐ Car Wash
☐ Residential (Leased)	☐ Retail with food preparation/service	☐ Hotel and/or Motels
☐ School / preschool / day care	☐ Medical / dental / veterinary facilities	☐ Swimming Pool/Clubhouse
☒ Food and drink facilities	☐ Church	☐ Swimming Pool/Filter Backwash
☐ Businesses / offices / factories	☐ Nursing Home	☐ Other (Explain in Attachment)

5. Nature of wastewater : 18 % Domestic 82 % Commercial _____ % Industrial (See 15A NCAC 02T .0103(20))
   If Industrial, is there a Pretreatment Program in effect? ☐ Yes ☐ No

6. Has a flow reduction been approved under 15A NCAC 02T .0114(f)? ☐ Yes ☒ No
   - **If yes, provide a copy of flow reduction approval letter with this application**

7. Summarize wastewater generated by project:

Establishment Type (see 02T.0114(f))	Daily Design Flow [a,b]	No. of Units	Flow
Residential -lodging unit	120 gal/unit	1	120 GPD
Specialty food service	50 gal/100 sq ft floor space	1778 sq ft	890 GPD
Reserve	70 gal/	1	70 GPD
	gal/		GPD
	gal/		GPD
	gal/		GPD
		Total	1,080 GPD

   a See 15A NCAC 02T .0114(b), (d), (e)(1) and (e)(2) for caveats to wastewater design flow rates (i.e. proposed unknown non-residential development uses; public access facilities located near high public use areas; and residential property located south or east of the Atlantic Intracoastal Waterway to be used as vacation rentals as defined in G.S. 42A-4).

   b Per 15A NCAC 02T .0114(c), design flow rates for establishments not identified [in table 15A NCAC 02T.0114] shall be determined using available flow data, water using fixtures, occupancy or operation patterns, and other measured data.

8. Wastewater generated by project: 1,080 GPD (per 15A NCAC 02T .0114 and G.S. 143-215.1)
   - Do not include future flows or previously permitted allocations

   If permitted flow is zero, please indicate why:

   ☐ Pump Station/Force Main or Gravity Sewer where flow will be permitted in subsequent permits that connect to this line. Please provide supplementary information indicating the approximate timeframe for permitting upstream sewers with flow.

   ☐ Flow has already been allocated in Permit Number: _____ Issuance Date: _____

   ☐ Rehabilitation or replacement of existing sewers with no new flow expected

   ☐ Other (Explain): _____

VII. GRAVITY SEWER DESIGN CRITERIA (If Applicable) - 02T .0305 & MDC (Gravity Sewers):

1. Summarize gravity sewer to be permitted:

Size (inches)	Length (feet)	Material

- Section II & III of the MDC for Permitting of Gravity Sewers contains information related to design criteria
- Section III contains information related to minimum slopes for gravity sewer(s)
- **Oversizing lines to meet minimum slope requirements is not allowed and a violation of the MDC**

VIII. PUMP STATION DESIGN CRITERIA (If Applicable) – 02T .0305 & MDC (Pump Stations/Force Mains):

PROVIDE A SEPARATE COPY OF THIS PAGE FOR EACH PUMP STATION INCLUDED IN THIS PROJECT

1. Pump station number or name: #1
2. Approximate Coordinates (Decimal Degrees): Latitude: 36.3785° Longitude: -75.8324°
3. Total number of pumps at the pump station: 2
3. Design flow of the pump station: 0.1152 millions gallons per day (firm capacity)
   - This should reflect the total GPM for the pump station with the largest pump out of service.
4. Operational point(s) per pump(s): 11 gallons per minute (GPM) at 17 feet total dynamic head (TDH)
5. Summarize the force main to be permitted (for this Pump Station):

Size (inches)	Length (feet)	Material
1.5	212	PVC sch 80

If any portion of the force main is less than 4-inches in diameter, please identify the method of solids reduction per MDCPSFM Section 2.01C.1.b. ☒ Grinder Pump ☐ Mechanical Bar Screen ☐ Other (please specify) _____

6. Power reliability in accordance with 15A NCAC 02T .0305(h)(1):

☐ Standby power source or ☐ Standby pump

- Must have automatic activation and telemetry - 15A NCAC 02T.0305(h)(1)(B):
- Required for all pump stations with an average daily flow greater than or equal to 15,000 gallons per day
- **Must be permanent to facility** and may not be portable

Or if the pump station has an average daily flow less than 15,000 gallons per day 15A NCAC02T.0305(h)(1)(C):

☒ Portable power source with manual activation, quick-connection receptacle and telemetry -

or

☐ Portable pumping unit with plugged emergency pump connection and telemetry:

- Include documentation that the portable source is owned or contracted by the applicant and is compatible with the station.
- If the portable power source or pump is dedicated to multiple pump stations, an evaluation of all the pump stations' storage capacities and the rotation schedule of the portable power source or pump, including travel timeframes, shall be provided as part of this permit application in the case of a multiple station power outage.

IX. SETBACKS & SEPARATIONS – (02B .0200 & 15A NCAC 02T .0305(f)):

1. Does the project comply with all separations/alternatives found in 15A NCAC 02T .0305(f) & (g)? ☒ Yes ☐ No

15A NCAC 02T.0305(f) contains minimum separations that shall be provided for sewer systems:

Setback Parameter*	Separation Required
Storm sewers and other utilities not listed below (vertical)	18 inches
[2]Water mains (vertical - water over sewer preferred, including in benched trenches)	18 inches
[2]Water mains (horizontal)	10 feet
Reclaimed water lines (vertical - reclaimed over sewer)	18 inches
Reclaimed water lines (horizontal - reclaimed over sewer)	2 feet
**Any private or public water supply source, including any wells, WS-I waters of Class I or Class II impounded reservoirs used as a source of drinking water, and associated wetlands.	100 feet
**Waters classified WS (except WS-I or WS-V), B, SA, ORW, HQW, or SB from normal high water (or tide elevation) and wetlands associated with these waters (see item IX.2)	50 feet
**Any other stream, lake, impoundment, or ground water lowering and surface drainage ditches, as well as wetlands associated with these waters or classified as WL.	10 feet
Any building foundation (horizontal)	5 feet
Any basement (horizontal)	10 feet
Top slope of embankment or cuts of 2 feet or more vertical height	10 feet
Drainage systems and interceptor drains	5 feet
Any swimming pools	10 feet
Final earth grade (vertical)	36 inches

- If noncompliance with 02T.0305(f) or (g), see Section X.1 of this application

*15A NCAC 02T.0305(g) contains alternatives where separations in 02T.0305(f) cannot be achieved. Please check "yes" above if these alternatives are used and provide narrative information to explain.
**Stream classifications can be identified using the Division's NC Surface Water Classifications webpage

2. Does this project comply with the minimum separation requirements for water mains? ☒ Yes ☐ No ☐ N/A
   - If no, please refer to 15A NCAC 18C.0906(f) for documentation requirements and submit a separate document, signed/sealed by an NC licensed PE, verifying the criteria outlined in that Rule.

3. Does the project comply with separation requirements for wetlands? ☒ Yes ☐ No ☐ N/A
   - Please provide supplementary information identifying the areas of non-conformance.
   - See the Division's draft separation requirements for situations where separation cannot be met.
   - No variance is required if the alternative design criteria specified is utilized in design and construction.

4. Is the project located in a river basin subject to any State buffer rules? ☐ Yes Basin name: _____ ☒ No
   If yes, does the project comply with setbacks found in the river basin rules per 15A NCAC 02B .0200? ☐ Yes ☐ No
   - This includes Trout Buffered Streams per 15A NCAC 2B.0202

5. Does the project require coverage/authorization under a 404 Nationwide/individual permits or 401 Water Quality Certifications? ☐ Yes ☒ No
   - Please provide the permit number/permitting status in the cover letter if coverage/authorization is required.

6. Does project comply with 15A NCAC 02T.0105(c)(6) (additional permits/certifications)? ☒ Yes ☐ No
   Per 15A NCAC 02T.0105(c)(6), directly related environmental permits or certification applications must be being prepared, have been applied for, or have been obtained. Issuance of this permit is contingent on issuance of dependent permits (erosion and sedimentation control plans, stormwater management plans, etc.).

7. Does this project include any sewer collection lines that are deemed "high-priority?" ☐ Yes ☒ No
   Per 15A NCAC 02T.0402, "high-priority sewer" means any aerial sewer, sewer contacting surface waters, siphon, or sewers positioned parallel to streambanks that are subject to erosion that undermines or deteriorates the sewer. **Siphons and sewers suspended through interference/conflict boxes require a variance approval.**
   - If yes, include an attachment with details for each line, including type (aerial line, size, material, and location).

   High priority lines shall be inspected by the permittee or its representative at least once every six-months and inspections documented per 15A NCAC 02T.0403(a)(5) or the permittee's individual System-Wide Collection permit.

X. CERTIFICATIONS:

1. Does the submitted system comply with 15A NCAC 02T, the Minimum Design Criteria for the Permitting of Pump Stations and Force Mains (latest version), and the Gravity Sewer Minimum Design Criteria (latest version) as applicable?

   ☒ Yes ☐ No

   If no, for projects requiring a single variance, complete and submit the Variance/Alternative Design Request application (VADC 10-14) and supporting documents for review to the Central Office. **Approval of the request will be issued concurrently with the approval of the permit, and projects requiring a variance approval may be subject to longer review times. For projects requiring two or more variances or where the variance is determined by the Division to be a significant portion of the project, the full technical review is required.**

2. Professional Engineer's Certification:

   I, _____, attest that this application for _____
   (Professional Engineer's name from Application Item III.1.) (Project Name from Application Item II.1)

   has been reviewed by me and is accurate, complete and consistent with the information supplied in the plans, specifications, engineering calculations, and all other supporting documentation to the best of my knowledge. I further attest that to the best of my knowledge the proposed design has been prepared in accordance with the applicable regulations, Minimum Design Criteria for Gravity Sewers (latest version), and the Minimum Design Criteria for the Fast-Track Permitting of Pump Stations and Force Mains (latest version). Although other professionals may have developed certain portions of this submittal package, inclusion of these materials under my signature and seal signifies that I have reviewed this material and have judged it to be consistent with the proposed design.

   NOTE – In accordance with General Statutes 143-215.6A and 143-215.6B, any person who knowingly makes any false statement, representation, or certification in any application package shall be guilty of a Class 2 misdemeanor, which may include a fine not to exceed $10,000, as well as civil penalties up to $25,000 per violation. Misrepresentation of the application information, including failure to disclose any design non-compliance with the applicable Rules and design criteria, may subject the North Carolina-licensed Professional Engineer to referral to the licensing board. (21 NCAC 56.0701)

   North Carolina Professional Engineer's seal, signature, and date:

3. Applicant's Certification per 15A NCAC 02T .0106(b):

   I, _____, attest that this application for _____
   (Signature Authority Name from Application Item I.3.) (Project Name from Application Item II.1)

   attest that this application has been reviewed by me and is accurate and complete to the best of my knowledge. I understand that if all required parts of this application are not completed and that if all required supporting documentation and attachments are not included, this application package is subject to being returned as incomplete. I understand that any discharge of wastewater from this non-discharge system to surface waters or the land will result in an immediate enforcement action that may include civil penalties, injunctive relief, and/or criminal prosecution. I will make no claim against the Division of Water Resources should a condition of this permit be violated. I also understand that if all required parts of this application package are not completed and that if all required supporting information and attachments are not included, this application package will be returned to me as incomplete.

   NOTE – In accordance with General Statutes 143-215.6A and 143-215.6B, any person who knowingly makes any false statement, representation, or certification in any application package shall be guilty of a Class 2 misdemeanor, which may include a fine not to exceed $10,000 as well as civil penalties up to $25,000 per violation.

Signature: _____ Date: _____

State of North Carolina
Department of Environmental Quality
Division of Water Resources

Flow Tracking for Sewer Extension Applications
(FTSE 10-23)

Entity Requesting Allocation: Duck Land Co., LLC

Project Name for which flow is being requested: 1120 Corolla Village Road

More than one FTSE may be required for a single project if the owner of the WWTP is not responsible for all pump stations along the route of the proposed wastewater flow.

I. Complete this section only if you are the owner of the wastewater treatment plant.

a. WWTP Facility Name: Monteray Shores WWTP
b. WWTP Facility Permit #: WQ00097720

	All flows are in MGD
c. WWTP facility's permitted flow	0.720
d. Estimated obligated flow not yet tributary to the WWTP	0.029775
e. WWTP facility's actual avg. flow	0.191005
f. Total flow for this specific request	0.00108
g. Total actual and obligated flows to the facility	0.221860
h. Percent of permitted flow used	30.81%

II. Complete this section for each pump station you are responsible for along the route of this proposed wastewater flow.

List pump stations located between the project connection point and the WWTP:

Pump Station (Name or Number)	Pump Station Permit No.	Firm Capacity, * MGD	**(A)** Design Average Daily Flow** (Firm / pf), MGD	**(B)** Approx. Current Avg. Daily Flow, MGD	**(C)** Obligated, Not Yet Tributary Daily Flow, MGD	**(D)=(B+C)** Total Current Flow Plus Obligated Flow	**(E)=(A-D)** Available Capacity***
None							

*** The Firm Capacity (design flow) of any pump station is defined as the maximum pumped flow that can be achieved with the largest pump taken out of service.**

**** Design Average Daily Flow is the firm capacity of the pump station divided by a peaking factor (pf) not less than 2.5, per Section 2.02(A)(4)(c) of the Minimum Design Criteria.**

***** A Planning Assessment Addendum shall be attached for each pump station located between the project connection point and the WWTP where the Available Capacity is ≤ 0.**

Downstream Facility Name (Sewer): _____

Downstream Permit Number: _____

III. Certification Statement:

I Travis Dupree, VP of Engineering certify to the best of my knowledge that the addition of the volume of wastewater to be permitted in this project has been evaluated along the route to the receiving wastewater treatment facility and that the flow from this project is not anticipated to cause any capacity related sanitary sewer overflows or overburden any downstream pump station en route to the receiving treatment plant under normal circumstances, given the implementation of the planned improvements identified in the planning assessment where applicable. This analysis has been performed in accordance with local established policies and procedures using the best available data. This certification applies to those items listed above in Sections I and II plus all attached planning assessment addendums for which I am the responsible party. Signature of this form certifies that the receiving collection system or treatment works has adequate capacity to transport and treat the proposed new wastewater.

11/11/2024

Signing Official Signature *Date*

VP, Project Mgt & Eng

Title of Signing Official

WithersRavenel
Our People. Your Success.

October 24, 2024

Caitlin Spear

NCDOT
1929 North Road St.
Elizabeth City, NC 27909

Re:

Right of Way Encroachment &
Driveway Access Agreement
1120 Corolla Village Rd
Corolla, Currituck County, North Carolina

Ms. Spear,

On behalf of TFP, LLC, WithersRavenel hereby submits for your review and approval a Two-Party Right of Way Encroachment and Driveway Access Agreement for a development located at 1120 Corolla Village Rd. in Corolla, Currituck County, NC. The following is attached and shall be considered part of this package:

1. A digital copy of the executed Street and Driveway Access Permit Application;
2. A digital copy of the executed Two Party Right-of-Way Encroachment Agreement for entrance removal, entrance installation, driveway culvert, hydrant, water service and grading;
3. A digital copy of the sealed plan sheet.

At your earliest convenience, please review and do not hesitate to contact me by email at ndashti@quible.com or by phone at (252) 491-8147 should you have any questions or require any additional information.

Thank you for your time and attention to this project.

Sincerely,
WithersRavenel

Nadeen Dashti
Staff Professional II

APPLICATION IDENTIFICATION		N.C. DEPARTMENT OF TRANSPORTATION STREET AND DRIVEWAY ACCESS PERMIT APPLICATION
Driveway Permit No.	Date of Application	
County: Currituck County		
Development Name: 1120 Corolla Village Rd		

LOCATION OF PROPERTY:

Route/Road: SR 1185 (Corolla Village Rd)

Exact Distance 0 ☐ Miles ☐ Feet N ☐ S ☐ E ☐ W ☐

From the Intersection of Route No. SR 1185 and Route No. SR 1406 Toward _____

Property Will Be Used For: ☐ Residential /Subdivision ☒ Commercial ☐ Educational Facilities ☐ TND ☐ Emergency Services ☐ Other

Property: ☒ is ☐ is not within General Business City Zoning Area.

AGREEMENT

- I, the undersigned property owner, request access and permission to construct driveway(s) or street(s) on public right-of-way at the above location.
- I agree to construct and maintain driveway(s) or street entrance(s) in absolute conformance with the current "Policy on Street and Driveway Access to North Carolina Highways" as adopted by the North Carolina Department of Transportation.
- I agree that no signs or objects will be placed on or over the public right-of-way other than those approved by NCDOT.
- I agree that the driveway(s) or street(s) will be constructed as shown on the attached plans.
- I agree that that driveway(s) or street(s) as used in this agreement include any approach tapers, storage lanes or speed change lanes as deemed necessary.
- I agree that if any future improvements to the roadway become necessary, the portion of driveway(s) or street(s) located on public right-of-way will be considered the property of the North Carolina Department of Transportation, and I will not be entitled to reimbursement or have any claim for present expenditures for driveway or street construction.
- I agree that this permit becomes void if construction of driveway(s) or street(s) is not completed within the time specified by the "Policy on Street and Driveway Access to North Carolina Highways".
- I agree to pay a $50 construction inspection fee. Make checks payable to NCDOT. This fee will be reimbursed if application is denied.
- I agree to construct and maintain the driveway(s) or street(s) in a safe manner so as not to interfere with or endanger the public travel.
- I agree to provide during and following construction proper signs, signal lights, flaggers and other warning devices for the protection of traffic in conformance with the current "Manual on Uniform Traffic Control Devices for Streets and Highways" and Amendments or Supplements thereto. Information as to the above rules and regulations may be obtained from the District Engineer.
- I agree to indemnify and save harmless the North Carolina Department of Transportation from all damages and claims for damage that may arise by reason of this construction.
- I agree that the North Carolina Department of Transportation will assume no responsibility for any damages that may be caused to such facilities, within the highway right-of-way limits, in carrying out its construction.
- I agree to provide a Performance and Indemnity Bond in the amount specified by the Division of Highways for any construction proposed on the State Highway system.
- The granting of this permit is subject to the regulatory powers of the NC Department of Transportation as provided by law and as set forth in the N.C. Policy on Driveways and shall not be construed as a contract access point.
- I agree that the entire cost of constructing and maintaining an approved private street or driveway access connection and conditions of this permit will be borne by the property owner, the applicant, and their grantees, successors, and assignees.
- **I AGREE TO NOTIFY THE DISTRICT ENGINEER WHEN THE PROPOSED WORK BEGINS AND WHEN IT IS COMPLETED.**

SIGNATURES OF APPLICANT

PROPERTY OWNER (APPLICANT)		WITNESS	
COMPANY	TFP, LLC - Douglas A. Twiddy	NAME	Carole W. Thompson
SIGNATURE		SIGNATURE	Carole W. Thompson
ADDRESS	1181 Duck Rd. Duck, NC 27949	ADDRESS	3634 Va. Dare Trl N.
	Phone No. 252-457-1177		Kitty Hawk, NC 27949

AUTHORIZED AGENT		WITNESS	
COMPANY	WithersRavenel	NAME	WithersRavenel
SIGNATURE		SIGNATURE	
ADDRESS	8466 Caratoke Hwy Powells Point, NC 27966	ADDRESS	8466 Caratoke Hwy Powells Point, NC 27966
	Phone No. 252-202-7112		

APPROVALS

APPLICATION RECEIVED BY DISTRICT ENGINEER

SIGNATURE DATE

APPLICATION APPROVED BY LOCAL GOVERNMENTAL AUTHORITY (when required)

SIGNATURE TITLE DATE

APPLICATION APPROVED BY NCDOT

SIGNATURE TITLE DATE

INSPECTION BY NCDOT

SIGNATURE TITLE DATE

COMMENTS:

STATE OF NORTH CAROLINA

ROUTE 1185 PROJECT 1120 COROLLA VILLAGE RD COUNTY OF CURRITUCK

DEPARTMENT OF TRANSPORTATION

-AND-

TFP, LLC

RIGHT OF WAY ENCROACHMENT AGREEMENT FOR NON-UTILITY ENCROACHMENTS ON PRIMARY AND SECONDARY HIGHWAYS

THIS AGREEMENT, made and entered into this the 23rd day of August, 20 24, by and between the Department of Transportation, party of the first part; and TFP, LLC party of the second part,

WITNESSETH

THAT WHEREAS, the party of the second part desires to encroach on the right of way of the public road designated as Route(s) SR 1185, located AT THE INTERSECTION OF SR1185 AND SR1406 (SCHOOLHOUSE LN)

with the construction and/or erection of: removal of the existing entrances, installation of a single concrete entrance, 31 LF of 15" CL IV RCP driveway culvert and associated grading. Project also proposes a new hydrant and water service.

WHEREAS, it is to the material advantage of the party of the second part to effect this encroachment, and the party of the first part in the exercise of authority conferred upon it by statute, is willing to permit the encroachment within the limits of the right of way as indicated, subject to the conditions of this agreement;

NOW, THEREFORE, IT IS AGREED that the party of the first part hereby grants to the party of the second part the right and privilege to make this encroachment as shown on attached plan sheet(s), specifications and special provisions which are made a part hereof upon the following conditions, to wit:

That the said party of the second part binds and obligates himself to install and maintain the encroaching facility in such safe and proper condition that it will not interfere with or endanger travel upon said highway, nor obstruct nor interfere with the proper maintenance thereof, to reimburse the party of the first part for the cost incurred for any repairs or maintenance to its roadways and structures necessary due to the installation and existence of the facilities of the party of the second part, and if at any time the party of the first part shall require the removal of or changes in the location of the said facilities, that the said party of the second part binds himself, his successors and assigns, to promptly remove or alter the said facilities, in order to conform to the said requirement, without any cost to the party of the first part.

That the party of the second part agrees to provide during construction and any subsequent maintenance proper signs, signal lights, flagmen and other warning devices for the protection of traffic in conformance with the latest Manual on Uniform Traffic Control Devices for Streets and Highways and Amendments or Supplements thereto. Information as to the above rules and regulations may be obtained from the Division Engineer of the party of the first part.

That the party of the second part hereby agrees to indemnify and save harmless the party of the first part from all damages and claims for damage that may arise by reason of the installation and maintenance of this encroachment.

It is clearly understood by the party of the second part that the party of the first part will assume no responsibility for any damage that may be caused to such facilities, within the highway rights of way limits, in carrying out its construction and maintenance operations.

That the party of the second part agrees to restore all areas disturbed during installation and maintenance to the satisfaction of the Division Engineer of the party of the first part. The party of the second part agrees to exercise every reasonable precaution during construction and maintenance to prevent eroding of soil; silting or pollution of rivers, streams, lakes, reservoirs, other water impoundments, ground surfaces or other property; or pollution of the air. There shall be compliance with applicable rules and regulations of the North Carolina Division of Environmental Management, North Carolina Sedimentation Control Commission, and with ordinances and regulations of various counties, municipalities and other official agencies relating to pollution prevention and control. When any installation or maintenance operation disturbs the ground surface and existing ground cover, the party of the second part agrees to remove and replace the sod or otherwise reestablish the grass cover to meet the satisfaction of the Division Engineer of the party of the first part.

That the party of the second part agrees to assume the actual cost of any inspection of the work considered to be necessary by the Division Engineer of the party of the first part.

That the party of the second part agrees to have available at the encroaching site, at all times during construction, a copy of this agreement showing evidence of approval by the party of the first part. The party of the first part reserves the right to stop all work unless evidence of approval can be shown.

Provided the work contained in this agreement is being performed on a completed highway open to traffic; the party of the second part agrees to give written notice to the Division Engineer of the party of the first part when all work contained herein has been completed. Unless specifically requested by the party of the first part, written notice of completion of work on highway projects under construction will not be required.

That in the case of noncompliance with the terms of this agreement by the party of the second part, the party of the first part reserves the right to stop all work until the facility has been brought into compliance or removed from the right of way at no cost to the party of the first part.

That it is agreed by both parties that this agreement shall become void if actual construction of the work contemplated herein is not begun within one (1) year from the date of authorization by the party of the first part unless written waiver is secured by the party of the second part from the party of the first part.

R/W (161A) : Party of the Second Part certifies that this agreement is true and accurate copy of the form R/W (161A) incorporating all revisions to date.

IN WITNESS WHEREOF, each of the parties to this agreement has caused the same to be executed the day and year first above written.

DEPARTMENT OF TRANSPORTATION

BY: _____
DIVISION ENGINEER

ATTEST OR WITNESS:

Carole W. Thompson

Carole W. Thompson

TFP, LLC

DOUGLAS A. TWIDDY

Second Party

INSTRUCTIONS

When the applicant is a corporation or a municipality, this agreement must have the corporate seal and be attested by the corporation secretary or by the empowered city official, unless a waiver of corporate seal and attestation by the secretary or by the empowered City official is on file in the Raleigh office of the State Utilities Manager. In the space provided in this agreement for execution, the name of the corporation or municipality shall be typed above the name, and title of all persons signing the agreement should be typed directly below their signature.

When the applicant is not a corporation, then his signature must be witnessed by one person. The address should be included in this agreement and the names of all persons signing the agreement should be typed directly below their signature.

This agreement must be accompanied, in the form of an attachment, by plans or drawings showing the following applicable information:

1. All roadways and ramps.
2. Right of way lines and where applicable, the control of access lines.
3. Location of the proposed encroachment.
4. Length and type of encroachment.
5. Location by highway survey station number. If station number cannot be obtained, location should be shown by distance from some identifiable point, such as a bridge, road, intersection, etc. (To assist in preparation of the encroachment plan, the Department's roadway plans may be seen at the various Highway Division Offices, or at the Raleigh office.)
6. Drainage structures or bridges if affected by encroachment.
7. Typical section indicating the pavement design and width, and the slopes, widths and details for either a curb and gutter or a shoulder and ditch section, whichever is applicable.
8. Horizontal alignment indicating general curve data, where applicable.
9. Vertical alignment indicated by percent grade, P.I. station and vertical curve length, where applicable.
10. Amount of material to be removed and/or placed on NCDOT right of way, if applicable.
11. Cross-sections of all grading operations, indicating slope ratio and reference by station where applicable.
12. All pertinent drainage structures proposed. Include all hydraulic data, pipe sizes, structure details and other related information.
13. Erosion and sediment control.
14. Any special provisions or specifications as to the performance of the work or the method of construction that may be required by the Department must be shown on a separate sheet attached to encroachment agreement provided that such information cannot be shown on plans or drawings.
15. The Department's Division Engineer should be given notice by the applicant prior to actual starting of installation included in this agreement.
16. Method of handling traffic during construction where applicable.
17. Scale of plans, north arrow, etc.